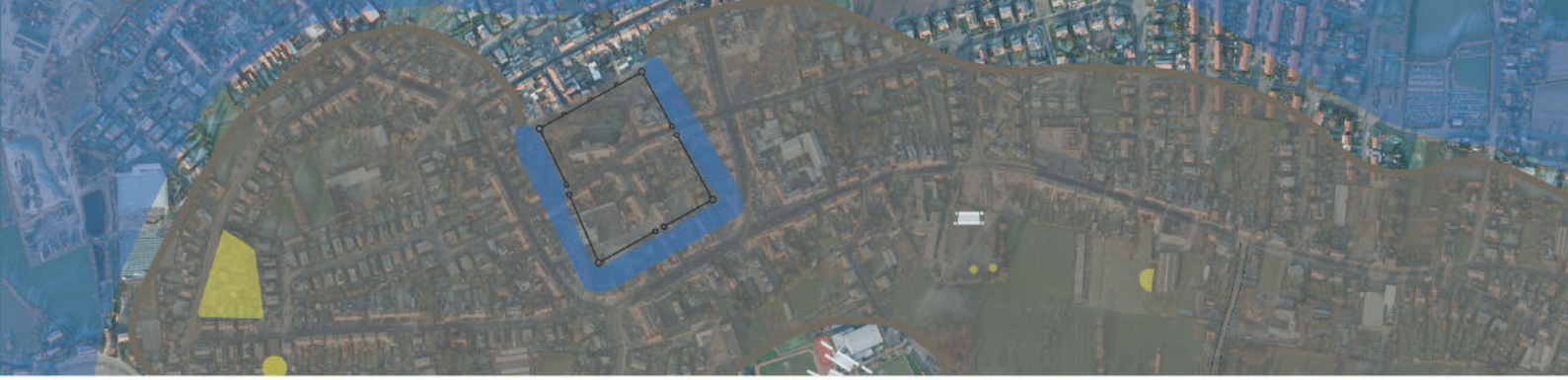

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Volume II: The material culture of the south-west corner site

S. VANHOUTTE (ED.)

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Contents Volume II

1. The pottery

A. Imported fine wares

1. Samian wares

Sofie Vanhoutte, Wim De Clercq and Johan Deschieter

1. Introduction to the samian assemblage

During the 2001-2005 excavations at the south-west corner of the Oudenburg fort, 8972 samian fragments were collected[1]. This amount of material represents one of the largest quantities of samian found in the coastal region of northern Gaul. The more or less continuous occupation at the Oudenburg fort into the late Roman period allows us to interpret the evolution of the samian ware supply to this military site and to gain insight into its use in this remote, North Gaulish region. Samian studies for the 3rd and 4th centuries in the North of Gaul are indeed not well represented and comprehensive, in-depth analyses of all samian wares, especially within a contextual framework, are lacking for military and civil sites along the North Sea and Channel coast and in the hinterland. Because of the high rate of unidentifiable coins at the Oudenburg site (see Chapter 2 in this volume), the samian pottery provides a very relevant alternative for a better understanding of the chronology of the fort occupation.

This samian study is the result of a labour-intensive collaboration between the authors (cf. also Vanhoutte *et al.* 2013a; 2013b). We are most grateful to Dr. Lothar Bakker (Römisches Museum Augsburg), Wim Dijkman (Centre Céramique, Maastricht) and prof. em. dr. Paul Van Ossel (Université Paris Nanterre) who took on the identifications of the late Argonne sigillata with roller-stamped decoration, and to prof. em. dr. G. Raepsaet and prof. em. dr. M.-Th. Raepsaet-Charlier (both Université Libre de Bruxelles) who clarified the graffiti.

The samian was studied first of all within its role as a provider of pure quantitative data, yielding relative proportions of different fabrics, types, functional groups, potter stamps, decorations and graffiti. In relation to this, the samian study also investigated the quality and residuality of the finds. Secondly the samian's potential was explored within a wider site-related and regional perspective.

First, the methodology of the study and the general presentation and appearance of the material is described, followed by the general aspects of the spatial distribution of the samian. Subsequently, an overview of the represented fabrics and their characteristics is given. After a general overview of the functions represented by the samian, the plain wares are discussed in detail, ordered first by function, then by type, both in relation to their fabrics. The analysis of the samian stamps is followed by the study of the decorations, first the mid-Roman, then the late Roman decorated bowls. After this analysis integrating form, type and fabric, the distribution and chronology of the samian assemblage according to the stratified evidence is

1 **North Gaulish samian derivatives are included. Although these products display a fabric and a surface layer clearly distinguishable from the classical samian products, their typology demonstrates that they should be considered in the same tradition, being the successors of the traditional samian wares. In contrast, the British samian imitations like the Oxfordshire and Much Hadham products were not included in this study. Their technique fits in with that of the colour-coated wares and although their typology is often related to that of the samian wares through imitating several forms, it also shows a different repertoire and should therefore be considered as a separate group (Brulet *et al.* (réd.) 2010, 264-266 however refer to these British wares as sigillata productions).**

Table 1.1. Fabric codes of the samian occurring at the Oudenburg fort, in alphabetical order.

ARG SA	Argonne samian
BLW SA	Blickweiler samian
CG SA	Central Gaulish samian
EG SA	East Gaulish samian
LEZ SA	Lezoux samian
LG SA	La Graufesenque samian
LMV SA	Les Martres-de-Veyre samian
MAD SA	La Madeleine samian
NOG SA	North Gaulish samian
RHZ SA	Rheinzabern samian
SG SA	South Gaulish samian
TRI SA	Trier samian

discussed. After a general description of the samian found at the Roman level, detailed studies of samian key context assemblages respectively follow for each fort level. Subsequently a closer look is given to the reparations, re-uses and to the graffiti. Finally, an attempt is made to draw conclusions concerning the supply of the samian wares to the Oudenburg fort and the significance of this supply within the broader context of the North Sea and Channel region. To enable this, the results from the Oudenburg fort are confronted with data known from other sites in the region.

Catalogues of the stamps and decorations accompany this analysis text; they form respectively Section 14 and Section 15 of this chapter. When discussing identifications and datings of stamps and decorations, we refer to these catalogues in order to avoid unnecessary repetitions.

2. Methodology and general presentation

Before a detailed inventory was initiated, all fragments were subjected to an intensive puzzling process in order to distinguish a maximum of cross joining sherds[2] and therefore the minimum number of individuals. First, the samian sherds were grouped into fabrics. Fresh breaks were systematically observed under the binocular microscope (X10-40) and compared to the Tomber and Dore (1998) and Bird (1993) fabric descriptions. The Tomber and Dore codes were used for the main fabric groups; where possible subgroups were identified according to the fabrics described by Brulet *et al.* (2010). A new code was created for the North Gaulish fabric, NOG SA, using the same coding system as Tomber and Dore with characters 1-3 indicating the source area (Table 1.1).

Once the potsherds were divided into fabrics, they were quantified using different approaches: sherd count, minimum number of individuals (MNI) and estimated vessel equivalent (EVE). Sherd count is the simplest quantification method and has been proven as reliable as other methods of pottery quantification commonly in use (Symonds and Haynes 2007). In this case all individual sherds were counted regardless of the number of joining sherds identified (except for recent breaks; these were not counted). The MNI was estimated by separating the sherds into groups representing individual vessels; by definition this quantification method is based on fabric and type. Therefore, this calculation was primarily based on rim sherds. For specific vessel types, bases and distinctive body sherds were considered in defining individuals as well. As for the Drag. 37 bowls and the Chenet 320 bowls, respectively the decorated freeze fragments and the roller stamps were taken as primary criteria. After the rim diameter of the rim sherds was defined, also the EVE (based on the percentage of rim preserved) could be calculated[3]. This quantification method, very popular in Britain but hardly used on the Continent, does not explicit how many individuals the assemblage comprises (cf. Orton *et al.* 1993, 168-169, 172), but shows its value in a comparative analysis. The EVEs also give insight into the fragmentation degree of the assemblage; the smaller the EVE, the higher the fragmentation. Biases of each quantification method (cf. Symonds and Haynes 2007[4]), can be partly compensated by the comparison of their results. Since the calculation of the EVEs only yields restricted information on the actual size of groups, this quantification method has only been used in a limited way in the analysis.

For the classification of vessels, primarily the Dragendorff (1895) typology was used, complemented by some Curle (1911) types. The main Drag. types in the Rheinzabern pottery have their equivalents in the Ludowici repertoire (Ludowici 1908/1912); some specific types of dishes, bowls and beakers however are only known as Ludowici types. A few other forms were characteristic at the Niederbieber fort (Oelmann 1914). One dish only knows its specific parallel in the Gose (1950) typology, another in the Walters (1908) typology. One cup is defined as a Vertet (1972) (Ve) type dish; one dish is attributed to the Bet repertoire of Lezoux (Bet *et al.* 1989; Bet and Delor 2000). Two Drag. 46 cups can be specified according to the typology of Oswald and Price (1920) (O&P). Several beaker types are defined according to the Déchelette (1904) typology. The kantharos fragments were identified in accordance to Thomas (2001). Some 3rd-century East Gaulish vessels are recognized as types defined at the 'Massenfund' site at Trier (Huld-Zetsche 1971). The late Roman samian forms find their types mainly in the Chenet (1941) repertoire, complemented by a type only defined by Brulet (1990b), a type encountered at Alzey (Unverzagt 1916) and a characteristic profile from Mareuil (Bet and Delage 2008) and one from Trier (Hussong and Cüppers 1972).

A representative selection of the samian vessels is illustrated; for well-represented types this selection has been kept rather large since it was found important to show the range of variations in rim profiles and rim diameters (Plates XLVII-CXXIX). The samian is

2 I would like to thank especially Norbert Clarysse, technical assistant at the Flanders Heritage Agency who helped with the puzzling of the fragments and who checked the complete collection very systematically and with great care in order to maximize the number of cross joins.

3 The EVE was only listed when the rim diameter, precisely or approximately, could be defined which implies that the sum of the EVEs is an underestimation.

4 Symonds and Haynes (2007) list the advantages and disadvantages of each quantification method currently in use in Britain and on the Continent, but do not come to a comparative evaluation of the different quantification methods.

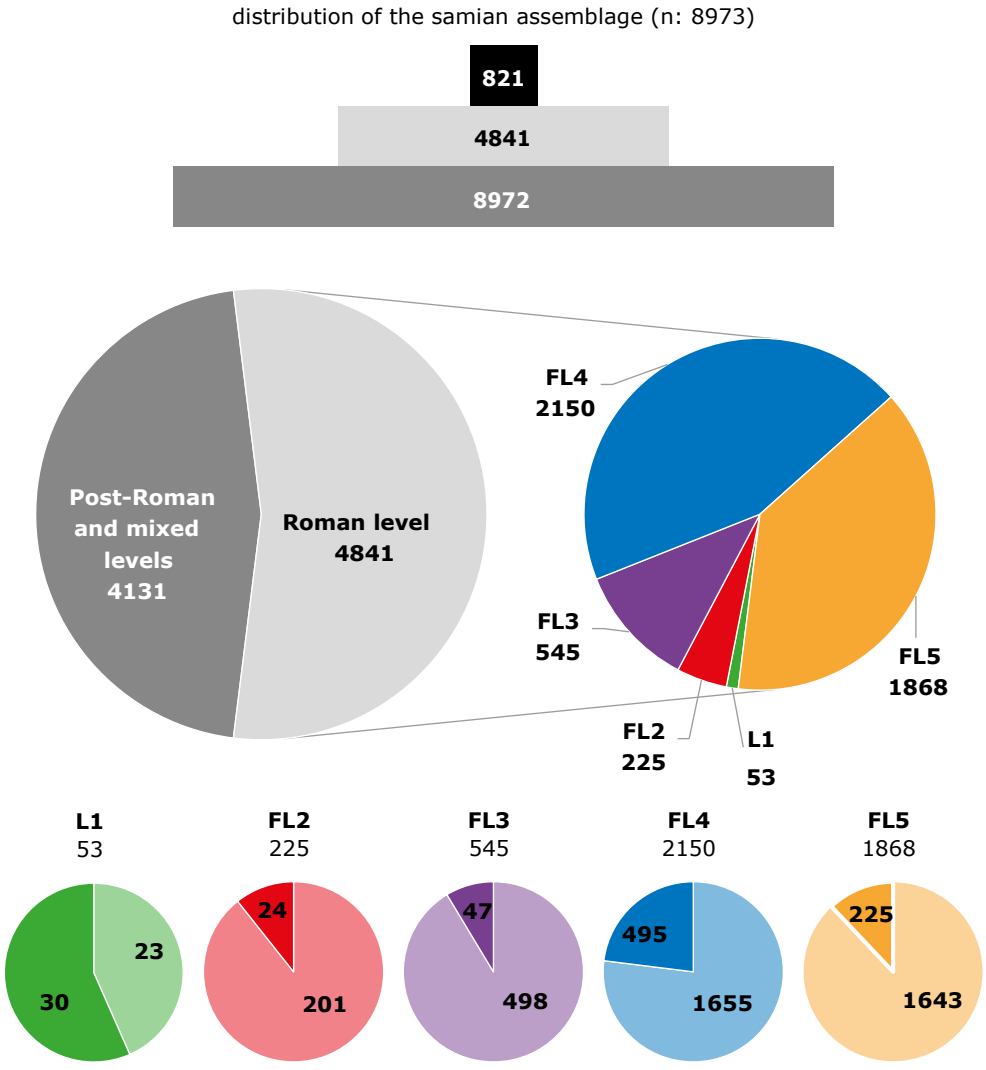

Figure 1.1. Visualization of the proportions of samian at the south-west corner site: the total number of 8972 samian fragments of the site versus the 4841 samian fragments recovered from the Roman level (and related to the different (fort) levels) versus the 821 samian fragments as part of contextually, quantitatively and qualitatively reliable assemblages (which are presented in the lower row versus the other fragments of the respective (fort) levels).

shown according to form and type, furthermore divided by fabric. First, complete vessel profiles are represented followed by rim profiles classified according to the size of their rim diameter, from small to large. Only rims with an EVE of at least 10% are retained; rims with a smaller EVE are only shown when they yield additional information. When representative, bases and specific decorated body sherds have been added.

3. General aspects of spatial distribution

3.1 The samian in the Roman and post-Roman levels

In total 4841 samian sherds were, based on the stratified evidence, related to the Roman structures *in situ* (Figure 1.1) (or 4132 records; 54% of the total amount of 8972 samian sherds)[5] [6], representing 1619 rims, 2564 body sherds and 658 bases or base fragments; 43 complete profiles were counted. These fragments were recovered from a wide spectrum of features, such as waste-pits, ditches, gullies, construction slots, wells, floor levels and levelling, occupation and destruction layers. When the samian of the Roman level is considered as one assemblage, this large amount can be reduced to a minimum number of 1151 individuals for the Roman level. The MNI quantification method however implies that the subgrouping of an assemblage into phases results in a recalculation of the MNI (cf. Symonds and Haynes 2007, 69). Therefore, the sum of the MNIs of the respective levels is higher than the total MNI of the assemblage studied in its totality. When the samian fragments and the definition of the MNI are considered per level, the sum of the MNIs per level concludes to a total of 1493 individuals. The sum of the EVEs, regardless their fabric, form or type, concludes to a total of 120.91, pointing to a high degree of fragmentation of most of the material. The quality of the samian is very diverse and unequal: very well-preserved versus very abraded, complete profiles versus very fragmented material.

5 Included are 29 fragments deriving from the post-Roman or from a mixed level but cross joining with a fragment from the Roman level.

6 For the benefit of a more practical processing of the data and for a better understanding of trends, it was chosen to include fragments from mixed levels to the latest level in question (*e.g.* a fragment from a level '1 or 2' is added to 'general level 2'). The same approach was used in the study of the other pottery categories.

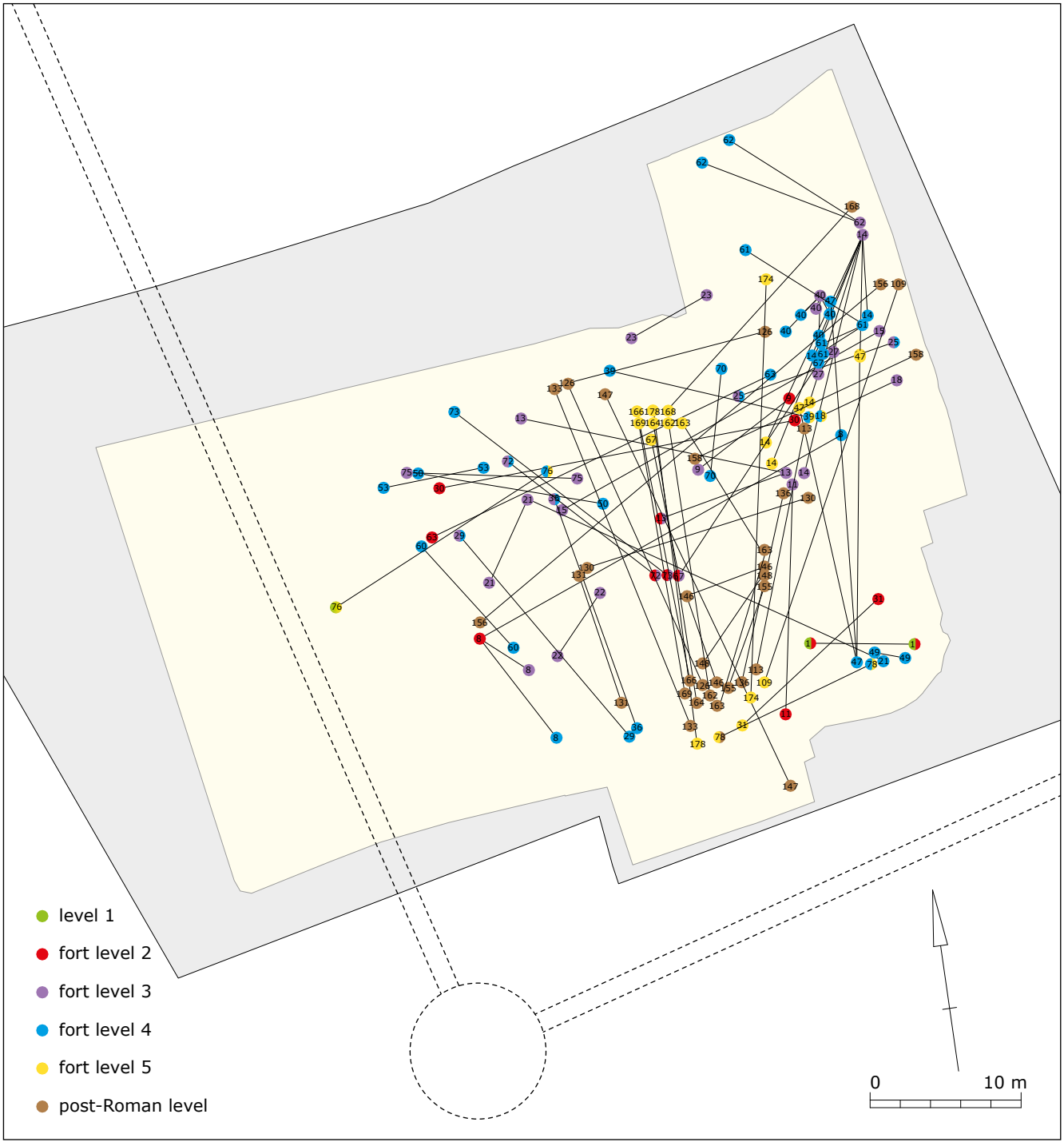

Figure 1.2. Visualization of the lateral cross joining samian fragments stretching over a distance of at least 2 m.

The remaining 4131 samian fragments (or 46% of the total samian) belong to the post-Roman features, the dark earth covering the site and the transition levels that are mixed with dark earth material (Figure 1.1). These sherds can be considered as residual. Very noticeable is that 90.25% of all pottery recovered from the medieval dark earth consists of Roman ceramics. Within the latter, 11.7% is samian ware, illustrating the phenomenon of the on-site residuality. As already discussed, the dark earth covering the Roman site undoubtedly consists of earth brought in from outside the fort. The samian from this level, covering the 1st to 4th centuries, therefore not only reflects the military occupation but presumably also, and maybe even largely, the civil occupation surrounding the fort. Since so far it is unclear where this material originates from and since it is therefore uncertain which occupation it represents, it was decided not to integrate this samian portion in the present detailed study and to focus on clarifying the evolution of the samian of the

military occupation. However, the residual samian material was considered in the puzzling process in order to investigate residuality of the samian of the Roman level of this location within the post-Roman level.

An exception was made for the Argonne roller-stamped sigillata which have been studied in their totality. Since these were only produced from *c.* AD 320 onwards and as the extramural occupation appears to have ceased in the late 3rd century AD, all Argonne roller-stamped sigillata are related to the military occupation at Oudenburg.

3.2 Residuality in the Roman level

An important degree of residuality manifests itself also within the Roman level. One of the key indicators are the different cross joins attested during the reconstruction of samian pottery individuals, directly visible when cross joining fragments covering a distance of more than a few metres are plotted on the site map (Figure 1.2). Several fragments are scattered over different chronological levels, obviously the result of a long-lasting occupation and related building activities with associated soil interventions. Attention to this aspect of samian intra-site circulation has already been drawn by Wallace (2006, with references to various German studies). The dispersion of samian fragments not only occurred vertically but also horizontally which might partly be the result of cleaning up the area from refuse or waste accumulations. In his study on the nature of the incidence of samian at British sites, Willis acknowledged the often high degree of residuality on sites. He however points to the pitfalls when studying samian wares. Samian often had a longer life-span than other pottery categories; they were looked after and were often even curated, which sometimes makes it difficult to distinguish the longer surviving vessels and the truly residual, dug-up pieces (Willis 2005, Chapter 5.7). Through the mapping of pottery cross joins at the Oudenburg fort, the high degree of these truly residual, dug-up pieces is demonstrated and visualized.

With these previous aspects in mind, to consider the samian assemblage as representative for the specific fort level in which it has been found, should be treated with much caution (as should also be the case for the other find categories). As a result, a valuable dating of the different fort levels has to rely on a selection of smaller but contextually firm key assemblages in which the residual factor can be recognized.

Table 1.2. Proportional distribution of the represented samian fabrics in the Roman level, based on sherd count, MNI and EVE.

SAMIAN FABRICS	n	%n	MNI	%MNI	EVE	%EVE
LG SA	21	0.4	12	1.0	0.13	0.1
LMV SA	11	0.2	5	0.4	0.58	0.5
LEZ SA	365	7.5	95	8.3	10.17	8.4
CG SA	13	0.3	5	0.4	0.00	0.0
MAD SA	4	0.1	3	0.3	0.00	0.0
ARG SA	618	12.8	209	18.2	17.90	14.8
BLW SA	1	0.0	1	0.1	0.00	0.0
TRI SA	980	20.2	257	22.3	27.57	22.8
RHZ SA	1383	28.6	326	28.3	35.98	29.8
EG	47	1.0	12	1.0	1.54	1.3
NOG SA	269	5.6	70	6.1	7.01	5.8
undet.	7	0.1	0	0.0	0.00	0.0
burnt	1122	23.2	156	13.6	20.05	16.6
TOTAL	**4841**	**100.0**	**1151**	**100.0**	**120.91**	**100.0**

4. The production centres and their fabrics

4.1 The distribution of the samian fabrics in the Roman level

Several samian pottery fabrics were identified (Table 1.1). The fabric of a large number of sherds could not be determined since they were heavily burnt (1122 fragments or no less than 23.2% of the total sherd count; 156 MNI or 13.6% of the total MNI) or there was uncertainty as to the nature of their inclusions (seven fragments).

The general distribution of the fabrics of the 1151 recorded individuals reveals the predominance of the East Gaulish material pointing to the importance of the 3rd-century samian import at the site (Tables 1.2-1.3; Figure 1.3: top). With a minimum number of 808 individual vessels the amount of East Gaulish material runs up to 70.2 % of the total assemblage, this is when the productions of Argonne (both the mid- and the late-Roman component) and La Madeleine – together good for 18.4% MNI of the total assemblage – are included. Tableware from Chémery-Faulquemont was not recognized at the south-west corner site, although one Drag. 37 bowl fragment at the north-east fort site (Kapellestraat-site ET24) could be attributed to Satto (Vanhoutte *et al*. 2014, 209).

SAMIAN FABRIC GROUPS	n	%n	MNI	%MNI	EVE	%EVE
South Gaulish samian	21	0.4	12	1.0	0.13	0.11
Central Gaulish samian (LEZ/LMV/CG SA)	389	8.0	105	9.1	10.75	8.89
North-East Gaulish samian (MAD/ARG SA)	622	12.8	212	18.4	17.90	14.80
East Gaulish samian (BLW /TRI/RHZ/EG SA)	2411	49.8	596	51.8	65.09	53.83
North Gaulish samian (NOG SA)	269	5.6	70	6.1	7.01	5.79
undet.	1129	23.3	156	13.6	20.05	16.58
TOTAL	**4841**	**100.0**	**1151**	**100.0**	**120.91**	**100.00**

Table 1.3. Proportional distribution of the regional samian fabric groups in the Roman level, based on sherd count, MNI and EVE.

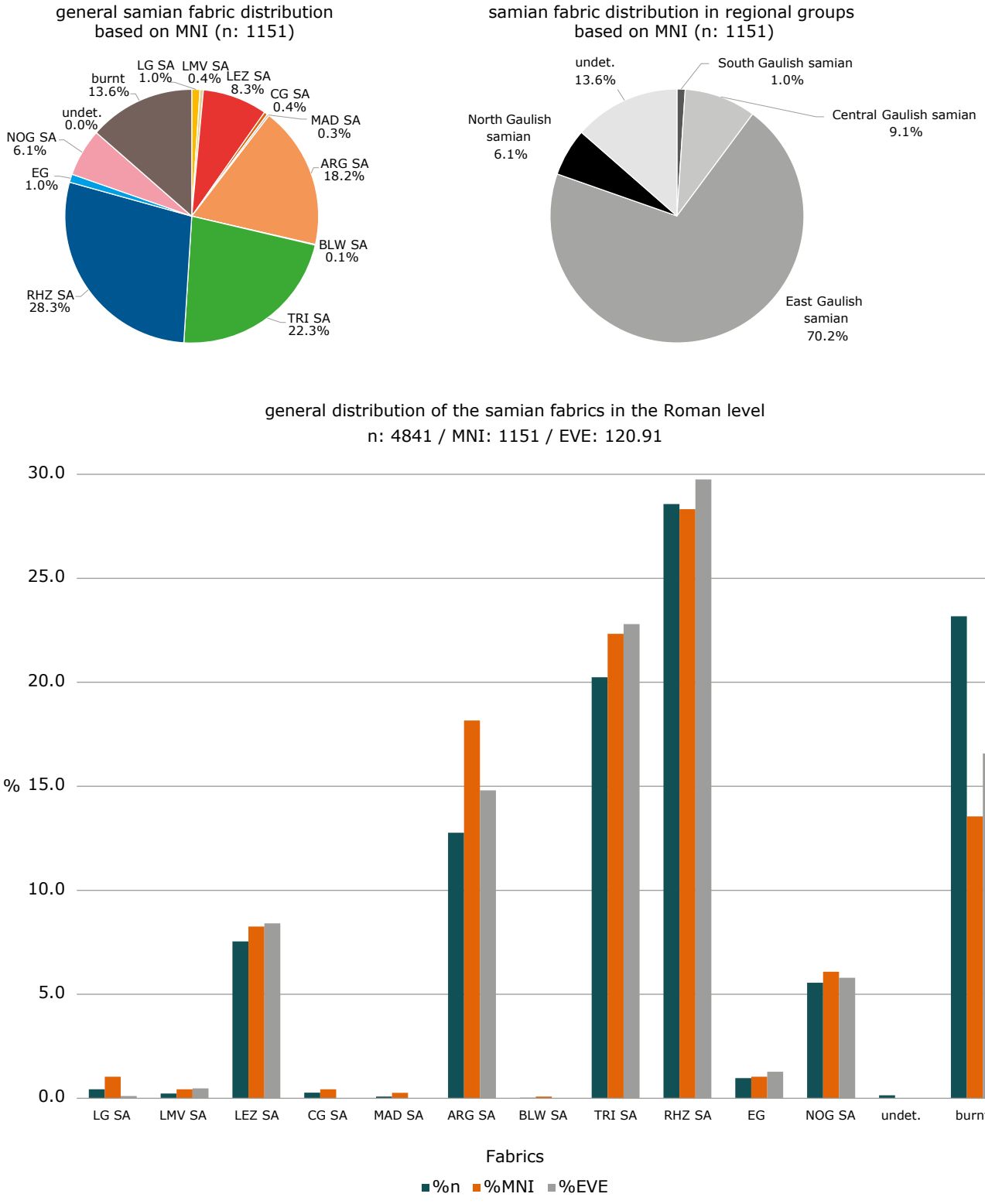

Figure 1.3. Top: proportional distribution of the individual samian fabrics (to the left) and the regional samian fabric groups (to the right) represented in the Roman level at the south-west corner site. Based on MNI. Below: general proportional distribution of the samian fabrics in the Roman level, based on sherd counts, MNI and EVE.

The East Gaulish predominance is largely generated by the products of Rheinzabern[7] with 40.3% and Trier with 31.8% seen in comparison to the East Gaulish MNI total, respectively 28.3% and 22.3% of the total MNI.

The distribution of the samian fabrics in the Roman level has been calculated based on sherd count, MNI and EVE. As shown in the graph, their percentages conclude to very similar conclusions in fabric distribution (Figure 1.3: below). Apart from these proportional data, two important conclusions can be drawn. First, regardless the quantification method used, the respective fabrics show the same share and similar interrelationships within the totality of the assemblage. This is rather remarkable, since the MNI quantification is by definition based on fabric and type, while the EVE quantification is a generalising method, independent of type and fabric. Although the EVE percentages show the same results as the MNI and sherd count percentages, they are less valuable as counts *an sich*; according to the sum of the EVEs (120.91), this assemblage only comprises at least 121 individuals. Secondly, as the EVEs implicitly indicate the degree of fragmentation (the smaller the EVE, the higher the fragmentation) and with the EVEs following the same pattern as the MNI, one can conclude from the graph to a similar degree of fragmentation for the totality of the assemblage. Subsequently, this implies that – in average – all pottery has undergone similar disposal and postdepositional processes. With the preceding conclusions, it is important to bear in mind the size of the represented dataset. The fact that the correlation in the patterns shown by the three quantification methods is so clear, is largely due to the high numbers the samian ware represents.

While the general patterns and interrelationships shown by the sherd count, MNI and EVE percentages are similar, small deviations can be noticed. The Argonne fabric is characterized by a higher MNI percentage than the sherd count percentage, while the EVE percentage is in-between. This points to a fragmentation degree of the Argonne vessels that is slightly lower than for the other fabrics. This may partly be due to the hardness of the Argonne fabric, but can also partly be explained on a functional level: of the mortaria, the most robust samian vessel in the assemblage and thus the less breakable, 26.8% was made in Argonne fabric (mid-Roman or late Roman). A considerable difference in the percentages can also be noticed for the burnt vessels, with many fragments for less EVEs and even fewer MNI. This can be explained by the nature of this group: burnt material is often more fragmented. Moreover, this group contains less rim or other diagnostic fragments since these could often, despite their burning, be assigned to a specific fabric (*e.g.* typical North Gaulish vessel forms, roller-stamped Argonne fragments). This results in a lower MNI for the undetermined burnt group comprising more body fragments in comparison to other fabric groups.

4.2 Trier

When the total assemblage is considered, Trier samian accounts for 20.2% of the fragments, 22.3% of the MNI and 27.57% of the EVEs; the latter indicates a slightly lower degree of fragmentation than the other wares (Table 1.2).

Trier produced samian from *c.* AD 130 until at least AD 275 (Cüppers 1990, 629-630; Vilvorder, in Brulet *et al.* 2010, 193). Frey (2000) believes that while the production of mould-decorated forms in Rheinzabern stopped around AD 260, the Trier workshops were still producing Drag. 37s at that time, probably until the end of the 3rd century.

Within the Oudenburg Trier group (TRI SA) three different fabrics could be discerned (Figure 1.4). Generally, these are characterized by abundant ill-sorted limestone, common black iron-rich grains and sparse fine silver mica (Tomber and Dore 1998, 41).

Fabric 'TRI SA A' stands for the classic red fabric containing a high density of limestone inclusions. Stamps on plain vessels in this fabric found at the south-west fort site are identified as Iucundus v (SS20), Elenius i (SS19), Patruinus ii (SS24) and Dessius (SS17). Decorated vessels in this fabric are attributed to Werkstatt I (DS43), Werkstatt II 'spätere Ausformung' (DS49), Comitialis (DS 64) and Afer (DS68). The identified potters represent a wide chronological range from the Antonine period to the middle of the 3rd century.

Fabric 'TRI SA B' represents a very pale, white to yellowish-cream coloured fabric with abundant to very abundant limestone inclusions (up to 1 mm), with a smooth fracture and a surface covered with a pale, dull orange-red poor quality slip. This fabric is very similar to the mid-3rd-century Trier fabric as defined by Bird (1986; 1993, 2) and by Huld-Zetsche (1971, 22, 85) for the Trier 'Massenfund'. This pale fabric seems different to the fabrics of the very latest Trier productions, an industry fading-out between AD 260-300, and described by Frey based on finds in Borg (Frey 2001, 43-44; 2000, 213-214). At Borg the latest Trier vessels are characterized by a dark-red to brown-orange coloured fabric. Stamps on plain vessels in the fabric TRI SA B found at the south-west corner site are identified as Drucaursus (SS18), Atilido (SS14); also one line-stamped vessel displayed the TRI SA B fabric (SS90). Decorated vessels in this fabric are recognized as Werkstatt II 'spätere Ausformung' (DS46, 47, 48), Maiiaaus? or related potter (DS51-53), Censor-Dexter (DS58), Afer, Dubitus-Dubitatus or Paternianus (DS75) and Primanus (DS76). All these potters can be dated from the later 2nd century onwards. When the Trier fabric could be specified, the TRI SA B fabric occurs twice as much as TRI SA A.

A third fabric 'TRI SA C' is characterized by many limestone inclusions, large ovoid or straight voids, fragments of quartz, some silver coloured mica and a fairly high density of black inclusions, possibly iron oxides. This fabric was only attested at five individuals and is represented by a stamp of Minutus (SS22) and a decorated Drag. 37 by Censor-Dexter (DS55).

Only one samian vessel at the Oudenburg fort site probably belonged to the late Roman Trier samian production. It concerns a decorated bowl of type Trier I, 8b, however, found completely burnt.

7 **The authors are well-aware of the location of Rheinzabern in *Germania Superior* but follows the wide-spread common attribution of this workshop to the East Gaulish group (see *e.g.* Tomber and Dore 1998; Brulet *et al.* (réd.) 2010).**

C2635_LG SA_Drag. 29-X12

C2609_SS1_LEZ SA_Albucius-X15

C1811_LEZ SA_Sabinus-X15

C2903_DS19_MAD SA_Drag. 37_Ware mit Ererstab C-X12

C2457_SS10_ARG SA_Giamillus iii-X15

OS2562C005_SS11_ARG SA_ Libonus-X15

C1438_SS20_TRI SA A_Iucundus v-X12

C2156_SS24_TRI SA A_Patruinus ii-X12

OS4980C008_SS14_TRI SA B_ Atilido-X12

C2102_SS18_TRI SA B_ Drucaursus-X15

C2659_TRI SA B_Drag. 45 with Fledermaus-X15

C2873_SS22_TRI SA C_Minutus-X12

Figure 1.4. La Graufesenque, Lezoux, La Madeleine, Argonne and Trier A, B and C fabrics of vessels from the south-west corner site. Selection of samian sherds of which the fabric identification is secured by stamp or decoration. Photos through binocular, with magnification of *c.* x12 or x15.

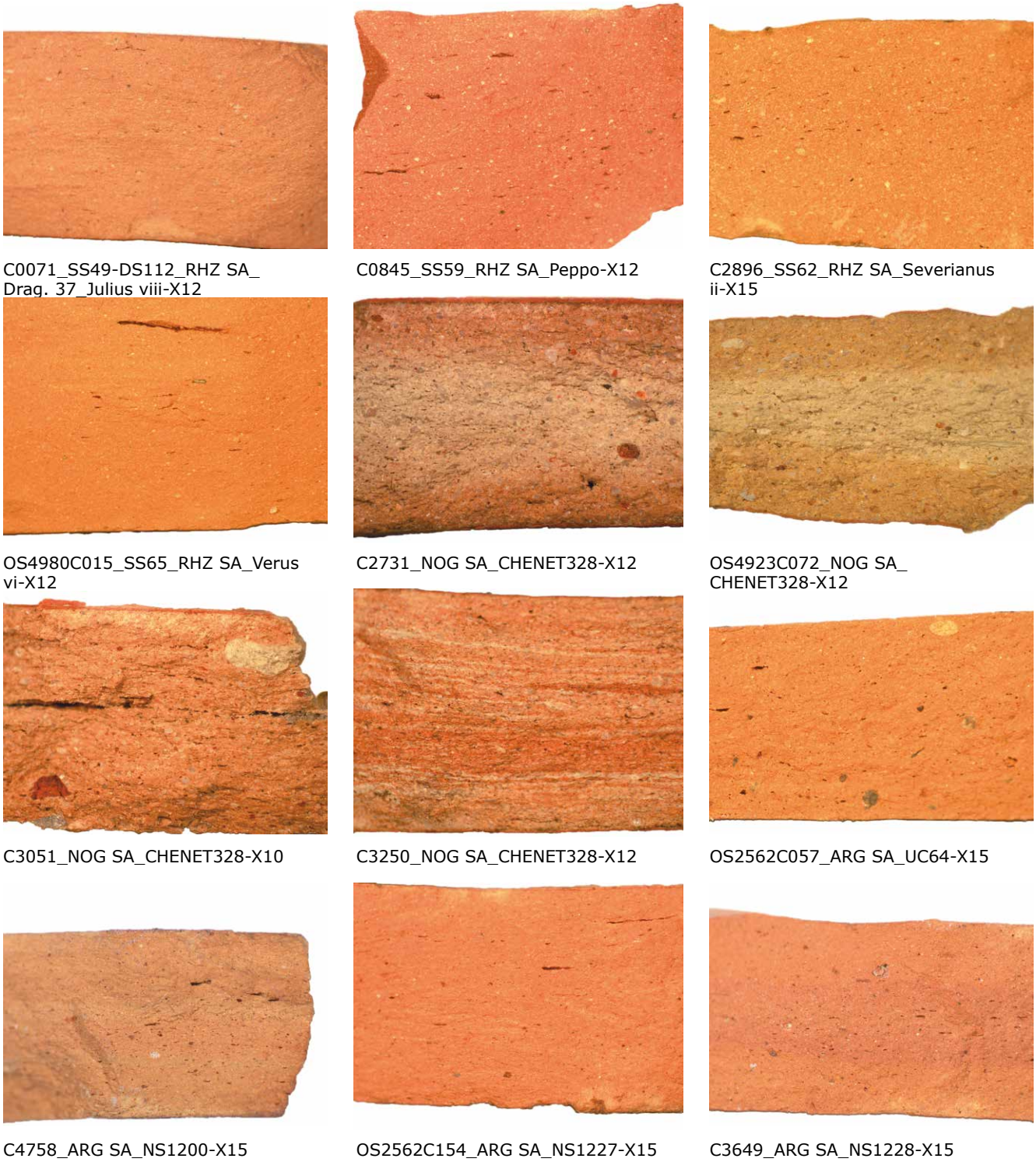

Figure 1.5. Rheinzabern, North Gaulish and late Argonne fabrics of vessels from the south-west corner site. Selection of samian sherds of which the fabric identification is secured by stamp, roller stamp, decoration or typical form. Photos through binocular, with magnification of *c.* x10, x12 or x15.

4.3 Rheinzabern

Within the samian assemblage, the Rheinzabern wares account for 28.6% of the fragments, 28.3% of the MNI and 29.8% when the EVEs are considered (Table 1.2).

It is generally accepted that the Rheinzabern workshops produced and exported samian on a large scale from the middle of the 2nd century until *c.* AD 260/270. The loss of a large market to the right of the Rhine due to the invasions by the Alamanni and the incursions of Germanic tribes over the Rhine had its repercussions on the pottery business and resulted in the cessation of the production of mould-decorated forms. Samian wares were still produced in the late 3rd and first half of the 4th century, but not for long-trade export (Bittner 1986; Cüppers 1990, 534, 537; Delage in Brulet *et al.* 2010, 188-190)[8].

The Rheinzabern fabrics (RHZ SA) present themselves as a fairly homogeneous group, with an orange-brown to orange-yellowish fabric containing moderate to abundant well-sorted limestone often showing central voids (<3 mm) with very few other inclusions (Tomber and Dore 1998, 39) (Figure 1.5). No clear differences could be discerned. The fabric seems close to Reuters' fabric 2-3 from the Regensburg-Grasgasse-group (*c.* AD 278-281) (Reuter 2005, 210-211) and appears similar to that recorded by Bird (1986, 144) at the mid-3rd-century London 'St. Magnus Ware House' site. The Rheinzabern products generally show a smooth, lustrous light-orange to orange-brown slip of good quality, but some vessels demonstrate a rather low quality with the slip not well applied. The latter remind one of the early 3rd-century samian from the London 'St. Magnus Ware House' site described by Bird (1986, 144), while she ascribed the glossy, better quality productions to the mid-3rd century (Bird 1993, 2).

4.4 Argonne

The Argonne ware (ARG SA) stands for 25.9% of the MNI of all East Gaulish wares or 18.2% of the total MNI (12.8% of the total sherd count; 14.8% of the EVEs) (Table 1.2); it represents both the 2nd-3rd century and the 4th-century productions which are not distinguishable in fabric (Figures 1.4-1.5).

The Argonne workshops of the High Empire produced for export from the middle of the 2nd century onwards and presumably continued to do so until around the middle of the 3rd century (Brulet in Brulet *et al.* 2010, 157), a wider date range than suggested by Chenet and Gaudron (1955, 211). However, Mitard *et al.* (1986) gave evidence from the Argonne kiln sites, demonstrating that at least some of the potteries continued to produce, mainly specialized in Drag. 45 mortaria (and as such covering the time-span until the beginning of the late Argonne productions).

The chronology of the late Argonne production is entirely based on the chronology of the roller stamps. A start date around AD 320 is generally accepted and the production continued until somewhere in the 5th century (Chenet 1941; Brulet in Brulet *et al.* 2010, 226).

The Argonne fabric is orange-yellow, sometimes with a slightly darker core, generally containing few visible inclusions (apart from the small translucent quartz grains) except for some larger, coloured quartz, sparse micas, limestones, foraminifers or iron oxides, all irregularly spread throughout the matrix (Figures 1.4-1.5) (for a petrographic description: see Brulet in Brulet *et al.* 2000, 223-224; Tomber and Dore 1998, 34). It is less smooth than TRI SA and RHZ SA and it sometimes has more limestone inclusions with foraminifers, which is the case for example with the stamped vessel Libonus of Lavoye (SS11) (Figure 1.4). The slip of the Argonne ware is smooth and lustrous orange-yellowish, of moderate to poor quality.

4.5 Other East Gaulish productions

The productions of La Madeleine (2nd quarter 2nd century – early? 3rd century AD), with a reddish, very micaceous and limestone-rich fabric (Vilvorder, in Brulet *et al.* 2010, 149; Tomber and Dore 1998, 38), are scarcely present with 3 MNI (0.3% of the total MNI) (Figure 1.4).

Only one individual from Blickweiler, with a fabric very rich in limestone (Tomber and Dore 1998, 35), could be recognized (DS42). At the north-east fort site (Kapellestraat-site ET24) the Blickweiler production equally only has one representative[9]. The export of Blickweiler products can generally be dated to AD 105-160 (Vilvorder, in Brulet *et al.* (réd.) 2010, 173).

4.6 The North Gaulish so-called 'derived' samian ware

A separate group, formed by 70 MNI or 6.1% of the total MNI, represents the later Roman so-called 'derived' samian ware. This ware was produced in Northern Gaul from the middle or the second half of the 3rd century onwards, mainly prevailing during the 4th century (Brulet *et al.* 2000), and was amply present at the sites of Arras and Bavay in Northern France and Tournai in the south of Belgium (Brulet *et al.* 1994). Although these Gaulish productions are *sensu stricto* technically and qualitatively not part of the 'classic' samian productions[10], ceramologists consider these as a further evolution of/from the samian. In the late Roman period they take over the role of the East Gaulish potteries with the exception of those of the Argonne. Only a few workshops are known so far: La Calotterie and Les Rues-des-Vignes in France and possibly Tournai in Belgium (Brulet *et al.* 2010, 271-279; 'DTS.BE-NO'). The North Gaulish derivatives at the south-west corner site generally display a pale cream fabric with a coarse matrix containing abundant quartz grains and iron oxides (Figure 1.5). In some cases a greyish core evolves to a more orange-brownish colour near the sherd surfaces.

8 **Production at Rheinzabern for local consumption continued however until *c.* AD 350 (Delage in Brulet *et al.* 2010, 190).**

9 **A base fragment of a dish or bowl revealed part of a stamp: SACI[, to be completed as SACIROF, which can be identified as 'die 2b' of the potter Saciro ii of Blickweiler, active in the period AD 125-160 (NOTS, vol. 8, 53; see for the context: Vanhoutte *et al.* 2014, 196, 198).**

10 **In this sense we should also refer to the British imports of which the typological repertoire was inspired by the samian forms such as the Oxfordshire, Much Hadham and Pevensey wares. Based on their affinity with the colour-coated wares, the authors decided to consider them as part of that pottery category.**

The surface of the bowls is covered with an orange to red-brown slip. The characteristics of most of the Oudenburg pottery fragments in question, as observed under the binocular, are very close to those of fabric B discussed by Brulet (2010e, 274-276; see also Brulet 1994) (DTS.BE-NOB). At least two sherds display the fabric C (DTS.BE-NOC) recognized at Tournai (Brulet 2010e, 276-277; see also Brulet 1994). Seven fragments (4 rims, 3 wall fragments: 4 MNI) can be distinguished as the by Brulet presumed Les Rues-des-Vignes productions (DTS.BE-RDV (Brulet 2010e, 277-279)). Of the North Gaulish assemblage, seventeen fragments – all rim fragments or body fragments with roller-stamped decoration – were analyzed by T. Delbey within the context of his doctoral research that focused on the identification of the origins of productions within the North Gaulish samian group (Delbey 2018; Delbey *et al.* 2013, 470). His study uses geochemical data retrieved by X-ray fluorescence (XRF) and petrographical and mineralogical analyses retrieved by X-ray diffraction (XRD), all considered in relation to the roller stamps present in the sample. The fabrics of the samples of Oudenburg appear to have a different chemical and mineralogical composition compared to the productions of the Argonne, Île-de-France, Normandy and Champagne. The Oudenburg fabrics show a clay rich in kaolinite most likely originating at the Wealden facies, which outcrops at the Boulonnais region in the North of France and the Mons Basin in Belgium. The potteries of Desvres, to the east of Boulogne-sur-Mer, are situated on such an outcrop of this clay formation and are a possible candidate for production, but further research is needed to confirm this. This North Gaulish assemblage of Oudenburg, identified as presumed Boulonnais productions, is similar to the group identified by Brulet (1994) as 'dérivées de sigillée du Nord-Ouest' and covers his fabrics B and C (see before) recognized under the binocular (Delbey 2018). As will be seen further, the NOG SA category only represents a very limited repertoire with the mortarium as its most frequent form.

One fragment of a collared bowl Carm. 5 (cf. Carmelez 1989) (not ill.) should be seen separately. Its fabric, recognized as DTS.HE-NE (Brulet 2010e, 269), assigns it as an isolated find of the mid-Roman sigillata derivative production likely originating from the region Bavay-Famars (cf. Brulet 2010e, 270).

4.7 The Central Gaulish productions

The Central Gaulish ware covers only 9.1% of all samian individuals retrieved from this fort sector (105 MNI) (Table 1.3), in first instance pointing to a rather low supply of samian in the 2nd century. Tableware from Les Martres-de-Veyre is very sparsely represented with only 5 MNI (0.4% of the total MNI). This production, of which the export can be dated between *c.* AD 90 and 160/170 (Delage 2010, 126-127; Terrisse 1968, 22), is characterized by a red, calcareous fabric with a very dense and well-fired clay matrix and a red, shiny slip (Tomber and Dore 1998, 30).

The Lezoux fabrics dominate the Central Gaulish assemblage with at least 90.5%[11] (95 MNI or 8.3% of the total MNI). Apart from two Drag. 37 bowl fragments (1 MNI) displaying the paler TS-LX3 fabric – both belong to level 1 of the earthen rampart at the south-west corner site –, all Lezoux vessels are in the TS-LX4 fabric defined by Delage (2010, 120-125). This fabric is dated to the maturity production at Lezoux (AD 140-240) which correlates with the potter stamps found on these vessels (SS1 to SS6: Albucius ii (AD 145-175); ?Carant-Don- (AD 160-200); Cintusmus I (AD 140-180); Magio i (AD 160-200); Pugnus ii (AD 135-165); Sabinus viii (AD 160-200)). This fabric is coloured pale red-brown and contains various ill-sorted inclusions among which are silver mica, moderate to abundant limestone and black to brown iron-rich grains (Tomber and Dore 1998, 32) (Figure 1.4). The vessels show a red-brown, glossy slip.

While the cessation of imports from Lezoux has generally long been dated to *c.* AD 190-200 (see *e.g.* Bird 1993, 1), Delage has evidenced a continuation of production until *c.* AD 240 (Delage 2010, 125), a date confirmed by King (2013, 123). In his study on the incidence of samian at British sites, Willis demonstrated that Lezoux samian appears frequently in 3rd-century (and later) deposits (see also Wallace 2006). Willis concluded that at some sites the Lezoux products are residual, but that at others it seems that a considerable number of Lezoux samian was still in use in the 3rd century (Willis 2004, Chapter 5.8.3).

The significant share of Lezoux products in the 3rd century at the Oudenburg fort (30.7% at fort level 2, 13.7% at fort level 3, both based on MNI), difficult to explain as totally residual material, seems to confirm that the Lezoux export to Oudenburg continued in the first half of the 3rd century.

4.8 The South Gaulish productions

Finally, the samian assemblage contains a negligible quantity of South Gaulish ware. These fragments, all identified as La Graufesenque productions, stand for 12 MNI or 1.0% of the total MNI (Table 1.2). The La Graufesenque fabric contains abundant, small limestone inclusions, sparse fine silver mica and rare, but very distinctive, elongate voids characteristic for the fabric (Tomber and Dore 1998, 28) (Figure 1.4). The fragments originating from La Graufesenque, of which the production is generally dated to *c.* AD 20-120 (Delage in Brulet *et al.* 2010, 71) are to be considered as residual finds dug up from civil settlement features predating the fort.

5. The functional spectrum of the samian at the Oudenburg fort

In terms of function (Table 1.4; Figure 1.6), the dishes/platters/shallow bowls dominate the spectrum with a MNI of 466; that is no less than 40.5% of the total MNI, which is not surprising for a peripheral fort area where the soldiers lived and worked. One can assume that every soldier had his own samian dish.

The second distinguishable group of recipients are the deep bowls (incl. the decorated bowls), accounting for at least 316 individuals in total, representing 27.5% of the total MNI. Within the assemblage of the deep bowls, the decorated ones (269 individuals) take up the largest proportion with 85.1% or 23.4% of the total MNI.

11 **Of some Central Gaulish vessels no further fabric identification was possible.**

Table 1.4. Functions versus fabrics in the samian of the Roman level at the south-west corner site.

functions in MNI	LG SA	LMV SA	LEZ SA	CG SA	MAD SA	ARG SA	BLW SA	TRI SA	RHZ SA	EG SA	NOG SA	BURNT	TOTAL	%MNI
BEAKER/VASE/JUG			1			7		5	13	1			**27**	**2.3**
KANTHAROS								1					**1**	**0.1**
BOTTLE								1				1	**2**	**0.2**
FLAGON									1				**1**	**0.1**
CUP	2	1	28	2		7		27	20	3		14	**104**	**9.0**
COLLARED BOWL		1	4	1		11		5	6	1	4	10	**43**	**3.7**
DECORATED BOWL	8	1	14		2	79	1	54	91	2	7	10	**269**	**23.4**
BOWL with BARBOTINE DEC.								1	3				**4**	**0.3**
DISH/SHALLOW BOWL	2	2	42	2	1	40		118	162	4		93	**466**	**40.5**
MORTARIUM			6			62		45	30	1	59	28	**231**	**20.1**
gritted dish						1							**1**	**0.1**
undetermined form						2							**2**	**0.2**
TOTAL	**12**	**5**	**95**	**5**	**3**	**209**	**1**	**257**	**326**	**12**	**70**	**156**	**1151**	**100.0**
TOTAL%	**1.0**	**0.4**	**8.3**	**0.4**	**0.3**	**18.2**	**0.1**	**22.3**	**28.3**	**1.0**	**6.1**	**13.6**	**100**	

Thereby, the decorated bowls account for 20.9% of the total MNI when only the mid-Roman samian is considered (213 MNI). The collared bowls, with 43 MNI, only represent 13.6% of the bowls assemblage, or 3.7% of the total MNI, while the East Gaulish bowls with barbotine freeze are scarcely present with only 4 MNI (1.3% of the MNI of the deep bowls).

The decorated bowls are followed in number by the mortaria, representing 231 individuals or 20.1% of the total MNI, and therefore particularly well-represented in the Oudenburg assemblage. The specific function of samian mortaria is still subject to debate. Several scholars consider these vessels as highly suited for the production of dairy products, like curds and whey, yoghurt, cheeses; others question this and point to a possible industrial or even ritual use (see Willis 2004, Section 8.4.4, with references). The large number of mortaria attested at the Oudenburg site may point to an evolution into a more multi-functional vessel (see further).

Another significant form in the samian vessel group at the south-west corner site are cups, accounting for 9.0% of the total MNI or 104 individuals. Beakers, vases and decorated jugs only represent a small assemblage with in total a minimum of 28 individuals, standing for a minority of 2.4% of the total vessel MNI. Represented in EVEs, the beakers only count for 5.65. Next to these main groups, the assemblage hardly contains any other forms. The kantharos, the bottle and the flagon are all forms to which only one individual can be assigned with certainty.

When only the mid-Roman assemblage (1020 MNI) is considered separately from the late Roman individuals, the main suppliers for samian ware to the Oudenburg fort were the Lezoux, Argonne, Trier and Rheinzabern potteries (Figure 1.7). In the case of the plain wares, the Lezoux and Argonne workshops represent respectively 10.0% and 14.9% of the supply, Trier and Rheinzabern dominate with respectively 25.2% and 29.1%, with a minor predominance for the Rheinzabern potters (Figure 1.7: left). A slightly different image is offered by the mid-Roman decorated wares (Figure 1.7: right). Although the East Gaulish potteries take the lead again, the Rheinzabern workshops are now prevailing in the supply of decorated wares. While Lezoux and Argonne count for respectively 6.6% and 13.1% of the MNI of the decorated wares, Trier now represents 25.4% and Rheinzabern no less than 42.7% of the decorated vessels.

The most common plain forms in the Oudenburg samian assemblage are the dishes Drag. 36 and 31, the cup Drag. 33 and the mortarium Drag. 45, an assemblage pointing mainly to the 3rd century. Bird (1993, 8) demonstrated that the Drag. 31, 33 and 45 vessels were the most common East Gaulish plain forms in *Britannia.*

The samian spectrum at the Oudenburg fort, especially for the 3rd century characterized by a wide variety in forms, fits in well with general patterns observed at military sites. Willis (2005; 2011) demonstrated that at military sites in Britain the dish/platter/shallow bowl category takes up *c.* 40% in the samian assemblages, while the decorated bowls form the second most common group with *c.* 27%, closely followed by the cups with 25.6% (Willis 2011, 209-212; Willis 2005, Chapter 8.2.2). Cups are also a significant group at the Oudenburg fort, although with 9.2% largely behind the general percentage observed in *Britannia* which probably reflects the comparatively late start date of the earliest occupation at the Oudenburg fort. A striking difference with the general patterns shown by Willis is the large amount of samian mortaria at the Oudenburg fort (20.5% of the total samian MNI or 16.6% of the mid-Roman samian assemblage versus only 0.1% at the British military sites (Willis 2011, 211: Fig. 2). Again this will be a function of the date range emphasis of the site. At the Caister-on-Sea fort for example, the mortaria percentages are indeed in line with those at Oudenburg (cf. Section 12 of this chapter).

The samian assemblage recovered from excavations in 2005 at *Forum Hadriani* (Voorburg, NL), capital city of the *civitas*

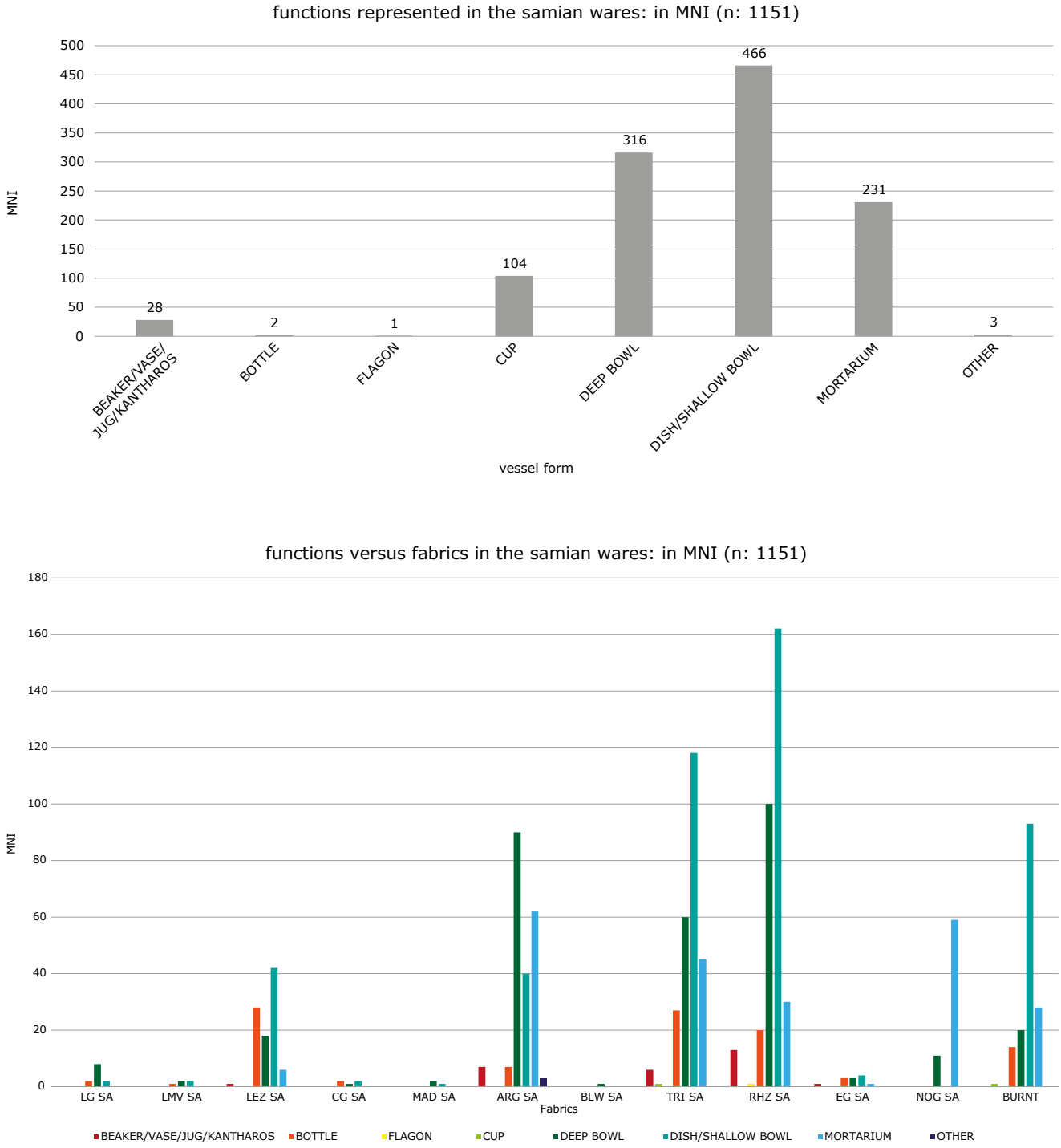

Figure 1.6. Functional distribution of the samian wares in the Roman level at the south-west corner site. Top: general counts per function, in MNI. Below: according to fabrics, in MNI.

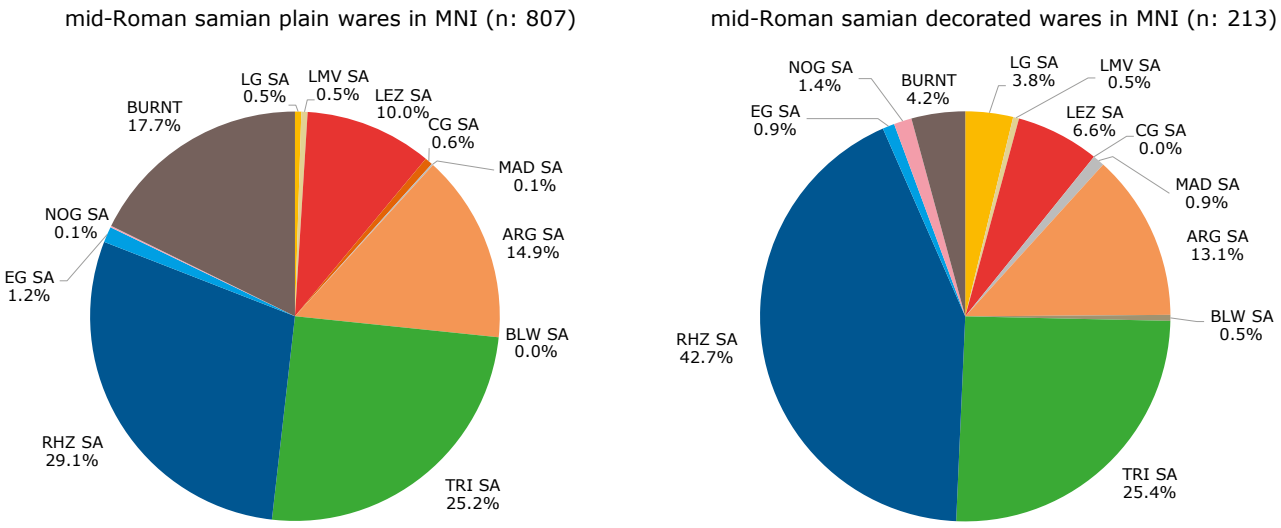

Figure 1.7. General distribution of the mid-Roman samian wares according to fabrics based on MNI. Plain wares versus decorated wares.

Cananefatium located near the North Sea and covering a date range from AD 120/125 to the middle of the 3rd century, in fact reveals – although not a military site – similar functional proportions as for the Oudenburg assemblage. The dishes represent 33.9% of the total samian sherd count, the decorated bowls account for 23.3%, the cups for 15.4% and mortaria for 12.4%. Van Diepen and Niemeijer also point to the high percentage of the mortaria and mention similar proportions in settlements of the later 2nd and 3rd centuries in the vicinity (van Diepen and Niemeijer (2011).

The popularity of mortaria (including the coarse examples) in the north of Gaul and Britain in the later Roman period in comparison to the Mediterranean world can refer to differences in the diet, but may also imply that the mortarium rapidly became a multipurpose vessel. Willis suggests that the mortarium was '*perhaps a widely familiar accoutrement of many lives*' (Willis 2005, Section 8.4)[12].

In the late Roman period, the supply to the Oudenburg fort was mainly taken over by the late Argonne and the North Gaulish potteries. While most of the decorated bowls were made at Argonne, the North Gaulish potteries were mainly responsible for the supply of mortaria.

6. The plain wares: functions, types and their supply

6.1 Dishes and shallow bowls

In the category of the dishes, the Drag. 36 (Lud. Te in the Rheinzabern repertoire), a form which became more common from the late 2nd century onwards (Webster 1996, 46), appears to be the most successful type (37.8% of the dishes MNI (466) with an EVE of 26.10), alongside the Drag. 31 (26.6% of the dishes MNI and an EVE of 15.01) (Table 1.5).

The Drag. 36 was mainly supplied by the Rheinzabern and Trier workshops (Plates XLVII-LV), respectively counting for 39.2% and 30.1% of the total Drag. 36 MNI. Only minimal three individuals were made in Lezoux fabrics (1.7%), two in Argonne ware and one at Les Martres-de-Veyre (Plate XLVII). The Rheinzabern and Trier Drag. 36 dishes display a large variety, not only in profile but also in rim diameter as well as in the characteristic barbotine leaf decoration on the rims (Plate XLIX-LIII). Sometimes the traditional leaf ornament is replaced by a more complex motif, like *e.g.* on the Rheinzabern dish Plate XLIX: 25, an element that occurs in the 3rd century (Bird 1993, 6). The rim diameter of the Rheinzabern dishes ranges between 170 and 300 mm with 40% of the individuals covering the size between 240 and 270 mm, with 240 mm as most popular size (represented eight times) (Figure 1.8: top). The Trier Drag. 36 dishes show a similar size range (except for one exceptional 340 mm wide individual), the rim diameters being equally spread but with a slight preference for sizes between 200 and 260 mm (53% of the individuals). The rouletted Drag. 36R (or Lud. TeR) is hardly represented in the Oudenburg assemblage. Only one individual could be distinguished, a Rheinzabern product (Plate L: 31). An interesting aspect is offered by one Trier (Plate XLIX: 20), one Rheinzabern (Plate XLIX: 23) and two burnt dishes (Plate LV: 74 and 76), all clearly of the Drag. 36 type, but displaying a (undamaged) plain, smooth rim without the characteristic barbotine leaf decoration.

As for the Drag. 31 type, a dish/shallow bowl form appearing in the mid-2nd century (Webster 1996, 35), the Rheinzabern and

12 The area of the site treated here, which covers only a small part of the fort, and the functionality of its find contexts obviously also determine the composition of the samian assemblage (as other find assemblages). This south-west corner was not at every level occupied by soldiers' barracks and other functional implementations obviously yield a different find spectrum. For example, no less than 114 mortaria or 53.5% of the mid-Roman mortaria assemblage can be attributed to fort level 4. Their presence at the workshop area could possibly be partly related to the reparation of these vessels, which were obviously of importance to the soldiers.

Table 1.5. The represented dish types and their fabrics, in MNI.

DISH TYPES IN MNI	LG SA	LMV SA	LEZ SA	CG SA	MAD SA	ARG SA	BLW SA	TRI SA	RHZ SA	EG SA	NOG SA	BURNT	TOTAL	%MNI
Bet 32			1										**1**	**0.2**
Curle 15						1						1	**2**	**0.4**
Curle 23			1										**1**	**0.2**
Walters 79			1										**1**	**0.2**
Drag. 18												1	**1**	**0.2**
Drag. 18/31	1	1	21	1	1	4		2	8	1		2	**42**	**9.0**
Drag. 18/31 or 31			7	1		11		5	9			5	**38**	**8.2**
Drag. 31 (R) (Lud. Sa/Sb)			6			11		42	45	1		19	**124**	**26.6**
Drag. 32 (R)			1			9		9	22			17	**58**	**12.4**
Drag. 36 (R) (/Lud. Te)		1	3			2		53	69	2		46	**176**	**37.8**
Drag. 42	1		1										**2**	**0.4**
Gose 138								1					**1**	**0.2**
decorated 'dolphin' dish									1				**1**	**0.2**
small dish Lud. SchF / NB 11b / Massenfund 6a								3				1	**4**	**0.9**
Lud. Tb									2				**2**	**0.4**
Lud. Th related								2					**2**	**0.4**
Lud. Th/Tl									1				**1**	**0.2**
Lud. Tl									2				**2**	**0.4**
Lud. Ti' / Massenfund 8b								1	2				**3**	**0.6**
Lud. To'									1				**1**	**0.2**
Chenet 304						1						1	**2**	**0.4**
Chenet 306						1							**1**	**0.2**
TOTAL	**2**	**2**	**42**	**2**	**1**	**40**	**0**	**118**	**162**	**4**	**0**	**93**	**466**	**100.0**
%MNI	**0.4**	**0.4**	**9.0**	**0.4**	**0.2**	**8.6**	**0.0**	**25.3**	**34.8**	**0.9**	**0.0**	**20.0**		**100.0**

Trier potteries again appear to have been the main suppliers for the Oudenburg fort, now in almost equal shares: Rheinzabern representing 45 individuals, Trier 42, or respectively 36.3% and 33.9% of the total Drag. 31 MNI (Table 1.5). The Rheinzabern assemblage shows the equivalent form type Lud. Sa and Sb. The Argonne workshops also supplied this type to the fort, albeit in minor quantities (11 MNI; 8.9% of the total Drag. 31 MNI). The limited number of Lezoux Drag. 31 dishes (6 MNI; 4.8% of the total Drag. 31 MNI) emphasizes the later date of this type.

Like the Drag. 36 dishes the Drag. 31 type displays a wide size range in rim diameters (Plates LVI-LX; Figure 1.8: below). The Argonne Drag. 31 dishes range between 194 and 300 mm. The rim diameters of the Rheinzabern Drag. 31 dishes range from 180 to 290 mm, with one exceptionally small dish of 166 mm and one exceptionally large one of 322 mm. As for the Trier Drag. 31 dishes the rim diameters vary largely, from 158 mm to 296 mm, with a preference for the sizes between 190 and 230 mm. Rouletting was apparently more common for the Drag. 31 dishes at Oudenburg than for the Drag. 36, although they still represent only moderate quantities. At least one Argonne (not illustrated) and two Lezoux Drag. 31R were counted (Plate LVI: 5-6); seven Trier Drag. 31 base fragments (two illustrated: Plate LVIII, 39-40) and thirteen Rheinzabern bases (three illustrated: Plate LIX, 61-63), belonging to a minimum of three individuals, showed rouletting. Since the Trier base fragments could not be related to rims, it is unclear how many MNI these represent.

The Drag. 32 dish was clearly less important and only represents 12.4% (58 MNI) of the total dish MNI and an EVE of 6.24 (Plates LXI-LXII) (Table 1.5). This form was characteristic from the late 2nd century onwards, but mainly in the 3rd century (Webster 1996, 44; Oswald and Pryce 1920, 205-206; Düerkop and Eschbaumer 2007, 112-144). Distribution patterns of this dish type have revealed that its production was not important at all potteries (Zanier 1992, 132-135). The Drag. 32 dishes (or Lud. Ta in the Rheinzabern repertoire) from the Oudenburg fort were mainly produced at Rheinzabern (22 MNI; 37.9% of the Drag. 32 MNI). The Argonne and Trier potteries supplied this type in equal, moderate shares, both counting for 15.5% of the total Drag. 32 MNI. As for the previous dish types, the rim diameters of the Drag. 32 dishes show a wide range (Argonne: 154-250 mm; Trier: 160-268 mm; Rheinzabern: 154-268 mm). The Drag. 32R type was attested only once, in a Trier fabric.

The Drag. 18/31 dish is represented by minimal 42 individuals or 9.0% of the dish MNI and an EVE of 4.52 (Plate LXII: 2-9; Plate LXIII) (Table 1.5). Half of these dishes is made in Lezoux fabrics (21 MNI; 50.0% of the Drag. 18/31 MNI) (Plate LXII: 2-9). Only a minor quantity of Drag. 18/31 dishes was made at the Rheinzabern potteries (8 MNI or 19.0%) (Plate LXIII: 18-21), they are scarcely present in Argonne ware (4 MNI or 9.5%) and were hardly supplied by Trier (2 MNI) (Plate LXIII). However, these counts may have been (much) higher since of no less than 38 individuals (8.2% of the dish MNI) it cannot be determined whether they are type Drag.

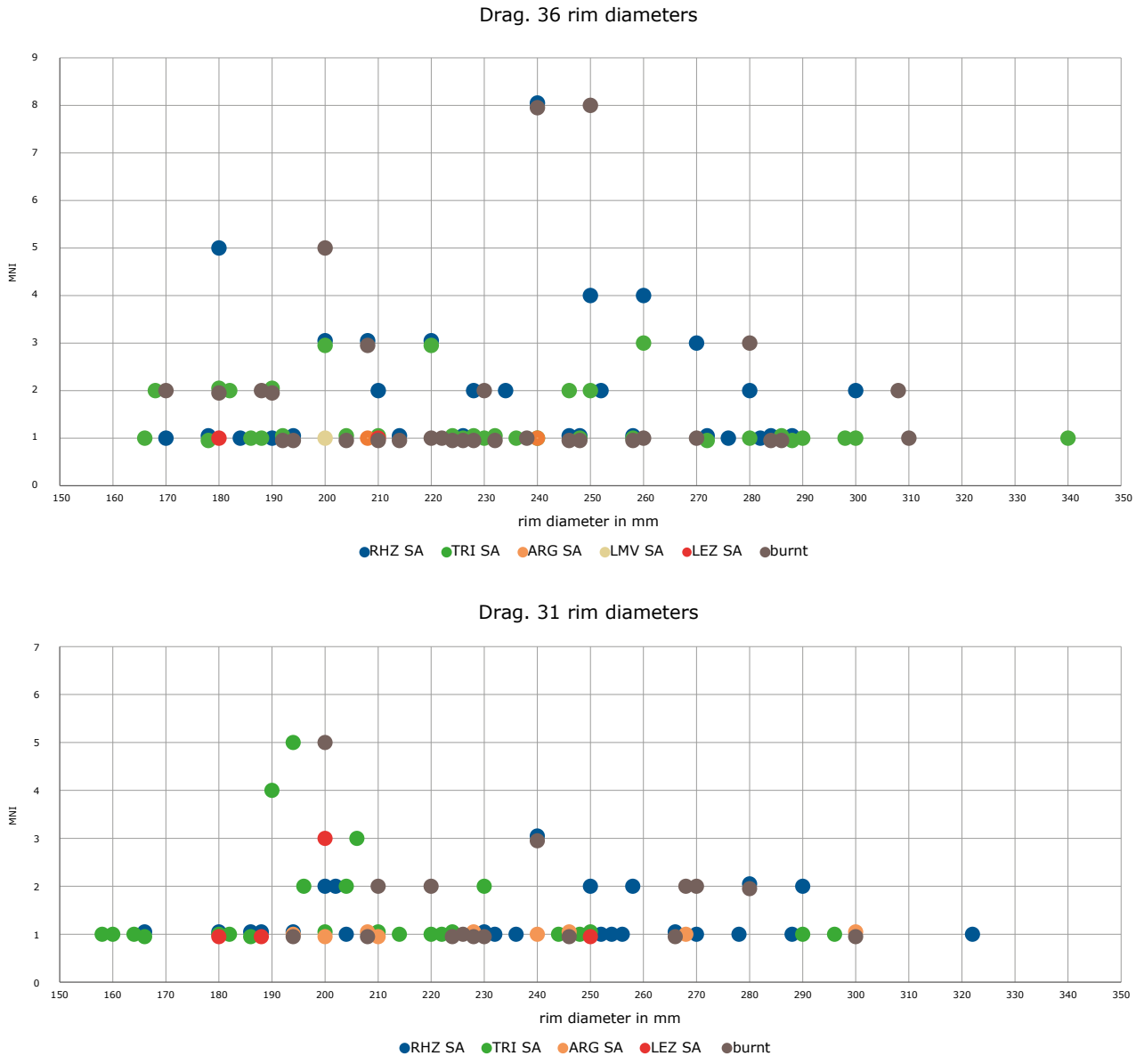

Figure 1.8. Top: the rim diameters of the Drag. 36 dishes. Comparison between the different fabrics. Below: the rim diameters of the Drag. 31 dishes. Comparison between the different fabrics.

18/31 or the later Drag. 31. Only one burnt Drag. 18 was identified, a residual find in a much later context (Plate LXII: 1).

Together, the types Drag. 18/31, 31 (incl. 18/31 or 31), 32 and 36 account for 438 MNI or 94.0% of the dish MNI. Other types represent only minor quantities of one, two or three MNI. The Drag. 42 type knows at least one individual in a South Gaulish fabric (Plate LXIV: 1), clearly a residual find, and one variant in a Lezoux fabric (with horizontal rim) (no. 2). From the Lezoux potteries, dishes Walters 79 (no. 3) and Curle 23 with rosette stamp (no. 4) can be mentioned, each present with one individual. The Curle 15 type was encountered only once, in Argonne ware (no. 5). The East Gaulish potteries added some more rarely produced vessels to the classical repertoire, most of them only listed in the Ludowici repertoire. The very small dish type Lud. SchF, also recognized as type NB 11b or Massenfund 6a, a type found in the mid-3rd century Massenfund context at Trier, is represented three times in the Trier fabric (two illustrated: nos 6-7). Of one more individual the fabric was burnt (no. 8). For the introduction of this type, Bird (1993, 12) concludes to a date in the second quarter of the 3rd century. Two Trier dish individuals are close to the type Lud. Th (nos 9-10). One rim profile can be identified as a Massenfund 8b, for which the equivalent type can be found in the Ludowici repertoire as Lud. Ti' (no. 11). In Rheinzabern ware one dish is identified as the type Gose 138, with similarities to Lud. Th (no. 15); one shallow bowl comes close to Lud. Tl (no. 16) and one rouletted rim fragment belongs to a Lud. To' (no. 14). The type Lud. Tb is represented by two MNI, one small and one

Table 1.6. The represented mortarium types and their fabrics, based on MNI.

MORTARIUM TYPES IN MNI	LG SA	LMV SA	LEZ SA	CG SA	MAD SA	ARG SA	BLW SA	TRI SA	RHZ SA	EG SA	NOG SA	BURNT	TOTAL	%MNI
Drag. 43			1			3		3	8				**15**	**6.5**
Drag. 43/45								1	2			1	**4**	**1.7**
Drag. 45 (/Lud. RSb)			5			57		41	20	1		26	**150**	**64.9**
Chenet 328-330						2					48	1	**51**	**22.1**
Chenet 330											11		**11**	**4.8**
TOTAL	**0**	**0**	**6**	**0**	**0**	**62**	**0**	**45**	**30**	**1**	**59**	**28**	**231**	**100.0**
%MNI	**0.0**	**0.0**	**2.6**	**0.0**	**0.0**	**26.8**	**0.0**	**19.5**	**13.0**	**0.4**	**25.5**	**12.1**	**100.0**	

larger version (nos 12-13). Two Lud. Ti' dishes complete this Rheinzabern assemblage (nos 17-18).

For the body fragment of an Argonne dish near to form Drag. 36 but clearly gritted, no parallels were found (Plate LXV: 1). This vessel appears to combine the functions of a dish and a mortarium.

A remarkably decorated dish completes the dish repertoire at the Oudenburg site (Plate LXVI). This unique piece among the samian finds concerns a deep dish, largely made up of burnt fragments which were scattered over a number of features. The shape of the deep dish can be assigned to the typology of the plain dishes as it was established by Ludowici and it has strong morphological affinities with his dish-type known as Teller c or t'. Even more than by the quality of its production this vessel distinguishes itself by the combination of three decoration techniques, likely referring to the repertoire of highly decorated precious metal plates. The decoration of this dish blends different ornamental techniques already applied to samian pottery from the Antonine period onwards but very trendy and more extensively applied on samian pottery during the 3rd century. The flaring rim-part shows an incised or 'cut-glass' decoration combined with scrolls and other motifs in trailed thick slip, generally referred to as barbotine decoration. In the concave centre of the dish a sort of flower medallion is depicted enclosing a figure-type resembling a dolphin. With this kind of vessel the Rheinzabern potter did not introduce anything new into the pottery market: since ancient times the world of Neptune had always been an inexhaustible source of inspiration for potters and the use of a fish or marine creature in the central part of plates or dishes also occurs in metal and especially silver tableware during the 2nd and 3rd centuries (cf. *e.g.* Strong 1966, 172-173, Pls. 48B-49). No exact parallels for the Oudenburg dish could be found; however, dishes with barbotine decoration applied to the floor are not unknown. Bird (1998) recorded and discussed ten such dishes, unusual by their form and the barbotine floor decoration showing animals, birds or a floral motif. According to Bird, decorating the floor of the vessel with a raised motif may have been inspired by the earlier series of the African Red Slip Ware from the first half of the 3rd century where this was a popular motif (Bird 1998, 155). The identifiable dishes from the study by Bird represent the Drag. 36 form or a variant and they can all be attributed to the Rheinzabern workshops. Bird concluded to a date in the first half of the 3rd century for this group of dishes, and probably within the second quarter (Bird 1998, 155). This date is in line with the find context of the Oudenburg dish, which was found at fort level 3, to be dated around the middle of the 3rd century. The Oudenburg dish distinguishes itself however from the dishes recorded by Bird in combining not two but three decoration techniques, with besides the fine barbotine rim decoration and the appliqué motifs on the floor of the vessel, also the cut-glass technique.

This particular dish from the Oudenburg fort gives evidence of the high degree of inventive skill and delicate craftsmanship of the Rheinzabern samian potters. Individually decorated vessels like this one indicate that the military not only had easy access to the more common forms of tableware, like plain dishes and cups, but were also able to obtain the more exquisite and rare pieces from a production centre like Rheinzabern.

In contrast to the mid-Roman dish spectrum, the dish form appeared to be no longer popular at the Oudenburg fort in the sigillata wares of the late Roman period, with only three MNI. Only the type Chenet 304, with one Argonne and one burnt individual (Plate LXV: 2-4), and a possible type Chenet 306 could be recognized in the late Roman assemblage.

6.2 Mortaria

With at least 231 individuals or 20.1% of the total MNI, the mortarium played an important role in the samian spectrum at the Oudenburg fort (Table 1.6). The most popular mortarium form at the Oudenburg fort site was the Drag. 45 with its upright rim-part and characterized by a moulded, open-mouthed lion's head spout (150 MNI or 64.9% of the total mortaria MNI of 231; with an EVE of 15.17) (Plates LXVII-LXXIV).

The Drag. 45 was produced in Central and East Gaulish kilns and distributed from the last quarter of the 2nd century onwards (Webster 1996, 56). In contrast to most of the other vessel types the Rheinzabern potteries were not the main suppliers of this type – they only account for 20 MNI or 13.3% of the Drag. 45 individuals (Plate LXXI: 61-71) –, but instead mainly the Argonne (38.0%) (Plate LXVII: 3-15; LXVIII; LXIX: 29-35), and also the Trier workshops (27.3%) took the lead here (Plate LXIX: 36-42; LXX; LXXI: 56-59). The mortaria display a large variety in rim diameter, with the Lezoux vessels between 176 and 300 mm (for the latter: see Plate LXVIII, 21), the Argonne mortaria between 162 and 304 mm, the Trier individuals between 180 and 320 mm and the Rheinzabern vessels between 186 and 296 mm (Figure 1.9). The small mortaria are particularly well-present in the Argonne assemblage; both Argonne

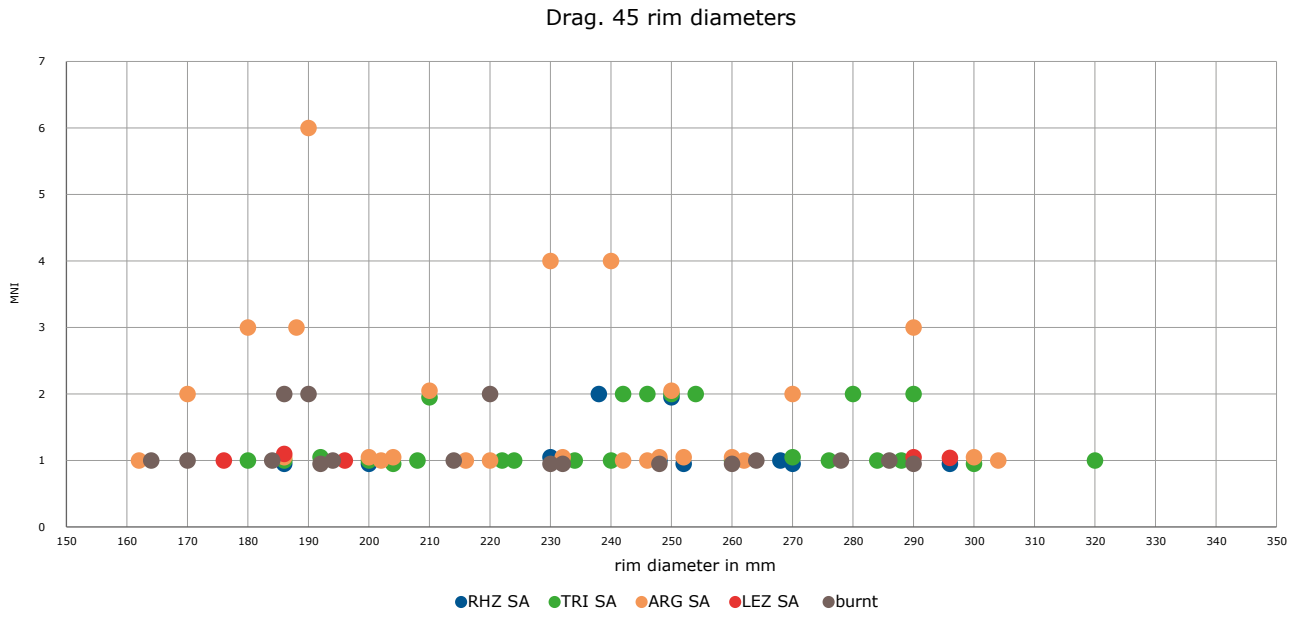

Figure 1.9. The rim diameters of the Drag. 45 mortaria. Comparison between the different fabrics.

and especially Trier supplied large mortaria. The Oudenburg assemblage includes the evolutions from the more 'realistic' lion head spouts from the Argonne and (early?) Rheinzabern workshops (see *e.g.* Plate LXVII: 14 and Plate LXXI: 67) to the more stylised examples from the Argonne (see *e.g.* Plate LXVII: 14; Plate LXVIII: 18), and the typical, widely distributed, bat-faced spouts from Trier which can be assigned to the mid-3rd century (Bird 1993, 8) (Plate LXIX: 38, 42; Plate LXX: 46).

The type Drag. 43 with its deep flange often decorated with elaborate barbotine motifs, a typical feature for the 3rd century (Bird 1993, 6), has a less significant presence in the assemblage with only 6.5% of the mortaria MNI (15 MNI) (Plate LXXIV). Of both types the Drag. 45s clearly occupy a very prominent position in a 10 to 1 ratio. It is not particular that the Drag. 43 was less common at the Oudenburg fort than the Drag. 45; this has also been noticed by Bird (1993, 6) for British sites. The Drag. 43 was mainly supplied by Rheinzabern (8 MNI) and less by Trier and Argonne, the latter both in equal quantities (three MNI). Only one Drag. 43 MNI was made at Lezoux.

The mortarium spectrum is complemented with the late Roman mortarium type generally known as Chenet 328-330 and accounting for 26.8% of the total mortaria MNI (62 MNI)[13]. The late Roman mortaria at the Oudenburg fort are nearly entirely supplied by the North Gaulish potters (minimum 59 out of 62 individuals or 95.2%) (Plate LXXII: 77-88; Plate LXXIII: 89-101). Four individuals can be identified as Les Rues-des-Vignes productions (fabric DTS.BE-RDV (see before) of which one is illustrated: Plate LXXII, 80). The other products were probably all supplied by potters from the Boulonnais region (see before). Only two late Roman Argonne mortaria were counted, both of type Chenet 328-330 (one illustrated: Plate LXXIII, 102).

In general, the North Gaulish derived samian group presents itself typologically in a very limited range of forms. The mortarium is its most frequent form at Oudenburg. Only one example displays a more or less realistically shaped lion spout (Plate LXXII: 77), perhaps a late 3rd-century fragment. In most cases, the figurative shape of the lion head spout of the North Gaulish mortaria is stylized (Plate LXXII: 81, 86, 87; Plate LXXIII: 90), in many cases into nothing more than a hole surrounded by small circles probably referring to the lion's mane hair (Plate LXXII: 88; Plate LXXIII: 92, 95, 96). Based on this assumed inspiration by (and imitation of?) the lion head spout, these fragments were catalogued as type Chenet 330. Based on the number of preserved spouts, at least eleven individuals Chenet 330 were counted. The 51 other individuals can only be generally identified as Chenet 328-330[14]. The sizes of the Chenet 328-330/330 mortaria show a wide variety, with rim diameters ranging between 144 and 260 mm.

6.3 Cups

The cup spectrum is dominated by the Drag. 33 cup representing 66 individuals or 63.5% of the total cups MNI (Table 1.7; Plate

13 **The type Chenet 328 is characterized by a plain vertical rim, the Chenet 329 by a simple pouring hole pierced through the vertical rim which sometimes bears a simple decoration. It is however only the Chenet 330 which has a pouring hole developed into an applique, mostly a lion's head. Since most often only rim fragments without the hole and/or applique are found, one cannot determine the exact type.**

14 **The Chenet 330 mortaria are illustrated amongst the Chenet 328-330 mortaria, in accordance to their rim diameter, in order to obtain a clear overview of the variety in sizes.**

Table 1.7. The represented cup types and their fabrics, based on MNI.

CUP TYPES IN MNI	LG SA	LMV SA	LEZ SA	CG SA	MAD SA	ARG SA	BLW SA	TRI SA	RHZ SA	EG SA	NOG SA	BURNT	TOTAL	%MNI
Ve B1	1												**1**	**1.0**
Drag. 27			2					1	1				**4**	**3.8**
Drag. 33		1	21	1		4		13	12	3		11	**66**	**63.5**
Drag. 35	1		2					3	1				**7**	**6.7**
Drag. 40			1			2		5	4			1	**13**	**12.5**
Drag. 46			1									2	**3**	**2.9**
O&P Pl. LV: 13 (Drag. 46 variant)			1	1									**2**	**1.9**
Massenfund 19 / O&P Pl. LV: 24 / NB 8b (Drag. 46 variant)								4					**4**	**3.8**
Lud. Bd / Oc									1				**1**	**1.0**
Lud. Bf / Bb								1					**1**	**1.0**
Massenfund 8a									1				**1**	**1.0**
Chenet 319						1							**1**	**1.0**
TOTAL	**2**	**1**	**28**	**2**	**0**	**7**	**0**	**27**	**20**	**3**	**0**	**14**	**104**	**100.0**
%MNI	**1.9**	**1.0**	**26.9**	**1.0**	**0.0**	**6.7**	**0.0**	**26.0**	**19.2**	**2.9**	**0.0**	**13.5**	**100.0**	

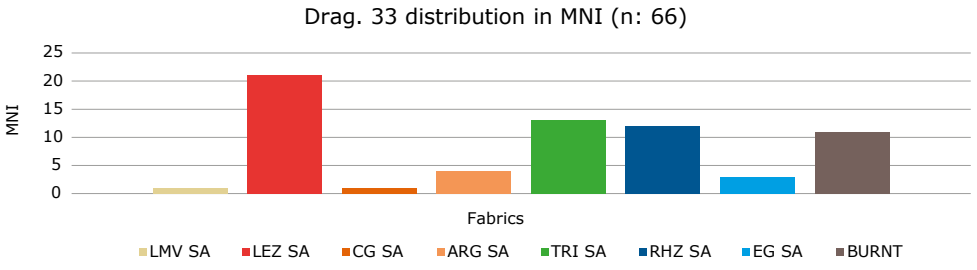

Figure 1.10. General distribution of Drag. 33 cups according to fabric, based on MNI.

LXXV: 3-24; Plate LXXVI). Of the other types only the Drag. 40 (13 MNI or 12.5%) (Plate LXXVII: 66-70) and the Drag. 35 (7 MNI or 6.7%) (Plate LXXVII: 55-59) are of significance, with Trier as leading supplier for the Drag. 35 and both Trier and Rheinzabern for the Drag. 40 cup. The study of a large stock group of Central Gaulish samian found at Nantes which was destroyed in a fire before being distributed, demonstrates that by the middle of the 3rd century Drag. 33 and Drag. 40 cups were still very popular (Delage *et al.* 2011).

When considering the total cup assemblage, a different view emerges in comparison to other forms (Figure 1.10). In general, the Lezoux and the Trier potteries play the most important role as supplier of cups, in equal quantities with respectively 28 and 27 MNI (26.9% and 26.0% of the cups MNI). The Rheinzabern workshops 'only' count for 19.2% and the Argonne potteries appear to be of less importance for the cup supply with 6.7%. When considering the types per fabric, Lezoux stands out as supplier of the Drag. 33 cup, with 31.8% of the MNI of this type, while Trier and Rheinzabern only count for respectively 19.7% and 18.2%. The definable rim diameters of the Argonne Drag. 33 cups range from 90 to 130 mm, of the Lezoux cups from 90 to 140 mm; the Trier Drag. 33 cups are within a range of 82 to 165 mm, the Rheinzabern ones within a range of 88 to 136 mm. The presence of more robust profiles, straight rather than slightly concave walls, the larger sizes (in height) and the absence of stamps in the Trier and Rheinzabern spectrum are indicative for the 3rd century (Bird 1993, 8) (Plate LXXVI: 30, 31, 38-41, 44, 45).

Other cup types are only present in minor quantities (Table 1.7). The 1st-century cup Ve B1 in La Graufesenque ware is clearly a residual find (not illustrated). This might also be the case for the four Drag. 27 cup fragments, two in a Lezoux fabric (one illustrated: Plate LXXV: 1), one from Trier (no. 2) and one from Rheinzabern (not illustrated), since this form went out of production *c.* AD 150-160 (Webster 1996, 38). Only one Lezoux cup (Plate LXXVII: 60) and two burnt individuals can be assigned to the type Drag. 46. However, a variant of the Drag. 46 type (O&P Pl. LV: 13) can be added, one from Lezoux (not illustrated) and one in an undefined Central Gaulish fabric (no. 61). Worth emphasizing is the presence of four individuals of the 3rd-century Drag. 46 variant type known as Massenfund 19 / NB 8b / O&P Pl. LV, 24 (nos 62-65). All four were made at the Trier potteries. One Rheinzabern cup shows the profile of the Massenfund type 8a of which no Ludowici equivalent is known (no. 71). Two fragments, one from Rheinzabern and one from Trier, can only be generally attributed to types from the Ludowici repertoire, respectively Lud. Bd/Oc and Lud. Bf/Bb.

Only one late Roman cup type could be distinguished, a Chenet 319 in Argonne ware (not illustrated).

Table 1.8. The represented collared bowl types and their fabrics, based on MNI. The table below only considers the mid-Roman types.

COLLARED BOWL TYPES IN MNI	LG SA	LMV SA	LEZ SA	CG SA	MAD SA	ARG SA	BLW SA	TRI SA	RHZ SA	EG SA	NOG SA	BURNT	TOTAL	%MNI
Curle 11		1											1	2.3
Curle 21			1			2							3	7.0
Drag. 38			3	1		5		3	4	1		7	24	55.8
Drag. 44								1	1				2	4.7
Massenfund 15												1	1	2.3
Carm. 5											1		1	2.3
Chenet 324g						1							1	2.3
Trier I, 8b / Chenet 325												1	1	2.3
Chenet 326											3		3	7.0
Brulet 424						1							1	2.3
Mareuil 326						1							1	2.3
Alzei 5						1							1	2.3
collared bowl undet.								1	1			1	3	7.0
TOTAL	**0**	**1**	**4**	**1**	**0**	**11**	**0**	**5**	**6**	**1**	**4**	**10**	**43**	**100.0**
%MNI	**0.0**	**2.3**	**9.3**	**2.3**	**0.0**	**25.6**	**0.0**	**11.6**	**14.0**	**2.3**	**9.3**	**22.3**	**100.0**	

COLLARED BOWL TYPES IN MNI (mid-Roman)	LG SA	LMV SA	LEZ SA	CG SA	MAD SA	ARG SA	BLW SA	TRI SA	RHZ SA	EG SA	NOG SA	BURNT	TOTAL	%MNI
Curle 11		1											1	2.9
Curle 21			1			2							3	8.6
Drag. 38			3	1		5		3	4	1		7	24	68.6
Drag. 44								1	1				2	5.7
Massenfund 15												1	1	2.9
Carm 5											1		1	2.9
collared bowl undet.								1	1			1	3	8.6
TOTAL	**0**	**1**	**4**	**1**	**0**	**7**	**0**	**5**	**6**	**1**	**1**	**9**	**35**	**100.0**
%MNI	**0.0**	**2.9**	**11.4**	**2.9**	**0.0**	**20.0**	**0.0**	**14.3**	**17.1**	**2.9**	**2.9**	**25.7**	**100.0**	

6.4 Collared bowls

The collared bowls account for 43 MNI or only 3.7% of the total samian assemblage (Table 1.8; Plates LXXVIII-LXXIX). The mid-Roman types dominate; they represent 32 MNI (or 35 with the undetermined ones from Trier and Rheinzabern and one burnt example included). With 54.5% of the total MNI or 68.6% of the MNI within the mid-Roman collared bowl group, the Drag. 38 bowl is the most popular type (24 MNI).

The Drag. 38 type was supplied by the Argonne (5 MNI), Rheinzabern (4 MNI), Trier (3 MNI) and Lezoux (at least 3 MNI) workshops (Plate LXXVIII: 3-14). The North Gaulish 'Drag. 38' individuals, accounting for four MNI, should possibly be added to these products. Though representing exactly the same form, they are designated as 'Chenet 326'. As they clearly already occur at fort level 4 (with at least two individuals covering four fragments), they most likely represent a mid-Roman vessel, indicated by its mid-Roman form (Plate LXXVIII: 15-16).

With seven burnt individuals, the numbers of the different fabrics are too small to make further conclusions on the supply of this collard bowl type. The shapes of the preserved profiles are very indicative though. They show a large variety in vessel size and collar shape; both rounded and hooked collars were fashionable. The Central Gaulish individuals (Plate LXXVIII: 3-4) and the bowl from the Argonne (no. 5) represent the typical 2nd-century form, large in size and with a rounded flange. Typologically, the shallower Drag. 38 bowl with square flange seems to be indicative for later, 3rd-century productions (Huld-Zetsche 1971, type 15; Bird 1993, 10). This type is clearly represented in the East Gaulish productions at the Oudenburg site (Plate LXXVIII: 7 (Argonne), 9 (Trier), 10 (Rheinzabern)), with one burnt example (no. 13) and with one North Gaulish product (no. 16).

Drag. 38 flanged bowls are common in find contexts of the late 2nd century and first half of the 3rd century but become rare in the second half of the 3rd century. According to Kortüm, production in Rheinzabern must have come to a halt by the middle of that century (Kortüm 1995, 251). However, the Trier Massenfund group (Huld-Zetsche 1971, 34, type 15) and the Louis-Lintz-Strasse-complex (dated AD 259 or 260-75) (Loeschcke 1923, taf. 11, 10) suggest that this form was still produced in Trier throughout the third quarter of the 3rd century.

The other identified collared bowl types are of very little significance. The Curle 11 bowl from Les Martres-de-Veyre is a residual, dug-up piece found in the construction pit of the large water-basin of fort level 5 (not illustrated). The Curle 21 type is represented by three individuals, the Drag. 44 type by two individuals. Two of the Curle 21s were supplied by the Argonne potteries (Plate LXXVIII: 1-2), one by

Table 1.9. The represented mid-Roman beaker types and their fabrics, based on MNI.

BEAKER TYPES IN MNI (mid-Roman)	LG SA	LMV SA	LEZ SA	CG SA	MAD SA	ARG SA	BLW SA	TRI SA	RHZ SA	EG SA	NOG SA	BURNT	TOTAL	%MNI
Déch. 64R						1							**1**	**4.0**
Déch. 72			1			4		1					**6**	**24.0**
Lud. Vd,e,f,g (Drag. 54)								1		1			**2**	**8.0**
Lud. Vd									2				**2**	**8.0**
Lud. Ve									3				**3**	**12.0**
Lud. Vf									1				**1**	**4.0**
Lud. VMg									1				**1**	**4.0**
Lud. VSb									3				**3**	**12.0**
Lud. VSd								1					**1**	**4.0**
Lud. KMa / VMc (large beaker or jug)									1				**1**	**4.0**
beaker large volume								2	2				**4**	**16.0**
TOTAL	**0**	**0**	**1**	**0**	**0**	**5**	**0**	**5**	**13**	**1**	**0**	**0**	**25**	**100.0**
%MNI	**0.0**	**0.0**	**4.0**	**0.0**	**0.0**	**20.0**	**0.0**	**20.0**	**52.0**	**4.0**	**0.0**	**0.0**	**100.0**	

Lezoux (not illustrated); the Drag. 44s are from Trier and Rheinzabern (not illustrated). The 3rd-century Massenfund 15 type is represented by only one MNI, representing two burnt pieces, a rim and a base fragment. A body fragment with transition to the collar and displaying the mid-Roman North Gaulish DTS.HE-NE fabric can be recognized as a Carm. 5 (not illustrated). This piece can possibly be dated to the end of the 2nd to 3rd century (Brulet 2010e, 269).

Related to the collared bowls are the East Gaulish deep bowls with barbotine freeze, represented in the assemblage of the south-west corner site with at least four individuals. These bowls, known as Lud. SM and Massenfund 11 or 12, are typical 3rd-century finds (Bird 1993, 6; Huld-Zetsche 1971). One Rheinzabern individual can be specified as Lud. SMa (Plate LXXIX: 1), another as Lud. SMc (no. 2). One Trier and another Rheinzabern bowl can only be generally ascribed to respectively the Massenfund 11-12 type and the Lud. SM type (not illustrated).

Five collared bowls can be undoubtedly identified as late Roman, four of them supplied by the Argonne; one burnt individual possibly originated from Trier. The latter would hence represent the only product in the samian assemblage that can be attributed to the late Roman Trier production. The late Roman collared bowls show a variety of types but each is scarcely represented: Chenet 324g with nicely profiled vertical rim (1 MNI, Argonne) (Plate LXXIX: no. 3), Trier I, 8b / Chenet 325 (1 MNI, burnt but based on the type a Trier product) (no. 4), Chenet 326 (3 MNI, NOG SA), Brulet 424 (1 MNI, Argonne), Mareuil 326 (1 MNI, Argonne) and Alzey 5 (1 MNI, Argonne).

6.5 Beakers, vases and related forms

Although 267 beaker fragments were recovered, only a minimum of 27 individuals can be counted, pointing to a high degree of fragmentation of these commonly thin-walled vessel forms. Twenty-five individuals can be attributed to mid-Roman beaker types (Table 1.9).

Except for one Déch. 72 beaker from Lezoux, all beakers were supplied by East Gaulish workshops with Rheinzabern as most important origin (13 MNI or 52.0% of the mid-Roman beaker group MNI), followed by Argonne and Trier, both responsible for 5 MNI. The Argonne beakers can be assigned to the types Déch. 64R (1 MNI) (only body fragments) and Déch. 72 (4 MNI) (Plate LXXX: 1-7). The latter type represents at least three beakers with so-called cut-glass decoration (nos 3-6[15]) and one with barbotine decoration depicting ivy leafs (only small body fragments preserved). The Trier beaker group, consisting of very fragmentary material, represents at least one Déch. 72 with barbotine decoration with floral motifs (only body fragments) and one plain globular beaker of the Lud. V series (no. 9). Although the body is not preserved, a rim fragment can be identified as originating from a large beaker Lud. VSd, a type characterized by cut-glass decoration (no. 8). The Rheinzabern assemblage (nos 10-25) contains at least five plain, globular beakers representing the types Lud. Vd (at least three) and Lud. Ve (at least two) (nos 10-17). Three beakers can be recognized as type Lud. VSb with characteristic cut-glass decoration (nos 19-21). At least one beaker, almost completely preserved, represents the type Lud. VMg with barbotine decoration (no. 18). The large Rheinzabern made foot may have belonged to a vase Lud. VWa, VWb, VSa, VMc, VMd or kantharos Thomas 5 (Plate LXXXI: 29). Also the heavy foot in Rheinzabern fabric (no. 30) was part of a large beaker or kantharos. The indications for kantharoi are scarce, but their presence is certainly attested. A body fragment with the start of a handle and a body sherd from a kantharos or flagon are worth mentioning for the Rheinzabern assemblage. A kantharos from Trier is proven by the barbotine-decorated small handle of a Thomas 6 (no. 28). In the Trier fabric, the lower body part with broken off high pedestal and another body fragment may also have belonged to a kantharos.

Several fragments – which can be reduced to a minimum of four MNI – draw attention because they are relatively thick-walled and point to vessels of large dimensions. These large closed forms are

15 **It cannot be excluded that nos 5 and 6 belong to the individuals nos 3 or 4 (Plate LXXX).**

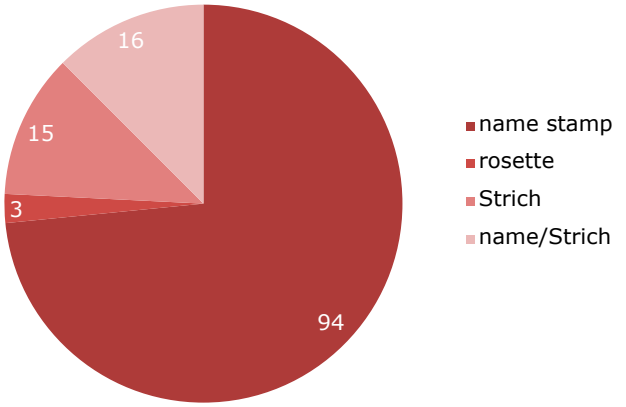

Figure 1.11. The different samian stamp types represented at the south-west corner site. Proportional distribution of the in total 128 stamps.

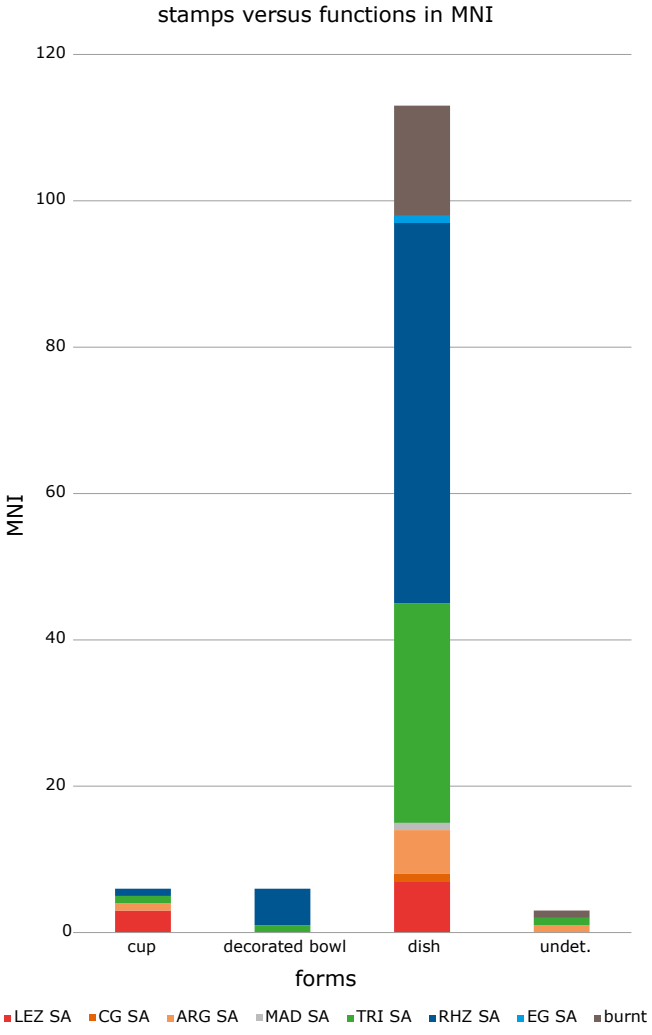

Figure 1.12. Distribution of stamps on cups, decorated bowls and dishes according to fabric, based on MNI.

Table 1.10. Number of stamps on cups, decorated bowls and dishes according to fabric, based on MNI.

	LEZ SA	CG SA	MAD SA	ARG SA	TRI SA	RHZ SA	EG SA	burnt	TOTAL
cup	3			1	1	1			**6**
dec. bowl					1	5			**6**
dish	7	1	1	6	30	52	1	15	**113**
undet.				1	1			1	**3**
TOTAL	**10**	**1**	**1**	**8**	**33**	**58**	**1**	**16**	**128**

not so much beakers, but are rather better referred to as jars. One burnt Rheinzabern wall sherd shows a floral barbotine decoration (Plate LXXXI: 26). A large form from Rheinzabern is composed by joining, mostly burnt, fragments which were scattered over the Roman level (horizontally and vertically). The extensive barbotine decoration shows a hunting or procession scene and was possibly part of a jug Lud. KMa or a very large beaker (no. 27). Apart from a rim fragment with large diameter, the Trier assemblage also yielded a fragment showing modelled decoration (only the edge preserved). One may wonder whether these large vessels played a role in the cult practices of the military community.

Only two late Roman beaker types can be recognized, namely a Chenet 333 and a Chenet 335 (not illustrated), both supplied by the Argonne potteries.

6.6 Rare forms in the samian assemblage

The samian assemblage, which can be described as fairly homogeneous in forms and types, is completed with a few rare forms. Only two bottles can be counted. A bottle from Trier shows the Massenfund 17b type which can be dated around the middle of the 3rd century (Huld-Zetsche 1971; Bird 1993, 11; Bird in Dickinson 1993, 160) (Plate LXXXI: 31). A second bottle rim, with start of a handle, is burnt and cannot be further specified typologically (no. 32). Body fragments from a flagon with barbotine decoration in Rheinzabern fabric are the only evidence for flagons in this samian assemblage. Flagons (like the NB 27) are essentially mid-3rd century and later products (Reuter 2005, 225).

7. The stamps

Within the totality of the 4841 samian sherds from the Roman level, 128 stamps were counted (Figure 1.11). Of this assemblage, 98 stamps are recorded in the catalogue (see Section 14 of this chapter); the remaining twenty stamps are not preserved enough to allow for an identification (completely abraded, only very partly or not preserved die). Another 31 stamps were retrieved from the post-Roman level, but since it is uncertain which occupation they represent and since neither their exact origin is known, they were not studied in detail[16]. The stamp numbers (SS) refer to the catalogue (Section 14 of this chapter) and are linked to Plates LXXXII-LCII.

16 The intermediate numbers not listed in the catalogue (S046, S049>052, S054>065, S067, S107, S129, S148, S150>153, S162) are the numbers of the stamps found in the post-Roman levels.

Table 1.11. Number of stamps according to type of vessel and fabric, based on MNI.

function	type	LEZ SA	CG SA	MAD SA	ARG SA	TRI SA	RHZ SA	EG SA	burnt	TOTAL
cup	Drag. 33	3			1	1				5
cup	Drag. 33 or 40						1			1
decorated bowl	Drag. 37					1	5			6
dish	Curle 23	1								1
dish	Drag. 18/31	4	1	1	4	2	2		3	17
dish	Drag. 18/31 or 31	1			1	1	6		2	11
dish	Drag. 31 / Lud. Sb				1	8	10		2	21
dish	Drag. 32 / Lud. Ta					1	2		1	4
dish	Drag. 32/36					2	5		3	10
dish	Drag. 36					3	6			9
dish	Lud. Tb						1			1
dish	Lud. Tg						1			1
dish	Lud. Th					1				1
dish	dish undet.	1				12	19	1	4	37
form undet.	undet.				1	1			1	3
TOTAL		10	1	1	8	33	58	1	16	128

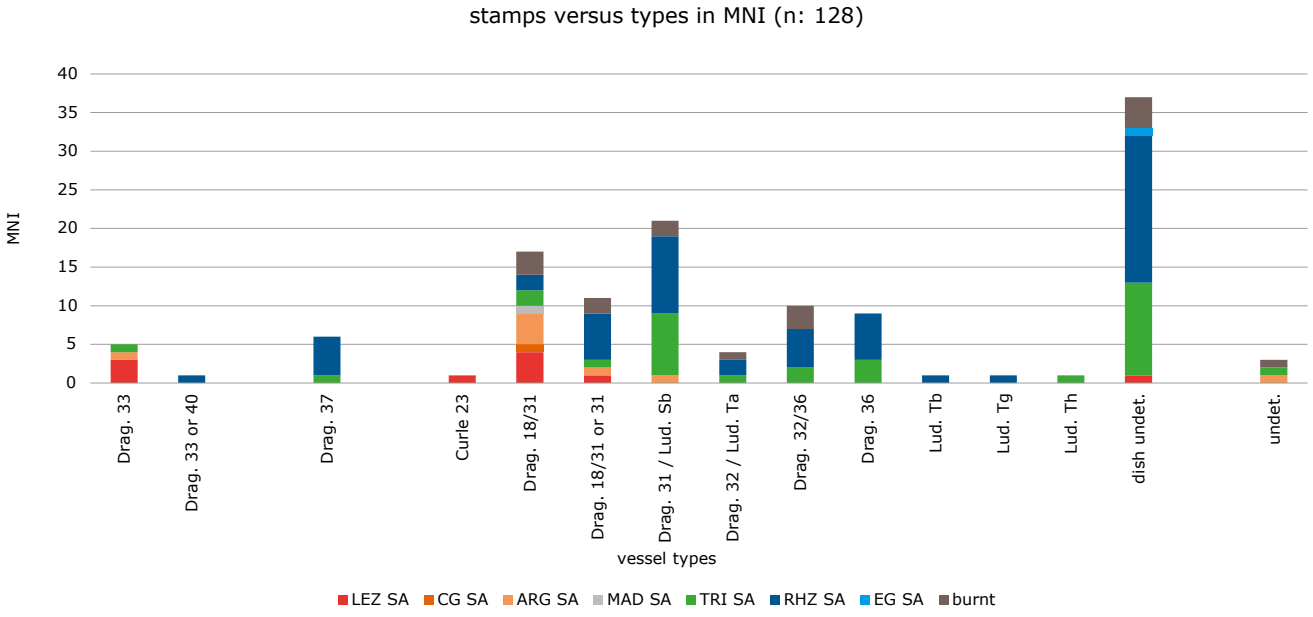

Figure 1.13. Distribution of stamps according to type of vessel and according to fabric, based on MNI.

The frequency of the stamps on the plain wares varies according to the forms, the workshops and through time (Tables 1.10-1.11; Figures 1.12-1.13). Particularly the Rheinzabern potters seem to have stamped their vessels frequently. The stamps mainly occur on dishes/shallow bowls, accounting for 113 items.

The identified potters demonstrate that the stamped dishes are mainly dated to the later 2nd and first half of the 3rd century. Stamps on Drag. 18/31 and 31 dishes are well-represented but it is the Drag. 31 dish that keeps on being stamped during the first half of the 3rd century. In the 3rd century only East Gaulish stamped dishes Drag. 18/31 and 31 occur in the assemblage, mainly produced at Rheinzabern, but also at Trier (Table 1.11; Figure 1.14). Although the Drag. 36 dish is the dominant dish type in the Oudenburg assemblage, only nine stamps could be attributed to this type with certainty. Except for the unknown Apolo/Apolus of Trier (SS13) (consequently no date range can be given), they are all stamped by Rheinzabern potters (Figure 1.14: below). However, with a total of 37 stamps which cannot be assigned to a specific dish type, this conclusion is evidently not absolute for the whole assemblage. Only six stamped cup bases were counted. The presence of many more Drag. 33 bases without stamp indicate that these cups were more often not named, a phenomenon already observed by Bird at British sites (Bird 1993, 3).

In total 94 name stamps were counted, including six intra-decorative stamps recorded on Drag. 37 bowls, one from Trier and five from Rheinzabern. Fifty-seven of the name stamps could identify the

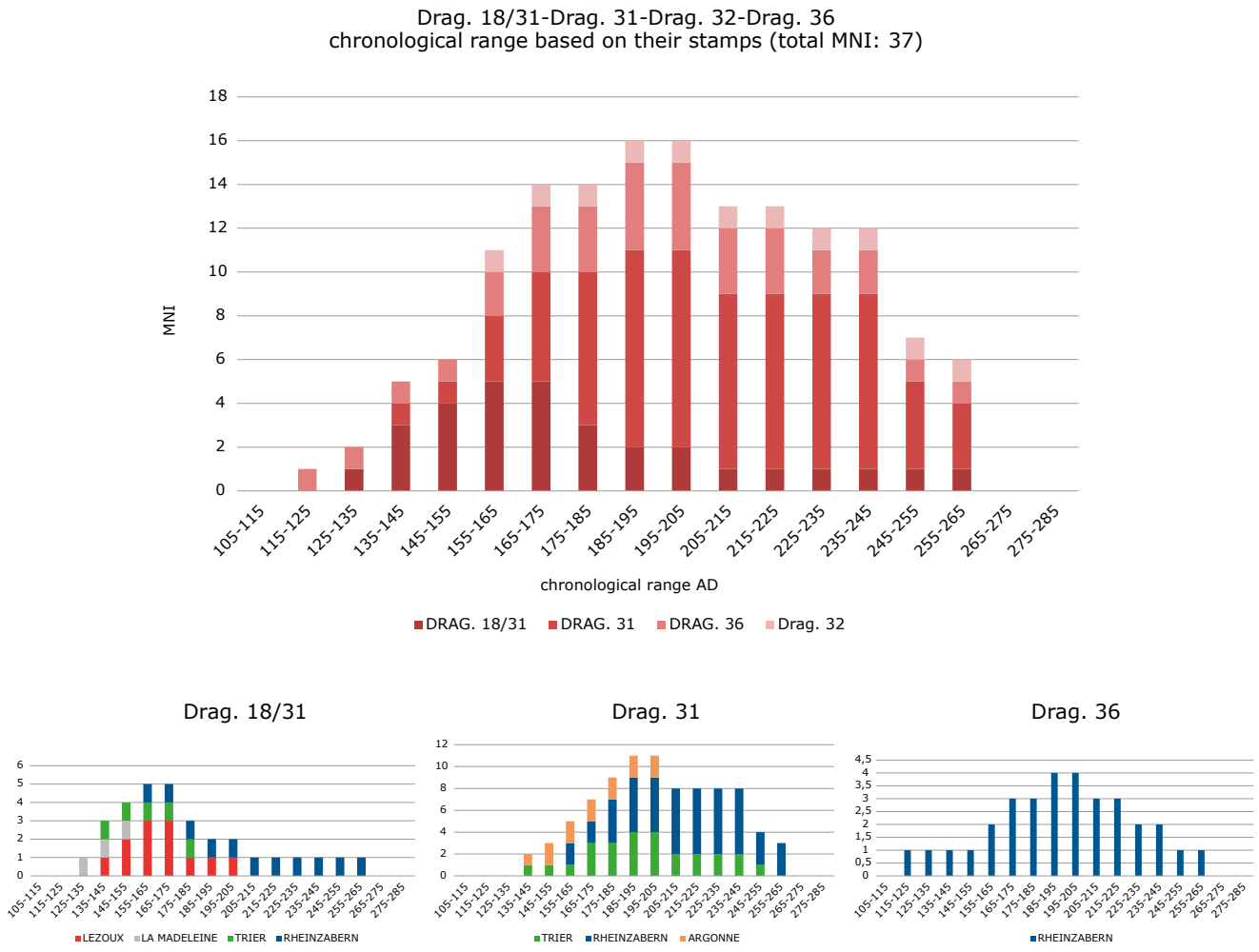

Figure 1.14. Top: chronological range of Drag. 18/31, Drag. 31, Drag. 32 and Drag. 36 dishes based on the presence of stamps. Based on MNI. Below: chronological range of Drag. 18/31 versus Drag. 31 versus Drag. 36 dishes based on the presence of stamps. Based on MNI.

potter, resulting in 51 unique stamps (Table 1.12). Four of the plain ware name stamps are illiterate. The assemblage contains three rosette stamps, two on Lezoux vessels (one Drag. 33 cup (SS82) and one Curle 23 dish (SS81)) and one on a Rheinzabern dish (SS83). Characteristic for the 3rd century is the presence of so-called *Strich* stamps or line-stamps which only exist of an empty frame (Bird 1993, 3). The vessels stamped with these *Strichs* were supplied by Trier (seven items: SS 84-90) and Rheinzabern (four items: SS91-94); another four items were found on burnt fragments (SS95-98). The *Strich* stamps occurred from fort level 3 onwards (three items) and are well-present in fort level 4 with eight items. It is worth emphasizing the presence of a Rheinzabern dish wearing a graffito by a potter, incised *ante-cocturam*, instead of a stamp (SS75). At Rheinzabern there were only a few potters who signed their products in this manner, namely Attianus and Belatullus (Schücker *et al.* 2011, 338-348). The fragmentation of the Oudenburg example however makes the reading and a more precise identification impossible; it is not clear whether it concerns an indication of a name or a number.

Six Lezoux potters can be identified: Albucius ii (SS1), ?Carant-Don- (SS2), Cintusmus i (SS3), Magio i (SS4), Pugnus ii (SS5) and Sabinus viii (SS6). They cover a production period between AD 135 and 200 but mainly refer to the 2nd half of the 2nd century. Two rosette stamps can be added for Lezoux. Only one stamp can be attributed to the La Madeleine production (SS9); Amabilis ii was working between AD 125 and 155 and its vessel should therefore be considered as a residual item.

For the Argonne only eight stamped plain ware vessels were recorded, mostly dishes, with one exception of a cup Drag. 33 stamped by Tullus (SS12). Three Argonne potters are recognized : Giamillus iii from Lavoye (SS10), Libonus from Lavoye (SS11) and Tullus from Le Pont-des-Rèmes (SS12). They were mainly active during the period AD 150-200. Giamillus iii and Libonus both worked until the start of the 3rd century.

Apart from one Drag. 37 bowl marked by Comitialis (SS16), all Trier name stamps were found on dishes. The Trier potters cover a period from AD 160 to 260. Only the production period of Cerialis vii (SS15) already started in the Antonine period; he

Table 1.12. List of potters by stamp at the south-west corner site, in chronological order according to production site.

potter	origin	AD start date	AD end date	vessel type
ALBVCIVS ii	Lezoux	145	175	Drag. 18/31
CARANT- DON-	Lezoux	160	200	Drag. 18/31 or 31
CINTVSMVS i	Lezoux	140	180	Drag. 18/31
MAGIO i	Lezoux	160	200	Drag. 18/31
PVGNVS ii	Lezoux	135	165	Drag. 33
SABINVS viii	Lezoux	160	200	Drag. 33
AMABILIS ii	La Madeleine	125	155	Drag. 18/31
GIAMMILLVS iii	Argonne (Lavoye)	140	200	Drag. 31
LIBONVS	Argonne (Lavoye)	150	200	Drag. 18/31 or 31
TVLLVS	Argonne (Le Pont-des-Rémes)	150	180	Drag. 33
APOLO/APOLVS	Trier	?	?	Drag. 32 or 36
ATILIDO	Trier	175	250	Dish
CERIALIS vii	Trier	140	180	Drag. 18/31
COMITIALIS	Trier	170	240	Drag. 37
DESSIVS	Trier	200	260	DishR
DRVCAVRSVS	Trier	160	260	Dish?
ELENIVS i	Trier	170	200	Drag. 31
IVCVNDVS v	Trier	160	260	Drag. 32
MERCVSSA	Trier	?	?	Lud. Th
MINVTVS	Trier	170	250	Drag. 31
PARENTINVS	Trier	180	260	Dish
PATRVINVS ii	Trier	200	260	Dish
VRBANVS	Trier	190	240	Drag. 31
XIATIVAV	Trier	?	?	Dish
ATTA	Rheinzabern	170	220	Drag. 36
ATTIANVS iv	Rheinzabern	160	260	Dish
CAPITOLINVS	Rheinzabern	170	260	Dish
CINTVGNATVS ii	Rheinzabern	140	180	Drag. 18/31 or 31
COMITIALIS	Rheinzabern	170	240	Drag. 37
CRACO ii	Rheinzabern	160	260	Drag. 36
CRASSIACVS (x2)	Rheinzabern	180	220	Dish; Drag. 18/31R or 31R
DATIVS	Rheinzabern	160	240	Drag. 18/31 or 31
DRVCAURSVS	Rheinzabern	160	260	Drag. 32 or 36
EVRITVS (x3)	Rheinzabern	180	240	Lud. SbR; Drag. 31R; Dish
FIRMINVS ii	Rheinzabern	160	220	Dish
FLAVIANVS ii	Rheinzabern	160	260	Dish
GIAMMILLVS v	Rheinzabern	120	200	Drag. 36
IVLIANVS iii (x2)	Rheinzabern	220	255	Drag. 37 (2x)
IVLIVS viii	Rheinzabern	220	255	Drag. 37
LATINIANVS	Rheinzabern	160	260	Drag. 18/31 or 31
MAGIO ii (x2)	Rheinzabern	160	260	Drag. 31; Dish
MARTINVS v	Rheinzabern	170	250	Drag. 33 or 40
MATERNINVS iii	Rheinzabern	160	260	Dish
NVNDINVS ii	Rheinzabern	160	260	Drag. 31R
ONERATVS	Rheinzabern	160	260	Drag. 32 or 36
ONNIOR	Rheinzabern	160	260	Drag. 18/31 or 31
PATRVINVS i	Rheinzabern	160	260	Drag. 18/31
PEPPO	Rheinzabern	160	260	Dish
RESPECTINVS ii	Rheinzabern	220	260	Drag. 37
SATINVS	Rheinzabern	160	260	Drag. 32 or 36
SEVERIANVS ii (x2)	Rheinzabern	190	240	Drag. 31; Drag. 36R
TARENTINVS	Rheinzabern	175	250	Dish
VERVS vi	Rheinzabern	210	260	Drag. 31R/Lud.SbR
VICTOR v or VICTORINVS ii	Rheinzabern	210	260	Dish
VICTORINVS ii	Rheinzabern	210	255	Dish

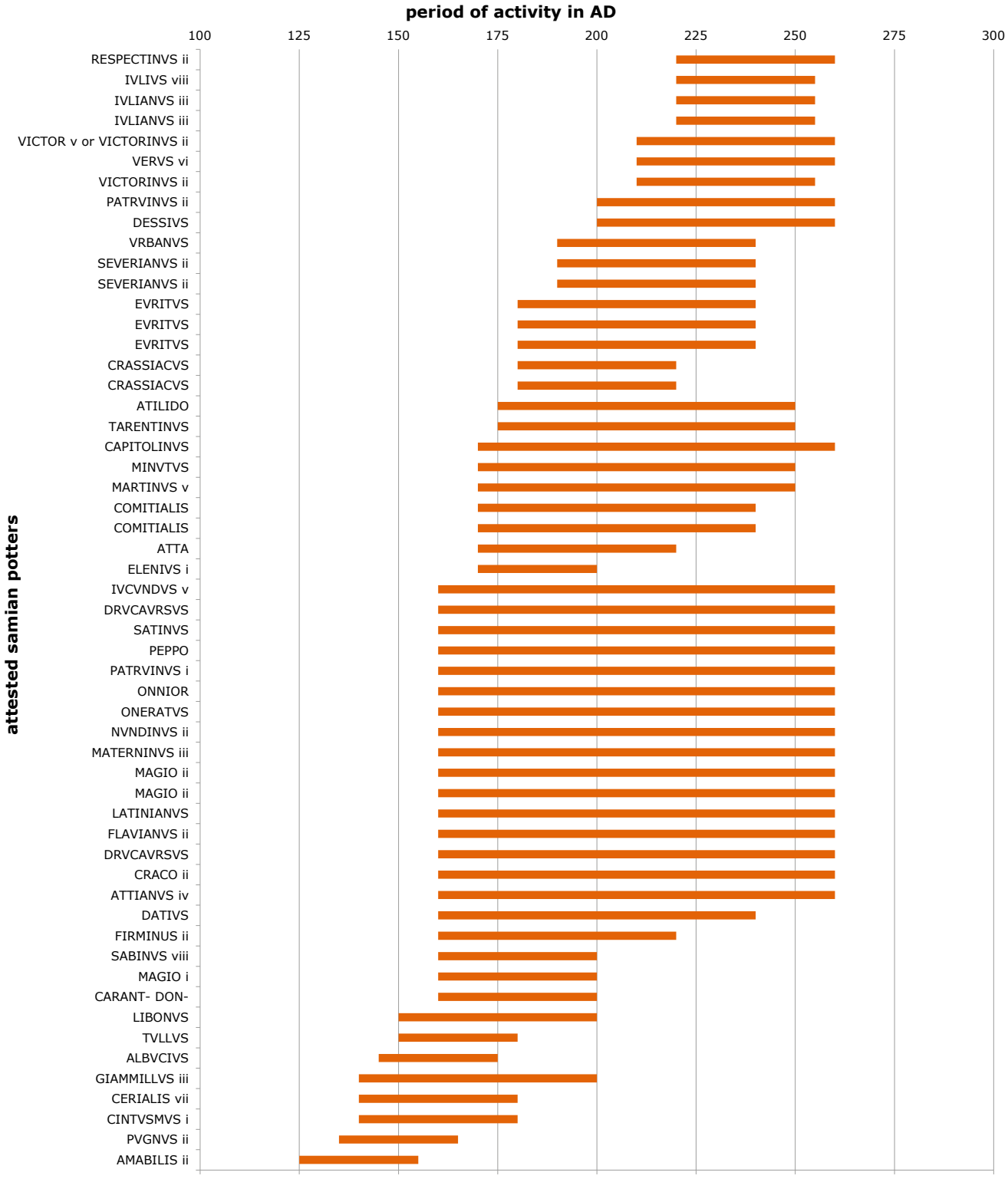

Figure 1.15. Chronological range of the potters represented by stamps at the south-west corner site.

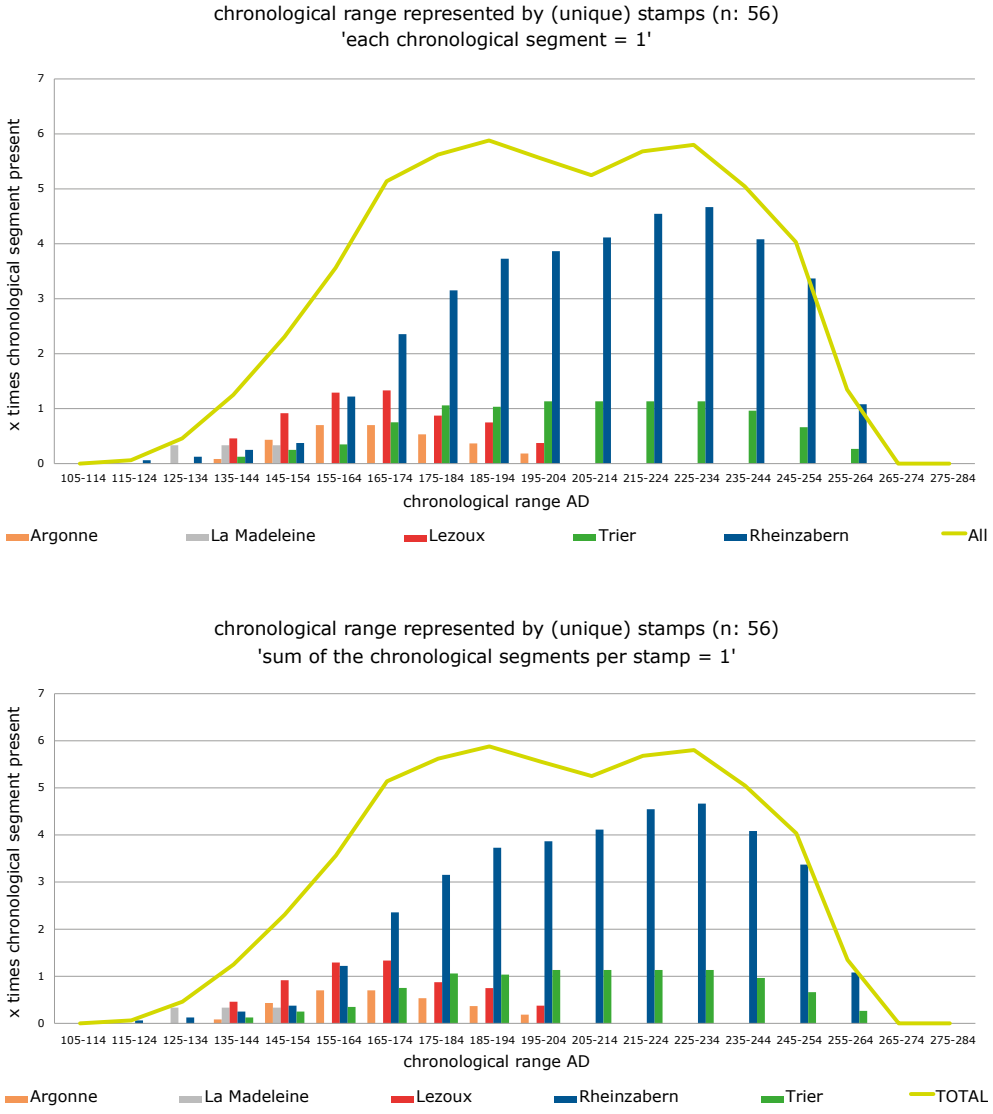

Figure 1.16. Chronological range represented by the potter stamps at the south-west corner site, based on unique stamps (a stamp found more than once is included as only one stamp). Top: each chronological segment (10 years) is counted as 1. Below: the sum of all chronological segments (each 10 years) is 1. With thanks to T. Clerbaut (Ghent University).

was probably active in the period AD 140-180. The youngest dates are provided by Dessius (SS17) and Patruinus ii (SS24), both working at Trier in the period AD 200-260. Also the stamp of Urbanus (AD 190-240) (SS25) is most probably to be dated in the early 3rd century.

The majority of the potters were working at Rheinzabern; of 37 stamps the potter can be identified. Apart from Martinus v who stamped a cup (SS54) and apart from Comitialis (SS36), Iulianus iii (two times : SS48 and SS49), Iulius viii (SS50) and Respectinus ii (SS61) who put their names on their Drag. 37 bowls, they all supplied dishes. Most of these Rheinzabern potters were active within the period AD 160-250. Only Giamillus v (SS47) and Cintugnatus (SS35) knew a production period starting earlier in the Antonine period. Very significant for the chronology of the Oudenburg fort are the potters which were attested more than once: Magio ii (two times: SS52 and SS53), active in the period AD 160-260; Crassiacus (two times: SS38 and SS39), active AD 180-220; Euritus (three times: SS42, 43 and 44), producing during the period AD 180-240 ; Severianus iii (two times: SS63 and SS64), active in the period AD 190-240. The most recent of Rheinzabern potters is Respectinus ii (SS61) who produced his Drag. 37 bowl in the period AD 220-260.

When the date ranges offered by the unique stamps are considered, the overall chronological range is situated mainly between AD 155 and 265 with a strong presence from AD 175 onwards (Table 1.12; Figures 1.15-1.16). When each chronological segment is considered as 'present one time' (which is in fact an over-representation), the graphic shows a small dip around AD 205-215 (Figure 1.16: top). This result is checked with a graph with each chronological segment calculated as an equal part of '1' (with the sum of the segments being '1'), from which it is clear that the same overall picture emerges (Figure 1.16: below).

Table 1.13. Represented decorated bowl types versus fabric, based on MNI.

DECORATED BOWL TYPES IN MNI	LG SA	LMV SA	LEZ SA	CG SA	MAD SA	ARG SA	BLW SA	TRI SA	RHZ SA	EG SA	NOG SA	BURNT	TOTAL	%MNI
Drag. 29	1												**1**	**0.4**
Drag. 30 / 30R						2		1					**3**	**1.1**
Drag. 37	7	1	14		2	25	1	53	89	2		9	**203**	**75.5**
Drag. 37R						1			2				**3**	**1.1**
imitation Drag. 37R											3		**3**	**1.1**
Chenet 317?						1							**1**	**0.4**
Chenet 318?						1							**1**	**0.4**
Chenet 320						49					4	1	**54**	**20.1**
TOTAL	**8**	**1**	**14**	**0**	**2**	**79**	**1**	**54**	**91**	**2**	**7**	**10**	**269**	**100.0**
%MNI	**3.0**	**0.4**	**5.2**	**0.0**	**0.7**	**29.4**	**0.4**	**20.1**	**33.8**	**0.7**	**2.6**	**3.7**	**100**	

DECORATED BOWL TYPES IN MNI (mid-Roman)	LG SA	LMV SA	LEZ SA	CG SA	MAD SA	ARG SA	BLW SA	TRI SA	RHZ SA	EG SA	NOG SA	BURNT	TOTAL
Drag. 37	7	1	14		2	25	1	53	89	2		9	**203**
Drag. 37R						1			2				**3**
imitation Drag. 37R											3		**3**
TOTAL	**7**	**1**	**14**	**0**	**2**	**26**	**1**	**53**	**91**	**2**	**3**	**9**	**209**
%MNI	**3.3**	**0.5**	**6.7**	**0.0**	**1.0**	**12.4**	**0.5**	**25.4**	**43.5**	**1.0**	**1.4**	**4.3**	**100.0**

8. The decorated wares

8.1 The mid-Roman decorated bowls

The basis for the analysis of the decorations, included in the following analysis, is formed by the catalogue of the decorated samian (Section 15 of this chapter). All bibliographical references for the dating of the potters and workshops can be found there. The decoration numbers (DS) refer to the catalogue and are linked to Plates XCVII-CII.

A body fragment and part of a footring, both in La Graufesenque fabric, are the only fragments of the type Drag. 29 (one MNI) discovered at the site (not illustrated). The body fragment was found in a layer of fort level 4; the footring was recovered from the construction pit of the large water-basin of fort level 5. Both are clearly residual, dug-up finds from earlier civilian activity at this location. Also the presence of the Drag. 30 type is negligible; this form is only represented by three MNI with one Argonne Drag. 30 (Plate XCIII: 2), one Argonne Drag. 30R (no. 1) and one Trier Drag. 30 (not ill.). The Drag. 30R type mainly occurred in the 2nd century, whereas the decorated Drag. 30 was made throughout the exporting period, even still by the East Gaulish potters into the 3rd century, mainly from Rheinzabern, although in small numbers (Webster 1996, 43; Bird 1993, 3). The absence of *in situ* Drag. 29 bowls and the low numbers of Drag. 30(R) (see Table 1.13) emphasize that the fort occupation represented by the mid-Roman samian assemblage is situated largely in the 3rd century.

The main decorated bowl type encountered at the south-west corner site is the Drag. 37 with 75.5% of the decorated bowl MNI (203 of 269 MNI) (Table 1.13). Only three Drag. 37R bowl individuals were counted, one from Argonne (not ill.) and two from Rheinzabern (Plate XCVI: 41-42). Three MNI Drag. 37R imitations in North Gaulish technique, with one complete profile, also belong to the mid-Roman repertoire (Plate XCVI: 44-45).

Within the totality of 209 Drag. 37 bowls (203 MNI Drag. 37, 3 MNI Drag. 37R, 3 MNI Drag. 37R imitation), the Rheinzabern potteries take an impressive lead with 91 MNI or 43.5%. The supply of the Trier workshops was also important, with 53 MNI or 25.4%. The Argonne represents a moderate quantity with 26 MNI or 12.4%. The decorated products from Lezoux only count for 6.7% of the Drag. 37 MNI (14 MNI), again indicating that the main fort activities are to be situated in the 3rd century. Other production centres only supplied in minor quantities.

The Drag. 37/37R bowl profiles show a large variety in rim diameter and body profile (Plates XCIII: 3-11; XCIV-XCV). Both the Trier and Rheinzabern products comprise smaller and compact examples as well as large vessels with a high, often flaring, rim. The latter is a 3rd-century evolution (cf. Bird 1993, 4). Trier examples are Plate XCIV, 17 and 19; examples of Rheinzabern vessels with such high rim are Plate XCV, 32 and Plate XCVI, 33 and 36.

The decorated bowls are represented by 214 freeze fragments (with or without rim preserved) with 61 of them being too small or too abraded to consider further (ovolo too little preserved or hardly any freeze motif distinguishable). The remaining 153 fragments are listed in the catalogue of the decorated samian[17] (Section 15 of this chapter), and yield in total 76 unique potter, potter group or style identifications (Table 1.14).

17 The applied date ranges are the maximal dates as encountered in recent literature.

Table 1.14. Potters and potter groups (classified by decoration, per workshop) attested at the south-west corner site.

potter	origin	AD start date	AD end date
Censor/Censorinus, M. Crestio, Crucuro II or Mercator	La Graufesenque	70	120
L. Cosius	La Graufesenque	100	130
M. Crestio, Memor or Mercator	La Graufesenque	70	110
Mercator, Germanus or related potter	La Graufesenque	70	110
Momo	La Graufesenque	60	90
Cettus/Satus	Les Martres-de-Veyre	130	160
Censorinus II	Lezoux	160	190
Cinnamus II (2x)	Lezoux	135	180
Iullinus, Advocisus, Carantinus, Paternus or Cinnamus	Lezoux	130	200
Iustus II	Lezoux	160	200
Mercator II	Lezoux	160	200
Servus II	Lezoux	160	200
Sacer	La Madeleine	125	155
Virtus/Virtuus	La Madeleine	120	130
Ware mit Eierstab C	La Madeleine	120	190
Africanus or Germanus	Argonne	160	200
Eburus of Lavoye (2x)	Argonne	150	200
Gesatus of Lavoye	Argonne	150	200
Tocca group	Argonne	130	170
Tribunus ii of Lavoye (5x)	Argonne	150	200
Ware mit Eierstab G (2x)	Argonne	120	220
Ware mit Eierstab G / Tribunus	Argonne	150	200
unknown potter	Blickweiler	105	160
Afer (3x)	Trier	190	240
Afer Marinus group	Trier	190	240
Afer, Dubitatus-Dubitus or Paternianus	Trier	190	260
Afer-Marinus, Dubitatus-Dubitus or related potter	Trier	190	260
Atillus-Pussosus	Trier	220	260
Atillus-Pussosus, Amator or related potter	Trier	200	260
Censor, Maiiaaus or Art der Ware mit Eierstab Fölzer 941	Trier	165	240
Censor-Dexter (group) (6x)	Trier	180	240
Comitialis of Trier (4x)	Trier	170	240
Dubitatus-Dubitus	Trier	200	260
Maiiaaus or related potter (4x)	Trier	170	240
Maiiaaus, Comitialis or related potter	Trier	165	240
Primanus	Trier	230	275
Werkstatt I	Trier	130	150
Werkstatt II (2x)	Trier	145	165
Werkstatt II 'spätere Ausformung' or Maiiaaus group	Trier	145	210
Werkstatt II 'spätere aufsformung' (4x)	Trier	170	210
Arvernicus-Lutaevus (2x)	Rheinzabern	160	190
Attilus	Rheinzabern	180	250
Atto or Reginus II	Rheinzabern	160	235
Atto, Marcellus II, Primitivus I or IV, or Ware mit Zierglied O382/383	Rheinzabern	160	260
B.F. Attoni	Rheinzabern	170	220
Belsus II, Attilus or Ware mit Eierstab E25/E26	Rheinzabern	170	250
Cerialis group	Rheinzabern	160	230
Cerialis I or V	Rheinzabern	160	230
Cerialis I, IV, V, Comitialis I or Arvernicus-Lutaevus (2x)	Rheinzabern	160	240
Cerialis III	Rheinzabern	160	230
Cerialis VI, Primitivus I or III	Rheinzabern	160	260
Comitialis group of Rheinzabern (2x)	Rheinzabern	170	240

potter	origin	AD start date	AD end date
Comitialis I, Iulius II-Iulianus I, Ware anschliessend an Iulius II-Iulianus I or Victorinus II	Rheinzabern	170	260
Comitialis IV (or related potter) (3x)	Rheinzabern	170	240
Comitialis V (or related potter) (7x)	Rheinzabern	170	240
Comitialis V, Iulius II-Iulianus I or related potter (3x)	Rheinzabern	170	260
Firmus II	Rheinzabern	165	220
Helenius	Rheinzabern	180	200
Iulius I	Rheinzabern	220	255
Iulius I, Lupus or Perpetuus	Rheinzabern	190	275
Iulius II-Iulianus I (9x)	Rheinzabern	220	255
Iulius II-Iulianus I or Respectinus I	Rheinzabern	220	260
Iulius II-Iulianus I, Respectinus I or Victorinus II	Rheinzabern	210	260
Lucanus II	Rheinzabern	160	200
ovolo Ri-Fi E23 (2x)	Rheinzabern	170	260
ovolo Ri-Fi E25	Rheinzabern	170	260
ovolo Ri-Fi E26 (2x)	Rheinzabern	170	260
Perpetuus	Rheinzabern	230	275
Primitivus I or III	Rheinzabern	220	260
Primitivus IV	Rheinzabern	220	260
Reginus I, Cobnertus or Ianu I	Rheinzabern	150	200
Respectinus II	Rheinzabern	220	260
Statutus II	Rheinzabern	230	260
Verecundus II	Rheinzabern	160	220
Victor II or Ianuco	Rheinzabern	220	270
Victorinus II	Rheinzabern	210	250
Ware B mit Zierglied O382/383	Rheinzabern	200	275

8.1.1 La Graufesenque (DS1-6)

Some Drag. 37 fragments come from the South of Gaul. They were all supplied by the La Graufesenque workshops and the identified styles can be attached to the late 1st and early 2nd century AD. Five potter groups are recognized: Momo (DS1), Censor/Censorinus – M. Crestio – Crucuro II – Mercator (DS4), M. Crestio – Memor – Mercator (DS2), Mercator – Germanus – related potter (DS3), and L. Cosius (Virilis) (DS5). They cover a date range from AD 60 to 130. The Momo sherd has been reworked as a counter (DS1). These La Graufesenque pieces have to be considered as residual finds from an early occupation at Oudenburg prior to the fort. In addition to their considerable fragmentation, they were found in association with later samian sherds. This was also the case for a body fragment and part of a footring in La Graufesenque fabric which can be attributed to the Drag. 29 type. From the earliest sector of the civil settlement, found underneath the late Roman graveyard A, two Drag. 29 bowls could be attributed to the South of Gaul (Creus 1975, 18, 17: Afb. 7, 32-33).

8.1.2 Central Gaul (DS7-17)

Only one decorated Drag. 37 wall sherd can be assigned to the productions at Les Martres-de-Veyre (DS7). The identified potter is Cettus or Satus, also known as the Small S-potter; he was active in the period AD 130-160.

The rest of the Central Gaulish Drag. 37 bowls were supplied by the Lezoux potteries; they count for fourteen MNI. Apart from only two substantial rim fragments (Plate XCIII: 3-4) and one complete base (no. 5), the Lezoux assemblage consists merely of loose body sherds. Six potters or styles were recognized: Cinnamus II (two times: DS8 and DS9), Iullinus – Advocisus – Carantinus – Paternus – Cinnamus (DS10), Censorinus II (DS 11), Iustus II (DS13), Mercator II (DS14) and Servus II (DS12). The period of production of these potters covers a date range from AD 130 to 200 with an emphasis on the period AD 160-200. Delage (2003, 186-188) has however demonstrated that their production period and definitely the period of distribution of their vessels may have continued much longer. For Cinnamus he suggests a continuation until AD 220; the decorated vessels of Iullinus and Paternus may even be dated until AD 240 while the end date for Mercator II is pushed forward until AD 250 (Delage 2003, 187: Fig. 2). While their original date range seems to indicate that these sherds, recovered from features belonging to fort level 2 and later, are residual, dug-up items, these proposed new date ranges imply that this is not necessarily the case.

8.1.3 North-East Gaul

The La Madeleine production is only recognized by three decorated Drag. 37 body sherds (DS18-20). The identified potters, Sacer (DS20) and Virtus/Virtuus (DS18), and the style group Ware mit Eierstab C (DS19) cover a date range from AD 120 to 190. The early period represented by Virtus/Virtuus (AD 120-130) might indicate that this is a residual sherd from the civil settlement. This fragment (DS18) was found as a dug-up item in the construction

pit of the large water-basin of fort level 5. The sherd of the Sacer bowl (DS20) was recovered from the earliest earthen rampart level. In accordance to the date range of the accompanying Lezoux products, it seems most probable that also this fragment, dated to AD 125-155, is a residual piece. Also the bowl fragment of the Ware mit Eierstab C (DS19) is definitely a dug-up piece as it was found in a fort level 4 pit.

The decorated Drag. 37 bowls from Argonne are represented in moderate quantities in the Oudenburg assemblage with 26 MNI or 12.4% of the total Drag. 37 MNI (Plate XCIII: 6-11). Two fragments can be attributed to the Drag. 30 type: one rim Drag. 30R most likely datable to the 2nd century and one Drag. 30 base not further identifiable. The sixteen Drag. 37 rim sherds show a variety of rim diameters ranging from *c.* 188 to 270 mm. Based on the identifiable freeze fragments, six potters or styles have been distinguished: Africanus-Germanus (DS31), Eburus of Lavoye (DS29 and DS30), Gesatus of Lavoye (DS28), Tocca group (DS21), Tribunus ii of Lavoye (DS22-26) and Ware mit Eierstab G (DS32 and possibly DS33). Tribunus ii of Lavoye is represented with certainty no less than five times. With a date range between AD 150 and 200 this is a very significant element for the fort occupation chronology. The Argonne potters cover a very wide date range from AD 120 to 275, though most of them were working in the period AD 150-200.

8.1.4 East Gaul

Although the potter could not be identified, one Drag. 37 body sherd is to be attributed to the Blickweiler production based on its fabric and decoration (DS42). The fragment can only be generally dated according to the production period of these workshops to the period AD 105-160 (Vilvorder, in Brulet *et al.* (réd.) 2010, 173) and is most likely a residual piece from the pre-fort settlement.

With 53 MNI, merely defined by the different freeze fragments and in relation to distinguishable fabrics, a lot of Trier potteries supplied their Drag. 37 bowls to the Oudenburg fort. Only one Drag. 30 rim sherd can be attributed to the Trier workshops. The thirteen Drag. 37 rim profiles of which the rim diameter could be defined, reveal small and larger bowls with rim diameters ranging from 168 to 288 mm (Plate XCIV). The largest vessels show very high rim parts, a typical late phenomenon (see before).

Only 39 Trier finds yield a 'readable' decoration and are recorded in the catalogue (DS43-82). The Trier products cover the whole exporting period of the Trier workshops. One body sherd can be attributed to the Antonine Werkstatt I, dated AD 130-150, and can be considered as a residual find (DS43). The later Werkstatt II, in its initial phase dated to AD 145-165, is represented by at least two individuals (DS44 and DS 45). At least four bowls can be identified as so-called 'spätere Ausformungen' (DS44, DS46-48). Another individual may also have been from the Maiiaaus group (DS50). The distinctive late fabric of these products indicates that they were produced in reused or old moulds by potters working in the period AD 170-210. Five groups of potters cover a production period from the later 2nd century to AD 240: Censor – Maiiaaus – Art der Ware mit Eierstab Fölzer 941 (DS61), Maiiaaus – Comitialis – related potter (DS66), Comitialis of Trier (DS62-65), Maiiaaus or related potter (DS51-54)[18] and the Censor-Dexter group (DS55-60). Very significant for the Oudenburg chronology is the multiple presence of three potters: Comitalis of Trier (four times, once confirmed by intradecorative stamp (DS64)), Maiiaaus or related potter (at least four times) and the Censor-Dexter group with no less than six individuals. Ten Drag. 37 bowls were made by potters or groups (mainly) working in the 3rd century: Afer (DS67-69), Afer Marinus group (DS70), Afer – Dubitatus – Dubitus or Paternianus (DS75), Afer – Marinus – Dubitatus – Dubitus or related potter (DS74), Atillus – Pussosus – Amator or related potter (DS71), Dubitatus – Dubitus (DS73), Atillus – Possusos (DS72) and Primanus (DS76). Important to emphasize is the precence of at least three Afer Drag. 37 bowls, dated to AD 190-240.

With 89 MNI of Drag. 37 bowls and two MNI Drag. 37R, Rheinzabern plays a dominant role in the supply of decorated bowls to the Oudenburg fort. In the catalogue 65 Rheinzabern freeze fragments are recorded of which 59 can be attributed to a potter, group or style. The diameters of 27 rims could be defined ranging from 155 to 260 mm. According to the Ludowici typology these small to large bowls can be identified as types Lud. BSa, BSc and Bse (Plates XCV, XCVI: 33-40).

Only four Rheinzabern bowls were made by potters or groups solely working in the 2nd half of the 2nd century, namely Reginus I/ Cobnertus/Ianu I (DS88), Arvernicus – Lutaevus (attested twice : DS89 and DS90) and Lucanus II (DS91). Many of the attested potters or potter groups started their productions around AD 160 or 170, but were active until well into the first half of the 3rd century or until the middle of the 3rd century: Verecundus II (DS95), the Cerialis group (attested three times (DS92-94), possibly four when including DS97), Atto or Reginus II (DS96), the Comitialis group (represented twelve (DS101-112), but possibly fifteen times; once confirmed by intradecorative stamp (DS103)), Firmus II (DS99) and B.F. Attoni (DS100). In addition to these potters who can be identified with certainty, also Marcellus II (DS136) and Belsus II (DS113) are possible candidates for the attribution of certain bowls. Helenius (DS114) and Attilus (DS115) started their production only *c.* AD 180. While Helenius offers a narrow date range until AD 200, Attilus produced until the middle of the 3rd century. At least nineteen bowls can only be dated to the 3rd century. Their makers are identified as: Victorinus II (DS116), Iulius I (once, possibly twice: DS117 and DS141), Iulius II – Iulanus I (attested

18 In the final editing stage of the manuscript, some new data were provided by prof. dr. E. Ebermann (Karl-Franzens-Universität Graz, Austria) on six decorations attributed to Maiiaaus and related potters. This information could be added in the catalogue, but the graphs and tables could not be altered anymore. However, the time-spans these potters worked are similar and do not alter the chronological conclusions drawn here. The decorations in question are DS51 (according to Ebermann not identifiable as Maiiaaus, only generally as a late potter of the 3rd century), DS52 (which should most likely be identified as Comitialis as Trier), DS53 (which should be ascribed to Maiiaaus or one of several contemporaries), DS54 (which is according to Ebermann from Afer), DS61 (which can be recognized solely as from Maiiaaus according to Ebermann) and DS66 (which Ebermann ascribes with certainty to the Afer-Marinus group).

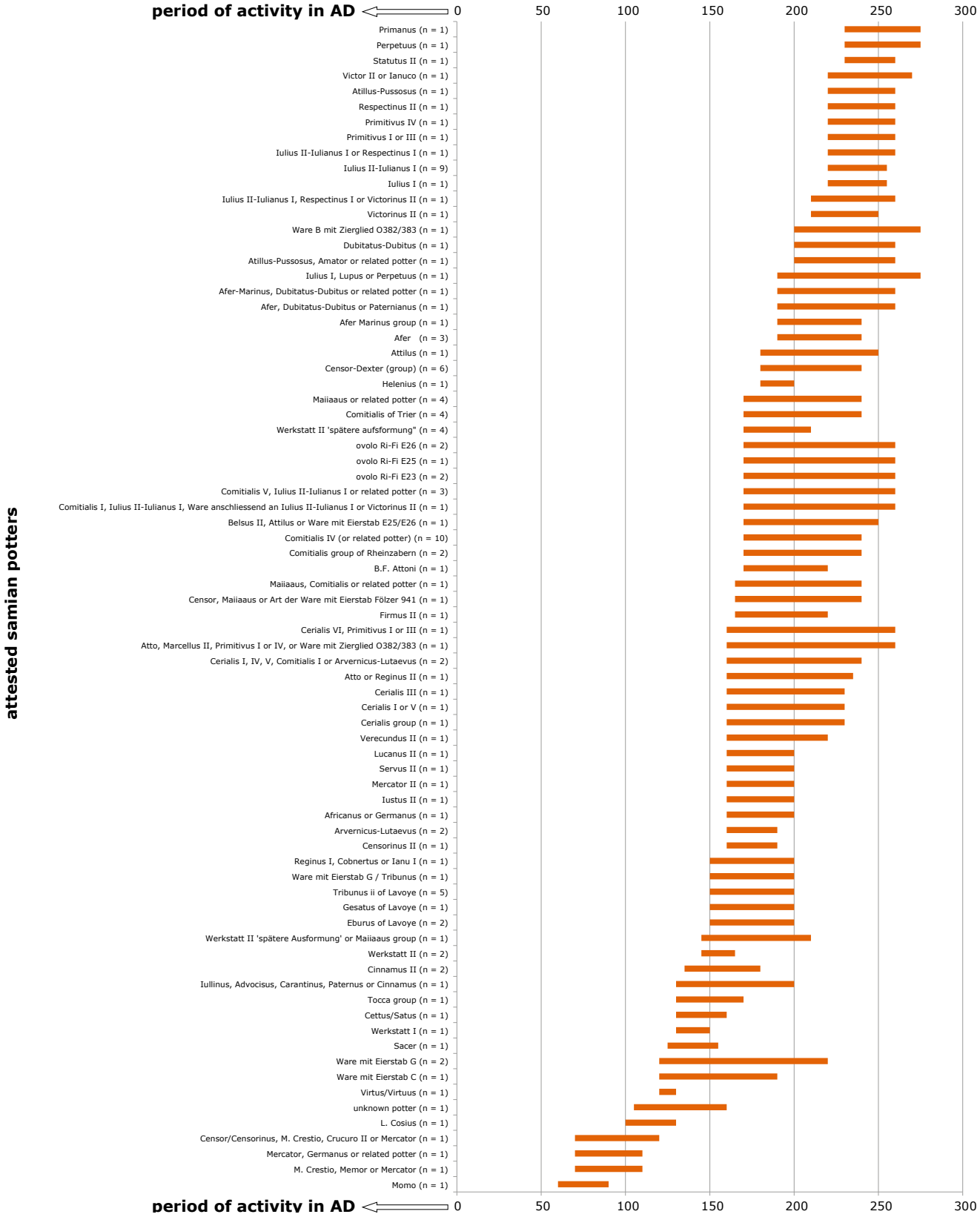

Figure 1.17. Chronological range of the potters represented by decoration at the south-west corner site, with indication of their frequency (number of individuals).

nine times : DS118-126), Iulius II – Iulianus I – Respectinus I (- Victorinus II) (attested twice: DS127 and DS128), Primitivus I or III (DS130), Primitivus IV (DS131), Respectinus II (confirmed by intradecorative stamp DS129), Victor II or Ianuco (DS132), Statutus II (DS133) and Perpetuus (DS134). The latter two potters started their production not earlier than AD 230.

Very significant for the Oudenburg chronology is the multiple presence of bowls decorated by Comitialis of Rheinzabern and by Iulius II – Iulianus I. Twelve Comitialis bowls were recognized; another three vessels may also belong to this group. Styles I, IV as well as V seem to be represented. Unfortunately the Comitialis group covers a very wide date range of AD 170-240. Iulius II – Iulianus I are the makers of at least nine bowls; four more may also have been decorated by them. The close date range of this potter group, AD 220-255, is a very important chronological element for the Oudenburg fort occupation dating range (see further). The production by this workshop is generally dated in the second quarter of the 3rd century. Simon (1968, 22) and Bernhard (1981, Abb. 3) date this group more specifically after AD 233. The Iulius II – Iulianus I products are well-represented in contexts of the second quarter of the 3rd century (*c.* AD 233 – 260/270) such as the London New Fresh Warf assemblage, dated by Bird between AD 235 and 245 (Bird 1986, 143; cf. also Bird 2002, 34-35 and Scholz 2006, 36 with reference to other authors who date this group between AD 210/230 and 260/270).

8.1.5 The mid-Roman decorations and their chronological implications

When decorations are considered in their totality, most of them fall within the date range AD 160-260 (Figure 1.17). The decoration dates are presented in two graphs (Figure 1.18). Figure 1.18 top graph shows the date ranges per fabric with each chronological segment represented as 'one time present', while Figure 1.18 graph below displays the same date ranges per fabric with each chronological segment calculated as an equal part of '1' (with the sum of the segments being '1')[19]. They represent a similar overall picture, but the graph below shows some important nuances. While the top graph marks a clear supply from AD 165 onwards, the graph below seems to shift the start date rather to AD 175. Both graphs present a dip around the period AD 205-215 which is a similar outcome as with the date ranges shown by the stamps where it was less marked though.

8.2 Late Roman decorated bowls with roller-stamped decoration from the Argonne region and the North of Gaul

The late Roman decorated bowl repertoire in the Roman level of the south-west corner site is completely taken up by the Chenet 320 type (54 MNI), except for one possible Chenet 317 body sherd[20] (with decoration preserved) and one rim of a small Chenet 318? bowl (no decoration preserved) (Plate CII: 1), both in Argonne fabric. The MNI quantification of this group is based on the different roller stamps, as their number exceeds the number of Chenet 320 rims (23 unique rim fragments).

Most of the Chenet 320 bowls from the Roman level, and also from the later levels, originate from the Argonne; for the Roman level 49 MNI were counted. Both very good (hard fabric, good quality coating, clear stamp) as bad quality (bad quality coating, soft fabric and/or bad quality stamp) products are represented in the assemblage. The fourteen Argonne rims with definable rim diameter fall within a range from 140 to 252 mm, thus including a variety of smaller and larger vessels (Plate CII: 2-14). Slightly concave profiles as well as more flaring, conical shapes occur. Only four decorated bowl MNI from the Roman level can be attributed to the late Roman North Gaulish potteries[21]. All four represent rim fragments without decoration preserved.

Most of the Chenet 320 fragments bear roller stamps[22] (Plates CIV-CXI). These roller-stamped sigillata form the index fossils for the late Roman period at Oudenburg. While the general study of the samian wares only comprised the sherds found within the Roman level itself, all roller-stamped sigillata items recovered from the site were included in a specific detailed analysis for the chronological information they can provide. Since the civil occupation around the fort apparently no longer existed after the late 3rd century AD and roller-stamped sigillata only appeared from *c.* AD 310/320 onwards (cf. Hussong and Cüppers 1972; Brulet 2010d, 226), all cases found regardless of context including the ones from the post-Roman and mixed levels (as residual finds), reflect the military occupation at Oudenburg.

The south-west corner site yielded in total 307 roller-stamped individuals, representing 491 fragments (Table 1.15). They were studied by W. Dijkman; a recent revision following new developments in the study of roller stamps was performed by L. Bakker. All identifications, dating proposals and places of origin were provided by Dijkman, Bakker and Van Ossel[23].

The post-Roman level completes the late Roman decorated type spectrum with only a few other types (Plate CIII). While the Roman level only yielded one decorated, possible Chenet 317 body

19 **The La Graufesenque date range can be attributed to an earlier occupation prior to the fort.**

20 **This small fragment was recovered from a fort level 4 layer (and counted as such) but should be considered as an intrusive find from fort level 5.**

21 **Three other decorated bowl MNI in North Gaulish fabric represent a type imitating the Drag. 37R, and are clearly belonging to the mid-Roman samian repertoire (Plate XCVI: 44-46). They were recovered from levels assigned to fort level 3 and 4.**

22 **The UC coding system of the roller stamps refers to the publications of Unverzagt (1919) and Chenet (1941). Since 1995, L. Bakker (Augsburg), W. Dijkman (Maastricht) and P. Van Ossel (Paris) are preparing a Corpus of roller stamped sigillata. For the roller stamps which were not identified by Unverzagt and Chenet, a new coding has been created by them, with a NS-number (=Nouvelle Série). All roller stamps found at Oudenburg are included in the Corpus that Bakker, Dijkman and Van Ossel are preparing (Bakker *et al. forthcoming*).**

23 **The given dates are the present proposals by L. Bakker, W. Dijkman and P. Van Ossel. Slight changes may occur in the future as their general study of roller stamps proceeds. They will not alter the general image presented here though (pers. comm. by Van Ossel).**

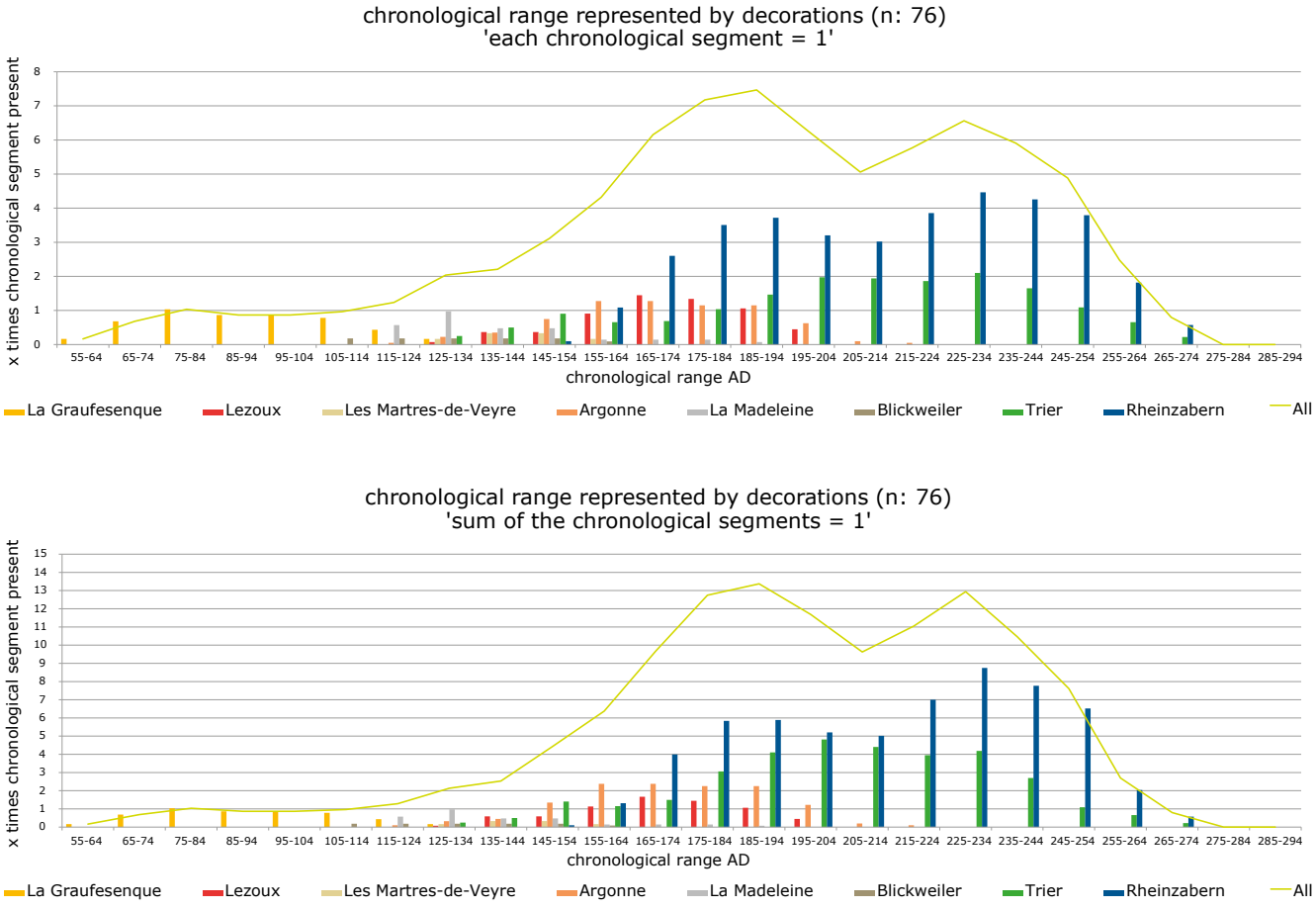

Figure 1.18. Chronological range represented by the samian decorations at the south-west corner site, based on unique potters (a potter found more than once is included as only one style). Top: each chronological segment (10 years) is counted as 1. Below: the sum of all chronological segments (each 10 years) is 1. With thanks to T. Clerbaut (Ghent University).

sherd (with roller stamp UC 24) and one Chenet 318 (broken off above decoration) in the decorated assemblage dominated by the type Chenet 320, two Chenet 313 dishes, both from the Argonne, can be added to the late spectrum: one complete profile with roller stamp NS 3232 (no. 1) and one rim fragment with roller stamp UC 56 (no. 2). In addition, another 250 MNI of Chenet 320 bowls can be added to the 49 MNI from the Roman level.

The North Gaulish decorated bowls remain a minority in the post-Roman level. Only another fourteen roller-stamped fragments in North Gaulish fabric, belonging to nine MNI, were recovered. All North Gaulish decorated vessels from the Oudenburg site appear to originate from the Boulonnais region. Three different roller stamps were preserved: one UC 123 var., one NS 2057 and two NS 2050. The two latter roller stamps are so far only known from the Oudenburg fort and appear to be characteristic for the North Gaulish production (Delbey 2018). In the North Gaulish fabric an undefined collared bowl (rim not preserved) (no. 3) can be added, bearing the roller stamp NS 2057.

Fourty-nine of the total number of 307 roller stamps belong to the Roman level[24]. Based on the stratified evidence, the roller-stamped vessels appear from fort level 5 onwards[25]. Of these 49 roller stamps, 24 were recovered from the 'double' well OS 2562 (see Vanhoutte *et al.* 2009b, 82-88); seven stamps were retrieved from the large water-basin OS 4923. They will be discussed further within their respective context assemblages.

Identified roller stamps are shown in Plates CIV-CXI[26]. The identified stamps cover a date range from *c.* AD 320 until *c.* AD

24 **This number of 49 roller stamps can also be considered as the MNI of the Argonne Chenet 320 bowls at fort level 5, since in total only 28 unique rim fragments were counted.**

25 **Eight very small sherds were found in earlier levels (no closed contexts), but must be regarded as intrusive finds.**

26 **Due to their fragmentary or abraded state of preservation, the following roller stamps are not illustrated: UC 1, UC 2, UC 4, UC 20, UC 24, UC 26, UC 32, UC 60, UC 93, UC 123 var., UC 159, UC 255, UC 286=327, UC 306(?), UC 351=354, NS 1025, NS 1138, NS 1240, NS 1242, NS 1274, NS 1330, NS 1470, NS 3026, NS 3134, NS 3149, NS 3156, NS 3230, NS 3232, NS 20 000, NS 30 008 and NS 30 010.**

Table 1.15. The attested roller stamps at the south-west corner site, with their origin (when known) and their proposed dating. From the 307 roller stamps, 264 could be identified, 44 remain unclassifiable because of their size or state of preservation. They mainly include roller stamps of Hübener (1968) groups 2 and 3. *: same maker.

roller stamp type	n	known origin	date
UC 1	1		320-360
UC 2	1		IV b-c
UC 4	1		IV b-c
UC 6	3		IV b-c
UC 10	1		IV b-c
UC 20	1		360-390/400
UC 24	1		410-450
UC 25	2	Vauquois-Les Allieux	410-450
UC 26	1		410-450
UC 29	3		410-450
UC 32	1		IV A
UC 33	2		370 - 420/30
UC 38	1		370 - 410
UC 40	4	Vauquois-Les Allieux	390-430
UC 45	9		390-430
UC 50	1		IV d - V a
UC 55=236	4	Vauquois-Les Allieux	IV b-d
UC 56	1	Avocourt	IV d
UC 60	1		IV B
UC 62=285	2	Vauquois-Les Allieux	IV d - V a (?)
UC 64	10		IV d - V a (?)
UC 66	1	Vauquois-Les Allieux	IV d - V a
UC 86	4	Aubréville	IV d - V a
UC 88	1		V A
UC 93	1	Lavoye / Vauquois-Les Allieux	IV d - V a
UC 94	3	Vauquois-Les Allieux	IV d - V a
UC 95	5	Vauquois-Les Allieux	IV d - V a
UC 96	3	Lavoye	IV d - V a
UC 107	2	Vauquois-Les Allieux	IV d - V a
UC 108	1		IV B
UC 110	2	Avocourt	IV B
UC 111=333	4		IV d - V a
UC 112=341	1	Vauquois-Les Allieux	IV d - V a
UC 113	10		IV B - V a
UC 114=340	3	Avocourt	390/400-420/430
UC 117	12	Lavoye / Vauquois-Les Allieux	340-380/390
UC 118	1	Lavoye / Vauquois-Les Allieux	IV d
UC 121	2	Vauquois-Les Allieux	IV d - V a
UC 123 var.	1		[IVd-Va]
UC 127	1	Vauquois-Les Allieux	360 - 380/390
UC 129=325	3	Avocourt	350-400/410
UC 132=264	2	Vauquois-Les Allieux	IV b-c
UC 135	2	Vauquois-Les Allieux	390-430
UC 148	1	Vauquois-Les Allieux	IV d - V a
UC 158	6		IV b - IV d
UC 159	1		IV b - IV d
UC 164	2	Vauquois-Les Allieux	IV d - V a
UC 165	6	Vauquois-Les Allieux	IV d - V a
UC 172	2	Vauquois-Les Allieux	360 - 390/400
UC 177	3	Vauquois-Les Allieux	IV d - V a
UC 188	1		IV b-c
UC 196	2		IV b-c
UC 199	1		390 - 425
UC 200	2		IV b-c
UC 207	1		IV b-c
UC 255	1		IV B (?)
UC 270	1		IV b-c
UC 286=327	2		IV b-c
UC 288	1		IV b-c
UC 299	7	Vauquois-Les Allieux	IV b - IV c
UC 301	1	Vauquois-Les Allieux	IV d - V a
UC 304	5		IV b-c
UC 306(?)	1		IV b-c
UC 308	6	Lavoye / Vauquois-Les Allieux	IV B
UC 319	7	Vauquois-Les Allieux	IV d - V a
UC 324	1	Vauquois-Les Allieux	IV d - (V a ?)
UC 334	4		IV d - V a
UC 351=354	1		IV d
NS 1003	2	Avocourt	IV b-c
NS 1025	1	Vauquois-Les Allieux	IV c
NS 1037	1		IV d - V a
NS 1038	1		IV d - V A
NS 1055*	3	Vauquois-Les Allieux	360 - 390/400
NS 1138	1		IV B
NS 1197	3		IV d - V a
NS 1200	15		V A
NS 1227	3	Vauquois-Les Allieux	IV d - V a
NS 1228	1		IV d - V a
NS 1229*	4	Vauquois-Les Allieux	360 - 390/400
NS 1240	1		IVB
NS 1242	1		IV d - V a
NS 1274	1		V A
NS 1281	2		IV b-c
NS 1289	1	Île-de-France	IV d
NS 1398	5		IV b-c
NS 1470	1		IV b-c
NS 2006	1	Avocourt / Vauquois-Les Allieux	IV b
NS 2050	2		IV B
NS 2057	1		IV B
NS 3026	1		IV b
NS 3091	3		IV b - IV d
NS 3134	1		IV b-c
NS 3137	1		IV b
NS 3140	2		IV b
NS 3144	1		IV b
NS 3149	1		IV b-c
NS 3156	1		IV b-c (?)
NS 3161	2		IV b-c
NS 3181	1		IV b-c
NS 3223	3		IV b-c
NS 3224	1		IV b-c
NS 3228	1		IV B
NS 3230	1		IVB - Va (?)
NS 3232	1		IV b-c (?)
NS 3233	2		IV b-c (?)
NS 3234	1		IV b-c (?)
NS 20 000	2		
NS 30 008	3		
NS 30 010	1		
unclassifiable	44		
TOTAL	**307**	**identified**	**264**

450, with a well-spread chronological distribution between AD 325 and AD 425 (Figure 1.24).

The publications of Hübener (1968) and Bakker (1994) list three roller-stamped types which were retrieved from the excavations by Mertens on the fort area (during the 1960s and 1970s excavations at the western defensive area): UC 45 (AD 390-430), UC 100 (IVd) and NS 1018 (IVd-Va).

From the roller stamps of which the origin could be determined, the main proportion was produced at Vauquois-Les Allieux, the largest pottery site known and most studied in the Argonne region (see Feller and Brulet 1998). Striking is the presence of the stamp NS 1289 from Île-de-France, a '*molette francilienne*', a type of stamp which had a limited distribution area (Van Ossel 2011, 240: Fig. 9). This fragment was recovered from the post-Roman dark earth level.

The roller stamps from Chatel-Chéhéry, with a production not earlier than the very end of the 4th century (Brulet 2010d, 250), and from Pont-des-Quatre-Enfants, only producing in the 5th century (Brulet 2010d, 246), are completely absent, but this does not necessarily have any chronological implications (pers. comm. W. Dijkman).

9. Reparation and re-use

The significance of the mortaria in the samian assemblage is confirmed by the number of attested reparations. In total fourteen samian fragments yielded one or more repair holes. Apart from one Drag. 37 decorated bowl and one dish Drag. 18/31R, they all represent mortaria. It emphasizes the importance one gave to these vessels and the value they obviously had for their owner. Next to one Argonne Drag. 43, one Rheinzabern Drag. 43, three Argonne Drag. 45 and two Rheinzabern Drag. 45, five Chenet 328-330 mortaria (three NOG SA, two burnt) show reparations. The Rheinzabern Drag. 43 rim fragment even yielded six repair holes of which three were still filled with lead. The wear on a high number of mortaria fragments emphasizes their long use and life-span. When the usage of the samian vessels is considered, mainly mortaria fragments show a surface heavily worn on the inside.

A small number of items are modified, re-used samian sherds. They represent one more aspect of residuality at the site. Several bases were intentionally shaped, with or without the removal of the footring, to obtain a disc-like object, probably for use as lid or counter. This was the case for eight Drag. 33 cup bases, three complete bases of Drag. 37 bowls and two beaker bases. The rim of a Drag. 32 or 36 was broken off and afterwards its edge sharpened. A North Gaulish Chenet 328-330 mortarium shows a central circular perforation in the base (Plate LXXIII: 101). Of a Trier Drag. 45 only part of the lion spout was preserved but clear traces of intentional chipping of the spout can be noticed. Finally, three samian sherds were reworked as counter: one dish fragment, one Drag. 37 sherd (Plate XCVII: DS1) and one Drag. 43/45 piece.

10. Graffiti

Only eighteen samian vessels or vessel fragments from the Roman level of the south-west corner site bear a graffito (Table 1.16), a remarkable low number for a military site (cf. *e.g.* Bakker and Galsterer-Kröll 1975, 9; Haynes 2013, 319)[27]. Another eleven graffiti were collected from the post-Roman level; they are not discussed in detail here but they confirm the image provided by the graffiti from the Roman level. The same low number of graffiti is attested among the other pottery groups. In general, graffiti appear mostly on samian and are best represented at military sites (Bakker and Galsterer-Kröll 1975, 9). A study on the occurrence of graffiti in Britain has concluded to a decline of graffiti on military sites through time. Evans suggests that this may be related to a less communally organized fort community in the later periods (Evans 1987, 199). As such it would not reflect a lesser degree of literacy. This decline in applying graffiti as a late phenomenon seems to be confirmed by the Oudenburg material.

All graffiti on the samian fragments of the Oudenburg fort site were incised *post cocturam*. These written testimonies appear to reflect different functionalities.

The names on the bottom of bases are clearly signatures by the vessel owner. Graffiti on samian vessels were mostly placed on the base as they were apparently in general reversely stored (Bakker and Galsterer-Kröll 1975, 55-56). The graffiti demonstrate that samian vessels were personal items. Bakker and Galsterer-Kröll concluded from their study of the graffiti from several military sites in *Germania Superior* and *Inferior* that the, generally high proportion of, graffiti on the bases of vessels should be interpreted as possession marks or distinguishing signs to avoid that other soldiers, when eating and living together, would use and damage each other's vessel (Bakker and Galsterer-Kröll 1975, 56).

Five names or abbreviations of names can be recognized on the Oudenburg samian vessels. They were identified by G. Raepsaet and M.-Th. Raepsaet-Charlier (both Université Libre de Bruxelles). A Trier mortarium base bears the name SERGII C[, a *gentilicium* in genitive ('of Sergius') followed by the beginning of a cognomen starting with C (Plate CXII: 1). The bottom of the foot of a Rheinzabern beaker of the Lud. V series shows the name VIRNATTA, clearly a Celtic name (Plate CXII: 2). VIRNO exists in Martigues (Provence) as name (*L'année* épigraphique 2002, 920), but there are also other name forms known with the same radical. Anyhow, this radical points to a Celtic name (Delamarre 2007, 202). A Trier Drag. 37 bowl has the name MESSIC or MESSIE on its base (no. 3). Messic may well have been an abbreviation for Messicus, a name also recognized as graffito on pottery found at Bavay (*L'année* épigraphique 1999, 1077), at Warcq (CIL XIII 3553) and at the fort of Vindolanda (*Tabulae Vindolandenses* 175). 'Messie' is also possible though; this name has been attested at Arlon (*Inscriptions Latines de Belgique* 91). Again, Messic/Messie points to a Celtic name (Delamarre 2007, 132). The large 'PRI' on a Rheinzabern Drag. 36R (or Lud. Te) dish (no. 4) can be seen as an abbreviation of the common name Primus, attested in large numbers for example at Xanten (Weiss-König 2010, 396),

27 See *e.g.* Haalebos (1997, 53 (with references)) mentions many graffiti from the forts at Woerden, Vechten, Utrecht, Valkenburg and Zwammerdam at the Dutch limes. At the fort of Alphen aan den Rijn *c.* 0.4% of the pottery is provided with a graffito (Polak *et al.* 2004, 162).

Table 1.16. The attested graffiti on samian vessels at the south-west corner site and general fort level to which the find context can be attributed. The illustration numbers refer to Plates CXII-CXIV.

ill. no.	vessel	location of graffito	fort level	type of graffito	description
1	mortarium Drag. 45	bottom base	2	signature: name	SERGII C[
2	beaker Lud. Vseries	bottom base	4	signature: name	VIRNATTA
3	decorated bowl Drag. 37	bottom base	4	signature: name	MESSIC/MESSIE
4	dish Drag. 36R	interior base	4	signature: name	PRI
5	cup	bottom base	5	signature: name (abbreviation)	E (complete)
6	cup Drag. 33	bottom base	3	signature: analphabetic	X
7	decorated bowl Drag. 37	bottom base of footring	4	signature: analphabetic	X
8	dish Drag. 31	bottom base	4	signature: analphabetic	X
11	mortarium Drag. 45	bottom base	4	signature(s): analphabetic?	scratches in which several crosses can be discerned
12	dish	bottom base	4	signature: analphabetic	intersecting lines forming star
13	dish Drag. 31	bottom base	4	signature: analphabetic	crossing lines
14	dishR	bottom base	4	signature: analphabetic?	straight line and straight-angled line upon: fragmentary
9	cup Drag. 33	bottom base	5	signature: analphabetic	X
10	dish	bottom base	5	signature: analphabetic	X
15	cup Drag. 33	wall	2	text cf. ostracon	numbers?
16	cup Drag. 40	base of wall	2	text cf. ostracon?	]VI
17	dish Lud. Th	on exterior and interior body	4	text cf. ostracon?	2x uncertain letters?
18	decorated bowl Drag. 37	inside bottom	4	pattern cf. ostracon	intensive scratching: linear pattern

but other names such as Primatus, Primigenius, Primitius, Primulus are also possible. The same can be said of the large 'E' on the bottom of the base of an Argonne cup (no. 5), also likely to be the initial of the owner's name[28].

Apart from these 'names', another ten signs on bases or footrings can most likely be identified as owner marks. Most of these cases represent small or larger crosses, by several scholars accepted as being owner marks (Galsterer 1983, 15), possibly analphabetic signatures[29]. They occur on two Drag. 33 cups – one from Lezoux (Plate CXII: 6) and one from Rheinzabern (Plate CXIII: 9) -, on one Trier Drag. 37 bowl (Plate CXII: 7) and one Trier dish (Plate CXIII: 10). A burnt mortarium Drag. 45 base reveals a dense concentration of scratches in which at least two crosses can be distinguished (Plate CXIII: 11). One can wonder whether this mortarium had successive owners: was the second owner trying to erase the signature of the former when marking it as its own property? The cross-graffiti on the burnt dish base (no. 12) and the Rheinzabern Drag. 31 dish (no. 8) rather represent star-like crossing lines in the centre of the bottom of their bases. Like the X-graffiti they can be interpreted as owner marks or signatures. This is also likely for the linear graffito of another burnt *Strich*-stamped and rouletted base, however only fragmentary preserved (no. 14).

The totality of the signature-graffiti shows that a diversity of vessel forms were marked: mostly dishes (six items), but also cups (three items), decorated bowls and mortaria, both twice represented, and one beaker were 'named'. Dishes and cups are generally the forms that were marked most, and graffiti were in general applied on the inside of the footring (Weiss-König 2010, 48). Most of the signatures belong to fort level 4. Only the SERGII C[graffito can be attributed to fort level 2 and one 'cross' signature on a Lezoux Drag. 33 cup to fort level 3. The presumed initial 'E' signature and two 'cross' signatures, one on a Drag. 33 and one on a dish, were found at fort level 5; since this level is characterized by late Roman sigillata with roller-stamped decoration these finds are obviously dug-up from an earlier level.

Three samian fragments seem to have been used as ostracon, as support of an epigraphic message. The body of a Lezoux Drag. 33 cup found at fort level 2 shows a series of numbers (no. 15). Another body sherd from a Lezoux Drag. 40 from fort level 2 bears the letters]VI and represents most likely a fragment of an ostracon (Plate CXIV: 16). The rim sherd of a Trier dish type Lud. Th found at fort level 4 is densely scratched on both interior and exterior (no. 17). Both graffiti possibly represent a stylized text; some presumed letters can be discerned. On the interior a V and an I seem to be linked, followed by an A; the graffito on the exterior however remains undefinable. The interior of the base of a Drag. 37 bowl found at fort level 4 shows a graffito of intensive scratching with a linear pattern with more or less parallel lines (no. 18). Between some lines smaller transversal lines can be observed. Maybe this ostracon represents a game or some kind of listing.

Apart from the samian assemblage, several graffiti were found on amphorae fragments, mainly belonging to Dressel 20 amphorae (23 graffiti *ante cocturam*, 4 graffiti *post cocturam*), three to Gauloise

28 **Weiss-König (2010, 51) however leaves their interpretation open.**

29 **For a discussion on this topic: see Weiss-König 2010, 52.**

4 amphorae (two graffiti *ante cocturam*, one with two graffiti *post cocturam*)[30] (see Chapter 1.B.1 in this volume). Apart from the samian and the amphorae, only three other graffiti were found in the totality of the ceramic assemblage belonging to the Roman level[31].

Although a very small assemblage, the 'name' graffiti of the samian assemblage represent a very important contribution as they are one of the few epigraphic elements of the site.

11. Distribution and chronology in relation to the stratified evidence

11.1 General aspects and the significance of the samian assemblage as a chronological indicator

At the Oudenburg site, the sherd counts and MNIs increase when climbing up in the fort levels up to fort level 4, after which there is a certain decline (Figures 1.19-1.20)[32]. Nearly 45% of the samian sherds found within the Roman level are assignable to fort level 4 (Table 1.17). However, this increase should not be seen as an indication for an expansion of the samian supply to the fort site. Fort period 4 represents a much longer occupation, thus a longer period of incoming samian. Besides, the increasing number is probably also partly linked to the digging up of older fragments as a consequence of the building activities, the related earthworks and debris removals which took place at each level. This was not only the case when a new fort was built, but also happened during the several building phases within the successive main fort periods of which the renovations at every level bear witness. At fort period 4, the fort seems to have undergone a substantial transformation, the most important being the construction of the first stone defence. The intense building activities clearly involved large-scale digging, levelling and redepositioning of large amounts of soil and older debris. From this point of view, the high percentage of material from fort level 4 is most likely more a reflection of the physical activities or actions on the field during that period, rather than an indication for an increase in supply of samian pottery. This can partly be confirmed by the earlier samian sherds found at this level. This phenomenon of residuality also has consequences for the interpretation of the material, especially from that particular fort period. It means we have to be well aware of the high amount of residual material, not only in samian pottery, but also in other find categories.

Table 1.17. Proportional distribution of the samian in the Roman level, based on sherd count and MNI.

SAMIAN	n	%n	MNI	%MNI
L1	53	1.1	21	1.4
FL2	225	4.6	88	5.9
FL3	545	11.3	190	12.7
FL4	2150	44.4	619	41.5
FL5	1868	38.6	575	38.5
TOTAL	**4841**	**100**	**1493**	**100**

In this respect, it is equally very important to be aware of the dating restrictions that emerged during the study of the samian wares, concerning the 3rd century, with wide date ranges for the East Gaulish samian in contrast to the South and Central Gaulish samian of the 1st and 2nd centuries (cf. Bird 1993, 1). In addition, Delage (2003) remarked that 3rd-century samian is often dated too early, a problem mainly encountered for the Central Gaulish samian[33].

Another major problem encountered while studying this assemblage is the dating of individual decorated and stamped vessels coming from Trier and Rheinzabern during the late 2nd and 3rd century. One of the sore points is generally well-known: the evidence that both factories reused earlier moulds towards the middle of the 3rd century (Bird 1993, 3; see for Trier: Huld-Zetsche 1972, 81-88; see for Rheinzabern: Bittner 1986, 254-255).

Therefore, for a valuable perception of chronology and supply of samian wares, it is important to use contextually, quantitatively and qualitatively reliable assemblages, representative for the successive fort levels, where possible considered in relation to external chronological elements like dendrochronological datings and coin evidence. For the first two fort levels such contexts appear to be very scarce; hardly any context contains a significant amount of samian. Moreover, the first two fort levels cannot rely on valid external chronological elements. This changes from fort level 3 onwards.

Apart from studying specific samian contexts, and despite the residual element, it is nevertheless worth looking at the samian found at each level in general. Relative proportions of fabrics, forms and types and the latest samian vessels at every fort level create a

30 While the amphora graffiti *ante cocturam* have a very different functionality than the graffiti on the samian fragments discussed above, some of the graffiti *post cocturam* on amphora fragments can be part of ostraca (see in this volume Chapter 1.B.1). Specific attention is to be drawn to the *post cocturam* graffito on the base fragment of a North Gaulish Gauloise 13 amphora. The amphora must have been broken before the text was scratched since the text would have been written upside down; this fragment, belonging to fort level 4, can therefore be interpreted as an ostracon. The graffito probably reads as [VICT]oris(?) xx[x] (see Chapter 1.B.1, Section 5.1).

31 Only one of these graffiti joins the ones described above. It is located on the bottom of the base of a marbled ware vessel, possibly a jug, and attributed to fort level 5. The graffito, incised *post cocturam* represents crossing lines which can be interpreted in the same way as the analphabetic signatures on the samian vessels. The two other graffiti are made *ante cocturam* and represent a different type of information. The shoulder fragment of a flagon found in the earliest level of the earthen rampart shows an incomplete graffito, most likely a content or size indication. A small, unclear graffito on the inside of a wheel-turned reduced bowl, just underneath the rim part, close to the spout, may equally have been a size indication.

32 As already described, the MNI quantification method implies that the subgrouping of an assemblage into phases results in a recalculation of the MNI (cf. Symonds and Haynes 2007, 69). Therefore, the sum of the MNIs of the respective levels is higher than the total MNI of the assemblage studied in its totality.

33 Delage also draws attention to the problems of the chronological characterization of the Argonne and Rheinzabern samian in the 3rd century due to a deficit of chronological studies (Delage 2003, 183: footnote 1).

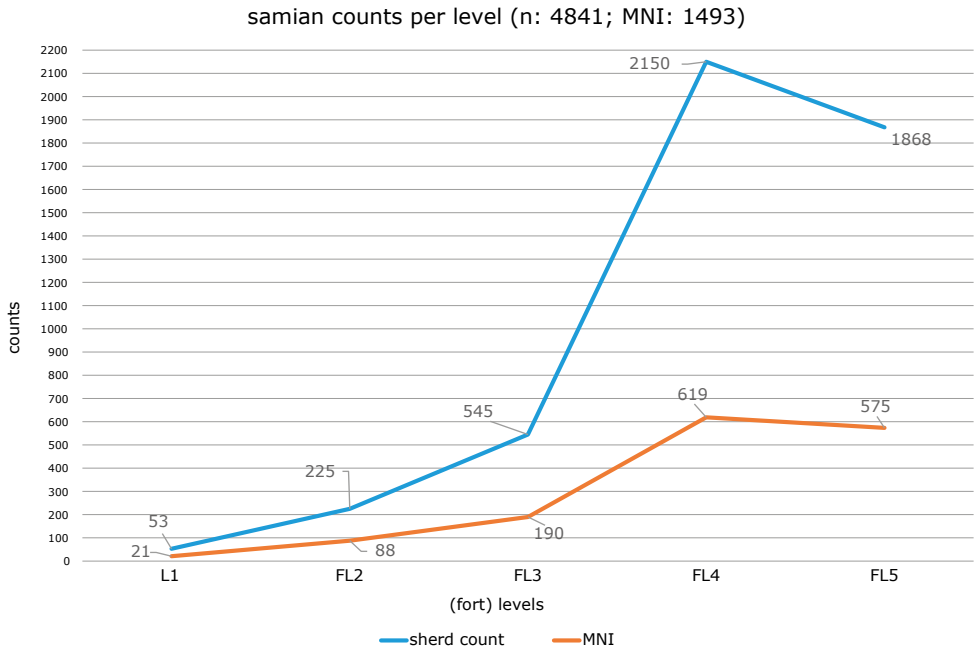

Figure 1.19. Samian counts per level within the Roman level, based on sherd count versus MNI.

SAMIAN FABRICS in MNI	L1	FL 2	FL 3	FL 4	FL 5	TOTAL
LG SA	1	2	2	5	4	14
LMV SA			2	1	3	6
LEZ SA	9	27	26	27	38	127
CG SA	1			1	6	8
MAD SA	1			1	2	4
ARG SA	1	28	40	60	114	243
BLW SA				1		1
TRI SA	3	11	39	165	109	327
RHZ SA	3	13	59	212	104	391
EG SA	2	1		8	4	15
NOG SA			2	21	62	85
burnt		6	20	117	129	272
TOTAL	**21**	**88**	**190**	**619**	**575**	**1493**

SAMIAN FABRICS in %MNI	L1	FL 2	FL 3	FL 4	FL 5	TOTAL
LG SA	4.8	2.3	1.1	0.8	0.7	0.9
LMV SA	0	0	1.1	0.2	0.5	0.4
LEZ SA	42.9	30.7	13.7	4.4	6.6	8.5
CG SA	4.8	0	0	0.2	1.0	0.5
MAD SA	4.8	0	0	0.2	0.3	0.3
ARG SA	4.8	31.8	21.1	9.7	19.8	16.3
BLW SA	0	0	0	0.2	0	0.1
TRI SA	14.3	12.5	20.5	26.7	19.0	22.0
RHZ SA	14.3	14.8	31.1	34.2	18.1	26.2
EG SA	9.5	1.1	0	1.3	0.7	1.0
NOG SA	0	0	1.1	3.4	10.8	5.7
burnt	0	6.8	10.5	18.9	22.4	18.2
TOTAL	**100**	**100**	**100**	**100**	**100**	**100**

Table 1.18. Chronological distribution of the represented samian fabrics in the Roman level, based on MNI and MNI%.

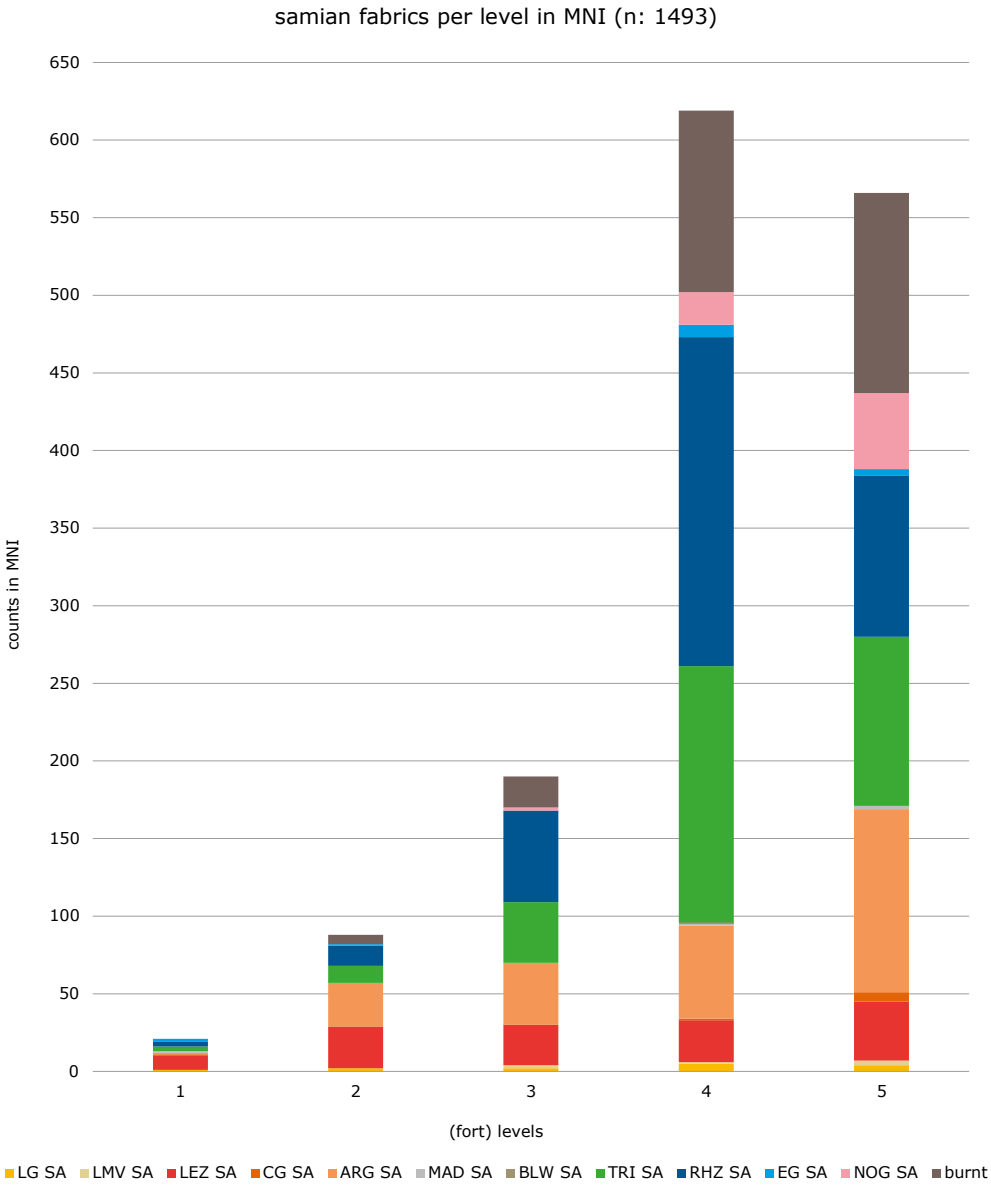

Figure 1.20. Distribution of samian fabrics per fort level, based on MNI.

preliminary chronological framework and a first impression of the character of the samian supply (Table 1.18; Figures 1.20-1.21).

11.2 The samian wares of level 1

11.2.1 The samian assemblage of level 1 in general

Since level 1 comprises both military and pre-fort features, its samian assemblage is definitely socially and chronologically mixed. Therefore only the latest samian sherds can with certainty contribute to our understanding of the dating of the first fort level. At this level, the Lezoux fabric is best represented with nine MNI out of 21, while Argonne and La Madeleine both count for only one, and Trier and Rheinzabern both for three. The dominance of Lezoux together with the low number of East Gaulish products may situate this fort level still in the 2nd century AD. Within the plain ware assemblage the fragment of a Drag. 43/45 is worth emphasizing; both Drag. 43 and 45 only first appear after *c.* AD 170 (Webster 1996, 53, 56). Level 1 yielded three stamped samian fragments. Apart from one rosette stamp from Lezoux (SS81) and one unidentifiable stamp (SS8), the stamp from the Trier potter Cerialis vii was found on a Drag. 18/31 (SS15). This potter was active in the period AD 140-180. Five fragments of Drag. 37 bowls were counted for level 1, of which four yield an identifiable decoration. The fragment of a decorated bowl made by L. Cosius (Virilis) of La Graufesenque (DS5) dated to AD 75-130 (largest range in literature), is clearly a fragment that can be attributed to earlier activities on the site. The fragment of a bowl decorated by Sacer of La Madeleine (DS20), active AD 125-155, may also represent a residual piece or may have been a vessel already in use for a long time. Fragments of decorated bowls from Iustus ii of Lezoux (DS13) (AD 160-200) and from Comitialis of Trier (DS62) (AD 170-240) confirm a *terminus post quem* date of AD 170 for fort level 1.

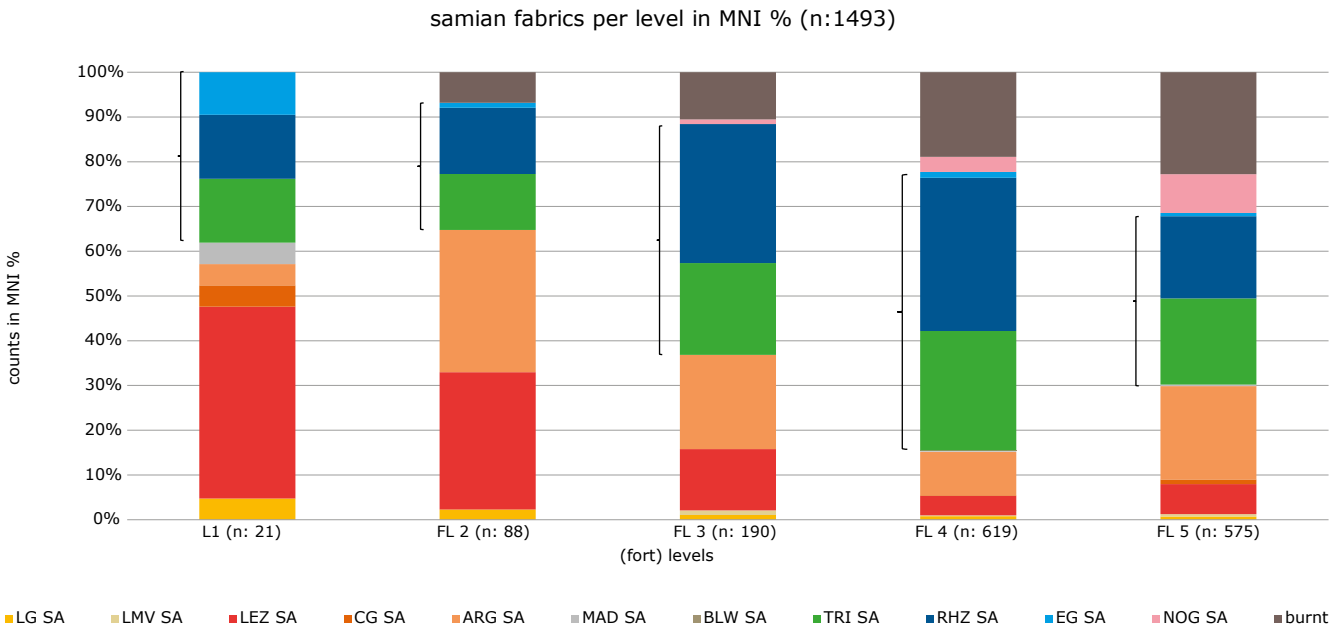

Figure 1.21. Distribution of samian fabrics per fort level, in MNI percentages. The curly brackets group the East Gaulish fabrics.

11.2.2 Closed contexts of level 1

The complete samian cup Drag. 33 of Trier, found in the central front posthole of a construction (built with the sleeper beam technique in combination with posts) situated underneath the earthen rampart of fort level 1 and obviously predating fort level 1, yields a first *terminus post quem* element for the first military occupation (see Volume I, Chapter II, Section II.4.2: Figure 27; for location of the context: Plate XXI, d). Made in the Trier fabric, the Drag. 33 cup type can generally be dated to the second half of the 2nd – first half of the 3rd century (Webster 1996, 45). Its small size, the slightly concave walls and the lack of a groove on the wall externally tend to point to a later 2nd-century date.

For fort level 1, no external chronological elements like dendrochronological or radiocarbon dates are at hand. Only one coin was found at level 1, an *as* or *dupondius* only generally dated to the 1st to 3rd century.

Level 1 hardly yielded any pottery context with a considerable number of samian fragments. At the base level of the earthen rampart, which can be assigned to the installation of fort level 1 (context OS 30905), only nine samian sherds were recovered, representing five MNI (for location of this context and further analysis of this assemblage: see the Appendix in this volume, Section 2.1). The only decorated bowl fragment with part of the ovolo is too small to identify. The plain wares are represented by a cup Drag. 33 from Lezoux, a dish Drag. 18/31 from Lezoux and an undetermined body fragment of an Argonne vessel. A Rheinzabern rim and body fragment represent at least one Drag. 31 individual. A small rim fragment of East Gaulish fabric cannot be specified further.

More information can be retrieved from the context OS 30916, representing a fire layer full of pottery fragments in the earthen rampart, which can be assigned to the first fort level based on stratified evidence (see the Appendix in this volume, Section 2.1). This OS 30916 pottery assemblage comprises 23 samian fragments, accounting for at least ten individuals (Table 1.19; Plate CXV). Most of the samian from this context was supplied by Lezoux: 18 fragments for 6 MNI. A Drag. 37 bowl was most likely made by Iustus II/ii, active in the period AD 160-200 (DS13) (no. 2). Another Drag. 37 rim fragment has no freeze preserved (no. 1). The cup Drag. 33 is represented by two Lezoux individuals (nos 3 and 4). A complete profile of a Curle 23 dish/shallow bowl shows a five-fold rosette (SS81) (no. 5). Another stamp (SS8) was found on the base of a Lezoux dish or bowl but is not identifiable due to its fragmentation (no. 7). Apart from fragments of a Drag. 18/31 and possibly two Drag. 18/31 or 31 dishes, the presence of a body fragment from a mortarium Drag. 43/45 in Lezoux fabric is significant since mortaria were only produced from *c.* AD 170 onwards (Webster 1996, 56). A rim fragment in a not specified Central Gaulish fabric belongs to another Drag. 18/31 or 31 (no. 6). The East Gaulish productions each represent only one individual in this assemblage. A Drag. 37 bowl from La Madeleine (body fragment) was decorated by Sacer who was active AD 125-155 (DS20) (no. 8). A base fragment from a Trier dish or bowl shows the stamp of Cerialis vii, most likely active in the period AD 140-180 (SS15) (no. 9). A rim fragment can only be generally attributed to an East Gaulish Drag. 18/31 (no. 10). The Rheinzabern fabric is only represented by a body fragment of a mortarium Drag. 43/45, nevertheless an interesting chronological element.

11.2.3 Chronological conclusions for fort level 1 based on the samian

The presence of the potter Iustus II places the construction of the first fort after AD 160. In one of the post-trenches of Construction IV, a fragment of a Drag. 37 bowl, decorated by

Table 1.19. The samian fabrics represented in context OS 30916, in sherd count and MNI.

OS 30916	n	MNI
LEZ SA	18	6
CG SA	1	1
MAD SA	1	1
TRI SA	1	1
EG SA	1	
RHZ SA	1	1
TOTAL	23	10

Comitialis of Trier (AD 170-240), enables to shift this date to even later in the 2nd century. This date is confirmed by the several mortarium fragments, as mentioned above a form only produced from *c.* AD 170 onwards. The dominance of Lezoux and the absence of clear 3rd-century elements seem to indicate that the disposal of the pottery still occurred in the 2nd century.

11.3 The samian wares of fort level 2

11.3.1 The samian assemblage of fort level 2 in general

The proportional quantities of Lezoux and Argonne vessels, equally shared with 28 MNI for the Argonne and 27 for Lezoux, are standing out for this fort level 2 (Table 1.18). Trier and Rheinzabern only count for respectively 11 and 13 MNI. Seven samian stamps were recovered.

Apart from two unidentifiable stamps, they comprise two intradecorative name stamps, of Iulius viii (SS55) and Iulianus iii (SS48), both active at Rheinzabern in the period AD 220-255, and three stamps on dishes: Drucaursus of Trier (SS18)[34] (AD 160-260), Euritus of Rheinzabern (SS44) (AD 180-240) and Materninus iii of Rheinzabern (SS55) (AD 160-260). The intradecorative stamps of Iulius viii and Iulianus iii conclude to AD 220 as *terminus post quem* date for fort level 2. The decorated fragments found at this fort level 2, nineteen in total, do not yield extra chronological indicators. The La Graufesenque bowl decorated by Mercator, Germanus or a related potter (DS3) clearly represents a residual find. The Argonne products of Gesatus (DS28), Eburus (DS29 en DS30) and Africanus or Germanus (DS31), all dating not later than *c.* AD 200 at the latest, neither contribute to the dating of this level. The Lezoux vessels of Cinnamus ii (DS8 and DS9) and of Servus II (DS12) are respectively dated to AD 135-180 and AD 160-200. The revised date range for Cinnamus until AD 220 suggested by Delage (2003, 187: Fig. 2) may fit in well with the dates offered by the other samian at this level.

Three Trier decorated fragments, one 'spätere Ausformung' from Werkstatt II (DS47) and two from the Censor-Dexter group (DS56 and DS58), are indicative; however, their date range is too large. The two decorated bowls of the Iulius II – Iulianus I group (DS118 and DS120), both confirmed by their intradecorative stamps mentioned above (respectively SS48 and SS49), are the main chronological indicators within the samian assemblage for this level, situating this fort occupation after AD 220.

11.3.2 Closed contexts of fort level 2

The only available 'absolute' dating evidence for fort level 2 is offered by the radiocarbon date of the remains of a charred wooden beam, which was preserved in one of the construction slots of the hospital building at this level. The date of 1835±25BP resulting in a very large calibrated date range of 130AD (68.2%) 215 AD or 120AD (93.7%) 250 AD, is however of no help to clarify the chronology of this level. Neither does the coin evidence. A *sestertius* of the 2nd to 3rd century was collected from a feature dated to level 1 or 2. Of fort level 2, only three *sestertii* assigned to Antoninus Pius (138-161), next to four undetermined coins, of which two *sestertii* and one *as* or *dupondius,* can be mentioned.

Only two samian contexts can be selected for fort level 2, both containing a small samian assemblage. These assemblages were retrieved from drainage gully OS 23966-70920-83780 and pit OS 70977 (cf. the Appendix, Section 3 in this volume for their location).

Drainage gully OS 23966-70920-83780

The drainage gully yielded sixteen samian fragments, accounting for eleven MNI (Table 1.20; Plate CXVI: A). The Lezoux products dominate with eight fragments for six MNI. A small rim fragment belongs to a beaker Déch. 72. At least three Lezoux cups type Drag. 33 can be counted (nos 1-3). They attract attention with their large diameters – especially example no. 2 has a very wide-standing, flaring wall -, a typical feature for East Gaulish Drag. 33 cups in their 3rd-century evolution. The Lezoux assemblage comprises furthermore a base of a Drag. 18/31 or 31 (no. 4) and a body fragment of a mortarium Drag. 45. The Argonne products are represented by a Drag. 30R bowl (no. 5) and a cup Drag. 33 (body fragment). The rouletted Drag. 30 was mainly a 2nd-century product. The Trier potter Comitialis was responsible for the decoration of the Drag. 37 bowl in the assemblage. This potter and his group were active over a long period of AD 170-240 (DS63). Important is the presence of a complete profile of a mortarium Drag. 45 in Trier fabric. On its base it bears a graffito *post cocturam* SERGII C[, identified as 'of Sergius', probably initially followed by a cognomen. Rheinzabern is only represented by a Drag. 32 dish.

Pit OS 70977

Pit OS 70977 contained only eight samian fragments, accounting for five MNI (Table 1.21; Plate CXVI: B). The Lezoux potters were responsible for two cup forms, a 'classic' Drag. 46 (no. 1), a predominantly 2nd-century form (Webster 1996, 57) and a Drag. 33 (no. 2). Another Drag. 33 cup was made at Trier (no. 4); its large size and flaring form indicate a 3rd-century date. The Censor-Dexter group from Trier produced the decorated bowl Drag. 37 of which only a body fragment was preserved (DS56) (no. 3). This potter group only yields a wide date range of AD 180-240. Only one rim fragment from a Drag. 18/31 or 31 dish/shallow bowl was

34 This stamp was found in a pit for which it cannot be concluded whether it belonged to level 1 or 2, based on the stratified evidence. Therefore the stamp is included in the latest, and therefore the fort level 2, assemblage.

Table 1.20. The samian fabrics represented in context OS 23966/70920/83780, in sherd count and MNI.

OS 23966-70920-83780	n	MNI
LEZ SA	8	6
ARG SA	2	2
TRI SA	5	2
RHZ SA	1	1
TOTAL	**16**	**11**

Table 1.21. The samian fabrics represented in context OS 70977, in sherd count and MNI.

OS 70977	n	MNI
LEZ SA	5	2
TRI SA	2	2
RHZ SA	1	1
TOTAL	**8**	**5**

made in the Rheinzabern fabric (no. 5). This assemblage seems to indicate a date in the early 3rd century.

11.3.3 Chronological conclusions for fort level 2 based on the samian

Both contexts of fort level 2 are illustrative for the limitations of small samian assemblages for dating. As they represent the largest samian contexts for fort level 2, the problems for narrow dating are obvious. Apart from the Drag. 37 fragments present in the key contexts, another two Drag. 37 fragments were found in very significant features, decisive for the chronological outline of this fort level. A fragmented, but almost complete Rheinzabern Drag. 37 bowl decorated by Iulius II – Iulianus I (confirmed by an intradecorative stamp by Iulius viii) (DS118) was found scattered over two nearby pits to the south of the hospital. A body fragment of a Drag. 37 decorated by the same potter (group) (DS120) was recovered from the doubled construction slot at the north side of the hospital. This potter (group) was active in AD 220-255; hence, the installation of fort level 2B with the building of the hospital is to be situated after at least AD 220. This may even be shifted to after AD 233 as scholars have proposed for this potter group (see before). Anyhow, it has to be taken into account that this fort level 2B was preceded by an earlier phase. The absence of the cut-glass technique and of the Strich stamps so characteristic for the mid-3rd-century concludes to an end date prior to that period.

11.4 The samian wares of fort level 3

11.4.1 The samian assemblage of fort level 3 in general

At fort level 3, the Rheinzabern ware takes the lead for the first time, with 59 of in total 190 MNI (31.1%) (Table 1.18; Figures 1.20-1.21). Both Argonne and Trier are equally quantified with respectively 40 and 39 MNI. The Lezoux fabric is still represented by 26 MNI (13.7%). The North Gaulish fabric NOG SA appears for the first time, although very limited (ten sherds; 2 MNI). According to Brulet (2010e, 272) the earliest North Gaulish products were only made in the transition period end of 3rd – beginning of 4th century. Of these ten North Gaulish sherds recovered at fort level 3, seven sherds belong to the same individual, an imitation of a Drag. 37R, with a cross joining sherd at fort level 4. The fragments of this individual assigned to fort level 3 all originate from the upper fillings of a pit, belonging to the end of this level.

From the fourteen name stamps on vessels found at fort level 3, seven could be identified. Apart from an intradecorative stamp by Iulianus iii (SS49) (AD 220-255), one Sabinus viii occurs on a cup Drag. 33 (SS6) (AD 160-200). Four dishes were stamped by Crassiacus of Rheinzabern (SS39) (AD 180-220), Nundinus ii of Rheinzabern (SS56) (AD 160-260), Onnior of Rheinzabern (SS58) (AD 160-260) and Patruinus ii of Trier (SS24) (AD 200-260). Another dish was marked XIATIVAV, most likely an illiterate stamp; a parallel was found at Trier (Frey 1993, 92 and Taf. XVI, 21). Apart from these fourteen name stamps, three so-called *Strichs* were found, the earliest of this type at the Oudenburg site. Apart from one *Strich* on a burnt fragment (SS95), two *Strich* stamps originate from Rheinzabern (SS91 and SS92). According to Bird (1993, 3) these *Strichstempel* or line-stamps are dated towards the middle of the 3rd century.

The decorated samian assemblage found at fort level 3 cannot contribute more specifically to this chronology. The vessels of Censorinus ii (DS11) and of Mercator II (DS14), both from Lezoux, were originally dated not later than the end of the 2nd century. As already discussed, revised date ranges suggested by Delage (2003) push forward the end dates. The end date or at least the distribution of Mercator II bowls is now situated around AD 250 (Delage 2003, 187: Fig. 2), making it feasible that these vessels were found in their original level. As Delage also mentioned, the same chronological problem may be occurring for the Argonne products (see Delage 2003, 183: footnote 1). At fort level 3 one product of the Tocca group (DS21) was found and two Drag. 37 bowls made by Tribunus of Lavoye (DS25 and DS26). The identified Trier decorating workshops found at this level are those of Werkstatt II 'spätere Ausformung' (DS48), Atillus – Pussosus (DS72) and Dubitatus – Dubitus (DS73). The identified potters of decorated bowls from Rheinzabern are Arvernicus – Lutaeus (DS89), Comitialis IV (DS101), Comitialis V (DS105 and DS106), Iulius II – Iulianus I (DS121), Lucanus II (DS 91) and Verecundus II (DS95); other fragments cannot be attributed to a specific potter. The attested Trier and Rheinzabern potters fit well into a time-span around the middle of the 3rd century but their chronological ranges are too wide to specify the *terminus post quem* date of AD 220.

11.4.2 Closed contexts of fort level 3

The only external chronological indicator for fort level 3 is given by coin evidence. This level yielded one *antoninianus* of Gordianus III (238-244), a *terminus post quem* date for this fort occupation. All other coins of this level are earlier issues and remain mainly undetermined.

Two pits and a gully of fort level 3 each contained a substantial samian assemblage yielding chronological information for this level (for their location: see the Appendix in this volume, Section 4).

Gully OS 1169

Although gully OS 1169 only yielded twelve samian sherds or seven MNI, the assemblage comprises interesting chronological indicators for fort level 3 (Table 1.22; Plate CXVII: A). Except for three burnt body fragments of which one belongs to a Drag. 36 dish, the samian products can be attributed to the Argonne and, mainly, to the Rheinzabern workshops. The Argonne is represented by the rim of a Drag. 38 collared bowl and a large rim fragment of a Drag. 45 mortarium (no. 1). The Rheinzabern assemblage contains a beaker Déch. 72 / Lud. VSb with cut-glass decoration of which more fragments were dug-up in later levels (no. 2). A body fragment of another beaker of the same type and decoration belongs to the beaker of which the largest part was found in key context OS 80925 of fort level 3 (see further) and which was found scattered over different levels. A beaker footring can only be generally identified as belonging to a beaker of the Lud. V series. The Rheinzabern fabric is furthermore represented by a Drag. 36 dish rim, a Drag. 31 body fragment and a Drag. 43/45 body sherd, besides un undetermined piece. The appearance in this context of the cut-glass decorated beakers is very significant since Bird has demonstrated, based on British assemblages, that they can be dated well into the 3rd century (Bird 1993, 4).

Pit OS 71445

Pit OS 71445 only contained eight samian fragments, representing at least five individuals (Table 1.23; Plate CXVII: B). Interesting is the presence of at least three mortaria. Apart from one Argonne Drag. 43 mortarium rim (no. 1) and one burnt mortarium fragment, the assemblage contains only Trier and Rheinzabern products. A collar fragment of a Trier Drag. 43/45 mortarium, a Drag. 31 base with unidentifiable stamp (SS31) (no. 2) and a dish fragment originate from Trier. The Rheinzabern potteries are responsible for a Drag. 37 rim (no freeze preserved), a Drag. 45 mortarium fragment and an unidentified body sherd.

Pit OS 80925

The large pit OS 80925 contained a samian assemblage of 28 fragments, accounting for at least sixteen individuals (Table 1.24; Plate CXVII: C). Cross joining sherds across the pit confirm that the content of its filling-in can be considered as a homogeneous assemblage. The samian spectrum is dominated by East Gaulish products. The Central Gaulish potters are represented by a Drag. 33 cup (complete profile) (no. 1) and a body fragment of a Drag. 43/45 mortarium. A complete profile of a Drag. 36 dish is a rare product from Les Martres-de-Veyre (no. 2). Since the export of les Martres-de-Veyre covered the period *c.* AD 90 to 160/170, this fragment is most probably a dug-up item from level 1, if not a residual piece from earlier features on the site. The Argonne fabric is represented by a Drag. 45 mortarium rim with lion head spout (no. 4) and a body fragment of a dish. Another body fragment belongs to a Drag. 37 decorated bowl by the hand of Dubitatus – Dubitus of Trier, active AD 200-260 (no. 4). Other Trier fragments are a rim (no. 5) and two bases of Drag. 31(R) dishes (no. 6). The Rheinzabern spectrum dominates with two beakers, two dishes Drag. 36 (nos 9 and 10) and at least one Drag. 43 mortarium, represented by a rim

Table 1.22. The samian fabrics represented in context OS 1169, in sherd count and MNI.

OS 1169	n	MNI
ARG SA	2	2
RHZ SA	7	5
burnt	3	0
TOTAL	12	7

Table 1.23. The samian fabrics represented in context OS 71445, in sherd count and MNI.

OS 71445	n	MNI
ARG SA	1	1
TRI SA	3	2
RHZ SA	3	2
burnt	1	0
TOTAL	8	5

fragment but to which a base also may belong (no. 11). A large body fragment is part of a plain beaker Lud. Ve (no .7); wall sherds with cut-glass decoration come from a beaker Lud. VSb (no. 8) of which joining sherds were found in context OS 1169 (see before) and in later levels as dug-up material. The East Gaulish assemblage is completed with another Drag. 33 cup (no. 12). Fragments from a Drag. 36 dish (no. 14), a possible Drag. 31 dish and a Drag. 45 mortarium are burnt. Very significant is a central base fragment of a Drag. 18/31 with line-stamp (no. 13). Although burnt, the presence of a *Strich* stamp (SS95) points to its East Gaulish origin and its mid-3rd-century date.

Construction slot OS 8970

An interesting addition to the former assemblages is formed by the highly-decorated Rheinzabern dish already discussed, and found in construction slot OS 8970, the southern construction slot of Unit IVa, interpreted as a fort level 3B construction. The incised decoration, one of the three decoration techniques represented in this vessel (Plate LXVI), most likely dates this dish around the middle of the 3rd century. Its exquisite character assumes that it did not belong to a regular soldier but rather to an officer or another member of the high-ranked military. The dish was found scattered over different levels. The complete profile, representing nine fragments, was found in the construction slot in question, another three fragments in a nearby layer assigned to the same level. Twelve fragments were found as dug-up pieces in fort level 4 features, one in fort level 5 and two in later levels.

11.4.3 Chronological conclusions for fort level 3 based on the samian

The most important chronological indicators for fort level 3, also present in the samian key context assemblages, are the *Strich* stamps and the cut-glass decorated beakers. Both are seen by Bird as elements

Table 1.24. The samian fabrics represented in context OS 80925, in sherd count and MNI.

OS 80925	n	n%	MNI	MNI%
LEZ SA	5	18.5	2	12.5
LMV SA	2	7.4	1	6.25
ARG SA	2	7.4	2	12.5
TRI SA	4	14.8	3	18.75
RHZ SA	9	33.3	5	31.25
EG SA	1	3.7	1	6.25
burnt	4	14.8	2	12.5
TOTAL	**27**	**100**	**16**	**100**

typical for the late East Gaulish productions. Especially the *Strich* stamps can be dated towards the mid-3rd century (Bird 1993, 3).

11.5 The samian wares of fort level 4

11.5.1 The samian assemblage of fort level 4 in general

At fort level 4, the Rheinzabern and Trier potteries are the main suppliers of the samian ware with respectively 212 and 165 MNI of a total MNI of 617 (respectively 34.2% and 26.6%) (Table 1.18; Figures 1.20-1.21). The Argonne ware still represents 61 MNI (9.8%), while the Lezoux products count for only 27 MNI (4.4%). At first sight, the Lezoux products seem to represent residual, dug-up finds from earlier levels as Lezoux production ceased around AD 240. As will be clear further, some Lezoux vessels seem to have been still in use though. This fort level yielded the only identified Blickweiler fragment, clearly dug-up from the earliest features on the site. The large number of barbotine-decorated vessels, beakers with cut-glass decorations and the presence of mid-3rd-century 'Massenfund' types like the cups Massenfund 8a and 19, the bottle Massenfund 17b, the collared bowl Massenfund 15 and the barbotine-decorated cordoned Massenfund 11-12 are indications enabling to date this fort level at least to the middle or rather the second half of the 3rd century.

In total 61 samian stamps were found at fort level 4, of which 23 (name) stamps could not be identified. Three of the latter are illiterate of which one incised *ante cocturam* stamp originated from Rheinzabern (SS75). Another analphabetic stamp also belongs to the Rheinzabern ware (SS70); a third one is burnt (SS079). Eight *Strichs* were recovered from this level, all occurring on dishes. Two of them are burnt (SS96 and SS97), only one originates from Rheinzabern (SS93), and five *Strich*-stamped vessels were made by Trier potters (SS84-88). That leaves us with a total of 30 identified name stamps. Three Drag. 18/31 dishes were stamped by Lezoux potters: Albucius ii (SS1) (AD 145-175), Cintusmus i (SS3) (AD 140-180) and Magio i (SS4) (AD 160-200), most likely residual items at this level. Identified Argonne potters are Giamillus ii of Lavoye (SS10) (AD 140-180) and Tullus of Le Pont-des-Rèmes (SS12) (AD 150-180), their datings being too early to consider the vessels in question as *in situ* finds. The Trier potters are represented by Apolus/Apolo (SS13) for which no parallel was found, Atilido (SS14) (AD 175-250), Dessius (SS17) (AD 200-260), Iucundus v (SS20) (AD 160-260), Mercussa (SS21) for which neither a parallel was found, Minutus (SS22) (AD 170-250) and Urbanus (SS25) (AD 190-240), who all stamped dishes. The identified Rheinzabern potters are Atta (SS32) (AD 170-220), Capitolinus (SS34) (AD 170-260), ?Cintugnatus ii (SS35) (AD 140-180), Datius (SS40) (AD 160-240), Drucaursus (SS41) (AD 160-260), twice Euritus (SS42 and SS43) (AD 180-240), Firminus ii (SS45) (AD 160-220), Flavianus ii (SS46) (AD 160-260), Giamillus v (SS47) (AD 120-200), Patruinus i (SS59) (AD 160-260), twice Severianus iii (SS63 and SS64) (AD 190-240), ?Tarentinus (SS65) (AD 175-250), Verus vi (SS66) (AD 210-260) and (Victor or) Victorinus ii, possibly two times (SS68 and SS69) (AD 210-255), all of them marking dishes. Comitialis of Rheinzabern (SS36) (AD 170-240) and Respectinus ii (SS61) (AD 220-260) marked their Drag. 37 bowls with an intradecorative stamp. While some stamps are clearly dated too early for this level and are to be considered as residual pieces, the chronological range of other stamps is too large to be able to closely date fort level 4, based on these indicators. The stamps only conclude to a *tpq* date of AD 220.

The three Drag. 37 bowls from La Graufesenque (DS1, DS2 and DS4), mainly dated to the Flavian period, are clear residual items from the pre-fort settlement. The same can be said of the Blickweiler decorated bowl (DS42), the La Madeleine Ware mit Eierstab C (DS19) and the Argonne products by Tribunus of Lavoye (DS22) and the Ware mit Eierstab G (DS32 and DS33). Decorated bowls from Trier are represented by Werkstatt II and 'spätere Ausformung' (DS44, DS46, DS49, DS50?), Maiiaaus (DS51?, DS52 and DS53?), Censor-Dexter (DS55, DS57, DS59, DS60), Comitialis (DS65?) and Afer (DS67 and DS69). Potters recognized from Rheinzabern are Reginus I/Cobnertus/Ianu (DS88), Arvernicus – Lutaevus (DS89), Cerialis group (DS94), Atto (DS96), Firmus II (DS99), Comitialis group (DS103, DS108, DS110, DS111), Helenius (DS114), Attilus (DS115), Iulius I (DS117), Iulius II – Iulianus I (DS119, DS122-126), Respectinus II (DS129), Primitivus IV (DS131), Victor II/Ianuco (DS132), Statutus II (DS133), Perpetuus (DS134). Other vessels cannot be attributed to one specific potter. Some of the Trier and Rheinzabern potters seem to be dated too early to have been an original part of this fort level. However, Bird already pointed to the evidence from both workshops for some reuse of old moulds by potters working around the middle of the 3rd century (Bird 1993, 3). The dominance of fabric TRI SA B and some vessels in TRI SA C can support this possibility for several individuals belonging to fort level 4. The potters Primitivus IV (AD 220-260), Victor II/Ianuco (AD 220-270), Statutus II (AD 230-260) and Perpetuus (AD 230-275) represent the latest workshops at Rheinzabern. With AD 230 as starting date of their production, Statutus II and Perpetuus yield the latest secure *tpq* date obtainable from the decorated samian for this level.

The production of decorated Rheinzabern samian ceased around AD 270; decorated Trier ware was no longer produced after AD 275. The 'classic' samian wares can therefore not contribute to the understanding of how long this occupation of fort level 4 continued.

Important in this respect is the North Gaulish ware which is clearly present at this level, with 19 MNI. Four of the North Gaulish products are related to the Les-Rues-des-Vignes productions; all other products were probably supplied by potters from the Boulogne region. The North Gaulish vessels are mainly the mortarium type Chenet 328-330 and the collared bowl Chenet 326. These types, announcing the 4th-century repertoire, may indicate that this fort occupation continued until the very late 3rd century or even until around AD 300, the date suggested by Brulet (2010e, 272) for the start of the North Gaulish potteries, and a date *an sich* not in contrast with the coin evidence at the site. However, with the presumed fort level 3 attribution of a few North Gaulish fragments, the start date of the North Gaulish production may well be shifted to an earlier date (see before).

11.5.2 Closed contexts of fort level 4

Fort level 4 not only yielded the largest number of samian, both in sherd count and in minimum number of individuals, it is also best represented when considering contextually, quantitatively and qualitatively reliable samian assemblages. It is also the level best captured by external chronological indicators. While radiocarbon analysis on charred cereals from this level only yielded very wide date ranges, dendrochronological research by Haneca resulted in a more secure basis for the chronological framework of this level, at least for its starting date (cf. Volume I, Appendix 6). From the growth ring pattern of boards from well OS 22926 could be concluded that the most recent ring was formed in AD 260, which results in a felling date between AD 260 and 275 (Haneca 2009). Moreover, indirect evidence is given by the beams of the outer framework of the double well OS 2562 of fort level 5. Although a 4th-century installation, the outer framework of this well appeared to be constructed with re-used construction wood. The dendrochronological analysis of these beams yielded a felling date of *c.* AD 266 (Haneca in Vanhoutte *et al.* 2009b). It is most likely that these beams were recycled wood from fort level 4 and that this *tpq* date is related to this level.

Considering the coin evidence, all period AD 260-274 coins and all period AD 275-294 coins were found from fort level 4 onwards. One Probus coin (AD 276-282) can also be attributed to this level. The coins found in the selected key contexts will be discussed below.

Four contexts were selected as samian key context assemblages: pit OS 7949 of Unit I, containing a lot of brooch production waste, the large waste-pit OS 4980, well OS 22926 and the fire layer OS 7957/7971 (for their location: see Plate XXVII and the Appendix in this volume, Section 5).

Pit OS 7949

Pit OS 7949, located in Unit I of the workshop area along the western earthern rampart, belongs to the first phase of fort level 4. At some point this depression was closed off by a clay level on top of which two – contemporaneous or successive? – hearths (hearth 3 and hearth 4) were installed. Context OS 7949 not only yielded a lot of bronze production waste, mainly related to brooch production, but also a large number of pottery sherds. They were accompanied by three coins, unfortunately not yielding any valuable dates for this context: a silver *denarius* of Antoninus Pius, a copper alloy *dupondius* possibly from Marcus Aurelius and an undetermined copper alloy *as*.

Table 1.25. The samian fabrics represented in context OS 7949, in sherd count and MNI.

OS 7949	n	n%	MNI	MNI%
MAD SA	1	1.2	1	3.3
ARG SA	6	7.3	2	6.7
TRI SA	21	25.6	8	26.7
RHZ SA	50	61.0	18	60.0
NOG SA	1	1.2	1	3.3
burnt	3	3.7	0	0
TOTAL	**82**	**100**	**30**	**100**

The samian in this pottery assemblage accounts for 82 fragments, representing 30 MNI (Table 1.25; Plate CXXII). The samian almost completely consists of East Gaulish products. Rheinzabern outnumbers Trier with 50 against 21 fragments or 18 against 8 MNI, respectively 61.0%-25.6% and 60.0%-26.7% of the total samian counts for this context. The Argonne and La Madeleine only count for respectively two and one MNI. The La Madeleine body fragment (no. 1) belongs to a Drag. 37 decorated bowl, which can be attributed to the Ware mit Eierstab C group, generally dated to AD 120-190, clearly a residual item in this context. The Argonne is represented by two mortaria (nos 2-3). One North Gaulish rim sherd joins the complete profile of a Chenet 330 mortarium found in the nearby large waste-pit OS 4980 (see further) (Figure 1.22). Striking is the presence of at least six mortaria, all of the type Drag. 45: at least two Argonne individuals (nos 2 and3), three Trier mortaria (nos 6 and 7) and one Rheinzabern example. The significant presence of mortaria in this workshop-related depression makes us wonder whether they do not represent vessels that were already broken or cracked at the time and brought to the workshop for repair. A tripartite lead item found in the same context may indicate this; it possibly represents a repair piece of which the 'legs' were joint in drilled holes to fixate the vessel.

Furthermore, the Trier spectrum consists of a cup Drag. 33, a small dish NB 11b (Lud. Sch F / Gose 44) (no. 4), at least two Drag. 31 dishes (one ill.: no. 5) and one Drag. 36 dish. The small dish NB 11b is indicative for the middle of the 3rd century (Bird 1993, 12). The Rheinzabern assemblage contains fragments of at least four Drag. 37 bowls of which one is a Drag. 37R (no. 11). The base fragment (no. 9) can be attributed to Perpetuus, most likely active in the period AD 230-275. The body fragment (no. 10) belongs to a bowl possibly of the style Ware B mit Zierglied O382/383, only generally dated to the 3rd century. The ovolo on the rim fragment (no. 8) is too fragmentary to identify. Rheinzabern is furthermore represented by at least one beaker Déch. 72 with cut-glass decoration (no. 12), a cup Drag. 33, three dishes Drag. 31 (nos 13-15), two dishes Drag. 36 (only one illustrated: no. 16), four dishes Drag. 32 (only one illustrated: no. 17), a dish Lud. Th or Tl (no. 18) and a Drag. 18/31 dish (no. 19). The preserved central part of a Drag. 31 dish base (no. 15) presents the stamp of Severianus ii, most likely active

Figure 1.22. A North Gaulish rim sherd from pit OS 7949 joins the complete profile of a Chenet 330 mortarium found in the nearby large waste-pit OS 4980 of the same fort level.

in the period AD 190-240. The Drag. 18/31 base (no. 19) bears a fragmentary stamp identified as of Patruinus i of Rheinzabern, only generally dated to AD 160-260. The stamp on another dish base (no. 20) is too little preserved to identify. The samian assemblage is completed by three burnt samian fragments, of which only another Drag. 36 dish is worth mentioning.

While the potters of the stamped dishes and of the decorated bowls represent date ranges too early or too wide to specify the date of this context – only Perpetuus yields a *tpq* date of AD 230 -, the small Trier dish NB 11b (no. 4) and the presence of a cut-glass decorated beaker (no. 12) place this samian assemblage around the middle of the 3rd century, at the earliest. The dominance of the East Gaulish samian with Rheinzabern taking the lead, is very representative for fort level 4.

Large waste-pit OS 4980

The primary in-fill of the large waste-pit OS 4980 yielded a very large amount of pottery sherds (5640 fragments for 729 MNI) of which the samian with 233 fragments for 75 MNI represent 4.1% or 10.3% (depending on the quantification method)[35]. The many large potsherds, some almost intact vessels, the many cross joins of pottery found scattered throughout the different layers and the freshness of the pottery sherds, all indicate that this considerable infill happened within a short time-span and that the objects were thrown into the pit deliberately, immediately or shortly after they became unfit for use.

This context also contained a small coin hoard (hoard 1)[36] (see in this volume Chapter 2, Section 2.1) next to an early *sestertius* and an undetermined coin. The hoard consisted of two connected piles of in total 32 low quality silver coins. Two coins could be identified as of Gallienus: one early type dated to AD 257-258 and one late issue dated to AD 267-268, providing a *tpq* for the infill of this waste-pit. With an absence of radiate copies, which are abundant in the final layers of fort level 4, it can be assumed that rubbish pit OS 4980 functioned in the period *c.* AD 267/268-275.

From this context the pottery assemblage as a whole has been published in detail (Vanhoutte *et al.* 2009c). Only the main conclusions will be repeated here. In order to be in accordance with the other samian contexts and in favour of the visual apprehension of the samian contexts available for the site, it was decided to include the samian overview table (Table 1.26) and the illustrations in which all forms and types are presented[37] (Plates CXVIII-CXXI).

According to this assemblage, Trier and Rheinzabern supplied their products to Oudenburg in equal quantities, although Trier focussed more on mortaria and dishes, while more plain bowls (deep dishes) and beakers were supplied by Rheinzabern. The Argonne and North Gaulish potteries only distributed their products in low numbers. Most Lezoux samian will have been residual in this context. However, the presence of a complete Drag. 38 from Lezoux is very significant. The intense use-marks and the absence of a bead-rim suggest that it was a relatively late product of the Lezoux workshops still used during fort period 4. It apparently survived for some decades and was clearly looked after well (Vanhoutte *et al.* 2009c, 107) (see also below).

35 These figures differ slightly from the ones presented in Vanhoutte *et al.* 2009c, since the further study of the overall samian of the site, in collaboration with J. Deschieter and W. De Clercq, has led to some revisions. However, the overall picture of the samian in this context remains intact. The 'Black samian' listed in the publication could in the meantime be identified as 'classic' samian completely burnt to black, based on the find of a small unburnt joining fragment of the dish presented on Plate LXVI. This original 'enigma' could only be unravelled through the exhaustive study of the samian of the site. This study also enabled us to identify the undetermined fragments listed in the article.

36 This coin hoard was not yet known at the time of the publication of the pottery assemblage in Vanhoutte *et al.* 2009c. This hoard was unrecognizably corroded and only came to light after a Xray-analysis of metal finds, which could only take place after the publication date of the article in the *Journal of Roman pottery studies*.

37 In Vanhoutte *et al.* 2009c only a selection of the forms and types could be illustrated.

Table 1.26. The samian fabrics represented in context OS 4980, in sherd count and MNI.

OS 4980	n	n%	MNI	MNI%
CG SA	4	1.7	2	2.7
ARG SA	9	3.9	7	9.3
TRI SA	104	44.6	34	45.3
RHZ SA	96	41.2	27	36.0
EG SA	2	0.9	1	1.3
NOG SA	6	2.6	2	2.7
burnt	12	5.2	2	2.7
TOTAL	**233**	**100**	**75**	**100**

Table 1.27. The samian fabrics represented in context OS 22926 – waste fillings I and II, in sherd count and MNI.

OS 22926 - waste fillings I and II	n	n%	MNI	MNI%
TRI SA	29	44.6	11	42.3
RHZ SA	27	41.5	9	34.6
burnt	9	13.8	6	23.1
TOTAL	**65**	**100**	**26**	**100**

The stamp of Verus vi of Rheinzabern (AD 210-260/270) (Plate CXX: 51), a *Strich* stamp (Plate CXIX: 25), decorated bowls of Iulius II – Iulianus I (AD 220-255) (no. 30) and of Primitivus IV (AD 220-260) (no. 29), an almost complete VMg beaker with barbotine decoration from Rheinzabern (no. 33), the base of a Chenet 335 beaker (Plate CXVIII: 4), the bat-like spout on a Trier Drag. 45 mortarium (Plate CXIX: 26), the small NB 11 dish (Plate CXVIII: 13), as well as the poor-quality decorative arrangements on several Drag. 37 bowls, all point to a date around the middle of the 3rd century for this samian assemblage. With AD 269 as *tpq* date from the coin evidence, the samian was clearly already obtained a while before it was deposited into the waste-pit.

Well OS 22926

The dendrochronologically obtained felling date of the boards of the framework (see before) places the filling-in of this well with samian fragments together with other waste at least after AD 260, perhaps even after AD 275. The samian assemblage under study here belonged to the levels described as 'waste fillings I' and 'waste fillings II' (see the Appendix in this volume, Section 5.3), in total 65 samian fragments counting for 26 MNI. These levels also yielded 29 coins which have been studied by J. van Heesch (Coin Cabinet of the Royal Library of Belgium / KULeuven). Nineteen of these coins were found clustered together and represent billon coins from the second half of the 3rd century (Coin hoard 5, see in this volume Chapter 2, Section 2.1). Fifteen of them could be identified as *antoniniani* or copies from Gallienus (AD 260-268), Postumus (AD 260-268) or Claudius (AD 268-270). Four coins are distinctive in thickness, metal composition and size (diameter of *c.* 22 mm); they are probably very corroded, older *antoniniani* (AD 215-260). The nineteen coins possibly represent a small hoard or purse content dated at least after AD 260 or 268. Another ten coins were recovered from these waste fillings. An *as* or *dupondius* was possibly made at an unofficial workshop under Postumus (AD 260-269). Two coins represent *antoniniani* or copies, four others are certainly copies; they can all be generally dated to the last quarter of the 3rd century. Another three copies can be attributed to Tetricus I (one item) and Tetricus II (two coins); they date the final filling-in of the well with samian fragments and other waste with certainty after AD 274.

The samian assemblage of this context consists of 65 fragments or 26 MNI (Table 1.27; Plates CXXIII-CXXIV). The large size of many of the fragments implies that most of the vessels were thrown in the pit not long after they were out of use. The fact that the vessels are all of Trier or Rheinzabern fabric, next to some burnt individuals, is very significant and representative for fort level 4. Trier and Rheinzabern are equally shared: Trier accounts for 29 fragments for ten MNI, Rheinzabern for 27 fragments for nine MNI. Both productions represent the common forms and types of fort level 4.

In the Trier fabric at least two Drag. 37 individuals were counted (nos 1-2); however, no identifiable decoration has survived. The typical later 3rd-century, thick, square-shaped Drag. 37 base (no. 3) bears the graffito MESSIE or MESSIC (see Section 10 of this chapter). The Trier spectrum furthermore consists of one beaker Drag. 54, two Drag. 31 dishes (nos 4 and 5), three Drag. 36 dishes (nos 6-8) and two Drag. 45 mortaria. One dish base, possibly from a Drag. 36, bears a *Strich* stamp (no. 10). Two name stamps can also be attributed to Trier potters, but they remain unidentified (nos 9 and 11).

The Rheinzabern fabric is represented by at least three Drag. 37 bowls (nos 12-16), one beaker Lud. VMg (no. 17), one Drag. 33 cup (no. 18), two Drag. 18/31 dishes (nos 19-20), one Drag. 36 dish (no. 21) and at least one Drag. 45 mortarium (nos 26-27). A base fragment (not counted as MNI) belonged to a Drag. 31R or 32R (no. 24). The Drag. 33 cup is characterized by a large diameter and very oblique walls (no. 18). Only two of the Drag. 37 decorations can be attributed to a specific Rheinzabern potter. While the bowl made by Arvernicus – Lutaeus (AD 160-185/190) (no. 14) must certainly be considered as a residual find, the bowl in the style of Iulius II – Iulianus I (no. 13) (AD 220-255) could still have been in use in the late 3rd century. The heavy, thick and rather square Drag. 37 base (no. 16) is a typical characteristic for after *c.* AD 230 (Bird 1993, 4). Two base fragments bear a name stamp. An abraded, small stamp fragment (no. 22) can possibly be identified as Cintugnatus ii, active in the period AD 140-180, clearly a residual fragment. The dish stamped by Victorinus ii, active in the period AD 210-255, may well have been a vessel in use at fort level 4.

The burnt individuals, possibly all East Gaulish products, complement the spectrum with two Drag. 33 cups (nos 28-29), two Drag. 31 dishes, one Drag. 36 dish (no. 30) and one Drag. 43 mortarium.

The coin evidence gives evidence that the deposition of this samian assemblage took place at least after AD 274. The spectrum the samian assemblage of the filling-in of well OS 22926 represents, does not differ from that of the previous context OS 7949 dated to the early phase of this fort level. Moreover, it is not significantly

different from the contexts of fort level 3. This emphasizes that narrow dating based on samian contexts is difficult, and perhaps impossible, for the 3rd century. It also points to the issue of the life-span of samian wares, a phenomenon already demonstrated by Willis in his study on the nature of the incidence of samian at British sites. Samian vessels were likely looked after and possibly often curated (Willis 2004, Chapter 5.8). The coins in the Oudenburg context in question give a *tpq* for the moment in time when the samian of this context was discarded; however, at that time, the vessels already had a 'life of use' behind them.

Fire layer OS 7957/7971

Although a fire layer cannot be considered as a closed context, its samian assemblage was selected as this layer could clearly be defined in space and since its content represents the end of fort level 4. However, due to the character of the context, more residual items are to be expected.

The fire layer also yielded 24 coins. Except for one *sestertius* dated to the 2nd-3rd centuries and nine undetermined coins (3rd-4rd centuries), all other fourteen pieces were identified as *antoniniani* with radiate crowns or radiate copies, most of them datable from AD 275 onwards, yielding a *tpq* for the fire.

The samian assemblage consists of a total of 114 fragments, representing 40 MNI (Table 1.28; Plates CXXV-CXXVI). As can be expected, a large percentage of the samian is burnt (46.5% of the total sherd count; 37.5% of the total MNI), which makes it impossible to draw conclusions from the fabric distribution. Within the non-burnt assemblage, Rheinzabern prevails with thirteen MNI (or 32.5% of the total MNI).

The Lezoux and Argonne fragments in the assemblage most likely represent residual items. In the Lezoux fabric three dishes occur: a Drag. 18/31, a Drag. 31 (no. 1) and a Drag. 42 variant (no. 2). The Argonne fabric is represented by a base fragment of a Drag. 30 decorated bowl (no. 3) and fragments of one or two beakers, of which a complete base intentionally chipped off.

The Trier assemblage (fifteen fragments, six MNI) consists of at least two Drag. 37 decorated bowls (nos 4-6), two Drag. 33 cups, one Drag. 31 dish (no. 7) and one Drag. 45 mortarium (no. 8). The decorations present on the Drag. 37 bowls refer to Afer (no. 4), active in the period AD 190-240, and the Censor-Dexter group (no. 5), generally dated to AD 180-240. The very high, flaring rim of the Afer bowl, a late characteristic (see before), assigns this bowl to the latest phase of this potters' production. The Drag. 33 cups are represented by the base of a large example and a complete base which was intentionally chipped off.

The Rheinzabern spectrum is more divers. At least two Drag. 37 bowls can be counted, with again a late, very high, flaring rim (no. 9). One of the bowls can be attributed to the Iulius II – Iulianus I style (no. 10); for the other decoration (no. 11) several contemporaneous potters can be considered. The base of a beaker of the Lud. V series bears a graffito with the name VIRNATTA (no. 12). The barbotine bowl Lud. SMa (no. 13) clearly is a late product. The Rheinzabern assemblage furthermore consists of the complete base of a large Drag. 33, again intentionally chipped off (no. 14), one Drag. 18/31 dish, two Drag. 31 dishes (nos 15 and 16), two Drag. 36 dishes (nos 17 and 18), one collared bowl, one Drag. 43 and one Drag. 45 mortarium. At least one of the Drag. 31 dishes was rouletted (no. 20). A small, completely burnt base fragment reveals the stamp of Flavianus ii (no. 19), working at Rheinzabern in the period AD 160-260.

Table 1.28. The samian fabrics represented in context OS 7957/7971, in sherd count and MNI.

OS 7957-7971	n	n%	MNI	MNI%
LEZ SA	7	6.1	3	7.5
ARG SA	3	2.6	2	5
TRI SA	15	13.2	6	15
RHZ SA	32	28.1	13	32.5
EG SA	3	2.6	0	0
NOG SA	1	0.9	1	2.5
burnt	53	46.5	15	37.5
TOTAL	**114**	**100**	**40**	**100**

The burnt fragments of this context complement the assemblage with one thick-walled beaker or vase with incised leaf decoration (no. 21), two complete, intentionally chipped off, Drag. 33 cup bases without stamp, one Drag. 40 cup (no. 22), five Drag. 36 dishes (three illustrated: nos 23-25), one Lud. T dish and three collared bowls of which one Drag. 38 (no. 26). The large beaker or vase and the Lud. T dish certainly are East Gaulish products. Only one North Gaulish product was found in this context, a small thin-walled example of a Chenet 328-330.

While this context is most likely somewhat 'contaminated' and the burnt portion troubles the picture of the fabric distribution, this assemblage still represents the typical later 3rd-century spectrum but lacks the very late Trier products. The high flaring rims of the Drag. 37 bowls, the barbotine-decorated bowl Lud. SMa, the thick-walled beaker or vase with incised decoration and the absence of stamps on the Drag. 33 cups are all characteristic elements for the late East Gaulish potteries. Striking is the presence of no less than five complete Drag. 33 cup bases intentionally chipped off to obtain a disc-like item, possibly to use as lid or as large counter?

11.5.3 Chronological conclusions for fort level 4 based on the samian

Based on the stratified evidence, the dendrochronological data and mainly the coin evidence, the four selected contexts represent at least two phases within fort level 4. The levelling of pit OS 7949 for the installation of new hearths places this context in an early phase of fort period 4. The large waste-pit OS 4980 yielded a coin hoard with a *tpq* date of AD 267. The waste fillings of well OS 22926 – the structure itself dendrochronologically dated after at least AD 260 – can be situated after at least AD 275 based on the presence of Tetrici

radiate copies. The waste had already been thrown in the well OS 22926 to level it up before a fire raged over and burnt the area.

The samian assemblages retrieved from these contexts, showing in general the same fabrics and types, do not reflect this succession; even more, they appear to date much earlier than the external chronological elements indicate. All four contexts display significant parallels to the assemblages of the Trier Massenfund (*c.* AD 240-260) (Huld-Zetsche 1971), the Louis-Lintz-Strasse site, dated by Loeschcke (1923, Taf. 11) *c.* AD 259-260 but revized and put somewhat later by Gard *c.* AD 275 (Gard cited by Huld-Zetsche 1971, 23), and of the Shadwell watch-tower site in London (*c.* AD 260) (Bird 2002). The absence of the late Trier fabric and typical forms dominating the 'post-Niederbieber-horizon' (AD 260-300) such as the NB 6, 18, and 19 (Reuter 2005, 231) suggest that a date after AD 260 would be too late for the samian assemblages at fort level 4 and rather point to a date *c.* AD 250-260. This conclusion can be drawn from the 'classic' samian wares. However, the clear presence of North Gaulish samian rather refers to the late 3rd century.

With the coin evidence pointing to an end date at least after AD 276 (based on the Probus coins, but possibly much later since the Tetrici copies occurred at least until *c.* AD 300), it is clear that the 'classic' samian of this fort level does not capture this late date range and does not represent the very late 3rd-century repertoire. This can only imply that the samian supply to the Oudenburg fort most likely had ceased at some point in the 260s. It also points to the long life-span the samian vessels had, or rather, were supposed to have since apparently no new samian came in. Very indicative in this respect is the presence of an almost intact Central Gaulish Drag. 38 collared bowl in the large waste-pit OS 4980 (Plate CXVIII: 1; Figure 1.23). The almost complete vessel shows intense traces of use and the cut-marks and the eroded slip in the interior indicates that this bowl was probably in use for a long time before its deposition. The lack of a bead-rim could be an indication for a 3rd-century date (Bird 1993, 10). With an assumed end date for the Lezoux production around AD 240, this bowl was at least 30 years old – but probably some decades older – at the time of its deposition.

Figure 1.23. The complete Lezoux Drag. 38 bowl recovered from the large waste-pit OS 4980 of fort level 4.

Table 1.29. The late Argonne and late North Gaulish vessels from fort level 5 at the south-west corner site. Attested vessels and forms based on MNI.

late ARG SA FL5		
vessel type	***form***	***MNI***
Chenet 320	decorated bowl	49
Chenet 318	decorated bowl	1
Chenet 333	beaker	1
Chenet 335	beaker	1
Chenet 319	cup	1
Chenet 304	dish	1
Chenet 306?	dish	1
Alzei 5	collared bowl	1
Brulet 424?	collared bowl	1
Mareuil 326	collared bowl	1
Chenet 324g	collared bowl	1
Chenet 328-330	mortarium	2
TOTAL ARG SA		**61**

NOG SA FL5		
vessel type	***form***	***MNI***
Chenet 320	decorated bowl	3
imitation Drag. 37R	decorated bowl	1
Chenet 326	collared bowl	1
undet.	collared bowl	1
Chenet 328-330	mortarium	50
Chenet 330	mortarium	5
TOTAL NOG SA		**61**

11.6 The samian wares of fort level 5

11.6.1 The samian assemblage of fort level 5 in general

The samian assemblage recovered from features which are attributed to fort level 5, based on the stratified evidence, is characterized by the late Roman repertoire represented by the late Argonne and the North Gaulish ware. When the MNI is considered for fort level 5, both regions appear to have been evenly important for the supply of late 'samian' to the fort. Each production is represented by 61 MNI. Apparently, the demand was focused, as they were responsible for different products (Table 1.29). The late Argonne spectrum at fort level 5 is dominated by decorated bowls (50 out of 61 MNI), almost completely taken in by the Chenet 320 type (49 MNI). Only one Chenet 318 was recovered from fort level 5 (and even from the entire site)[38]. The mortarium Chenet 328-330 is only represented twice in the Argonne fabric. All other late Argonne types yielded only one MNI: the decorated bowl Chenet ?318, the beakers Chenet 333 and 335, the cup Chenet 319, the dishes Chenet 304 and Chenet 306?, the collared bowls type Alzey 5, Chenet 324g, Mareuil 326 and the small collared bowl Brulet 424?.

In contrast, the North Gaulish potteries were very popular for their mortaria. No less than 55 MNI were counted of type Chenet 328-330 of which five MNI can be more specifically assigned to

38 A Chenet 317 individual should be added here, but was found at fort level 4, clearly an intrusive find.

FORT LEVEL 5		
roller stamp type	**n**	**date**
UC 24	1	410-450
UC 40	1	390-430
UC 45	2	390-430
UC 62=285	1	IV d - V a (?)
UC 64	4	IV d - V a (?)
UC 94	1	IV d - V a
UC 95	2	IV d - V a
UC 114=340	1	390/400-420/430
UC 117	4	340-380/390
UC 118	1	IV d
UC 132=264	1	IV b-c
UC 159	1	IV b - IV d
UC 196	1	IV b-c
UC 200	1	IV b-c
UC 299	2	IV b - IV c
UC 308	2	IV B
UC 324	1	IV d - (V a ?)
NS 1055	1	360-390/400
NS 1200	1	V A
NS 1227	2	IV d - V a
NS 2006	1	IV b
NS 3091	1	IV b - IV d
NS 3137	1	IV b
NS 3149	1	IV b-c
NS 3156	1	IV b-c (?)
NS 3223	1	IV b-c
NS 3224	1	IV b-c
NS 3228	1	IV B
NS 3230	1	IVB - Va (?)
NS 3233	1	IV b-c (?)
NS 30 008	2	
unclassifiable	6	
TOTAL	**49**	

LEVEL 5+POST		
roller stamp type	**n**	**date**
UC 6	2	IV b-c
UC 26	1	410-450
UC 45	1	390-430
UC 62=285	1	IV d - V a (?)
UC 64	1	IV d - V a (?)
UC 95	1	IV d - V a
UC 107	1	IV d - V a
UC 108	1	IV B
UC 117	1	340-380/390
UC 123 var.	1	[IVd-Va]
UC 158	1	IV b - IV d
UC 165	1	IV d - V a
UC 199	1	390-425
UC 207	1	IV b-c
UC 270	1	IV b-c
UC 288	1	IV b-c
UC 306	1	IV b-c
UC 308	1	IV B
UC 319	3	IV d - V a
UC 129=325	2	350-400/410
UC 111=333	1	IV d - V a
NS 1025	1	IV c
NS 1281	1	IV b-c
NS 1398	1	IV b-c
NS 1470	1	IV b-c
NS 2006	1	IV b
NS 3137	1	IV b
NS 3161	1	IV b-c
NS 3232	1	IV b-c (?)
NS 30 010	1	
unclassifiable	4	
TOTAL	**38**	

Table 1.30. The represented roller stamps in fort level 5 and in the transition level 5+post.

type Chenet 330. Within the late Roman North Gaulish repertoire, apart from one collared bowl Chenet 326 and one of unidentified type, only three Chenet 320 decorated bowls are counted. The latter is in strong contrast with the significant amount of Chenet 320 individuals in the Argonne fabric. With 50 decorated bowls in Argonne ware versus four in North Gaulish ware and 55 mortaria in North Gaulish fabric versus only two in Argonne fabric, the image is very convincing. The late Argonne and the North Gaulish potteries were clearly specialising their productions during the 4th century and were supplying to the Oudenburg fort on specific demands.

Within the burnt items, two more mortaria Chenet 328-330, one Chenet 320 bowl and one dish Chenet 304 can be added. A specific item is a burnt collared bowl Trier I, 8b, a variant of the Chenet 325, the only recorded individual of this type in the assemblage.

The 49 roller stamps recovered from fort level 5 cover a date range between AD 325 and 450, a similar image as the one resulting from the totality of the roller stamps of the site (Table 1.30; Figure 1.24). Twenty-four of these roller stamps belong to the double well OS 2562; seven were recovered from the construction pit and the primary infill of the large basin OS 4923. The road level to the south of the bath house yielded a UC 117 (AD 340-380/390), a UC 200 (IV b-c), a NS 3156 (IV b-c (?)) and a NS 3223 (IV b-c).

The remaining 448 samian individuals found at this level all represent mid-Roman fabrics and types, and are therefore all to be considered as residual, dug-up material of the earlier levels. With 127 late Roman versus 448 mid-Roman individuals or a ratio of *c.* 1 to 3.5, the high degree of residuality is very visible at this level. In contrast to earlier levels where the same mid-Roman fabrics and types are common, the contrast between the mid- and late Roman types at fort level 5 can be measured clearly.

11.6.2 Closed contexts of fort level 5

The early and the late phase of fort level 5 are both marked by a dendrochronological date. Both (felling) dates were retrieved from wood from different parts of the double well OS 2562: AD 319-329 and AD 379-380 (see Volume I, Appendix 6). While considerably

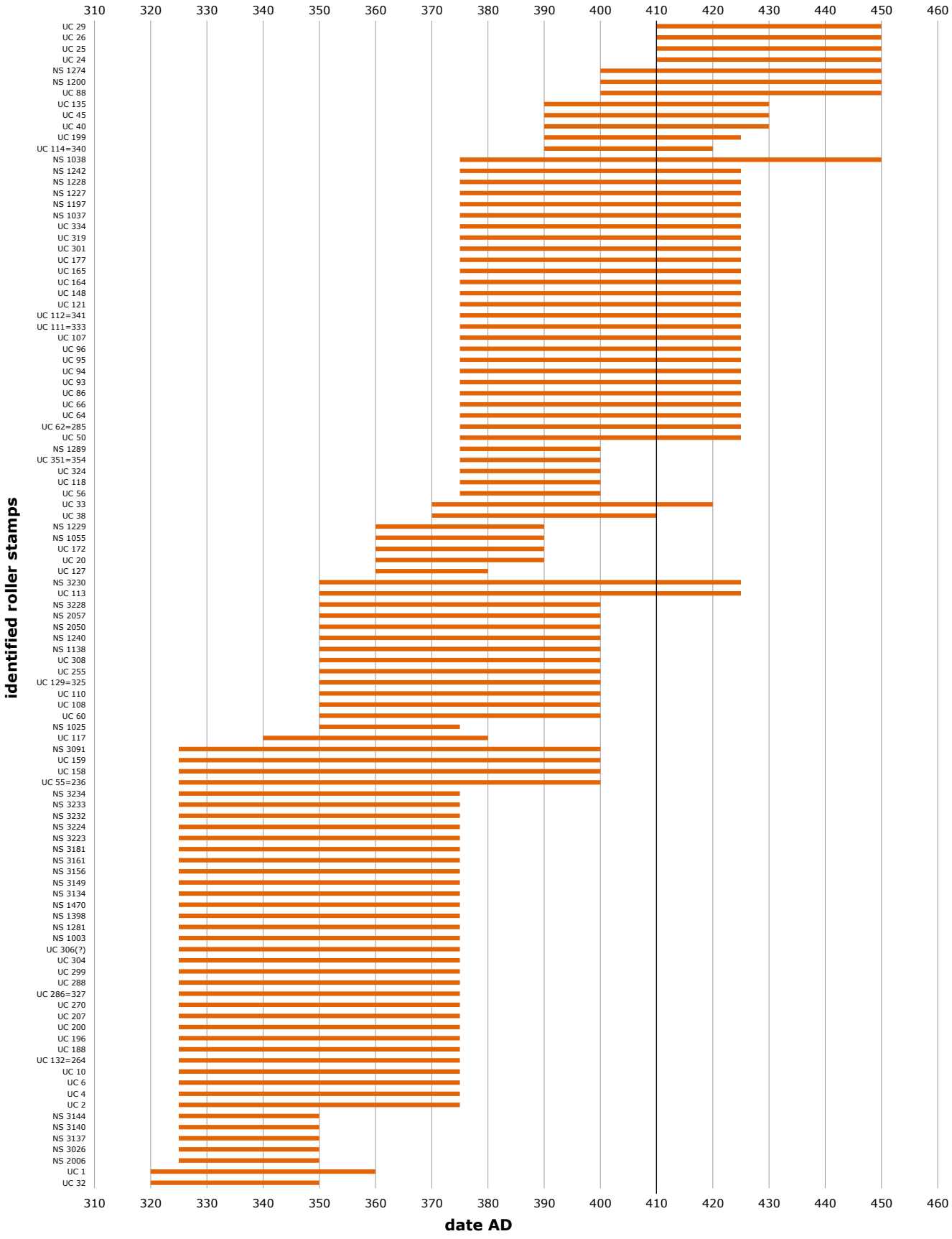

Figure 1.24. Chronological range of all identified late Roman roller stamps (n: 105 unique stamps) versus the afore assumed AD 410 end date of the Oudenburg fort.

more late Roman coins were recovered from the post-Roman levels, only four late Roman issues could be identified at fort level 5: a *nummus* of Licinius (AD 310-315), a *nummus* of Constantinus I (*c.* AD 320), a *Victoriae Laetae Princ Per* type (AD 320-325) and a *Securitas Reipublicae* AES-3, dated to AD 364-375.

The residuality factor increases at this fort level 5, as already mentioned, and can clearly be recorded with late Roman ceramics easily recognizable from mid-Roman fabrics and types. Only two quantitatively and qualitatively valuable contexts can be selected, OS 4923 and OS 2562, each containing a significant portion of late Roman samian (for their location: see Plate XXIX and the Appendix in this volume, Section 6).

From the context of the large water-basin OS 4923, only the primary infill of the basin after its last use is considered here, as its construction pit appeared to contain a considerable amount of dug-up material from all levels. Only one 4th-century coin was found in this context, more specifically in the construction pit: the *Victoriae Laetae Princ Per* issue (AD 320-325). Nevertheless, it is important to draw attention to the three Chenet 320 bowl fragments retrieved from this construction pit. Two of the roller stamps can be identified as UC 64 (IVd-Va(?)), one as UC 94 (IVd-Va). They date the installation of the basin at least after AD 375.

From the context of the double well OS 2562 several levels are selected (see for the position of these levels the Appendix in this volume, Section 6.2.5). The samian from structure level 6 contains the fragments which were found in the shaft in-between both frameworks; they can be related to the installation of the inner framework, dendrochronologically dated after AD 379-380. The samian from structure level 0+1 represents the fragments thrown into the inner well right after its last use; they can be related to the end phase of fort level 5 and simultaneously probably the final end of the fort occupation at Oudenburg. Structure level 2 is the primary infill of waste material; structure levels 3 and 4 are successive infills, with the latter being the final waste infill of the pit. The double well yielded sixteen coins, however only one can be dated to the late Roman period with certainty. This AES-3 *Securitas Reipublicae* (AD 364-375) was found in the waste fillings after abandonment of the structure (structure level 4).

Basin OS 4923

The samian from the primary infill of basin OS 4923 accounts for 62 fragments, representing 27 MNI (Table 1.31; Plate CXXVII). Only six MNI (or thirteen fragments) can be assigned to late Roman fabrics and/or types: one North Gaulish Chenet 328-330 mortarium and at least five late Argonne Chenet 320 decorated bowls (nos 2-7). All other fabrics and types refer to the 3rd century or earlier and are to be considered as residual, dug-up individuals: two from Lezoux, one from Les Martres-de-Veyre (no. 1), five mid-Roman individuals from the Argonne (three illustrated: nos 8-10), seven individuals from Trier (*e.g.* no. 11) and four from Rheinzabern (*e.g.* nos 12-13). Also the two burnt individuals represent mid-Roman types (*e.g.* no. 14). With 49 mid-Roman versus thirteen late Roman fragments, this context is above all an illustration of the large residual component in the late Roman contexts. Of the four roller stamps, three are identifiable of which two are datable, both in the period *c.* AD 325-375 (Table 1.32). However, from the construction pit of the basin three more roller stamps could be retrieved, twice a UC 94, once a UC 64. They date the installation of the structure in the last quarter of the 4th or first quarter of the 5th century. Simultaneously, they point to the difficulty to obtain narrow dates from samian assemblages as the samian from the primary infill did not result in such a late date.

Table 1.31. The samian fabrics represented in context OS 4923 – primary infill, in sherd count and MNI.

OS 4923 - primary infill	n	n%	MNI	MNI%
LEZ SA	3	4.8	2	7.4
LMV SA	1	1.6	1	3.7
ARG SA (mid)	11	17.7	5	18.5
TRI SA	15	24.2	7	25.9
RHZ SA	14	22.6	4	14.8
NOG SA	4	6.5	1	3.7
ARG SA (late)	9	14.5	5	18.5
burnt	5	8.1	2	7.4
TOTAL	**62**	**100**	**27**	**100**

Table 1.32. The presence of roller stamps of Chenet 320 bowls in basin OS 4923 of fort level 5, with reference to their illustration on Plate CXXVII. **: joins with fragment from the final infill of well OS 2562 (see Table 1.33).

OS 4923	MNI	roller stamp	date	ill. no.
construction pit	1	**UC_94**	IV d - V a	
construction pit	2	**UC_64**	IV d - V a (?)	
primary infill	1	**NS_3149**	IV b-c	2
primary infill	1	**NS_3233**	IV b-c (?)	4
primary infill	1	**NS_30 008 ****		3
primary infill	1	undet.		5

Well OS 2562

The previously mentioned different levels of the double well OS 2562 yielded in total 129 samian fragments, accounting for 58 MNI (Plates CXXVIII-CXXIX).

From structure level 6, 31 samian fragments were recovered for 23 MNI (Plate CXXVIII: 1-15). The late Roman spectrum, all in Argonne fabric, represents at least five Chenet 320 bowls (nos 6-10), two Chenet 304 dishes (nos 11-12), and one possible Chenet 306 dish. Four of the roller-stamped decorations can be identified: UC-324 (no. 6), NS 30 008 (no. 7), UC-299 (no. 8) and UC 114=340 (no. 9); no. 10 remains unidentified. UC 299 can be dated to IVb-c; UC 324 probably to IVd-Va. UC 114=340 yields a very close date between AD 390/400 and 420/430. All other individuals from this level represent mid-Roman fabrics and types: one from La Graufesenque (no. 2), one from Lezoux, one South or Central Gaulish individual (no. 1), four mid-Roman Argonne

OS 2562	MNI	roller stamp	date	ill. no.
structure level 6	1	**UC 114=340** *	390/400-420/430	9
structure level 6	1	**UC 299**	IV b - IV c	8
structure level 6	1	undet.		10
structure level 6	1	**UC 324**	IV d - (V a ?)	6
structure level 6 bottom	1	**NS 30 008**		7
structure level 2	1	**NS 3230**	IVB - Va (?)	25
structure level 4	1	**UC 40**	390-430	26
structure level 4	1	**UC 45**	390-430	17
structure level 4	1	**UC 62=285**	IV d - V a (?)	29
structure level 4	2	**UC 64**	IV d - V a (?)	27 and 30
structure level 4	1	**UC 114=340**	390/400-420/430	20
structure level 4	3	**UC 117**	340-380/390	24 and 25 and 32
structure level 4	1	**UC 118**	IV d	23
structure level 4	1	**UC 159**	IV b-d	not ill.
structure level 4	1	**UC 196**	IV b-c	31
structure level 4	1	**UC 299**	IV b - IV c	35
structure level 4	1	**UC 308**	IV B	33
structure level 4	2	**NS 1227**	IV d - V a	21 and 28
structure level 4	1	**NS 3091**	IV b - IV d	18
structure level 4	1	**NS 3228**	IV B	22
structure level 4	1	**NS 30 008** **		19
structure level 4	1	undet.		34
structure level 4	1	undet.		not ill.

Table 1.33. The presence of roller stamps of Chenet 320 bowls in double well OS 2562 of fort level 5, with reference to their illustration on Plates CXXVIII-CXXIX. *: joins with fragment recovered from structure level 4; **: joins with fragment from the primary infill of basin OS 4923 (see Table 1.32).

individuals (nos 3, 13-15), two from Trier, four from Rheinzabern (*e.g.* no. 4) and two burnt individuals (*e.g.* no. 5).

Structure level 0+1, the first infill right after the last use of the structure as well, only yielded nine samian fragments, accounting for four MNI (Plate CXXVIII: 16-21). Only one rim sherd of a Chenet 320 bowl, however without the decoration preserved (no. 18), and the base of a Chenet 304 dish (no. 19) can be attributed to the late Roman period. Remarkable is the amount of mid-Roman residual material: a dish base stamped by Libonus of Lavoye (no. 16), a rim fragment of a Drag. 43 mortarium (no. 17) and two more Argonne dish or bowl base fragments (nos 20-21).

A similar picture is shown by structure level 2, with nine fragments, accounting for six MNI (Plate CXXVIII: 22-26). Only one fragment of a Chenet 320 bowl (no. 25) and one undetermined Chenet bowl base (no. 26) can be identified as late Roman. The Chenet 320 roller stamp (no. 25) can be identified as NS 3230, dated to IVB-Va(?). All other fragments represent the mid-Roman spectrum (*e.g.* nos 7-9). Structure level 3, with five fragments (two MNI) (nos 27-28), only yielded one late Roman individual: a base of a Chenet 328-330 in North Gaulish fabric (no. 28).

Structure level 4, to which several layers of the last waste infill into the inner framework are defined, yielded 106 samian fragments, accounting for 45 MNI (Plate CXXIX). Within this assemblage, only 37 fragments for 25 MNI can be attributed to the late Roman period. The Argonne fabric represents 30 fragments or at least twenty-one Chenet 320 bowls (nos 18-42), one Chenet 318 bowl (no. 43), one Chenet 333 beaker (no. 44), one Chenet 324 collared bowl and one very large Chenet 328-331 mortarium. Nineteen of the twenty-one Chenet 320 roller stamps can be identified. They are listed in Table 1.33. The latest date they represent, is AD 390-430. The beaker Chenet 333 can be dated to the second half of the 4th century – early 5th century (Brulet 1994). The Chenet 328-331 mortarium (not illustrated) displays an interesting aspect: after the footring was broken off, the break was flattened and the vessel remained in use. It refers to the long life-span envisaged for this kind of vessel and the value a mortarium had for its owner. The North Gaulish fabric is only represented by three fragments, accounting for one MNI, a Chenet 328-330 mortarium. The remaining 71 fragments can all be related to mid-Roman fabrics and types. The represented individuals originate from Lezoux (1 MNI), Central Gaul (1 MNI), the Argonne (3 MNI: *e.g.* no. 1), Trier (at least 4 MNI: nos 3, 5-8), Rheinzabern (8 MNI: nos 9-16); two burnt individuals complete this list (nos 2, 4). In combination with the late Argonne ware, these can all be considered as residual, dug-up pieces. The very oblique rim fragment from the Argonne (no. 44) remains unidentified and cannot be attributed to either the mid-Roman or late Roman production.

11.6.3 Chronological conclusions for fort level 5 based on the samian

The chronological framework offered by the dendrochronological dates for fort level 5 (AD 319-329 and AD 379/380) covers all late Roman samian found on the site. The conclusions that could be drawn from the late Roman samian assemblage as a whole are therefore without any doubt representative for this fort level. The samian assemblages of the two selected key contexts only slightly confirm this picture and cannot be considered as representative for the total spectrum of fort level 5. Based on the samian, and even when considering all the late Roman pottery, many features and structures of fort level 5 can hardly be dated to a narrow range. The stratified evidence appeared to be the only reliable direct information to subdivide most features and structures into a phasing at this level, except for basin OS 4923 and double well OS 2562. It also emphasizes, together with the large amount of roller-stamped Chenet 320 bowls in the covering post-Roman levels, that this latest fort level was thoroughly disturbed after the abandonment of the fort.

11.7 Chronological conclusions from the samian assemblage

The general picture represented by the combined dating data from the mid-Roman stamped vessels and decorated wares from the samian assemblage of the south-west corner site, assumes a fort occupation from the second half of the 2nd century until *c.* AD 265 (Figure 1.25). The first peak in the period AD 175-185 may indicate the start of the first occupation. Whereas a strong samian supply can be attested during the 3rd century, a decline can be observed in the period AD 205-215, both in the stamps and the decorations. This could confirm an interruption (or a drastic decline) in the occupation during the early 3rd century as is shown by the contextual study of closed assemblages. Obviously, the end date of *c.* AD 260 or somewhat later for the samian supply cannot be considered as end date for the fort occupation (see before); it only represents the cessation of the distribution from the Trier and Rheinzabern potteries.

The contextual approach of the samian research, considering selected samian key context assemblages for every fort level, yields further chronological information and narrows the dating ranges. At the same time, it shows the dating restrictions of samian for the late 2nd and 3rd centuries and the need to integrate the chronological evidence from as many other pottery (and other find) categories as possible in order to narrow the date ranges. Based on the samian, fort level 1 can be dated *c.* AD 175-200. The samian of fort level 2 covers a date range between AD 220 and *c.* 240/250, while the fort level 3 assemblages point to the middle of the 3rd century. The samian present in the key contexts of fort level 4 can all be dated to *c.* AD 250-260; however, the coin evidence and other pottery categories clearly point to a continuing occupation until at least the end of the 3rd century. Even more, while the samian is dated *c.* AD 250-260, it occurs together with later wares in the same contexts (cf. *e.g.* the colour-coated and black-slipped wares) – exemplified by key context OS 4980 -, pointing to the long life-span the samian vessels must have had. The contextual data indicate that a stop in the supply of samian to the Oudenburg fort can be assumed in the 260s. Only three potters present in the samian assemblage were still active until AD 270/275, but obviously, it cannot be deduced whether their products represent the end phase of their production.

The late Roman samian was entirely supplied by the Argonne and the North Gaulish potteries, with the Argonne almost solely responsible for the decorated Chenet 320 bowls and with the North Gaulish workshops mainly supplying mortaria. Although the key contexts are limited, the presence of identifiable roller stamps in these contexts gives evidence of a date range from the second quarter of the 4th until the first decades of the 5th century (Figure 1.25).

12. Reference material: samian at the other Shore forts in the North Sea and Channel region

The scarcity of available data from the other military shore sites covering the occupation period of the Oudenburg fort accentuates the significance of the present samian study to uncover trade networks in the North Sea and Channel region. The data available for the Aardenburg fort are integrated in the further discussion on the mid-Roman samian supplies to the Oudenburg fort and the wider region in the following Section 13.1. Looking into the stamp presence at the other shore forts through the *Names on Terra Sigillata* research database[39] is indicative for supplies to some level, although this should not be overestimated. Readable stamps represent only a small percentage of samian assemblages and only a proportion of forms were stamped. Hence, the chances of recovering a stamp of any particular potter or matches of potters and dies is low unless huge assemblages are considered. It is therefore noteworthy that several identical stamps at the British forts like at Oudenburg have been found.

From the *Classis Britannica* fort at Boulogne-sur-Mer no studied context assemblages validate a comparison with the samian assemblages of the Oudenburg fort as the Boulogne contexts date too early or cover a too wide a time-span[40]. Combing through the more than 260 samian stamps found at Boulogne (recorded in the RGZM samian database) only results in three potters from Lezoux also distributing stamped vessels to Oudenburg: the overall-present Albucius ii, Cintusmus I and Magio I; Cinnamus ii distributed decorated bowls to Oudenburg.

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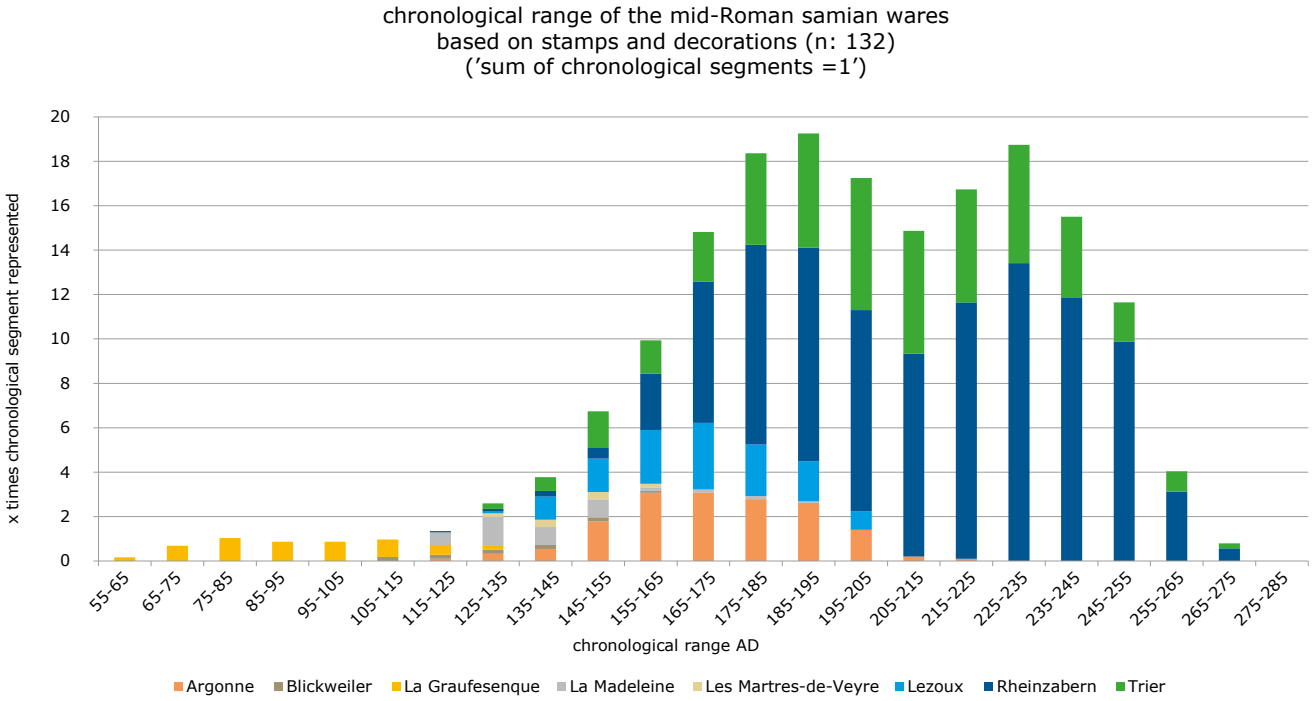
39 ***Corpus Vasorvm Arretinorvum / Names on Terra Sigillata*, the samian research database of the Römisch-Germanisches Zentralmuseum Mainz, created by G. Dannell and A. Mees: http://www.rgzm.de/samian/home/frames.htm.**

40 **The pottery assemblage of a waste-pit was studied by Seillier and Thoen (1978). A study by Belot and Canut (1994) of 2nd- and 3rd-century pottery assemblages did not include the samian. The pottery assemblage of a collecting sewerage, in use from the beginning of the 2nd century into the 4th century, yielded samian dated to the Flavian period and the 2nd century (Dhaeze and Seillier 2005; Dhaeze 2011). Three other contexts were studied by Dhaeze (2011): the debris fillings of a tower and related to the construction of it, located at site Rue Saint-Jean (dated first quarter 2nd century); waste fillings of a sewerage at Rue de Pressy (dated to *c.* AD 100 until end 3rd century); a waste-pit located in-between barracks E and H, site 'Ancien évêché' (later 2nd century; the samian of this context accounts only for 8 MNI).**



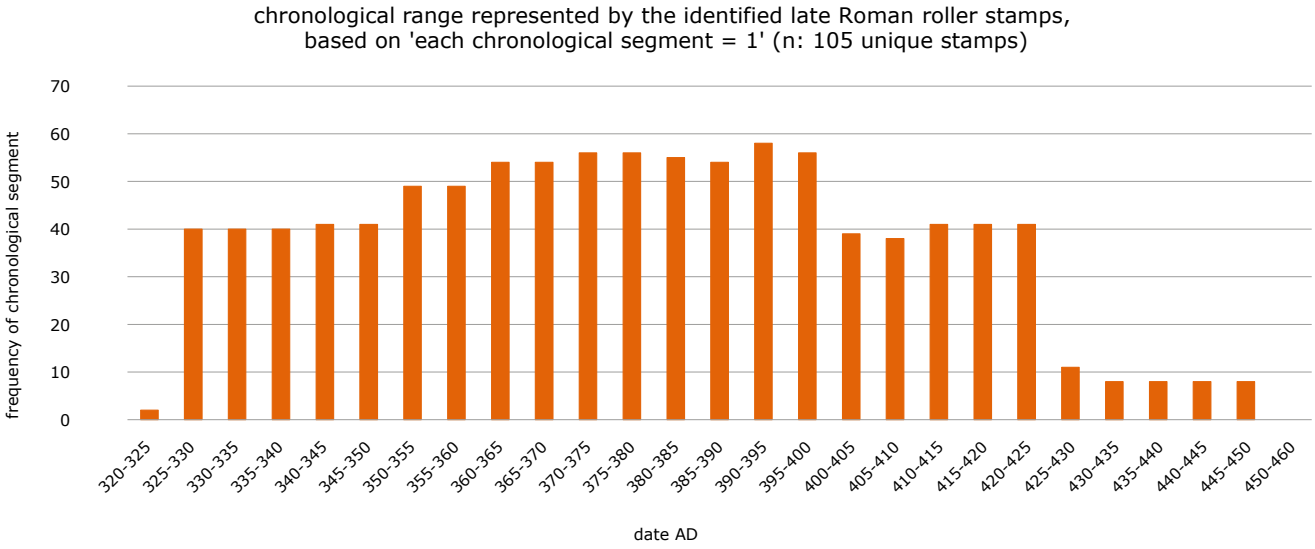


Figure 1.25. Top: chronological range concluded from the mid-Roman samian stamps and decorations, with the sum of the chronological segments (10 years) seen as 1. This graph combines the data from Figures 1.16 and 1.18, resp. graphs below. Below: chronological range represented by the identified late Roman roller stamps. Each chronological segment (10 years) is counted as 1.

From the limited data available from the British Shore forts that were already installed in the late 2nd or during the 3rd century, some – but only some –, comparisons can be made; it should be taken into account that available data are scarce.

The only large, and studied, assemblage of samian ware of a British Shore fort comes from Caister-on-Sea (1525 samian fragments) (Dickinson 1993). It shows several similarities with that from Oudenburg. Being mainly of late-Antonine and 3rd-century date, the proportion of the East Gaulish products is remarkably high in comparison to other sites in *Britannia*, with Trier and Rheinzabern productions prevailing. However, Dickinson mentions that this picture is not differing from other Saxon Shore fort assemblages (Dickinson 1993, 154), without yielding evidence though. The form spectrum as well shows close parallels with that at the Oudenburg fort, with large quantities of mortaria, cups Drag. 33 and dishes Drag. 31(R), and the presence of the Lud. SMb and Trier Massenfund 8b. At Caister-on-Sea, the mortaria represent no less

than 33.4% of the East Gaulish individuals, while they account for 14% of the wares in Central Gaulish fabric (weight percentages). Different figures however were obtained by Dickinson for Brancaster where the mortaria represent 16% of the East Gaulish vessels, while they only account for 4.4% of the Central Gaulish individuals (Dickinson 1993, 155)[41].

The Shore fort at Reculver was installed in the late 2nd century (Philp 2005, 216) and may well have been constructed contemporaneously with the Oudenburg fort. The 2nd-century samian wares all come from Lezoux, the 3rd-century East Gaulish products originate from Trier, Rheinzabern and Argonne (Bird in Philp 2005, 143-144)[42]. Only one Argonne Drag. 37 bowl was recorded, made by Tribunus who also distributed to Oudenburg. Also at Reculver, the decorated wares show a dominance of Rheinzabern over Trier; from Trier several mortaria were imported. For the Rheinzabern assemblage at Reculver, Bird however records no less than eleven decorated bowls, with at least three or four by Iulius II – Iulianus I, and single Drag. 37 bowls by Cerialis IV, Cerialis VI or Primitivus I, and Atto I or Firmus II, aside from four stamped plain ware vessels, amongst which Iulianus iii who distributed decorated vessels to Oudenburg, and large beakers of Drag. 54, late versions of Lud. Sb and unstamped Drag. 33 cups (Bird in Philp 2005, 144). Overall, this samian assemblage shows striking parallels with that of the 3rd century at the Oudenburg fort.

The Saxon Shore fort at Dover was only installed by the end of the 3rd century, but the site had been previously occupied by two successive *Classis Britannica* forts of which the last one dates to the period AD 190/200-*c.* 208. It is therefore not surprising that only a small amount of Rheinzabern samian was found at the site, likely for the largest part datable to the late 2nd-early 3rd century (Bird and Marsch 1981, 179)[43].

The Richborough fort was constructed in the late 3rd century on the same location where there had been a bridgehead and storage depot and later a civil port and settlement that developed from the 1st century onwards. The fort was occupied again by the military around the middle of the 3rd century. Consequently, the samian recovered during the excavations in the early 20th century, obviously covers a very wide time-span. In the listings of the samian stamps and decorations in the successive reports of Bushe-Fox (1926, 49-84; 1928, 53-92; 1932, 94-159; 1949, 160-240), the 1st- and 2nd-century samian largely outnumbers the 3rd-century fragments. Only in the fifth Richborough report an analytical study of the samian stamps found on site has been presented which reveals a dominance of 2nd-century Lezoux samian (Dickinson *et al.* 1968, 146-148)[44]. The Rheinzabern products only represent an '*extreme rarity*', and there is only a low quantity of East Gaulish products in general; there are even more stamps from the Argonne and Chémery-Faulquemont potteries than from Rheinzabern[45]. According to Dickinson *et al.* this reflects a very limited occupation in the first half of the 3rd century (Dickinson *et al.* 1968, 148). Nevertheless, chronologically the rarity of Rheinzabern products and especially the lack of late Rheinzabern stamps at Richborough may well be in line with the picture from Oudenburg. It confirms that by the time the Richborough fort was installed – whether this was in the 260s or 270s –, the Rheinzabern export to the North Sea and Channel region already had stopped.

During the investigations in the 1970s at the Lympne fort, installed in the late 3rd century and believed to have been occupied until the middle of the 4th century (Cunliffe 1980), only a very small amount of samian was found. Some 2nd-century Central Gaulish samian, outnumbering even the East Gaulish fragments, and one mid- or late Argonne samian dish (Bird in Cunliffe 1980, 275, 277) are residual material from the *Classis Britannica* fort.

At the Portchester fort, only a very small proportion of late Argonne ware was found, representing five decorated bowls and twenty plain vessels, of which only some fragments were recovered from a stratified context (Cunliffe 1975, 278-279; Fulford 1977, 77). The variety in the plain forms is however remarkable. Apart from the five Chenet 320 bowls, the Portchester assemblage contains the types Chenet 304, 313, 324, 326, 328 and 329. The vessels can be dated between *c.* AD 320 and 390 (Cunliffe 1975, 278-279). Cunliffe also pointed to the rarity of the Argonne ware in Britain and saw an explanation in the competition from the Oxfordshire and other fine ware products. Interesting is his comment that '*it is difficult to interpret its* (*i.e.* the late Argonne ware) *presence as either through trade or the casual import of belongings by individuals*' (Cunliffe 1975, 278).

From the Richborough fort, over thirty late Argonne vessels are mentioned by Fulford (1977, 76), however most of them are unpublished. Bushe-Fox records a Chenet 304 dish with roller-stamped decoration (Bushe-Fox 1949, 270: 480 and Plate XCIV) and a decorated Chenet 320 bowl, found in a late 4th century deposit (Bushe-Fox 1926, 102: 95 and Plate XXVII).

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41 Of the sixteen samian stamps recorded for Brancaster in the RGZM samian database, two potters, both from Rheinzabern, also occur at Oudenburg: Crassiacus (two times attested at the Oudenburg fort, with the same die 1a) and Severianus ii (also two times attested at Oudenburg, with different dies). For Crassiacus a production in the period AD 180-220 is suggested, for Severianus ii activity in the period AD 190-240 is believed (see respectively Oudenburg stamps SS38-39 and SS63-64).

42 The RGZM samian database lists several stamps found at Reculver, among which Urbanis iv of Trier who occurs also at Oudenburg (with the same die); this potter however knew a wide-spread distribution, with attested vessels at several Rhine limes forts and in *Britannia*.

43 From the 90 samian stamps listed for Dover in the RGZM samian database, three potters of Antonine date also distributed stamped vessels to Oudenburg: Albucius ii and Cintusmus i from Lezoux (cf. also Boulogne-sur-Mer), Amabilis ii from La Madeleine. The attested Cinnamus ii was responsible for decorated bowls at Oudenburg.

44 Lezoux potters (of Antonine or late 2nd-century date), attested at Richborough and listed in the RGZM samian database, and who also distributed stamped plain wares to the Oudenburg fort, are Albucius ii, Cintusmus i (both with similar die at Oudenburg), Pugnus ii and Sabinus viii. Again, Cinnamus ii is attested, who distributed decorated wares to Oudenburg.

45 Only one Rheinzabern potter occurs at both the Richborough and Oudenburg fort: Victorinus ii, active in the period AD 210-255 (NOTS, vol. 9, 237-238).

Excavations at the 4th-century fort of Burgh Castle only yielded two possible late Argonne bowls (Johnson 1983, 90, 91: Fig. 38, 1-2). From Lympne, one late Argonne vessel is known (Fulford 1977, 76). The late Roman assemblages at the Reculver fort comprise some Argonne wares of late 3rd- and 4th-century date, but of only one Chenet 320 bowl the roller stamp was preserved, however unidentified (Bird in Philp 2005, 151).

With a *c.* AD 293 date for its installation, the Pevensey fort evidently only validates a comparison with its late Roman samian assemblage. Argonne wares are present, however in small quantities. The function of the samian repertoire was clearly taken over by the other fine wares, of British origin. These fine wares are dominated by the Oxfordshire wares (often imitating samian forms) mainly representing closed forms including beakers with open forms from the early 4th century onwards, the Pevensey wares (mainly necked and other bowls) and the New Forest beakers and bottles (Lyne 2009, 99). The late Argonne wares, represented by ten individuals, show a remarkable variety : two roller-stamped Chenet 320 bowls (respectively dated AD 320-360 and AD 390-425), two Chenet 323 bowls, one Chenet 323A bowl, one Chenet 324c bowl, one Chenet 310 bowl, one Chenet 319b bowl, one Rigoir (1968) 15A bowl 'sigillée paléochrétienne', and one rouletted Rigoir (1968) 17 bowl (Lyne 2009, 119, 118: Fig. 32, respectively illustrated as 22, 26, 31-32, 30, 23, 24, 25, 27, 28).

13. The samian supplies to the Oudenburg fort and what they can tell us about trade networks in the wider region

13.1 The mid-Roman samian ware supplies

During the successive fort periods a shift in the samian supply can be observed. In the late 2nd and early 3rd century, apart from some distribution from Trier and Rheinzabern, the supply from the Central Gaulish workshops (mainly Lezoux) and the Argonne potteries dominates. The dominance of the Lezoux products in the late 2nd century (fort period 1) corresponds well with the samian at other sites in the Menapian region and more to the south at the sites of Etaples, Amiens, Ardres and Boulogne in the North of France. In their research of the samian assemblage of Steene-Pitgam, located in South Menapian territory, in the very North of France, De Clercq and Deschieter (1999, 85) pointed to the Central Gaulish supremacy at these sites in the Antonine period, in contrast to sites in the North along the Rhine where the East Gaulish products prevailed at that time (with reference to Raepsaet 1987, 5). At the harbour of *Forum Hadriani* (Voorburg-Arentsburg), active between *c.* AD 70 and 300, Trier clearly dominated the supply, way over Rheinzabern, while Lezoux hardly came in and La Madeleine and Argonne represent moderate quantities (Driessen 2014; van Diepen and Niemeijer 2011).

The first half of the 3rd century shows a strikingly high percentage of Argonne products with 31.8% MNI at fort period 2[46], next to Lezoux. Taking into account a portion of residual Lezoux examples, Argonne took the lead in the market in that period, over the Lezoux imports (30.7%). At Steene-Pitgam for example, during the 2nd century, the Argonne is represented by 10% based on the decorated and stamped samian vessels, but this number is significantly higher when the numerous Drag. 45 mortaria in Argonne fabric at this site are included. This trend of the importance of Argonne during the 3rd century appears to be in contrast with data from Ardres, Etaples, Thérouanne, Boulogne, Amiens, Arras and Bavay where the Argonne represents an average of 5% (De Clercq and Deschieter 1999, 85; with reference to Raepsaet 1987).

While the Lezoux and Argonne potteries were first leading the market – Lezoux in the late 2nd century, Argonne in the first half of the 3rd century -, this changes during the 3rd century in favour of Trier and Rheinzabern which then came to completely dominate the supply of samian tableware in the north-west provinces. With the Lezoux potters producing until *c.* AD 240 as Delage (2010) suggests – albeit this output was much diminished compared to the 2nd century -, all Lezoux samian certainly from fort period 3 onwards *i.e.* around the middle of the 3rd century (certainly since a new unit occupied the fort), should be considered as residual material, besides some vessels likely to be still in use as carefully looked after. After all, the military was provided by regular and selective supplies and these contained up-to-date products as Willis could demonstrate for the British military sites (Willis 2005, Section 6.3; Willis 1998). In the 3rd century, the East Gaulish products gain more and more popularity at the Oudenburg fort. While at fort level 2, Trier and Rheinzabern represent respectively only 12.5% and 14.8%, Trier becomes as important as Argonne at fort level 3 (both *c.* 21%) and Rheinzabern takes the lead with 31.1%. During fort period 4, Rheinzabern becomes even more important and dominates the supply slightly over Trier (respectively 34.2% and 26.6%). Rheinzabern and Trier largely became the only samian suppliers to the Oudenburg fort (as embodied by the samian assemblage of well OS 22926). A functional difference can be noticed in their final supplies (evidenced by the samian spectrum of large waste-pit OS 4980): Trier mainly responsible for dishes and mortaria, while Rheinzabern offered a more diverse spectrum. Rheinzabern eventually prevailed, mainly in the supply of decorated wares[47].

The contextual data indicate that a stop in the supply of samian to the Oudenburg fort can be situated around *c.* AD 260 or somewhat later. The latest East Gaulish samian products did not reach the Oudenburg fort which might be related to problematic provisioning due to external threats. It is possible that the lack of late Rheinzabern stamps at Richborough (cf. Dickinson *et al.* 1968, 148) supports the idea that Rheinzabern export to the North Sea and Channel region stopped around that time (see Section 12 in this chapter).

The same overall picture of supply is represented at the Aardenburg fort with Trier and Rheinzabern being the main suppliers of the

46 In contrast to only one MNI at level 1. However, it should be emphasized that only a small total samian number of 21 MNI is listed for this level 1.

47 The same patterns have been attested in the smaller samian assemblages from the north-east sites at the Oudenburg fort: see Vanhoutte *et al.* 2014.

samian[48]. According to the stamped and decorated samian, the Lezoux, Argonne, La Madeleine and in small quantities Ittenweiler or Blickweiler and Chémery-Faulquemont appear to have only exported to Aardenburg in the (second half of the) 2nd century, but even then they already appear to have been less important than the East Gaulish productions (van der Linden and Huijben 2013, 69-70). The importance of the Argonne imports at the Oudenburg fort during the first half of the 3rd century, demonstrated by the significant presence of the Argonne plain wares, cannot be checked at the Aardenburg fort, though, since only the stamped and decorated fragments have so far been studied there. Also at Aardenburg, Trier and Rheinzabern completely dominated the supply in the 3rd century, the first well-represented with its plain wares; Rheinzabern prevailed however more and more during the 3rd century with its decorated wares (van der Linden and Huijben 2013, 70-71; Dhaeze 2013, 279-281), again a similar picture as can be observed at the Oudenburg fort. The connection between the Aardenburg and the Oudenburg fort for the supply of samian prevails from the presence of products made by the same potters[49]. The many similarities in the samian spectrum, and also in other pottery categories *e.g.* the North Menapian pottery, point to a strong ceramic connection and identical military pottery supply arrangements for both forts.

The Rheinzabern-Trier distribution from the second half of the 3rd century at both forts displays a clear dominance of Rheinzabern which stands in strong contrast to the picture retrieved at the northern limes in *Germania Inferior* where Trier prevails over Rheinzabern. At Zwammerdam (*Nigrum Pilum*) for example, in period III (last quarter 2nd century – start last quarter 3rd century) the Trier samian stands for *c.* 70% while Rheinzabern only reaches *c.* 10% (Haalebos 1977, 125). At Voorburg-Arentsburg, the samian studies of two different sites of *Forum Hadriani* confirm that Lezoux samian hardly reached the Lower Rhine limes. There, Trier outnumbers La Madeleine, Rheinzabern and Argonne both in the stamped plain wares[50] as in the decorated wares[51] with Rheinzabern products only accounting for a small share (van Diepen and Niemeijer 2011; Driessen 2014). Only in the stamped samian wares of the harbour site (2007-2008), Rheinzabern was more important in the period AD 225-250, although still only representing small quantities (Sepers 2014).

As De Clercq and Deschieter already demonstrated (1999; 2002), the leading role of Rheinzabern in the 3rd century appears to be characteristic for the whole North Menapian region, not only at the military sites but also at the civil sites, and for the hinterland up to the river Lys. It is also the general situation at the extramural settlement of Oudenburg (see Creus 1975; Gilté 1993; Dhaeze *et al.* 2018) and for the coastal region (Thoen 1978, 117)[52]. Thoen (1978, 117-118) stated that the East Gaulish samian supply in the coastal region was mainly controlled by some large producers as they occur frequently[53]. Although quantitatively and contextually strong comparative data are lacking for the coastal region, the dominance of Rheinzabern for the 3rd century seems clear from the available data. For Thoen, this is exemplified in the samian assemblage of the presumed port site (site Fort Lapin) at Bruges; however, being a late 19th-century excavation this assemblage may at the time have been selectively collected. Within a total of 40 identified samian pots 30 vessels came from Rheinzabern (or 75%), seven from Trier and three from the Argonne (Thoen 1978, 117).

As mentioned before, the importance of the coastal plain for the exploitation of salt, which was under the control – directly or indirectly – of the army, is clearly attested (see Volume I, Chapter I, Section I.4.1.2). From this can be assumed that also the people were to some level dependent on the army and its economy. This may be confirmed by the occurrence of a high proportion of vessels made by the same Rheinzabern potters as the products from the Oudenburg fort, as this similar ceramic identity (also visible in the other pottery categories) seems to imply that the people of the coastal region benefited from the same samian (and other) (military) supply network. It is noteworthy in this respect that for *Britannia* Willis (2004, Chapter 6.3 and 6.7) concluded from the distribution of East Gaulish samian on British sites that an important part of the supply must have been organized by, or with, the military. A military-oriented economy for the East Gaulish samian in the North Sea and Channel region can only be suggested though, as comparative assemblages for the 3rd century at the British Shore

48 **Study of the samian from Aardenburg focused on the potter stamps and the decorated wares, retrieved from different sites and collections (van der Linden and Huijben 2013). In total 301 stamps were catalogued, together with 796 of the 1486 available decorated fragments. The stamped and decorated samian found inside the fort was studied together with that recovered from sites outside the fort walls. A contextual approach undertaken by Dhaeze in studying some key contexts from the Aardenburg fort representing the phase 175-225 and the phase 225-275 in comparison to contexts which are earlier than the fort (see Dhaeze 2013) complements this assessment.**

49 **From the 72 Aardenburg dies recorded in the online RGZM samian database, representing 67 different potters, five identical dies occur at the Oudenburg fort: Comitialis (die 3a), Datius (die 2a), Iulius viii (die 5c), Martinus v (die 4a) and Minutus (die 3a). Apart from the Trier potter Minutus, they all worked at Rheinzabern. Five other potters are present with a different die: Albucius ii (Aardenburg: die 6b – Oudenburg: die 6e), Materninus iii (Aardenburg: die 2a – Oudenburg: die 1a), Satinus (Aardenburg: die 2b – Oudenburg: die 2a); Verus vi (Aardenburg: die 2c – Oudenburg: die 3f); Victorinus ii (Aardenburg: die 4n – Oudenburg: die 11a). They too all worked at Rheinzabern, apart from the, very well-distributed, Albucius ii of Lezoux. Another six potters whose stamps were found at Aardenburg, made decorated bowls recovered at Oudenburg fort: Afer iii of Trier; Atto i of Rheinzabern; Dubitatus ii of Trier, Primitius I of Rheinzabern, Statutus of Rheinzabern, and the Tocca group of the Argonne.**

50 **Stamped plain wares at the 2005 excavations at *Forum Hadriani*: Trier 19%, La Madeleine 11%, Rheinzabern 9%, Argonne 7% (van Diepen and Niemeijer 2011, 170, 171: Abb. 6).**

51 **Decorated wares at the 2005 excavations at *Forum Hadriani*: Trier 43%, La Madeleine 21%, Argonne 18%, Rheinzabern 7% (van Diepen and Niemeijer 2011, 170, 171: Abb. 6).**

52 **Thoen (1978) studied all the then known samian fragments from the coastal plain (and the bordering region), mostly found unstratified but clearly related to occupation sites and burials (cf. several complete vessels).**

53 **For Rheinzabern: Comitialis (I to VI), Primitivus (I to IV), Iulius II – Iulianus I; for Trier: Comitialis, Dexter, Censor, Maiiaaus, Afer; for Argonne: Tribunus, Germanus and Africanus (Thoen 1978, 117-118, 160-162). Mainly the imports of the listed Rheinzabern potters were prominent as they are each attested several times. All these potters are all represented at the Oudenburg fort.**

forts are scarce. The pottery assemblages are either very limited – Caister-on-Sea forms an exception – or the installation of the fort dates too late to yield (much) pottery for this period (see Section 12 of this chapter); so no firm statements on this can be made[54].

This high proportion of Rheinzabern products accounts for an important difference with the surrounding *civitates* (of the *Morini, Atrebati, Nervii* and *Tungri*) to the south and to the east of the *civitas Menapiorum* where these products are hardly found (cf. De Clercq and Deschieter 1999, 85). De Clercq and Deschieter saw a possible explanation within the context of the export of Rheinzabern samian to *Britannia,* via the Rhine to *Helinium* and onwards via the North Sea, or within the context of the military presence in the region from the last quarter of the 2nd century onwards (De Clercq and Deschieter 2002, 43-44). While they see a supply network via the Rhine to the *civitas Menapiorum* through a distribution network via the Scheldt, the Durme and the Lys rivers, possibly by middlemen, imports via the sea and the tidal channels can certainly not be excluded. Regions more to the south benefited from a well-equipped road network that could have reinforced the supply of the Argonne products (De Clercq and Deschieter 1999, 86). It appears that the North Menapian region, and particularly the Oudenburg fort, benefited from both these networks. The remarkable differences the samian supply to the Oudenburg fort shows with the supply to the Lower Rhine *limes* and with the region more to the south clearly testifies to a commercial geography in samian supply.

13.2 The 'samian' supply in the 4th – early 5th century

The supply of samian to the late Roman army at Oudenburg remained fairly strong, while the fort had become a remote outpost in a poorly populated region. On the other hand, the supply to Oudenburg will have benefited from the enhanced accessibility via the tidal channel resulting from the increased marine influence, already from the later 3rd century onwards, making direct sea transports possible. The late Roman 'samian' was entirely supplied by the Argonne workshops and the North Gaulish potteries, with most products originating from the Boulonnais region apart from a few products from Les Rues-des-Vignes (near Cambrai). The datable roller stamp evidence shows a date range from the second quarter of the 4th until the first decades of the 5th century. The samian in use at the fort at this time included decorated bowls mainly from the Argonne region whereas mortaria came largely from the North Gaulish potteries. The Argonne supply mainly focused on the supply of Chenet 320 bowls, but also a small scale of plain forms. No late Argonne ware is known from the coastal region outside the fort, the late Roman graveyards or its immediate surroundings[55]. In the neighbouring hinterland, there might have been some late Roman occupation, albeit very scarcely. The only other centres in the Menapian region that were supplied by late Argonne wares, are Kortrijk and Ghent; at both sites a late Roman fort is assumed (cf. for Kortrijk the record of the *Cortoriacenses* in the *Notitia Dignitatum*) but not yet found (see Volume I, Chapter I, Section I.3.2). At Aardenburg late Argonne wares are lacking; it is one of the reasons to conclude that there was no 4th-century occupation at this fort.

The late Argonne production was widely distributed, mainly in northern and northeastern Gaul, on all types of sites. While this seems to be the result of a market distribution, Esmonde Cleary argues, based on the large numbers of late Argonne ware on military sites, that its distribution may well be an example of the tax-spine model, as aforementioned the model which seems to characterize most of the late Roman economy in general. This integration of economies encloses a market economy which benefited from the infrastructure of a political economy, with late Argonne wares riding piggyback on the supply lines installed by the state or army, perhaps of grain (Esmonde Cleary 2013, 320-321, 327).

It is however remarkable that only a very limited range of functions are represented by the late Argonne and North Gaulish vessels, and one can wonder whether those supplies were sufficient. The increased significance of the distribution from products from *Britannia* will have emerged in part as the continental industries were still continuing at some level whilst other industries had ceased.

While the Oudenburg fort was relatively well-supplied with late Argonne wares, this pottery appears to be only scarcely present at the late Roman forts of the British Shore. Although late Argonne ware vessels have been found over a large area in southern Britain, they represent in general very low quantities (Tyers 1996, 136 (but appears to include also the earlier Argonne wares from the 3rd century); Fulford 1977, 76-77: Appendix 1). Fulford specified the late Argonne ware distribution to the south-east, in the Thames estuary, Essex and Kent with the majority of the find spots either close to or along the coastline (Fulford 1977, 40: Fig. 1, 42).

Fulford (1977, 43, 58) assumed, based on the lack of Eifel querns at the Portchester fort and the near absence of late Argonne ware at York, that the mid-Roman trade from East Gaul via the Rhine to *Britannia* did not continue in the late Roman period ánd that the Argonne ware was not traded via the Rhine. He also stated that the small quantities were not the subject of specialized trade (Fulford 1977, 38). He argued that this could be partly explained by the location of these regions, closer to the Argonne kilns and further away from the Oxfordshire kilns, which were the largest competitors (Fulford 1977, 42). However, one can wonder whether the extra barrier of crossing the North Sea makes a comparison in distance relevant; the expensive undertaking that a crossing represented, as it is today, would not be able to compete with more miles via the river or road network. On the other hand, by this time it seems very likely indeed that consumers got what they could when they could and not as a result of a specific oriented economy. Fulford furthermore stated that '*export may have taken place from anywhere along the relevant coastline, as casual loads on a wide variety of routes*', and not as products of trade, since once the late Argonne ware arrived, there seems to be not much further distribution (Fulford 1977, 42).

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54 Dickinson and Hartley (1971) state that East Gaulish samian in the south of *Britannia* generally show higher proportions along the east coast and they connect this with the presence of the Shore forts with a late 2nd- and 3rd-century installation. However, hard evidence for this statement lacks.

55 The single Chenet 320 bowl fragment, dated to the second half of the 4th century, and found at the early medieval settlement of Roksem, a municipal district of Oudenburg, may have been a pick-up from Oudenburg in early medieval times (Hollevoet 1991, 183; cf. Hollevoet and De Clercq 2019, 84-85).

The low proportion of late Argonne wares at the late Saxon Shore forts combined with the variety in forms they display, is indicative that these products were retrieved as casual items. This possibly happened within the context of the provisioning of other products, or, more likely, within the context of military contacts. These late Argonne wares might have come along with recruits from the Continent or through larger troop movements as cross-Channel rotations in the fort occupations of the 4th century can be expected based on several finds (*e.g.* the two identical bracelets at Portchester and Oudenburg (Graveyard A); the Much Hadham face-pot at Graveyard B). Moreover, it is important to keep in mind that in the late Roman period the forts were no longer solely military entities. Not only were they remote bases in a landscape deprived of dense occupation, they also housed non-military people and families (see Volume I, Chapter V.3.4). Forts now functioned more as economic communities on their own. While several products of for example the Romano-British coarse pottery, came in from *Britannia* through military personnel, the late Argonne wares may represent such exchange in the other direction. An obvious candidate for exchange contact would be Boulogne. However, Fulford mentions the lack of pottery coming from the northern France in contexts in which late Argonne wares have been found (Fulford 1977, 43). Given that the Oudenburg fort and the British late Roman forts were part of a unified defence system, it is a likely possibility that the contacts, leading to the exchange of late Argonne wares, also happened with the Oudenburg units.

14. Catalogue of the samian stamps of the south-west corner site (Plates LXXXII-LXXXVII)

For each stamp[56] the following data are listed:
Stamp no. and reading
Context in which the stamp was found
(Fort) level to which the find context belongs
Type of vessel
Identified potter
Established dating of the potter

14.1 NAME STAMPS (see also details on Plates LXXXVIII-XCII)

LEZOUX

SS1.]**BVCI**
Demolition layer of furnace OS 7905 (furnace for metalworking)
4
Drag. 18/31 (TS-LX4)
Albucius (ii) of Lezoux (NOTS vol. 1, 137-144: die 6e?)
AD 145-175

SS2.]**ONI·I**
Layer OS 80038
5
Drag. 18/31 or 31 (TS-LX4)
?Carant- Don- of Lezoux, possibly an association of two potters (NOTS vol. 2, 234: close to die 1a (only one die known))
AD 160-200

SS3. **CINTVSMIM**
Layer OS 70189
4
Drag. 18/31 (TS-LX4)
Cintusmus i of Lezoux (NOTS vol. 3, 38-43: die 2b; Bird 1986, 188: 3.36)
AD 140-180

SS4.]**OM**
Earthen rampart OS 30915
1>4
Drag. 18/31 (TS-LX4)
Magio i (Magionus?) of Lezoux (NOTS vol. 5, 199-201: die 3a)
AD 160-200

SS5. **PVGNI·M**
Level OS 7909/7656
4+5
Drag. 33 (TS-LX4)
Pugnus ii of Lezoux (NOTS vol. 7, 283-285: die 2e)
AD 135-165

SS6. **SABINI OF**
Level OS 70914
2+3
Drag. 33 (TS-LX4)
Sabinus viii of Lezoux (NOTS vol. 8, 33-35: die 5a)
AD 160-200

SS7.]**CVLNO (?)** abraded
Pit OS 7044.IV
4
Drag. 18/31 (TS-LX4)
Reading direction uncertain; no match found
?

SS8.]**V**[ ]**NI** abraded
Level rampart I OS 30916
1
Dish? (TS-LX4)
No match found
?

LA MADELEINE

SS9.]**BIL** abraded
Level OS 80918
4+5
Drag. 18/31
Amabilis ii of La Madeleine (NOTS vol. 1, 161-166: die 7b?)
AD 125-155

ARGONNE

SS10. **GIAMILLVS** very worn and possibly not well stamped
Level OS 80917
4
Drag. 31 (with graffito G11: crossed lines on bottom of base)
Giamillus iii of Lavoye (NOTS vol. 4, 206: die 5a)
AD 140-200

SS11. **LIBONI**
Primary infill inner structure of double well OS 2562
5
Drag. 18/31 or 31
Libonus of Lavoye (NOTS vol. 5, 60: die 1a)
AD 150-200?

SS12. **TVLLVSFE**
Pit OS 8924C
4
Drag. 33
Tullus of Le Pont-des-Rèmes (NOTS vol. 9, 107: die 2a; Frey 1993: Taf. XIV, 292.2)
AD 150-180

56 The catalogue of the samian stamps comprises the diagnostic stamps, meaning the stamps preserved well enough to lead to the identification of the stamp and/or the reading of the name of the potter, besides also stamp fragments with a readable portion of the die but so far not identifiable. The stamps are classified according to fabric/origin and furthermore in alphabetical order.

TRIER

SS13. **APOLI**
Primary infill of large waste-pit OS 4980
4
Drag. 32 or 36
Unparalleled stamp: Apolo/Apolus?
?

SS14. **ATI[ ]IDO F**
Primary infill of large waste-pit OS 4980
4
Dish (TRI SA B)
Atilido of Trier (NOTS vol. 1, 294: die 1a)
late 2nd – first half of 3rd century AD

SS15. **]LIS.F**
Level rampart I OS 30916
1
Drag. 18/31
Cerialis vii 'of East Gaul' (NOTS vol. 2, 357-358: die 1a/1b; Hartley and Dickinson suggest Blickweiler or Trier as origin)
AD 140-180?

SS16. **]IALISF ?** intradecorative stamp; abraded
Construction pit large basin OS 4923
5
Drag. 37 (TRI SA A)
Comitialis of Trier, also based on the freeze decoration (NOTS vol. 3, 95-102: die 5f tab?)
AD 170-240

SS17. **D[ ]SIVS**
Unit VIII: level OS 8959
4
DishR (TRI SA A)
Dessius of Trier (NOTS vol. 3, 269; Frey 1993, 37 and Taf. VI: 106)
AD 200-260

SS18. **DRVCAVRSV**
Pit OS 81905
1 or 2
Dish? (TRI SA B)
Drucaursus of Trier (NOTS vol. 3 'East Gaul', 330: die 1a but the Oudenburg die is neater)
AD 160-260

SS19. **IILIINIΛS**
Mixed level OS 30915
1 to 4
Drag. 31 (TRI SA A)
Elenius i 'of Les Allieux', but also active at Trier (NOTS vol. 3, 347: die 5a)
AD 170-200

SS20. **IVCV[**
Unit V: large fire layer OS 8905B
4
Drag. 32 (TRI SA A)
Iucundus v of Trier (NOTS vol. 4, 316: die 1c)
AD 160-260?

SS21. **ME[ ]VSSA**
Primary infill of large waste-pit OS 4980
4
Lud. Th
Mercussa of Trier (identification provided by B. Dickinson, but the die has no parallel; potter also unknown to I. Huld-Zetsche (pers. comm.))
?

SS22. **MINVT\[**
Layer OS 71334
4
Drag. 31 (TRI SA C)
Minutus of Trier (NOTS vol. 6, 113-115: die 3a; Frey 1993, 62 and Taf. X: 203,2)
AD 170-250? (dated by Frey (1993, 62) around the middle of the 3rd century)

SS23. **PAR[** very abraded
Construction pit of large basin OS 4923
5
Dish (burnt) (with graffito G28: crossed lines on the bottom of the base)
?Parentinus of Trier (NOTS vol. 7, 9-10: die not identifiable)
AD 180-260

SS24. **]VINVSFE**
Level OS 22935
2+3
Dish (TRI SA A)
Patruinus ii of Trier (NOTS vol. 7, 90: die 1a)
AD 200-260

SS25. **VRB[ ]SFE** with ligature FE
Unit II: construction slot OS 7994
4
Drag. 31
Urbanus of Trier (NOTS vol. 9, 120-121: die 1a; Frey 1993, Taf. XVI, 310, 1)
AD 190-240? This potter seems to have been active in both Rheinzabern and Trier workshops. Stamps of Urbanus amongst Rheinzabern samian wasters of a kiln at Rheinzabern points to an early 3rd-century activity at Rheinzabern (NOTS vol. 9, 121). The fabric of the Oudenburg piece identifies it as a Trier product.

SS26. **XIATIVAV**
Level OS 70956
3
Dish
Illiterate stamp (cf. Frey 1993, 92 and Taf. XVI, 21: attested on a Drag. 31 at the potter workshops excavations of 1914 (Töpferstrasse) and 1917 (Louis-Linz-Strasse))
?

SS27. **I?]MI(?)N[**]ƨ
Level OS 44928
4+5
Drag. 31 (TRI SA B)
No match found
?

SS28.]˚**NIE[**
Secondary infill of well OS 22926
4
Dish?
No match found
?

SS29. **]VCA FII or]VSSA FE** (with ligature VS?)
Secondary infill of well OS 22926
4
Drag. 36?
No match found. It is however possible that it concerns Mercussa, the same potter as SS21 (but with another die), but there are no known parallels for this potter.
?

SS30. **]SFII** broken off and abraded
Level OS 8936
5
Dish (TRI SA B)
No match found
?

SS31. **]SE**
Pit OS 71445
3
Drag. 31
Undetermined
?

RHEINZABERN

SS32. **AT[** abraded
Unit V: fire layer OS 8905B
4
Drag. 36 (burnt to black)
Atta of Rheinzabern, based on shape of A and largeness of the letters (NOTS vol. 1, 299: die 3a)
AD 170-220

SS33. **AT[** stamped twice
Secondary infill of pit OS 4980
4+5
Dish
Attianus iv of Rheinzabern (NOTS vol. 1, 303-306: possibly die 4g or 9a)
AD 160-260

SS34. **]OLINVS[**
Fire place OS 7932
4
Dish
Capitolinus of Rheinzabern (NOTS vol. 2, 228-229: die 1a)
AD 170-260

SS35. **CI[?** abraded

Secondary infill of well OS 22926
4
Drag. 18/31 or 31
?Cintugnatus ii of Rheinzabern (NOTS vol. 3, 34-38: die 2a)
AD 140-180

SS36. **COMITI[** intradecorative stamp, retrograde
Level OS 8955, to the east of Unit VIII
4
Drag. 37
Comitialis of Rheinzabern (NOTS vol. 3, 95-102: die 3a tab)
AD 170-240

SS37. **CRA[**
Level OS 8914
5
Drag. 36
Craco ii of East Gaul (NOTS vol. 3, 167: die 1a)
AD 160-260

SS38. **]SIACVSF**
Primary infill of large basin OS 4923
5
Dish
Crassiacus of Rheinzabern (NOTS vol. 3, 170-171: die 1a)
AD 180-220?

SS39. **]IACVSF**
Level OS 70910
3
Drag. 18/31R or 31R
Crassiacus of Rheinzabern (NOTS vol. 3, 170-171: die 1a); cf. stamp 32.
AD 180-220?

SS40. **]ATIVSF[**
Level OS 8951
4
Drag. 18/31 or 31
Datius of Rheinzabern (NOTS vol. 3, 257-258: die 2a)
AD 160-240

SS41. **DRV[**
Layer OS 70214
3 or 4
Drag. 32 or 36
Drucaursus of 'East Gaul' (NOTS vol. 3, 330). Same Drucaursus as stamp 16? In this case however the fabric is clearly Rheinzabern
AD 160-260

SS42. **EVRITVSF**
Primary infill of large waste-pit OS 4980
4
Lud. SbR
Euritus of Rheinzabern (Oswald 1936, 117; NOTS vol. 3, 369: die 1a)
AD 180-240 / 3rd century AD (pers. comm. I. Huld-Zetsche and M. Thomas)

SS43. **EVRITVSF**
Oven debris OS 7955
4
Dish (with graffito G42: intersecting straight lines on the bottom of the base)
Euritus of Rheinzabern (NOTS vol. 3, 369: die 1a)
AD 180-240

SS44. **EV[**
Level OS 23962
2
Drag. 31R
Euritus of Rheinzabern (NOTS vol. 3, 369: die 1a)
AD 180-240

SS45. **]MINV(?)ƨ<FE**
Level OS 7987
4
Dish (burnt to black)
Firminus ii of Rheinzabern (NOTS vol. 4, 48-49: die 2b)
AD 160-220?

SS46. **FLAVIA[**
Large fire layer OS 7957/7971
4 (end)
Dish (burnt to black)
Flavianus ii of Rheinzabern (NOTS vol. 4, 65: die 2a)
AD 160-260

SS47. **GIA[ ]L(L)VS** abraded
Unit V: fire layer OS 8905B
4
Drag. 36
Giamillus v of Rheinzabern (NOTS vol. 4, 207: die 1a: East Gaul)
AD 120-200

SS48. Intradecorative stamp, letters abraded but possibly also badly stamped
north side hospital: doubled construction slot OS 82843/82845
2
Drag. 37
Iulianus iii of Rheinzabern, based on the freeze decoration style Julius II-Julianus I (NOTS vol. 4, 322-326: die not identifiable).
AD 220-255

SS49. Intradecorative stamp, letters abraded
pit OS 80979
3
Drag. 37
Iulianus iii of Rheinzabern, based on the ovolo style Julius II-Julianus I (NOTS vol. 4, 322-326: die not identifiable).
AD 220-255

SS50. **]VLIVS** Intradecorative stamp, retrograde
Pit OS 83765
2
Drag. 37
Iulius viii of Rheinzabern (NOTS vol. 4, 335-339: die 5c tab, but end F not stamped here (wiped))
AD 220-255

SS51. **]SFEC**
Level OS 7935
4+5
Drag. 18/31 or 31
?Latinianus of Rheinzabern (NOTS vol. 5, 21-22: die 1a)
AD 160-260

SS52. **MAGIOF**
Layer OS 7397
5
Dish
Magio ii of Rheinzabern (NOTS vol. 5, 201-202: die 2a)
AD 160-260

SS53. **MA[**
Level OS 4971
4+5
Drag. 31
Magio ii of Rheinzabern (NOTS vol. 5, 201-202: die 2a)
AD 160-260

SS54. **MARTINF** retrograde with ligature NF
Construction pit of large basin OS 4923
5
Drag. 33 or 40 (fabric very close to TRI SA A)
Martinus v of Rheinzabern (NOTS vol. 5, 321-323: die 4a), active in Pfaffenhofen, Rheinzabern and Westerndorf
AD 170-250

SS55. **MATER[**
Pit OS 70960
2
Dish
Materninus iii of Rheinzabern (NOTS vol. 6, 10)
AD 160-260

SS56. **NVDIN[**
Level OS 80992
3
Drag. 31R?
Nundinus ii of Rheinzabern (NOTS vol. 6, 267-268: die 3b)
AD 160-260

SS57. **ONE[** stamped twice (different directions)
Covering layer on top of Unit V level 4
5(+4)
Drag. 32 or 36
Oneratus of Rheinzabern (NOTS vol. 6, 282: die 1a)
AD 160-260

SS58. **O[ ]R abraded**
Pit OS 80982
3
Drag. 18/31 or 31
Onnior of Rheinzabern (NOTS vol. 6, 283: die 1a)
AD 160-260

SS59. **PAT[**
Pit OS 7949
4
Drag. 18/31
Patruinus i of Rheinzabern (NOTS vol. 7, 89-90: die 3a)
AD 160-260

SS60. **PIIP.POFIIC**
Level OS 70965
Mixed level
Dish
Peppo of Rheinzabern (NOTS, vol. 7, 124-125: die 2a)
AD 160-260

SS61. **]NVS** Intradecorative stamp, retrograde
Level OS 70919
3+4
Drag. 37
Probably Respectinus (ii) (NOTS vol. 7, 380-383: die 2c tab)
AD 220-260?

SS62. **SAT[**
Level OS 4912
5
Drag. 32 or 36
Satinus of Rheinzabern (NOTS 8, 97-98: die 2a)
AD 160-260

SS63. **SEVERIANVSFE**
Pit OS 7949
4
Drag. 31
Severianus ii of Rheinzabern (NOTS vol. 8, 245-248: die 2a)
AD 190-240?

SS64. **SIIVIIR[**
Layer OS 22551
4
Drag. 36R (with graffito G36: PRI on the bottom of the base)
Severianus ii of Rheinzabern (NOTS vol. 8, 245-248: die 3d)
AD 190-240?

SS65.]**ARENTINVSF** abraded
Level OS 7966
4
Dish
?Tarentinus of Rheinzabern (Oswald 1936, 311 (on a Drag. 32 from Cologne: Arentinus; NOTS vol. 9, 9) (Hartley and Dickinson 2012, 9 mention it is possible that an East Gaulish Tarentinus existed (at Trier?) but this is still uncertain)
Late 2nd or 3rd century

SS66. **VE[ ]S-E** with ligature FE
Primary infill of large waste-pit OS 4980
4
Drag. 31R (Lud. SbR)
Verus vi of Rheinzabern (NOTS vol. 9, 213-217: die 3f; Oswald 1936, 332; Ludowici 1912, 4, 64, stamp 8345). A stamped vessel from Verus was found at the Trier Louis-Linz-Strasse potter workshop (Loeschcke 1923) in a find context dated to AD 260-275. The die differs from the Oudenburg die and it is not clear if this potter moved from Rheinzabern to Trier or not (I. Huld-Zetsche, pers. comm.)
AD 210-260/270

SS67. **VII[** ? abraded
Pit OS 70906
3
Dish
No match found
?

SS68. **VI[**
Level OS 2953
4
Dish
Victor v or Victorinus ii of Rheinzabern (NOTS vol. 9, 232-236/237-248)
AD 220-260 / 210-250

SS69. **VIC[ ]RIIIГ** abraded
Secondary infill of well OS 22926
4
Dish
Victorinus ii of Rheinzabern (NOTS vol. 9, 237-248: die 11a)
AD 210-255

SS70. **II/XIIX**
Primary infill of pit OS 4980
4
Lud. Ta/Te
Illiterate stamp[57]
?

SS71. **R**(?)[**V?**]**M**[? abraded
Level OS 70956
3
Drag. 31R
No match found. A possibility is perhaps RVCATANI, found on a Drag. 18/31 in the civil settlement to the west of the fort (Creus 1975, 13-14: Afb. 5: 9), however identified as Ruccatanus, a potter from Trier.
?

SS72.]**VS**[:]**VSA** or]**VSM**
?Construction pit of double well OS 2562
5
Drag. 36
No match found
?

SS73.]**CII or VIC**[retrograde
Construction slot OS 83768
2A
Dish
No match found
?

SS74.]**A**?[ ]**NF** abraded
Level OS 70908
3
Drag. 18/31 or 31
No match found
?

SS75.]**VIIII** or]**XIIII** *ante-cocturam*
Layer OS 1.1 bis (7)
4
Drag. 32 or 36
Illiterate? *ante cocturam* stamp referring to a number. Two potters are known from Rheinzabern using this kind of stamp: Attianus and Belatullus (Schücker *et al.* 2011, 338-348).
?

SS76.]**V**ƨ
Pit OS 7949
4
Dish (fabric burnt, but most likely Rheinzabern)
No match found
?

FABRIC UNDET.

SS77. **BR**[
?Level OS 7935
4+5
Drag. 18/31 (burnt to black)
No match found
?

SS78.]**NEV** retrograde, with ligature EN
Level OS 2986
5
Drag. 32 or 36
No match found
?

SS79.]**VIIVX (?)**
Level OS 7983
4
Dish (burnt)
Illiterate stamp
No match found
?

SS80.]**XA**[or]**VX**[
Level OS 2953
4
Dish
No match found; according to fabric East Gaulish
?

14.2 ROSETTE STAMPS

LEZOUX

SS81. Five-fold rosette
Level rampart I OS 30916
1
Curle 23 (TS-LX4)

SS82. Eight-fold rosette
Level OS 70965
3
Drag. 33 (TS-LX4)

RHEINZABERN

SS83. Four-leaved rosette
Level OS 7935
4+5
Dish

57 **In Vanhoutte *et al.* 2009c wrongly noted as IIXVIIX.**

14.3 STRICH STAMPS

TRIER

SS84. Strich
Primary infill large waste-pit OS 4980
4
Dish

SS85. Strich
Secondary infill of well OS 22926
4
Drag. 36?

SS86. Strich
Level OS 7930
4
Dish

SS87. Strich
Level OS 80917
4
Drag. 31

SS88. Strich
Level OS 7937
4
Dish

SS89. Strich
Layer OS 8748
5
Dish (TRI SA A)

SS90. Strich
Level OS 8930
5
Drag. 36 (TRI SA B)

RHEINZABERN

SS91. Strich
Level OS 70908
3
Dish

SS92. Strich
Level OS 7985
3
Lud. Tg

SS93. Strich
Layer OS 22713
4
Dish

SS94. Strich
Level OS 8934
5
Drag. 18/31

FABRIC UNDET.

SS95. Strich
Pit OS 80925
3
Drag. 18/31 (burnt to black)

SS96. Strich
Pit OS 7999
4
DishR (burnt to black) (with graffito G27: straight line with straight-angled line upon on bottom of base)

SS97. Strich
Level OS 80917
4
Dish (burnt to black)

SS98. Strich
Level OS 8956
4+5
Drag. 18/31 or 31 (burnt to black)

15. Catalogue of the decorated samian of the south-west corner site (Plates XCVII-CII)

For each decoration[58] the following data are listed:
Pottery workshop
Decoration no.
Context in which the fragment was found
(Fort) level to which the find context belongs
Fragment type (CP: complete profile; R: rim; W: wall; B: base)
Description of the decoration
Identified potter/style
Established dating of the potter or style group

LA GRAUFESENQUE

La Graufesenque
DS1.
Large pit OS 44940
4
1 W Drag. 29 or 37 (reworked as counter)
Part of panel freeze with metopes (bordered with beaded rows with small rosettes on the corners) of which one contains arrowheads, above part of undefined figure, to the left back legs of animal to the left. Comparable composition shown by Momo: Mees 1995, Taf. 144: 1.
Momo (**Mommo**) (NOTS, vol. 6, 135-148)
AD 60-85 according to NOTS, vol. 6, 146; AD 70-90 according to Mees 1995, 88

La Graufesenque
DS2.
Mixed level earthen rampart OS 30915
1>4
1 W Drag. 37
Part of freeze with panel decoration with saltire with bud tendrils and torsed endings enclosing triple leaf motif. Combination of motifs shown by M. Crestio (Mees 1995, Taf. 37: 3, Taf. 38: 1), Memor (idem, Taf. 124: 2) and Mercator (Knorr 1919, Taf. 57: A, B, J; Mees 1995, Taf. 129: 1, 2, 3, 7).
M. Crestio, **Memor** or **Mercator**
AD 70-110 (M. Crestio: *c.* AD 80-110 (Mees 1995, 75; NOTS, vol. 3, 174); Memor: AD 75-95 (Mees 1995, 86) / AD 60-90 (NOTS, vol. 6, 78); Mercator: AD 80-90 (Mees 1995, 86) / AD 70-110 (NOTS, vol. 6, 86))

La Graufesenque
DS3.
Level SO 81902
2
1 W Drag. 37
Ovolo Knorr 1919, Taf. 57, 19, delignated by beaded row, with underneath top of the freeze with branches of leafless tree. Ovolo used by several late Flavian potters like Mercator, Germanus, ...: see for example Zwammerdam (Haalebos 1977, Taf. 35: 68, 69, 84, 85).
Mercator, **Germanus** or related potter
Late Flavian (*c.* AD 80-96) or little later (Mercator: AD 80-90 (Mees 1995, 86) / AD 70-110 (NOTS, vol. 6, 86); Germanus: AD 65-90 (NOTS, vol. 4, 196))

La Graufesenque
DS4.
Hearth OS 7927 (level OS 7927.III)
4
1 W Drag. 37
Part of freeze with ovolo with three-pointed dart curving with the egg and placed to the right, and freeze with scrolls with leafs. Ovolo and scroll motif with leafs used by Censor/Censorinus (Mees 1995, Taf. 22: 3), M. Crestio (idem, Taf. 36: 7), Crucuro ii (idem, Taf. 54: 1), Mercator (idem, Taf. 128: 1, 2).
Censor/Censorinus, **M. Crestio**, **Crucuro II** or **Mercator**
AD 70-120 (Censor/Censorinus: *c.* AD 80-100 (Mees 1995, 73-74) = Censor i/Censorinus i: AD 70-90/70-110? (NOTS, vol. 2, 340 and 342), M. Crestio: *c.* AD 80-110 (Mees 1995, 75; NOTS, vol. 3, 174), Crucuro II: AD 90-120 (Mees 1995, 76) = Crucuro i: AD 75-110 (NOTS, vol. 3, 209), Mercator: AD 80-90 (idem, 86) / AD 70-110 (NOTS, vol. 6, 86))

La Graufesenque
DS5.
Cultivated soil pre-dating the fort
Pre-*castellum* / 1
1 W Drag. 37
Part of freeze with gladiator to the right holding bent sword Knorr 1919, Taf. 25: 8 / variant on Oswald (1936) 1016/1018, on top of beaded row which borders the base row of the freeze consisting of flowers. Same composition on three stamped Drag. 37 bowls by L. Cosius, one found at Sète-Barrou (F) (Mees 1995, Taf. 27: 5) and two at La Graufesenque (idem, Taf. 29: 1; Taf. 34: 4).
L. Cosius (Virilis)
AD 100-130 (Mees 1995, 74) / AD 75-110 (NOTS vol. 3, 146)

La Graufesenque (burnt to black)
DS6.
Posthole(?) OS 80369
4
1 W bowl(?)
Part of freeze with moulded decoration showing vegetal motif.
No parallel found
AD 70-120?

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58 **The catalogue of the samian decorations comprises all fragments displaying a 'readable' decoration. The fragments are classified according to fabric/origin and further per style or potter in chronological order, with first the complete profiles, then the rims and bases, consequently the wall fragments displaying an ovolo and finally the remaining freeze fragments.**

LES MARTRES-DE-VEYRE

Les Martres-de-Veyre
DS7.
Construction pit of large water-basin OS 4923
5
1 W Drag. 37
Base of freeze with small, double smooth medallion cutting the baseline and part of leaf motif Ri-Fi P145 turned upside down. Similar compositions in style of Cettus/Satus ('Small S-Potter') (Terrisse 1968, 52-53): see CGP, Pl. 141-143.
Cettus/Satus ('Small S-Potter')
AD 130-160 (NOTS vol. 3, 6)

LEZOUX

Lezoux
DS8.
Double well OS 2562: level OS 2562.2 (infill of inner well)
5
1 W Drag. 37 (with one repair hole) (TS-LX4)
Part of freeze with motif Rogers Q58 'pair of inverted dolphins on top of basket', with above this motif shield, part of sitting Mars Oswald 151, and to the right three smooth lines, probably part of a large scroll (see *e.g.* CGP, Pl. 161, 53 and Pl. 162, 60). Motif Q58 is regularly occurring in the work of Cinnamus II in combination with other motifs. The exact same combination of motifs has been found on a stamped Drag. 37 bowl of Cinnamus ii at York, cf. Dickinson 1997, Fig. 380, no.3458.
Cinnamus II (= Cinnamus ii (NOTS, vol. 3, 22-31)
AD 135-180 (NOTS vol. 3, 30)

Lezoux
DS9.
Posthole OS 11095
2
1 W Drag. 37 (TS-LX4)
Part of freeze with panel decoration divided by beaded rows with standing Apollo Oswald 632 and star-like motif Rogers U44. The combination of motifs probably refers to Cinnamus II.
Cinnamus II
AD 135-180 (NOTS vol. 3, 30)

Lezoux
DS10.
Level OS 4944
5
1 W Drag. 37 (TS-LX4)
Part of ovolo with smooth line underneath, with upper side of freeze with sitting Apollo Oswald 94a. This Apollo figure is used a lot by Iullinus (see *e.g.* CGP Pl. 125: 1 and 3, 126: 17-18), but is also shown by Advocisus, Carantinus, the Paternus group and the Cinnamus group.
Iullinus, **Advocisus**, **Carantinus**, **Paternus** or **Cinnamus**
AD 130-200 (Iullinus: AD 160-200 (NOTS, vol. 4, 366); Advocisus: AD 160-200 (NOTS, vol. 1, 79); Carantinus: AD 150-180 (NOTS, vol. 2, 235); Paternus group: AD 130-185 (NOTS, vol. 7, 53-62); Cinnamus: AD 135-180 (NOTS, vol. 3, 30))

Lezoux
DS11.
Rampart level OS 30907
3
1 R Drag. 37 (rim diam.: 160 mm; EVE: 4) (TS-LX4)
Ovolo Rogers B105 with astragal border Rogers A11 underneath, cf. CGP, Pl. 102, 11-15. This combination is used by Censorinus (II) (CGP, 191: Fig. 29: 2).
Censorinus II/ii (NOTS, vol. 2, 342-344)
c. AD 160-190 (Bird 1986, 152; NOTS, vol. 2, 344)

Lezoux
DS12.
Level OS 10901
2
1 W Drag. 37 (TS-LX4)
Edgy ovolo Rogers B147.
Servus II (Rogers 1974) (= Servus iv (NOTS vol. 8, 239-241))
AD 160-200 (NOTS, vol. 8, 241)

Lezoux
DS13.
Rampart level OS 30916
1
1 W and 1 B Drag. 37 (TS-LX4)
Base of freeze with metopes and panels with zigzag-borders: cushion Rogers C98 underneath branch motif Rogers U281 flanked by two spindles, rosette Rogers C98, various striated spindles and part of a leaf Rogers H137 or H129; a curled line at the base of the panel is probably the stem of the leaf. The composition as a whole refers to Iustus II (see CGP, Pl. 110, 7-8).
Iustus II/ii (NOTS, vol. 4, 389-392)
AD 160-200 (NOTS, vol. 4, 392)

Lezoux (TS-LX4)
DS14.
Level OS 70965
3?
1 W Drag. 37 (TS-LX4)
Remains of badly stamped ovolo, probably Rogers B180, with pearl row underneath, a combination used by Mercator II: cf. Rogers 1974, Pl. 145.
Mercator II (Rogers 1974) (=Mercator iv: NOTS, vol. 6, 89-92)
AD 160-200 (NOTS, vol. 6, 92)

Lezoux
DS15.
Mixed level OS 7900C
1>5
1 W Drag. 37 (TS-LX4)
Part of freeze with double-lined medallion with unidentifiable figure type.
No potter identification possible.
Late Antonine? (*c.* AD 170-193)

Lezoux
DS16.
Level OS 4912
5
1 W Drag. 37 (TS-LX4)
Lower part of freeze with running animals (hunting scene): figures too fragmentary for further identification.
No potter identification possible.
Late Antonine? (*c.* AD 170-193)

Lezoux? (burnt to black)
DS17.
Fire layer OS 7980
4
1 W Drag. 37
Part of (blurred) ovolo, possibly Rogers B248, used by unknown potter.
Unknown potter
?

LA MADELEINE

La Madeleine
DS18.
Level OS 8914
5
1 W Drag. 37
Upper part of freeze consisting of V-shaped leafs (bifols) instead of ovolo: cf. Arentsburg: Holwerda 1923, Pl. XXXVIII: Afb. 72: 12-17; cf. Zwammerdam: Haalebos 1977, Taf. 40, 186; see also Fölzer 1913, Taf. XXIV: 24. This element occurs on pieces attributed by Holwerda to Virtus/Virtuus of La Madeleine (Holwerda 1923, 111-112).
Virtus/Virtuus
AD 120-130? (NOTS, vol. 9, 292)

La Madeleine
DS19.
Pit OS 7949
4
1 W Drag. 37
Ovolo Ricken Taf. 7, C but stamped upside down and part of freeze with Amor walking to the left Ri-Fi M110a in panel marked by double pearl staff, with to the left fragment of saltire or diagonal pearl staff. Same combination of ovolo upside down and pearl staffs at Arentsburg: van Diepen and Niemeijer 2011, 203: Abb. 16, D29.
Ware mit Eierstab C
AD 120-190

La Madeleine
DS20.
Rampart level OS 30916
1
1 W Drag. 37
Base limit of freeze with a border of bifols within two smooth lines and start of double smooth medallion. Border of bifols: cf. Arentsburg: Holwerda 1923, Pl. XL: Afb. 74, 12, 13, 18-20, 23-25; van Diepen and Niemeijer 2011, 204: Abb. 17, D53-D54 (the latter also in combination with medallion, here single); cf. Zwammerdam: Haalebos 1977, Taf. 41, 200; Taf. 43, 231. This element appears to be characteristic for Sacer (C.C. Sacri) of La Madeleine.
Sacer (**C.C. Sacri**)
AD 125-155 (NOTS, vol. 2, 144)

ARGONNE

Argonne
DS21.
Pit OS 23167
3
2 W Drag. 37
Part of freeze with at the left figure with lifted right arm Hofmann 63a / Raepsaet-Charlier and Clausse H8, and at the right smaller figure with lifted right arm Hofmann 36 / Raepsaet-Charlier and Clausse H18; to the left of figure Hofmann 63a part of small unidentified figure type. All these motifs are used by one of the students of Tocca.
Tocca group
AD 130-170 (NOTS, vol. 9, 82)

Argonne
DS22.
Mixed level OS 30915
1>4
1 W Drag. 37
Part of very wide-standing ovolo, probably Chenet and Gaudron (1955) X1 / Raepsaet-Charlier and Clausse O14, and start of freeze with curled leaf Hofmann 345. Location of leaf comparable with composition Chenet and Gaudron 1955, 227: Fig. 62, 9 (Lavoye). Ovolo and leaf used by Tribunus of Lavoye.
Tribunus (ii) of Lavoye
AD 150-200 (NOTS, vol. 9, 100)

Argonne
DS23.
Secondary infill of large waste-pit OS 4980
4/5
1 W Drag. 37
Ovolo Raepsaet-Charlier and Clausse O1/O2 with wavy line below and part of freeze with panel decoration with two festoons Raepsaet-Charlier and Clausse D1; festoon to the right with stylized cup Raepsaet-Charlier and Clausse D42 / Hofmann 525. Similar composition shown by Raepsaet-Charlier and Clausse 1978, Pl. XIX, 101. Cup motif used by Tribunus of Lavoye.
Tribunus (ii) of Lavoye
AD 150-200 (NOTS, vol. 9, 100)

Argonne
DS24.
Transition primary infill of large waste-pit OS 4980 (FL 4) – bottom of construction pit of basin OS 4923 (FL 5) which has cut the waste-pit of fort level 4
4/5
1 W Drag. 37

Ovolo Chenet and Gaudron (1955) X1(?) (with deep pending dart) cut by smooth line underneath and start of freeze with head of running human to the left. Same composition by Tribunus: Chenet and Gaudron 1955, 223: Fig. 60, E.
Tribunus (ii) of Lavoye
AD 150-200 (NOTS, vol. 9, 100)

Argonne
DS25.
Level OS 70909
3
1 W Drag. 37
Part of free-style freeze with spirals Hofmann 503 and grass bunch motif Hofmann 519. Identical decoration on mould from Lavoye: Chenet and Gaudron 1955, 227: Fig. 62, L.
Tribunus (ii) of Lavoye
AD 150-200 (NOTS, vol. 9, 100)

Argonne
DS26.
Stone level OS 7986/7993
3
1 W Drag. 37
Part of ovolo (Chenet and Gaudron (1955) X1?) delignated underneath by smooth line.
?Tribunus (ii) of Lavoye
AD 150-200 (NOTS, vol. 9, 100)

Argonne
DS27.
Mixed level OS 7900C
1>5
Complete base Drag. 37
Bottom part of freeze with panel decoration and rosettes (Raepsaet-Charlier and Clausse rosette D66 / Hofmann 447) probably dividing the panels with wavy lines or beaded rows. Similar decoration cf. Chenet and Gaudron 1955, 217: Fig. 57, B, P respectively attested at La Vaux-Régnier and at Lavoye; cf. also Vieux-Virton: Raepsaet and Clausse 1978, 80: Pl. XIX, 97 and Arentsburg: Holwerda 1923, Pl. XLVIII: Afb. 82, 2; van Diepen and Niemeijer 2011, 206: Abb. 19, D84-D87.
Ware mit Eierstab G / Tribunus?
AD 150-200

Argonne
DS28.
Fill of defence ditche FL 1 or 2
1/2
1 W Drag. 37
Ovolo (broken off) with wavy line underneath and part of abraded freeze with double-lined smooth festoons with at least one enclosing twofold leaf Raepsaet-Charlier and Clausse D 59 / Fölzer 401 / Hofmann 403. Leaf motif used by Gesatus (?) of Lavoye (Hoffman 1968).
Gesatus (=Cesatus ii) **of Lavoye** (NOTS, vol. 3, 3)
AD 150-200 (Hofmann 1968, 275; NOTS, vol. 3, 3)

Argonne
DS29.
Pit OS 11063 (3 W; FL 2) and level OS 1924 (1 W; FL 3)
2
4 W Drag. 37, not fitting
Ovolo delignated by beaded row and top of freeze with vegetal motif, probably Hofmann 381 / Raepsaet and Clausse P3, but dirty mould. Vegetal motif used by Eburus of Lavoye.
Eburus of Lavoye
AD 150-200 (Deschieter *et al.* 2012)

Argonne
DS30.
Double well OS 2562, secondary infill after abandonment inner well
End 5
1 W Drag. 37
Part of freeze with parade of running lions (or dogs?) to the right Hofmann 151. Worn surface. Similar composition shown by Eburus of Lavoye, found on mould: Chenet and Gaudron, 1955, 47: Fig. 19, 13.
Eburus of Lavoye (Atelier du gobeletier de Lavoye)
AD 150-200 (Deschieter *et al.* 2012)

Argonne
DS31.
Pit OS 11063
2
1 W Drag. 37
Blurred ovolo and part of freeze with jumping dog to the left Hofmann 250. Dog used by Africanus and Germanus.
Africanus (=Africanus iii of Lavoye (NOTS, vol. 1, 98) / **Germanus** (=Germanus iii of Lavoye (NOTS, vol. 4, 200)
AD 160-200 (?) (NOTS, vol. 1, 98 – vol. 4, 200)

Argonne
DS32.
level OS 2953 (FL4) – level OS 2996 (FL4) – level OS 7044 F (FL4+5+post) (cross joining sherds; slightly burnt after breakage)
4
3 R, 5 W Drag. 37 (rim diam.: 394 mm; EVE: 31)
Ovolo Ricken C or D, lignated by a beaded border; freeze consisting of panel decoration divided by vegetal column Hofmann 496 with on the top and at the base rosette motif Hofmann 447, and with dispersed small branches (Ricken 1934, Taf. VII, 18 or 19); panel consisting of festoon Raepsaet-Charlier and Clausse D3 and medallion with Andreas cross Hofmann 412 / Raepsaet-Charlier and Clausse D39 and deer to the left Hofmann 209. Similar composition at Arentsburg: Holwerda 1923, Pl. XLVII: Afb. 81, 27, but with different ovolo. Same combination of vegetal column Hofmann 496 with rosettes Hofmann 447, with medallion with Andreas cross Hofmann 412 at Arentsburg: van Diepen and Niemeijer 2011, 206: Abb. 19, D84.
Ware mit Eierstab G (Eburus, Tribunus, Germanus, Africanus, Tocca (Hofmann 1968))
AD 150-220/250?

Argonne
DS33.
Mixed level OS 30915
1>4
1 R Drag. 37 (rim diam.: 230 mm; EVE: 8)
Ovolo Raepsaet-Charlier and Clausse O2, delignated by smooth line, and upper part of leaf motif underneath, likely top of panel division element. Same combination at Arentsburg: van Diepen and Niemeijer 2011, 206: Abb. 19, D89.
Ware mit Eierstab G?
AD 150-220/250?

Argonne
DS34.
Construction pit large water-basin OS 4923
5
1 W Drag. 37
Ovolo Raepsaet-Charlier and Clausse O10 and part of freeze with to the left lion running to the left Raepsaet-Charlier and Clausse A1 / Hofmann 179B and to the right smaller version of the same lion (?). Comparable composition shown by Raepsaet-Charlier and Clausse 1978, 71: Pl. XV, 61.
No potter identification
AD 150-220/250?

Argonne
DS35.
Level OS 2953
4
1 W Drag. 37
Part of ovolo, probably Raepsaet-Charlier and Clausse O10, and part of double smooth medallion (too small to identify more accurate).
No potter identification possible
AD 150-220/250?

Argonne
DS36.
Layer OS 2014
5
1 R Drag. 37 (rim diam.: 188 mm; EVE: 6)
Part of ovolo, probably Raepsaet-Charlier and Clausse O9 or O10.
No potter identification possible
AD 150-220/250?

Argonne
DS37.
Large waste-pit OS 4980
4
1 W Drag. 37
Ovolo, probably Raepsaet-Charlier and Clausse O6? (dirty mould).
No potter identification possible
AD 150-220/250?

Argonne
DS38.
Level OS 70972
2
1 W Drag. 37
Part of freeze with medallion Raepsaet-Charlier and Clausse D14 to the left and festoon Raepsaet-Charlier and Clausse D6 ('triple arcade').
No potter identification possible
AD 150-220/250?

Argonne
DS39.
Double well OS 2562, filling-in between both frameworks, *tpq* (dendro) AD 319-322
5
1 W Drag. 37
Part of freeze with leaf Raepsaet-Charlier and Clausse P11, with on top running lion to the right Raepsaet-Charlier and Clausse A5 and to the left of the leaf probably start of running animal, possibly running deer to the left Raepsaet-Charlier and Clausse A26?
No parallel found
AD 150-220/250?

Argonne
DS40.
Level OS 1924
3
2 W Drag. 37, not joining
Parts of freeze: back part of running animal to the left and unidentified part of human figure
No potter identification possible
AD 150-220/250?

Argonne
DS41.
Pit OS 11063
2
1 W Drag. 37
Part of freeze with running animal to the right (dog or deer?)
No potter identification possible
AD 150-220/250?

BLICKWEILER

Blickweiler (very calcareous fabric)
DS42.
Level OS 80917
4
1 W Drag. 37
Part of lower freeze, decorated with line of rosettes Knorr-Sprater (1927) Taf. 82, 46 (popular motif at Blickweiler) bordered by smooth lines, and with panel decoration with bird to the right and trifold leaf.
No exact parallel found
AD 105-160 (Delage in Brulet *et al.* (réd.) 2010, 173)

TRIER

Trier
DS43.
Level OS 8905A covering Unit V of fort level 4
5 (+4)
1 W Drag. 37 (TRI SA A)
Part of the lower freeze delignated by a compact row of bifold leafs Huld-Zetsche (1972) O47 with smooth line underneath, with stem of vegetal motif (?) starting in this row and above edge of rosette?. Bifold leaf row only delignated underneath: cf. Huld-Zetsche 1972, Taf. 2: A16.
Werkstatt I
c. AD 130-150 (Huld-Zetsche 1972, 78)

Trier
DS44.
Level OS 7934
4
1 W Drag. 37
Ovolo Huld-Zetsche E16 and part of freeze with women's head Huld-Zetsche M 73 / Fölzer 553 in double toothed medallion Huld-Zetsche K 23, boxer to the left Huld-Zetsche M 119 / Fölzer 525, boxer to the right Huld-Zetsche M 120 / Fölzer 524, little tree Huld-Zetsche O 148 / Fölzer 752, and base line consisting of bifold leafs Huld-Zetsche O 124. Identical decoration on pottery fragment 1172 found at Colchester: Bird 1999, 114: Fig. 2.59.
Werkstatt II
AD 145-165 (Huld-Zetsche 1993, 45)

Trier
DS45.
Mixed level OS 7952
4+5
1 W Drag. 37 (burnt to black)
Base of ovolo and part of freeze (burnt to black) with large rosette Huld-Zetsche O 96 / Fölzer 847 and part of head of running animal to the left (running hare? Fölzer 667).
Werkstatt II
AD 145-165 (Huld-Zetsche 1993, 45)

Trier
DS46.
Level OS 80917
4
1 R Drag. 37 (rim diam.: 240; EVE: 10) (TRI SA B)
Ovolo Huld-Zetsche E16 (badly stamped) and fragment of freeze with head of figure, probably boxer to the right Huld-Zetsche M 121 / Fölzer 506. Cf. Huld-Zetsche 1993, Taf. 51: E1; see also Butzbach: Müller 1968, Taf. 40, 1082-1083; Den Haag – Ockenburgh II *vicus*: Waasdorp and van Zoolingen 2015, 151: Afb. 3.9, no. 3560.2; Schillingen: Fölzer 1913, Taf. XXIII: 2.
Werkstatt II 'spätere Ausformung'
AD 170-210 (Huld-Zetsche 1993, 53)

Trier
DS47.
Construction slot OS 83768
2
1 W Drag. 37 (TRI SA B)
Ovolo without staff Huld-Zetsche E 12 (dirty mould) with smooth (?) line underneath and part of erotic scene Huld-Zetsche M 96 / Fölzer 528 (see Fölzer 1913, Taf. XII: 26): cf. Huld-Zetsche 1993, Taf. 22: A 155.
Werkstatt II 'spätere Ausformung'
AD 170-210 (Huld-Zetsche 1993, 53)

Trier
DS48.
Level OS 70909
3
1 W Drag. 37 (TRI SA B)
Ovolo Huld-Zetsche E 14 or E 15 and part of freeze with probably top of antler of deer Huld-Zetsche T 77 (deer running to the left).
Werkstatt II 'spätere Ausformung'
AD 170-210 (Huld-Zetsche 1993, 53)

Trier
DS49.
Level OS 80942
4
1 W Drag. 37 (TRI SA A)
Part of freeze with baseline consisting of bifold leafs to the left Huld-Zetsche O 124 (?), erotic scene Huld-Zetsche M 98 and start of small pearl medallion at the line delignating the ovolo (broken off) underneath. Same composition as Huld-Zetsche 1993, Taf. 84: F179. Identical piece at Kortrijk (B), BST-site, unpublished. Combination of bifold leaf row and erotic scene shown by Fölzer 1913, Taf. XXIII: 22, Taf. XXIV: 4.
Werkstatt II 'spätere Ausformung'
AD 170-210 (Huld-Zetsche 1993, 53)

Trier
DS50.
Level OS 7947
4
1 W Drag. 37 (TRI SA B)
Ovolo without dart Huld-Zetsche E 12.
Werkstatt II 'spätere Ausformung' / Maiiaaus group
AD 170-210 (Huld-Zetsche 1993, 53) / 165/170-190/200 (Huld-Zetsche 1993, 43-45; Brulet *et al.* (réd.) 2010, 195)

Trier
DS51.
Pit OS 7951
4
1 W Drag. 37 (TRI SA B)
Part of freeze (heavily worn) with hunting scene in free-style with running small deer to the right Fölzer 659 with vegetal motif Fölzer 794.
Maiiaaus?, according to E. Ebermann however another late potter of the 3rd century (pers. comm. in 2020 while finalising the manuscript)

AD 165/170-190 (Huld-Zetsche 1993, 43-44) or little later? (Brulet *et al.* (réd.) 2010, 195: AD 160/170-190/200; according to NOTS, vol. 5, 210-211, Maiiaaus is dated AD 170-240)

Trier
DS52.
Road level OS 8937
5
1 W Drag. 37 (TRI SA B)
Ovolo Oelmann (1914) Taf. VIII: 11 and part of freeze with head of panther or lion to the right.
Maiiaaus or **related potter**, according to E. Ebermann possibly Comitialis of Trier (pers. comm. in 2020 while finalising the manuscript)
AD 165/170-190 (Huld-Zetsche 1993, 43-44) or little later? (Brulet *et al.* (réd.) 2010, 195: AD 160/170-190/200; according to NOTS, vol. 5, 210-211, Maiiaaus is dated AD 170-240, which is the same period as Comitialis of Trier)

Trier
DS53.
Level OS 80963
4
1 W Drag. 37 (TRI SA B)
Ovolo with central tongue, two narrow running staffs and bent dart to the right: ovolo Oelmann (1914) Taf. VIII: 10, 13, 14, 15 etc. = ovolo Fölzer 941
Maiiaaus, Comitialis, **Dexter**, **Tordilo**, **Victor**, **Marcellinus** or **Marinus** (pers. comm. E. Ebermann)
AD 170-240

Trier
DS54.
Mixed level OS 70924
3/4
2 W Drag. 37
Broad ovolo Fölzer 954? / Gard R19? and part of freeze with smooth composite double medallions Fölzer 837 and large composite medallion with outer cogged and inner smooth medallion; panel decoration divided by vertical beaded row. Comparable compositions at Niederbieber with Maiiaaus and Afer-group (see Oelmann 1914, Taf. 8, 7-8); combination of Fölzer 837 medallions with large composite medallion (or arcade?) at Butzbach: Müller 1968, Taf. 38: 1011.
Maiiaaus, **Afer** (=Afer iii (NOTS, vol. 1, 95-96: AD 190-240) or **related potter / Art der Ware mit Eierstab Fölzer 944** (according to E. Ebermann identifiable as a product of **Afer** (pers. comm. in 2020 while finalising the manuscript)
AD 165-250 / Afer: AD 190-240 (NOTS, vol. 1, 95-96)

Trier
DS55.
Fire layer OS 70045
4
1 W Drag. 37 (TRI SA C)
Ovolo without staff or tongue Huld-Zetsche E15 or Gard R26-27.
Censor-Dexter
c. AD 160-190 (Bird 1986, 143) / AD 180-240 (according to NOTS, vol. 2, 342: Censor ii: AD 180-220; according to NOTS, vol. 3, 270-272: Dexter ii: AD 190-240)

Trier
DS56.
Pit OS 70977
2
1 W Drag. 37 (heavily burnt after breaking)
Part of freeze with smooth festoons with loose pearls (Fölzer 809) inhabited with chair Fölzer 795 – Gard O43, to the right deer running to the left Fölzer 626. Identical composition at Holzhausen: Pferdehirt 1976, Taf. 5: A131, see also A124 (Censor), A132. Same composition of festoon with chair motif, combined with ovolo Gard R2, at Andernach: Fölzer 1913, Taf. XV, 9 (Dexter).
Censor-Dexter group
?AD 180-240 (*c.* AD 160-190 (Bird 1986, 143) / AD 180-240 (according to NOTS, vol. 2, 342: Censor ii: AD 180-220; according to NOTS, vol. 3, 270-272: Dexter ii: AD 190-240))

Trier
DS57.
Layer OS 80390
4
1 W Drag. 37 (heavily burnt after breaking)
Ovolo Gard R2 / Fölzer 945 with related fine pearl row Gard V66 / and part of freeze with smooth festoons with loose pearls (Fölzer 809) inhabited with mussle Fölzer 706 and (start of) chair Fölzer 795 – Gard O43. Identical composition at Arentsburg: van Diepen and Niemeijer 2011, 211: Abb. 24, D158; also comparable to Fig. 24: D163. Decoration is related to DS52 (but clearly different vessel): identical composition with combination of all elements at Holzhausen: Pferdehirt 1976, Taf. 5: A131, see also A124 (Censor), A132. Comparable composition with same ovolo and festoon but with other motif within festoon at the civil settlement of Oudenburg: Creus 1975, 24: Afb. 10, 86.
Censor-Dexter group
?AD 180-240 (*c.* AD 160-190 (Bird 1986, 143) / AD 180-240 (according to NOTS, vol. 2, 342: Censor ii: AD 180-220; according to NOTS, vol. 3, 270-272: Dexter ii: AD 190-240))

Trier
DS58.
Level, section through different features OS 70975
2
1 W Drag. 37 (TRI SA B)
Part of freeze with alternation of toothed and smooth medallions containing undefined figure types (in the left medallion: undefined animal to the right), with in between running hare Fölzer 659 and vegetal ornament Fölzer 794, flanked by two rosettes Fölzer 851. Combination of medallions with in between vegetal ornament Fölzer 794 at Arentsburg: Holwerda 1923, Pl. L: Afb. 84, 7.
Censor-Dexter group
?AD 180-240 (*c.* AD 160-190 (Bird 1986, 143) / AD 180-240 (according to NOTS, vol. 2, 342: Censor ii: AD 180-220; according to NOTS, vol. 3, 270-272: Dexter ii: AD 190-240))

Trier
DS59.
Fire layer OS 7957/7971
4
1 W Drag. 37 (slightly burnt)
Ovolo Gard R2 and part of freeze (slightly burnt) with broad-beaded arcade.
Censor-Dexter group
?AD 180-240 (*c.* AD 160-190 (Bird 1986, 143) / AD 180-240 (according to NOTS, vol. 2, 342: Censor ii: AD 180-220; according to NOTS, vol. 3, 270-272: Dexter ii: AD 190-240))

Trier
DS60.
Mixed level OS 30915
1>4
1 W Drag. 37
Ovolo Fölzer 945 or 946 and part of vegetal motif (bifid leaf) (burnt to black).
Group of Censor-Dexter
?AD 180-240 (*c.* AD 160-190 (Bird 1986, 143) / AD 180-240 (according to NOTS, vol. 2, 342: Censor ii: AD 180-220; according to NOTS, vol. 3, 270-272: Dexter ii: AD 190-240))

Trier
DS61.
Mixed level OS 7918
4+5
1 W Drag. 37
Part of the lower freeze bordered by a row of astragals Huld-Zetsche lying column O86 and rosette Fölzer 892 / Huld-Zetsche O 99 on top of transition between two astragals. Same combination at Butzbach: Müller 1968, Taf. 49: 1373-1374.
Censor, **Maiiaaus** or **Art der Ware mit Eierstab Fölzer 941**, according to E. Ebermann definitely Maiiaaus (pers. comm. in 2020 while finalising the manuscript)
AD 165-240 / for Maiiaaus: AD 170-240 (NOTS, vol. 5, 210-211)

Trier
DS62.
Construction slot OS 11267
1
1 W Drag. 37
Ovolo Fölzer Taf. 10, 59 / Oelmann (1914) Taf. VIII, 11 and part of free-style freeze with ribbed, pointed leaf Fölzer 762, lion to the left Fölzer 585, bear to the left Oelmann (1914) Taf. VIII, 12. This combination of lion and leaf appears also at Arentsburg (Holwerda 1923, Pl. L, 25; van Diepen and Niemeijer 2011, Abb. 22, D139), at Zwammerdam (Haalebos 1977, Taf. 49, 345; Taf. 50, 360), at Nijmegen (Kalee 1973, Abb. 9, 37) and at Aardenburg (de Visser 2001: foto 84-85). Together with identical ovolo: at Niederbieber (Oelmann 1914, Taf.VIII: 11) and at Holzhausen (Pferdehirt 1971, Taf. 6: A144). The same ovolo appears together with identical leaf at Nijmegen (Kalee 1973, Abb. 8, 31).
Comitialis of Trier
AD 170-240 (Kortüm and Mees 1998, 162; NOTS, vol. 3, 101)

Trier
DS63.
Drainage gully OS 70920
2
1 W Drag. 37
Ovolo Fölzer Taf. 10, 59 / Oelmann (1914) Taf. VIII, 11 and part of free-style freeze with dolphin to the left Fölzer 692. Cf. DS63. At Kortrijk a wall sherd shows the composition of identical ovolo, dolphin and lion (cf. DS62) (Deschieter, unpublished material). The rib and groove delignating the top of the freeze and the thickness of the wall show that this body fragment represents another individual than DS62. However, it is possibly that they were made from the same or a very similar mould.
Comitialis of Trier
AD 170-240 (Kortüm and Mees 1998, 162; NOTS, vol. 3, 101)

Trier
DS64.
Construction pit of large water-basin OS 4923
5
1 W Drag. 37 (TRI SA A)
Lower part of freeze with jumping panther to the left Fölzer 594, a leaf Fölzer 776 and an incomplete intradecorative stamp (SS16).
Comitialis of Trier
AD 170-240 (Kortüm and Mees 1998, 162; NOTS, vol. 3, 101)

Trier
DS65.
Hearth OS 7915 (level II)
4
1 R and 2 W Drag. 37 (rim diam.: 288; EVE: 12)
Ovolo Fölzer 941 underneath broad strip.
?Comitialis of Trier
AD 170-240 (Kortüm and Mees 1998, 162; NOTS, vol. 3, 101)

Trier
DS66.
Earthen rampart mixed level OS 30915
1>4
1 W Drag. 37
Ovolo Fölzer 941 (because of the overlapping ovolos the torsed staff is disappearing) and upper part of freeze with deer running to the left Fölzer 636 and discoid motif (medallion Fölzer 557?). Similar decoration on an unpublished bowl from Hochscheid, in the Rheinisches Landesmuseum Trier (inv. no. 62.36); identical decoration on a fragment from Arentsburg (Holwerda 1923, no. 2555) (pers. comm. E. Ebermann)
Maiiaaus, **Comitialis** or related potter?; according to E. Ebermann **Afer-Marinus** group (pers. comm. in 2020 while finalising the manuscript)
AD 165-240 / Afer-Marinus: AD 190-240

Trier
DS67.
Fire layer 7957/7971
4
1 R Drag. 37 (rim diam.: not definable; EVE: 2)

Ovolo Fölzer 941 / Gard R20 and part of freeze with toothed (empty) medallion Gard K 27, cf. Huld-Zetsche K 20b. Same combination of motifs at Zwammerdam (Haalebos 1977, Taf. 55, 428; Taf. 74, 693) and London (Bird 1986, 160: 2.74).
Afer (=Afer iii (NOTS, vol. 1, 95-96))
AD 190-240 (NOTS, vol. 1, 96)

Trier
DS68.
Construction pit large water-basin OS 4923
5
1 R Drag. 37 (rim diameter: 168; EVE: 6) (TRI SA A)
Large ovolo Gard R20.
Afer (=Afer iii (NOTS, vol. 1, 95-96))
AD 190-240 (NOTS, vol. 1, 96)

Trier
DS69.
Pit OS 1919 (FL4) – level OS 8936 (FL5) – mixed level OS 8907 (FL5+post)
4
9 W Drag. 37
Ovolo Fölzer 953 and part of freeze (burnt to black) with crossing toothed medallions Fölzer 825 above row of shells (shell motif Fölzer 707). Comparable composition with beaded arcades and shell motif found in London (Bird 1986, 160: 2.78); similar arrangements shown by Gard 1937, Taf. 14: 9, 14.
Afer (=Afer iii (NOTS, vol. 1, 95-96))
AD 190-240 (NOTS, vol. 1, 96)

Trier
DS70.
Construction pit of double well OS 2562
5
1 W Drag. 37
Part of freeze intersected by columns (Fölzer 875? (blurred)) with probably arcades, with in between Diana with dog to the right Oswald 105 / Fölzer 478. This decoration has also been found at the Oudenburg civil settlement (Creus 1975, 22-23: Afb. 9, 65) and at Brugge (Thoen 1978, 158: Fig. 53, 2). Same composition at Zwammerdam: Haalebos 1977, Taf. 74, 688. Same combination of Diana with columns shown by Fölzer 1913, Taf. XVIII, 6.
Afer-Marinus group
AD 190-240

Trier
DS71.
Secondary infill of inner well of double structure OS 2562 after abandonment.
End 5
1 W Drag. 37
Square ovolo Gard R14. This ovolo was used by Atillus-Pussosus and Amator and by other potters of probable 3rd century date (Dickinson *et al.* 2014, 273: 101).
Atillus-Pussosus, **Amator** or related potter
AD 200-260

Trier
DS72.
Level OS 80991
3
1 W Drag. 37
Fragment of freeze just underneath ovolo. Ovolo delignated by smooth line with part of circular motif or ring which connected row of beads intersecting a panel decoration, cf. Butzbach: Müller 1968, Taf. 45, 1282 and 1286; Taf. 46, 1287.
Atillus-Pussossus
AD 220-260? (NOTS, vol. 7, 289)

Trier
DS73.
Pit OS 80925
3
1 W Drag. 37
Ovolo with small impression on the tongue Fölzer 953 / Gard R18 (found on a mould) and part of freeze with running hind to the right Fölzer 663 / Gard T75, within a toothed medallion Fölzer 825. Similar composition found in the Oudenburg *vicus*: Creus 1975, 24: Afb. 10, 79.
Dubitatus-Dubitus (=Dubitatus ii (NOTS, vol. 3, 336-339))
AD 200-260 (NOTS, vol. 3, 339)

Trier
DS74.
Level OS 8981
3+4
1 W Drag. 37
Part of freeze with back legs of running animal to the left within toothed medallion. Similar decorations were used among the Trier late Antonine potters like Dubitatus-Dubitus and the Afer-Marinus group.
Afer-Marinus, **Dubitatus-Dubitus** or related potter
AD 190-260

Trier
DS75.
Level OS 8914
5
1 W Drag. 37 (TRI SA B)
Ovolo without staff Fölzer 953/954 with underneath wavy line, slightly burnt.
Afer, Dubitatus-Dubitus or **Paternianus**
AD 190-260

Trier
DS76.
Level OS 4907
5
1 W Drag. 37 (TRI SA B)
Part of freeze with large rosette Fölzer 845 / Gard V91 with vegetal motifs around?: cf. Zwammerdam: Haalebos 1977, Taf. 75, 714-715; Arentsburg: van Diepen and Niemeijer 2011, 214: Abb. 27, D202.
Primanus (=Primanus v (NOTS, vol. 7, 201))
AD 230-275? (NOTS, vol. 7, 201)

Trier
DS77.
Construction pit of large water-basin OS 4923
5
1 W Drag. 37
Part of free-style freeze with rosette (no exact identification found), back legs of animal (?) to the left and back leg of gladiator with whip Oswald (1936) 1121 (?) but slightly larger (see Fölzer 491); part of the base line of the freeze is still visible.
No parallel found
? AD 200-270

Trier
DS78.
Level OS 7947
4
1 W Drag. 37
Part of freeze (burnt) with male figure Fölzer 560 and jumping hare.
Too small for potter identification
? AD 200-270

Trier
DS79.
Level OS 1924
3
1 W Drag. 37
Part of freeze divided by small column (?) and to the right back part of undefined motif.
Too small for potter identification
? AD 200-270

Trier
DS80.
Large waste-pit OS 4980
4
1 W Drag. 37
Small part of freeze with ovolo with staff to the left and large triangular leaf Fölzer 776?
Too small for potter identification
? AD 200-270

Trier
DS81.
Large waste-pit OS 4980
4
Part of freeze with column and with double-leaf Fölzer 907.
Too small for potter identification
? AD 200-270

Trier
DS82.
Large waste-pit OS 4980
4
Part of freeze with bush? motif (abraded) and start of two other elements.
Too small for potter identification
? AD 200-270

Trier
DS83.
Large waste-pit OS 4980
4
Part of freeze with remains of ovolo with staff and blocked pearls.
Too abraded for identification.
? AD 200-270

Trier
DS84.
Large waste-pit OS 4980
4
Lower part of freeze with panther Fölzer 594 and bird Fölzer 684.
Too small for potter identification
? AD 200-270

Trier
DS85.
Pit OS 7965
4
1 W Drag. 37
Part of freeze (secondary burnt) with blurred motifs, possible standard to the right, but too small to identify.
Too small for potter identification
? AD 200-270

Trier
DS86.
Pit OS 8975/80913
4
1 W Drag. 37 (TRI SA B)
Heavily abraded freeze (slightly burnt) with beaded festoon (see Butzbach: Müller 1968, Taf. 33, 892-893) and unclear vertical linear motif.
Too abraded to specify
? AD 200-270

Trier
DS87.
Level OS 7987
4
1 W Drag. 37
Part of freeze with fragment of double-lined medallion with animal to the right; too little to identify.
No potter identification possible
? AD 200-270

RHEINZABERN

Rheinzabern
DS88.
Earthen rampart, mixed level OS 30915
1>4
1 W Drag. 37
Lower part of freeze delignated by double line and part of toothed medallion.

Reginus I (=Reginus vi of Rheinzabern (NOTS, vol. 7, 349-359)), **Cobnertus** (=Cobnertus iv of Rheinzabern (NOTS, vol. 3, 66-68)) or **Ianu(s) I?** (=Ianus ii/Ianuarius (NOTS, vol. 4, 248-251))
AD 150/160-190/200 (Kortüm and Mees 1998, 162) / 155-180 (Mees 2002, 324, 325, 328; Reginus I, NOTS, vol. 7, 357: AD 155-180; Cobnertus, NOTS, vol. 3, 68: AD 155-180; Ianu I, NOTS, vol. 4, 250: AD 155-180)

Rheinzabern
DS89.
Level OS 70908 (FL3) – level OS 70909 (FL3) – pit OS 7044.IV (FL4) (cross joining sherds)
3
Drag. 37: 4 W and 1 B fitting, 1 W not fitting
Ovolo Ri-Fi E1 and freeze with panel decoration in which the panels are divided by tripods (Ri-Fi O11), crownd by a bird (Ri-Fi T258) (cf. Ricken-Thomas, Taf. 72: 1), with bifold leaf freeze Ri-Fi R33 on the base line; unclear motifs (masks?) within toothed medallions Ri-Fi K35 and panther to the right Ri-Fi T46. Same style of composition as Ricken-Thomas, Taf. 72, 1.
Arvernicus-Lutaevus (=Arvernicus iii/Lutaeus of Rheinzabern (NOTS, vol. 1, 269; vol. 5, 146-148))
AD 160-185/190 (NOTS, vol. 1, 269; vol. 5, 146-148)

Rheinzabern
DS90.
Secondary infill of well OS 22926
4
1 W Drag. 37
Base fragment of freeze with tripod Ri-Fi O11 as panel intersection, tail of panther to the right Ri-Fi T46 and small fragment of toothed medallion; base line consisting of bifid leafs Ri-Fi R33.
Arvernicus-Lutaevus (=Arvernicus iii/Lutaeus of Rheinzabern (NOTS, vol. 1, 269; vol. 5, 146-148))
AD 160-185/190 (NOTS, vol. 1, 269; vol. 5, 146-148)

Rheinzabern
DS91.
Pit OS 1900
3
4 W Drag. 37, fitting
Large ovolo Ri-Fi E8 and part of free-style freeze with running dog to the left Ri-Fi T133, followed by figure with coat or cape, running man to the left Ri-Fi M171, followed by adorant (*Schutzflehender*) Ri-Fi M213. Comparable composition: Ricken-Thomas, Taf. 164, 13 and Taf. 165, 3.
Lucanus II (Ware mit Eierstab E8) (=Lucanus vi of Rheinzabern (NOTS, vol. 5, 110-111))
AD 160-200? (NOTS, vol. 5, 111)

Rheinzabern
DS92.
Secondary infill of double well OS 2562
5
1 W Drag. 37
Free-style freeze with to the left female figure carrying basket Ri-Fi M56 and to the right faun Ri-Fi M94a: cf. Ricken-Thomas Taf. 56, 11, but here female figure to the right and male figure to the left.
Cerialis III (= Style III of group Cerialis v of Rheinzabern (NOTS, vol. 2, 353-357))
AD 160/170-220/230 (Kortüm and Mees 1998, 162) / 160-180/200 (NOTS, vol. 2, 356; Mees 2002, 332)

Rheinzabern
DS93.
Primary infill large water-basin OS 4923
5
1 W Drag. 37
Unidentifiable ovolo with base line and part of freeze with astragal Ri-Fi O196 on top of converting lines: cf. Ricken-Thomas, Taf. 50, 10-11 (Cerialis i); Ricken-Thomas, Taf. 64, 20 (Cerialis v).
Cerialis I or **Cerialis V** (= Style I or V of group Cerialis v of Rheinzabern (NOTS, vol. 2, 353-357))
AD 160/170-220/230 (Kortüm and Mees 1998, 162) / 160-180/200 (NOTS, vol. 2, 356; Mees 2002, 332)

Rheinzabern
DS94.
Layer OS 71899
4
1 W (chip) Drag. 37
Square ovolo with a row of square beads underneath, with part of a festoon and an animal or vase to the right of the festoon.
Style of **Cerialis group** (= group Cerialis v of Rheinzabern (NOTS, vol. 2, 353-357))
AD 160/170-220/230 (Kortüm and Mees 1998, 162) / 160-180/200 (NOTS, vol. 2, 356; Mees 2002, 332)

Rheinzabern
DS95.
Level OS 22935
2/3
1 W Drag. 37
Part of freeze with metopes with beaded arcade Ri-Fi KB95 enclosing undefined figure (broken off) and flanked by beaded row: cf. Ricken-Thomas, Taf. 173, 7.
Verecundus II (=Verecundus vi of Rheinzabern (NOTS, vol. 9, 198-202))
AD 160-220? (Mees 2002, 346; NOTS, vol. 9, 201)

Rheinzabern
DS96.
Level OS 8950
4
1 W Drag. 37
Part of freeze with decorative motif Ri-Fi O214a and rosette with six petals Ri-Fi O34, trophy Ri-Fi O214 and two unidentifiable motifs (secondary burnt): cf. style of Atto (see Ricken-Thomas, Taf. 134, 1) or style of Reginus II (see Ricken-Thomas, Taf. 136, 5)
Atto (=Atto i of Rheinzabern (NOTS, vol. 1, 322-324)) or **Reginus II** (=Reginus xi of Rheinzabern (NOTS, vol. 7, 361-364))
AD 160-235 (Atto: AD 160-200 (NOTS, vol. 1, 324); Reginus II: AD 180-235 (NOTS, vol. 7, 364))

Rheinzabern
DS97.
Debris layer/shallow gully(?) OS 8943
4
2 W Drag. 37, not fitting
Probably ovolo Ri-Fi E1 and fragment of freeze with pointed leaf Ri-Fi P47a.
Cerialis I, IV, V, Comitialis I or **Arvernicus-Lutaevus**.
AD 160-240 (group Cerialis v of Rheinzabern: AD 160-180/200 (NOTS, vol. 2, 356; Mees 2002, 332); Comitialis of Rheinzabern: AD 170-240 (Kortüm and Kees 1998, 162; NOTS, vol. 3, 101); Arvernicus-Lutaevus (=Arvernicus iii/Lutaeus of Rheinzabern: AD 160-185/190 (NOTS, vol. 1, 269; vol. 5, 146-148))

Rheinzabern
DS98.
Pit OS 7965
4
1 W Drag. 37
Ovolo Ri-Fi E1 and fragment of freeze with tree Ri-Fi P3 and toothed vertical line.
Combination of motifs used by Cerialis I, IV, V, Comitialis I or Arvernicus-Lutaevus.
Cerialis I, IV, V, Comitialis I or **Arvernicus-Lutaevus**.
AD 160-240

Rheinzabern
DS99.
Earthen rampart, mixed level OS 30915
1>4
1 W Drag. 37
Part of ovolo, too small to identify, and part of freeze with fragment of human figure (?), probably cf. Ricken-Thomas, Taf. 27, 4, within a double smooth medallion.
Firmus II (=Firmus iv of Rheinzabern, NOTS, vol. 4, 59-64)
AD 165-220? (NOTS, vol. 4, 63)

Rheinzabern
DS100.
Secondary infill of double well OS 2562
5
1 W Drag. 37
Ovolo Ri-Fi E23 and part of freeze with leaf Ri-Fi P61 and fragment of beaded scroll decoration using a large beaded wavy line Ri-Fi KB95: cf. Ricken-Thomas, Taf. 36, 2-4, 9-11.
B.F. Attoni (=B.F. Attonus of Rheinzabern (NOTS, vol. 2, 1-2))
AD 170-220 (Mees 2002, 330; NOTS, vol. 2, 2)

Rheinzabern
DS101.
Level OS 70956
3
2 W Drag. 37, fitting
Part of freeze with playing Putto Ri-Fi M140 within double smooth medallion Ri-Fi K20 underneath bottom edge of ovolo. Same composition: see Ricken-Thomas, Taf. 92: 2.
Comitialis IV (Comitialis of Rheinzabern (NOTS, vol. 3, 95-102))
AD 170-240 (Mees 2002, 336; NOTS, vol. 3, 101)

Rheinzabern
DS102.
Pit OS 10908/8924A
5
1 W Drag. 37
Lower part of freeze with double smooth medallion Ri-Fi K19 with archer to the right Ri-Fi M174 and probably candelabra to the right: cf. Ricken-Thomas, Taf. 98, 1 and 3; Taf. 89, 14.
Comitialis V (Comitialis of Rheinzabern; NOTS, vol. 3, 95-102)
AD 170-240 (Mees 2002, 336; NOTS, vol. 3, 101)

Rheinzabern
DS103.
Level OS 8955
4
Drag. 37: 3 R, 4 W, 1 B, all fitting (rim diam.: 174; EVE: 16)
Ovolo Ri-Fi E17 and part of freeze with decoration in so-called 'medallion style': smooth double medallion Ri-Fi K19 or 19a, large lioness to the left Ri-Fi T29, smaller lion to the left Ri-Fi T54, lying panther to the right Ri-Fi T35 and intradecorative stamp (SS36) COMITI[retrograde : Comitialis of Rheinzabern (NOTS vol. 3, 95: die 8a); cf. Ricken-Thomas, Taf. 97, 8-9.
Comitialis V (Comitialis of Rheinzabern; NOTS, vol. 3, 95-102)
AD 170-240 (Mees 2002, 336; NOTS, vol. 3, 101)

Rheinzabern
DS104.
Construction pit large water-basin OS 4923
5
1 W Drag. 37
Part of freeze with panel decoration with five-pointed leaf with curved stem Ri-Fi P96a and part of a festoon: cf. Ricken-Thomas, Taf. 99, 6, 14-15.
Comitialis V (Comitialis of Rheinzabern; NOTS, vol. 3, 95-102)
AD 170-240 (Mees 2002, 336; NOTS, vol. 3, 101)

Rheinzabern
DS105.
Pit OS 1900
3
2 R Drag. 37, fitting (rim diam.: 180 mm; EVE: 44)
Ovolo Ri-Fi E17 and running animals in free-style freeze: lion Ri-Fi T29 with to the left start of probably smooth medallion and to the right part of small bear Ri-Fi T54 (Comitialis V) or mask Ri-Fi M2 (Perpetuus), with underneath start of unidentifiable motif or figure. Composition comparable to Ricken-Thomas, Taf. 97: 6F, 7-10. The diagonal position of the animals is common for Comitialis V.
Comitialis V (Comitialis of Rheinzabern; NOTS, vol. 3, 95-102)
AD 170-240 (Mees 2002, 336; NOTS, vol. 3, 101)

Rheinzabern
DS106.
Pit OS 71442
3
2 W Drag. 37, fitting
Ovolo Ri-Fi E17 with part of freeze with pointed leaf Ri-Fi P96 and smooth festoon Ri-Fi KB76 with astragalus Ri-Fi O196. Same combination at Ricken-Thomas, Taf. 99: 6. Comparable

composition at the civil settlement of Oudenburg: Creus 1975, 27: Afb. 11, 100.
Comitialis V (Comitialis of Rheinzabern; NOTS, vol. 3, 95-102)
AD 170-240 (Mees 2002, 336; NOTS, vol. 3, 101)

Rheinzabern
DS107.
Level OS 4912
5
Drag. 37: 1 R and 1 W fitting (rim diam.: 164; EVE: 15)
Probably ovolo Ri-Fi E23 with part of freeze with blurred animal (running hare or dog to the left?) within smooth festoon. Typical decoration for a potter like Comitialis V: see *e.g.* Ricken-Thomas, Taf. 101, 2-6.
?Comitialis V
AD 170-240 (Mees 2002, 336; NOTS, vol. 3, 101)

Rheinzabern
DS108.
Oven OS 7955
4
1 W Drag. 37
Part of freeze with lioness to the right Ri-Fi T35a within double smooth medallion Ri-Fi K19. Combination of motifs frequently used by Comitialis IV (see Ricken-Thomas Taf. 90, 6, Taf. 91, 7) and Comitialis V (see Ricken-Thomas Taf. 100, 10).
Comitialis IV or V
AD 170-240 (Mees 2002, 336; NOTS, vol. 3, 101)

Rheinzabern
DS109.
Level OS 7918
4+5
1 W Drag. 37
Ovolo Ri-Fi E25 and free-style freeze with tree Ri-Fi P3; fragment heavily burnt. Comparable compositions shown by Comitialis IV (see Ricken-Thomas Taf. 95, 9 and 11) and Comitialis VI (see Ricken-Thomas, Taf. 106, 7-9: in this case the circle is Ri-Fi O142).
Comitialis IV or **Comitialis VI**
AD 170-240 (Mees 2002, 336; NOTS, vol. 3, 101)

Rheinzabern
DS110.
Level OS 70907
4
1 W Drag. 37
Probably ovolo Ri-Fi E25 and part of freeze with running deer to the left Ri-Fi T94 in smooth festoon.
Style of **Comitialis IV** or related potters
AD 170-240 (Mees 2002, 336; NOTS, vol. 3, 101)

Rheinzabern
DS111.
Earthen rampart, mixed level OS 30915
1>4
1 W Drag. 37
Part of freeze with small tree Ri-Fi P3 or variant (cf. Ricken-Thomas, Taf. 95: Comitialis IV). Motif used by several potters, like *e.g.* Comitialis IV
Comitialis IV or related potters
AD 170-240 (Mees 2002, 336; NOTS, vol. 3, 101)

Rheinzabern
DS112.
Level OS 8956
4+5
1 W Drag. 37
Part of elegant ovolo Ri-Fi E17 with narrow staff to the left and part of double smooth medallion Ri-Fi K19: cf. Ricken-Thomas, Taf. 100, 1, 10, 19, Taf. 101, 1-2. Style of Comitialis V or related potter.
Comitialis V or related potters
AD 170-240 (Mees 2002, 336; NOTS, vol. 3, 101)

Rheinzabern
DS113.
Road level OS 8937
5
1 W Drag. 37
Panel decoration with leaf motif Ri-Fi P145 at the end of a thin vertical beaded row in between two double smooth medallions. Comparable composition shown by Belsus ii (see Ricken-Thomas, Taf. 110, 14 and 20), Ware mit Eierstab E25/E26 (see Ricken-Thomas, Taf. 115, 9) and Attilus (see Ricken-Thomas, Taf. 180, 16F).
Belsus II, **Attilus** or **Ware mit Eierstab E25/E26**
AD 170-250 (Mees 2002, 337, 338, 348) (Belsus II (=Belsus of Rheinzabern (NOTS, vol. 2, 55-57)): AD 170-220; Attilus (=Attilus vi of Rheinzabern (NOTS, vol. 1, 314-315)): AD 180-250)

Rheinzabern
DS114.
Level OS 80942
4
1 W Drag. 37
Ovolo Ri-Fi E7 and part of medallion-style freeze with alternation of rosettes: double smooth medallion Ri-Fi K19a and flower with six petals Ri-Fi O34(b): cf. see Ricken-Thomas, Taf. 174, 1, 2, 6.
Style of **Helenius** (=Helenius ii of Rheinzabern (NOTS, vol. 4, 230-231)
AD 180-200 (Mees 2002, 346; NOTS, vol. 4, 231)

Rheinzabern
DS115.
Level OS 7947
4
1 W Drag. 37
Probably ovolo Ri-Fi E40 and fragment of freeze with part of discoid motif Ri-Fi O74; burnt to black.
Probably **Attilus** (=Attilus vi of Rheinzabern (NOTS, vol. 1, 314-315)
AD 180-250 (NOTS, vol. 1, 315)

Rheinzabern
DS116.
Level OS 7900C
1>5
1 W Drag. 37
Ovolo Ri-Fi E17 and part of freeze with smooth medallion, probably with small cross Ri-Fi K11, and decorative motif Ri-Fi O210: see Ricken-Thomas, Taf. 204, 13-28. Combination of ovolo and decorative motif used by Victorinus II: cf. Ricken-Thomas, Taf. 219, 9.
Victorinus II (=Victorinus ii of Rheinzabern (NOTS, vol. 9, 237-248))
AD 210-250 (Bird 1986, 144; Mees 2002, 354; NOTS, vol. 9, 246)

Rheinzabern
DS117.
Level OS 7966
4
1 W Drag. 37
Part of freeze with striding Amor to the left Ri-Fi M110, within double medallion Ri-Fi K20: part of panel decoration divided by vertical beaded row Ri-Fi O261 with end motif Ri-Fi O11: Ricken-Thomas, Taf. 152, 9F.
Iulius I (=Iulius viii of Rheinzabern) (NOTS, vol. 4, 335-339))
AD 220-255 (NOTS, vol. 4, 339) / AD 190/200 – 250/260 (Kortüm and Mees 1998, 162)

Rheinzabern
DS118.
Pit OS 82765 – pit OS 82763 – level OS 81902 (cross joining sherds)
2
Drag. 37: 4 R, 3 W and 1 B, all fitting (rim diam.: 165; EVE: 60)
Ovolo Ri-Fi E4 and part of freeze with running deer to the left Ri-Fi T106b, ornament Ri-Fi O169 and running dog to the left Ri-Fi T130b. Intradecorative stamp (SS50)]VLIVS retrograde: Iulius viii of Rheinzabern. The combination of motifs confirms the style of Iulius II-Iulianus I: cf. Ricken-Thomas, Taf. 214: 12F and 14F.
Iulius II-Iulianus I (=Iulius viii-Iulianus iii of Rheinzabern (NOTS, vol. 4, 322-326, 335-339))
AD 220-255 (NOTS vol. 4, 325, 339)

Rheinzabern
DS119.
Pit OS 7951
4
1 R Drag. 37 (rim diam.: not definable; EVE: 1)
Partially blurred ovolo E23 and part of freeze with fragment of a small four-armed cross, probably Ri-Fi O53 and a double smooth medallion or arcade. Combination of this ovolo and these motifs is regularly seen in the work of Iulius II-Iulianus I: see *e.g.* Ricken-Thomas, Taf. 207, 7, 8, 10, 11.
Iulius II-Iulianus I (=Iulius viii-Iulianus iii of Rheinzabern (NOTS, vol. 4, 322-326, 335-339))
AD 220-255 (NOTS vol. 4, 325, 339)

Rheinzabern
DS120.
Doubled construction slot OS 82843-82845
2
1 W Drag. 37
Blurred ovolo Ri-Fi E17 with part of free-style freeze with Hercules Oswald (1936) 758 / Ri-Fi M87 and remains of intradecorative stamp (SS48), letters abraded. Same combination of Hercules motif, identical ovolo and vertical stamp: see Ricken-Thomas, Taf. 215, 12.
Iulius II-Iulianus I (=Iulius viii-Iulianus iii of Rheinzabern (NOTS, vol. 4, 322-326, 335-339))
AD 220-255 (NOTS vol. 4, 325, 339)

Rheinzabern
DS121.
Pit OS 80979
3
1 W Drag. 37
Ovolo Ri-Fi E17 and part of freeze with intradecorative stamp (SS49), letters abraded, vertically positioned in between two smooth medallions. Arrangement of vertical stamp in between two medallions: see Ricken-Thomas, Taf. 204: 6F, 27.
Iulius II-Iulianus I (=Iulius viii-Iulianus iii of Rheinzabern (NOTS, vol. 4, 322-326, 335-339))
AD 220-255 (NOTS vol. 4, 325, 339)

Rheinzabern
DS122.
Level OS 70924
3+4
1 W Drag. 37
Ovolo Ri-Fi E17 and part of freeze with vertical beaded row, comparable with Ricken-Thomas Taf. 212, 15F (with intradecorative stamp of Iulius II-Iulianus I).
Iulius II-Iulianus I (=Iulius viii-Iulianus iii of Rheinzabern (NOTS, vol. 4, 322-326, 335-339))
AD 220-255 (NOTS vol. 4, 325, 339)

Rheinzabern
DS123.
Large waste-pit OS 4980
4
2 W Drag. 37, fitting
Blurred ovolo Ri-Fi E17 and part of freeze with free-style decoration with gladiator scene. The gladiator fighting to the left (type Ri-Fi M216a) (and repeated at the right of the fragment) and his opponent to the right (type Ri-Fi M227a) are well-known in the decorative repertoire used by the late Rheinzabern group of potters, including the Iulius II-Iulianus I group; here probably Iulius II-Iulianus I: see Ricken-Thomas; Taf. 215, 11 and 15.
Iulius II-Iulianus I (=Iulius viii-Iulianus iii of Rheinzabern (NOTS, vol. 4, 322-326, 335-339))
AD 220-255 (NOTS vol. 4, 325, 339)

Rheinzabern
DS124.
Primary infill well OS 22926
4
1 W Drag. 37
Ovolo Ri-Fi E23 and upper part of freeze with leaf chalice or cup Ri-Fi P111 in between double smooth arcade. Same combination of leaf motif and arcade decoration: see Ricken-Thomas, Taf. 205: 10-11, Taf. 207: 20-21.
Iulius II-Iulianus I (=Iulius viii-Iulianus iii of Rheinzabern (NOTS, vol. 4, 322-326, 335-339))
AD 220-255 (NOTS vol. 4, 325, 339)

Rheinzabern
DS125.
Fire layer OS 7957/7971
4
1 W Drag. 37
Ovolo Ri-Fi E17 with part of freeze with bird to the right Ri-Fi T230 underneath beaded arcade Ri-Fi KB100 with ornament figure type Ri-Fi O210 and with above cross-motif Ri-Fi O53: see Ricken-Thomas Taf. 209, 14F.
Iulius II-Iulianus I (=Iulius viii-Iulianus iii of Rheinzabern (NOTS, vol. 4, 322-326, 335-339))
AD 220-255 (NOTS vol. 4, 325/339)

Rheinzabern
DS126.
Secondary infill of well OS 22926
4
1 W Drag. 37
Bottom part of ovolo and part of freeze with pillar ornament Ri-Fi O161 (*Stütze*) underneath double smooth arcade with same pillar motif at the base: typical arcade decoration. Similar composition in the work of Iulius II-Iulianus I: see Ricken-Thomas Taf. 209, 10.
Iulius II-Iulianus I (=Iulius viii-Iulianus iii of Rheinzabern (NOTS, vol. 4, 322-326, 335-339))
AD 220-255 (NOTS vol. 4, 325, 339)

Rheinzabern
DS127.
Level OS 7947
4
1 W Drag. 37
Part of freeze, burnt to black, with vertical beaded rows Ri-Fi O256. Motif commonly used by Iulius II-Iulianus I (see Ricken-Thomas, Taf. 212, 13-15-16-19; Bird 1986, 168-169: 2.116 and 2.117; Pferdehirt 1976, Taf. 3: A 43), Respectinus I and Victorinus II; cf. also Arentsburg: Holwerda 1923, Pl. LII: Afb. 86, 10.
Iulius II-Iulianus I, **Respectinus I** or **Victorinus II**
AD 210-260

Rheinzabern
DS128.
Level OS 70956
3
1 W Drag. 37
Small fragment of lower freeze with tree Ri-Fi P2a situated on top of smooth base line of freeze. Motif used by several potters but this particular position was applied by Iulius II-Iulianus I (see Ricken-Thomas, Taf. 217: 19) and Respectinus I (Ricken-Thomas, Taf. 222: 5F).
Iulius II-Iulianus I or **Respectinus I** (=Respectinus of Rheinzabern (NOTS, vol. 7, 380-382))
AD 220-260 (Bird 1986, 144; Mees 2002, 352, 355; NOTS vol. 4, 355-359; vol. 7, 380-383)

Rheinzabern
DS129.
Level OS 70919
3+4
1 W Drag. 37
Part of freeze with arcade Ri-Fi KB139, with running dog to the left Ri-Fi T141b, with underneath probably start of cross-motif O53; to the left, end of intradecorative stamp (SS61)]NVS retrograde (Respectinus).
Respectinus (II)
AD 220-260? (NOTS vol. 7, 380-383; see also Mees 2002, 356)

Rheinzabern
DS130.
Level OS 80918
4+5
1 W Drag. 37
Ovolo Ri-Fi E40 and part of freeze with pointed leaf Ri-Fi P30(b?) and double beaded medallion Ri-Fi K54 or arcade Ri-Fi KB135.
Primitivus I or **III** (=Primitius i of Rheinzabern (NOTS, vol. 7, 203-210))
AD 220-260? (Mees 2002, 350; NOTS, vol. 7, 209) / AD 190/200 – 250/260 (Kortüm and Mees 1998, 162)

Rheinzabern
DS131.
Large waste-pit OS 4980
4
Drag. 37: 1 R and 1 W fitting (burnt to black after breaking) (rim diam.: 192 mm; EVE: 13)
Ovolo Ri-Fi E41 underneath broad strip.
Primitivus IV (=Primitius i of Rheinzabern (NOTS, vol. 7, 203-210))
AD 220-260? (Mees 2002, 350; NOTS, vol. 7, 209) / AD 190/200 – 250/260 (Kortüm and Mees 1998, 162)

Rheinzabern
DS132.
Pit OS 7934
4
1 W Drag. 37
Lower part of freeze with love couple Ri-Fi M69a and rosette Ri-Fi O34a: cf. Ricken-Thomas, Taf. 233, 4, Taf. 234, 4.
Style of **Victor II – Ianuco**
AD 220-260/270? (Victor II (=Victor v of Rheinzabern (NOTS, vol. 9, 232-236)): AD 220-260?/270 (Kortüm and Mees 1998, 162); Ianuco (NOTS, vol. 4, 248): AD 240-260?))

Rheinzabern
DS133.
Hearth OS 7927
4
1 W Drag. 37
Part of ovolo, probably Ri-Fi E22, used by Statutus II.
Statutus (II)
AD 230-260? (NOTS, vol. 8, 355)

Rheinzabern
DS134.
Pit OS 7949
4
1 B Drag. 37
Bottom of freeze with oblique pearl row Ri-Fi O261 ending on base line of freeze, and small leaf motif Ri-Fi P144a: cf. Ricken-Thomas Taf. 236, 6.
Perpetuus (=Perpetus ii of Rheinzabern (NOTS, vol. 7, 133-136))
AD 230-275? (NOTS, vol. 7, 136)

Rheinzabern
DS135.
Construction slot OS 23600 (OS 72410) (FL3) – clay layer OS 1925 (FL3) (cross joining sherds)
3
Drag. 37: 1 R + 1 W, not fitting (rim diam.: 228 mm; EVE: 8)
Ovolo Ri-Fi E40 and part of freeze with two-fold leaf motif Ri-Fi P145.
Cerialis VI, Primitivus I or **Primitivus III**.
AD 160-260

Rheinzabern
DS136.
Level OS 22955
3+4
1 W Drag. 37
Part of freeze with columnlike figure type Ri-Fi O124 with start of double smooth medallion. Motifs used by Atto (Ricken-Thomas, Taf. 134, 6), Marcellus II (Taf. 184, 4F and 7), Primitivus I (Taf. 188: 3F and 4), Primitivus IV (Taf. 199: 3 and 7; Taf. 200: 1) and Ware mit Zierglied O382, 383 (Taf. 227, 16 and 17).
Atto, **Marcellus II** (=Marcellus vi of Rheinzabern (NOTS, vol. 5, 273-274)), **Primitivus I**, **Primitivus IV** or **Ware mit Zierglied O382/383**
AD 160-260

Rheinzabern
DS137.
Level OS 7920
5
1 W Drag. 37
Ovolo Ri-Fi E17; used by several potters, like *e.g.* Comitialis V (see *e.g.* Ricken-Thomas, Taf. 101, 16), Iulius II-Iulianus I.
Comitialis V, Iulius II-Iulianus I or **related potter**
AD 170-255

Rheinzabern
DS138.
Construction pit large water-basin OS 4923
5
1 W Drag. 37
Ovolo Ri-Fi E17; used by several potters, like *e.g.* Comitialis V (see *e.g.* Ricken-Thomas, Taf. 101, 16), Iulius II-Iulianus I.
Comitialis V, Iulius II-Iulianus I or **related potter**
AD 170-260

Rheinzabern
DS139.
Fire layer OS 7957/7971
4
1 W Drag. 37
Part of free-style freeze with kantharos Ri-Fi O24 and fragments of two unidentified motifs: cf. *e.g.* Ricken-Thomas, Taf. 220, 19.
Comitialis I, Iulius II-Iulianus I, Ware anschliessend an Iulius II- Iulianus I or **Victorinus II**.
AD 170-260

Rheinzabern
DS140.
Layer OS 71838
4
1 W Drag. 37
Ovolo Ri-Fi E17 and small part of freeze but no further identification possible; secondary burnt. Ovolo used by several potters, like Comitialis V, Julius II-Julianus I.
Comitialis V, **Iulius II-Iulianus I** or related potter
AD 170-260

Rheinzabern
DS141.
Pit OS 8980
4
1 W Drag. 37
Probably ovolo Ri-Fi E42; fragment secondary burnt partially.
Iulius I (Iulius viii), **Lupus** (Lupus iv) or **Perpetuus** (Perpetus ii)
AD 190-275 (Lupus iv: AD 190-225 (NOTS ,vol. 5, 144-145); Iulius viii: AD 220-255 (NOTS, vol. 4, 335-339); Perpetus ii: AD 230-275? (NOTS, vol. 7, 133-136))

Rheinzabern
DS142.
Pit OS 7949
4
1 W Drag. 37
Ovolo Ri-Fi E44 and part of the freeze with double smooth inhabited medallion Ri-Fi K20 with Amor to the left Ri-Fi M111: cf. Ricken-Thomas, Taf. 228, 2, Taf. 229, 11F.
?Ware B mit Zierglied O382/O383
3rd century (Mees 2002, 356)

Rheinzabern
DS143.
Construction pit large water-basin OS 4923
5
1 W Drag. 37
Probably ovolo Ri-Fi E23, used by several potters.
AD 170-260

Rheinzabern
DS144.
Secondary infill of well OS 22926
4
1 W Drag. 37
Probably ovolo Ri-Fi E23 and fragment of freeze with part of leaf motif. Ovolo used by several potters.
AD 170-260

Rheinzabern
DS145.
Level OS 1904
3+4
1 R Drag. 37 (rim diam.: 220; EVE: 6)
Probably ovolo E25, used by several potters.
AD 170-260

Rheinzabern
DS146.
Level OS 23963
2/3
1 W Drag. 37
Ovolo Ri-Fi E26 and part of beaded arcade with running animal to the right. Ovolo used by several potters.
AD 170-260

Rheinzabern
DS147.
Large waste-pit OS 4980
4
1 W Drag. 37
Not well-stamped, blurred ovolo with staff to the left and fragment of freeze with start of smooth medallion and to the right fragment of unidentified motif, too small to identify further.
?

Rheinzabern
DS148.
Pit OS 7949
4
Drag. 37: 1 R and 1 W fitting (rim diam.: 190; EVE: 7)
Fragment of ovolo, not accurately identifiable; secondary burnt.
?

Rheinzabern
DS149.
Construction pit well OS 22926
4
1 W Drag. 37
Base of freeze with kneeling man to the left Ri-Fi M263 above base line with bifold leafs Ri-Fi R34?
Too small to identify further
?

Rheinzabern
DS150.
Level OS 4912
5
1 W Drag. 37
Lower part of freeze with standing rabbit or hare, probably panel decoration with beaded lines, on the left part of unidentified motif.
Too small to identify further
?

Rheinzabern
DS151.
Pit OS 1900
3
1 W Drag. 37
Small fragment of freeze with back half of running animal to the right.
Too small to identify further
?

Rheinzabern
DS152.
Pit OS 1376
4
1 W Drag. 37
Small part of lower freeze delignated by smooth line and with animal leg (back leg of animal to the left?), too small to identify.
No potter identification possible
?

FABRIC UNDET.

Fabric undet. (burnt to black)
DS153.
Level OS 2951
5
1 W Drag. 30
Base of freeze with two-folded leaf with vertical beaded line departing from it on top; too little to identify.
No potter identification possible
?

2. Colour-coated and black-slipped wares

Robin P. Symonds and Sofie Vanhoutte

1. Introduction to the colour-coated and black-slipped assemblage

The fine wares found at Oudenburg constitute one of the most interesting assemblages of such pottery in northern Europe. It is an assemblage that tells the story of the site's evolving connections both to the Rhineland and to Britain, as well as illustrating quite clearly the changing roles of each of the major production centres that provided Oudenburg's supply of fine wares. It should be noted that among the major advantages offered by the material at Oudenburg are not simply the clear stratigraphic structure of the site, but also the fact that no significant fine ware pottery production centres were established nearby.

With 1177 sherds or 296 MNI[59], the colour-coated and black-slipped wares stand for 0.94% of the total sherd count of the site, or 1.71% of the total MNI.

2. Quantification methodology and possibilities for quantitative comparison

The fine wares have been quantified by four methods: sherd count, MNI (minimum number of individuals), EVEs (estimated vessel equivalents) and weight in grammes. The catalogue of the representative and illustrated fragments can be found under Section 6. The fine ware assemblage consists of 1177 sherds, 296 MNI, 19.015 EVEs and 12,998 g. The relative merits and flaws of each of the quantification methods have been presented by Symonds and Haynes (2007). Here, it has proved very useful to compare the different percentages furnished by each method. For example, while MNI is the now universally accepted method used in France, and EVEs are generally considered in Britain to be the most statistically valid method, Tables 1.34, 1.35 and 1.36 show that both of these methods have a tendency to ignore small quantities of pottery. These two methods alone would not have recorded the presence of the following fabrics: Colchester colour-coated ware, Hadham black ware, Oxfordshire colour-coated ware, Argonne colour-coated ware, Central Gaulish black metallic ware, La Madeleine black-slipped ware; a further five fabrics are present as MNI but not as EVEs. For the most part these fabrics occur in anecdotal numbers, but their presence attests to the wide range of contact enjoyed by this apparently remote outpost on the North Sea continental coast.

Comparing assemblages in late Roman sites is an inherently difficult task, and this chapter will not do more than indicate how that might be done. The principal inconvenience is that virtually all late Roman contexts are contaminated by residual elements that were initially deposited much earlier, and this phenomenon is unlikely to have occurred in a systematic, quantifiable manner. Similarly, with the exception of cemetery sites and some types of military occupation, it is often difficult to know the specific activities that resulted in a given deposit, and whether or not these were the same at different sites. Oudenburg is exceptional in offering relatively uncontaminated late Roman military deposits, but these conditions are generally not matched at the sites where we would most like to be able to make comparisons. There is an interesting comparative study to be made using the data available from the Saxon Shore forts of Brancaster (Andrews 1985) and Caister-on-Sea (Darling and Gurney 1993), from London (Symonds and Tomber 1994), and from the Butt Road cemetery site at Colchester (Symonds and Wade 1999), but the current study is not the place for such work. At all of these British sites one can observe a geographical bias that needs to be well understood before one can compare their assemblages with Oudenburg. The fine wares at Brancaster, for example, are heavily dominated by Nene Valley products (83%: see Andrews 1985, 85 and Fig. 50), which is not surprising, given the locations of the fort and the production centre. At London, the late fine wares are also dominated by Nene Valley wares (45% by EVEs and weight), but there is more Hadham red ware (about 20%) than there is Oxfordshire ware (about 15%), again probably because Hadham is the closest of the three centres to London (figures derived from data prepared for Symonds and Tomber 1994).

Oudenburg thus provides an interesting window on the long-distance distribution of Romano-British fine wares, but we should not lose sight of the fact that it remains a continental site where the majority of the fine wares arrived not from Britain but from the Rhineland, mainly from Cologne and Trier.

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59 **Compared with Volume I Chapter V.2.3 Table 8 the sherd and MNI counts for level 1 and fort level 3 differ due to attributions based on further type/fabric study of the sherds from mixed levels.**

Table 1.34. Quantification of represented fine wares according to production regions and fabric, based on sherd count, MNI, EVE and weight.

origin	*description*	date AD	code	sherds	% sherds	MNI	% MNI	EVEs	% EVEs	g	% g
African	African red slipped ware	360-450	**AFR RS**	2	0.2%	1	0.3%	0.04	0.2%	52	0.4%
British	Colchester colour-coated ware (1)	100-250	**COL CC I**	1	0.1%		0.0%		0.0%	2	0.0%
	Colchester colour-coated ware (2)	120-300	**COL CC II**	10	0.8%	4	1.4%	0.3	1.6%	100	0.8%
	Colchester fabric MR	250-400	**COL MR**	7	0.6%	2	0.7%		0.0%	79	0.6%
	Hadham black ware	250-400	**HAD BW**	3	0.3%		0.0%		0.0%	12	0.1%
	Hadham red ware	250-400	**HAD RS**	29	2.5%	11	3.7%	0.69	3.6%	406	3.1%
	Lower Nene Valley ware	150-400	**LNV CC**	98	8.3%	27	9.1%	1.19	6.3%	1221	9.4%
	New Forest colour-coated ware	250-400	**NFO CC**	37	3.1%	8	2.7%	1.28	6.7%	281	2.2%
	Oxfordshire black-slipped ware	240-400	**OXF BS**	7	0.6%	4	1.4%	0.13	0.7%	202	1.6%
	Oxfordshire colour-coated ware	240-400	**OXF CC**	1	0.1%		0.0%		0.0%	6	0.0%
	Oxfordshire red/brown colour-coated ware	240-400	**OXF RS**	99	8.4%	53	17.9%	2.51	13.2%	2607	20.1%
	Oxfordshire white-slipped ware	240-400	**OXF WS**	1	0.1%	1	0.3%		0.0%	82	0.6%
	Oxfordshire parchment ware	240-400	**OXPA**	1	0.1%	1	0.3%		0.0%	15	0.1%
	Pevensey red-slipped ware	300-400	**PEV RS**	1	0.1%	1	0.3%		0.0%	68	0.5%
Gaulish	Argonne colour-coated ware	120-250	**ARG**	15	1.3%		0.0%		0.0%	170	1.3%
	Argonne black-slipped ware	180-300	**ARG BS**	58	4.9%	10	3.4%	1.03	5.4%	282	2.2%
	Argonne red-slipped ware	180-300	**ARG RS**	5	0.4%	2	0.7%		0.0%	46	0.4%
	Central Gaulish black metallic ware	120-250	**CGBL**	1	0.1%		0.0%		0.0%	6	0.0%
	La Madeleine black-slipped ware	200-300	**LM BS**	2	0.2%		0.0%		0.0%	6	0.0%
German	Cologne colour-coated ware	100-250	**KOL CC**	280	23.8%	77	26.0%	4.22	22.2%	3760	28.9%
	Moselkeramik	180-400	**MOS BS**	300	25.5%	60	20.3%	5.98	31.4%	1486	11.4%
	late Trier black-coated ware	300-400	**late Trier**	186	15.8%	26	8.8%	1.39	7.3%	1831	14.1%
unattributed	unattributed black-slipped ware		**BS**	3	0.3%		0.0%		0.0%	11	0.1%
	unattributed glazed ware		**GLAZ**	1	0.1%		0.0%		0.0%	3	0.0%
	unattributed red-slipped ware		**RS**	4	0.3%		0.0%		0.0%	21	0.2%
	unattributed white colour-coated ware		**WCC**	1	0.1%		0.0%		0.0%	4	0.0%
	unattributed colour-coated ware		**CC**	24	2.0%	8	2.7%	0.255	1.3%	239	1.8%
TOTAL				**1177**	**100.0%**	**296**	**100.0%**	**19015**	**100.0%**	**12998**	**100.0%**

3. Distribution and chronology in relation to the stratified evidence

3.1 The fine wares at level 1
(49 sherds, 12 MNI, 1.63 EVEs, 435 g; Plate CXXX: 1-6)

The earliest fort level contains just 49 sherds, mostly Cologne colour-coated ware (31 sherds), but with some *Moselkeramik*, and one sherd of a probable beaker in La Madeleine black-slipped ware. Apart from the aforementioned sherd probably from La Madeleine, the level contains no Romano-British or Gaulish fine wares, and all of the fine wares present could have passed on river transport via the Rhine to Oudenburg. The confluence of Cologne ware and *Moselkeramik* suggests, despite the small quantities involved, a date after *c*. 180 AD.

For many years there has been a general assumption that the widely-exported Cologne colour-coated wares with white fabric are essentially a production of the 2nd century (cf. Vilvorder 2010a, 335), whose role was largely overtaken by fine ware beakers from Trier in the 3rd century (cf. Symonds 1992, 47; Desbat and Vilvorder 2000, 178)[60]. The assemblages at Oudenburg confirm this general chronology, while adding some refinement to it. The assemblages at Oudenburg seem to confirm that *Moselkeramik*, at least the plain vessels, began to be widely distributed as early as the late 2rd century. Cologne ware was clearly still very much in circulation, and the two types would continue to circulate towards the same destinations until well into the 3rd century.

60 Probably the best summary of the general dating of Cologne ware is given in Vilvorder 2010a, 335: *"[...] production at Cologne workshops does not seem to have begun before about 80 AD. [...] The whole of the ceramic industry seems to have stopped around the beginning of the 3rd century, before beginning again a century later"* (translation RPS). It should be noted that there is no evidence that the later wares made in the 4th century were distributed outside of the Rhineland. Trier Moselkeramik seems to have been widely exported from as early as the late 2nd century (cf. Tyers 1996b, 138 with references), most likely from *c*. AD 180 onwards (cf. Künzl 1997, 118-22). Vilvorder (2010b, 355; see also Desbat and Vilvorder 2000, 179) summarizes the general chronology by saying that there are few good assemblages for the end of the 2nd and the first half of the 3rd century, but suggests white barbotine decoration may have begun at Trier around 255, and continued until *c*. AD 275, after which there was a marked decline in quality represented by late Trier ware.

Table 1.35. Quantification of the represented CC&BS wares at the south-west corner site, according to form and type, based on sherd count, MNI, EVE and weight.

form	*type*	code	date	sherds	% sherds	MNI	% MNI	EVEs	% EVEs	g	% g
flagons	miscellaneous or otherwise unidentifiable flagon	1	50-400	13	1.1%	5	1.7%		0.0%	299	2.3%
	flagon Young C8	1C8	240-400	4	0.3%	2	0.7%	0.12	0.6%	63	0.5%
flagons/beakers	flagon/beaker	42795	50-400	15	1.3%	2	0.7%		0.0%	188	1.4%
jars	otherwise undistinguishable necked jar	2T	50-400	1	0.1%	1	0.3%	0.04	0.2%	15	0.1%
jars/beakers	jar or beaker; enclosed vessel	42796	50-400	2	0.2%		0.0%		0.0%	10	0.1%
	jar or bowl	42827	50-400	2	0.2%	2	0.7%		0.0%	24	0.2%
beakers	miscellaneous or otherwise unidentifiable beaker	3	50-400	682	57.9%	119	40.2%	4815	25.3%	5534	42.6%
	beaker with short everted rim	3E	70-160	22	1.9%	14	4.7%	1.73	9.1%	537	4.1%
	tulip-shaped beaker	3J	100-200	62	5.3%	26	8.8%	2.55	13.4%	856	6.6%
	tulip-shaped beaker with pedestal base *	3JP	150-250	2	0.2%	2	0.7%		0.0%	19	0.1%
	necked globular beaker	3K	180-400	187	15.9%	43	14.5%	5.48	28.8%	1331	10.2%
	pentice beaker	3L	180-400	16	1.4%	6	2.0%	0.52	2.7%	127	1.0%
bowls	miscellaneous or otherwise unidentifiable bowl	4	40-400	15	1.3%	9	3.0%	0.23	1.2%	296	2.3%
	hemispherical bowl with bead rim, Young C55	4C55	240-400	2	0.2%	1	0.3%		0.0%	201	1.5%
	bead-rimmed bowl, Young C69	4C69	325-400	2	0.2%	2	0.7%	0.05	0.3%	97	0.7%
	double-bead-rimmed bowl, Young C73	4C73	270-400	1	0.1%	1	0.3%	0.07	0.4%	16	0.1%
	necked bowl with out-turned rim, Young C75	4C75	325-400	1	0.1%		0.0%		0.0%	10	0.1%
	wall-sided, bead-rimmed carinated bowl, Young C81	4C81	300-400	1	0.1%	1	0.3%	0.14	0.7%	78	0.6%
	bowl 4C81 with impressed decoration, Young C83	4C83	300-400	1	0.1%		0.0%		0.0%	28	0.2%
	bowl 4C81 with cordon, Young C84	4C84	350-400	1	0.1%	1	0.3%	0.09	0.5%	24	0.2%
	Dragendorff 38 bowl	4Dr38	150-400	1	0.1%	1	0.3%		0.0%	44	0.3%
	Black-Burnished-type flanged bowl	4M	250-400	29	2.5%	20	6.8%	1.04	5.5%	1131	8.7%
bowls/dishes	bowl/dish	42859	50-400	16	1.4%	5	1.7%		0.0%	369	2.8%
dishes	miscellaneous or otherwise unidentifiable dish or plate	5	50-400	4	0.3%	1	0.3%	0.04	0.2%	109	0.8%
	Dragendorff 31 dish, slightly hooked rim, Young C44	5C44	270-350	1	0.1%	1	0.3%	0.04	0.2%	20	0.2%
	shallow bowl with out-turned rim, Young C49	5C49	240-400	1	0.1%	1	0.3%	0.08	0.4%	22	0.2%
	5C49 with white-painted decoration, Young C50	5C50	325-400	2	0.2%	2	0.7%	0.2	1.1%	80	0.6%
	dish with simple rim	5J	50-400	41	3.5%	11	3.7%	0.94	4.9%	814	6.3%
cups	miscellaneous or otherwise unidentifiable cup	6	50-400	2	0.2%	1	0.3%	0.08	0.4%	8	0.1%
mortaria	miscellaneous or otherwise unidentifiable mortarium	7	50-400	9	0.8%	7	2.4%	0.25	1.3%	196	1.5%
	Dragendorff 45 mortarium, Young C97	7C97	240-400	4	0.3%	2	0.7%	0.13	0.7%	46	0.4%
	Dragendorff 45 mortarium, painted decoration, Young C97	7C98	350-400	3	0.3%	1	0.3%	0.06	0.3%	43	0.3%
	mortarium with upright rim & angular flange, Young C100	7C100	300-400	6	0.5%	4	1.4%	0.3	1.6%	153	1.2%
	Dragendorff 45 mortarium	7Dr45	150-300	1	0.1%	1	0.3%	0.02	0.1%	8	0.1%
lids	lid (usually post-70)	9A	50-400	1	0.1%	1	0.3%		0.0%	28	0.2%
closed vessels	otherwise undistinguishable closed vessel	clv	40-400	17	1.4%		0.0%		0.0%	135	1.0%
unidentified	unidentified form	10	40-400	7	0.6%		0.0%		0.0%	39	0.3%
TOTAL				**1177**	**100.0%**	**296**	**100.0%**	**19015**	**100.0%**	**12998**	**100.0%**

Table 1.36 (opposite page). Quantification of represented fine wares according to production regions and fabric, and per level, based on sherd count / sherd count % and MNI / MNI %.

origin	description	code	L1	FL2	FL3	FL4	FL5	5+P +POST	TOTAL sherds	L1	FL2	FL3	FL4	FL5	5+P +POST	TOTAL MNI
African	African red slipped	**AFR RS**						2	2						1	1
British	Colchester cc (1)	**COL CC I**						1	1							
	Colchester cc (2)	**COL CC II**			2	4		4	10				2		2	4
	Colchester fabric MR	**COL MR**					2	5	7					1	1	2
	Hadham black	**HAD BW**					2	1	3							
	Hadham red	**HAD RS**		1	1	5	8	14	29		1		2	2	6	11
	Lower Nene Valley	**LNV CC**		1		20	22	55	98				3	6	18	27
	New Forest colour-coated	**NFO CC**			1	3	17	16	37			1		4	3	8
	Oxfordshire black-slipped	**OXF BS**			1		1	5	7					1	3	4
	Oxfordshire cc	**OXF CC**						1	1							
	Oxfordshire red/brown cc	**OXF RS**		1		2	22	74	99				2	11	40	53
	Oxfordshire white-slipped	**OXF WS**						1	1						1	1
	Oxfordshire parchment	**OXPA**						1	1						1	1
	Pevensey red-slipped	**PEV RS**					1		1					1		1
Gaulish	Argonne colour-coated	**ARG**				1		14	15							
	Argonne black-slipped	**ARG BS**		1		9	20	28	58					4	6	10
	Argonne red-slipped	**ARG RS**					5		5					2		2
	Central Gaulish black metallic	**CGBL**						1	1							
	La Madeleine black-slipped	**LM BS**	1	1					2							
German	Cologne colour-coated	**KOL CC**	31	55	47	46	32	69	280	10	14	14	13	8	18	77
	Moselkeramik	**MOS BS**	17	13	36	94	83	57	300	2		10	20	14	14	60
	late Trier black-coated	**late Trier**		1	3	25	27	130	186			1	3	2	20	26
Other	unattributed black-slipped	**BS**				2		1	3							0
	unattributed glazed	**GLAZ**						1	1							0
	unattributed red-slipped	**RS**		1			1	2	4							0
	unattributed white cc	**WCC**						1	1							0
	unattributed cc	**misc. CC**		1	2	5	5	11	24				1	1	6	8
	TOTAL		**49**	**76**	**93**	**216**	**248**	**495**	**1177**	**12**	**15**	**26**	**46**	**57**	**140**	**296**

origin	description	code	L1	FL2	FL3	FL4	FL5	5+P +POST	TOTAL sherds	L1	FL2	FL3	FL4	FL5	5+P +POST	TOTAL MNI
African	African red slipped	**AFR RS**						0.4%	0.2%						0.7%	0.3%
British	Colchester cc (1)	**COL CC I**		0.0%				0.2%	0.1%							0.0%
	Colchester cc (2)	**COL CC II**			2.2%	1.9%		0.8%	0.8%				4.3%		1.4%	1.4%
	Colchester fabric MR	**COL MR**					0.8%	1.0%	0.6%					1.8%	0.7%	0.7%
	Hadham black	**HAD BW**					0.8%	0.2%	0.3%							0.0%
	Hadham red	**HAD RS**		1.3%	1.1%	2.3%	3.2%	2.8%	2.5%		6.7%		4.3%	3.5%	4.3%	3.7%
	Lower Nene Valley	**LNV CC**		1.3%		9.3%	8.9%	11.1%	8.3%				6.5%	10.5%	12.9%	9.1%
	New Forest colour-coated	**NFO CC**			1.1%	1.4%	6.9%	3.2%	3.1%			3.8%	0.0%	7.0%	2.1%	2.7%
	Oxfordshire black-slipped	**OXF BS**			1.1%		0.4%	1.0%	0.6%					1.8%	2.1%	1.4%
	Oxfordshire cc	**OXF CC**						0.2%	0.1%							0.0%
	Oxfordshire red/brown cc	**OXF RS**		1.3%		0.9%	8.9%	14.9%	8.4%				4.3%	19.3%	28.6%	17.9%
	Oxfordshire white-slipped	**OXF WS**						0.2%	0.1%						0.7%	0.3%
	Oxfordshire parchment	**OXPA**						0.2%	0.1%						0.7%	0.3%
	Pevensey red-slipped	**PEV RS**					0.4%		0.1%					1.8%	0.0%	0.3%
Gaulish	Argonne colour-coated	**ARG**				0.5%	0.0%	2.8%	1.3%							0.0%
	Argonne black-slipped	**ARG BS**		1.3%		4.2%	8.1%	5.7%	4.9%					7.0%	4.3%	3.4%
	Argonne red-slipped	**ARG RS**					2.0%	0.0%	0.4%					3.5%		0.7%
	Central Gaulish black metallic	**CGBL**						0.2%	0.1%							0.0%
	La Madeleine black-slipped	**LM BS**	2.0%	1.3%					0.2%							0.0%
German	Cologne colour-coated	**KOL CC**	63.3%	72.4%	50.5%	21.3%	12.9%	13.9%	23.8%	83.3%	93.3%	53.8%	28.3%	14.0%	12.9%	26.0%
	Moselkeramik	**MOS BS**	34.7%	17.1%	38.7%	43.5%	33.5%	11.5%	25.5%	16.7%		38.5%	43.5%	24.6%	10.0%	20.3%
	late Trier black-coated	**late Trier**		1.3%	3.2%	11.6%	10.9%	26.3%	15.8%			3.8%	6.5%	3.5%	14.3%	8.8%
	unattributed black-slipped	**BS**				0.9%	0.0%	0.2%	0.3%							0.0%
Other	unattributed glazed	**GLAZ**						0.2%	0.1%							0.0%
	unattributed red-slipped	**RS**		1.3%			0.4%	0.4%	0.3%							0.0%
	unattributed white cc	**WCC**						0.2%	0.1%							0.0%
	unattributed cc	**misc. CC**			2.2%	2.3%	2.0%	2.2%	2.0%				2.2%	1.8%	4.3%	2.7%
	TOTAL		**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

The absence of Central Gaulish fine wares at Oudenburg is interesting, since although the fine wares from Lezoux and other Gaulish sources were generally less systematically exported than Cologne ware or *Moselkeramik*, or than samian ware from Central Gaul, they do nevertheless appear in Britain, for example at Colchester (Symonds and Wade 1999, Fig. 5.37, nos 1-12) and, much more abundantly, at London (Richardson 1986, 115-118, nos 1.97-1.114). But their absence at Oudenburg could in fact confirm Richardson's first proposal that the deposit of Central Gaulish wares at St. Magnus House could belong to the period *c*. AD 170-180, rather than the later proposed date range of 'until *c*. AD 220' (Richardson 1986, 115). Alternatively, since there are no Romano-British fine wares at Oudenburg before fort level 2, this may instead be an indication that Oudenburg's supply of fine wares simply came exclusively from the Rhineland until the early 3rd century, or until after fine wares from Central Gaul had ceased to be widely circulated. It should also be noted, in passing, that at Oudenburg Central Gaulish samian is overall the third most common identifiable mid-Roman type of samian present, and the predominant type seen in level 1, although it represents just nine out of a total of twenty-one individuals. There is, however, no concrete evidence that Central Gaulish samian and fine wares were distributed together: they may have arrived at the quays at St. Magnus House in crates in the same ships, but they were packed in separate crates, and thereafter (the vessels that survived unloading) may also have travelled separately.

The Cologne wares in level 1 are all tulip-shaped beakers (form 3J, Hees 3, probably all with plain rims as Plate CXXX: 3-4), with the exception of the base of a flat dish (Hees 17a / NB 40 / Höpken E1/E2, not illustrated). The beakers are plain, or with multiple bands of rouletting (or knife-trimming), and one small sherd (2g, not illustrated) has barbotine decoration; this may be an intrusive find, though. Lastly, it is worth noting that the *Moselkeramik* found in level 1 at Oudenburg includes only plain beakers with rouletted bands, typified by Plate CXXX: 5, a globular vessel with relatively short neck.

3.2 The fine wares at fort level 2
(76 sherds, 15 MNI, 1.05 EVEs, 1244 g; Plate CXXX: 7-16)

In fort level 2, dated by the samian after AD 220, the Cologne colour-coated ware reaches its highest percentages, as much as 100% by EVEs, although only 72.4% by sherd-count (more than 90% by MNI and weight). These high percentages, coupled with the appearance of at least three Romano-British sherds, suggest that even if production at Cologne effectively stopped sometime during this period, it was apparently still engaged in mass production and distribution, almost until the end of its production. The Cologne vessels present in this level include plain-rimmed tulip-shaped beakers (3J, Hees 3: nos 11-13), but also short-necked beakers with short everted rims (3E, NB 32b/c: nos 8 and 10). These are accompanied by flat dishes (5J, Hees 17a/NB 40/Höpken E1/E2: nos 14 and 15) that can look very much like Cologne versions of Pompeian-red ware dishes.

Although it remains the second most common fabric associated with fort level 2, there are fewer sherds of *Moselkeramik* in level 2 than in level 1 (just thirteen, down from seventeen). One sherd is illustrated (no. 16), the wall of a beaker which probably represents the earliest white barbotine decoration at the site.

The three British sherds are, respectively, from the Nene Valley, Hadham and Oxfordshire, all of which are thought of as generally later production centres, not generally achieving wide distribution before *c*. AD 250. Also in fort level 2 is a single sherd identified as late Trier ware, generally not thought to have been produced before *c*. 300. All of these sherds are very small (except for the Hadham bowl base of 27 g, none weighs more than 8 g), and none were sufficiently large to illustrate. It is therefore not impossible that at least some of them are intrusive finds, or have been misidentified. As in level 1, in fort level 2 a single sherd probably of La Madeleine black-slipped ware was recorded, also of just 3 g, so not illustrated.

3.3 The fine wares at fort level 3
(93 sherds, 26 MNI, 2.35 EVEs, 779 g; Plate CXXX: 17-26)

The fine ware spectrum in fort level 3 is very similar to that in fort level 2. Cologne colour-coated ware is again the most common fabric, although at not much more than 50% by most measures, it is nearly matched in quantity by *Moselkeramik*, with around 40%, except by weight, since Cologne ware vessels can frequently be a little heavier. Based on the samian and a coin of Gordianus III (AD 238-244), this fort level 3 is dated around the middle of the 3rd century.

Cologne ware beakers are somewhat more robust than the Trier vessels, the latter tending to break into quite small, light fragments, whose fabric and form are nonetheless often easy to identify. In this level all of the Cologne vessels seem to be beakers, either plain-rimmed tulip-shaped beakers with underslip barbotine decoration (no. 19) or with rouletting (no. 20), with short neck and short everted rim (no. 18). No dishes were recorded in level 3.

The *Moselkeramik* in fort level 3 is represented mainly by necked globular beakers (NB 33, Symonds Trier form 1) such as nos 17 and 22. These usually have single bands of rouletting at the shoulder, mid-body and at the join of the base with the body. There are also some sherds of motto beakers (probably belonging to Symonds 1992, Group 36) with white barbotine decoration and a motto or word painted in large letters just below the shoulder. In fort level 3, however, these vessels are only present as small fragments, with no more than a single letter visible. Nos 23 and 24 are two variations in the standard *Moselkeramik* form, the first with a long neck and small globular body, and the second with a narrow neck. This latter individual may simply be a small vessel (cf. Symonds 1992, Group 36, Fig. 28), but the former seems unusual: there has been an assumption that vessels with long necks are a 'late' development, whether at Trier (for example, Symonds Group 65) or elsewhere. However, beaker no. 23 has a much more globular body than the vessels in late Trier ware of Group 65, and occurring in a level dated to the mid-3rd century, it is in fact fairly late as far as *Moselkeramik* production is concerned.

Rather more worrying is no. 26, a short-necked beaker apparently in late Trier ware. While the fabric of this vessel is happily compatible with that of late Trier ware, this form is not common among vessels of this fabric at Trier itself (although it is somewhat similar to Symonds Fig. 50, no. 855). Late Trier ware or '*späte Schwarzfirniswar*e' is generally thought to have begun production at least after *c*. AD 275, but more likely after *c*. AD 300 (cf. Desbat and Vilvorder 2000, 179). Another, perhaps more likely, possibility to be considered is that this vessel should be associated with Symonds Groups 27 and 30 (Figs 20 and 22), from Alsace and the Wetterau – having just the rim and shoulder, it is difficult to know the shape of the body.

Level 3 also contains five probable Romano-British sherds (none illustrated): a base fragment of a beaker of the New Forest, fragments from two probable beakers in Colchester colour-coated ware, one beaker in Oxfordshire black-slipped ware, and a body sherd of a bowl in Hadham red ware similar to Symonds and Wade 1999, fig 5.54 no. 84, but with poor quality rouletting. By the mid-3rd century, these wares were already beginning to circulate in Britain, so perhaps they indicate the beginning of contact with Oudenburg as well. This seems to be confirmed by the clear presence of Romano-British mortaria at this level.

3.4 The fine wares at fort level 4
(216 sherds, 46 MNI, 3.04 EVEs, 1680 g; Plate CXXIX: 27-52)

This level, dated from *c.* AD 260 to the end of the 3rd century / *c.* 300 based on dendrochronological, numismatic and other ceramic evidence, shows a significant change in the fine ware spectrum. It is in this period that there is a sharp decline in the presence of Cologne colour-coated ware, together with a continuing rise in the quantity of *Moselkeramik* and fairly significant rises in Roman-British wares, late Trier wares and Argonne black-slipped ware.

The Cologne colour-coated wares make up around 25% of the fine wares in fort level 4 by all the measures, thus proportionately about half the amount seen in fort level 3. The forms are mainly beakers, including with short neck (no. 28), and tulip-shaped with cornice rim, and with underslip barbotine decoration (nos 29 and 30). No. 31 is a rare Cologne beaker with longer neck.

Moselkeramik is the most common fabric in fort level 4, with around 40% (an average of all measures). This seems to correspond with the period of greatest productivity and creativity at Trier, including decorated motto beakers such as nos 34-37. Probably the first two of these (34 and 35) belong to the small-sized model of the necked globular beaker (Symonds Group 36, Fig. 28), while the latter two (nos 36 and 37) are medium-sized (Symonds Group 36, Fig. 29). Although these beakers were made with consistently high quality, they were also made with the same mass-produced repetitiveness that the samian potters achieved with the use of moulds. In the first half of the 2nd century Lezoux potters experimented with the use of moulds for beakers (cf. Symonds Group 3), but it was ultimately unsuccessful because moulded decorations only work well on the lower parts of the vessels, while the upper half requires applied-moulded figures. At Trier applied moulded figures were used on only a few vessels found at Trier itself. Instead, the mass-produced vessels all use white barbotine scroll decorations, accompanying white painted lettering for the motto. Also present at Oudenburg are beakers with small and large vertical indentations such as no. 38 (Symonds Group 33), no. 39 (Symonds Group 35), and no. 41 (probably Symonds Group 37). One vessel, no. 43, represents a variant *Moselkeramik* form, a beaker with short neck and everted rim (Symonds Group 41).

It is in level 4 that Romano-British wares begin to appear at Oudenburg in notable quantities, reaching on average around 18% of the fine wares (up to nearly 30% by weight, which is easily explained by the relative heaviness of most late R-B fine wares compared to the lightness of *Moselkeramik*, for example. Nevertheless, it is clear that the supply of fine wares from Britain to Oudenburg became more than simply anecdotal in the latter half of the 3rd century, and its importance would continue to grow through the next century.

The most abundant Romano-British ware in fort level 4 is Lower Nene Valley colour-coated ware. In very general terms, it could be said that Oxfordshire red/brown colour-coated ware is a rather unrefined late version of samian ware, and, on a lesser scale, the same is true of Hadham red ware, although both of these productions also made their own distinctive forms not found in other late samian. Their focus was mostly on open forms such as bowls and dishes. At the Nene Valley, however, the model was not samian but dark coloured beakers, and so in the 2nd century the predominant form was the tulip-shaped cornice-rimmed beaker, which was subsequently replaced by the necked globular beaker. The first of these forms was copied with such skill that a limited programme of chemical analyses was carried out in the early 1980s to determine the origins of beakers found in Britain: the result was that perhaps more than had been expected were from Cologne, but the copies from the Nene Valley were very similar (Anderson *et al*. 1982; see also Howe *et al*. 1980, Fig. 5, in which both forms are illustrated). The Nene Valley versions of tulip-shaped beakers do not seem to have reached Oudenburg, however, probably because the conversion to necked globular beakers had already occurred before Romano-British wares began to arrive in significant numbers, in other words before level 4 or *c*. AD 260. The necked globular beakers from the Nene Valley are clearly copies of Trier products, but generally they are not difficult to distinguish from the originals, because Nene Valley products usually have a white fabric, or in some cases a pinkish-cream fabric quite unlike that of *Moselkeramik*. They can be a little more difficult to distinguish from late Trier ware, which has a less fine reddish fabric, but it is usually much more consistently red than that of similar vessels from the Nene Valley.

Thus, in level 4, nos 45 to 48 are all Nene Valley necked globular beakers, the last of these quite similar to Howe *et al.* 1980, Fig. 5, no. 50 (dated to the 3rd century). No. 49 is in Oxfordshire red/brown colour-coated ware, probably the base of a flanged bowl copying Dragendorff form 38. No. 27 (from level 3+4, but most likely to be attributed to fort level 4) and nos 50 to 52 (from level 4) are the late Trier vessels illustrated here. No. 44 is the only illustrated representative of Argonne black-slipped ware in level 4: a beaker of Chenet form 339a, a rare example of a beaker with both roughcasting and rouletting.

3.5 The fine wares at fort level 5
(248 sherds, 57 MNI, 4.55 Eves, 2343 g; Plate CXXXII: 53-82)

In level 5, based on the dendrochronological evidence (earliest felling date: AD 319-329) and the presence of late Argonne roller-stamped ware dated from *c.* AD 320 onwards, *Moselkeramik* remains the most common fabric, even though it almost certainly had ceased to be manufactured at Trier by the late 3rd century, and its numbers have declined significantly since level 4. Its high percentages (33.5% by sherd count, and 33.6% by EVEs) must be partly explained by the fact that the very thin walls can break into many fragments, but rim sherds can still be measured. Cologne wares, clearly residual, decline even more sharply in level 5, down to just 5.1% by EVEs, although around 14% by the other measures.

By contrast, Romano-British wares reach more than 45% by EVEs and weight, although only 30% by sherd count, undoubtedly owing to the general robustness of the Romano-British fabrics. Argonne wares now reach around 10% of the fine wares, while late Trier ware seems to be about the same by most measures, but there are no rims present, so no EVEs were recorded. One sherd of Pevensey ware (no. 80; fabric confirmed by M. Lyne, pers. comm.) is associated with level 5 (where, chronologically, it undoubtedly belongs).

The forms in *Moselkeramik* are represented by nos 55-57 and 61-66. These are all necked globular beakers (NB 33, Symonds Trier form 1) with the exception of no. 61, which is a short-necked beaker with everted rim (NB 32, Symonds Trier form 2, similar to no. 43). Nos 56-57 and 62 all have white barbotine decoration; the last of these is to be a fairly large vessel, but without the usual motto, or painted inscription. The three illustrated Cologne colour-coated ware beakers (nos 58-60) all have underslip barbotine decoration, probably all parts of hunt scenes. Although beakers are always the most common Cologne form, at least three plain dishes (Hees 17a / NB 40 / Höpken E1/E2) were also recorded in level 5. Argonne ware, represented here by nos 53-54 and 67-69, also consists mainly of beakers, but in level 5 two probable flagons have been identified, including no. 69 with a three-lobed handle.

The Romano-British wares are composed mainly of Lower Nene Valley ware and Oxfordshire ware; New Forest ware reaches its highest recorded quantities (on average, about 7%, although higher by EVEs). Lower Nene Valley wares are represented by nos 70-72, all beakers, the last of which has white painted decoration. Although clearly copying *Moselkeramik*, white decorations on Nene Valley beakers only rarely can be described as barbotine rather than paint, being rather more two-dimensional than the decorations on Trier vessels. The only illustrated New Forest vessel here is the (rimless) top of a flagon with the stump of a single handle (no. 73). The Oxfordshire wares (nos 74-79) show that the range of vessels coming from this source was generally somewhat different from other colour-coated ware types: of the six illustrated vessels, none are beakers, two are direct imitation of samian forms (no. 74 is a Young C51 copy of a Dragendorff 38, while nos 77 and 78 are Young C97 copies of Dragendorff 45); three are mortaria (nos 77-79) and three are original Oxfordshire open forms (nos 75-6: Young C73/84 bowls with stamped decoration; no. 79: a Young C100.2 mortarium). These are the latest dated vessels in the assemblage – mostly dated *c.* AD 300-400, although Young dates his form C84 to *c.* AD 350-400. The base of a probably Pevensey ware bowl (no. 80) and the base and most of the body of a late Trier ware beaker are undoubtedly contemporary with the Oxfordshire and other Romano-British wares present.

3.6 The fine wares from the post-Roman and unstratified levels
(495 sherds, 140 MNI, 6.4 EVEs, 6517 g; Plate CXXXIII-CXXXIV: 83-130)

The last group of contexts provides us with roughly 40% of all the fine ware fragments recorded, obviously all recovered in redeposited contexts. For the most part the fine wares present are the latest of their types. In this group both Cologne colour-coated ware and *Moselkeramik* decline to their lowest percentages, whereas both late Trier ware and Romano-British wares in general reach their highest levels.

As a result, just one *Moselkeramik* beaker (no. 83) and one Cologne colour-coated ware plain-rimmed dish (no. 90) are illustrated. Hadham red ware has been identified as early as fort level 2 (one sherd), but it never reaches more than 3.7% of the fine wares by any quantification method. Among the illustrations it is represented just by one vessel, a short-necked beaker with everted rim (no. 84). However, after Oxfordshire red-brown colour-coated ware, which occurs at Oudenburg in no fewer than ten different general forms, Hadham ware, also including both imitations of samian ware and its own original forms, occurs in no less than nine different forms (Table 1.38).

In the entire assemblage just two sherds of African Red Slip ware have been identified. One of these is the rim of a dish (no. 89), probably Hayes form 67-72, generally dated *c.* AD 360-470. Among the non-samian fine wares as a whole, these are the only sherds that might reflect the occupation at Oudenburg beyond the end of the 4th century, but neither sherd can be dated more precisely.

Another type that is surprisingly rare at Oudenburg is Central Gaulish Black metallic ware, mentioned above in the discussion of level 1. The only recorded sherd is recovered from the post-Roman level and represents the upper wall of a beaker with underslip barbotine dots (no. 91). This individual seems very likely to belong to the early 3rd century at the latest.

Argonne ware is not as rare at Oudenburg as other Gaulish wares, since it accounts for around 5% of the assemblage by all measures, and more sherds were recorded in the post-Roman levels than earlier (for an overview of the attested Argonne ware types: Figure 1.26). The percentages of Argonne ware were slightly higher however in level 5. Its only illustrated representatives here are no. 92, an Argonne black-slipped ware necked globular indented beaker, NB 33c, Symonds form 1 with large oval indentations and bands of rouletting at the join of neck and shoulder (cf. Symonds 1992, Fig. 18, Group 25, nos 393 and 397), and no. 93, the mid-body of a beaker or flagon in Argonne ware with white-painted decoration, similar to Chenet 1941, Pl. 17, types 334-335.

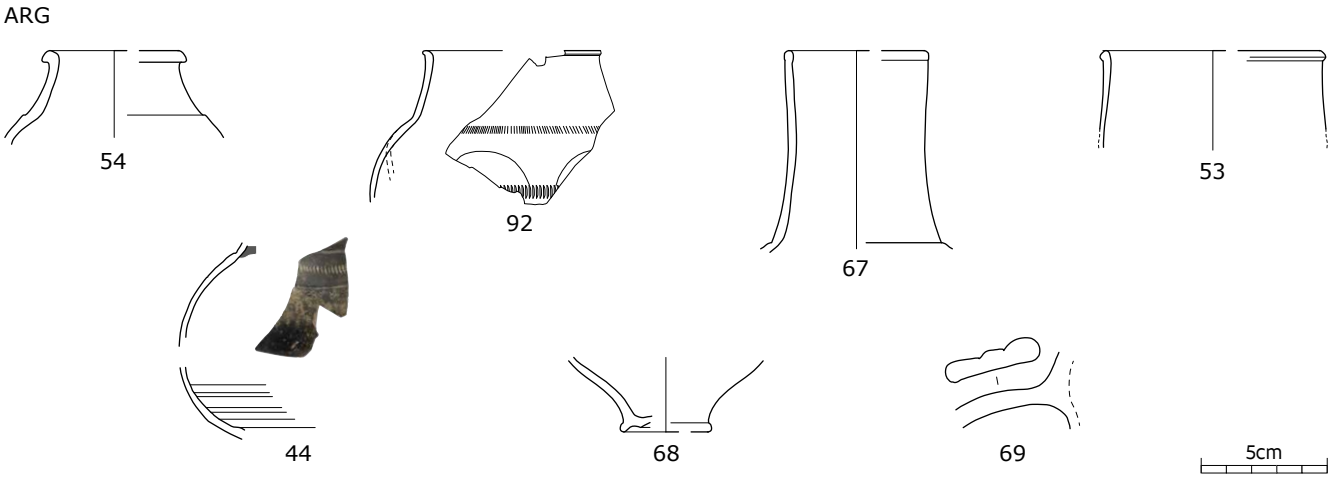


Figure 1.26. Overview of the Argonne fine ware productions attested at the south-west corner site.

Like Argonne ware, New Forest wares seem to peak in fort level 5, and decline somewhat thereafter. Both of the illustrated examples in the post-Roman levels are globular necked beakers with what is known as excised or cut-glass technique decorations (nos 97 and 98). This seems a fairly rare decorative style in New Forest wares, while it is much more common on vessels from Central Gaul (cf. Symonds 1992)[61], for example at Domecy-sur-Cure[62] and at Jaulges-Villiers-Vineux[63]. Generally this is a decorative style that developed between the second half of the 2nd century and the end of the 3rd century; it is rare in the 4th century (cf. Fulford 1975, 30).

Lower Nene Valley wares reach their highest numbers in the post-Roman and mixed levels: with around 11% by all measures, they are the third or fourth most common ware. Unlike Oxfordshire ware or Hadham ware, Nene Valley colour-coated products do not include significant numbers of forms imitating samian ware; the most common vessels are beakers in the tradition of *Moselkeramik*. Mostly these are beakers of the form NB 33, Symonds Trier form 1, but in the 4th century a variant of this form appears in the pentice beaker (HPM Fig. 5, nos 55-7), which seems to be a late version of the high-shouldered beaker first developed in Central Gaul, and then at Trier (Symonds Group 14, Fig. 12, no. 251 and Group 46, Fig. 37, nos 677-680). An example of a pentice beaker in Colchester colour-coated was noted in fort level 4 (no. 32), an example was recorded in the post-Roman levels in Oxfordshire colour-coated ware (Young C23), along with two more in Colchester colour-coated ware, but at least four examples were recorded in the same levels in Lower Nene Valley ware, including the illustrated rim, no. 94. There are also, however, other notable forms from the Nene Valley, in particular flanged bowls that seem to be an imitation of late flanged bowls in Black-Burnished ware or Alice Holt Farnham ware (see, for example, the juxtaposition of Symonds and Tomber 1994, Fig. 14, nos 148-54, including flanged bowls in different Romano-British fabrics). Here the illustrated example of the form is no. 95. There is also the base of a small vessel, presumably a lamp, in Lower Nene Valley ware (no. 96).

Oxfordshire wares are the most common ware type in the post-Roman levels, except by sherd count, where they are outnumbered by *Moselkeramik*, the latter type being broken into many small sherds while the former is obviously a more robust fabric. Oxfordshire ware also appears in a wider variety of forms than any other type (Table 1.38), hence the considerable number of illustrations here (nos 85-87 and 99-119). As observed in fort level 5, the Oxfordshire wares include several forms that are copies of samian ware forms, such as the collared bowl Young C52/ Dragendorff 38 (nos 87, 100 and 108-111), the dish Young C44-5/ Dragendorff 18/31 (no. 112) and the mortarium Young 98/ Dragendorff 45 (no. 116) (see also Figures 1.32-1.33). Also Young notes that the C49/50 dish/bowl form is '*probably derived from Dragendorff 36 and Curle 15*' (Young 1977, 158): here the form is represented by nos 113-115. More original forms include both narrow-necked and broad-mouthed flagons (Young C8 and C13: nos 85, 101 and 102); open carinated bowls (Young C69.2: No. 105; Young C83/84: Nos 106-7; Young C81: No. 86); open rounded bowls (Young C55: No. 104); beakers (notably, an example with rouletting and white painted decoration: no. 103); and colour-coated mortaria (Young C100: nos 116-118).

The vessels included in the category of late Trier ware are described in Symonds 1992, Chapter 8. At the time of writing that chapter, it was known that the ware was common in the Rhineland, especially in late cemetery sites, at Trier itself, at Bonn, at Cologne, at Nijmegen and at Krefeld. Although examples do exist in French museums (Symonds 1992, Fig. 49, nos 849-850, respectively at the Musée des Antiquités Nationales and the Musée Bargoin at Clermont-Ferrand), the ware is mostly absent from sites to the south of the Rhineland, and does not appear to have reached Britain. It did, however, reach Oudenburg, where it has been recorded in greatest numbers in the post-Roman and mixed levels – indeed by sherd count it is the most common fabric in the post-Roman levels, and by other measures it is the second most common, after Oxfordshire

61 **Symonds 1992, Fig. 4, nos 5, 59-64, 67-70; Fig. 5, nos 75-81, 84-5, 87-94; Fig. 6, 99-100, 104, 106-9; Fig. 8, 148-9, 156.**

62 **Symonds 1992, Fig. 14, no. 288, Fig. 17, no. 371 and probably Fig. 17, nos 366 and 373 and Fig. 18, nos 378-9 and 381-6.**

63 **Symonds 1992, Fig. 14, no. 305, Fig. 17, no. 353 and probably Fig. 16, nos 338, and 340-3.**

ware. Late Trier ware, like *Moselkeramik*, occurs mainly as beakers (98.9%, Table 1.38), with not much variety of shapes, as can be seen in our illustrated examples, nos 120-129 (see also Figure 1.30).

The final illustrated vessel, no. 130, ought perhaps to have been classified as samian ware: it is a bowl with pale colour-coated fabric more likely to be a colour-coated variation of a late sigillata bowl, similar to Drag. 49, but with a simpler curved rim, decorated with bands of rouletting. Its origin remains unknown.

4. Motto beakers from Trier

The presence of *Moselkeramik* motto beakers is particularly significant as these are important chronological indicators. The study of motto beakers from Trier and other sites in the North of Gaul and *Britannia* has enabled Künzl (1997) to classify these beakers in five chronological groups, based on form and decoration elements, in relation to closed contextual data. She concluded that the start of the *Spruchbecher* (or white barbotine motto beaker) production was around AD 255. Her groups cover a date range from AD 255 to 355. However, at the St. Magnus / New Fresh Wharf site in London, excavated in 1974-78, ten or eleven[64] motto beakers came to light in the fill of the wooden quay construction and later levels (Richardson 1986, 119-120; Künzl 1997, 195). The samian assemblage from the London site, which, for example, offers one of the distinct parallels for that of the large waste-pit OS 4980 of fort level 4 of the Oudenburg site, has been dated to AD 235-245 (Bird 1986, 143; cf. Bird 2002, 34-35). Scholz (2006, 36) however refers to other authors who date this group between AD 210/230 and 260/270. At first sight, the date AD 235-245 seems to contradict the chronology by Künzl with AD 255 as start date for the production of motto beakers. In this respect it is important to draw attention to the dating conclusion of waste-pit OS 4980. The date of its samian assemblage has eventually been shifted to somewhat later (*c.* AD 250-260), and the other accompanying pottery evidence has eventually lead to a date for the whole pottery assemblage of AD 260-270 (Vanhoutte *et al.* 2009c). Recently, this date could even be set more specifically, because a small, heavily corroded, coin hoard was found in the infill of the waste-pit, which could only be recognized through X-radiation and cleaning after the study (and publication) of the pottery. Its closing coin by Gallienus of AD 267-268 indicates that the infill happened only after at least AD 267, a date which could not be assumed by the samian. With an absence of radiate copies, which are abundant in the final layers of fort level 4, it is likely that rubbish pit OS 4980 functioned in the period *c.* AD 267/268-275. This date has important consequences: it reveals the long life-span that can be attributed to the samian within this context.

Most of the samian wares of the London site came from the filling of the Roman quay, *i.e.* phases 4 (construction of quay) and 5 (infill) at the site, and from later levels[65] (Bird 1986, 139). Both phase 4 and 5 were considered to have been contemporary (or nearly so) and dated *c.* AD 225-245, mainly based on the dendrochronological analyses and the pottery evidence. The latter was mainly supported by the samian conclusions. Moreover, it is important to point to the difficulty the authors faced in interpreting the tree-ring dates (Hillam and Morgan 1986, 84; Miller *et al.* 1986, 63-64). Phase 5 is definitely stratigraphically later than the quay construction '*dated by dendrochronology to sometime during 209-244 or shortly after*' (Miller *et al.* 1986, 63). Richardson in the same publication summarized: '*It must reluctantly be concluded that there is much dating evidence, but little of it certain enough to form the basis for categorical statements. What can be said is that the quay contains material dated c. AD 180-245, that on dendrochronological evidence the material can have been deposited no earlier than c. AD 209, and that on the evidence of a small quantity of East Gaulish Rheinzabern samian in the lower fills of the quay it seems possible that the quay was filled in the second quarter of the 3rd century*' (Richardson 1986, 98). Künzl concluded from these uncertainties that the accompanying pottery could also have been of later date, namely from around AD 260 (Künzl 1997, 21; see also Desbat and Vilvorder 2000, 184), and apparently did not consider the New Fresh Wharf motto beakers as conclusive evidence upon which to adapt her chronological groups, a classification that she based on closed contextual data from a wide range of sites. Simultaneously, it should be emphasized, though, that the London assemblage has been studied by several specialists, who themselves applied a high degree of scepticism to come to their final conclusions on the dating of the pottery assemblage. The St. Magnus / New Fresh Wharf material cannot simply be written off as unreliable, although on the other hand one has to remember the dating shift that the OS 4980 assemblage underwent (see above). Also Desbat and Vilvorder (2000, 184), based on typological arguments, endorsed Künzl's hypothesis for an AD 260 start date for the London assemblage. Clearly more research is needed, with integration of more recently excavated find contexts, to come to a more definite conclusion on the actual start date of the motto beaker.

The Oudenburg assemblage yielded 54 fragments of such motto beakers, resulting in at least eight individuals. They are illustrated as nos 16, 25, 34, 35, 36, 37, 56 and 57. Four of them are sufficiently preserved to enable an identification according to the Künzl classification (Table 1.37).

As these all belong to fort level 4, they contribute significantly to the chronology of this level. Of the other fragments, one body sherd was found in a context of fort level 2. Since motto beakers only started to be produced around AD 255, and based on the dates resulting from the accompanying pottery, this fragment should be considered as an intrusive find (with a weight of only 2 grammes, this is certainly possible). Fort level 3 yielded three body fragments of motto beakers, of which two were found in key contexts (gully OS 1169 and pit OS 80925). When relying on Künzl's chronology, they indicate a date after AD 255, at least for the end of this fort level 3 occupation. Apart from the individuals specified above, seven more body fragments were recovered from fort level 4. Three fragments belonged to fort level 5 but should be considered to be re-deposited items, as is also the case for the fragment found in the 5+post level and the one in the post-Roman level.

64 **Künzl (1997, 195) lists three unpublished motto beakers (LON 15-17) of which cannot be ruled out that LON 16 and LON 17 belong to the same vessel.**

65 **At least four vessels of the New Fresh Wharf site did not belong to the Roman levels (Künzl 1997, 195).**

Table 1.37. The four motto beakers recovered from the south-west corner site which can be identified according to the classification by Künzl (1997). The illustration numbers refer to CXXXI.

ill. no.	fort level	find context	Künzl 1997 classification	date according to Künzl	reference
36	FL4	large waste-pit OS 4980	Gruppe II	AD 260-270	Künzl 1997, 56
37	FL4	final layers FL4	Gruppe IIIc	AD 270-280	Künzl 1997, 62
34	FL4	hearth 18 (end phase FP4)	Gruppe IV	AD 280-310/315	Künzl 1997, 65
35	FL4	final fire/demolition layers FL4	Gruppe IV	AD 280-310/315	Künzl 1997, 65

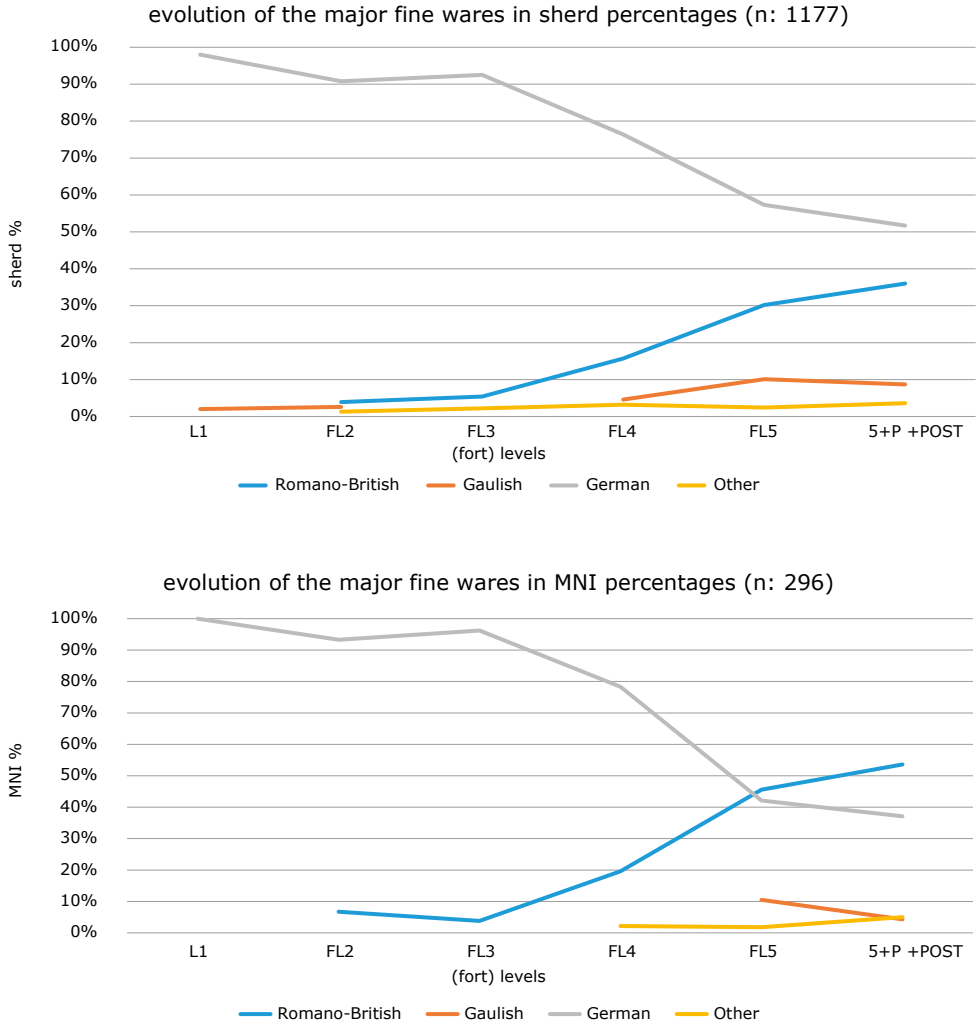


Figure 1.27. Chronological evolution of the presence of Romano-British, Gaulish, German and other fine ware imports at the Oudenburg fort. Top: based on sherd count. Below: based on MNI. The Romano-British sherds of fort level 2 are most likely residual elements.

5. Conclusions from the non-samian fine wares and their significance within a wider context

The supply of fine wares to the Oudenburg fort was exclusively long-distance, as no significant fine ware pottery production centres were established nearby. The trade to Oudenburg coincides with a period in northern Europe, and especially Britain, when production of pottery types like fine wares and mortaria became increasingly centralized, with otherwise only a few local productions left, serving limited regions. The centralizing trend seems to have begun on the Continent, however, with the wide distribution of Cologne colour-coated ware in the 2nd century both down the Rhine and along the established roads leading south-west towards Bavay providing firm evidence. In the 3rd century, Trier became increasingly important to eventually be the main supplier of fine ware beakers by the later 3rd century. Thus, in the late 2nd and 3rd century the Oudenburg fort was mainly supplied from the Rhineland; Gaulish potteries were hardly of significance, only distributing to Oudenburg in very limited quantities (Figure 1.27). From the later 3rd century onwards, and increasing towards the 4th century, also a wide variety of Romano-British fine wares came in.

Each of the major centres whose products would arrive at Oudenburg has a somewhat different history, and various specific characteristics.

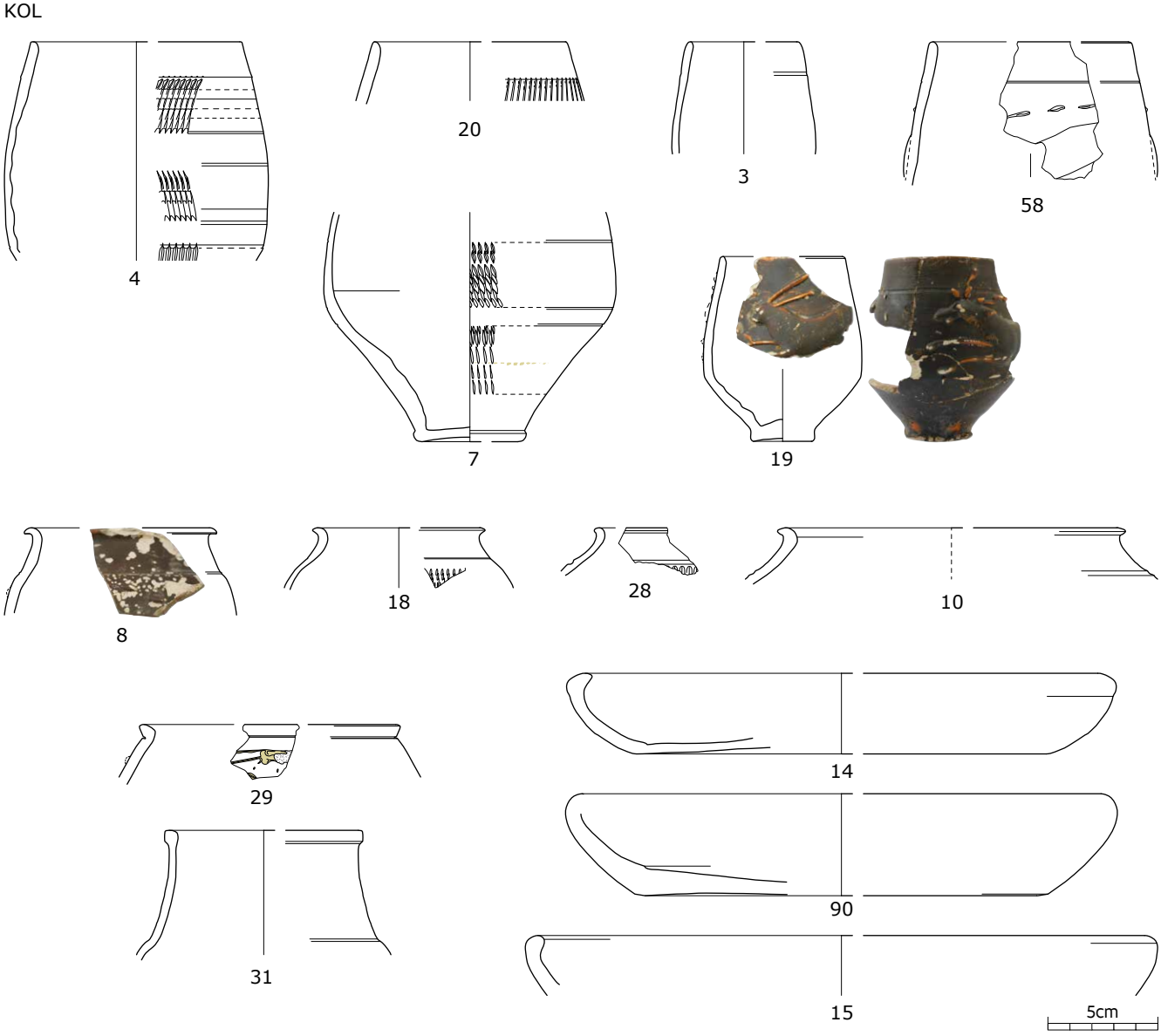


Figure 1.28. Overview of the Cologne vessel types attested at the south-west corner site.

Cologne began fine ware production in the 1st century, but probably not before about *c*. AD 80, when the centre began to make globular, cornice-rimmed beakers in plain versions, or decorated with roughcasting, underslip barbotine scales or abstract leaves (Höpken 2015). These early beakers do not appear at Oudenburg, but they were certainly more widely exported than Colchester wares. Like Colchester, production at Cologne is associated with a major Roman town, but, undoubtedly because of the presence of the Rhine, coupled with the relatively high quality of the products, wider distribution began almost immediately. Cologne had thus most of a century of fine ware production before its wares began to arrive at Oudenburg, where it would be the most common non-samian fine ware found in levels 1 to 3 (see for an overview of the attested types: Figure 1.28). In fort level 4, however, from about AD 260 onwards, the numbers of Cologne ware vessels drop fairly dramatically, which suggests that perhaps the industry had declined by the middle of the century, possibly because of manufacturing problems, or, more likely, because of the superior competitive quality of the *Moselkeramik* beakers coming from Trier, which came to dominate the market not only throughout the Rhineland but at Cologne itself. While there is some later production at Cologne, it does not seem to have found the export market of late Trier wares in the 4th and 5th centuries.

Although *Moselkeramik* pottery may have been made for a local market somewhat earlier, Trier seems to have blossomed as a centre for fine ware production from *c*. AD 180. By the time of Oudenburg level 1, the wares were well-established, making up somewhere between one-quarter and one-third of the fine wares (almost all the rest being from Cologne), however bearing in mind that all counts for level 1 are very low. There is apparently a significant decline in level 2, although since the numbers of sherds (much less vessels) is still quite small, it is difficult to know what this decline in the second quarter of the 3rd century might signify. In levels 3, 4 and 5 the

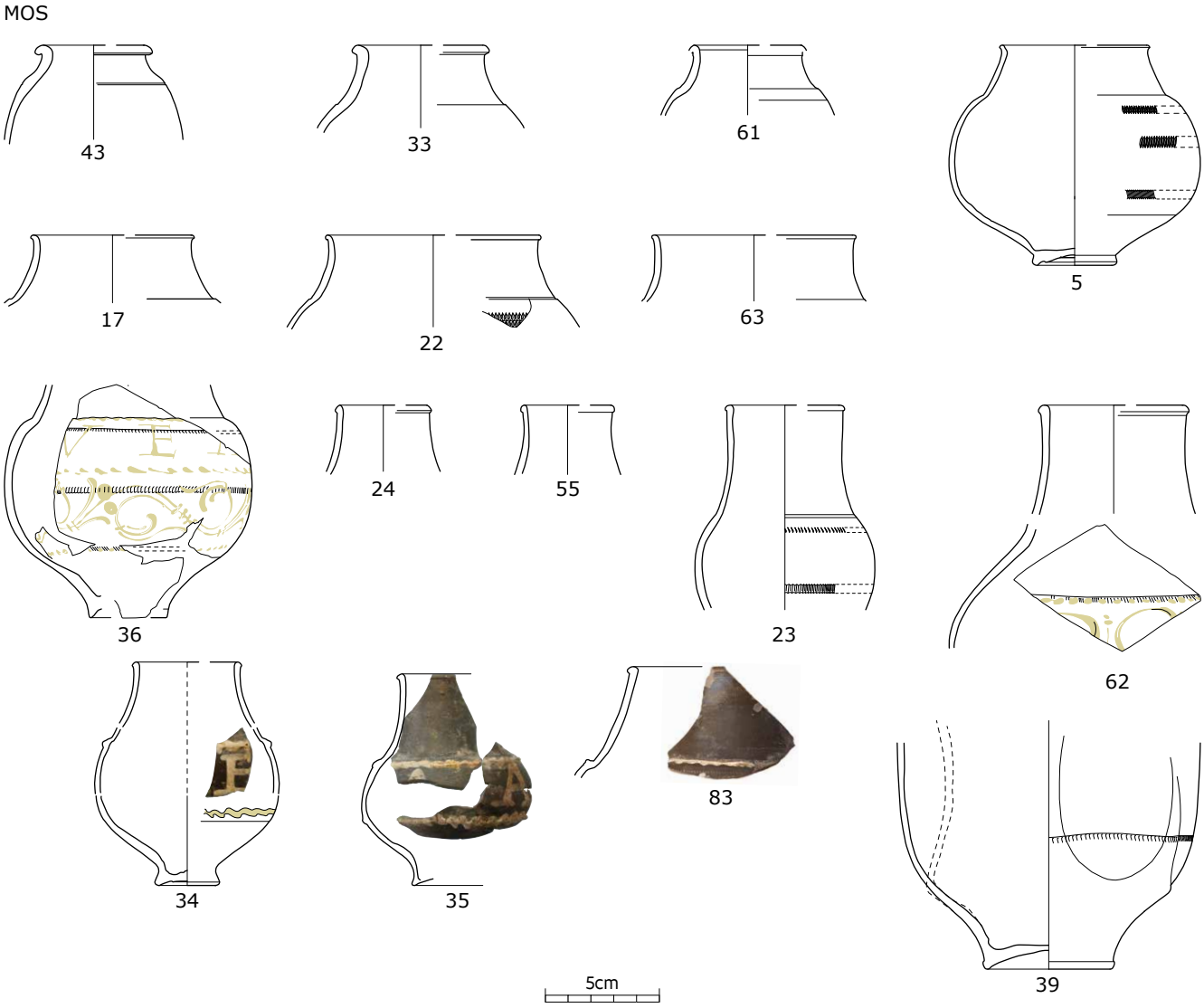


Figure 1.29. Overview of the vessels in *Moselkeramik* attested at the south-west corner site.

quantities of *Moselkeramik* rise again, making it the most common fabric in the latter two levels (for an overview of the attested types: Figure 1.29).

With the decline in *Moselkeramik* which begins in level 5, it seems that the production and distribution of the ware was seriously interrupted, probably beginning in the third quarter of the 3rd century. But already with small quantities appearing at that time, apparently Trier potters decided to make an alternative, less costly and high-quality version of their beakers, using an inferior fabric, firing at a lower temperature and decorating with white paint rather than barbotine, and, perhaps surprisingly, this became a success in the 4th century (cf. Symonds 1992, Chapter 8). One explanation for this could perhaps be because these vessels were very popular as grave goods – a large proportion of the vessels at Trier were found at cemetery sites – and as such would be viewed and used only at the time of a funeral, after which they would disappear from circulation. At the late Roman Oudenburg Graveyard A graves 128 and 130 each contain a late Trier beaker (respectively Pirling type 60 and Pirling type 58 motto beaker with 'DISCEME') (Mertens and Van Impe 1971, Plate LXIX, 1-2). In any case, late Trier ware is the second most common ware found in the post-Roman levels at the south-west corner site of the Oudenburg fort (for an overview of the attested types: Figure 1.30). For an occupation site the high numbers of Trier and late Trier beakers are quite extraordinary.

The Nene Valley began as a production centre supply at an urban agglomeration, *Durobrivae*, but, situated in a relatively rural area near the modern town of Peterborough, it began exporting fine wares from about the mid-2nd century. In the 3rd and 4th centuries, its fine wares and mortaria were exported more or less throughout Britain (Howe *et al.* 1980). Its earlier phase of production of fine wares was essentially devoted to making beakers copying contemporary beakers from Cologne (HPM, Fig. 5, nos 44-48), which did not reach as far as Oudenburg (although they did reach Colchester and London). Thereafter the production switched to copying *Moselkeramik*, along with some more original beaker forms, clearly reflected in the imports at Oudenburg. Well before this change the Nene Valley industry had lost any dependence it previously had on a local market; it became, along with the

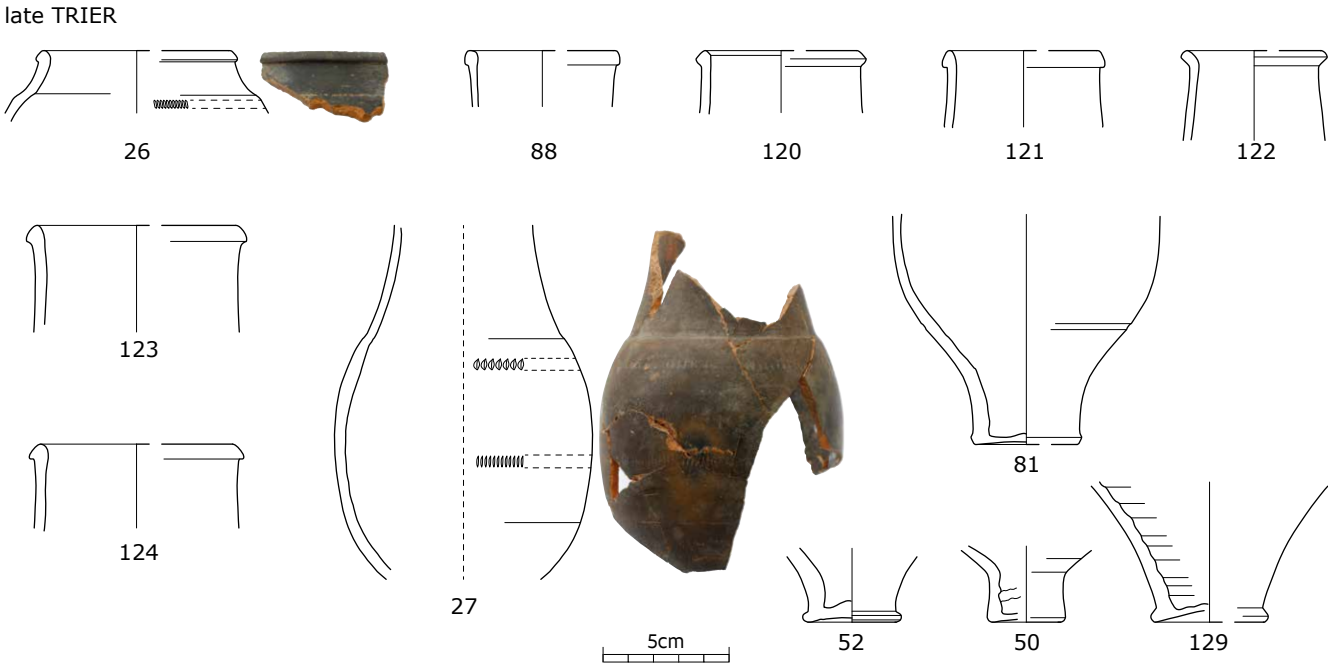


Figure 1.30 Overview of the late Trier beaker types attested at the south-west corner site. Note: it cannot be ruled out that no. 26 is a beaker from Alsace and the Wetterau (see before).

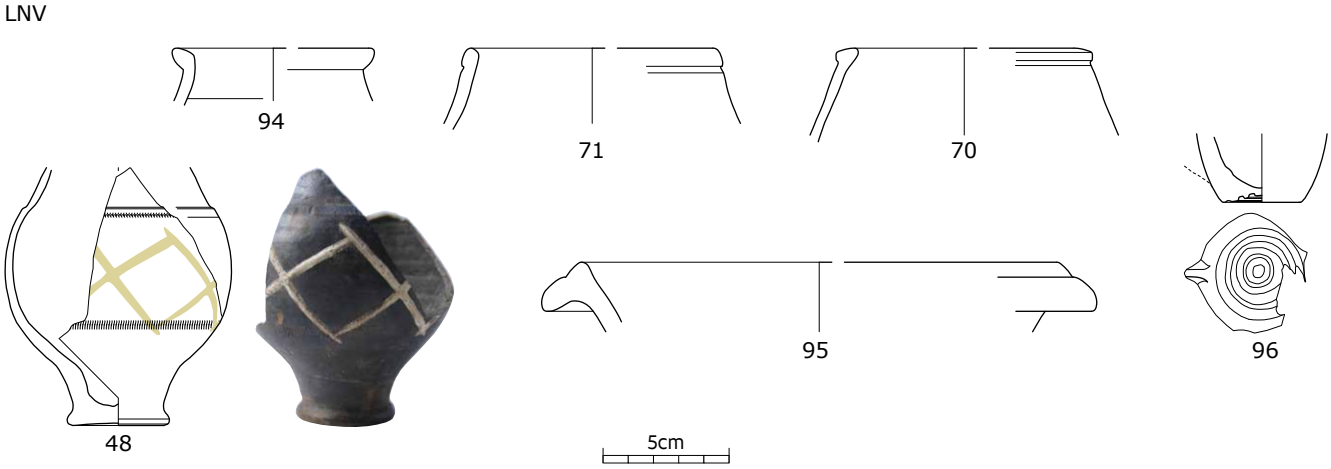


Figure 1.31. Overview of the vessel types from the Lower Nene Valley attested at the south-west corner site.

Oxfordshire industry and to a lesser extent the production centres at Hadham and the New Forest, devoted to long-distance trade (for an overview of the attested LNV vessel types: Figure 1.31).

While Oxfordshire ware production began in the 2nd century in the region to the east of present-day Oxford city, there was never much of a local market for the products. The industry seems to have developed mainly for centralized, long-distance distribution beginning in the early 3rd century, and it grew to become arguably the largest pottery industry in Roman Britain (cf. Young 1977). Its development seems to have mainly centred around creating its versions of samian ware, in particular the last forms that arrived from the East-Gaulish industries, but while these forms would continue, in the face of the severe decline in continental samian supply, the Oxfordshire potters began their own innovation, which became quite elaborate and refined, and specializing in painted and stamped decorations (see for an overview of the attested types: Figures 1.32-1.33). Oxfordshire products, accompanied by those from the Nene Valley, dominate the late levels at Oudenburg, but what is exceptional about the former wares is the very wide variety of forms present. Oxfordshire potters seem to have been relatively uninhibited by the typological constraints of Gaulish samian potters, and the variety can be seen at Oudenburg as well as in Britain.

Other late Romano-British production centres, notably Hadham (32 sherds), the New Forest (37 sherds) and Pevensey (one sherd), are represented by small numbers of sherds. The same is the case for fine wares from Central Gaul (one sherd), La Madeleine (two sherds), and for North African Red Slip ware (two sherds) (see for the representative New Forest types at Oudenburg: Figure 1.34).

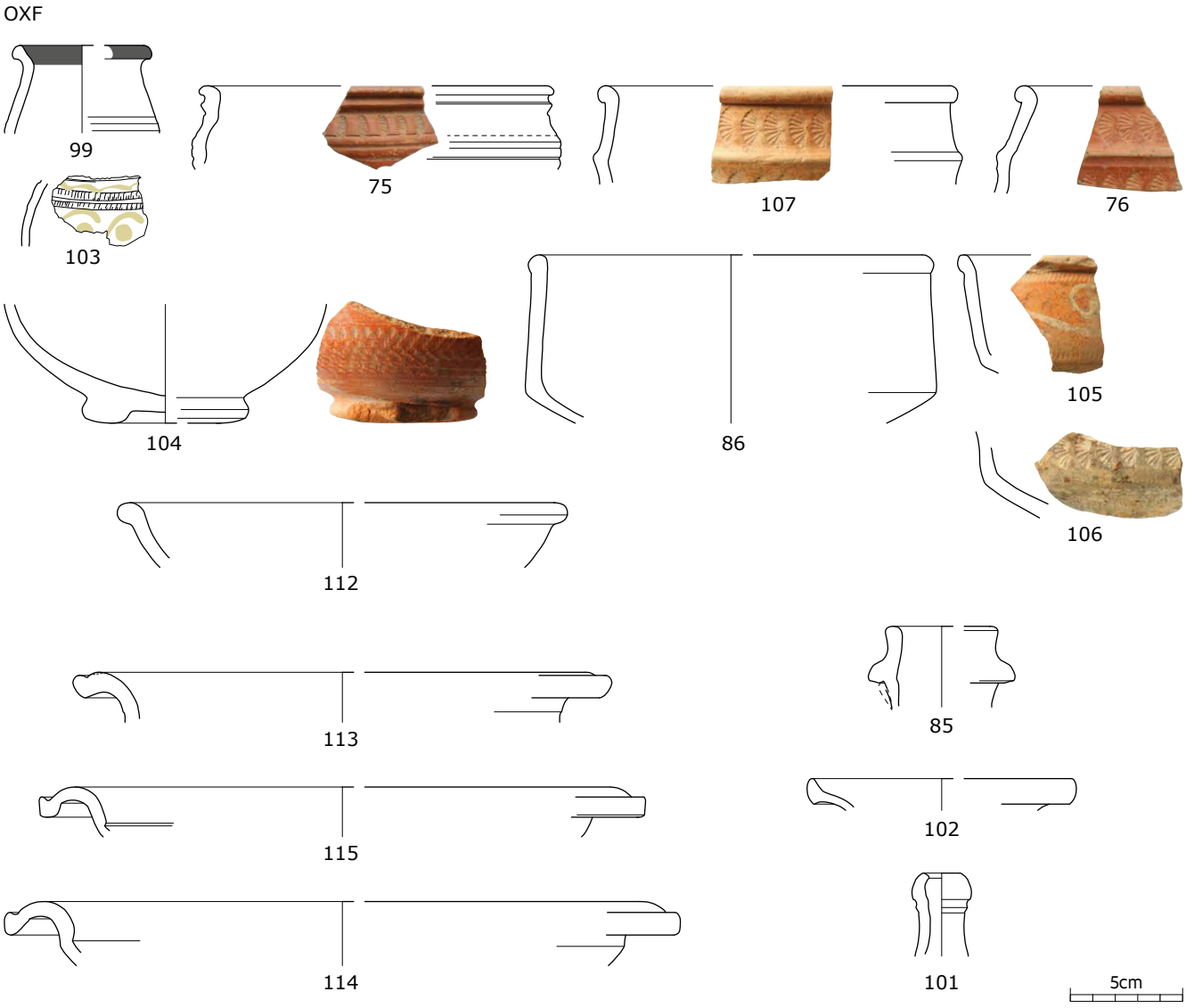


Figure 1.32. Overview of the Oxfordshire vessels attested at the south-west corner site (part 1).

The numbers for Hadham ware and New Forest ware are notably higher though, than those for Colchester ware (just eighteen sherds), emphasizing thus the lack of export from the latter centre. At Colchester, fine wares began to be manufactured in the pre-Flavian period, and the industry grew steadily for roughly three centuries, but from the beginning there never seems to have been a great interest in marketing or exporting the products (cf. Symonds and Wade 1999). At Oudenburg just eighteen sherds (six MNI, 0.3 EVEs, 181 g) have been recorded, mostly the mainstream Colchester colour-coated ware of the 2nd and 3rd centuries, beside the fabric defined as Colchester MR (Symonds and Wade 1999, 294-297), a brown coloured ware mainly used to make a local version of the Drag. 38 flanged bowl (*c.* AD 250-400).

The major suppliers of fine wares to Oudenburg were thus the production centres at Cologne and Trier in the Rhineland, and at the Nene Valley, Oxfordshire, as well as Hadham and the New Forest in Britain. The Rhineland centres, the Nene Valley and the New Forest provided mostly beakers: 85% of the vessels from Cologne, 99% of the vessels from Trier, 87.8% of the vessels from the Nene Valley and 94.6% of the vessels from the New Forest were beakers. Of the Cologne colour-coated wares only 15% are plain dishes, perhaps playing the same role as Pompeian-Red ware dishes. At Trier it is clear that a wider variety of vessel forms was made (Symonds 1992; Künzl 1997), but they were intended for the local market or for Cologne, not for wider export. It is interesting to note that whereas fine ware production at Trier developed alongside samian ware production, probably with similar production standards, this was not the case at Cologne (where an alternative red fabric would have been required), or at the Nene Valley, most of whose products also have a white fabric, although some do have a pinkish fabric. Oxfordshire and Hadham ware are, by contrast, essentially late versions of samian ware, with a much wider variety of forms, some copying samian while others seem to be original.

Aside from the Cologne dishes, the essence of the competition between Cologne and Trier is between the tulip-shaped beaker and the necked globular beaker, the former shape notable for underslip

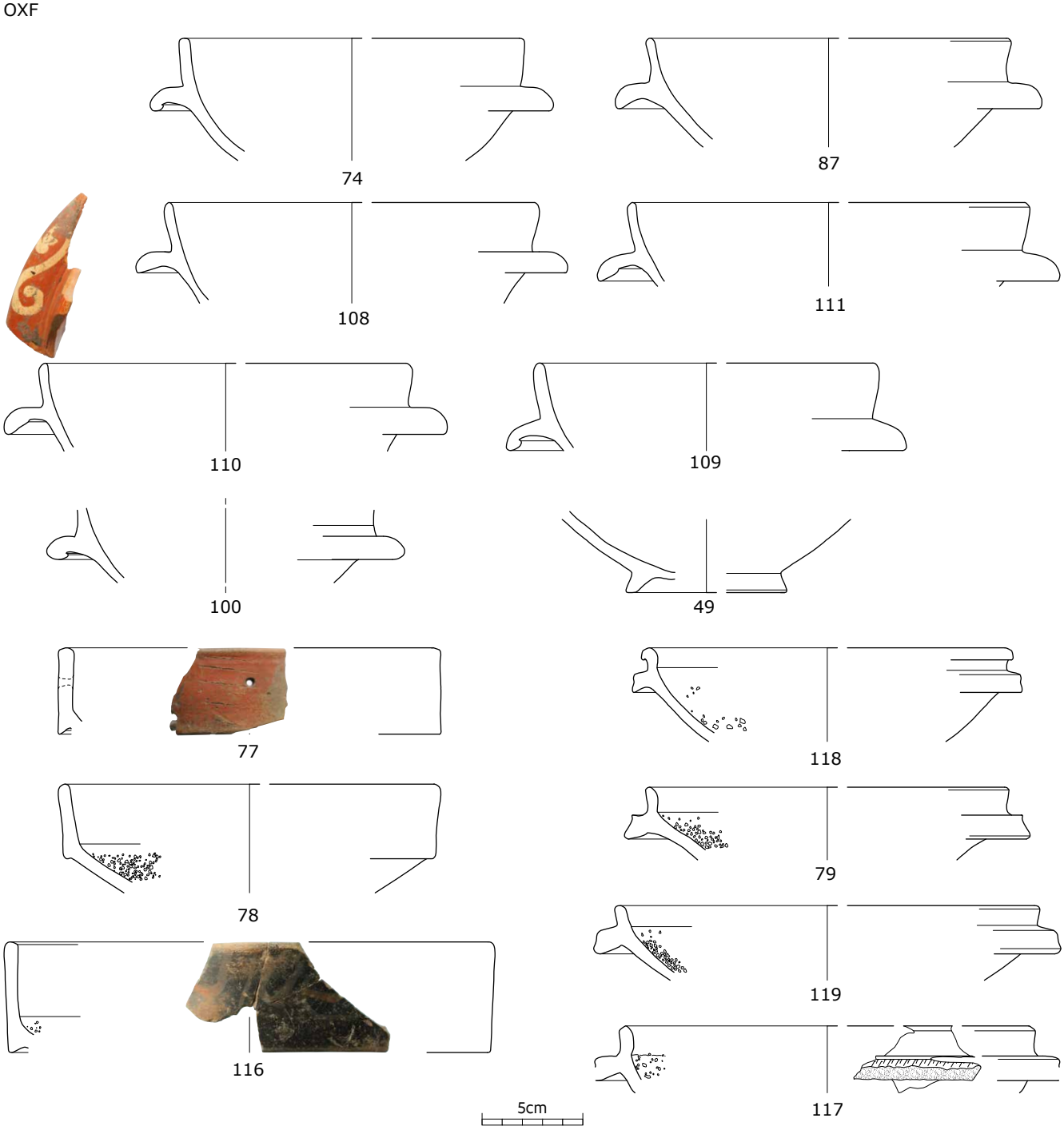


Figure 1.33. Overview of the Oxfordshire vessels attested at the south-west corner site (part 2).

barbotine decoration, either abstract or with running animals creating hunt scenes, while the latter shape was decorated with white barbotine, sometimes including white painted letters of a word or motto, and evolving in late Trier ware into white painted decoration. In level 1, the absence of Central Gaulish beakers at Oudenburg is noted; in Britain, it could be surmized from the presentations of Brewster (1972) and Greene (1978b) that the main competition in imported beakers was between those from Central Gaul and those from Trier. The assemblage at Oudenburg shows that while this might have some relevance in British assemblages of the late 2nd or early 3rd centuries, there was probably relatively little overlap in the main floruits of these two wares, whereas Cologne and Trier had a considerable period of competition in the supply of beakers, that did not come to an end until *c*. AD 260. All of this is reflected in the wares produced in the Nene Valley, where the earlier vessels are tulip-shaped, cornice-rimmed beakers, copying both Central Gaulish (dark colour-coated with red fabric) and Cologne (dark colour-coated with white fabric) vessels, and the later vessels are neck globular beakers copying Trier products (although some similar vessels had already been made in Central Gaulish production centres).

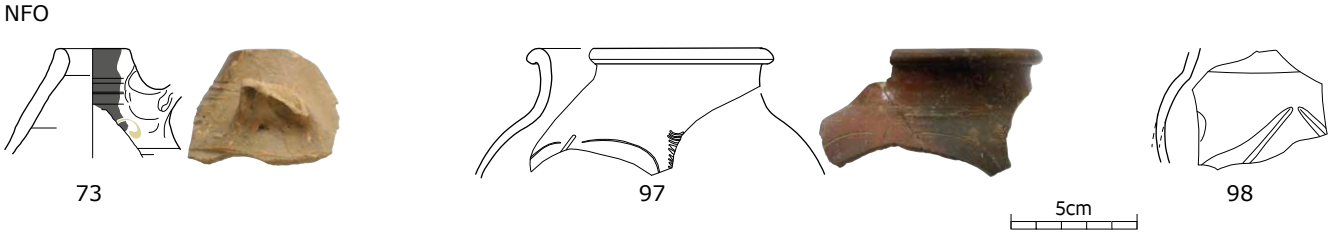


Figure 1.34. Overview of the New Forest vessels attested at the south-west corner site.

Table 1.38. Quantification of represented fine wares according to production regions and fabric, and according to function/form, based on sherd count (below) and sherd count % (next page).

origin	description	FABRIC / FORM TYPE	flagons	flagons/ beakers	jars	beakers	bowls	bowls/ dishes	dishes	cups	mortaria	lamp	misc.	closed vessels	sherds
African	African red slipped	**AFR RS**							1					1	**2**
British	Colchester cc (1)	**COL CC I**				1									**1**
	Colchester cc (2)	**COL CC II**				10									**10**
	Colchester fabric MR	**COL MR**				1	3	1					1	1	**7**
	Hadham black	**HAD BW**				2		1							**3**
	Hadham red	**HAD RS**	1	1	1	7	8	2			3		2	4	**29**
	Lower Nene Valley	**LNV CC**	5			86	5	1				1			**98**
	New Forest colour-coated	**NFO CC**	1	1		35									**37**
	Oxfordshire black-slipped	**OXF BS**	1			4	2								**7**
	Oxfordshire cc	**OXF CC**				1									**1**
	Oxfordshire red/brown cc	**OXF RS**	7	5		16	33	8	6	1	20		2	1	**99**
	Oxfordshire white-slipped	**OXF WS**					1								**1**
	Oxfordshire parchment	**OXPA**					1								**1**
	Pevensey red-slipped	**PEV RS**						1							**1**
Gaulish	Argonne colour-coated	**ARG**	3	1		6								5	**15**
	Argonne black-slipped	**ARG BS**				57								1	**58**
	Argonne red-slipped	**ARG RS**	4			1									**5**
	Central Gaulish black metallic	**CGBL**				1									**1**
	La Madeleine black-slipped	**LM BS**				2									**2**
German	Cologne colour-coated	**KOL CC**				238			42						**280**
	Moselkeramik	**MOS BS**		1		297		1		1					**300**
	late Trier black-coated	**late Trier**				184							1	1	**186**
unattr.	unattributed black-slipped	**BS**				3									**3**
	unattributed glazed	**GLAZ**				1									**1**
	unattributed red-slipped	**RS**	1			3									**4**
	unattributed white cc	**WCC**				1									**1**
	unattributed cc	**misc. CC**			2	16	1	1					1	3	**24**
	TOTAL		**23**	**9**	**3**	**973**	**54**	**16**	**49**	**2**	**23**	**1**	**7**	**17**	**1177**

origin	description	FABRIC / FORM TYPE	flagons	flagons/ beakers	jars	beakers	bowls	bowls/ dishes	dishes	cups	mortaria	lamp	misc.	closed vessels	sherds
			%	%	%	%	%	%	%	%	%	%	%	%	%
African	African red slipped	**AFR RS**							50.0					50.0	**100.0**
British	Colchester cc (1)	**COL CC I**				100.0									**100.0**
	Colchester cc (2)	**COL CC II**				100.0									**100.0**
	Colchester fabric MR	**COL MR**				14.3	42.9	14.3					14.3	14.3	**100.0**
	Hadham black	**HAD BW**				66.7		33.3							**100.0**
	Hadham red	**HAD RS**	3.4	3.4	3.4	24.1	27.6	6.9			10.3		6.9	13.8	**100.0**
	Lower Nene Valley	**LNV CC**	5.1			87.8	5.1	1.0				1.0			**100.0**
	New Forest colour-coated	**NFO CC**	2.7	2.7		94.6									**100.0**
	Oxfordshire black-slipped	**OXF BS**	14.3			57.1	28.6								**100.0**
	Oxfordshire cc	**OXF CC**				100.0									**100.0**
	Oxfordshire red/brown cc	**OXF RS**	7.1	5.1		16.2	33.3	8.1	6.1	1.0	20.2		2.0	1.0	**100.0**
	Oxfordshire white-slipped	**OXF WS**					100.0								**100.0**
	Oxfordshire parchment	**OXPA**					100.0								**100.0**
	Pevensey red-slipped	**PEV RS**						100.0							**100.0**
Gaulish	Argonne colour-coated	**ARG**	20.0	6.7		40.0								33.3	**100.0**
	Argonne black-slipped	**ARG BS**				98.3								1.7	**100.0**
	Argonne red-slipped	**ARG RS**	80.0			20.0									**100.0**
	Central Gaulish black metallic	**CGBL**				100.0									**100.0**
	La Madeleine black-slipped	**LM BS**				100.0									**100.0**
German	Cologne colour-coated	**KOL CC**				85.0			15.0						**100.0**
	Moselkeramik	**MOS BS**		0.3		99.0		0.3		0.3					**100.0**
	late Trier black-coated	**late Trier**				98.9							0.5	0.5	**100.0**
unattr.	unattributed black-slipped	**BS**				100.0									**100.0**
	unattributed glazed	**GLAZ**				100.0									**100.0**
	unattributed red-slipped	**RS**	25.0			75.0									**100.0**
	unattributed white cc	**WCC**				100.0									**100.0**
	unattributed cc	**misc. CC**			8.3	66.7	4.2	4.2					4.2	12.5	**100.0**

6. Catalogue of the illustrated fine wares of the south-west corner site

Table 1.39. The illustrated non-samian fine wares of the south-west corner site. Context, characteristics and description. The catalogue numbers are linked to Plates CXXX-CXXXIV. The catalogue is followed by the clarification of the used codes.

ill. no.	(fort) level	code	date AD	description	rim diam. (in mm)	sherd count	MNI	EVE	g
1.	1	KOL CC 3J	100-250	Cologne cc ware tulip-shaped beaker with dark green slip, Hees 2 or 3; the complete base of a small vessel		2	1		47
2.	1	KOL CC 3J rod	100-250	Cologne cc ware tulip-shaped beaker with dark grey slip, Hees 3, with several rows of rouletted decoration		7	1		93
3.	1	KOL CC 3J	100-250	Cologne cc ware tulip-shaped beaker with dark grey slip, Hees 3	55	3	1	34%	11
4.	1	KOL CC 3J rod	100-250	Cologne cc ware tulip-shaped beaker, Hees 3b	95	8	1	45%	74
5.	1	MOS BS 3K rod	180-275	Moselkeramik necked globular beaker, NB 33; profile; three rows of rouletting	65	12	1	69%	77
6.	1	MOS BS 3K rod	180-275	Moselkeramik necked globular beaker, NB 33; base, with lower row of rouletting preserved		2	1		14
7.	1+2	KOL CC 3J rod	100-250	Cologne cc ware tulip-shaped beaker with dark green grey slip, Hees 3 / Höpken E22, and rouletted decoration; almost complete profile		3	1		206
8.	2	KOL CC 3E bad	100-250	Cologne cc ware beaker with short everted rim, barbotine decoration and abraded dark grey slip; NB 32b	80	1	1	2%	14
9.	2	KOL CC 3E rod	100-250	Cologne cc ware beaker with short everted rim, roulette decoration and orange to grey slip; NB 32c; base		3	1		117
10.	2	KOL CC 3E	100-250	Cologne cc ware beaker with short everted rim, with orange to dark grey slip, NB 32	140	1	1	6%	8
11.	2	KOL CC 3J rod	100-250	Cologne cc ware tulip-shaped beaker with dark grey slip and rouletted decoration; Hees 3b / NB 30b		2			21
12.	2	KOL CC 3J	100-250	Cologne cc ware tulip-shaped beaker; Hees 3; base and wall of small vessel		1	1		36
13.	2	KOL CC 3J	100-250	Cologne cc ware tulip-shaped beaker; Hees 3, with dark grey slip	50	1	1	14%	4
14.	2	KOL CC 5J	100-250	Cologne cc ware dish with plain, incurving rim, with orange to dark brown slip; Hees 17a / NB 40 / Höpken E1/E2		3	1		
15.	2	KOL CC 5J	100-250	Cologne cc ware dish with plain, incurving rim, with orange to brown slip, Hees 17a / NB 40 / Höpken E1/E2	270	1	1	4%	15
16.	2	MOS BS 3 bad wpd	255-280	Moselkeramik beaker sherd with white barbotine and white painted decoration; part of a motto beaker with part of painted letter		1			2
17.	2+3	MOS BS 3K	180-275	Moselkeramik necked globular beaker, NB 33	70	1	1	29%	5
18.	3	KOL CC 3E rod	100-250	Cologne cc ware beaker with short everted rim with dark grey slip, NB 32c	85	2	1	15%	9
19.	3	KOL CC 3J bad	100-250	Cologne cc ware tulip-shaped beaker with dark grey green slip with orange brown spots, Hees 3c / NB 30c; complete profile with barbotine-decorated hunting scene	55	5	1	53%	73
20.	3	KOL CC 3J rod	100-250	Cologne cc ware tulip-shaped beaker with brown slip, Hees 3b / NB 30b	90	1	1	18%	13
21.	3	KOL CC 3 rod	100-250	Cologne cc ware beaker with dark grey slip with orange brown spots at the base, NB 32c; base with lower body		1	1		142
22.	3	MOS BS 3K rod	180-275	Moselkeramik necked globular beaker, NB 33	80	1	1	7%	7
23.	3	MOS BS 3K rod	180-275	Moselkeramik necked globular beaker, NB 33a / Symonds Trier form 1, with tall neck	55	3	1	20%	18
24.	3	MOS BS 3K	180-275	Moselkeramik necked globular beaker, NB 33, Symonds Trier form 1	40	1	1	29%	6
25.	3	MOS BS 3 wbad wpd	255-280	Moselkeramik motto beaker, with one white painted letter preserved: I with rouletting row on top and underneath row of short lines and below part of scroll		1			2
26.	3	late Trier? 3 rod	300-400	Late Trier beaker with rouletted decoration	80	1	1	21%	10
27.	3+4	late Trier 3K rod	300-400	Late Trier necked globular beaker, Symonds form 1, Group 61 (fig. 46); large part of vessel but without rim or base		16			131
28.	4	KOL CC 3E rod	100-250	Cologne cc ware beaker with short everted rim with dark grey slip, NB 32c (residual)	80	1	1	8%	5
29.	4	KOL CC 3J bad	100-250	Cologne cc ware tulip-shaped beaker with dark grey slip, Hees 2; with barbotine-decorated hunting scene (?)	120	1	1	7%	7
30.	4	KOL CC 3J bad	100-250	Cologne cc ware tulip-shaped beaker, Hees 2b; base with barbotine-decorated hunting scene		1	1		30
31.	4	KOL CC 3K rod	100-250	Cologne cc ware necked beaker with roulette decoration		1			3
32.	4	COL CC II 3L	200-300	Colchester cc ware (type 2) pentice beaker, Symonds & Wade 1999, fig. 5.36, nos 179-181	90	2	1	20%	21
33.	4	MOS BS 3E	180-275	Moselkeramik beaker with short everted rim, NB 32; burnt to black	55	1	1	40%	17
34.	4	MOS BS 3K wbad wpd	280-310/315	Moselkeramik necked globular motto beaker, NB 33, similar to Symonds Trier form 1, Group 36, fig. 28; with very metallic slip, and with white barbotine wavy lines above and beneath the white painted letter E; Künzl (1997) Gruppe IV	45	1		17%	3
35.	4	MOS BS 3K wbad wpd	280-310/315	Moselkeramik necked globular motto beaker, NB 33a/ Symonds Trier form 1, Group 36, fig. 28; probably the same small individual as C 5048 and C 5054?; with bands of white barbotine decoration above and below the white painted letters A (?), P E and V, with a large white dot as a separator; Künzl (1997) Gruppe IV	60	14	1	5%	9
36.	4	MOS BS 3K wbad wpd	260-270	Moselkeramik necked globular beaker, NB 33/ Symonds Trier form 1, Group 36, fig. 29; with motto:]VEA[; Künzl (1997) Gruppe II; almost complete profile, without the rim	50	6	1	7%	77
37.	4?	MOS BS 3 wbad wpd	270-280	Moselkeramik globular motto beaker, NB 33, Symonds Trier form 1; barbotine-decorated scrolls, dots and short lines with part of letter I in white painted decoration (lacking rim or base); Künzl (1997) Gruppe IIIc		2			27

ill. no.	(fort) level	code	date AD	description	rim diam. (in mm)	sherd count	MNI	EVE	g
38.	4	MOS BS 3K rod	180-275	Moselkeramik necked globular beaker, NB 33c, similar to Symonds Trier form 1, Group 33, fig. 25, no. 490; with vertical indentations and roulette decoration		1			5
39.	4	MOS BS? 3K rod	180-275	Moselkeramik necked globular beaker, NB 33c/ Symonds Trier form 1, Group 35, fig. 27; base, and body only; burnt; cross-join with FL5		1			
40.	4	MOS BS 3 wbad wpd	180-275	Moselkeramik beaker, NB 33c, with white barbotine & white painted decoration		1			5
41.	4	MOS BS 3 wbad	180-275	Moselkeramik beaker, NB 33c, barbotine drops on edge of deep indentation; burnt		1			6
42.	4	MOS BS 3	180-275	Moselkeramik globular beaker, NB 33; base and part of lower body		1	1		21
43.	4	MOS BS 3	180-275	Moselkeramik beaker, NB 29, Symonds form 2; burnt	50	3	1	50%	18
44.	4	ARG BS 3 rcd2, rod	200-300	Argonne black-slipped ware, with silvery metallic cc; Chenet 339a, a rare beaker form with both roughcasting and rouletting		6			10
45.	4?	LNV CC 3 wpd	150-400	Lower Nene Valley ware beaker with black slip, and white painted lattice decoration		1			3
46.	4	LNV CC 1/3 wbad, rod	150-400	Lower Nene Valley ware beaker or flagon with black slip, and white barbotine diagonal lines, with one band of rouletting visible		2			9
47.	4	LNV CC 3 rod	150-400	Lower Nene Valley ware beaker, with red-brown interior slip and flamed bluish-grey metallic exterior, with three rows of rouletting		4			51
48.	4	LNV CC 3K wbad, rod	150-400	Lower Nene Valley ware necked globular beaker with black cc and white barbotine lattice decoration, with two bands of rouletting; cross-join with FL5		2	1		138
49.	4	OXF RS 4M?	240-400	Oxfordshire red/brown colour-coated ware, probably the base of a flanged bowl copying Dragendorff form 38		1	1		46
50.	4	late Trier 3JP	300-400	late Trier beaker with pedestal base (Symonds 1992, Group 21, fig 16, nos 348-350 203-212), with orange slip		1	1		10
51.	4	late Trier? 3	300-400	late Trier (?) beaker	65	1	1	10%	3
52.	4	late Trier? 3 wpd	300-400	late Trier (?) beaker, with some very small white painted drops		1	1		43
53.	4+5	ARG BS 3K	200-300	Argonne black-slipped ware necked globular beaker, NB 33a	90	5	1	14%	14
54.	4+5	ARG BS? 3	200-300	Argonne black-slipped ware necked beaker, Symonds form 2 (Group 21, nos 348-9); burnt to black	60	1	1	6%	7
55.	4+5	MOS BS 3K	180-275	Moselkeramik necked globular beaker, NB 33, Symonds Trier form 1	40	1	1	24%	5
56.	4+5	MOS BS 3 wbad wpd	255-280	Moselkeramik necked globular motto beaker, NB 33, Symonds Trier form 1, with part of a barbotine scroll with white painted letter underneath		1			6
57.	4+5	MOS BS 3 wbad rod	255-280	Moselkeramik motto beaker with white barbotine scroll and row of dots and one band of rouletting		1			3
58.	5	KOL CC 3J bad	100-250	Cologne cc ware tulip-shaped, Hees 3c / NB 30c, with dark grey slip and underslip barbotine hunting scene decoration: part of animal body underneath line of drops	90	1	1	8%	20
59.	5	KOL CC 3 bad	100-250	Cologne cc ware beaker with dark grey slip; underslip barbotine hunting scene with running deer		1			23
60.	5?	KOL CC 3J bad	100-250	Cologne cc ware tulip-shaped beaker, Hees 3c / NB 30c, with underslip barbotine decoration hunting scene (?)		1	1		43
61.	5	MOS BS 3E	180-275	Moselkeramik beaker with short everted rim, NB 32; burnt	50	1	1	20%	9
62.	5	MOS BS 3K wbad	180-275	Moselkeramik necked globular beaker, NB 33, with white barbotine-decoration of circles and scrolls; at the bottom a row of dots, at the top a wavy line	70	7	1	12%	37
63.	5	MOS BS 3K	180-275	Moselkeramik necked globular beaker, NB 33	100	1	1	7%	4
64.	5	MOS BS 3K	180-275	Moselkeramik necked globular beaker, NB 33c, Symonds Trier form 1; small individual	70	4	1	24%	7
65.	5	MOS BS? 3	180-275	Moselkeramik beaker, NB 33 (?); with black coating on the base interior; burnt		1	1		65
66.	5	MOS BS 3 rod	180-275	Moselkeramik beaker, NB 33 (?); with one band of rouletting at the lower body		1	1		30
67.	5	ARG BS 3K	200-300	Argonne black-slipped ware necked globular beaker, NB 33, with a long neck	60	2	1	41%	28
68.	5	ARG BS 3	200-300	Argonne black-slipped ware beaker, base only		1	1		7
69.	5	ARG RS 1	200-300	Argonne red-slipped ware flagon, 3-lobed handle		1	1		38
70.	5 (+4)	LNV CC 3	300-400	Lower Nene Valley ware beaker with pale brown to black slip, HPM 52; small bead under the rim	90	1	1	9%	7
71.	5	LNV CC 3	300-400	Lower Nene Valley ware beaker with red interior and black exterior cc, variant of HPM 52	100	1	1	12%	11
72.	5	LNV CC 3 wpd	200-400	Lower Nene Valley ware beaker with orange slip and white painted lattice decoration		1			12
73.	5	NFO CC? 1 wbad	300-400	New Forest colour-coated ware (?) flagon with greyish brown interior and exterior cc, orange; not a rim, but probably the neck of a flagon with start of a handle and part of a barbotine scroll decoration fabric; fabric identification Malcolm Lyne, *pers. comm.*		1			26
74.	5	OXF RS 4C51	240-400	Oxfordshire red/brown colour-coated ware, Young C51, copy of Drag. 38; interior coating worn collar with part of wall		2	1		96
75.	5	OXF RS? 4C73 STD	270-400	Oxfordshire red/brown colour-coated ware, Young C73 / 84, with stamped decoration	150	1	1	7%	16
76.	5	OXF RS? 4C84 STD	350-400	Oxfordshire red/brown colour-coated ware, Young C84, with stamped decoration	140	1	1	3%	18
77.	5	OXF RS 7C97	240-400	Oxfordshire red/brown colour-coated ware, Young C97, mortarium copying Drag. 45; stylised spout hole surrounded by oblique incised lines (bat's head or lion's head missing); with a second, lower reparation (?) hole	170	1	1	7%	29

ill. no.	(fort) level	code	date AD	description	rim diam. (in mm)	sherd count	MNI	EVE	g
78.	5 (+4)	OXF RS 7C97	240-400	Oxfordshire red/brown colour-coated ware, Young C97, mortarium copying Drag. 45; partly burnt to black		2	1		57
79.	1>5	OXF RS 7C100	300-400	Oxfordshire red/brown colour-coated ware, Young C100.2, mortarium with angular flange	180	1	1	9%	45
80.	5	PEV RS 4/5	300-400	Pevensey red-slipped ware, base of bowl or dish		1	1		68
81.	5	late Trier 3	300-400	late Trier beaker, base and lower body		4	1		91
82.	5	RS? 1 wpd	undet.	unattributed red-slipped ware flagon with white painted dots (diameter 3 to 4 mm)		1			8
83.	4+5+ post	MOS BS 3K wbad rod	180-275	Moselkeramik necked globular beaker with white barbotine wavy line and one band of rouletting, NB 33, Symonds Trier form 1	70	1	1	2%	12
84.	5+ post	HAD RS 3E	200-400	Hadham red ware beaker with short everted rim, similar to Symonds & Wade, fig. 5.55, no. 133; three non fitting rim sherds, all somewhat burnt	120	3	1	42%	63
85.	5+ post	OXF RS 1C8	240-400	Oxfordshire red/brown colour-coated ware, Young C8 flagon	50	1	1	12%	14
86.	5+ post	OXF RS 4C81	300-400	Oxfordshire red/brown colour-coated ware, wall-sided, bead-rimmed carinated bowl, Young C81, with very abraded surfaces	180	1	1	14%	78
87.	5+ post	OXF RS 4M wpd	350-400	Oxfordshire red/brown colour-coated ware, Young C52.4; Dr 38-type flanged bowl with white painted decoration on the collar; interior coating abraded	180	1	1	12%	190
88.	5+ post	late Trier 3K	300-400	late Trier necked globular beaker, Symonds Trier form 1	70	1	1	13%	3
89.	post	AFR RS? 5	360-470	African red slipped ware dish, rim of Hayes form 67-72	340	1	1	4%	50
90.	post	KOL CC 5J	100-250	Cologne cc ware dish with plain, incurving rim, with orange slip, Hees 17a / NB 40 / Höpken E1/E2	250	4	1	3%	117
91.	post	CGBL 3 bad	120-250	Central Gaulish black metallic ware beaker with a row of (underslip) barbotine dots		1			6
92.	post	ARG BS 3K rod	200-300	Argonne black-slipped ware necked globular indented beaker, NB 33c, Symonds form 1 with large oval indentations and bands of rouletting at the join of neck & shoulder (cf Symonds 1992, fig. 18, Group 25, nos 393 & 397)	70	1	1	6%	15
93.	post	ARG CLV	300-400	Argonne ware, mid-body of beaker or flagon with white-painted decoration, similar to Chenet 1941, Pl. 17, types 334-5; burnt		5	1		34
94.	post	LNV CC 3L	300-400	Lower Nene Valley ware pentice beaker with short everted rim with black cc, probably HPM fig. 5, nos 54-7	90	1	1	11%	6
95.	post	LNV CC 4M	300-400	Lower Nene Valley ware flanged bowl with dark green to black brown cc; HPM fig. 7, no. 79, Cam form 305B/Symonds & Wade EA type 79, London form 4M	200	2	1	8%	47
96.	post	LNV CC 9A?	200-400	Lower Nene Valley ware with orange brown cc; small vessel or oil lamp		1	1		28
97.	post	NFO CC 3 cgt	300-400	New Forest colour-coated ware beaker with short neck, Fulford fabric 1a (metallic); with incised curved lines, vertical stamped lines and vertical indentations; burnt; joins with OS4967a		11	1	54%	69
98.	post	NFO CC 3 cgt	300-400	New Forest colour-coated ware beaker, Fulford fabric 1a (metallic); with linear, oblique indentations		1			14
99.	post	OXF BS? 3	240-400	Oxfordshire black-slipped ware beaker	70	1	1	13%	10
100.	post	OXF BS 4M	300-400	Oxfordshire black-slipped ware flanged bowl, Young C51/ Dr 38		1	1		52
101.	post	OXF RS 1C8	240-400	Oxfordshire red/brown colour-coated ware flagon, Young C8		1	1		18
102.	post	OXF RS? 1C13?	350-400	Oxfordshire red/brown colour-coated ware (?) flagon, probably Young C13	120	1	1	8%	6
103.	post	OXF RS? 3 rod, wpd	240-400	Oxfordshire red/brown colour-coated ware beaker with orange fabric and slip; with white painted wavy line, curved lines and dots		3			8
104.	post	OXF RS? 4C55 rod	240-400	Oxfordshire red/brown colour-coated ware bowl, probably Young C55, with multiple bands of rouletting on lower body		2	1		201
105.	post	OXF RS 4C69 rod, wpd	325-400	Oxfordshire red/brown colour-coated ware bowl, Young C69.2, with bands of rouletting above and below white-painted scroll decoration	130	1	1	5%	15
106.	post	OXF RS 4C83 rod, std	300-400	Oxfordshire red/brown colour-coated ware bowl, Young C83/84, with band of rouletting line and row of stamped shell decoration; burnt		1			28
107.	post	OXF RS 4C84 std	350-400	Oxfordshire red/brown colour-coated ware bowl, Young C84.7, with two rows of stamped shell decoration	160	1	1	9%	24
108.	post	OXF RS 4M	300-400	Oxfordshire red/brown colour-coated ware flanged bowl, Young C51	170	1	1	18%	81
109.	post	OXF RS 4M	300-400	Oxfordshire red/brown colour-coated ware flanged bowl, Young C51; almost burnt to black	180	2	1	11%	56
110.	post	OXF RS 4M wpd	350-400	Oxfordshire red/brown colour-coated ware flanged bowl, Young C52.4 with white painted scroll decoration on the flange	170	1	1	2%	31
111.	post	OXF RS 4M wpd	350-400	Oxfordshire red/brown colour-coated ware flanged bowl, Young C52, with white painted decoration on the flange (worn)	180	1	1	8%	73
112.	post	OXF RS 5C44	270-400	Oxfordshire red/brown colour-coated ware dish, Young C44/45, or Dr 18/31	200	1	1	4%	20
113.	post	OXF RS 5C49 rod	240-400	Oxfordshire red/brown colour-coated ware dish, Young C49, with rouletting on the rim	220	1	1	8%	22
114.	post	OXF RS 5C50 rod, wpd	325-400	Oxfordshire red/brown colour-coated ware dish, Young C50, with rouletting on rim and white painted scroll decoration	270	1	1	7%	37
115.	post	OXF RS 5C50 wpd	325-400	Oxfordshire red/brown colour-coated ware dish, Young C50, with white painted decoration on the rim	250	1	1	13%	43

ill. no.	(fort) level	code	date AD	description	rim diam. (in mm)	sherd count	MNI	EVE	g
116.	post	OXF RS 7C98 wpd	350-400	Oxfordshire red/brown colour-coated ware mortarium, Young C98 or Dr 45 with fine micaceous fabric, and white painted scroll decoration; burnt to black	210	3	1	6%	43
117.	post	OXF RS 7C100 rod	300-400	Oxfordshire red/brown colour-coated ware mortarium, Young C100.10, with rouletting on flange	160	1	1	4%	23
118.	post	OXF RS 7C100	300-400	Oxfordshire red/brown colour-coated ware mortarium, Young C100.2; interior worn, but with some remaining trituration grits	180	3	1	15%	46
119.	post	OXF RS 7C100	300-400	Oxfordshire red/brown colour-coated ware mortarium, Young C100.2, with very densely-packed trituration grits; burnt	200	1	1	2%	39
120.	post	late Trier 3K	300-400	late Trier necked globular beaker, Symonds 1992, Groups 61-3	65	1	1	13%	5
121.	post	late Trier 3K	300-400	late Trier necked globular beaker, Symonds 1992, Groups 61-3	80	1	1	10%	3
122.	post	late Trier 3K	300-400	late Trier necked globular beaker, Symonds 1992, Groups 61-3	50	1	1	23%	8
123.	post	late Trier 3K	300-400	late Trier necked globular beaker, Symonds 1992, Groups 61-3	80	1	1	22%	15
124.	post	late Trier 3K	300-400	late Trier necked globular beaker, Symonds 1992, Groups 61-3	70	1	1	14%	8
125.	post	late Trier 3 wpd	300-400	late Trier ware, with white painted scroll decoration		1			9
126.	post	late Trier 3 rod wpd	300-400	late Trier ware, with white painted dot decoration with one band of rouletting		1			4
127.	post	late Trier 3 rod wpd	300-400	late Trier ware, with white painted scroll decoration and a double band of rouletting		1			8
128.	post	late Trier 3 wpd	300-400	late Trier ware, with white painted dot and scroll decoration		1			10
129.	post	late Trier? 3	300-400	late Trier ware beaker base		1	1		20
130.	post	CC 4? rod		pale colour-coated fabric more likely to be a colour-coated variation of a late sigillata bowl, similar to Dr 49, but with a more simple curved rim; with bands of rouletting; not a common fabric or form	160	1	1	8%	10

decoration code	start date	end date	decoration	form code	form
al	120	250	black-burnished-type acute lattice decoration	1	flagons
bad	50	400	barbotine decoration (under CC)	1/3	flagons/beakers
cgd	50	400	cut glass decoration	2	jars
rcd	50	400	unidentified roughcast decoration	3	beakers
rcd1	50	120	sand/quartz roughcast decoration	4	bowls
rcd2	50	300	clay pellet/grog roughcast decoration	4/5	bowls/dishes
rod	50	400	rouletted decoration (incl. knife-trimming)	5	dishes
rpd	50	400	red painted decoration	6	cups
std	50	400	stamped decoration	7	mortaria
tbd	50	400	thumbed decoration	9	lids
wbad	180	300	white barbotine decoration	clv	closed vessels
wpd	270	400	white painted decoration (on late wares)	10	unidentified

3. Marbled wares

Robin P. Symonds

1. Description of the marbled ware assemblage

A total of 194 sherds, representing a minimum of 32 vessels, measuring a total of 1.75 estimated vessel equivalents (EVEs) and weighing a 3451 g, are reported on in this section. The marbled-type wares include just three identified fabrics, *céramique à l'éponge*, Lower Rhineland marbled ware and Verulamium marbled ware, along with some unidentified vessels. The presence of Verulamium marbled ware is limited to two sherds, each weighing 11 grammes and both of uncertain identification (*sandy white fabric with reddish slip, very abraded*), but perhaps from the same vessel. A few representative fragments are catalogued in Table 1.40 (Plate XXXV).

The largest category of the marbled ware assemblage, between about 46% (by EVEs) and 69% (by MNI), is composed of *céramique à l'éponge*. This ware, generally dated to the 3rd and 4th centuries (Tyers 1996b, 144; Brulet 2010a, 262), was made in western Gaul, probably in the region surrounding Poitiers (Raimbault 1973; Simon-Hiernard 1991; Sireix and Convertini 1997; Guitton 2012). This late production seems to have much in common with the late productions of Oxfordshire and Hadham in Britain, as well as having some connections with productions in the Argonne (Barat 2011; Guitton 2012). All four of these late ware types are characterized by a quite varied typological range that includes some late samian forms, notably versions of Dragendorff forms 37, 38 (the most common) and 45, as well as flagons, beakers, bowls and dishes. At Oudenburg, the *céramique à l'éponge* occurs in a wide range of forms, although closed forms (flagons, beakers, jars/beakers and otherwise undistinguishable closed vessels) are very predominant. This seems to contrast somewhat with some other assemblages of the ware, notably one from the site of the Cité Judiciaire at Bordeaux, which furnished some 47 individuals (MNI), of which 45 were flanged bowls (versions of Dragendorff 38) and there were no closed vessels at all (Sireix and Convertini 1997, 322 and fig. 2). Closed vessels, including flagons and beakers, are present in the assemblages from the Poitiers region (Raimbault 1973; Guitton 2010) and in Île de France (Barat 2011), but clearly they are not the main forms there. Only Guitton (2010) shows quantifications: in his histogram of general forms, open forms (various bowl forms and mortaria) reach 68.71%, dishes and platters reach 17.18%, but flagons and pichets account for just 14.11%.

Céramique à l'éponge begins to appear at Oudenburg at fort level 4, but 113 of the 131 sherds, or 86%, were found in the 5+post- and post-Roman levels. By other measures the percentage is closer to 80%, but generally it is not appropriate to present the percentages for all the marbled wares, since in most cases the total sums are too low for percentages to be useful. Two illustrated vessels (Plate CXXXV: 1-2) are probable representatives of *céramique à l'éponge*, although neither one is typical. Both are plain dishes, with a slightly thickened rim, similar to Raimbault 1973, Pl. 1, Forme II, Type B, 8.

The second most common marbled ware type is Lower Rhineland marbled ware which can be generally dated from the middle of the 3rd to the early 5th century (cf. Brulet 2010b, 385 with references). This pottery was first described in detail by Oelmann (1914), and then divided into two categories by Hussong and Cüppers (1972), with a broader typology included in Gose 1950/1976 (the later forms being numbers 261 to 282). The ware's presence in Britain has been highlighted by Bird and Williams (1983). In the marbled ware assemblage of the south-west corner site of the Oudenburg fort, it reaches almost 40% by weight, but not quite 16% by MNI. Like *céramique à l'éponge* at Oudenburg, Lower Rhineland marbled ware occurs at the site mainly in closed forms, especially flagons. Although there is virtually no quantified data available for Lower Rhineland marbled ware to compare with, most general typologies (notably Bird and Williams 1983 and Brulet 2010b) include no forms other than flagons and pitchers[66].

Lower Rhineland marbled ware seems to be contemporary with *céramique à l'éponge* at Oudenburg. It occurs very largely in the post-Roman levels; just one sherd has been identified in fort level 4, with none in any other Roman level. Lower Rhineland marbled ware is represented here by three illustrated pieces: Plate CXXXV: 3-5. No. 3 is an example of the most common form, the disk-mouthed flagon; no. 4 may well be a flagon with spouted rim, but not enough of the rim was present to be able to suggest this in the illustration; no. 5 is a body sherd with white painted decoration.

Two body sherds of closed vessels have been identified as Verulamium Region marbled ware, each weighing 11 grammes. In both cases the identification is uncertain, and the sherds are residual in fort level 5 and in the post-Roman levels.

Some nineteen sherds are listed as unattributed marbled ware. These occur in almost as much typological variety as *céramique à l'éponge*, although it is interesting to observe that here there are at least a few bowls, as well as one mortarium sherd (just 9 grammes), and some sherds of other open forms. Like the other marbled fabrics, the

66 In Gose 1950/1976 there are three two-handled bowls (nos 274-6) in the category, but it is not clear if they really have the same fabric.

Table 1.40. The illustrated marbled wares, representative for the types attested at the Oudenburg fort. Illustration numbers refer to Plate CXXXV.

ill. no.	level	code	date AD	description	rim diam. (in mm)	n	MNI	EVE	g
1.	post	EPO MA 5J	300-400	*céramique à l'éponge* marbled ware dish, similar to Raimbault 1973, Pl. 1, Forme II, Type B, 8	200	2	1	0.13	36
2.	post	EPO MA 5J	300-400	*céramique à l'éponge* unattributed marbled ware dish, similar to Raimbault 1973, Pl. 1, Forme II, Type B, 8	210	2	1		26
3.	post	LOR MA 1D	300-450	Lower Rhineland marbled ware disk-mouthed flagon, similar to Bird and Williams 1983, Fig. 2, no. 2, Gose 261/2	63	4	1	0.69	106
4.	post	LOR MA 1 WPD	300-400	Lower Rhineland marbled ware flagon, with white painted decoration, similar to Gose 277-282, except that the rim appears to be circular, rather than spouted – but less than 10% of the rim was recovered	110	23	1	0.09	587
5.	post	LOR MA CLV WPD	300-400	Lower Rhineland marbled ware closed vessel with white painted decoration (large dots)		2			13
6.	5+post	MARB OPV WPD		unattributed marbled ware open vessel, base with broad footring; dark coloured paint dripping on exterior surface		1	1		48

unattributed ware occurs mostly in the post-Roman levels. The one illustrated piece in this category, Plate CXXXV: 6, is the base of an open vessel with a broad footring.

2. Conclusions from the marbled wares

The marbled-type ware fragments at the Oudenburg fort occur first at fort level 4, although very limited, and are mainly predominant in the 5+post/post-Roman levels as residual items. Since this pottery category is mainly a late type, one can assume that the fragments in the 5+post/post-Roman levels can all be attributed to the fort occupation, and more specifically can be assigned mostly to fort level 5.

Marbled wares are something of an anomalous category. Although the quality of the decorative effect of the marbled surface may vary considerably, it does seem to be enough to define this class of pottery. The types clearly have affinities with both samian and colour-coated and black-slipped wares, and have many similarities with the wares produced in Oxfordshire, at Hadham and in the Argonne. If they had been included in the colour-coated and black-slipped wares report, *céramique à l'éponge* would have been the fourth most common fabric, and Lower Rhineland marbled ware would have been the eighth most common (by sherd count). It seems fair to say that this makes these two marbled ware types somewhat more common at Oudenburg than they generally seem to be in Britain. This is probably to be explained by Oudenburg's position as a site mainly supplied by production sites in the Rhineland and Gaul. Apart from the very minor production at Verulamium, marbled-type wares do not seem to have been made in Roman Britain, nor do they appear to have established a market in Britain.

It is also interesting to observe that *céramique à l'éponge* is more or less the only fine ware to have reached Oudenburg from so far south in Gaul. While there are some fine wares from the Argonne region, but none at all from Jaulges-Villiers-Vineux, along with one sherd of Central Gaulish black ware and two from La Madeleine, it is hard to say exactly why *céramique à l'éponge* managed to travel so far north while some contemporary wares did not.

4. Fine oxidized wares

Sonja Willems

Within the total pottery assemblage of the site, only 83 fragments, representing sixteen individuals, were classified as belonging to the group of the fine oxidized tableware vessels. For some individuals, only partly preserved, their attribution to this group is even not absolutely certain. When it only concerns fragments, it is difficult to differentiate between flagons and tableware vessels, as certain flagons have burnished zones on the exterior.

Five individuals from the fine oxidized group originate from the Bavay-Famars region and have a soapy fabric (cf. Figure 1.35: SAV FO). Two of them have an identifiable form: a cult vessel with applied face (Plate CXXXVI: 1) and a bowl with pending collar (no. 2).

The cult vessel, recovered as a body fragment from the primary fillings of the large waste-pit OS 4980 of fort level 4 (Vanhoutte *et al.* 2009c, 108, 109: Fig. 12), belongs to the planetary vases or '*vases à visages*' (Flahaut *et al.* 2014) and shows the face of a beardless god with curled hair, probably Mercurius (no. 1). The production of these vessels has been confirmed at Famars (Willems and Borgers 2015), through the find of a face mould and through the excavation of a pottery kiln producing soapy wares. At Famars they occur mainly in late 3rd and early 4th century consumption contexts, but production of this type of cult vessels probably already started in the 1st century as the examples of Bavay testify to (Flahaut *et al.* 2014). However, the attested production at Famars is the only one proven so far.

Collared bowls in soapy fabric, such as the Oudenburg example (no. 2), are popular by the end of the 2nd and the beginning of the 3rd century. At Famars they were found together with the first productions of the soapy mortaria of the Pont-sur-Sambre type, with low internal lip (Willems *et al.* 2017a). The Oudenburg collar fragment was found in the fillings of the well OS 22926 of fort level 4 and can be seen as a residual item, possibly originally belonging to fort level 1 or 2.

Two foot bases in soapy fabric, also attributed to the Bavay-Famars productions, are very developed, with several external ribs and an annular foot elevated underneath (Plate CXXXVI: 3 and 4). This kind of base is most likely related to the cult vessels. Interesting to note is that one (no. 3) was recovered from fort level 4, the same level as the cult vessel fragment with applied face; the other was found in the final filling-in of the double well OS 2562 and must have been a dug-up item (no. 4). Other vessel sherds possibly belong to beakers, but no type can be identified. They occur from fort level 2 onwards (fort level 2: one item; fort level 3: five items; fort level 4: eight items; fort level 5: ten items; post-Roman levels: ten items).

A second area that succeeded in supplying fine oxidized wares to the Oudenburg fort is the Cambrai region. A bowl with bayonet-shaped rim, attributed to fort level 4, originated from the potteries of Les Rues-des-Vignes (no. 5). This production using a white, very fine fabric and establishing highly-burnished surfaces, has only been distributed in small quantities to sites further than a few 100 kilometres away from the workshops. These rare exported examples were found in prosperous contexts, like the neighbourhood of the temple of Famars-La Rhonelle (ongoing study), or at Avenches, Switzerland (Bosse Buchanan 2010). For this type of bowl with bayonet-shaped rim no type number is known (cf. Deru 2005), but Deru concludes that a production and distribution of this type should be set in the first quarter of the 2nd century. The Oudenburg fragment, found in the earthen rampart level which can presumably be dated to fort period 4, is therefore most likely a residual item. A second individual from the Cambrai region potteries can be identified as a beaker with short concave neck and pedestal foot (not preserved), a typical form for the period after AD 260 (no. 6). The rim fragment, recovered from a mixed level 4+5 but presumably belonging to fort level 4, seems to be burnt since it shows a dark grey fabric with a creamish slip. This slip may have been originally black to become white after exposure to fire (Figure 1.35: CAM FO).

Other identified fine oxidized fragments all have fabrics related to the regional North Gaulish production. Their fabric is comparable to the ones identified for the flagons and the mortaria (cf. Figure 1.35: NOG FO). The forms are very fragmented. Worth mentioning are the body fragments of a small beaker with knife-trimming decoration recovered from fort level 4 (no. 7), a rim from a pedestaled beaker, recovered from the large water-basin OS 4923 of fort level 5 and most likely residual (no. 8), an everted lip, slightly tapered (no. 9) and a dish with a triangular-shaped lip and burnished interior and exterior surface (no. 10), the latter two found in post-Roman levels. From the latter two it remains unclear whether they are residual items from the fort or whether they were brought in with the dark earth from outside the fort (cf. Volume I, Chapter II.2.3).

Some fragments remain of unidentified origin. A bowl with incurved wall – an unstratified find – has a micaceous fabric of unknown origin (no. 11) (cf. Figure 1.35: UNDET FO). It is uncertain whether the end represents a pending collar or the lip of the vessel. Here the fragment is presented as a bowl. One fine oxidized fragment is produced in a whitish fabric close to the ones

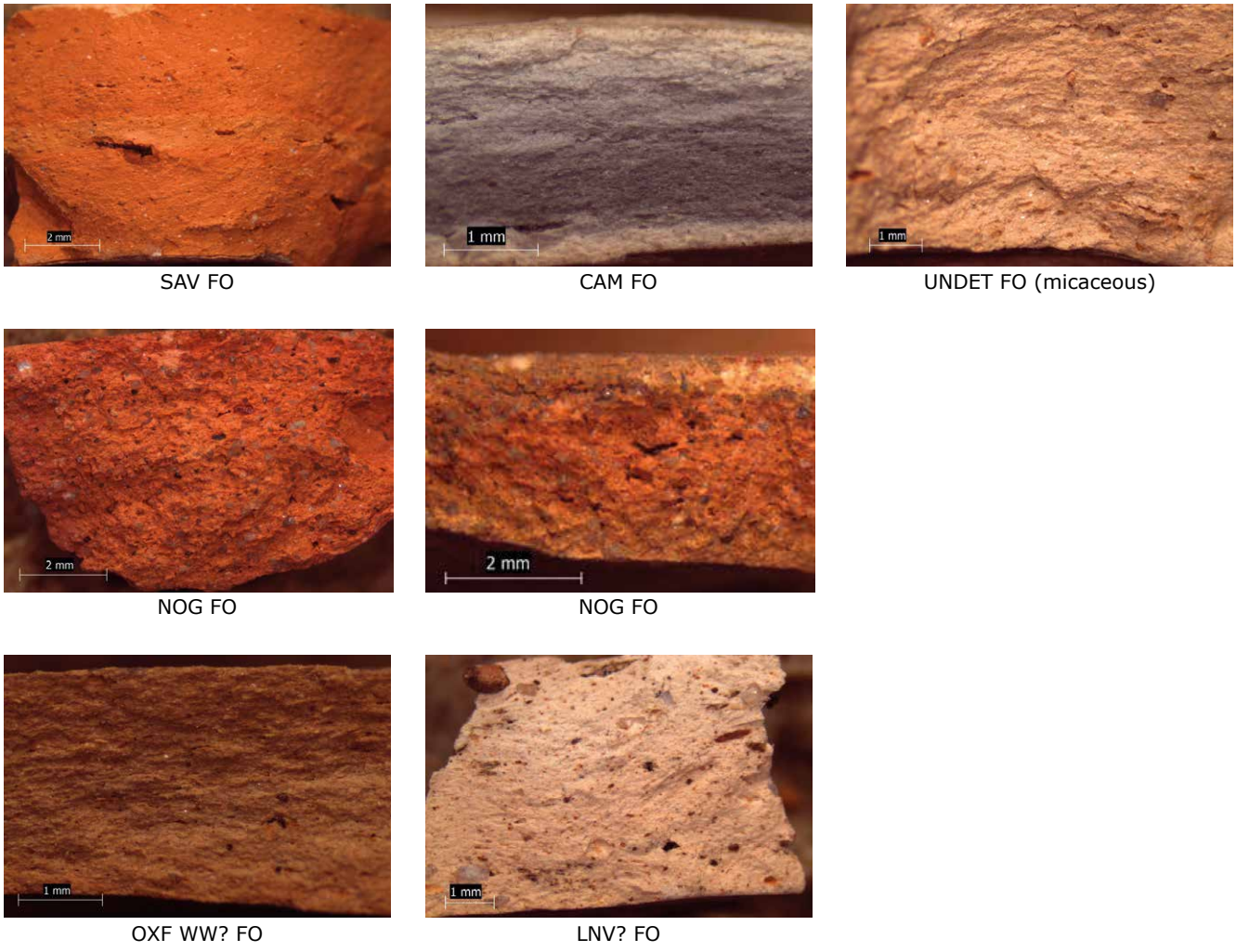


Figure 1.35. Attested fine oxidized ware fabrics at the south-west corner site: a production from Bavay-Famars (SAV FO), from the Cambresis region (CAM FO), from Oxfordshire(?) (OXF WW? FO), from Lower Nene Valley(?) (LNV? FO), regional productions from the North(?)-Menapian region (NOG FO) and an undetermined, micaceous fabric (UNDET FO). Magnifications under the binocular (Photos by S. Willems).

of the Romano-British Lower Nene Valley Wares and was found in the final layers of fort level 5 (Figure 1.35: LNV? FO). Two fragments, both recovered from fort level 3, resemble the white fabrics of the Desvres region. Four fragments, found at fort levels 4 and 5, are made of a very whitish fabric close to the Rhineland productions but this determination could not be confirmed by an identifiable form. The remains of a knife-trimming decoration possibly attribute them to the beaker group. The burnished surface excludes the possibility that they belong to the Cologne colour-coated wares of which the slip was abraded. One of the regional fragments with knife-trimming decoration can certainly be related to a beaker, supporting the identification of the former fragment as part of a drinking vessel.

The lower part of a bottle, beaker or jar with slim foot has an elevated interior base, decorated with some lines in order to emphasize the transition of wall to base (no. 12). The whitish sandy fabric is very similar to the Oxfordshire production wares but its attribution is not certain (Figure 1.35: OXF WW? FO).

A second vessel fragment in the same whitish fabric is very interesting for the interpretation of the military occupation of the fort. It is a fragment of a breast-pump found in the construction pit of the large water-basin of fort level 5 (no. 13). The upper part of the fragment, conical-shaped, ends in a small bottleneck or pipe. The other side which is not preserved, has a larger opening. Commonly this object has been interpreted as a feeding bottle but the tightness of the pipe seems to be unsuited for the nutrition of an infant. Loridant and Rouquet who studied the typology and distribution of this type of object (Rouquet and Loridant 2000), have investigated this by experiment and demonstrated the facility of the use as breast-pump (Rouquet and Loridant 2003). The find of a breast-pump in a military context is most interesting, since it most likely points to female presence at the fort site. However, the known practice of the consumption of human milk in medicine, namely in ophthalmic treatments, cannot be denied as a possibility, although it seems unlikely to us that the milk would have been brought into the fort inside the breast-pump itself and not poured into another vessel.

We can conclude that fine oxidized vessels only make out a very small part of the fort's consumption material. This is not deviant from other North Gaulish sites, where – next to the samian and the colour-coated and black-slipped wares – fine wares are mostly represented by *terra nigra* or – at late Roman sites – late reduced fine wares like the pedestaled beakers with long necks. In general, oxidized wares become less popular from the end of the 2nd century onwards, replaced by reduced local imitations of colour-coated and black-slipped pottery.

The only exception concerns the face pots, which seem very popular on late 3rd-century consumption sites. Besides the face pot type, one more individual – a Cambrai beaker – can be dated after AD 260. For the rest, the Oudenburg fine oxidized assemblage is dominated by material from the pre-fort phase and fort levels 1 and 2, mostly recovered as residual fragments from later levels.

In this small assemblage the large number and variety of fabrics is striking. Most likely, these fine oxidized vessels reached Oudenburg not as intended trade products but rather as individual items which came along with the actual trade lines. For the more exclusive types, such as the face pots, gift exchange may also be a possibility, but they may also have been part of soldier's personal items. Nevertheless, this small assemblage emphasizes the economic relations with important pottery production sites already attested in other pottery groups: workshops in the Bavay-Famars region, the Cambrai region, and of course, British workshops in the Oxford region or the Lower Nene Valley. Some of these fabrics stay unidentified, and hopefully their description will enable future recognition of commercial links.

Last but not least, the presence of cult vases and of a breast-pump puts forward the importance of daily life practices within the Roman fort. Cult vases reflect the practice of individual religious rituals, while breast pumps are of course linked to the presence of women and children within this military context.

5. Mica-dusted wares

Sonja Willems

The mica-dusted wares only form a very small assemblage with 129 fragments representing seventeen individuals in total for the Roman pottery assemblage of the site (or 0.10% in sherd count and in MNI). This small assemblage of tablewares imitating bronze vessels is very homogeneous. Only three individuals and a body fragment appear to be imported from outside the region. The others can be identified as regional productions. This is based on the similarities of their fabrics with the North Menapian reduced ware group and the North Gaulish flagon ware group for which a North Menapian origin can be assumed.

The form spectrum of the mica-dusted individuals is very limited. Most of them can be identified as flagons, of which some can clearly be recognized as oenochoes, *i.e.* flagons with scupper and handle imitating bronze examples. No less than twelve of the seventeen individuals belong to the flagon form, like *e.g.* base fragment no. 1 from mixed level 2+3 (Plate CXXXVII). The flagon/*oenochoe* fragments were recovered from fort levels 2, 3, 4 and 5.

The oenochoes had a small lid attached. One of the Oudenburg individuals, found in a context of fort level 2, is – although fragmented – rather well preserved and shows almost the complete vessel profile (Plate CXXXVII: 2; only the upper half of the vessel is illustrated). The rim has an eaves trough with clay expansions simulating a scupper lip and the start of the broken-off attachment button of the lid. Hence, the rim is not shamrock-shaped as is often the case both in the ceramic and the bronze versions. The collar is grooved, the handle triploid and the foot annular, close to the bases of certain flagons. The form of the Oudenburg *oenochoe* therefore combines type Vanvinckenroye 299 (eaves trough lip) and 301 (pronounced collar/shoulder), types dating to the second quarter of the 2nd century AD based on find contexts at Tongeren (Vanvinckenroye 1991). This date is however not compatible with the phasing at Oudenburg where the find context puts it a century later. As this flagon is so complete, it cannot be a residual item and its attribution to fort period 2 (second quarter of the 3rd century AD) demonstrates that this type continued to be in use well into the 3rd century. The couple *patera*-flagon/*oenochoe*, used during rituals of ablutions (purification by pouring liquids), is often found in funerary contexts. It is possible that also the Oudenburg oenochoes are to be situated in a ritual context. The fragments were found scattered over several features of fort level 2, like the southern section of the draining ditch dug prior to the construction of the military hospital of phase 2B, and a large pit *c.* 24 m to the north. The material recovered from their infills should be attributed to fort period 2A, which starts around AD 220. Although it cannot be determined with certainty, it is likely that the military hospital of fort period 2B had a predecessor in fort period 2A with the same function (see Volume I, Chapter II.4.4). At the inner courtyard of the *valetudinarium* of fort period 2B, a *sacellum* for the healing deities can be located based on features and finds. If a similar shrine can be supposed for period 2A, the presence of an *oenochoe* would fit in well. It may well have served a ritual purpose, for example within the context of a *lustratio* in which the body or objects were washed ritually.

A mica-dusted flagon handle, recovered from the fire layer of the top of fort level 4, bears a small pike, which is clearly a thumb support (Plate CXXXVII: 3). Its fabric is identical to mortaria fabric 5 and most likely points to a North Gaulish origin. The presence of the thumb support indicates that this form is also an imitation of a bronze vessel, namely a boiler or *oenochoe* with tubular or ridged spout. Bronze jugs of type Eggers 128 have a ridged mouth and show such thumb supports, as finds from Nijmegen show (Koster 1997, 35, *e.g.* no. 13). Pottery comparisons from the North of France (Famars, Boulogne-sur-Mer, Nesle, Vendeuil-Caply or La Boissière-École) show their presence in mainly 3rd-century and early 4th-century contexts (Flahaut, in Buchez *forthcoming*). Another mica-dusted handle, found in the large water-basin of fort level 5, also shows a small thumb support (Plate CXXXVII: 4) and indicates a second individual. Its sandy white fabric seems to be related to the Oxfordshire wares (Figure 1.36: OXF WW? MD); however, no such type is known in the Oxfordshire wares typology by Young (1977b). Maybe we should rather suggest a French origin, as La Boissière-École has also produced these vessels, using white clays. Further research is certainly needed to exclude a British origin.

The mica-dusted assemblage also includes three bowls. One of them, found at fort level 5, bears the start of a small handle, indicating that this individual was a *patera* (Plate CXXXVII: 5). Another bowl with small everted rim and found at the same level, can also be attributed to the *patera* group (no. 6). Both show a fabric likely from North(?) Menapian origin (cf. Figure 1.36: NOG MD). The third bowl, recovered from the dark earth level – therefore an origin outside the fort cannot be excluded -, has a collar (no. 7). Its beige fabric with fine silt-sized quartz inclusions remains unidentified.

Only one pot with concave collar and everted rim bears traces of mica dust (no. 8). This individual has been found in a level of the earthen rampart and can be assigned to fort level 1. Its fragmentary state allows no further identification than its general form. Its fabric resembles mortaria fabric 7, most likely of North Gaulish origin.

An irregular rim, flattened at one side, forms an exception within this assemblage (no. 9). The flattening recalls a bottle type called 'field flask', like type Vanvinckenroye 620, dated to the first half of the

NOG MD NOG MD OXF WW? MD

Figure 1.36. Some of the attested mica-dusted ware fabrics at the south-west corner site: North(?)-Menapian (?) productions (NOG MD) and a presumed Oxfordshire white ware production (OXF WW? MD). Magnifications under the binocular (Photos by S. Willems).

3rd century according to find contexts at Tongeren (Vanvinckenroye 1991). According to its find context, the Oudenburg individual can be attributed to fort period 4, the later 3rd century AD.

Most of the mica-dusted ware fragments at the Oudenburg site appear to be of regional origin. They show an orange to red fabric with regular fracture and containing medium-sized quartz, with some larger ones, all opaque or milky-white (Figure 1.36: NOG MD). The fabric resembles the one of the regional flagons with burnished surface. As mentioned above, two fragments have a fabric identical to those identified in the mortaria group (fabric 5 and 7), which are red coloured and most likely of North Gaulish (North(?)-Menapian?) origin. Only one soapy body fragment with burnished surface is possibly imported from the Bavay-Famars region.

To conclude, as for the oxidized table wares, the mica-dusted wares only represent a very limited part of the material. A similar image can be deduced from the key context assemblages from the Aardenburg fort (cf. Dhaeze 2013). The mica-dusted wares from the Oudenburg site appear to be mainly of regional origin. The couple '*patera* and *oenochoe*' is often encountered on cemetery sites, related to washing or purifying rituals. Nevertheless, the oenochoes and the *patera* from Oudenburg imitate bronze vessels and can also reflect a certain standard of living, *e.g.* wine preparation and drinking, which would not be illogical on a military site.

6. Pompeian red wares

Sonja Willems

1. Introduction to the Pompeian red ware assemblage

The dishes with internal red slip, the so-called Pompeian Red ware dishes (Peacock 1977, 147, after Loeschcke 1909, 271), belong to the cooking vessels; the slip prevented the food from sticking to the surface. The first examples of these dishes found in the North of Gaul originated from Campania and are considered as signs of the culinary adaptation to the Roman way of cooking. Only a few workshops seem to have produced this type of vessel indicating a specialisation of certain potteries. The largest suppliers are located in the North of Gaul, namely the pottery workshops of Les Rues-des-Vignes, close to Cambrai (Thuillier 1993). The assemblage of Pompeian Red dishes of the Oudenburg fort site is very interesting given the geographic position of the site in direct contact with *Britannia* and the Rhineland axis. In Britain, productions with red internal slip are attested but generally not identified as cooking plates. The question arises whether the Hadham Red slipped wares should not be classified within this category.

At the Oudenburg south-west corner site 133 individuals (of which 79 at the Roman level) with a sherd count of 216 fragments (of which 140 at the Roman level) were identified within this category. The percentage of these cooking dishes – with only an average of 0.73% MNI for the Roman level – remains very restricted in comparison with the rest of the pottery at the site. No less than thirteen different fabrics, of which some represent subvariants, could be distinguished. Subvariants belong to specific workshops and reflect chronological evolutions in baking and fabric treatment.

2. Plates from Les Rues-des-Vignes

2.1 Fabric description

Four fabric variants, produced at the workshop of Les Rues-des-Vignes (belonging to the wider Cambrai group), were identified in the Oudenburg assemblage.

2.1.1 Fabric 1

Fabric 1 (cf. Figure 1.37) is characterized by a cream clay comprising abundant fine quartz, well-sorted. Other distinguishable inclusions consist of sandstone particles. The fabric has a typical black core with cream margins. The fine, cream-pink coloured surface is occasionally burnished. The high-quality slip is blood red. This fabric (CAM RDV B) is typical for the first period of production at Les Rues-des-Vignes (Deru 2005).

A single body fragment in fabric 1 with black core was recovered at the fort site as an unstratified find (not illustrated). The production of dishes with black core is attested at Les Rues-des-Vignes between the middle of the 1st and the middle of the 2nd century (Deru 2005), confirmed by the consumption contexts at Tongeren, site Hondsstraat (study by S. Willems, publication forthcoming), or at Famars, site Technopole (Willems *et al.* 2017b). The form of these plates is limited to those with a horizontal everted rim (type Blicquy I: De Laet and Thoen 1969). The external surface, not slipped, is burnished and the colour cream pink. The red slip of these dishes is of good quality. The Oudenburg fragment can be considered as a residual find from the pre-fort civil settlement.

2.1.2 Fabric 2

Fabric 2 is divided into three subvariants: 2A, 2B and 2C. They represent an evolution or a variation in colours and inclusions within the same group. Fabric 2A is characterized by a cream clay with bright grey-blue core, comprising multiple inclusions of small size. Small long voids and quartz grains are oriented in the direction of the potters' wheel. The fine quartz, sometimes translucent or white, and of heterogeneous form, completes the matrix. The well-fired fabric, almost overfired, comprises red and black inclusions, very visible in the yellow matrix. It concerns iron oxides and sandstone particles. The slip is bright orange. Fabric 2B is characterized by the same colours: a grey-blue core with yellow margins and presenting same long voids, quartz and sandstone. This fabric distinguishes itself by the presence of large- and small-sized red grog inclusions. Some grog elements form elongated layers which yields a marbled aspect. The orange slip seems to be finer than the one of 2A. Fabric 2C presents itself as a much finer and whiter variant. This fabric also shows a difference between a bright grey core and yellow margins however with less vivid nuances. The very clean matrix contains less voids and a multitude of fine quartz, together with iron oxides and rare sandstone inclusions. The slip which is very thin, is decolourised into a bright cream colour, maybe a result from it being buried in the ground. The three variants belong to the Cambrai group (probably Les Rues-des-Vignes). Fabric 2, characterized by its bright grey core and yellow

fringes has been named RDV-A (CAM RDV A) (cf. Figure 1.37). It represents a second production period that started in the 2nd century and continued into at least the 4th century, given its presence in most of the late Roman contexts at Famars (Willems *et al.* 2017b).

2.1.3 Fabric 8

Fabric 8 shows two variants according to the percentage of the quartz inclusions (cf. Figure 1.37). Variant 8A comprises a large number of small-sized quartz of different colours and forms: from white to grey, or translucent, and from blunt to angular-shaped. The fine, bright cream matrix has a dense core. Other inclusions consist of small iron oxides, red grog inclusions in certain subvariants, as well as very small black inclusions (iron oxides?) and small angular sandstone. Voids are rare and of small size. The slip is orange. Variant 8B contains less quartz, accompanied by red and black inclusions, and its colour is more cream brown with a bright cream core. The dense aspect of the matrix of fabrics 8A and 8B and the presence of sandstone fragments attribute this fabric to the production at Les Rues-des-Vignes.

2.1.4 Fabric 9

Fabric 9 resembles fabric 8 except for its colour which is vivid orange with a brighter cream core (cf. Figure 1.37). Its aspect is less fine. Fabric 9 only contains medium-sized quartz, mainly of translucent and white colour, subangular- or angular-shaped. The dense matrix sometimes contains elongated voids. Grog inclusions occur as well. In this fabric, the sandstone is lacking. The slip is red. Fabric 9 also refers to the fabrics of the group of Cambrai (Les Rues-des-Vignes). It resembles the fabrics used for the samian imitations dated to the end of the 3rd century (CAM POS).

2.2 Analysis of form and fabric evolution

From the 2nd century the production at Les Rues-des-Vignes evolved from plates with horizontal rims into plates with concave shape (type Blicquy V). It is this form that remained popular during the whole mid-Roman period, still persisting until at least the beginning of the 4th century (Thuillier 1993). The dishes mainly became wider with larger diameters. Sometimes an inclination appeared on the external body to mark the sharp lip. A groove and a ridge underlined the transition to the foot. The slip, sometimes crushed or dull, lowered in quality.

The assemblage of the Oudenburg site makes it possible to look into the evolution of the fabrics of Les-Rues-des-Vignes (cf. Plate CXXXVIII: 1-12). Fabrics 2 (37 MNI) and 9 (7 MNI) are represented at all fort levels. Fabric 8 with compact matrix (in total 31 MNI) is mainly in use during fort levels 3 and 4 which are dated to the middle and the second half of the 3rd century, while fabric 2 with fine sandy matrix and bright grey core is only present in very low quantities. It is from fort level 4 onwards that fabric 2 becomes popular and takes the lead, from *c.* AD 260 onwards. This fabric seems to be still well-used in the 4th century. The orange-brown fabric 9, comprising larger quartz, iron oxides and grog, first appears in mixed levels 4+5 and seems to be popular at fort level 5, during the 4th century. The dishes became wider and the inclination of the body is sometimes marked by a groove.

3. Dish in Hadham Red slipped ware (fabric 3)

The intense orange, fine sandy fabric 3 has a slightly brighter surface (cf. Figure 1.37). The irregular matrix, caused by a large number of inclusions heterogeneous in form and size, comprises a multitude of fine quartz and small red and black iron oxides, mixed with large white quartz grains, translucent or grey, of blunt shape. The alternation of white quartz and iron oxides gives the fabric a 'pepper and salt' look. Also, some mica is present. The fabric can be identified as belonging to the Hadham Red slipped wares of which kilns are located at Little Hadham and Much Hadham in Hertsfortshire. Their production started in the middle of the 3rd century and had a large distribution from the beginning of the 4th century onwards (Tyers 1996b, 168). The Oudenburg fragments probably belonged to plates close in form to the Pompeian Red ware dishes.

One base fragment (not ill.), recovered from the post-Roman levels as a residual item, was identified as a Hadham product, thanks to the comparison with mortaria of this region, found at the fort site. The productions of Little Hadham and Much Hadham in Hertfordshire are dated mainly after the middle of the 3rd century but their export started even later (Tyers 1996b, 168). Some of the Hadham forms imitate the spectrum of the samian wares and it is not clear whether these plates should be classified as cooking vessels or rather as late Roman imitations of samian plates.

4. Plates of (wider-)regional production: fabrics 4 and 6

Two fabrics were identified as presumed regional productions, distinguishing themselves even more by their rim profiles.

4.1 Fabric 4

Fabric 4 is characterized by its cream, orange to pinkish colour (cf. Figure 1.37). The clean break with compact matrix shows an alignment of quartz in the direction of the potters' wheel. Some small voids occur but they do not seem to be characteristic of this fabric. Small-sized, translucent quartz go together with medium-sized, white quartz. Characteristic are red inclusions, probably grog, while iron oxides complete the list of inclusions. The slip is red-orange and of good quality. The origin of this production remains uncertain. The cream variant resembles the fabric of certain regional flagons (cf. Chapter 1.B.2 in this volume). The orange variant is very similar to the fabric of the samian imitations of the Cambrai region.

4.2 Fabric 6

Fabric 6 is sandy, of an intense orange colour with a redder core (cf. Figure 1.37). The dish has a red-orange slip. The irregular matrix and break contain a multitude of heterogeneous sand inclusions, from small- to medium-sized. The medium-sized quartz is often blunt and white. Hardly any other inclusions are detected, except for small-sized voids. Some larger voids indicate the location of quartz or grog inclusions fallen out while making the fresh break. This fabric is related to the fabric of the group of the regional flagons which may originate from Dourges.

4.3 Analysis of form and fabric

The baking plates in fabric 4 and 6 represent respectively at least six and eight individuals. The fabric 4 plates have a triangular rim and a neat well finished red slip, as well as a clear detached foot (only one base ill.: Plate CXXXVIII: 13). The dishes of fabric 6 distinguish themselves by their rim and surface (Plate CXXXVIII: 14-15). The general form with concave body is individualized by a rim, marked at the exterior by a ridge which gives it a triangular shape. The surface, fabric and slip are all orange. Neither the external surface nor the internal one where the slip is situated, are burnished or very neat. The foot is detached and shows a marked angle in the same way as the dishes of Les-Rues-des-Vignes. The internal transition between body and base is formed by a groove. With only a few known potteries in the North of Gaul producing this type of cooking dish, this regional production is remarkable. A comparison with pottery sherds from the potteries at Arlon in orange fabric have enabled us to exclude this region as possible origin[67]. Other typological comparisons can be found in the form of the red and brown colour-coated wares from the Oxford region, specifically type C44 or C45.6 (Young 1977, 157-158, Fig. 57-58). The Oudenburg fragments in fabrics 4 and 6 appear from fort level 4 onwards – *i.e.* from *c.* AD 260 onwards – and at fort level 5.

5. Fabrics with silt-sized quartz (Oxfordshire?) (fabrics 5 and 7)

5.1 Fabric descriptions

Fabric 5 shows the same distribution of small quartz as fabric 4, sometimes almost silt-sized, and medium-sized quartz (cf. Figure 1.37). The latter, sub-angular and white, is clearly visible. The marbled aspect of this very fine sandy fabric is very distinctive. However, the break remains rather irregular, despite of the fine inclusions. A white and orange fabric have been mixed here. In certain variants, the orange clay represents itself as grog elements. No other inclusions but voids are spotted, sometimes of very long shape, which characterize the matrix. The slip is bright orange. The fabric reminds us of certain variants of the Oxfordshire White wares, showing a fabric with marbled aspect.

Fabric 7 resembles fabric 5 but its colour is dominated by an orange-brown clay containing threads of white clay (cf. Figure 1.37). It gives the impression that both clays were mixed in opposite proportions compared to fabric 5 where the white clay dominates. The very clean matrix contains a multitude of very fine quartz. The high percentage of silt-sized quartz results in a granular matrix, emphasized by the presence of rare medium-sized quartz. Some shiny micro quartz may indicate the presence of feldspars. The slip is orange-red. Its origin remains unknown but the link with fabric 5 indicates a possible import from *Britannia.*

5.2 Fabric and form analysis

The plates in fabric 5 (8 MNI) are characterized by their massive form, with thick, widened body and rounded rim (Plate CXXXIX: 1-4). Sometimes the rim has an internal groove; the massive, flattened base sometimes has a detached foot. The colour of the body varies from cream to very vivid orange with a bright orange slip. The slip sometimes runs almost down to the base and gives the impression of sloppy work. The matrix itself is paler than the surface.

The plates in fabric 7 (2 MNI) show an orange-brown body with a neat look and a supplementary burnishing at the top of the rim (Plate CXXXIX: 5-6). The orange slip is hardly distinguishable from the non-slipped surface. The matrix of the fabric is also almost identical in colour. The general form is characterized by a concave, very widened body with a large diameter (around 30 cm). The foot is marked by a clear angle, like the dishes of Les-Rues-des-Vignes. The base shows fine intentional wheel-turning lines on the bottom. The interior transition between body and base is marked by a shallow groove. The walls of the dishes have a thickness up to 0.8 cm. One example shows a rounded perforation indicating a reparation (Plate CXXXIX: 6). The refurbishment of this culinary vessels underlines their importance and their rarity on site.

Of both groups 5 and 7 only one individual was found at fort level 4. One dish in fabric 5 belonged to fort level 5. All other individuals were found in post-Roman levels.

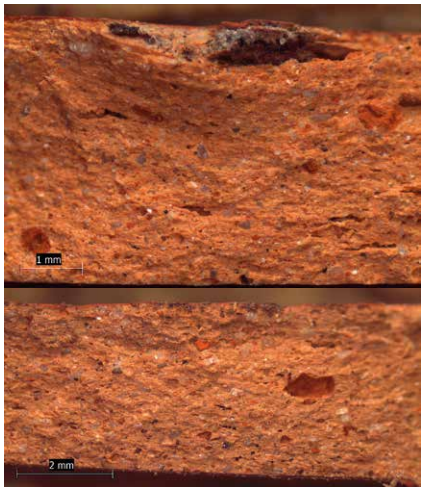
6. White fabrics 10 and 11, related to the 'Oxfordshire White Wares'?

6.1 Fabric descriptions

Fabric 10 is a white fabric (kaolinite clay?) containing a large number of medium-sized quartz oriented in the direction of the potters' wheel (cf. Figure 1.37). This gives the fabric an irregular aspect. The fabric furthermore contains an important amount of small-sized quartz and some rare small black inclusions or iron oxides. The slip is bright orange. This fabric is close to certain

67 **With thanks to F. Hanut and D. Henrotay (both AWaP *Agence Wallonne du Patrimoine*) who were so kind to provide us with pottery sherds from the kilns producing plates with internal red slip.**

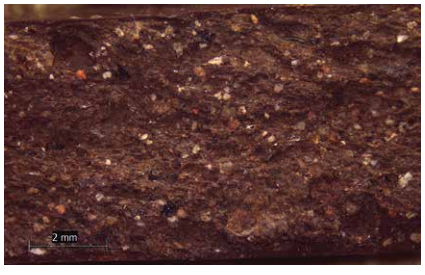
FABRIC 1



FABRIC 4

FABRIC 8

FABRIC 9



FABRIC 12

FABRIC 2

FABRIC 5

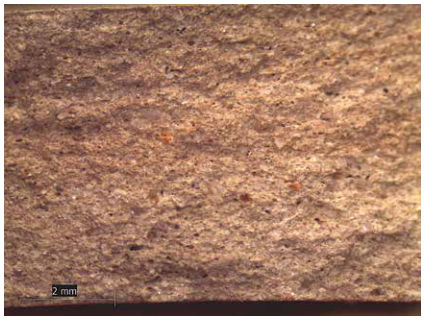
FABRIC 10

FABRIC 13

FABRIC 3

FABRIC 6

FABRIC 7



FABRIC 11

Figure 1.37. The attested Pompeian Red ware fabrics at the south-west corner site. Magnifications under the binocular (Photos by S. Willems).

variants of the Oxfordshire White Wares and can probably be associated with this industry.

Fabric 11 is represented by two variants showing a slight difference in colour (cf. Figure 1.37). Fabric 11A, cream in colour, contains a multitude of micro-sized quartz. Some white, medium-sized quartz is mixed in, as well as white grog elements, visible to the naked eye. The colour of variant 11B is brighter which makes it easier to distinguish the presence of multiple iron oxides. This fabric is clearly related to fabrics 5 and 7 and comparable to the fabric of one of the Oxfordshire White Ware mortaria found at Oudenburg, from the middle of the 3rd century.

6.2 Fabric and form analysis

Fabrics 10 and 11 – representing together 16 MNI – are very similar to the fabrics identified as Oxfordshire White Wares for the category of the mortaria present at the site. The plates have a very wide body and a simple, rounded rim, less inclined than the Les Rues-des-Vignes group (Plate CXXXIX: 7-13). The foot is marked but rounded. The transition between body and base is sometimes emphasized by a deep groove. Despite some fragments at fort levels 2, 3 and 4 (level 2: one item; level 3: two items; level 4: two items; level 4/5: one item), the plates mainly occur in the final fort level. No less than half of this assemblage was recovered from fort level 5 or the post-Roman levels. Tyers (1996b, 129) mentions an expansion of the exports of Oxfordshire White Wares mortaria from the middle of the 3rd century onwards and mainly during the 4th century which is not contradictory in accordance with the find contexts at the Oudenburg fort. However, such plates seem to be unknown from the British production sites ánd consumption sites, according to British colleagues (M. Lyne, J. Timby, pers. comm.). Therefore, we must be careful in attributing this group to a given region.

7. An Italian plate: a residual find from the first phase of the civil settlement (fabric 12)

A single base (not ill.) seems to have been imported from the Campanian region based on the presence of volcanic sand and biotites in its fabric (IT CAMP) (cf. Figure 1.37). The first examples of Roman dishes with internal red slip, imported in the beginning of the 1st century AD, actually originate from this part of Italy although they are characterized by a rough and irregular surface. Hence, it seems likely that the Oudenburg individual recovered from fort level 4 is a dug-up item from the earliest phase of the settlement and thus a residual find.

The find in question is a burnt base. Its description is biased by its subjection to fire. The colour has turned into brown, the surface brown grey (cf. Figure 1.37). The irregular break, caused by the angular-shaped medium-sized inclusions, contains brown micas (biotite), black sand (green augite and volcanic sand), white carbonised inclusions, white, milky-white and translucent quartz and feldspars, and red inclusions (grog or iron oxides ?). This fabric corresponds to Peacock's fabric 1 (Peacock 1977, 149). These plates have a rough surface, sometimes burnished, with a thick red slip. The black sand inclusions and the dark red colour of the fabric make it easily recognizable.

8. Plate with micaceous fabric: a Low Lands ware product ? (fabric 13)

One dish rim, recovered from the construction pit of the large basin OS 4923 from fort level 5, stands out by its fine micaceous fabric (Plate CXXXIX: 14). The surface is pink and has an orange internal slip. Fabric 13, pink-orange in colour, distinguishes itself from all the other productions by its very fine matrix consisting of a multitude of silt-sized quartz or feldspars (cf. Figure 1.37). The large-sized orange grog inclusions form the most visible characteristic of this fabric. The form distinguishes itself by the very incurved and rounded body; the rim thickens slightly into a ribbon-shaped one.

The fabric similarities to the Low Lands Ware 1 flagons found at Oudenburg suggest that this plate could be a regional product of LLWI potteries, specialised in tableware (dishes, flagons, beakers), fine ware (fine reduced) as well as jars and containers from the Holwerda (1923) 139-142 type series. An origin in the Bergen-op-Zoom (Lower Scheldt) region (the Netherlands) has been evidenced by De Clercq and Degryse (2008).

9. Conclusions from the Pompeian Red ware assemblage

Although several fabrics can be discerned amongst the attested Pompeian red ware plates of the south-west corner site, the plates with red internal slip mostly originate from the South-Nervian region where the workshops at Les Rues-des-Vignes were specialised, amongst other vessels, in this type of cooking plate. Neither the Rhineland workshops nor the potteries in *Britannia* managed to provide a competitive production for this category, shown by the domination of the Les Rues-des-Vignes dishes at the Oudenburg fort throughout its occupation history. Although one cannot speak of a long-distance trade as was the case for the samian, the fine wares, the coarse ware mortaria and the amphorae, the products from Les Rues-des-Vignes seem to have controlled the whole of the North Gaulish market for this type of utensile. Local imitations did exist at several places, like for example at Tongeren, the capital of the *Tungri* (on-going research) or Arlon, where the production remained focused on the Belgian Lorraine and Ardenne region (Hanut 2010) and was not distributed to the coastal region. Local and regional productions can be assumed, based on fabrics 4, 6 and 13.

The Nervian products were only competed in small numbers by possibly British imports using white or marbled fabrics. From discussion with several British colleagues, we might assume that red slipped plates were not produced in Britain, although Peacock (Peacock 1977b, 154-155) indicates a British origin for his fabrics 4 and 5. The latter is – according to Hull (1963, 67) – a Colchester production. Another small production seems to have been present at Longthorpe (Nene Valley) (Peacock 1977b, 156). Comparison to mortarium fabrics suggests an Oxford region origin for fabrics 5 and 7, although Young (1977b) does not mention a production of culinary plates with red internal slip. The potteries for these plates remain unknown for the moment and there is no recent specific information about the production of this category in *Britannia*.

Fabric comparison with regional flagons indicate a continental origin for fabrics 4 and 6, but there again, workshops have yet to be identified. The act of imitating remains very interesting, since the original products easily provided the market. The results of this study in depth, based on fabric analysis, has revealed several so far unrecognized Pompeian Red ware fabrics which deserve closer attention. In the future, we should consider comparisons to Rhinish, British as well as Dutch and Belgian samples, in order to clear out the question of Pompeian Red plate productions.

B. Imported coarse wares

1. Amphorae

Patrick Monsieur and Sofie Vanhoutte

1. Introduction to the amphora assemblage

Amphorae are not only very important in the light of the long-distance and interregional trade, but also in the evidence of the products, *i.e.* liquid commodities and foodstuffs, stored and transported in these pottery containers. Moreover, the amphorae assemblage of the south-west corner site yields important chronological guide fossils for the dating of at least one of the fort levels.

Based on the number of sherds, the amphorae at the Oudenburg site account for 1.9% (2398 fragments) of the total Roman ceramic assemblage, nearly 2% (1769 sherds) when only the ceramics of the Roman level are considered. They account for 103 MNI. However, only 65 MNI were found stratified within the Roman level. The other 38 individuals belonged to the post-Roman and mixed levels as residual items. Although they form a rather small group compared to the other ceramic groups, the amphorae fragments represent an interesting spectrum, a remarkable assemblage for the North of Gaul of amphorae for olive oil, wine and fish products of Mediterranean and Atlantic origin, so far little attested in our region (Monsieur 2015). The largest share of the amphorae was imported over a long distance; a small portion though represents regional amphorae.

The intense occupation of the fort resulted in a significant periodic disturbance of earlier layers, so-called 'reworking' of material which makes the assignment to the specific original fort level difficult. Moreover, the amphorae sherds themselves show an intense re-use – of half of the vessels or of fragments – pointing to different functionalities in the second lives of the amphorae. Several indicators mark this re-use: modification traces (with chisel, saw, hammer), wearing traces, the degree of fragmentation (*e.g.* the striking large amount of Dr. 20 chips), burning marks, renovation holes with or without the remains of an iron or lead dowel, graffiti *post cocturam*. Some amphorae were probably re-used, completely or as a half, as a vessel or container of some kind, sherds were recycled for small constructional purposes in floor levels and oven walls, some fragments were used for epigraphic messages (cf. *ostraca*). The post-depositional distribution of the sherds could be traced based on the exhaustive puzzling out and the resulting cross joins, showing not only vertical but also horizontal dispersion (Figure 1.38).

2. Methodology of the study

For the amphorae assemblage the choice was made to study both the finds from the Roman level and the post-Roman level. Certainly the several cross joins of fragments from the Roman level with pieces of the post-Roman level indicate the high level of residuality at this site. Obviously, the analysis takes into account the additional residuality from outside the fort, from the civil settlement, as already referred to in the samian study.

Since diagnostic fragments, such as rims and handles, are not common in the amphorae assemblage, much priority was given to the exhaustive puzzling of the fragments. (Sub)groups were made, not only based on the cross joining, but also differences in fabric, technique, surface and wearing were taken into account. As such, more (sub)groups or individuals (MNI) could be distinguished (cf. Tables 1.41-1.42 versus 1.43).

Also weights were taken as an extra comparison medium (Table 1.44). Since the division in fabric groups was easier for some types (*e.g.* the Dressel 20 and the North African amphorae, with clear visual and technical differences in fabric and surface) than for other types (*e.g.* the Gauloise 4 and the Gauloise 13, with very little variety between the fabrics), it is important to combine the results of the MNI counts, the sherd counts and the weights in the analysis (cf. Tables 1.41-1.44; Figures 1.39, 1.40 and 1.41).

The amphorae imported over a long distance are studied as a group and all comparisons and percentages are made in relation to this group. The regional amphorae are considered separately, since it is likely that, due to the properties of these vessels, they could not be captured in their totality (*i.e.* moderately thick-walled medium and small body sherds in regional fabrics might belong as well to amphorae as to flagons) and their quantification may be not completely representative.

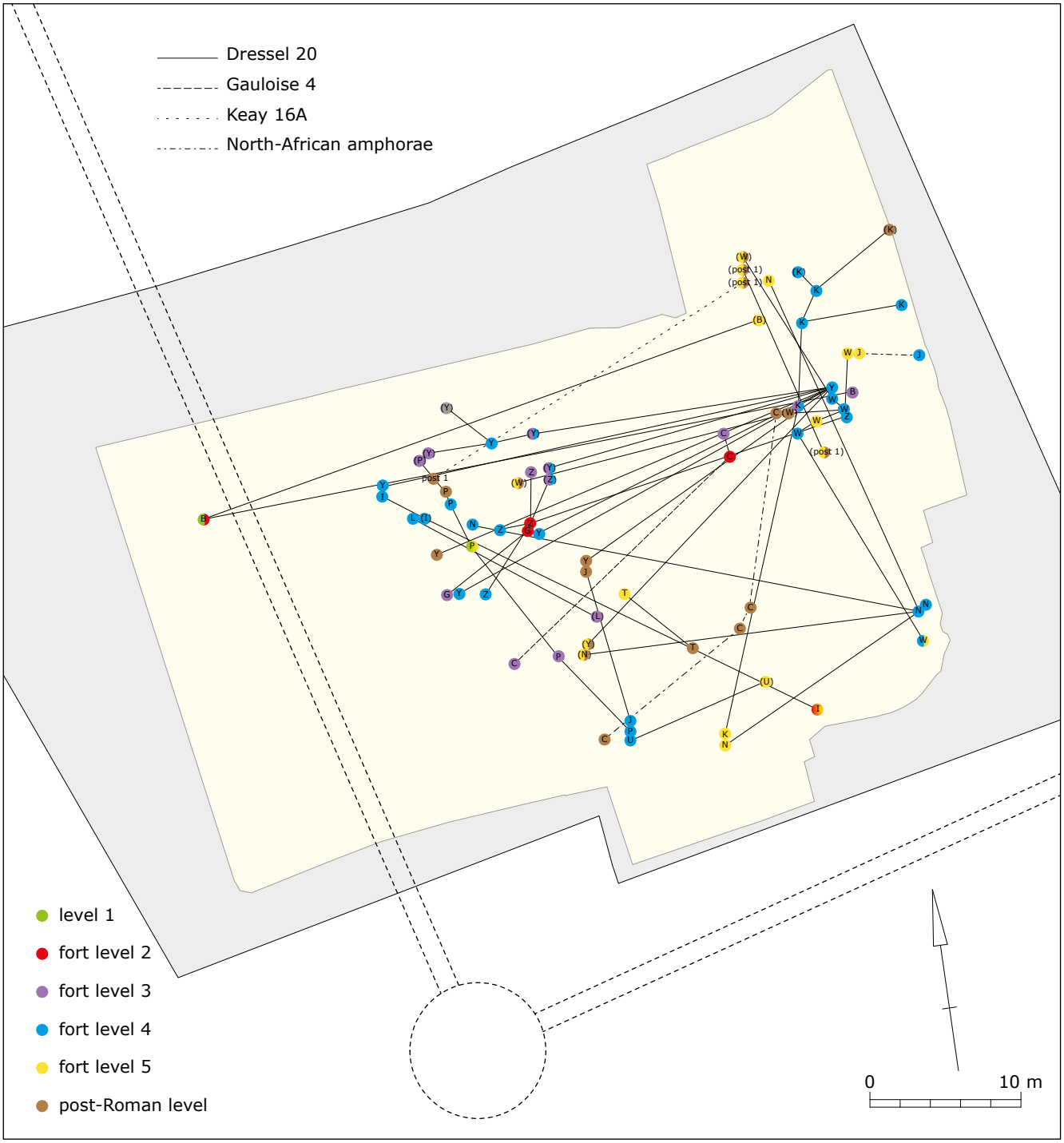


Figure 1.38. Visualization of the lateral cross joining amphorae fragments stretching over a distance of at least 2 m.

Table 1.41. Distribution of the amphorae at the south-west corner site, according to the stratified evidence, based on sherd count and sherd count percentage.

MEDITERRANEAN TRANSPORT AMPHORAE: sherd count	DR 20	G4	DR 14	KEAY 16A	KEAY 19C	NAF AM	KAPITÄN 2	DR 7/10	HALTERN 70	BELTRAN II A/B	BAETICA undet.	undet.	TOTAL
L1	3	46	0	0	0	0	0	0	0	0	0	0	**49**
FL2	15	9	0	0	0	0	0	0	0	0	0	0	**24**
FL3	116	19	0	0	0	2	0	1	0	0	0	0	**138**
FL4	926	49	0	0	0	3	5	1	0	0	0	0	**984**
FL5	450	19	0	0	0	26	0	0	0	1	0	1	**497**
TOTAL ROMAN LEVEL	**1510**	**142**	**0**	**0**	**0**	**31**	**5**	**2**	**0**	**1**	**0**	**1**	**1692**
5+POST / POST	438	47	1	6	1	92	3	4	13	0	1	0	**606**
TOTAL	**1948**	**189**	**1**	**6**	**1**	**123**	**8**	**6**	**13**	**1**	**1**	**1**	**2298**

MEDITERRANEAN TRANSPORT AMPHORAE: sherd count %	DR 20	G4	DR 14	KEAY 16A	KEAY 19C	NAF AM	KAPITÄN 2	DR 7/10	HALTERN 70	BELTRAN II A/B	BAETICA undet.	undet.	TOTAL
L1	6.12	93.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**100**
FL2	62.50	37.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**100**
FL3	84.06	13.77	0.00	0.00	0.00	1.45	0.00	0.72	0.00	0.00	0.00	0.00	**100**
FL4	94.11	4.98	0.00	0.00	0.00	0.30	0.51	0.10	0.00	0.00	0.00	0.00	**100**
FL5	90.54	3.82	0.00	0.00	0.00	5.23	0.00	0.00	0.00	0.20	0.00	0.20	**100**
TOTAL ROMAN LEVEL	**89.24**	**8.39**	**0.00**	**0.00**	**0.00**	**1.83**	**0.30**	**0.12**	**0.00**	**0.06**	**0.00**	**0.06**	**100**
5+POST / POST	72.28	7.76	0.17	0.99	0.17	15.18	0.50	0.66	2.15	0.00	0.17	0.00	**100**
TOTAL	**84.77**	**8.22**	**0.04**	**0.26**	**0.04**	**5.35**	**0.35**	**0.26**	**0.57**	**0.04**	**0.04**	**0.04**	**100**

Table 1.42. Distribution of the amphorae at the south-west corner site, according to the stratified evidence, based on sherd count and sherd count percentage, leaving out chippings.

MEDITERRANEAN TRANSPORT AMPHORAE: sherd count without chips	DR 20	G4	DR 14	KEAY 16A	KEAY 19C	NAF AM	KAPITÄN 2	DR 7/10	HALTERN 70	BELTRAN II A/B	BAETICA undet.	undet.	TOTAL
L1	3	46	0	0	0	0	0	0	0	0	0	0	**49**
FL2	15	9	0	0	0	0	0	0	0	0	0	0	**24**
FL3	111	19	0	0	0	2	0	1	0	0	0	0	**133**
FL4	724	47	0	0	0	3	5	1	0	0	0	0	**780**
FL5	436	19	0	0	0	26	0	0	0	1	0	1	**483**
TOTAL ROMAN LEVEL	**1289**	**140**	**0**	**0**	**0**	**31**	**5**	**2**	**0**	**1**	**0**	**1**	**1469**
5+POST / POST	412	42	1	6	1	92	3	4	13	0	1	0	**575**
TOTAL	**1701**	**182**	**1**	**6**	**1**	**123**	**8**	**6**	**13**	**1**	**1**	**1**	**2044**

MEDITERRANEAN TRANSPORT AMPHORAE: sherd count % without chips	DR 20	G4	DR 14	KEAY 16A	KEAY 19C	NAF AM	KAPITÄN 2	DR 7/10	HALTERN 70	BELTRAN II A/B	BAETICA undet.	undet.	TOTAL
L1	6.12	93.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**100**
FL2	62.50	37.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**100**
FL3	83.46	14.29	0.00	0.00	0.00	1.50	0.00	0.75	0.00	0.00	0.00	0.00	**100**
FL4	92.82	6.03	0.00	0.00	0.00	0.38	0.64	0.13	0.00	0.00	0.00	0.00	**100**
FL5	90.27	3.93	0.00	0.00	0.00	5.38	0.00	0.00	0.00	0.21	0.00	0.21	**100**
TOTAL ROMAN LEVEL	**87.75**	**9.53**	**0.00**	**0.00**	**0.00**	**2.11**	**0.34**	**0.14**	**0.00**	**0.07**	**0.00**	**0.07**	**100**
5+POST / POST	71.65	7.30	0.17	1.04	0.17	16.00	0.52	0.70	2.26	0.00	0.17	0.00	**100**
TOTAL	**83.22**	**8.90**	**0.05**	**0.29**	**0.05**	**6.02**	**0.39**	**0.29**	**0.64**	**0.05**	**0.05**	**0.05**	**100**

Table 1.43. Distribution of the amphorae at the south-west corner site, according to the stratified evidence, based on MNI and MNI percentage.

MEDITERRANEAN TRANSPORT AMPHORAE: MNI	DR 20	G4	DR 14	KEAY 16A	KEAY 19C	NAF AM	KAPITÄN 2	DR 7/10	HALTERN 70	BELTRAN II A/B	BAETICA undet.	undet.	TOTAL
L1	0	1	0	0	0	0	0	0	0	0	0	0	**1**
FL2	4	1	0	0	0	0	0	0	0	0	0	0	**5**
FL3	5	1	0	0	0	1	0	1	0	0	0	0	**8**
FL4	13	1	0	0	0	2	1	1	0	0	0	0	**18**
FL5	8	1	0	0	0	10	0	0	1	1	0	0	**21**
TOTAL ROMAN LEVEL	**30**	**5**	**0**	**0**	**0**	**13**	**1**	**2**	**1**	**1**	**0**	**0**	**53**
5+POST / POST	13	4	1	4	1	5	0	3	2	0	1	1	**35**
TOTAL	**43**	**9**	**1**	**4**	**1**	**18**	**1**	**5**	**3**	**1**	**1**	**1**	**88**

MEDITERRANEAN TRANSPORT AMPHORAE: MNI %	DR 20	G4	DR 14	KEAY 16A	KEAY 19C	NAF AM	KAPITÄN 2	DR 7/10	HALTERN 70	BELTRAN II A/B	BAETICA undet.	undet.	TOTAL
L1		100											**100**
FL2	80	20											**100**
FL3	62.5	12.5				12.5		12.5					**100**
FL4	72.2	5.6				11.1	5.6	5.6					**100**
FL5	38.1	4.8				47.6			4.8	4.8			**100**
TOTAL ROMAN LEVEL	**56.6**	**9.4**	**0**	**0**	**0**	**24.5**	**1.9**	**3.8**	**1.9**	**1.9**	**0**	**0**	100
5+POST / POST	37.1	11.4	2.9	11.4	2.9	14.3		8.6	5.7		2.9	2.9	**100**
TOTAL	**48.9**	**10.2**	**1.1**	**4.5**	**1.1**	**20.5**	**1.1**	**5.7**	**3.4**	**1.1**	**1.1**	**1.1**	100

Table 1.44. Distribution of the amphorae at the south-west corner site, according to the stratified evidence, based on weight and weight percentage.

MEDITERRANEAN TRANSPORT AMPHORAE: weight (kg)	DR 20	G4	DR 14	KEAY 16A	KEAY 19C	NAF AM	KAPITÄN 2	DR 7/10	HALTERN 70	BELTRAN II A/B	BAETICA undet.	undet.	TOTAL
ROMAN LEVEL	121298	14168	70			5751	311	162	170	146			142076
5+POST / POST	21317	1601		1149	35	1033		493	417		38	38	26121
TOTAL	**142615**	**15769**	**70**	**1149**	**35**	**6784**	**311**	**655**	**587**	**146**	**38**	**38**	**168197**

MEDITERRANEAN TRANSPORT AMPHORAE: weight %	DR 20	G4	DR 14	KEAY 16A	KEAY 19C	NAF AM	KAPITÄN 2	DR 7/10	HALTERN 70	BELTRAN II A/B	BAETICA undet.	undet.	TOTAL
ROMAN LEVEL	85.38	9.97	0.05			4.05	0.22	0.11	0.12	0.10			100
5+POST / POST	81.61	6.13		4.40	0.13	3.95		1.89	1.60		0.15	0.15	100
TOTAL	**84.79**	**9.38**	**0.04**	**0.68**	**0.02**	**4.03**	**0.18**	**0.39**	**0.35**	**0.09**	**0.02**	**0.02**	**100**

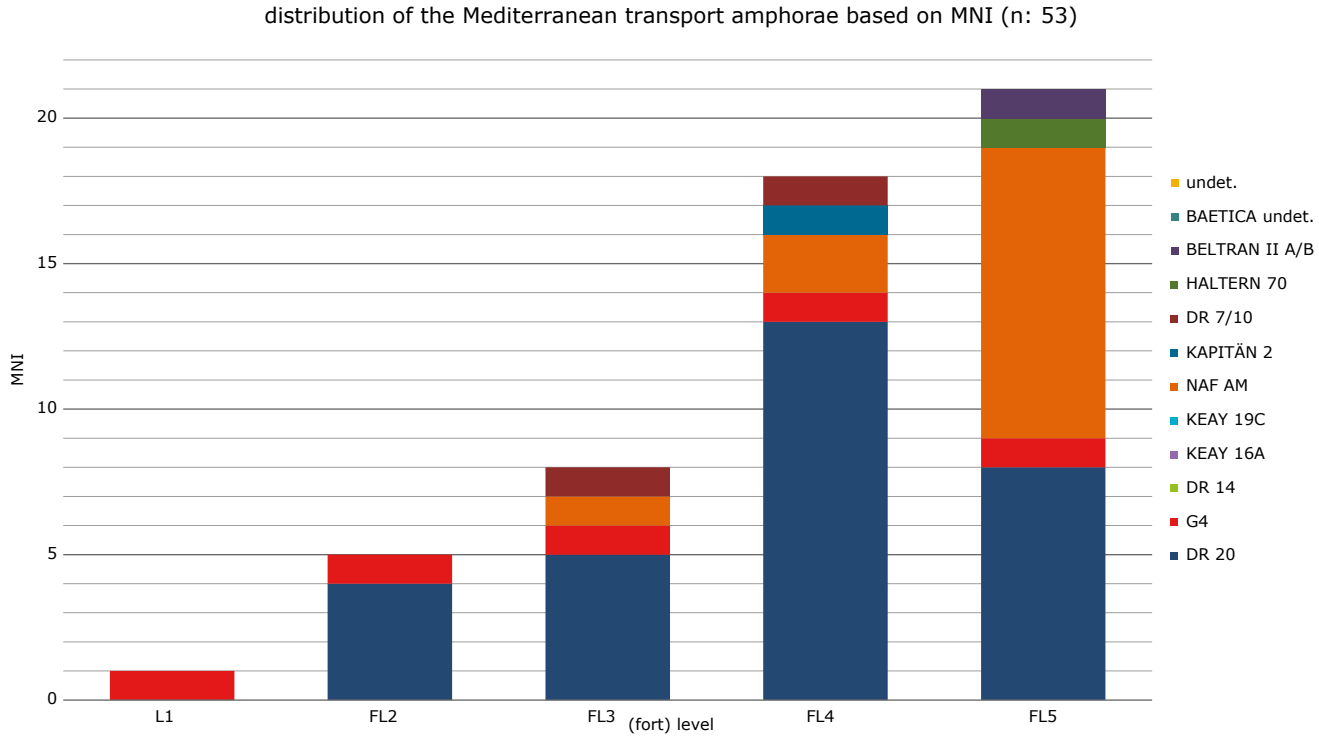


Figure 1.39. Visualization of the distribution of the amphorae at the south-west corner site, according to the stratified evidence, based on MNI.

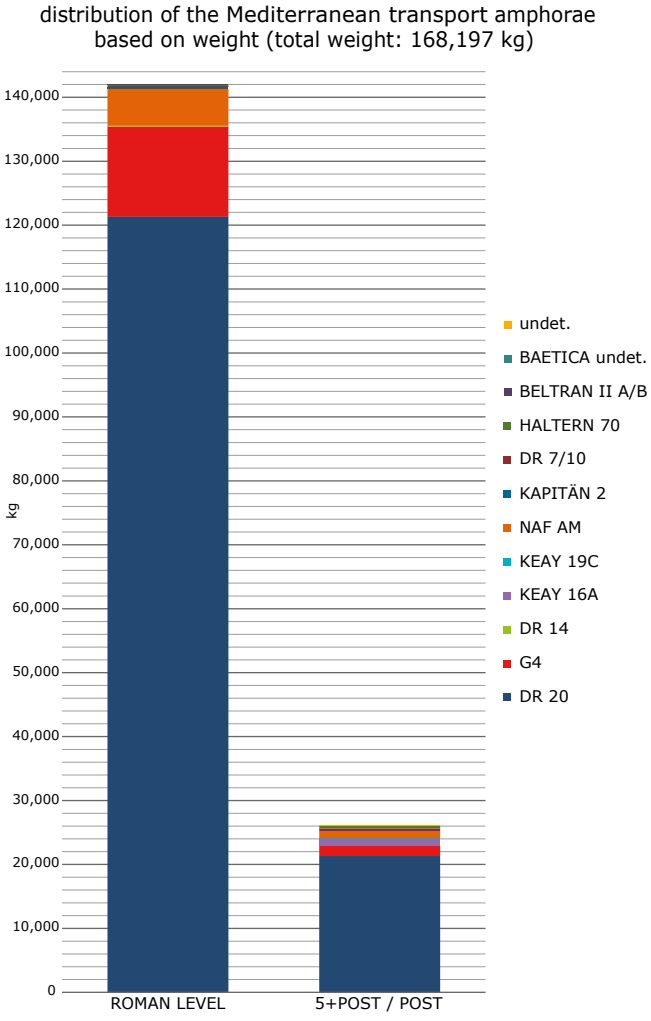


Figure 1.41. Visualization of the distribution of the amphorae at the south-west corner site, based on weight: the Roman level versus the level 5+post/post.

3. Mediterranean transport amphorae

3.1 Dressel 20

3.1.1 Presence and distribution (nos 1-46)

The *Baetican* Dressel 20 amphora form is a container for olive oil (Dressel 1899) and dominates the imported (*i.e.* over a long distance) amphorae assemblage of the south-west corner site, with 84.8% (1948 sherds) of the total amphorae assemblage, 89.2% (1510 sherds; 87.7% without the chips) when only the Roman level is considered (Tables 1.41-1.42). These numbers are confirmed by the weights: 84.8% of the total amphorae assemblage, 85.4% when only the ceramics of the Roman level are considered[68] (Table 1.44). However, these figures are somewhat biased by the fragmentation of some large parts of amphorae[69], by the large size of several fragments

68 These weights include the chips. The presence of chips was mainly characteristic for the Dressel 20 group.

69 *E.g.* large body parts of one group, fragmented in 33 sherds but representing a weight of 12,296 gram; one part of another amphora was found as 179 fragments in one context.

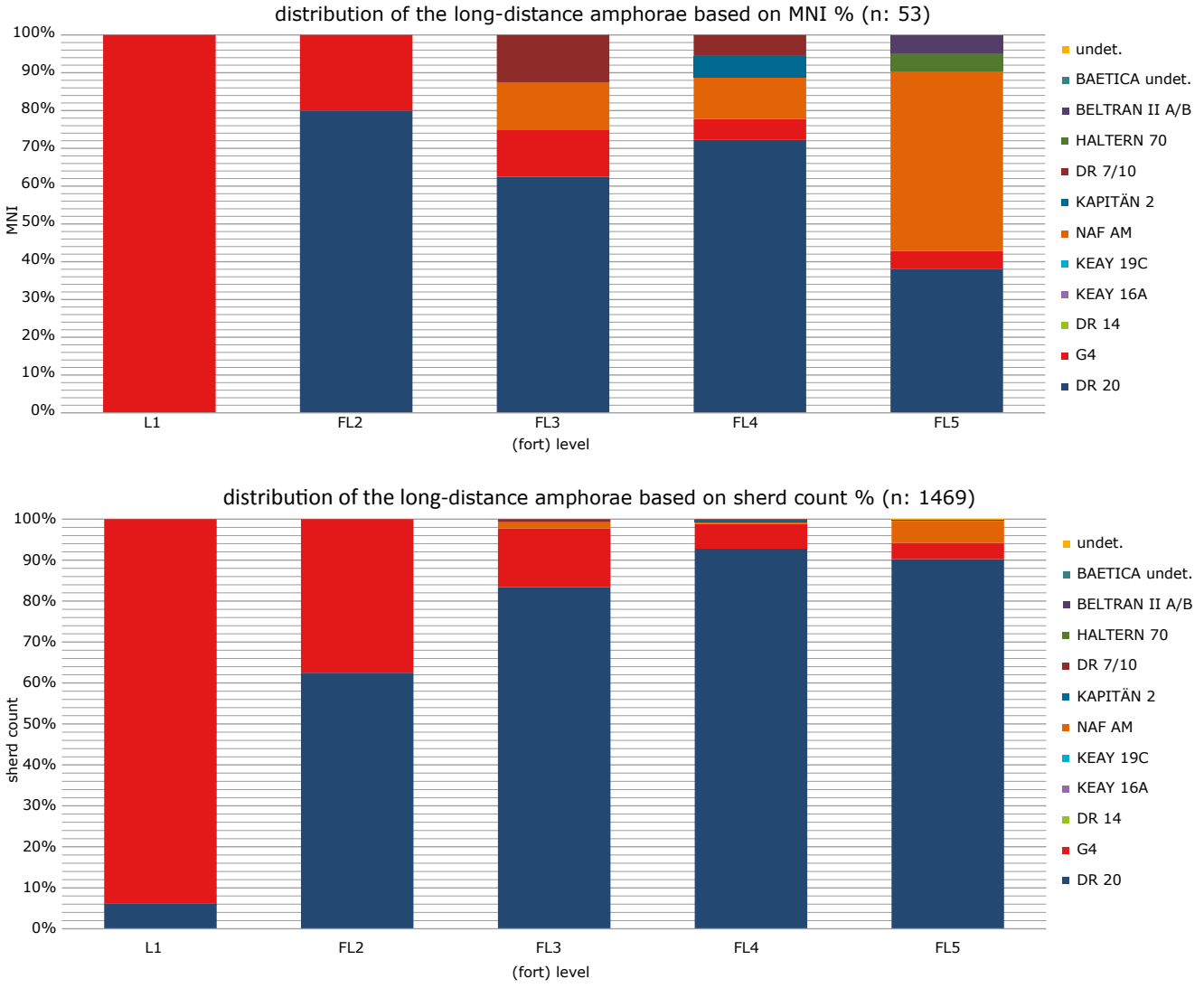


Figure 1.40. Visualization of the distribution of the amphorae at the south-west corner site, according to the stratified evidence. Top: the distribution based on MNI %. Below: the distribution based on sherd count %.

and by the percentage of vessels preserved[70]. It is therefore more reliable to look at the minimum number of individuals (MNI) represented by the Dressel 20 amphorae: 43, or 30 when only considering the Roman level, respectively 48.9% or 56.6% of the amphorae assemblage (Table 1.43; Figures 1.39-1.40). Still, all other amphorae groups represent minorities in comparison with the Dr. 20 group.

To the Roman level, 30 Dr. 20 groups, or individuals (MNI), can be assigned, belonging to levels 2 (four groups), 3 (five groups), 4 (thirteen groups) and 5 (eight groups). To the post-Roman level, another thirteen groups can be attributed, of course all residual material, from the fort levels but likely as well from the earlier settlement or from the contemporaneous extramural settlement.

Until level 4, the Dr. 20 amphorae dominate the amphorae spectrum; in level 5 its share diminishes to 38.1%, based on the MNI, with mainly the North African amphorae becoming important (Figures 1.39-1.40). However, all the Dr. 20's from level 5 should be considered as residual items.

That the *Baetican* olive oil amphora of the type Dressel 20 forms the largest share of the amphorae at the Oudenburg site, representing more than 80%, being followed in the first four levels by the Narbonese wine amphorae type Gauloise 4, is a familiar situation in *Britannia*, *Germania Inferior* and *Superior*, and *Gallia Belgica*, especially for the second half of the 1st and the 2nd century AD, but still persisting moderately in the 3rd century (van der Werff 1984; Martin-Kilcher 1987; Monsieur and Braeckman 1995a; Tyers 1996a; Carreras Monfort 1998; Monsieur 2005). Moreover, the dominance in Dressel 20 consumption seems to be mainly military-influenced (Remesal Rodríguez 1986; 1997; Carreras Monfort 1998; Carreras and van den Berg 2017, 369-371). The

70 ***E.g.*** **the upper half of an amphora, accounting for 41 sherds and a weight of 7277 gram; the complete base of another amphora, accounting for twenty sherds and a weight of 6293 gram.**

production of these amphorae ended under the reign of Gallienus, *c.* AD 250-260 (Rodríguez Almeida 1984). Also the dump of amphorae on the *Monte Testaccio* ceased at that time. As important reasons for the cut off of the trade network (at the recipient end) with the Mediterranean world, the invasions by the Franks and by the Alamanni in AD 260 combined with the following breakaway of the Gallic Empire by Postumus are considered (Monsieur 2015).

The end date in AD 260 for the Dr. 20 production implies that all Dressel 20 amphorae from the Roman level, originally (*i.e.* in their primary (consumption) function), must have belonged to the first three, perhaps four, fort levels and the earlier civil settlement level. This residuality is emphasized even more by the present rim and/or handle types and fabrics:

- from level 3: a handle type of the Severan period (Plate CXL: 2-3)
- from level 2: a classic 2nd-century fabric (Plate CXL: 4)
- from level 5: a classic 2nd-century fabric (Plate CXL: 5)
- from level 4: a classic 2nd-century fabric (rim fragment, not ill.)
- from level 4: a 2nd-century or early 3rd-century fabric (body fragments, with reparation hole, not ill.)
- from level 5: a handle type and fabric typical for AD 150-250 (Plate CXLII: 20)

The find context of the Dr. 20 groups from the post-Roman level obviously also endorses the residuality of these amphorae, emphasized by their type and/or fabric referring to the first fort levels or even earlier (Plate CXLIII):

- a 3rd-century fabric (no. 21)
- a 2nd-century type of rim (no. 25)
- a 2nd-century type of rim (no. 26)
- a 2nd-century type of rim and fabric (no. 27)
- a 2nd-century type of rim and fabric (no. 28)
- a classic Severan fabric (body fragments, not ill.)

The presence of the typical handle type and of the classic fabric from the Severan period possibly indicates a fort occupation in that period (AD 193-235). This period becomes even more precise when the dating information of the stamps is added (see further).

3.1.2 Epigraphy (nos 29-46)

No *tituli picti* were preserved on the Dr. 20 amphorae of the Oudenburg site, but a total of 32 fragments show some kind of epigraphical information[71]: two stamps, 26 graffiti *ante cocturam* and four graffiti *post cocturam*.

Dressel 20 stamps

An overview made by Monsieur (2015) of the Dressel 20 stamps in Northern Gaul and *Germania Inferior* for the period AD 200-260, in total 32, demonstrates the low quantity of stamp types and workshops in the 3rd century, in contrast to the situation in the first two centuries. This may be directly related to the economic decline in the 3rd century or the monopolisation of the market by important interest groups (Monsieur 2015).

The two Dr. 20 stamps of the Oudenburg site are remarkable in terms of content and of dating. Both can be assigned to the first half of the 3rd century.

The stamp L F C CV FC on a handle is collected as residual find in level 5 (no. 6; Plate CXL). The first three letters represent the *tria nomina* of a Roman citizen; CV stands for *clarissimus vir* (person of senatorial or pre-senatorial rank); FC is the abbreviation of *Figlina Catonia*, the known Dr. 20 workshop at the modern-day village Las Animas (Isla del Castillo) in the valley of the Guadalquivir. The stamp can be dated to AD 220-240 (Berni Millet 2008, 414-415; cf. Callender 1965, no. 851 (O)). Similar stamps of the same workshop were found in the North of Gaul at Arras (F), Braives (B) and Arentsburg/Voorburg (NL) (Monsieur 2015). In Britain, this stamp type is known from London (two specimens), Corbridge (several), Binchester and Wroxeter (Carreras and Funari 1998, no. 188: 1-9).

The other stamp on a handle was recovered from the post-Roman level and reads II IVNI MELISSI / ET MELISS(a)E (no. 23; Plate CXLIII). *Melissi* and *Meliss(a)e* are likely the names in the genitive of a male and female member of the family of the *Iunii* running a potter's workshop identified at Las Delicias (Guadajoz) in the valley of the Guadalquivir (Berni Millet 2008, 426-432; cf. Callender 1965, no. 879 (B)). While the first generation of the *Iunii* is dated to AD 200-220 (found in our region at Bavay (France), Merendree[72] (Monsieur 1998) and Tienen (both Belgium)), this second generation of the *Iunii* belongs to the period AD 210-230. Similar stamps as the Oudenburg one were recovered at Liberchies and Tongeren (both Belgium) (Monsieur 2015). This stamp is well-known in Britain; similar stamps of two members of the *Iunius* family were found at the fort of Richborough (Bushe-Fox 1926, 86: 7) and at sites as Caerleon, Verulamium (several), London (several), Colchester (several), Ribchester, Cirenchester, Lincoln, Wroxeter, York, Malton, Ospringe, Haudbridge (Carreras and Funari 1998, no. 271: 48-68).

The fragmented upper half of a Dressel 20 found in the large waste-pit OS 4980 and secondary burnt, appears to have had his stamp chopped off (no. 10; Plate CXLI; Figure 1.42). The shape of the break points to an intentional act of which the meaning ánd the timing remains unclear. Was a new owner mistrusting the writing which he could not read? Or was this a form of 'killing' the vessel?

Another specific act of re-use is the chopping into small pieces which seems to be characteristic for part of the Dr. 20 assemblage which contains a large amount of chips (247 items) and small pieces of less than 4 by 4 cm (682 items) (with fresh breaks). What kind of purpose this deliberate processing of amphorae fragments had, remains unclear.

71 One amphora bears a stamp ánd a graffito *ante cocturam*, resulting in a total epigraphical count of 29.

72 While Merendree was definitely an important settlement, there are more and more indications that there was also a military presence, possibly both in mid-Roman and in late Roman times (De Clercq 2009, 390).

Figure 1.42. The fragmented upper half of a Dressel 20 found in the large waste-pit OS 4980 of fort period 4 and secondary burnt. His stamp seems to be chopped off (see detail to the right).

Figure 1.43. Complete base of a Dressel 20 amphora with potter's mark near the base (on the photo to the right) (no. 19). The fragments of this amphora, originally most likely belonging to fort level 3, were found scattered over different levels.

Dressel 20 graffiti

The graffiti *ante cocturam* preserved on Dressel 20 fragments from the south-west corner site consist of two types. Seven of them are impressions in the internal clay ball of the base: the clay ball shows one or two circular impressions (nos 8, 9, 11, 15) or one linear imprint (nos 16, 17, 18 on Plate CXLII). They are believed to have had an apotropaic function in the manufacture process of the amphora (Martin-Kilcher 1987, 70-80).

All other nineteen graffiti *ante cocturam* most likely represent potter's marks (at least three specimens) and presumed so-called 'administrative' graffiti. One potter's mark from fort level 3 is completely preserved (no. 19; Plate CXLII; Figure 1.43). All 'administrative' graffiti are only partially preserved (nos 29-42 on Plate CXLIV). The preserved characters represent the last remains of *cognomina* (surnames) or a calendar date. These 'administrative' graffiti were characteristic in times of complex organization of the manufacture process during peaks in the mass production of Dr. 20 amphorae. Two of these moments are known: the reign of Antoninus Pius and the period under the first Severi (Rodríguez Almeida 1993; Monsieur 2005; 2007). The writing on the Oudenburg fragments seems rather careless and may refer to the Severan period. Their presence could be another indication that one of the fort occupation periods at Oudenburg coincides with the

period of the first Severi. Of the nine fragments of which the graffito can be identified with certainty as an 'administrative' graffito, one was found at level 3, four at level 4, one at level 4 or 5 and three in later levels. As will become clear below there is a case for seeing all these items as residual and deriving from what were originally all Severan arrivals at the site.

The graffiti *post cocturam* refer to activities of the fort inhabitants (or the civilians when a residual find) (nos 43-46 on Plate CXLIV). The incised name(s), number(s), mark(s) are usually indicators for secondary use of the vessel, or later on of the vessel fragments (cf. *ostraca*), both well-spread phenomena (Martin-Kilcher 1987, 152-176; van der Werff 1989; van der Werff 2003; Monsieur 2005 and 2007). The Oudenburg fragments are however too fragmentary to deduce their meaning.

Another Dressel 20 stamp found in 1977 on the fort area

A remarkable stamp among the finds of J. Mertens should be added here. The Dr. 20 amphora, of which the upper half was largely preserved (Figure 1.44), was found in Trench X during the 1977 campaign in the northern area of the fort (see Volume I, Figures 1.9 and 1.13). The stamp, located on the handle, was not completely impressed, but the reading should be FIG E[D] / PP AE [F]. The stamp type is identical with Berni Millet 2008, no. 17, displaying even the same die, but the Oudenburg stamp is apparently badly impressed resulting in a loss of the end letter of each line. The traditional interpretation for this stamp is FIG(lina) E[D](o?) / P(iana?) P(ubli) AE(li) F(usciani), pointing to the name of the *figlina* (pottery) 'Edopia' or 'Edopiana' (or with two p's) which is presented in an abbreviated manner. The name *Fuscianus* is certain, since a version is known with the complete name, also in the genitive (Berni Millet 2008, 468-471; cf. Callender 1965, no. 33). No parallels are known from the North of Gaul and *Germania Inferior* (Monsieur 2015). In Britain however, his stamp has been found two times at Colchester and once at Verulamium (Carreras Monfort and Funari 1998, no. 174: 1-3).

The Oudenburg name stamp is accompanied by a very rare, secondary stamp, in the form of an oval finger top impression. Normally this stamp shows a palm twig, sometimes an anchor or a dolphin (Berni Millet 2008, 468-471). This secondary stamp on the Oudenburg amphora is however illegible, but according to well-preserved examples, the stamp is most likely completely abraded; besides, also the principal (name) stamp is only preserved vaguely. Thanks to the combination of dated *tituli picti* with the stratified evidence on the *Monte Testaccio* in Rome with consul dates, this stamp can be securely dated between AD 210-230, and most probably even between AD 220-225 (Berni Millet 2008, 468-471).

The find context of this Oudenburg amphora assumes that the amphora has been deposited in its primary function. The find with code 77.0U.359 was excavated in 1977, in the southeast corner of trench X, south of the stone building (Figure 1.45, top). The amphora was located at *c.* 3.00 m below a fixed point, corresponding with *c.* 2.75 m underneath the current running surface, in a greyish-green clayish sand to green clay level with lime and mortar pieces and some gravel[73]. The trench profiles indicate that this find was situated *c.* 0.20 m above the cultivated soil, in a level covering the layer which fills in the earliest features on site (Figure 1.45, below). This stratified evidence and the composition of the layer reminds one of the level 2 layers attested at the south-west corner site at the same height and equally characterized by clay and mortar and plaster fragments. The identification of this layer 38 of the 1977 Trench X / layer 31-32 of the South profile of Trench X as the occupation or, more likely, the closing off layer of fort level 2, implies that the dating of the Mertens amphora yields a major contribution to the dating of this level as a *terminus post quem* of AD 220-225.

3.1.3 The late Roman levels

The reinstatement of the unity in the Roman Empire by Aurelianus in AD 274 after the period of the Gallic Empire did not reactivate the large export of *Baetican* olive oil (Monsieur 2015). The form Dressel 23 dated to *c.* AD 250 until the first half of the 4th century (Monsieur 2015) was the smaller, thinner-walled successor of the Dr. 20 of which the production ceased AD 250-260 (see before). Remarkably, the Dr. 23 is not represented at the Oudenburg fort site, indicating a complete stop in the supply of olive oil from *Baetica* to the Oudenburg fort by that time.

3.2 Gauloise 4

The second largest group of amphorae is represented by the Gauloise 4 form (Laubenheimer 1985; 1989) (nos 47-55). Regarding the number of sherds (over 8.0% of the imported amphorae assemblage: 142 sherds in the Roman level, 189 sherds when the post-Roman is counted in) and weight (just under 10%) (even somewhat less when chips are not counted in), this group is less important than the Baetican Dressel 20 amphorae. The MNI confirms these figures with 9.4% for the imported amphora individuals of the Roman level and 10.2% when looking at the total amphorae assemblage (cf. Tables 1.41-1.44; Figures 1.39-1.41).

The Gauloise 4 amphora was produced from the 1st to 3rd century, mainly in the Narbonne region, but also in the wider area of the Languedoc and the Provence in France (Laubenheimer 1985; 1989; Laubenheimer and Marlière 2010, 39). According to numerous *tituli picti* the Gauloise 4 contained wine (Laubenheimer 2004).

Based on the diagnostic fragments, only six individuals can be distinguished in the whole G4 assemblage of the south-west corner site, although the rest of the G4 assemblage clearly consists of body sherds from different fabrics. However, since the differences in fabric are rather small, a further exhaustive division in fabric groups seemed not opportune; only two extra groups with distinctively separate fabrics could be discerned. This has to be taken into account when comparing the MNI with other amphorae groups, since this is a different approach as for *e.g.* the North African assemblage where a fabric division of the body sherds based on visual and

73 **Taken over from the description by J. Mertens of layer 38 (1977 Trench X, level 1) (Archive J. Mertens, NDO/Flanders Heritage Agency). This layer corresponds with Trench X, South profile, layer 31 and 32 and layer 4 on the East profile and the West profile.**

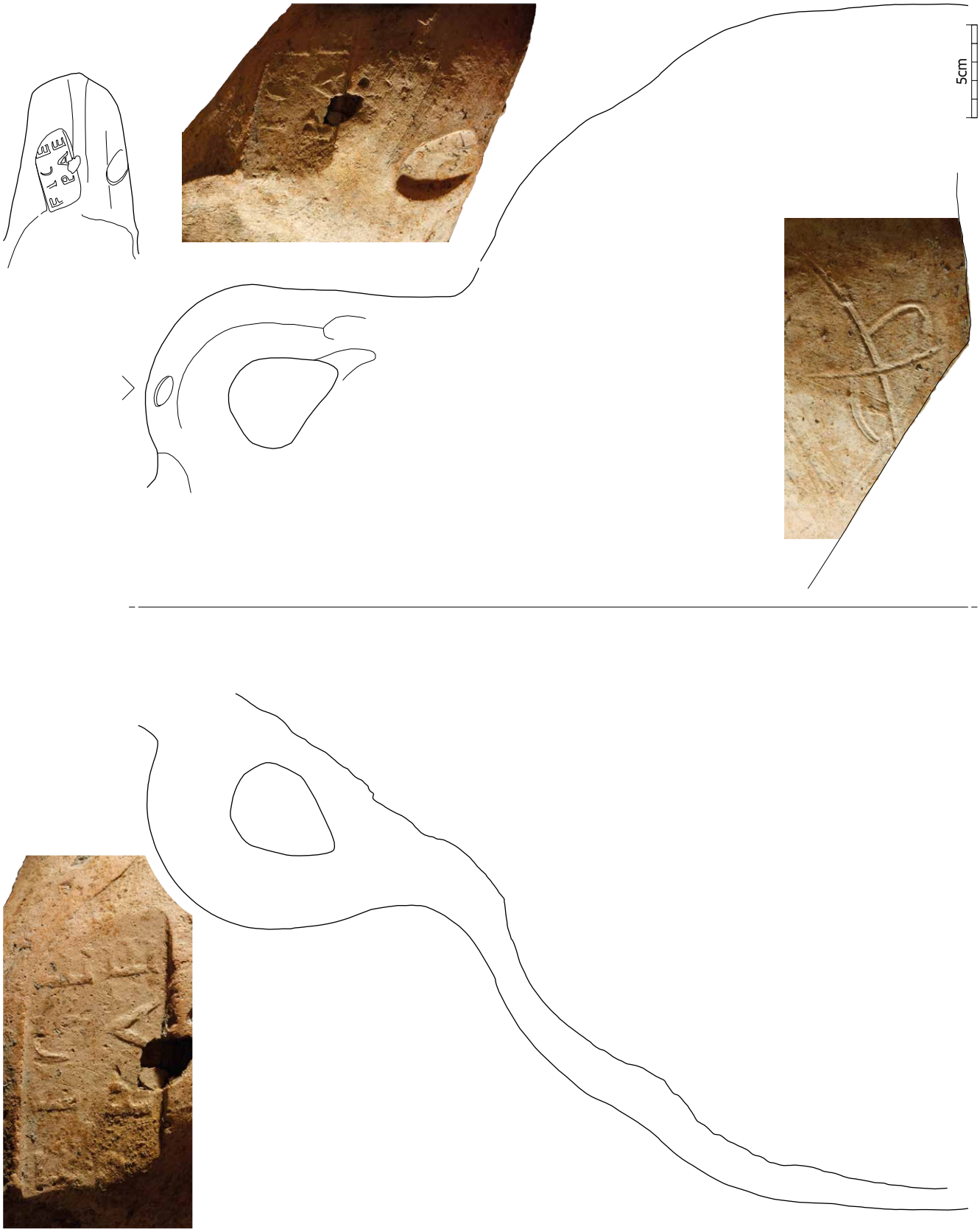


Figure 1.44. The upper half of a Dressel 20 amphora (no rim preserved) found in 1977 in the northern sector.

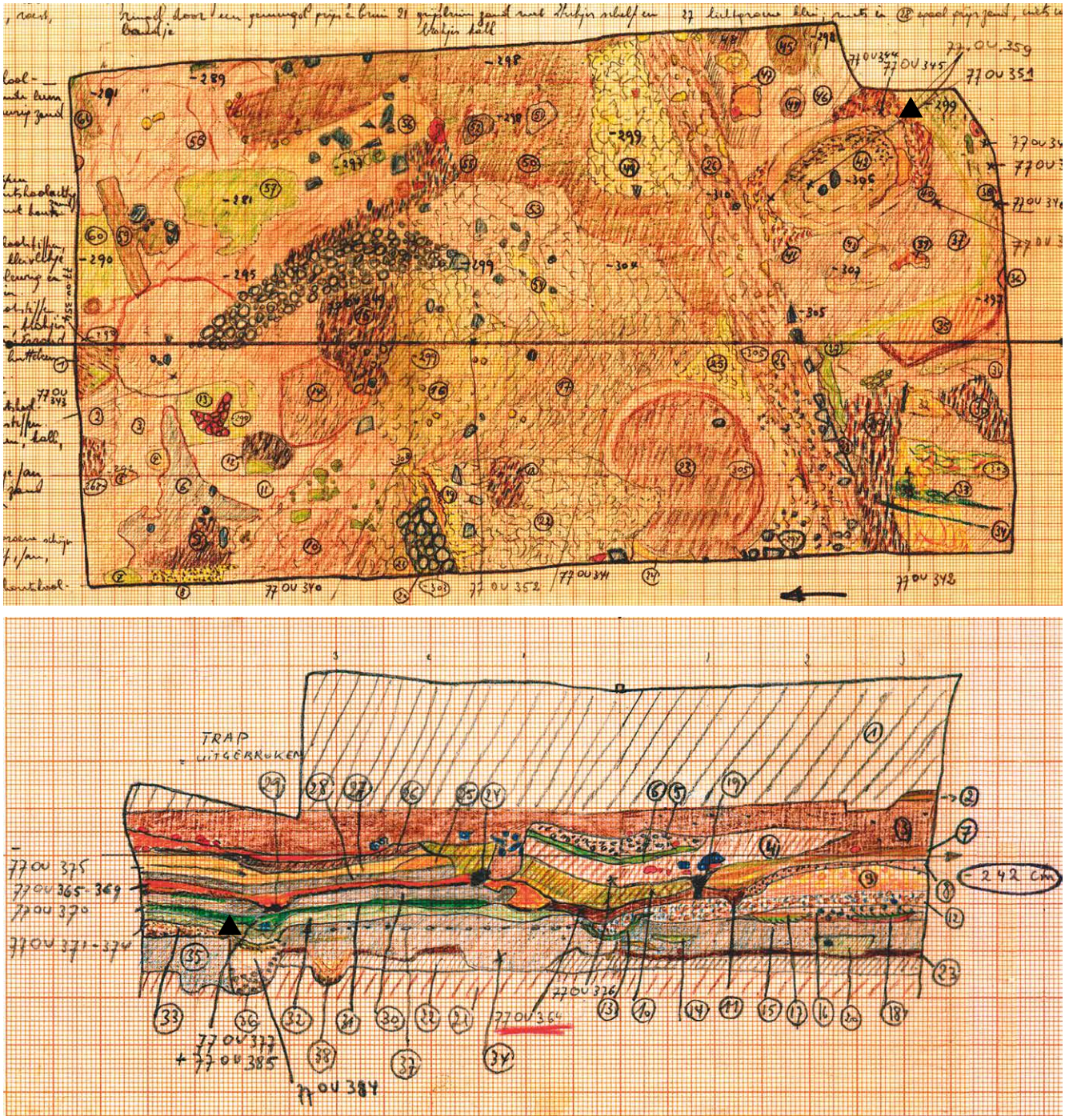


Figure 1.45. Localization of the find context of the in 1977 in Trench X recovered upper half of the Dressel 20 amphora of Figure 1.44. The black triangles mark the position of the amphora in the surface plan (top; see top right of the plan) and in the trench profile (below; see at the left side of the profile). Maps from the Archive of J. Mertens (NDO, now at the Flanders Heritage Agency).

technical differences appeared to be very useful. The MNI of the G4 amphorae cannot be compared as such with the MNI of the African specimen.

Four G4 groups can be assigned to the Roman levels (amongst which nos 47-49), another four groups to the post-Roman level (amongst which nos 51-53) (Plates CXLV-CXLVI). With these low numbers, little significance can be attached to the sherd counts for each level: the high sherd count for level 1 represents in fact only one almost complete Gauloise 4 amphora.

This individual was represented by some 46 conjoining sherds producing an almost complete profile of a G4 with one complete and one partially preserved handle (no. 47; Plate CXLV), and

Figure 1.46. Gauloise 4 amphora (no. 47) with potter's mark on the shoulder.

was found in/at the top of the earthen rampart of fort level 1. The shoulder of this amphora shows a complete potter's mark (see below). Although the chrono-typological sequence of the G4 is not so clear for the 2nd century, there can be no doubt that these amphorae are well-attested until the third quarter of the 3rd century (cf. the G4 of Boulogne: Dhaeze and Monsieur 2014). However, their typical 3rd-century appearance with broad shoulders and thick-set position of the handles against the rim is not exemplified in the Oudenburg individual which resembles more the earlier, 2nd-century types. The Oudenburg G4 amphora can be dated in the last quarter of the 2nd century AD (Martin-Kilcher 1994a/b; cf. Monsieur 2005: the Velzeke amphorae; Monsieur and Braeckman 1995a).

There are no reliable quantitative data regarding the importance of the export of these wine amphorae in the late 2nd and 3rd century and the end date of the production is still unknown. In any case, the G4 production did not extend into the 4th century and all sherds belonging to level 5 are to be considered as residual finds (amongst which no. 50), next to the four groups from the post-Roman level of course (cat. nos 51-53).

Two graffiti *ante cocturam* are preserved on G4 fragments. The almost complete Gauloise 4 amphora from fort level 1 (see before) bears a complete potter's mark (no. 47) (Figure 1.46). A body sherd from the post-Roman level shows a small fragment of a potter's mark (no. 54; Plate CXLVI). Two joining body sherds belonging to fort level 4 likely represent two graffiti *post cocturam* consisting of undefined scratches (no. 55; Plate CXLVI).

3.3 Dressel 14

Only one lower body fragment (not ill.) could be identified as part of a Dressel 14 amphora, a typical container for fish products, whether *salsamenta* or fish sauce. These amphorae are typical for the second half of the 1st to the first quarter of the 2nd century. Some later types, evolved out of the Dressel 14 form, can occur up to the second half of the 2nd century. The production is to be situated in the region of Cádiz (*Baetica*, Spain) (Martin-Kilcher 1994a/b; García Vargas 1998; Van Neer, Ervynck and Monsieur 2010). This fragment was a residual find in the post-Roman level and is another indication that material from the earlier civil settlement was brought onto the fort precinct together with the earth (cf. Volume I, Chapter II.2.3).

3.4 Keay 16A

The *Baetican* Keay 16A amphora (Keay 1984) is represented by four individuals, all recovered from the post-Roman level as residual finds (11.4% of the individuals within the post-Roman level) (of which three are illustrated: nos 56-58 on Plate CXLVI; Figure 1.47). This results in 4.5% of the site amphorae assemblage. The fragments are of the form Almagro 50, but the amphorae in question were not produced in *Lusitania* as one would expect[74] since the fabric here is *Baetican*. The type can be dated to AD 200-300 following the Lusitanian typology. One can surmise that the *Baetican* versions were also used for the transport of fish products. Similar amphorae were attested at Tongeren and Tournai (B) (Monsieur 2016). Surprisingly no single sherd of a Lusitanian amphora was identified in the Oudenburg assemblage which questions the real importance of the Atlantic as import route for Iberian amphorae. This seems to be confirmed by the lack of finds in Britain (Carreras Monfort 1998, 165). At any rate, Lusitanian amphorae are extremely rare in the North-West of the Empire, apparently only present on important administrative and military centres as Bavay, Strasbourg, Trier and Mainz (see Monsieur 2016 with references).

74 **In the article Monsieur and Vanhoutte 2011 the fragments in question are wrongly listed as *Lusitanian*.**

Figure 1.47. Keay 16A amphora no. 56. The rim-handle fragment was recovered from the transition level 5+post, whereas the two other joining rim fragments come from the post-Roman level.

3.5 Keay 19C

One *Baetican* Keay 19C amphora (Keay 1984) could be identified[75] (no. 59; Plate CXLVI): a rim fragment with the start of a handle recovered from the post-Roman level. This amphora also contained fish-based products. Dating to the period AD 350-410, it is the only amphora at the Oudenburg site which can be assigned with certainty to the (later) 4th-5th century.

3.6 North African cylindrical amphorae (nos 60-64)

Although seemingly less important than the G4 amphorae based on the number of sherds (*c.* 1.8 to 2.0% of the imported amphorae of the Roman level (chippings counted in or not), 5.4 to 6.2% of the overall amphorae), the MNI of the North African amphorae represents an important share of 24.5% of the Roman level amphorae, and 20.5% of the overall amphorae assemblage (cf. Tables 1.41-1.43) (illustrated: nos 60-64 on Plate CXLVII). However, as already explained, this may not be considered as an absolute difference, since a division of the body sherds into fabric groups appeared to be very opportune for the North African amphorae in contrast to the G4 fragments. Since the amount of diagnostic fragments in this assemblage is very limited, the visual and technical differences in fabric and surface of the body sherds (mainly the vertical scraping traces), which are very clear and very typical for this type of amphorae, were taken into account. However, these differences do not lead us to any chronological interpretations and the lack of diagnostic fragments makes it impossible to come to a proper typological differentiation.

With a total number of 123 sherds, only 25.2% of the North African amphorae sherds belong to the Roman level (31 sherds). The North African amphorae became important in fort level 5, the 4th century (with 26 sherds, while levels 2 and 3 respectively only yielded two and three fragments). However, the number for level 5 should probably be increased with the counts from the post-Roman level (92 sherds) as it is likely that most of these fragments were disturbed from fort level 5.

As for the Roman level, thirteen individuals could be identified. Most of these body fragments cannot be assigned to a specific type (like Africana I piccolo, Africana II grande, Keay 25, 'spatheion', etc.) (Keay 1984; Bonifay 2004) which makes it impossible to date the fragments (Figure 1.48). At least three individuals are dated to the 3rd century and should be identified as the Africana I piccolo and Africana II grande types (one group from fort level 3; two groups (amongst which no. 62), both from fort level 4). Nine individuals were recovered from fort level 5 and four individuals were found in the post-Roman level. The presence of the late type of Keay 19C makes it possible that at least part of these individuals belong to later types as the Keay 25 and the spatheion, assignable to the second half of the 4th and the first half of the 5th century AD.

Two fragments are to be considered separately. It concerns a body fragment of an unknown type of African amphora, for olive oil, salt fish or fish sauce, only generally datable to AD 200-450. The other distinguishable body fragment belonged to a small-sized African spatheion, for salt fish or fish sauce. Both fragments were collected from level 5.

In the eleven remaining groups within this North African amphorae assemblage, the fabrics NAF AM I and II (cf. Tomber and Dore 2000, 101-102) are equally represented. Six of the Roman level North African individuals were made in the lime-rich NAF AM I fabric; five groups show the lime-poor NAF AM II fabric.

The North African amphorae mainly derived from Byzacena and Zeugitana in Tunisia, maybe also from Tripolitania in Libya (Keay 1984; Bonifay 2004). The content of these amphorae is problematic. The regions of origin produced olive oil and were also important for the fish industry. Recent archaeometric research on African amphorae however has demonstrated that their function was most likely all-round (Piquès *et al.* 2008).

It is estimated that 10 to 20% of the *Monte Testaccio* consists of African amphorae (Blázquez Martínez and Remesal Rodríguez 2010). In the northern provinces the North African amphorae finds only form a patchy distribution. The assemblage at Oudenburg is rather substantial but yields little diagnostic material. More diagnostic finds from the 3rd and 4th centuries were recovered at Tournai (Brulet *et al.* 1999), Bavay and Trier (Monsieur 2015). In *Britannia* these amphorae occur in moderate quantities (Tyers 1996b, 104). Very significant for the chronology of this amphora group is the shipwreck Cabrera III along the south coast of Majorca in which the amphorae types Africana Grande II, Dressel 20, Dressel 23 and Keay 16A were found together with a coin hoard kept in a Dr. 23 of 965 *sestertii* with a closing coin of AD 257 (Bost *et al.* 1992).

3.7 Kapitän 2

One small group of amphora sherds can be assigned to an Aegean Kapitän 2 (Kapitän 1972; Riley 1979) and can be attributed to level 4 (no. 65; Plate CXLVII; Figure 1.49). This Greek wine amphora is very typical for the 3rd century in the North, not

75 **Identification confirmed by prof. dr. Bernal Casasola of the Cadíz University (Spain) and dr. Carlos Fabião of the Lisbon University (Portugal).**

Figure 1.48. Composition of representative North African cylindrical amphora fragments of the south-west corner site. The body fragments clearly show the vertical scraping traces.

in large quantities but regularly present (see *e.g.* at Braives (Brulet *et al.* 1992), Niederbieber (Oelmann 1914), Colchester (Williams *et al.* 1999)).

3.8 Dressel 7-10

Although no rim fragments were found (the only diagnostic piece is a handle fragment), five groups of Dressel 7-10 amphorae could be sorted based on differences in fabric: two individuals from the Roman level (one attributed to level 3, one to level 4), three from the post-Roman level. These types, made in *Baetica* and used for the transport of fish-based products, were very common in the North during the 1st century AD (Martin-Kilcher 1994a/b; García Vargas 1998; Van Neer *et al.* 2010) and are therefore most likely residual finds from earlier settlement features.

Figure 1.49. The Kapitän 2 amphora attested at the south-west corner site.

3.9 Haltern 70

The *Baetican* Haltern 70 amphora, used for the transport of olives in *defrutum*, was very common in the 1st century AD (Martin-Kilcher 1994a/b; Monsieur 2001; 2005). One rim fragment of a Haltern 70 with the start of a handle (no. 66; Plate CXLVII) can be attributed to level 5, and is clearly a residual find since this specific amphora can be dated AD 75-100, based on the late rim type and fabric (cf. van der Werff 1990). The post-Roman level yielded another two groups of Haltern 70, of which one was heavily burnt[76].

3.10 Beltrán II A/B

A body sherd close to the base can be identified as a *Baetican* Beltrán II A/B[77]. This amphora was used to contain fish sauce. Found in level 5, this is definitely a residual find from a feature of the pre-fort settlement, since this amphora is conventionally dated to AD 75-150 (García Vargas 1998).

3.11 Undetermined Baetican amphorae

Of one body sherd from the post-Roman level, fine-walled with clear wheelturning traces, no certain identification is possible. The *Baetican* origin is clear, but both an identification as Dressel 20 or a Haltern 70 are possible.

4. Origins and products

The Mediterranean transport amphorae represented in the assemblage from the south-west corner site of the fort show a variety of products, coming from different regions. They contained olive oil, olives, wine or fish-based products originating from *Baetica*, *Gallia Narbonensis*, *Africa* and the Aegean sea (Tables 1.45-1.46; Figure 1.50). The amphorae which can be undoubtedly related with the fort occupation evidence that wine was imported from *Gallia Narbonensis* (Gauloise 4) and from Greece (Kapitän 2), olive oil came in from South Spain (Dressel 20) and perhaps also from North Africa, and fish products were also imported from *Baetica* (Keay 16A, Keay 19C), perhaps also from North Africa.

The demonstrated high residuality factor in the Oudenburg assemblage makes it difficult to conclude to chronological evolutions in the supply of the products, neither functionally nor regarding origin. A general picture of the mid-Roman versus the late Roman situation can be obtained though (Tables 1.45-1.46; Figure 1.50). Olive oil and wine appear to have been standard products from fort level 1 onwards. Fish-based products only appear from fort level 3 onwards. North African olive oil or fish products seem mainly popular in fort level 5. The dominance of the supply from *Baetica* is above all determined by the Dressel 20 amphorae. The presence of the fish sauce amphora Keay 19C for fish-based products in the last fort level together with most likely some late Roman North African amphorae (containing olive oil or fish products) indicate that amphorae were still traded and transported to the Oudenburg fort up to at least the 4th century, although in small quantities.

5. Regional amphorae

Apart from long-distance trade amphorae, also regional amphorae circulated in the Oudenburg fort[78]. Besides only one body sherd of a Gauloise 4 imitation in Noyon fabric, the regional group consists of Gauloise 13 sherds and fragments of 'orange and red' amphorae. Both these amphorae groups are characterized by mostly flat bases.

5.1 Gauloise 13

With 78 sherds the North Gaulish Gauloise 13 form (see for G13: Baudoux *et al.* 1998) represents only a small share in the total amphorae assemblage (illustrated: nos 67-74 on Plate CXLVIII). The thick-walled heavy Gauloise 13 is inspired by the Dressel 20, but with a triangular-sectioned or rounded rim and a base which is either flat or in the form of a pointed button. The handles are often characterized by a 'beak' on the upper part (Baudoux *et al.* 1998) (cf. no. 70).

Based on the rim fragments, only four G13 individuals can be discerned in the assemblage of the south-west corner site. As for the G4 amphorae, a further division of the G13 body sherds was not

76 Because of this burning it cannot be absolutely excluded that it represents a Dressel 7-10.

77 This type is very close to Dressel 14; it cannot be excluded with certainty that it does not consist of one and the same group (see Dressel 14).

78 Van der Werff *et al.* 1997, 3 already pointed to the presence of regional amphora productions in *Britannia, Germania Inferior* and *Superior*.

AMPHORA CONTENT	wine	olive oil	olives	fish products	olive oil or fish products	unknown
mid-Roman MNI	5	30		4		3
late Roman MNI				1		10
total MNI	**10**	**43**	**3**	**14**	**17**	**2**

Table 1.45. The amphorae attested at the south-west corner site, in terms of content, based on MNI.

AMPHORA ORIGIN	Baetica	Gallia Narbonensis	Africa	Aegean	unknown
mid-Roman MNI	34	4	3	1	
late Roman MNI	1		10		
total MNI	**59**	**9**	**18**	**1**	**1**

Table 1.46. The amphorae attested at the south-west corner site, in terms of production region, based on MNI.

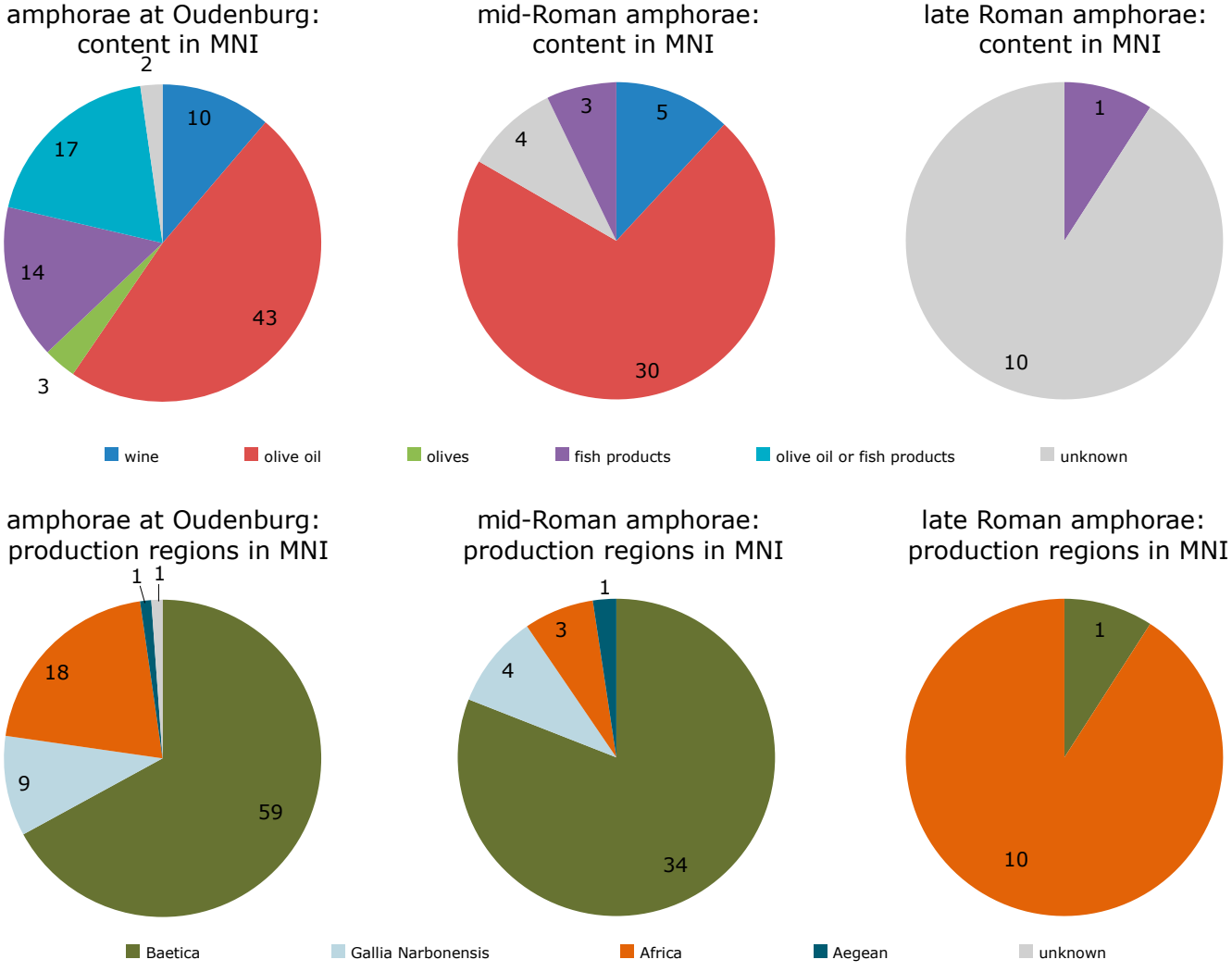


Figure 1.50. Top: distribution of the products represented by the long-distance amphorae recovered from the south-west corner site, based on MNI: to the left: general distribution, in the centre and to the right: the contents represented by the mid-Roman versus the late Roman products. Below: distribution of the production regions represented by the same amphorae: to the left: general distribution, in the centre and to the right: the production regions represented by the mid-Roman versus late Roman. Excluded from the counts are: the mid-Roman amphorae found in the post-Roman level as they may be residual from the extramural settlement, amphorae from the post-Roman level which cannot be classified into mid-Roman/late Roman, residual amphorae from the pre-fort settlement (Dressel 14, Dressel 7-10, Haltern 70, Beltrán II). Note: from the North African amphorae (of which the content is unknown) it cannot be excluded that at least part of them is residual from the mid-Roman level.

Figure 1.51. Graffito post cocturam on a lower body fragment, close to the base, of a Gauloise 13 amphora (no. 74).

possible since the differences in fabric are too small. Moreover, it is important to take into account that this fabric is macroscopically identical to that of part of the North Gaulish dolia[79]. Three G13 individuals can be assigned to the Roman level; one to the post-Roman level. Except for one fragment from level 2, most likely intrusive, the G13 amphorae are present from level 3 (18 sherds) onwards, but due to the lack of diagnostic fragments no MNI was assigned to this level. The appearance of Gauloise 13 at fort period 3 is in line with the dating of this type of amphora.

The G13 amphorae can be dated from the middle of the 3rd century until the start of the 5th century (Laubenheimer and Marlière 2010, 69). They were made in the north of France – so far only two workshops are known, at Cambrai (Nord) and at Bourlon (Pas-de-Calais), but there were definitely more of them – and were distributed in *Gallia Belgica* (Baudoux *et al.* 1998; Laubenheimer and Marlière 2010, 69). The Gauloise 13 amphora is also attested at the fort of Aardenburg (Dhaeze 2013, 219). The content of these amphorae is unknown but their imitation of the Dressel 20 form suggests that they served the commercialisation of a local oil, maybe nut oil (Baudoux *et al.* 1998; Laubenheimer 2000; Laubenheimer and Marlière 2010, 69).

Apart from the end of a graffito *ante cocturam*, an interesting graffito *post cocturam* can be read on a lower body fragment, close to the base (no. 74) (Figure 1.51), consisting of five joining sherds, yielding: [Vict]oris(?) xx[x] or '*from Victor xxx*' (cf. Bakker and Galsterer-Kröll 1975). Although the genitive form of the graffito points to an owner's mark followed by a number, the location of the text suggests that the amphora must have been broken before the text was scratched since the text is written upside down. It is possible that the xxx was an older graffito, seen the tight position after the name.

5.2 'Orange and red' amphorae

With this general term, a group of amphorae is assigned which are characterized by an orange or red fabric. They show the same fabrics as those occurring in the flagon wares. Only eight rims can undoubtedly be categorized as amphorae, and thus distinguished from the flagon group, either through their heavy rim shape or their large diameter. However, based on the differentiation in the (heavy) handles, at least fifteen individuals can be listed (only four illustrated: nos 75-78 on Plate CXLVIII).

Three fabrics can be identified: the Low Lands Ware I fabric (De Clercq and Degryse 2008), a quartz-rich fabric without mica, and a presumed (North) Menapian fabric as it can be recognized as the oxidized variant of the North Menapian reduced ware. Future research on this group is an important consideration to identify more specifically the different fabric groups of which probably more fragments are still present in the flagon ware category. The line between 'storage flagons' and 'amphorae' is thin; since no complete profiles were found, the assessment could only be based on diagnostic fragments such as the rim and the handles. The flagon group not only consists of tableware flagons but also storageware flagons or jar-amphorae. Therefore, it is possible that a share of (thick-walled) body sherds identified within this flagon group may have belonged to amphorae in the same fabric.

Three amphorae, respectively belonging to fort levels 3, 4 (no. 75) and 5, show a fabric identified under the binoculars as presumably the red variant of the North Menapian coarse reduced fabric. Typologically, the illustrated amphora with triangular rim (no. 75) has paralleled finds in the North of France, more specifically in the productions of the Cambrai region[80]. At Famars this type was found in contexts from the end of the 3rd century onwards (Willems *et al.* 2017b). The type resembles the Gauloise 13, identified by Laubenheimer and Marlière (2010) for Northwestern Gaul, and occurring from the middle of the 3rd century onwards. The Oudenburg example differs slightly in having a neck a bit more elongated. As Laubenheimer and Marlière already mentioned, other

79 **Therefore, it is very difficult to distinguish non-diagnostic wall sherds to the one or the other ceramic group. The thickness of the walls was in most cases decisive, but for some fragments there is reasonable doubt. The dolia were not studied in depth within the present research. Several fabrics can be identified, of which most are of North Gaulish origin, amongst which are the LLW1 fabric, the Scheldt-Valley fabric and the fabric identical to that of the G13 amphorae. One group shows a fabric close to that of the Rhineland mortaria of Soller and is characterized by applied bands with finger impressions. It is our aim to study the dolia in the near future.**

80 **With thanks to dr. S. Willems for pointing to these parallels.**

potteries than those in the Cambrai region must have produced this regional amphora. With the Oudenburg examples, a (North?-) Menapian production can be assumed.

A handle recovered from level 4 is assigned to the LLW1 fabric, a fabric well-represented in the flagon wares. The Low Lands Ware 1 was produced most likely in the Lower Scheldt Valley, near the Scheldt estuary in the Bergen-op-Zoom area in the Netherlands. The core of the distribution area was the Lower Rhine, the Meuse and the Scheldt valleys (De Clercq and Degryse 2008).

Six rims and six handles, clearly representing different individuals, are characterized by the quartz-rich that is usually identified as the so-called Scheldt-Valley fabric, with typical white slip, identified by van der Werff *et al.* 1997. The twelve amphora fragments in this fabric were spread over levels 4, 5 and the post-Roman level but appear to be dominant at fort level 4 (accounting for half of the examples). Together with the LLW1 fabric, this 'red' fabric also dominates the group of the flagon wares. These so-called Scheldt-Valley amphorae, investigated by van der Werff *et al.* 1997, have a reach in the north-west of *Gallia Belgica* and *Germania Inferior* with the core of the distribution area in East-Flanders (Monsieur and Braeckman 1995a; van der Werff *et al.* 1997, 4). These amphorae are also well-present at the Aardenburg fort (Dhaeze 2013, 219). Isolated finds have even been recorded in *Britannia* and Friesland. Originally it has been thought that the production originated from the Waasland region, based on the close resemblances with the 'Rupel' clay (van der Werff *et al.* 1997, 5). De Clercq (1995) however argues that the strong distribution of these amphorae in the Scheldt Valley is merely a reflection of a commercial trade link. Recent research has confirmed that these amphorae, or at least part of them, have been produced further upstream in the North of France. The comparison of samples of so-called Scheldt Valley flagons of Zele, Seclin, Hénin-Beaumont and Velzeke with sherds of so-called Scheldt Valley amphoras from pottery kilns found in Dourges (see Thuillier 2004) resulted in the conclusion of a macroscopically identical fabric (Vanhoutte *et al.* 2009c, 114). The eight kilns so far discovered at Dourges produced a wide spectrum of forms, including flagons and amphorae. The latest closely dated amphorae at Dourges date around AD 270, but the kilns were active until the (early) 4th century (Thuillier 2001; 2004; Leroy *et al.* 2012). However, as is argued for the flagons in this fabric, other kiln sites in Northern Gaul cannot yet be excluded as workshops (cf. Chapter 1.B.2, Section 3.2).

At *Colonia Ulpia Traiana*, a large group of such amphorae has been found, spread over several sites in the city (Schmitz 2014, 345: Abb. 30). The largest portion belonged to contexts dated to the 3rd century; only a small assemblage can be dated to the 2nd century. A typological study has enabled Schmitz to elaborate further on the classification of van der Werff *et al.* (1997) in three form groups (Schmitz 2014, 326 ff.). Oudenburg example (no. 76) finds close parallels in Gruppe 1 ('*amphoren mit bandförmigen Rand*') as rim R2 (Schmitz 2014, 328, 334: Abb. 19). The Oudenburg examples with heavy bead rim (nos 77-78) correspond with Gruppe 3 ('*amphoren mit Dreiecksrand*').

What products these regional amphorae transported, is uncertain. No residue of their original content has been preserved. The hypothesis of the storage and transportation of beer (presumably 'ale') has been put forward by van der Werff *et al.* 1997, 12-13; also the possibility of fish sauce has been discussed by them. However, Schmitz questions these suggestions and puts forward wine as possible content, mainly based on typological correspondences with South Gaulish wine amphorae with wide bases and the different distribution area the latter represent (Schmitz 2014, 351). The amphorae in this fabric only appear at the Oudenburg site from fort level 4 onwards, *i.e.* the later 3rd century. Although wine as content can be a valid possibility, one should not overlook possible changing consumption (food/drinking) patterns in this period in the North-West which can be a reason for a downfall of the wine import.

(North?-)Menapian and Low Lands Ware 1 productions seem to have ceased to exist by the late 3rd century; the presumed (North-) Menapian amphora from fort level 5 should be considered as a residual item. The red, so-called Scheldt-Valley amphorae, only occur from fort level 4 onwards, with examples mainly at this level and some in later levels. With the kiln sites at Dourges – in case these amphorae indeed originate from these workshops – still producing in the 4th century, while the local pottery industries ceased to exist by the late 3rd century, it is certainly possible that a large part of these red flagons (and amphorae) at fort level 5 are in their original level (and not residual). It is therefore likely that in the 4th century the regional supply by means of amphorae was provided by G13 amphorae and also 'North Gaulish' amphorae, both transported by river (the Scheldt) and further by roads.

6. In conclusion: amphora supplies and their evolution from the mid- to late Roman period

The amphorae assemblage[81] demonstrates that particularly during the 3rd century the Oudenburg fort was supplied by a variety of products: olive oil, olives, wine and fish-based products originating from *Baetica*, *Gallia Narbonensis*, *Africa* and the Aegean. The Oudenburg units clearly benefited from the wide trade network which was intensified by the supply to *Britannia*. The Dressel 20 and the Gauloise 4 amphorae dominate though, and this is typical for many sites of that period in the wider region, military or civilian.

Mediterranean products such as olive oil are known for their popularity in the army (who could afford the supply and the expensive products). Olive oil was not only used in food preparation, but also in bathing as a cleaning agent, moisturizer and massage oil, in medicine, lighting and in maintaining military equipment (Mattingly 1996, 224; Haynes 2013, 175). From the Augustan and Tiberian period onwards, olive oil was imported to the North-West in bulk and already in the second quarter of the 1st century AD Dressel 20 amphorae became the most common amphora imported in the North-West with a mainly military-oriented distribution (cf. Carreras and van den Berg 2017, 355, 369-371). The large military presence in *Britannia* will have implied an important traffic between the Continent and *Britannia*. Morris (2010) points to a distinct

81 **Preliminary conclusions were already published in Monsieur and Vanhoutte 2011.**

decline in the amount of olive oil that reached *Britannia* in the later 2nd century AD compared to earlier periods, followed by an increase in the stamped Dressel 20's dated AD 192-255. He relates the latter evolution to a higher rate of stamping in the 3rd century, as figures show for the *Monte Testaccio* in Rome, and contradicts a possible recovery in olive oil importation (Morris 2010, 103).

However, Monsieur (2015) argues against these figures for the North of Gaul and *Germania Inferior* for the period 200-260 and emphasizes the very low number of Dressel 20 stamps in these regions. If this is related to an economic decline or the monopolisation of the market by important interest groups, the increase in stamped Dressel 20 amphorae in *Britannia* could indeed imply a revival in the olive oil importation. The military campaigns by Septimius Severus in attempting the conquest of Scotland (208-211) must have strongly influenced and intensified the amphorae traffic to the British Isles when a massive army was assembled, albeit for a short episode. Illustrative for this traffic are the four single Dressel 20 amphorae found in the Belgian part of the North Sea and possibly pointing to three different shipwrecks. Or at least they were isolated finds originating from three different cargoes. Two, most likely from one wreck, are dated to the third quarter of the 1st century AD, two others, clearly from different wrecks, to the first half of the 3rd century (Monsieur, in Pieters *et al.* 2010, 187-192). The poor presence of Dressel 20 finds and the nearly total absence of Lusitanian amphorae in western France contradicts the assumption by Morris (2010, 69-70, 104) of the Atlantic as a primary trade route for bulk transports of olive oil directly from *Baetica* to *Britannia*. The trade route via the Rhône-Rhine corridor and by crossing the North Sea and Channel was definitely the most important. It seems most likely that the latter trade route will have been the one the Oudenburg fort and the surrounding region benefited of. The same Rhône-Rhine-North Sea-Channel route brought the Gauloise 4 wine amphorae to *Britannia* (Morris 2010, 72) and as can be supposed also to Oudenburg.

Most of the amphorae representing long-distance trade at Oudenburg pre-date Postumus (prior to AD 260). However, these vessels could have had a long life-span and were most likely still in reuse until late in the 3rd century. With however only one undoubtedly late Roman *Baetican* amphora (Keay 19C), next to several late Roman, North African containers at fort level 5, some Gauloise 13 and other North Gaulish (presumed Dourges) amphorae, the 4th-century amphora trade, although at a far lower level, seems to be to some level secured at Oudenburg. At Velzeke for example (see Volume I, Figure 2 for location), amphorae are hardly present in the 3rd century (Monsieur and Braeckman 1995b; Monsieur 2005; 2015). It emphasizes the military orientation of these later supplies. The import of Mediterranean amphorae to the North after the middle of the 3rd century is hardly comparable to the quantities in the preceding periods though (Monsieur 2015), as is also clear at the Oudenburg fort. Also in *Britannia,* imported wine amphorae are extremely rare after the middle of the 3rd century (Morris 2010, 132). It is very likely that other containers such as wooden barrels[82] were now more in play. Based on representations of barrels on stone carvings[83], an increase of barrelled trade can be noticed over time with a majority of the datable depictions in the 2nd and first half of the 3rd century, and they even witness of goatskin recipients to transport wine (Marlière 2002). Also fish products may have been transported in barrels (Morris 2010, 75; Van Neer *et al.* 2010, 179). The barrels found in the Guernsey shipwreck which sunk between AD 275 and 325, most likely contained wine. The presence of a cache of Romano-British pottery on board indicates it was a trading ship between *Britannia* and probably the west of France (Rule and Monaghan 1993; Tyers 1996a, 73). Barrels used for the construction of a mid-Roman well at Harelbeke, close to Kortrijk, in the southern part of the *civitas Menapiorum*, has been proved to have been made of silver fir and larch, the latter a tree at the time closest found in the Alpine foothills or the higher Vosges. The larch barrels may have originated from the Rhône Valley. They demonstrate that several northern wines were traded in barrels (Viérin and Leva 1961). Has this wine traffic with barrels eventually dominated the wine importation after the cessation of the Gauloise 4 imports in the last quarter of the 3rd century AD? Marlière (2002), however, has shown that this trade of wine in barrels equally declined in the late Roman period.

It is therefore more likely that wine and other products were no longer exported to the North. This may have been caused by changing drinking habits with wine for example becoming less important, not only for the soldiers but apparently in the complete North-West. Worth drawing attention to here is the explicit decline from the middle of the 3rd century onwards in the wine production of the production centres in the south of France and in Aquitaine (Brun and Laubenheimer 2001). It remains however unclear whether this should be seen as a cause for the situation in the North or as a result. The Moselle Valley, though, knew a flourishing wine production from the middle of the 3rd century onwards and in the 4th century (Brun and Gilles 2001), but Morris (2010, 132) questions whether these wines actually reached the North-West. Another possibility is that indeed other amphorae, in the case of our region those from

82 A study by Ejstrud (2005) of five amphorae assemblages from western continental Europe dated AD 30-70 has suggested that barrels must have played a major role in wine transport to the northern provinces already in the early Roman period. Several barrels from central or southern regions of France have been found on British sites (Marlière 2001; 2002), of which is thought that they were supplied in bulk through organized military supply (Morris 2010, 74).

83 Ellmers 1978, 13. See *e.g.* two mid-Roman presentations in stone, both preserved at the Rheinisches Landesmuseum at Trier on which the transportation of wine barrels from the Rhineland is evidenced. A relief of a wine business shows in its lower relief panel an ox pulling a wagon loaded with a large barrel. In the upper relief panel, a wine shop is depicted where wine is being served to two seated customers (McManus 1988). A sandstone model of a Roman ship transporting wooden barrels was found at Neumagen; it originally belonged to a larger funerary monument and can be dated *c.* AD 200 (McManus 2013). Also two of the Nehalennia altars found at Colijnsplaat and dated in the late 2nd – early 3rd century give evidence of wine barrel trade via the Rhine. These altars are dedicated by wine traders and bear depictions of vines and barrels (Stuart and Bogaers 2001, 58: A8, 79-80: A41).

Dourges, transported regional wines. Only future research on the content of the Dourges amphorae can offer key perspectives here.

Amphorae with fish sauce are known to have been imported from the coasts of South Spain and South Gaul; this is well-documented for the 1st century AD but less common for the 2nd and 3rd centuries (Martin-Kilcher 1994a; Monsieur 2010; Carreras and van den Berg 2017, 357). There is however more and more evidence for the production of local fish sauces in the provinces to the north of the Mediterranean (Van Neer *et al.* 2010). The fill of the well OS 22926 of the 4th fort level yielded many remains (*i.e.* a concentration of small bones) of locally-made fish sauce, made from small fishes caught in the North Sea close to the coast[84] (Ervynck *et al.* 2017). Besides, with fish sauce produced and consumed at the fort site one can expect that amphorae were not needed for transportation and other containers such as wooden barrels, dolia or other vessels may have fulfilled the storage function. In this respect it is worth drawing attention to the find at the Aardenburg fort of a rim fragment of a dolium on which a graffito *post cocturam* is preserved: 'ALIIC XI S(emis)', indicating that this dolium would contain the content of 11.5 amphorae (over 300 litre) of fish sauce (van Dierendonck and Vos 2013, 321: Fig. 8.22; De Clercq and van Dierendonck 2008, 24; Van Neer *et al.* 2010, 178).

There is an absence of available comparable data for the amphorae assemblage of the Oudenburg fort. The study of some key contexts of the late 2nd – 3rd century from the Aardenburg fort by Dhaeze (2013) also points to the dominance of Dressel 20 and Gauloise 4, next to a significant group of regional amphorae, according to Dhaeze largely consisting of the 'Scheldt Valley' amphorae, and some Gauloise 13 amphorae (Dhaeze 2013, 219-220). The amphorae presence at the British coastal forts remains largely obscure. Due to a lack of concerted research in terms of excavations and/or as the excavations that have occurred pre-date sophisticated modern study of amphorae or the potential has not been pursued (or they even may have not been recognized), it is uncertain what amphorae assemblages these forts had, if any. The published data seem to indicate that amphorae were hardly present at these late Roman forts[85]. Only at Caister-on-Sea several amphorae[86] were found with some late Roman types: at least three MNI Kapitän II amphorae, Late Roman 3 amphora fragments of Ephesian origin, at least three MNI of Chalk 6 amphorae, two MNI of Gaza amphorae and unknown red-brown ribbed amphorae from the Eastern Mediterranean (Darling and Gurney 1993). The Dressel 23 amphorae, absent at the Oudenburg fort, apparently hardly reached *Britannia* with only a few examples known on two British sites (Morris 2010, 132). North African amphorae started to be imported in *Britannia* from the early 3rd century onwards, in increasing but still limited quantities, up until the early 5th century. They have been found at major civil sites in *Britannia*; however, at the British Shore forts they appear to be absent (Morris 2010, 132). To compare with a civil site, also at Tournai the late Roman amphorae assemblage is very limited. More variety in the imports can be discerned though. Next to some North African amphorae, *Baetican* olive oil continued to come in in moderate quantities. However, together with the imports of some Gaza amphorae with oriental wine, the access to these supplies most likely rather emphasizes the status and the more 'romanized' character this site had (cf. Brulet *et al.* 2012, 144-148; Vilvorder 1994).

Clearly the movement of commodities in Mediterranean amphorae to army units tailed off in the late Roman period. This may be partly due to structural changes such as the reduced level of state organization of long distance supply and a smaller garrison network around the North Sea that might have been less vital to organize such expensive transports. However, it probably rather relates to a change in consumers and their cuisine. With more local and regional recruitment, including Germanic recruits, wine may have been less a part of the military cultural life of officers and men than products of local/regional brewing. Equally these soldiers still may have had use of oil for cooking, body care and possibly lighting if one considers the nut oil as the presumed content of the Gauloise 13 amphorae. Local solutions to the decline of exotic amphora-borne commodities are suggested with locally produced fish sauces. From this perspective, the range of later amphora types reaching the Oudenburg fort could be particularly noteworthy.

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84 This is not an isolated case. The production of local fish sauce has been attested at several sites in the North and seems to have been a rather late phenomenon of the 2nd-3rd century AD according to the study by Van Neer *et al.* 2010.

85 The 1958-61 excavations at Burgh Castle did not yield a single amphora sherd (cf. Johnson 1983a). The small-scaled excavations in 1976-78 at Lympne only resulted in three sherds of Dressel 20 and one unidentified amphora fragment (Cunliffe 1980, 277). The Portchester fort volume mentions four sherds of Spanish globular amphorae (Cunliffe 1975, 279). From the Richborough fort only amphorae stamps were studied, all belonging to earlier episodes of the Richborough site (Bushe-Fox 1926, 84-88; Bushe-Fox 1928, 93-95; Bushe-Fox 1932, 159-162; Bushe-Fox 1949, 242-253; Bushe-Fox 1968, 162-171 (by Callender)). From the Pevensey fort, only four amphora fragments are known from the 1994/5 excavations by Fulford; none were found during the research between 1936 and 1964 (Lyne 2009 and pers. communication M. Lyne). Of these four fragments, three are unidentified and the fourth is thought to come from the eastern Mediterranean (pers. comm. M. Lyne).

86 At Caister-on-Sea, the amphorae only account for a minority with *c.* 2.2% of the weight of the totality of the pottery. The mid-Roman amphorae fragments mainly represent the Gauloise 4 and the Dressel 20 (and possibly Dressel 23) amphorae, next to sixteen other MNI. The North African cylindrical amphorae are only represented by four fragments, accounting for at least two MNI (Darling and Gurney 1993).

2. 'Common' flagon wares

Sofie Vanhoutte and Sonja Willems

1. Introduction to the flagon assemblage

This pottery category, comprising in total 12,210 fragments of which 9,492 sherds were found in the Roman level, only represents the 'common' flagon wares. The few mica-dusted ware flagons and marbled ware flagons were counted in these separate categories (see respectively Chapter 1.A.5 and Chapter 1.A.3 in this volume). The 'common' flagon ware group shows the greatest difference between the different quantification methods when compared with the other pottery categories: when the Roman level is considered in total, the flagons represent 10.5% in sherd count and only 2.9% in MNI of the totality of the Roman pottery. This is mainly due to the large fragmentation degree and the on the average small rim diameter of these vessels. However, the percentages both do show a clear trend. In the first two levels the flagons represent a larger percentage of the pottery assemblage with 26.4% or 6.1% at level 1 and 18.6% or 4.4% at fort level 2 depending on the quantification method (sherd count versus MNI). From fort level 3 onwards, these percentages drop considerably: an average around 10% in sherd count and 2.2 to 2.9% in MNI count for fort level 3 to 5 show a decrease indicating that the flagon form became less popular from the middle of the 3rd century onwards. The small numbers of mica-dusted ware and marbled ware flagons do not change this general conclusion. As for fort level 5 – as is clear from the key context assemblages – the (small) proportion of flagons most likely even represents an over-representation due to a high number of residual, dug-up individuals (however, all pottery categories are subject to a high degree of residuality at this point).

This category comprises both 'tableware flagons' and 'storageware flagons'. The tableware flagons at Oudenburg could be both one or two-handled; therefore the division between 'flagons' and 'jar-amphorae', which is based on the number of handles, is avoided. Tableware and storageware flagons can be distinguished based on the size of the vessel, the thickness of the wall, the coarseness of the fabric and the finish of the exterior surface (see also Vanhoutte *et al.* 2009c).

From this large flagon group only the long-distance imports from the south were systematically analyzed under the binocular. All orange-red flagons of (presumed) regional origin were not systematically microscopically identified, except for those of key contexts OS 4980 (see Vanhoutte *et al.* 2009c) and OS 22926 (see the Appendix in this volume). However, on a macroscopical level, some important results can be drawn.[87]

2. Long-distance flagons

The small number of fragments of Cologne/Rhineland tableware flagons, characterized by a whitish fabric, only represent a few MNI. Also some Rhône Valley tableware flagon fragments could be discerned. Only four flagon sherds (no rim fragments) have a micaceous fabric referring to the Mediterranean production in the Narbonne region and another three fragments show a micaceous fabric of which the origin could not be identified.

More tableware flagons originate from southern territories, but – surprisingly – even they represent only a small portion.

From the total flagon assemblage from the Roman level, only 81 fragments, representing at least fifteen individuals, can be attributed to productions located in current France[88]. Fourteen individuals (based on rim/base/handle fragments), representing 65 fragments, originate from the region Bavay-Famars of which twelve have a saponaceous/soapy soft fabric (Figure 1.52: SAV FL, three variants) and two have a sandy calcareous fabric (Figure 1.52: BAFA FL). The dominance of the saponaceous variants at Oudenburg is not surprising considering the fort occupations in the 3rd and 4th centuries. In that period, the sandy variants drop back in favour of the saponaceous productions, using the same clay but with a treatment of filtering or washing to achieve a dense and fine aspect. The individuals defined for the Roman level are distributed as follows: one MNI for fort level 2, two MNI for fort level 3, four MNI for fort level 4 and eleven MNI for fort level 5. Only a few flagon forms are recognized since most of the flagon sherds represent body fragments, handles and base fragments. The identifiable flagons belong to the late types with ribbon-shaped rim, type Blicquy XIII.2/Reims 223 (for Blicquy: De Laet *et al.* 1972; for Reims: Deru 2014) (Plate CXLIX: 1-2). This type has been found at Famars from 'phase 5' onwards, dated after AD 260 (Willems *et al.* 2017a). At Reims, it has been generally dated in the 3rd century (Deru 2014), while at Blicquy the authors have situated the type in the 2nd century (De Laet *et al.* 1972). The find contexts of this type at Oudenburg, situated at fort level 4 or later, seem to support the dating suggested at Famars. One other individual (Plate CXLIX: 3), recovered from fort level 2, has a simple, out-curved rim, close to type Vanvinckenroye (1991) 440. The general dating of this type – 2nd to early 3rd century – fits with its find context in the first half of the 3rd century.

87 **Only the flagons from the Roman level are considered here. More of these imports were found as residual or dug-up fragments in the post-Roman and transitional level 5+post-Roman. These were not studied in depth.**

88 **Similar fabrics are represented in the fine oxidized group. Vessel fragments of which could not be determined with certainty whether they belonged to flagons or other tablewares, are not considered here.**

Fifteen flagon sherds (no rim fragments; therefore 1MNI for its presence) can be attributed to the potteries of Noyon (Figure 1.52: NOY FL); eight with absolute certainty and seven probably. The Noyon productions knew a mainly western distribution, via Boulogne to *Britannia*, but a small share seems to have been exported to the north via the Scheldt river to the *civitas Menapiorum*, as examples at Menen (B) testify to as well (Dhaeze *et al.* 2015). The Noyon potteries were popular in the 1st and 2nd centuries. Since the eight certain Noyon fragments were found at fort levels 4 and 5, they most definitely represent residual items, originally belonging to fort period 1 or the earlier occupation on the site.

3. Orange to red flagons: all regional?

The flagon group – comprising both tableware and storage ware flagons – is dominated by orange to red products. A large share can be identified as Low Lands Ware 1 flagons, but more productions are to be discerned.

3.1 Low Lands Ware 1 flagons

The Low Lands Ware 1 flagons, with a quartz-rich fabric characterized by the presence of muscovite mica (De Clercq & Degryse 2008), have been supplied in large quantities to the Roman fort. The tableware flagons of this group are frequently characterized by burnished zonal areas or a complete burnishing of the body (Plate CXLIX-CL: 4-18). These products occur from fort level 1 onwards, alongside 'North Gaulish' orange to red flagons (see further). During fort period 4 – the later 3rd century – the LLW1 flagons seem to dominate the flagon spectrum, as is clear from key context assemblages like the large waste-pit OS 4980 and well OS 22926 where this flagon group was examined in detail.[89] In the dump of OS 4980 the LLW1 products completely dominate the flagon group. In well OS 22926 this is also the case until the first waste level (structure level IV); in the final waste dump (structure level V), dated to the very end of fort period 4, the 'North Gaulish' orange-red flagons seem to take over.

Of several LLW1 flagons the interior of the neck was covered by a black coating (*e.g.* Plate CXLIX: 12). Analysis of such flagons, within a larger research project by De Clercq, has evidenced that it concerns birch-tar (pers. comm. W. De Clercq). This black coating points out that these flagons originally had wooden caps. Such wooden caps, in combination with black coating, were still preserved on several flagons found at *Forum Hadriani* (Voorburg-Arentsburg) (Van Kerckhove 2014, 470). They will have transported liquids, which indicates that at least part of the flagons were (also) imported for their content. According to their occurrence in the Oudenburg key context assemblages, this was already the case from period 1, the late 2nd century, onwards.

The most common LLW1 tableware flagons at the Oudenburg fort show: a ring-shaped rim, already occurring at fort level 1 (Plate CXLIX: 4-8) and still common at fort level 4 (nos 5-7); a constricted rim, a popular type at fort period 4 (nos 11-14), or an everted, flattened rim, like the examples at fort level 3 (no. 9) and fort level 4 (no. 10). Also occurring is the triangular rim (example of fort level 4: no. 15), the sickle-shaped rim (example of level 1: Plate CL, 16) and the collared-rim (no. 17, from level 1; no. 18 (profiled), from fort level 4).

The fine profiles with ring-shaped rim and everted, flattened rim seem to be restricted to the tablewares. The constricted-profile rim form is also present in the storage ware group (Plate CL: 19-21, all fort level 4). The triangular-profile rim no. 22, which imitates the Dressel 20 rim, was probably reserved for storage vessels. The storage ware handle no. 23 has a 'beaked' projection at the top of the handle, resembling those commonly found on Gauloise 13 amphoras produced in the North of France (see Baudoux *et al.* 1998). This 'beak' may be a decorative detail or may have improved grip on the handle (Vanhoutte *et al.* 2009c). They also occur on orange jar-amphorae produced at Bruay-La-Buissière, Dourges and Wervik (Willems 2019, vol. 2), which supports the idea of a functional reason and seems to indicate a larger northern cultural tradition.

3.2 'North Gaulish' orange to red flagons

Next to the LLW1 products, a large share of flagons displays a more quartz-rich fabric, without mica. They all seem to have been white-slipped, although the white slip is often not preserved. Different types can be distinguished, like a selection of types show: the everted rim type (Plate CL: 24), the type with high, constricted neck (no. 25), the constricted-and-collared rim type (no. 26). Usually, this flagon group is identified as the Scheldt-Valley production, after the 'Scheldt-Valley amphorae' described by van der Werff *et al.* (1997)[90], a denomination after the presumed production of these products.[91] Originally it has been thought that the production originated from the Waasland region, based on the close resemblances with the 'Rupel' clay (van der Werff *et al.* 1997, 5). However, macroscopical comparison, using binocular-magnification, of some 'Scheldt-Valley' flagons from our region with flagons from Dourges (Pas-de-Calais, North of France) has indicated similar fabrics and allows the assumption that at least part of the 'Scheldt-Valley' flagons and amphorae may be produced there (Vanhoutte *et al.* 2009c, 114).[92] At Dourges, up to eight pottery kilns are known, producing flagons and amphorae amongst others, with date ranges from the 1st to the 4th centuries (Thuillier 2004;

89 **For the assemblage of large waste-pit OS 4980: see Vanhoutte *et al.* 2009c. For the assemblages of well OS 22926: see the Appendix in this volume, Sections 5.2 and 5.3 resp.**

90 **They considered a rim diameter of 12 cm as criteria to distinguish the amphorae (with more than 12 cm rim diameter) from the flagons; the assemblages studied by them however hardly comprised 'flagons' (van der Werff *et al.* 1997, 6).**

91 **According to their study, the distribution area of these Scheldt-Valley products covered the north-west of *Gallia Belgica* and *Germania Inferior* with Nijmegen, Tienen and Tongeren forming the eastern border. The core was situated in East-Flanders (van der Werff *et al.* 1997, 4).**

92 **Schmitz (2014) states to have confirmed the production at Dourges for 'Scheldt-Valley amphorae' found at *Colonia Ulpia Traiana* (Xanten). However, with only one small reference sample from Dourges (no specific context is mentioned) with a slightly differing chemical composition (Schmitz 2014, 318), it remains to us an open question whether this contribution can be generalized.**

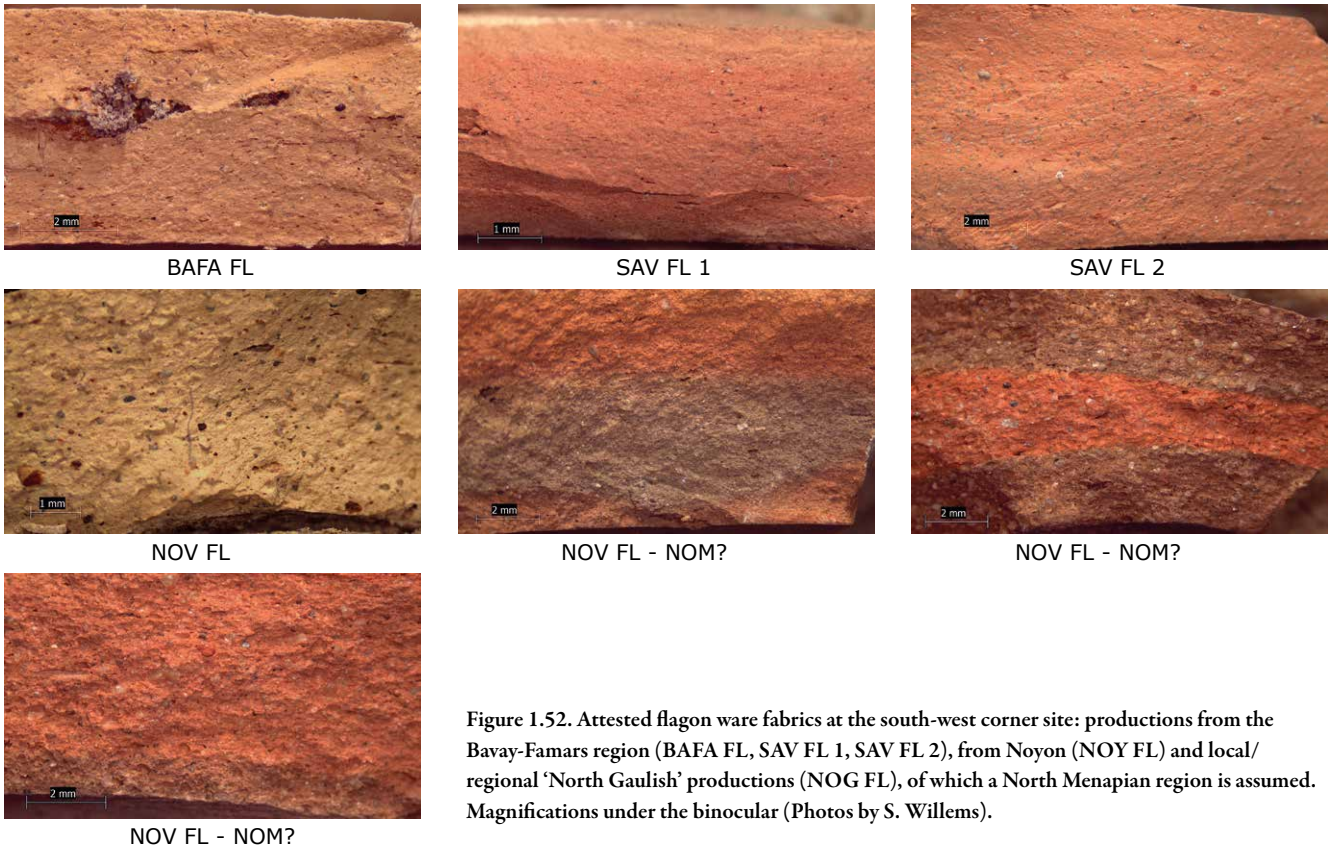

Figure 1.52. Attested flagon ware fabrics at the south-west corner site: productions from the Bavay-Famars region (BAFA FL, SAV FL 1, SAV FL 2), from Noyon (NOY FL) and local/regional 'North Gaulish' productions (NOG FL), of which a North Menapian region is assumed. Magnifications under the binocular (Photos by S. Willems).

Leroy *et al.* 2012). Such flagons and amphorae are said to be well-present at the Aardenburg fort too (Dhaeze 2013, 219).

Nevertheless, despite the resemblance with the Dourges products, other kiln sites in Northern Gaul which have produced similar forms in orange fabrics cannot yet be excluded as workshops. For instance, the collared-rim flagons (nos 13 to 15) are known to have been produced at Wervik, Ploegsteert (both Belgian sites along the border with France) as well as Bruay-la-Buissière (France, Pas-de-Calais) (Willems 2019, vol. 2). Certainly Bruay-la-Buissière still produced in the late Roman period (cf. Chapter 1.B.5.2 in this volume).

Moreover, fabric analysis using binocular microscope of a sample of flagons from Oudenburg revealed that within the white-slipped orange-red flagon group another fabric can be distinguished. A yet undefinable share of flagons shows a fabric which can be recognized as the oxidized variant of the (North) Menapian reduced ware. Some flawed flagon fragments represent second-class products and their presence may be an indication that the potteries were not far-of. Further study is needed to determine whether the North Menapian potteries, active until the later 3rd century and known for their handmade and reduced wheel-turned wares, were for sure also producing oxidized pottery. This fabric can only be distinguished from the other fabrics using binocular-magnification. As this could not be studied systematically, the more general denomination 'North Gaulish' has been used for the quartz-rich orange-red flagons in the analysis of the key context assemblages to comprise both fabrics.

While LLW1 and North Gaulish flagons are both in use until fort period 4, only the North Gaulish products seem to remain commercialised in the 4th and early 5th century. As the North Menapian industry stops in the late 3rd century, these flagons were most likely all produced at Dourges or other workshops in current northern France. At the in 2014 discovered border of Graveyard C (site Belleroche (ET28)) four inhumation graves of the 4th-early 5th century (graves 2, 4, 7 and 8) yielded an orange-red flagon with quartz-rich fabric (cf. Dyselinck *et al.* 2020, 133: Fig. 109). Three flagons are from the type with high, constricted neck, a type already occurring in the later 3rd century in the fort assemblage (Plate CL: 25). This type was also at Graveyard A a popular flagon form (cf. Mertens and Van Impe 1971, Pl. LXXII-LXXIII).[93] Both the LLW1 and North Gaulish fabric groups and forms are noted at Tournai, in the assemblages from the Notre Dame cathedral site (Brulet *et al.* 2012, 157-158; cf. Vilvorder *et al.* 2012 for the fabrics) as well as in the graveyard Rue Perdue (Brulet 1996a, 40 and Fig. 29). The flagons with constricted necks in North Gaulish fabric correspond to Brulet's type 6, especially present in the graves of the first half of the 4th century.

93 **A future goal is to examine closely the flagons from the late Roman graveyards to obtain more information on their fabrics, in comparison with the flagons found on the fort precinct, to gain insight into the flagon group of the late Roman period.**

4. A small storage vessel called 'honey pot'

One individual (two fragments) clearly belongs to the group of storage vessels of the type called 'honey pot', characterized by a shallow eaves trough and two small handles (Plate CL: 27). The burnished surface makes it difficult to distinguish the body fragments of honey pots from other tableware vessels. This is also a problem for certain flagons with burnished surfaces. Hence, the identification of burnished oxidized bodies remains difficult and the counts are therefore certainly biased by this. The classification '*céramique culinaire cuite en mode A*', used in the North of France, a classification not related to function, is a solution but the historically grown classification in Flanders into fine oxidized vessels and flagon wares is maintained for this site, enabling comparisons with other sites in Flanders. Therefore, this small storage vessel is included in this 'flagon' group. Moreover, in fabric and surface it is more related to the flagons than to the (coarser) oxidized wares of Chapter 1.B.4 in this volume.

The form of the Oudenburg honey pot with a rim including a shallow eaves trough and a truncated neck is typical for storage vessels with two small handles. Its white fabric and hence its origin remain undetermined. The dating of this vessel, recovered from fort level 3, is therefore difficult. The honey pots occur from the 1st century onwards until the beginning of the 3rd century AD, with a type spectrum that hardly changed. It is therefore not certain whether this individual belongs to fort period 3 of the middle of the 3rd century or whether it concerns a residual item.

5. Conclusion

Although they are an essential 'Roman' product, flagons appear to be of much less importance than the handmade and wheel-turned grey wares in the 3rd-century Oudenburg fort. Long-distance flagon imports only reached the Oudenburg fort in small quantities. The Cologne/Rhineland and Rhône Valley flagons even count for only some examples. Some Noyon flagons are likely assignable to the late 2nd-century fort (fort period 1) or the pre-fort settlement. Only the saponaceous soapy variant of the Bavay-Famars flagons seems to persist into the later 3rd and into the 4th century, although in very small quantities. During the 3rd century, flagons were mainly supplied by (supra)regional potteries. Until the later 3rd century these flagons comprise LLW1 products and quartz-rich orange to red flagons. The Low Lands Ware 1 flagons were very popular at fort period 4, after they seem to disappear at Oudenburg. Part of the orange to red flagons most likely originate from Dourges, but other workshops cannot yet be excluded. Moreover, a (North) Menapian production appears to be identified within the quartz-rich fabrics.

In the 4th and early 5th century the quartz-rich orange to red flagons take over the flagon assemblage, next to some saponaceous Bavay-Famars flagons. In that period, the orange-red flagons were most likely all imported from the Dourges or Tournai region.

It is clear that from the middle of the 3rd century onwards, the use of flagons diminished remarkably. Given the inevitable share of residual fragments (increasing higher up in the Roman level), the dropping counts around the middle of the 3rd century are the more significant. Perhaps the – mainly table ware – function of the flagons was taken over by other pottery categories and forms in the later 3rd century, such as the local/regional handmade and wheel-turned large beakers/pots. This may be due to changes in drinking habits and changing popularity of drinking liquids. At the late Roman graveyards at Oudenburg the flagon is still an important grave gift. Its significance is however not as clear in the fort assemblage of that period.

3. Mortaria

Sofie Vanhoutte, Sonja Willems and Robin P. Symonds

1. Introduction to the coarse mortarium assemblage

At the south-west corner site, 1068 pottery sherds belong to the coarse mortarium group, accounting for a number of at least 248 individuals (excluding samian and fine ware mortaria)[94]. No stamps are present, which is not surprising given the occupation mainly covering the 3rd and 4th centuries. When the total Roman level pottery is considered, the mortaria only represent 0.85% of the total sherd count, 1.35% when seen in MNI. This difference can easily be explained by the robustness of the vessels. The coarse mortarium assemblage is characterized by many large pieces; these rather thick-walled vessels, mostly displaying a very hard fabric, are evidently less breakable than most of the samian vessels and the fine wares, resulting in less fragments for one individual than the latter categories. In this respect, it is even more striking that several coarse ware mortaria appear to be scattered over different (fort) levels, as the high number of cross joining sherds testify (Figure 1.53).

A thorough study of the coarse ware mortaria, based on fabric analysis, is most significant, not so much for their chronological value, but especially from an economic perspective. The variety in fabrics is representative of the diversity in the supply to the Oudenburg fort. The coarse ware mortaria embody the wide trade network the Oudenburg fort was part of and reveal changing supply routes throughout its occupation history. The assemblage is particularly interesting since it comprises both Romano-British supplies along with supplies from the northern continental provinces.

The 1068 mortarium fragments, accounting for at least 248 individuals, are proportionally more or less evenly distributed throughout the Roman level. At level 1 and fort level 2, they account for respectively 2.8% and 2.0%. From fort level 3 onwards, the proportions decrease a little, reaching just over 1%, with *c.* 1.3% for each of the fort levels 3, 4 and 5 (Volume I, Chapter V.2.3, Tables 7-8).

When the assemblage is considered on its own, its large share within fort level 4 is striking (Figure 1.54). Compared with the total number of mortarium individuals, 25.4% can be assigned to fort level 4; when only their number from the Roman level is considered, the 43.2% (or 63 MNI) at fort level 4 stands out even more. The strong increase at fort level 4 in comparison to fort level 3 is not so remarkable on its own. Fort period 4 covers a much longer time-span than the preceding fort periods. However, when studied contextually, and considering the functional significance of this part of the fort during fort period 4 as an area of workshops, this large share of mortaria is rather remarkable and less easy to explain. Their spatial distribution at fort level 4 shows no specific clusters. It is worth drawing attention to the samian mortaria, also very present in the workshop area (Figure 1.54). Very striking are the seven samian mortarium individuals in the context OS 7949, the central depression at Unit I belonging to the first phase of this workshop, a context rich in brooch production waste (see Volume I, Chapter II, Section II.4.6.2.c). It has been suggested that the samian mortaria were brought to the workshop for repair using lead joints. Could this also be an explanation for many of the coarse ware mortaria in this fort level? Eight coarse mortarium fragments show repair holes[95]; four of them are attributed to fort level 4. Another explanation is suggested below.

The MNI count of the coarse ware mortaria decreases at fort level 5 to 44 MNI (30.1% of the mortaria from the Roman level). This is not surprising given the function of the south-west corner at that time. With a bath house at level 5A and including compounds to keep animals, probably horses, at level 5B, the mortaria at this fort level will not have been used on the spot, but should be considered to have been waste from nearby fort locations.

As already mentioned, the assemblage is characterized by a high number of cross joining sherds (Figure 1.53). After detailed puzzling of the fragments, no less than 45 cross joins can be counted (consisting of two or more joining sherds), including at least 37 vessels considered as MNI. The map shows the cross joins covering distances of more than 2 m, demonstrating the scattering of some individuals over different levels and the considerable movements these vessel fragments underwent[96]. This is remarkable bearing in mind their rather heavy weight and the size of most of the fragments. It emphasizes even more the impact of the building activities at every fort level, as already indicated by the many samian ware cross joins (see Chapter 1.A.1 in this volume).

94 This section does not include three sherds (2 MNI; 0.02 EVEs; 70 g) of Hadham red ware or twenty sherds (13 MNI; 0.74 EVEs; 376 g) of Oxfordshire red/brown colour-coated ware that are included in the fine wares section (no other mortaria were recorded among the fine wares), nor does it include any Dragendorff 43 or 45 mortaria or their later counterparts that were observed in the samian assemblage.

95 Apart from the fragments from fort level 4, one fragment from fort level 3 (Plate CLVII: 38), two from fort level 5 and two recovered from the post-Roman/mixed levels show one or more repair holes.

96 Evidently, the individuals in question are (only) counted in in the earliest level.

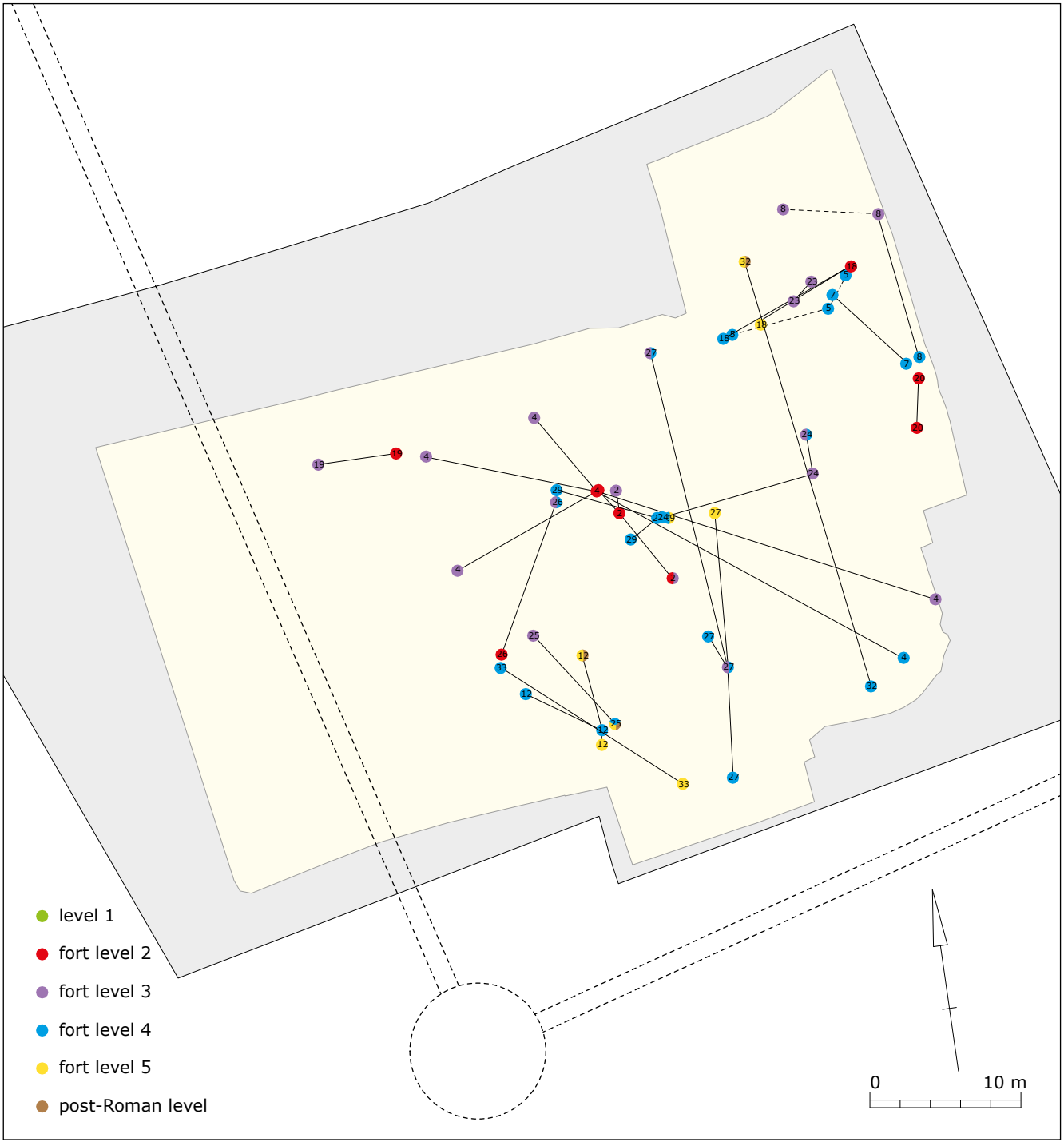

Figure 1.53. Visualization of the lateral cross joining coarse ware mortaria fragments stretching over a distance of at least 2 m.

The (coarse) mortarium, a vessel originally belonging to a Mediterranean culinary tradition, must have served for crushing, grinding and pulverising several foodstuffs and probably also other materials for non-culinary purposes. Coarse ware mortaria were probably mainly used for processing cereals for making bread, but may also have been used for making dough or seasoned sauces, and for the preparation of medicine, face creams or the grinding of pigments for painting and grog for clay tempering (cf. Symonds 2012, 171-172; Cramp *et al.* 2011, 1349; Hilgers 1969, 68-70). Organic residue analyses have certainly evidenced the processing of animal carcass fats and of leafy plants, but other commodities appeared undetectable, which does not rule them out though. It is very likely that the mortarium was a very multi-purpose vessel, within culinary and non-culinary contexts (Symonds 2012, 172).

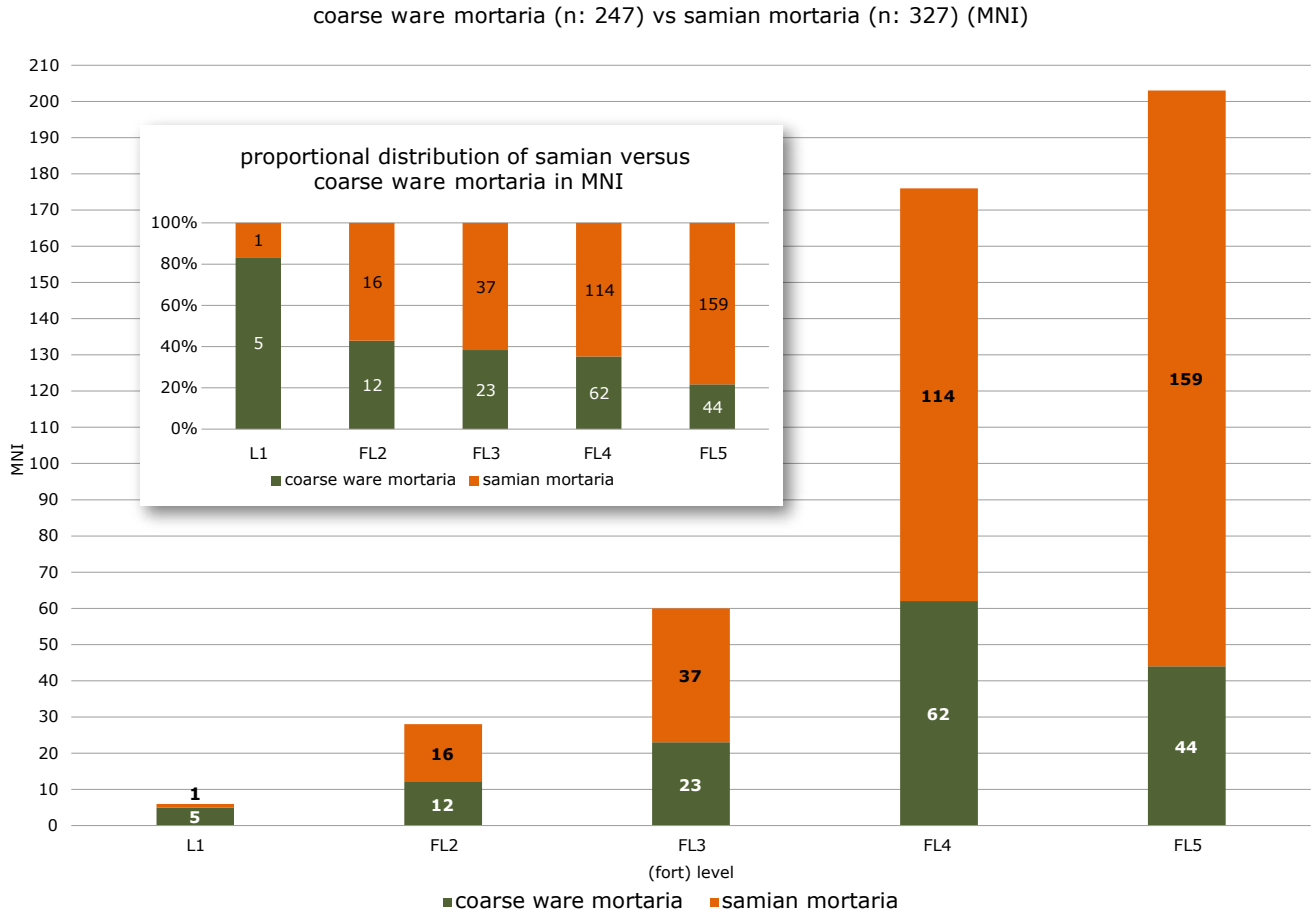

Figure 1.54. Distribution of the coarse ware mortaria versus the samian mortaria in the Roman level at the south-west corner site, according to the stratified evidence, based on MNI.

Inspired by the burnt marks on the rim and around the spout of several mortaria found at Tongeren (at the Sacramentstraat site), Vanderhoeven has suggested a specific function as an explanation for the large amounts of mortaria at this settlement site. The large numbers of these vessels indicate that they were obviously employed as a daily kitchen tool. Vanderhoeven relates them to the processing of cereals; after roasting, cereals had to be beaten to eliminate the chaff and for this a mortarium would have been ideal (Vanderhoeven *et al.* 2014, 36-37). This function could very well fit in at Oudenburg for fort period 4 and would explain the large share of mortaria in the workshop area. Layers full of charred cereals and the many quern fragments at this level, were already related to cereal processing, possibly at a nearby location just outside the excavation area since at the site itself hardly any chaff remains were found (cf. Volume I, Chapter II, Section II.4.6.2.c). Of the 374 mortarium fragments found at fort level 4, 188 are burnt, completely or partially, but in most cases this can be explained by post-depositional burning as many of them were recovered from fire layers. Three fragments of different mortaria stand out with a locally burnt interior. More examples with local burning come from later levels. From fort level 5 four individuals can be mentioned: three with the interior completely burnt with two of them covered with soot and one burnt mortarium with intense burnt, vitrified traces on the inside of the rim. From the 5+post transition level and the post-Roman level, two individuals stand out: one with only its rim collar burnt, one with heavily burnt rim with the surface partly vitrified. Even from level 1 a mortarium with burnt lip and upper part rim has been recovered, and one individual from fort level 3 shows a burnt rim. The local burnt traces on these mortaria could be related to the roasting of cereals; however, no certainty can be obtained from the material. A function within the processing of cereal would be consistent with the increased number of coarse ware mortaria at fort level 4.

Many mortaria from the Oudenburg fort have an abraded interior, which is not surprising. Coarse ware mortaria are heavy vessels to transport and all Oudenburg mortaria were imported over a long distance. It is therefore evident that they were used until they were exhausted and had to be replaced.

In first instance and from a functional point of view, one would assume that the coarse ware mortaria should be considered together with the samian mortaria, as they were both intended for grinding purposes. However, it is not likely that the same grinding function should be attributed to both.

In contrast to the coarse ware mortaria, the number of samian mortaria increases constantly throughout the Roman levels

Table 1.47. The attested coarse ware mortaria productions at the south-west corner site, based on MNI.

production	L1	FL2	FL3	FL4	FL5	5+POST /POST	TOTAL	%MNI
BAVAY-FAMARS	2	7	7	9	3	9	**37**	14.9
CHAMPAGNE				1		1	**2**	0.8
NOYON				1		1	**2**	0.8
RHÔNE VALLEY		1					**1**	0.4
NOYON/RHÔNE						1	**1**	0.4
LNV WW			2	3	1	1	**7**	2.8
OXF WW				6		5	**11**	4.4
OXF WS						1	**1**	0.4
VER MOR				1			**1**	0.4
BRITAIN (?)			1	1		3	**5**	2.0
mortaria white grits, R-B origin (?) (fabrics 1, 2, 3, 4, 6, 8)				3	7	36	**46**	18.5
mortaria white grits, continental origin (?) (fabrics 5 and 7)				1	3	7	**11**	4.4
SOLLER		4	9	17	14	19	**63**	25.4
RHINE VALLEY	1		3	15	12	14	**45**	18.1
MEUSE VALLEY				1		1	**2**	0.8
EIFEL	1				2		**3**	1.2
RHINE-MEUSE-EIFEL	1			2			**3**	1.2
undet.				2	2	3	**7**	2.8
TOTAL	**5**	**12**	**22**	**63**	**44**	**102**	**248**	**100**

(Figure 1.54). While they are not important at level 1 and hardly more significant than their coarse counterparts at fort level 2, they outnumber the coarse ones from fort level 3 onwards. As already mentioned in the samian study, the specific function of samian mortaria is still open to debate. Some scholars believe in an industrial or even ritual use of samian mortaria, and an evolution to a more multi-purpose vessel (Willis 2005, section 8.4.4, with references).

An overview of the fabrics demonstrates the wide variety of the Oudenburg mortaria (Table 1.47). Rare examples originating from the Champagne, Rhône and Noyon regions only represent casual imports accounting for a few MNI. The supply was largely dominated by only a few major production centres. When excluding the rare imports mentioned above, the presumed regional mortaria and the unattributed examples, the Soller mortaria, accounting for 63 individuals, stand out with 28.1% of the remaining MNI of 224. They are closely followed by other productions from the Rhine-Meuse-Eifel region (23.7%). A significant group of mortaria, representing 20.5% of the mortaria MNI, is characterized by white grits. Their origin is uncertain but is likely to be searched in Britain. They represent both red-ware and white-ware mortaria, standing for different fabrics which seem to have been closely related. The specifically-identified Romano-British mortaria comprise Lower Nene Valley White ware, Oxfordshire white ware, Oxfordshire white-slipped ware and one Verulamium white ware mortarium. They account for 8.1% of the mortarium MNI or 20 individuals. They are complemented by five more individuals that are identified as Romano-British without being more specific. The Bavay-Famars mortaria, with 37 MNI or 14.9%, represent another significant region, though only supplying in moderate quantities.

Since the value of this study focuses on the economic importance of the diversity in mortarium imports, rather than on their chronological significance, the following analysis of the mortarium assemblage is structured according to fabric groups. Conclusions are drawn based on the minimum number of individuals (MNI), defined by unique rim fragments. A large selection of the representative mortarium fragments are illustrated on Plates CLI-CLXVII.

2. The Bavay-Famars mortaria

In total, 126 mortarium sherds, accounting for 37 MNI, are identified as coming from the south-Nervian territory, more specifically from the kiln sites situated at or near Bavay (the *civitas* capital), namely Pont-sur-Sambre, Famars and Bavay itself.

Soon after the capital's creation, production of flagons and mortaria in a cream calcareous fabric started at Bavay. Recently, an area of the kiln site has been excavated, giving evidence for pottery activity from the Augustan period onwards (Willems 2012; Labarre and Willems 2019). Later, the production centre was moved to two of its economic satellites, at Pont-sur-Sambre for the production of mortaria, and at Famars for flagons. The abandonment of the artisanal area at Bavay has been suggested for a long time (Loridant 2001), and new data from Bavay confirms this hypothesis. Subsequently, by the end of the 2nd or the beginning of the 3rd century, Pont-sur-Sambre lost its importance. The potters probably moved to Famars where the production of mortaria continued. Next to flagons, also mica-dusted wares and a panoply of reduced wares for cooking and presentation, were now produced at these potteries.

The differences between these production centres, all three using the same calcareous clays, is attested by combining form and fabric variants, and their evolution can be recognized in the Oudenburg material.

The earliest examples from Bavay show a very sandy fabric; occasionally even heavily tempered with red grog although this is rather rare. The finishing of the base is neglected and its rim is heavy, with a rounded inner lip (bead rim) and with flint scoring on the flange.

The Pont-sur-Sambre examples are clearly very standardized with a bead rim that is flattened and very regular. Different rim variants exist, well described by Loridant and Ménard (2002). The fabrics are also standardized, well-fired, with well-sorted quartz, of consistent size, form and colour (for more detailed fabric descriptions: Willems 2005). There is no scoring on the flange, giving a well-finished appearance to the rim. The wall fragments show clearly-defined ribs on the outside.

At Famars, where production probably started by the end of the 2nd century, the mortaria are distinguishable by their type forms or by one of their variants, a fine calcareous fabric, regionally called 'soapy ware' (Deru and Vachard 2002). The potters from Famars took over the standardized form from Pont-sur-Sambre, which suggests migration of potters[97], but during the 3rd century they started using a finer variant of the calcareous clay, with a clean dense matrix and a fine surface. This variant could be the result of the sieving of raw material and clay treatment by the potter. The soft powdery feel is probably the result of a chemical reaction of the pottery in humid soil conditions, as Picon and Vertet suggest (Picon and Vertet 1970, 210, footnote 8) and these mortaria were most probably well-fired.

The production of these so-called soapy wares is also known at Bavay, as examples of Gallo-Belgian wares show, although this technique was not applied for the production of mortaria. This finer variant is totally absent in the kiln wastes found at Pont-sur-Sambre. At Famars, though, the presence of this finer variant is confirmed by the wasters of mica-dusted pots from one of the kilns at Famars-Technopôle (kiln 1381/1382) (Willems *et al.* 2019). The same fabric was probably used for the local production of standardized mortaria imitating the Pont-sur-Sambre types, as examples from consumption contexts at Famars demonstrate (Willems *et al.* 2017b). From the 3rd century onwards a production is attested by the wasters of kiln 5135. By that time, a new form was adopted, namely the typical 3rd-century type with high inner bead VV352-353.

The mortaria from Oudenburg reflect this evolution in the production, and three fabric groups have been identified (Figure 1.55). Very small differences exist and there are several subvariants, but they all clearly belong to the Bavay-Famars region. A fourth fabric group remains unidentified. The type spectrum of the Oudenburg Bavay-Famars group is rather homogeneous, with different types of the curly rim type. The type VV 352-353 is represented by Plate CLI: 1-13; Plate CLII: 14-23 can be identified as type VV 349-350. The mortaria examples Plate CLII: 24-26 are close to VV 349.

Fabric group 1 (cf. Figure 1.55) consists of mortaria with a sandy fabric and is represented in the Oudenburg assemblage by eighteen fragments, accounting for six MNI. Two subvariants can be distinguished, namely the Pont-sur-Sambre sandy fabric and the Famars laminar sandy fabric. Four mortaria are imported from the Pont-sur-Sambre kiln site, as their clay and form suggest. As described above, the fabric contains well-sorted quartz, and small black iron ore or red inclusions as well as voids. The fresh break is neat, because of the well-sorted inclusions, and very hard. The colour varies from cream to pink. They appear in (fort) levels 1 and 2, which is very logical considering their production period (respectively examples Plate CLII: 20 and 15). Two examples show a 3rd-century rim (type Vanvinckenroye 352-353); they were found respectively in fort level 3 and the post-Roman level (examples Plate CLI: 1 and 10). They have a laminar, hard fabric with long voids, and quartz inclusions. Because of their laminar character, they were probably produced at Famars, and one has to bear in mind that production at Pont-sur-Sambre ceased before the middle of the 3rd century.

Fabric group 2 (cf. Figure 1.55) is also sandy, faintly laminar with long voids, but containing amber coloured quartz. Its surface feel is powdery but very hard. It is closely related to the Famars subvariant of group 1 but the quartz changes to orange or amber, reacting to the iron oxides present within the fabric. It is probably the same clay combination, with the quartz having reacted, maybe due to firing conditions. Other inclusions are present, such as red grog, black spots, iron ore or voids. The colour of the fresh break and the surface is yellow to pinkish. This fabric group 2 is represented by ten fragments, accounting for five MNI. Most of them have the Pont-sur-Sambre form. Three MNI belong to fort level 2, one to fort level 3 and one to fort level 4; a base fragment was found at level 5+post. These mortaria probably represent the first variants produced at Famars, imitating the Pont-sur-Sambre form VV 349-350 (Plate CLII: 21-23), but with a laminar fine matrix still containing a certain amount of quartz.

Fabric group 3 (cf. Figure 1.55) comprises the fine so-called 'soapy' mortaria with a fabric containing no quartz inclusions or less than 1% of quartz. Voids, red grog and iron oxides are visible, but very rare. The matrix as well as the surface are extremely neat, powdery and with a soft feel, reflecting probably lower firing temperatures, as is the case for the mortaria from kiln 5135 at Famars (fabric 1, analysis by Borgers, in Willems and Borgers 2015) combined with a chemical reaction of the fabric in humid soil conditions. Fabric group 3 is represented by 94 fragments, accounting for 24 MNI. Most of the Oudenburg examples come from fort level 3 and 4 contexts. The 3rd-century type VV 352-353 is still popular (Plate CLI: 3, 5, 6, 12, 13), but a new type emerges as well, occurring from fort level 4 onwards, with a long and flattened rim with small inner bead (Plate CLII: 24-26). This form, absent in the occupation contexts at Famars, is peculiar. P. Herbin (Département du Nord) has observed similar examples from late Roman contexts at Bavay

97 **On the hypothesis of migration and transmission of pottery techniques, see Willems and Borgers 2017.**

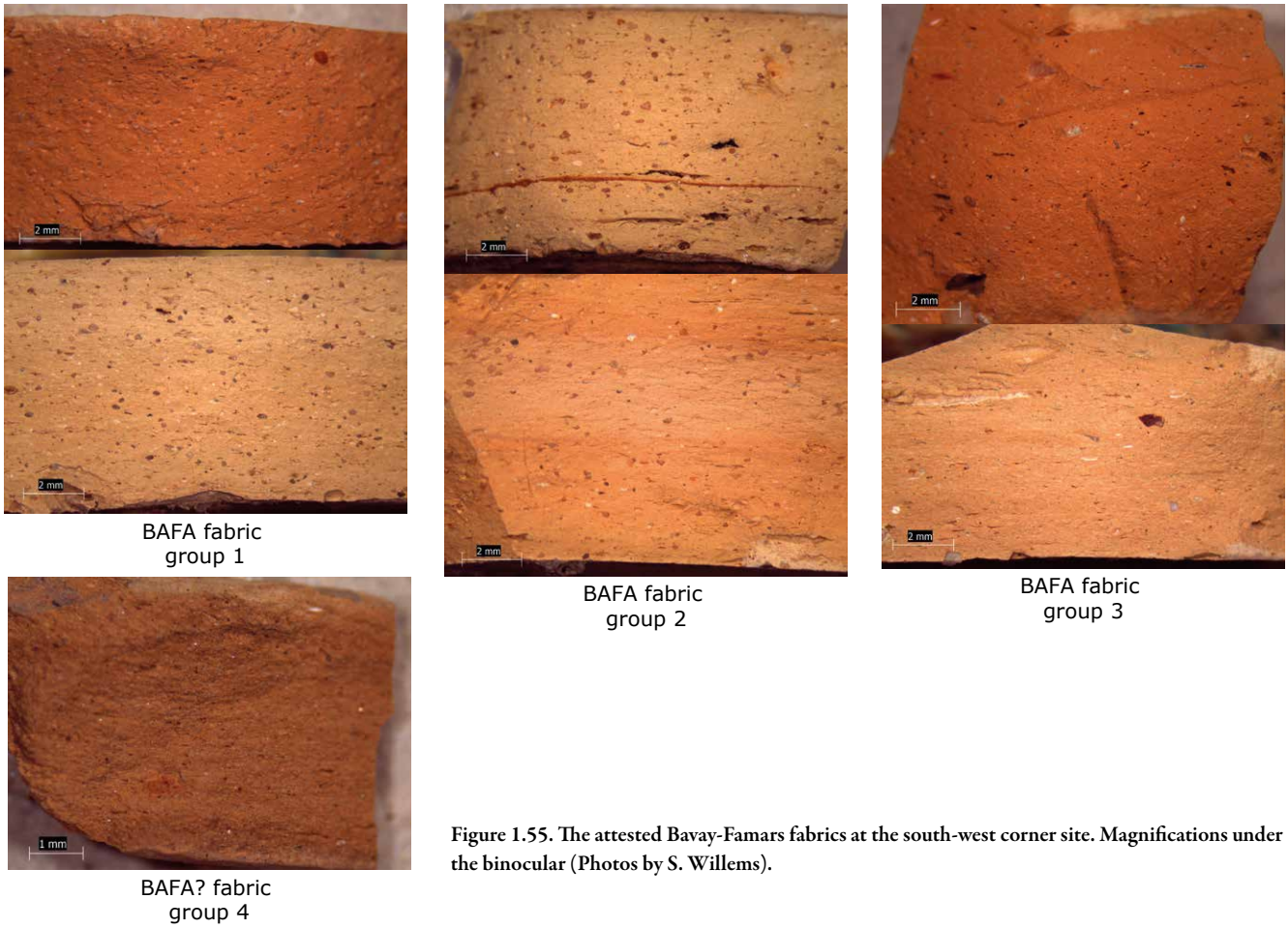

Figure 1.55. The attested Bavay-Famars fabrics at the south-west corner site. Magnifications under the binocular (Photos by S. Willems).

for which he suggests a date of AD 260-280 (pers. comm.). The form is close to the VV 349 type, but the flange is long and flat and the surface is delicately burnished. Two hypotheses are credible: given its absence at Famars, must we consider a production rebirth elsewhere, for instance at Bavay, or should this type be dated to the 4th century instead of the end of the 3rd? The Oudenburg contexts suggest the first option, since the number of individuals at fort level 4 is too consistent to be intrusive material from later levels. Still, its absence at Famars-Technopole during the period AD 260-320, when large quantities of pottery were consumed, is most striking.

A fourth fabric group (cf. Figure 1.55), only accounting for two fragments (no MNI), has been defined by the shiny matrix of the fabrics containing white mica. The precise provenance is uncertain, although its overall surface feel and fabric colour are close to Bavay-Famars productions. However, the matrix contains silt-sized quartz and is less calcareous. Only one broken rim fragment (not illustrated) belongs to this group; it was found in a mixed 4+5+post level.

In all, most of the mortaria from the Bavay-Famars group belong to the third finer fabric variant, typical of the 3rd and 4th centuries (98 sherds, for only ten sherds in fabric 2 and eighteen in fabric 1). Fabric 1, probably originating at Pont-sur-Sambre, occurs from level 1 to the post-Roman levels. Fabric 2 appears from fort level 2 onwards. 'Unfortunately', the dominating fabric 3 is also found throughout all levels (two in fort level 3, three in fort level 3+4 and three in fort level 4; only body fragments were found in fort level 5), which makes an analysis of the chronological distribution of the Bavay-Famars products at the Oudenburg fort difficult.

3. Some Noyon imports

Seven mortarium fragments, of which only two rims, have been identified as imported from the Noyon region. The fabric is very close to the Bavay-Famars region products, because of the use of a highly calcareous clay as well, but the position and the amount of quartz is different. In most cases, the Noyon fabrics do not contain abundant quartz inclusions; the quartz grains are of medium size and are hidden in the matrix. Abundant rounded iron ore is characteristic in these fabrics.

The Noyon region products were mainly popular during the 1st and 2nd centuries, continuing in the first half of the 3rd century (Dubois *et al.* 2009). The distribution patterns show a western movement and examples are attested in Britain, showing cross-Channel export (Hartley 1998, 200-204; Hartley, in Symonds and Wade 1999, 197; Symonds 2012, 180). The Bavay-Famars products blocked the distribution to the north, and only in rare cases have they been found in the northern part of North

Gaul[98] (see Chaidron *et al.* 2010 for distribution maps of both Noyon and Bavay-Famars productions; Willems 2019).

While the identification of the Noyon fabrics is difficult because of their resemblance to the Bavay-Famars examples, clearly a different repertoire was used. The first phase of the Noyon productions imitates the vertical rims of South Gaul, as also the first Bavay examples did, but when the productions became more locally developed, a different register of forms was chosen. Up till now, Noyon local products have not been studied in depth and a good typology is lacking[99]. Mostly, the typology used to describe the Noyon mortaria is the one given by Piton and Delebarre (1993) for the consumption site of Vendeuil-Caply, where most of the material seems to be imported from this pottery site.

The Oudenburg examples clearly represent late Noyon forms. The example (Plate CLIII: 28), found in a mixed level 1>4, corresponds to Vendeuil-Caply types 13/14 (Piton and Delebarre 1993, 318, Fig. 28, nos 7 and 8), a form popular at the end of the 2nd – beginning of the 3rd century. Characteristic are the ribbed exterior walls and the flange positioned in a 45° angle with a rounded extremity. Based on its form, the Oudenburg mortarium most probably belongs to level 1 or 2. The second individual is a Vendeuil-Caply type 10 mortarium, with a heavy rounded flange (Plate CLIII: 29), found in the post-Roman level. This is also a form most typical of the end of the 2nd – first half of the 3rd century (Piton and Delebarre 1993, 318, Fig. 28, nos 1-4).

4. Rhône Valley imports

Twenty-three mortarium fragments, with only one MNI, originate from the Rhône Valley. The calcareous clay is very close to the Noyon fabrics, but flakes of brown mica are a distinguishable characteristic. The form shows a long horizontal flange, close to Haltern 60 or Oberaden 73 (Gose type 455) (Plate CLIII: 30). This type is typical of the 1st century. The twenty-one fragments of this individual were found scattered through the Roman level; the joining fragments were recovered from no less than six contexts, one belonging to fort level 2, four contexts of fort level 3 and one context in the post-Roman level. Part of the mortarium was used as material to construct a hearth at fort level 3 (OS 70950). The earliest context to which fragments of this mortarium belonged can be assigned to fort level 2, but already at this level the individual should be considered to be a residual item, re-deposited from a pre-fort structure.

5. Champagne mortaria

Four sherds from one individual originate from the Champagne region and were found in fort levels 3 and 4 (not ill.; only small rim fragments preserved). They are easily recognizable by their white kaolinite rich, shiny clay with small quartz inclusions[100] and their heavy hammer shaped rim and ribbed walls. Several fabric variants as well as trituration grit variants (from abundant white grits to examples with only reddish grits) exist. The Champagne region products, after a first exporting period of Gallo-Belgian fine wares during the 1st century, became slightly more popular again during the 3rd century. Examples of coarse grey wares and mortaria are often found on consumption sites of that period in Northern Gaul (Biegert *et al.* 2004).

6. Soller mortaria

The Soller potteries, located at Kreis-Düren (to the south-west of Cologne), were the main suppliers of coarse ware mortaria to the Oudenburg fort, accounting for 282 fragments, representing 63 MNI or 25.4% of the mortaria MNI. They are characterized by a coarse (sometimes very rough), very hard fabric, with a hackly fracture, sometimes clearly layered, rich in large quartz inclusions which also protrude through the surface giving it a pimply feel; some of the fabrics contain red slate inclusions. The inner surface shows scattered trituration grits that can reach up to 3 to 4 mm in diameter (cf. Tomber and Dore 1998, 79-80). The Oudenburg examples display a variety of fabric and surface colours, from whitish, greyish to yellowish and orange. All but one of the Oudenburg individuals represent the collar-rimmed form, corresponding to VV 336 and mainly VV 337 (Plates CLIV-CLVII). One rim fragment belongs to a very large mortarium with horizontal, curly rim (Plate CLVII: 39).

The mortaria at Oudenburg occur throughout the Roman levels, except level 1. They are present at fort level 2 with four MNI, nine are counted for fort level 3, seventeen for fort level 4 (see *e.g.* Figure 1.56) and from fort level 5 fourteen individuals are recorded.

According to Haupt (1984, 413-414), production at Soller can be largely dated from *c.* AD 150 to 250. For the collar-rimmed mortaria, she mentions that they were still scarcely in use until the end of the 3rd century, although she also points to some occurrence even in the 4th century (Haupt 1984, 445). However, examples of collar-rimmed mortaria from Soller were found in late 3rd- and beginning of 4th-century contexts at Lincoln (UK). Nos 1442 and 1444 (Darling *et al.* 2014, 164, Fig. 136) even belonged to mid-4th-century assemblages. Besides, another collar-rimmed mortarium, close to the Soller examples and of the same date, was identified as a Speicher product, indicating the close relationship between these Rhineland kilns. The Lincoln examples clearly show a continuation of production, long after the production date suggested by Haupt. They also demonstrate that other kiln sites near Soller produced the same forms. With fourteen individuals at fort level 5 (and at least another nineteen (for 46 fragments) in the post-Roman and mixed levels), this assemblage seems too significant to be explained as mere residual material from earlier levels. It is likely that the Oudenburg assemblage confirms the later dates revealed at Lincoln.

98 Noyon products have been attested at Menen (B) (Dhaeze *et al.* 2015) or Tongeren (with *Quintvs Vanerivs Veranivs* stamp, pers. comm. N. De Winter, Aron bvba).

99 A typology of Noyon productions is forthcoming, within the context of the Atlas of Roman regional pottery productions: volume 2: Picardy (Inrap Research Project).

100 For a detailed fabric description: see Biegert *et al.* 2004.

Figure 1.56. The coarse ware mortaria from the large waste-pit OS 4980 of fort level 4. All but the large Soller mortarium rim at the bottom right (from the secondary filling of the waste-pit) belonged to the primary waste infill. The mortarium spectrum demonstrate the dominance of the Rhineland supply, with a complete vessel and a complete profile from Soller, a complete mortarium and a burnt, complete profile from the Rhine-Meuse-Eifel region, and another burnt, complete profile from the Rhineland. The two body fragments to the right belonged to an Oxfordshire White Ware mortarium.

Haupt defined eight rim types within the collar-rimmed form (Haupt 1984, Taf. 183: 1-8). Only Haupt types 3 and 6 are absent from the Oudenburg assemblage. The other rim types seem to occur randomly throughout the Roman level and do not reflect any chronological evolution. Haupt type 1 occurs only once, at fort level 3 (Plate CLIV: 1). Haupt type 2 is present two times, at fort level 4 (no. 2) and in the post-Roman/mixed level (no. 3). Three individuals show Haupt type 4: one at fort level 2 (no. 4) and two at fort level 4 (nos 5 and 6). Rim type Haupt 5 occurs two times, once at fort level 4 (no. 7) and once in the post-Roman/mixed level (no. 8). Haupt type 7 is represented once, at fort level 4 (no. 9). The latter is characterized by a very white fabric, containing some red slate inclusions. Haupt types 8 and 9 are best represented with respectively eighteen and thirteen MNI. Haupt 8 occurs at fort level 2 (twice: Plate CLV, 10-11), at fort level 3 (four times: nos 13-16), at fort level 4 (twice: nos 17-18), at fort level 5 (twice, not ill.) and seven times in the post-Roman/mixed level (four MNI ill.: Plates CLV-CLVI, 19-22). Two individuals can only be generally assigned to Haupt type 8-9 (one at fort level 3 and one at fort level 5, respectively Plate CLVI, 23 and 24). Haupt type 9 occurs at fort level 3 (twice: nos 25-26), at fort level 4 (three times: nos 27-29), at fort level 5 (four times: Plate CLVI-CLVII, 30-33) at in the post-Roman/mixed level (four times: Plate CLVII, 34-37).

One can wonder whether much significance is to be attached to these minor rim differences. Most of the rims display an exterior groove near the top; seven individuals lack this groove and show a smooth collar instead (nos 8, 12, 14, 17, 21, 28, 37). For all these Soller mortaria, diameters range between 24.0 and 39.4 cm.

Only one individual (Plate CLVII: 39) shows a large horizontal, curly rim that can be identified as Haupt (1984) Taf. 181: 1. This rim belonged to a very large mortarium, with a diameter of 53.2 cm. It was found on top of the primary infill of the large waste-pit OS 4980 and could only be generally attributed to level 4+5. This rim type is one of the characteristic rims of the VERECVNDVS workshop (cf. Haupt 1984, 443), the Soller potter known by the many stamps that survived on mortaria at this site. His production was dated by Haupt to AD 150-250 (Haupt 1984, 414). Again, at Lincoln, these large Verecundus-type mortaria occur until the beginning of the 4th century (Darling *et al.* 2014, 165, Fig. 137, no. 1452). The find context of the Oudenburg mortarium fits in well with a late 3rd-early 4th century date.

Haupt revealed that the Soller potters did not supply the Rhine army and mainly focused on smaller markets. Some specialties however, like the very large VERECVNDVS mortaria, were exported over very large distances, with Britain as an important consumer (Haupt 1984, 416). Several examples were found in London, at the harbour site St. Magnus Quay (Richardson 1986) and on numerous other sites, like the one mentioned for Lincoln (Darling *et al.* 2014). The Oudenburg fort is situated on the same east-west axis, but in contrast to Britain, was supplied mainly by the moderately-sized mortaria. Only one such extremely large, presumed VERECVNDVS, example has been found at the Oudenburg fort.

7. Other mortaria from the Rhineland and the Rhine-Meuse-Eifel region

A large share of 141 fragments, accounting for 45 mortarium individuals (18.1% of the total MNI), can only be generally attributed to the Rhineland (Plates CLVIII-CLIX). One individual belonged to level 1 (no. 51), none at fort level 2, and three at fort level 3 (nos 49 and 53). From fort level 4 onwards they are well-represented: fifteen individuals at fort level 4 (nos 40, 41, 50, 55, 56, 59), twelve at fort level 5 (nos 42, 43, 45, 52, 54) and fourteen MNI recovered from the 5+post and post-Roman levels (nos 44, 46, 47, 48, 57, 58). Also at Lincoln, a wide range of Rhineland fabrics was observed amongst the mortaria. They were mainly found in mid- to late 3rd century contexts (Darling *et al.* 2014, 162). They indicate that besides the Soller potteries other workshops were active in the Rhineland producing mortaria and distributing them widely.

The Rhine mortaria are all collar-rimmed, of type VV 336 or 337, but they display a lot of variation. Small- and moderately-sized examples are present. The defined diameters cover a size range from 22.2 cm (example 45) to 33.2 cm.

Several rims are similar to the rim types defined by Haupt; however, more variation than within the Soller group can be noticed. While some rims display the VV 336 rim type (nos 40-41), many recall the Haupt rim types (nos 42-51) and some display a pronounced hammer shaped rim profile (nos 52-58), and others have a prominent in-turning lip (nos 57-58). The hammer shaped collar-rimmed individual (no. 52) is very similar to no. 1441 of the Rhineland mortarium group defined at Lincoln (Darling *et al.* 2014, 162 and 164: Fig. 136: no. 1441). The authors compared it with a closely paralleled individual from the New Fresh Wharf site at London (Richardson 1986, 110: 1.70), where it was concluded that these collar-rimmed mortaria were made at Speicher and at Urmitz, and possibly also at other Rhineland kilns. While Urmitz functioned during the 2nd and 3rd centuries, Speicher continued production in the 4th century. The no. 1441 mortarium at Lincoln was found together with pottery from the mid-4th century (Darling *et al.* 2014, 162). Furthermore, in the Oudenburg assemblage, the mortarium (no. 59) from fort level 4 is remarkable by its long pending collar in combination with the elevated connection to the wall.

Eight mortarium fragments, for three MNI, are recognized as definitely Eifel products (Plate CLIX: 60-62). The three vertical rims show a pronounced hammer shaped profile, closely related to those of the Rhineland group. They belong to level 1 (no. 60), mixed level 4+5 (no. 61) and fort level 5 (no. 62). The base fragment (no. 63) was found in the post-Roman level. The individual of level 1 (no. 60) shows a fabric with red grog and some volcanic glass inclusions. Its trituration grits are remarkable as they show a large variety in size, colour and composition. The fabric of the base fragment (no. 63) is very similar to that of the Speicher coarse oxidized wares.

Only eight fragments, for two MNI, originate from the Meuse Valley, based on their fabric rich in quartz and iron oxides (cf. Willems 2005, 30) (Plate CLIX). Rim fragment no. 64 was found in a mixed level 3+4; the heavy curly rim with small upstanding lip no. 65 was recovered from the 5+post/post-Roman level. Large-scale pottery production has been attested at Heerlen, but other production centres, such as Tienen (just outside the actual Meuse region) and Amay, may also have exported such wares. Mortarium no. 64 comes close to type MOR-HEERL-M8 from Heerlen which can be equated with VV 350 (Van Kerckhove *et al.* 2014, 267, 266: Fig. 8); mortarium no. 65 approaches type MOR-HEERL-M6 that is similar to VV 345-346 (idem, 265, 266: Fig. 8). The MOR-HEERL-M8 type has been dated at Heerlen *c.* AD 130-170, the MOR-HEERL-M6 type *c.* AD 200-230. The pottery production at Heerlen covers a time-span from around AD 70 until around AD 230 (Van Kerckhove *et al.* 2014, 275).

Twenty-one mortarium sherds can only be generally attributed to the Rhine-Meuse-Eifel region. They account for three MNI, with one complete vessel broken into twelve fragments (Plate CLX: 67). One rim fragment with curly collar and upstanding lip (no. 66) belongs to type VV 348, a predominantly 2nd-century type (Vanvinckenroye 1991, 74), which is in line with its find context in level 1. The two other individuals (nos 67-68) were found in the fill of the large waste-pit OS 4980 of fort level 4 and show the collar-rimmed type VV 337. Both were heavily burnt which makes it impossible to specify their origin. Two body fragments within this Rhine-Meuse-Eifel group are distinctive because of the red slate occurring in the trituration grits, characteristic for the Red Soller group, also attested at St. Magnus House in London (Willems 2005, 40-41).

8. Romano-British imports

Within the mortarium group, some 405 sherds have been identified as either Romano-British in origin, or likely to be Romano-British or an imitation inspired by the Romano-British productions (see catalogue in Section 11 of this chapter). In total these represent a minimum of 82 individuals (MNI). However, the specifically-identified Romano-British mortaria are not numerous with twenty MNI (8.1% of the total MNI count); they comprise Lower Nene Valley White ware, Oxfordshire white ware, Oxfordshire white-slipped ware and one Verulamium white ware mortarium. The presumed Romano-British mortaria and imitations are discussed in the next section. Some twelve fragments (five MNI) have been assigned to a non-specific Romano-British category. These include four illustrated rims (Plate CLXIII: 22-25).

8.1 Lower Nene Valley white ware mortaria

Representing only a small assemblage of 27 fragments, accounting for seven MNI, the Nene Valley white ware mortaria are defined by their relatively fine whitish fabric, with black flint grits, and a series of distinctive forms (Plate CLXI). The most detailed typology can be seen in Hartley and Perrin 1999, figs. 77-8, although some of the Oudenburg vessels seem to find closer parallels in the Colchester assemblages (Symonds and Wade 1999). In particular, the represented types are similar to HP M42 (nos 1, 4 and 7) and M43 (no. 8), and to SW TF 22 (no. 2) and SW TF 35 (nos 5 and 6). The general dating for Lower Nene Valley white ware mortaria is *c.* AD 150-400; types HP M42 and M43 are described as '*typologically late 3rd to 4th century*' (Hartley and Perrin 1999, 132). The Lower Nene Valley white ware mortaria at Oudenburg occur from fort level 3 onwards[101]. Only small amounts of this ware were found at Oudenburg in fort levels 3, 5 and in the post-Roman levels; more fragments occur at fort level 4.

8.2 Oxfordshire white ware mortaria

White ware mortaria from Oxfordshire are perhaps marginally more common than their Nene Valley competitors at Oudenburg, representing 63 fragments, accounting for eleven MNI (Plate

101 **One LNV WW mortarium rim fragment was found in context OS 30916, part of the earthen rampart of fort level 1. It is however believed that this fragment is an intrusive find from the defensive wall trench cutting this level; the same can be assumed for the Mayen fragment in this context. Therefore, this Lower Nene Valley individual has been counted in the numbers of fort level 4.**

CLXII). The Oxfordshire fabric is hard and white, much like other fabrics defined as Romano-British, although it may sometimes have fine red inclusions, but the mortaria are easily distinguished by their very rounded, clear, white and grey trituration grits. The principal typology for Oxfordshire products is Young 1977, in which types M17 (no. 15), M17.2 (no. 16), M18.1 (no. 11), M18.2 (no. 12), M22.1 (no. 13), M22.10 (no. 18), M17-22 (no. 19) and the M22 series in general (no. 20) are all represented at Oudenburg. Two very similar rims (nos 14 and 17) do not seem to be closely paralleled in the Young 1977 typology, nor in other less extensive publications of the ware.

Oxfordshire white ware is generally dated *c*. AD 240-400, although forms M17 and M18 are somewhat earlier, *c*. AD 240-300; the two vessels identified as M18.1 and M18.2 (nos 11 and 12) are associated with fort level 3 and 3+4, respectively. Fragments of Oxfordshire white ware mortaria were found at Oudenburg in levels 3 to 5 and in the post-Roman levels, with a peak in fort level 4 (six MNI) and another in the post-Roman levels (again six MNI). Their chronological distribution at Oudenburg is thus quite similar to that of Nene Valley white ware.

8.3 Oxfordshire white colour-coated ware

Oxfordshire white colour-coated ware or white-slipped ware is a relatively rare Oxfordshire product with a red fabric, with some small black and red inclusions and larger chalk inclusions (Young 1977, 117). The trituration grits are the same as those used for Oxfordshire white ware. At Oudenburg just six sherds, all probably belonging to the same vessel (Plate CLXII: 9), were found in the post-Roman levels. The vessel form is Young WC7.2, and would normally be dated *c*. AD 240-400+.

8.4 A Verulamium white ware mortarium

As Verulamium (or London-made Verulamium-type) products seem to have hardly reached Oudenburg, these wares apparently ceased to be widely distributed before Romano-British pottery began to arrive in quantity at Oudenburg. However, one Verulamium white ware mortarium has been identified (Plate CLXIII: 21; Figure 1.57). The twelve joining fragments were found scattered over several levels; the earliest levels in which its fragments were found, can be assigned to fort level 4. The form is close to that of Wilson (1984) 2697, which happens to be the last mortarium in the series from the excavations conducted by Frere (1972, 1983 and 1984), and dated *c*. AD 280-360. This date is an important chronological element for the phasing of fort level 4.

9. Red-ware and white-ware mortaria with white grits (fabrics 1 to 8): a Romano-British phenomenon, regionally imitated?

A total of 288 fragments, accounting for 57 MNI, represent red-ware and white-ware mortaria with sandy fabrics that have relatively few distinctive inclusions (Plates CLXIV-CLXVII). They are characterized by prominent white grits. While they cannot directly be identified as British, the presence of these distinctive white grits rules them out as belonging to the known Rhineland or North Gaulish imports. Their rims are also different

Figure 1.57. The Verulamium white ware mortarium of which several fragments, found scattered over different contexts and levels, were burnt after breakage.

from what can be expected from these two territories, but are closely related to forms from the Romano-British repertoire. Fabric analysis under the binocular microscope indicates for most of the fabrics a resemblance to Romano-British wares, despite the absence of white grits in the descriptions of the British kiln sites.

Eight fabrics have been identified, some of them probably subvariants of one another (Figures 1.59-1.60). These eight fabrics can be divided into three groups, namely a white fabric and a pinkish to orange fabric – which are, despite their difference in colour, related -, and a red fabric which possibly represents a continental or regional imitation of the first two groups. When the identifiable forms within each of these fabrics are taken into consideration, it becomes clear that these fabrics can be defined as probably Romano-British mortaria (or their imitations) with white grits (cf. Table 1.49).

9.1 Group 1: orange/pinkish fabrics 1 and 2

The pinkish fabrics are characterized by a very fine granular matrix with silt-sized inclusions, containing quartz, red grog and iron ore.

Fabric 1 (cf. Figure 1.59) has a fine aspect with a laminar matrix containing small and silt-sized quartz and abundant small iron ore speckles. Larger inclusions consist of black, red and white grog and a rare large quartz or whitish stone fragment. The laminar structure is enhanced by the combination of a white and a pink clay, giving it often a marbled aspect that has also been noticed in Pompeian Red wares, where a number of dishes are probably Romano-British in origin (cf. Chapter 1.A.6 in this volume). The trituration grits are made of white stone (probably quartz).

Fabric 2 (cf. Figure 1.59) is clearly a subvariant of fabric 1, with the same laminar matrix containing silt-sized quartz and iron ore speckles. It distinguishes itself by having more medium-sized quartz accompanied by large white quartz or stone inclusions. The vessels in question have the same trituration grits of large white stones (cf. Figure 1.58).

These two pinkish fabrics recall a number of fabrics identified as Oxfordshire white wares at Oudenburg in showing a mixture of white and pink clay. Typologically, the Oudenburg mortaria find close parallels in the Oxfordshire repertoire. However, they would be quite unusual in having a different style of grits. Oxfordshire mortaria are particularly characterized by their distinctive trituration grits comprising well-sorted, well-rounded, abundant, multi-coloured translucent or transparent quartz (pink, black, white or brown) (Tyers 1996b, 129; Tomber and Dore 1998, 174). The presence of white grits, which is such a distinctive feature for our groups, makes a possible attribution to the Oxfordshire kiln sites unlikely.

Fabrics 1 and 2 and their variants are associated especially with forms Vanvinckenroye (1991) 351-353 (mortaria with a rounded, hooked flange), and therefore likely belong to a relatively specific group (examples Plate CLXIV: 26-30, 32-36). Apart from the generally smaller colour-coated vessels from Oxfordshire and Hadham, larger mortaria with reddish fabric are not common in Britain. However, the fabrics of the Oudenburg examples are similar to Oxfordshire productions and their forms find close parallels in the Oxfordshire white wares type series M6 (Young 1977). Most of the represented mortaria in fabrics 1 and 2 are M6 types with thick flanges with the tip turned down, and a small upstanding inner rim. Nos 26, 27, 30, 32 and 33 (Plate CLXIV) show similarities to type Young M6.3. Nos 28 and 34 are close to type M6.6, no. 29 is similar to M6.4, and no. 35 is near to type M6.3/M6.5. The only dated contexts mentioned in Young's typology for the M6 types are from the 2nd century (Young 1977). One Oudenburg example (no. 31), with a fabric 1 or 2, shows a totally different type, close to Young M12.3, with a stubby flange and upstanding inner rim. The Oudenburg flange is straighter than the Oxfordshire example though. The spout is formed by an excess of clay, and the wall exterior is ribbed. According to Young this form is dated to the late 2nd and early 3rd century, but the mortarium from Oudenburg belonged to a context from level 4/5 (AD 260+).

9.2 Group 2: white fabrics 3, 4, 6 and 8

Fabrics 3, 4, 6 and 8 are cream or white coloured, although fabric 3 often shows a composed colour consisting of a pink core with white fringes (cf. Figure 1.59).

Fabric 3 (cf. Figure 1.59) comprises abundant homogenous small quartz inclusions in an uneven matrix containing a few long-formed voids. It also contains rare medium-sized grog and abundant iron ore that causes the sand to be amber coloured. The trituration grit contains white stone and burnt flint.

Fabric 4 (cf. Figure 1.59) shows a much more heterogeneous matrix with abundant small- to medium-sized quartz, and a lot of iron ore inclusions, giving the fabric a cream to pink colour. Its overall aspect is coarser than fabric 3. The trituration grits are white.

Fabric 6 (cf. Figure 1.60) is white with a neat matrix containing abundant silt-sized or small-sized sand. Iron ore is present but rare. The trituration grit contains white stone and burnt flint.

Fabric 8[102] (cf. Figure 1.60) is also white, very fine and sandy, with overall small-sized and rare medium-sized quartz, abundant speckles of iron ore to which the quartz reacted and became orange coloured. Some rare red grog inclusions are present. The trituration grit contains white stone and burnt flint.

The rim forms of these mortaria clearly point to a non-continental origin. They can especially be compared with the mortarium types identified at Colchester and catalogued in Symonds and Wade (1999). Comparison with fabrics of hand-specimen of Oxfordshire White Ware mortaria shows several similarities. Assemblages which might yield answers, are those from Colchester. The fabric of the 2nd-century mortaria at Colchester (and later ones, since they do not have a noticeably different fabric from the earlier mortaria) is a generally soft cream coloured, often yellowish, fine calcareous clay, quartz-rich, with sparse silver mica and with some iron-rich inclusions. Trituration grits are white, grey or black flint, which dominates, and quartz (Tyers 1996b, 119; Tomber and Dore 1998, 133-135). However, Tyers indicates that more options for their origin can be considered, as he adds that '*similar fabrics* [were] *also produced elsewhere in East Anglia and perhaps Kent*' (Tyers 1996b, 120). Tomber and Dore (1998, 133) mention that '*the fabric cannot be macroscopically distinguished from that of many produced in the north of France (...), at Wiggonholt (...) and at least some sources elsewhere in Norfolk, nor does thin section provide a reliable means of separation*'. However, the current known productions at sites in the north of France definitely rule out the possibility that they were made there. A Normandy origin remains a track to investigate. Nevertheless, Tomber and Dore clearly indicate the problematic identification of these mortaria. No published records are available that include detailed fabric descriptions of later Colchester mortaria for further comparison to be able to answer our questions. Neither can the question be answered as to whether there were late Roman mortaria productions in East Anglia, or elsewhere in Britain, that applied only white grits.

As already mentioned above, on typological grounds, fabrics 3, 4 and 6 can all be associated with mortarium types identified at Colchester in Symonds and Wade (1999): SW TZ types 85-7, 137-141, and 151-158. These Colchester types are believed to represent a late Colchester production. The illustrated Oudenburg vessels are Plates CLXV-CLXVII nos 37-54[103] and nos 67-72, and their associations with Colchester types are detailed in the catalogue (see Section 11

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102 The fabric described as 'fabric 8 variant' could only be attested once, with a body fragment.

103 A rim fragment recovered from the final infill of the double well structure OS 2562 and similar to example no. 50 (fabric 3-6) has been identified in the 2009 publication of the well (Vanhoutte *et al.* 2009b) as a Speicher product. However, further comparative study with the Romano-British form repertoire and fabric analysis on the totality of the mortarium assemblage has lead to other conclusions, presented here.

Figure 1.58. Representative examples of mortaria of the south-west corner site in fabric 2, 5 and 7.

of this chapter). Fabric 8 includes just one identifiable form, a relatively rare Young M7.2 (Plate CLXVII: 78), which may thus be an Oxfordshire product. For the two other illustrated vessels in this fabric (nos 76 and 77) so far, no close parallels could be found.

Based on form and fabric similarities, a Romano-British origin seems convincing for this group. An attribution to Colchester, the Oxfordshire or another kiln site in the wider region can be supposed but remains hypothetical. Further research based on fabric analysis on the late Colchester mortaria and a comparison by hand-specimen with the Oudenburg examples in question is needed to come to definite conclusions on this.

When presenting the forms of the (later) mortaria made at Colchester, Hull made an extraordinary statement that is worth repeating here: '*So great is the diversity of our rims that at first sight one feels that several different forms are to be listed, but longer acquaintance teaches that this is almost impossible. In the end we have decided to group nearly all of them under one form-number (f497)*' (Hull 1963, 116). For the most part these Colchester mortaria have a fairly heavy curved flange and a small upright rim (see also Symonds 2012, 189-94, Groups 12/15 and 15). It is worth noting that although the Oudenburg examples Plate CLXVI: 52 and 54 are described as wall-sided, they do not correspond to the relatively specific late Colchester wall-sided mortaria SW TZ types 163-172, nos 298-320, but rather to the less vertical Hull 1963, Fig. 65, no. 9. The more vertical wall-sided mortaria made at Colchester do not seem to have been observed at Oudenburg, even though they were apparently made during the late 2nd and 3rd centuries (Hull 1963, 191, types 501 A and B).

9.3 Group 3: red fabrics 5 and 7: continental, regional imitations?

Two fabrics, 5 and 7, show an orange to reddish colour, and sometimes a layered colour difference, with a greyish core and orange fringes (Figure 1.60).

Fabric 5 (cf. Figure 1.60) has a matrix containing silt-sized quartz. Small-sized and medium-sized quartz are densely mixed, and iron ores and medium-sized red grog are present in some of the examples, but they are certainly not dominant inclusions. The trituration grits are white, mixed with red inclusions (grog?) (cf. Figure 1.58).

Fabric 7 (cf. Figure 1.60) belongs to the same fabric group, but with a neater matrix, slightly laminar and shiny because of the presence of white mica. The fabric contains regularly spread and larger rounded white quartz, red grog and iron ore inclusions. The trituration grits are more varied, with white and grey stones as well as what could be red grog (cf. Figure 1.58).

These two fabrics are of uncertain origin, but are similar to the fabrics of flagons of the regional group (cf. Chapter 1.B.2 in this volume), and comparable to fabric 6 of the Pompeian Red wares (cf. Chapter 1.A.6 in this volume). In first instance, because of the presence of the distinctive white grits, they were put in the group of the 'probably British mortaria'.

Most of the fabric 5 and 7 mortaria show a hammer-like rounded flange with a beaded inner rim, close to Gose 451/453 (cf. Plates CLXVI-CLXVII). At Colchester, the Oudenburg fabric 5 examples find parallels in types SW TZ types 131-135 (Oudenburg example no. 55), type 141 (no. 57), type 157 (nos 58, 59, 62, 63, 65) and type 159 (no. 66). The mortarium (no. 55) with hooked flange and upstanding inner rim, is also similar to the Oxfordshire type group Young M17. Other close parallels belong to the Champagne and Meuse Valley repertoire, similar to Reims MO 1 (Deru 2014) and Vanvinckenroye 347. The mortaria in fabric 7 cannot (so far) be associated closely with published vessels. The illustrated forms are examples nos 73 to 75. Fabric 5 and related fabrics are present from fort level 4 onwards (one MNI at fort level 4, two MNI at fort level 5, six MNI in the post-Roman level); fabric 7 only occurred in the post-Roman level.

The distinctive fabrics 5 and 7 in combination with their typology can be separated from the other identified mortaria with white grits and rather point to a continental production[104]. The Gose 453 type/Reims MO 1 is typical for later phases, from AD 230/240 onwards until the beginning of the 5th century, according to the Reims contexts. The type group

104 In the final stage of editing this manuscript, we noticed similar red-ware mortaria with white grits (VV248 and VV352) in the finds assemblages of Rumst (site Molenveld) (province of Antwerp), which is a further indication for a continental production. Comparative fabric analyses need to enlighten whether it may concern the same productions as the Oudenburg white grit-mortaria, but macroscopical comparison puts forward a possible relationship with the fabric 5 mortaria.

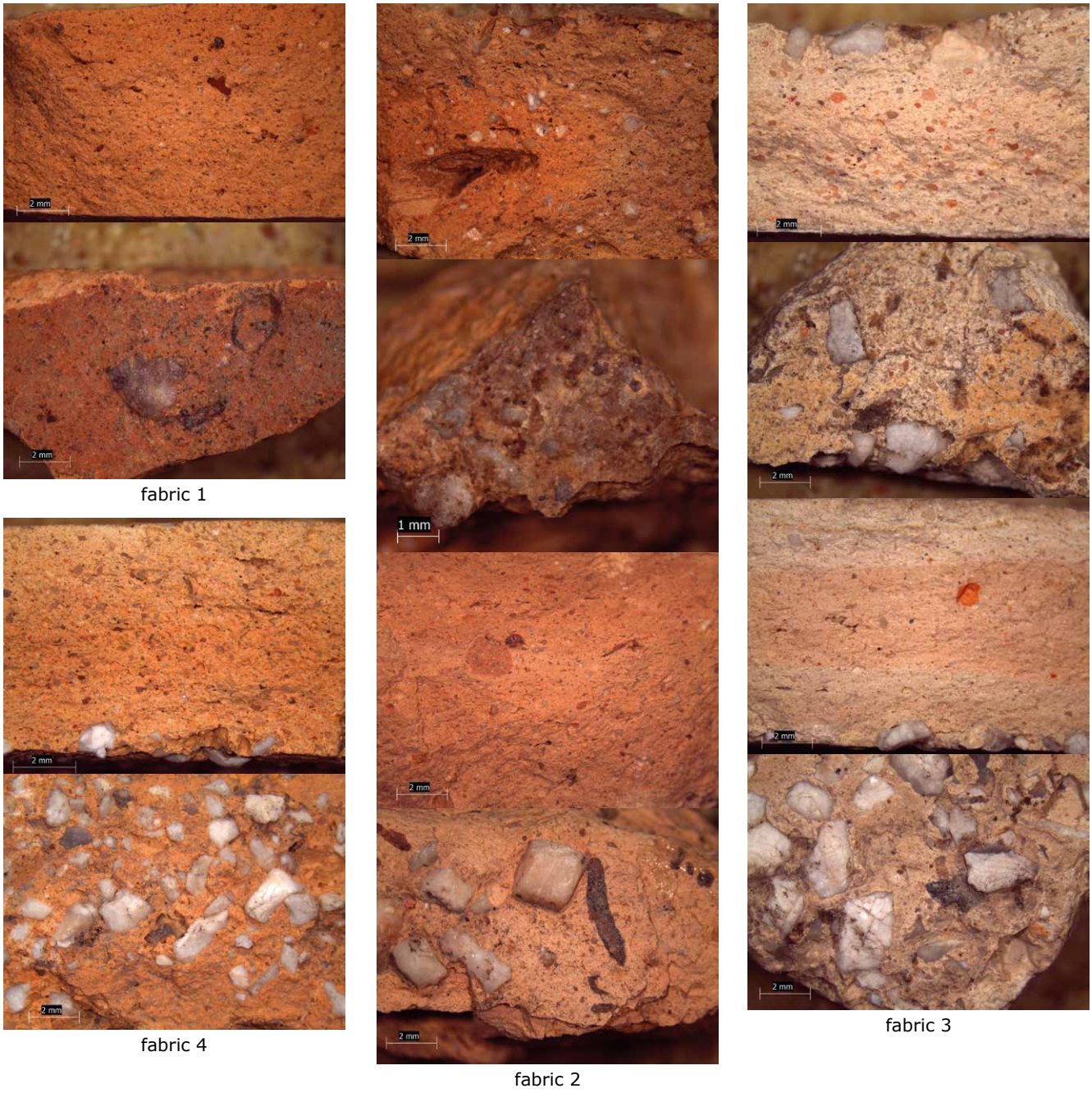

Figure 1.59. Red- and white-ware mortaria with white grits. Fabrics 1, 2, 3 and 4. Magnifications under the binocular (Photos by S. Willems).

Young M17 which shows parallels with mortarium no. 55, is dated to the period AD 240-300.

9.4 Preliminary conclusions on the red-ware and white-ware mortaria with white grits

Based on the represented forms and types, in combination with the fabrics, it seems justified to suggest a Romano-British origin for fabrics 1, 2, 3, 4, 6 and 8 and their variants. The fabrics 5 and 7 point to a regional production seemingly influenced by these Romano-British productions.

When the chronological distribution of the three provenance groups is considered, it becomes clear that most of these mortaria do not occur before fort level 4. They are all popular during fort level 5 and in the post-Roman level, likely indicating their belonging to the later period of occupation. This diverges from the classic Oxfordshire mortaria found at Oudenburg which were found from fort level 3 onwards and are well-present at fort level 4, but are nearly absent at fort level 5. As the 'Romano-British' group (including its presumed imitations) almost completely belongs to fort levels 4, 5 and the post-Roman levels, these mortaria are clearly a late(r) Roman phenomenon.

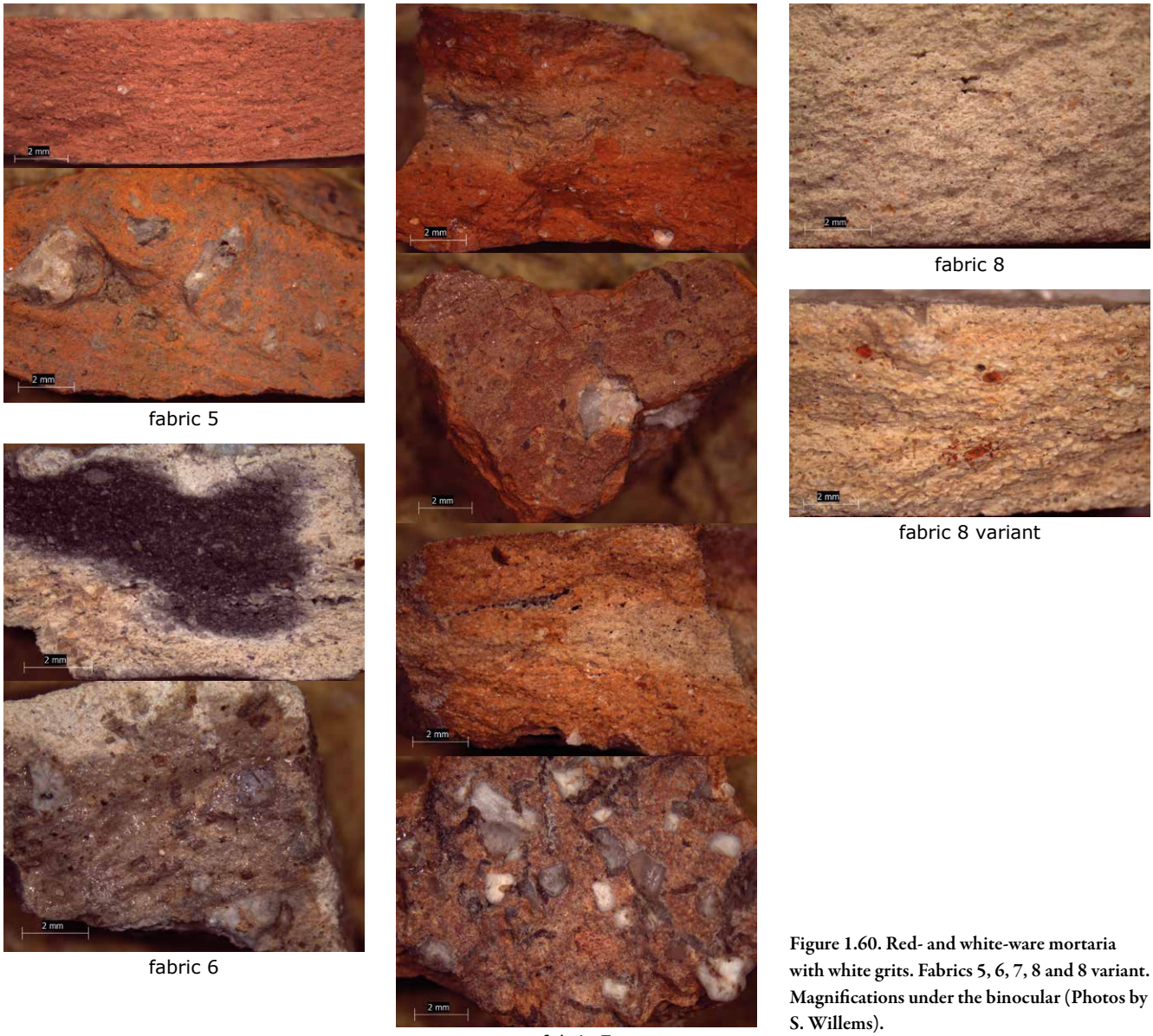

Figure 1.60. Red- and white-ware mortaria with white grits. Fabrics 5, 6, 7, 8 and 8 variant. Magnifications under the binocular (Photos by S. Willems).

It is obviously unfortunate that mortaria of this period can be notoriously difficult to identify and classify, as Hull remarked in his 1963 investigation of the subject (see above). A more wide-ranging programme of petrological and chemical analysis than has so far been possible could elucidate some of the problems. What is needed first is a set of samples from all of the possible production centres, both continental and British. As far as forms are concerned, there is also a need for a more concentrated approach to the difficulties of definition. It is evident that potters making later mortaria with a curved flange and upright rim were rather less bothered about standardization of their products than those who made fine wares or samian: what mattered was to make a robust flange that could provide the user with a firm grip while grinding the material with a pestle against the wall. However, our study shows that many of the mortaria reported on here could at least be assigned to a production centre region on the basis of their general form, even if we could not be a lot more specific than that. Much work has been done on this subject since the 1950s, but clearly there is much more work to do.

10. Conclusions on the coarse ware mortaria and their significance for revealing trade networks

The Oudenburg assemblage of coarse ware mortaria appears to be very significant, notably because it provides a rare opportunity to compare the vessels made in the northern continental provinces with those exported from Britain. When considering the mortarium imports according to the regions they represent, the main trade routes become very visible. If our assumption is true that most of the red-ware and white-ware mortaria with white grits originate from Britain, three supply axes can be defined: one from the East, one from the West and one from the South (Table 1.48; Figure 1.61).

production region	L1	FL2	FL3	FL4	FL5	5+POST /POST	TOTAL	%MNI
RHINE-MEUSE-EIFEL REGION	3	4	12	35	28	34	**116**	**48.1**
BRITAIN			4	13	8	46	**71**	**29.5**
BAVAY-FAMARS	2	7	7	9	3	9	**37**	**15.4**
REGIONAL?				1	3	7	**11**	**4.6**
MORE SOUTHERN TERRITORIES		1		2		3	**6**	**2.5**
TOTAL	**5**	**12**	**23**	**60**	**42**	**99**	**241**	**100**

Table 1.48. Distribution according to the stratified evidence of the production regions represented by the coarse ware mortaria at the south-west corner site, based on MNI.

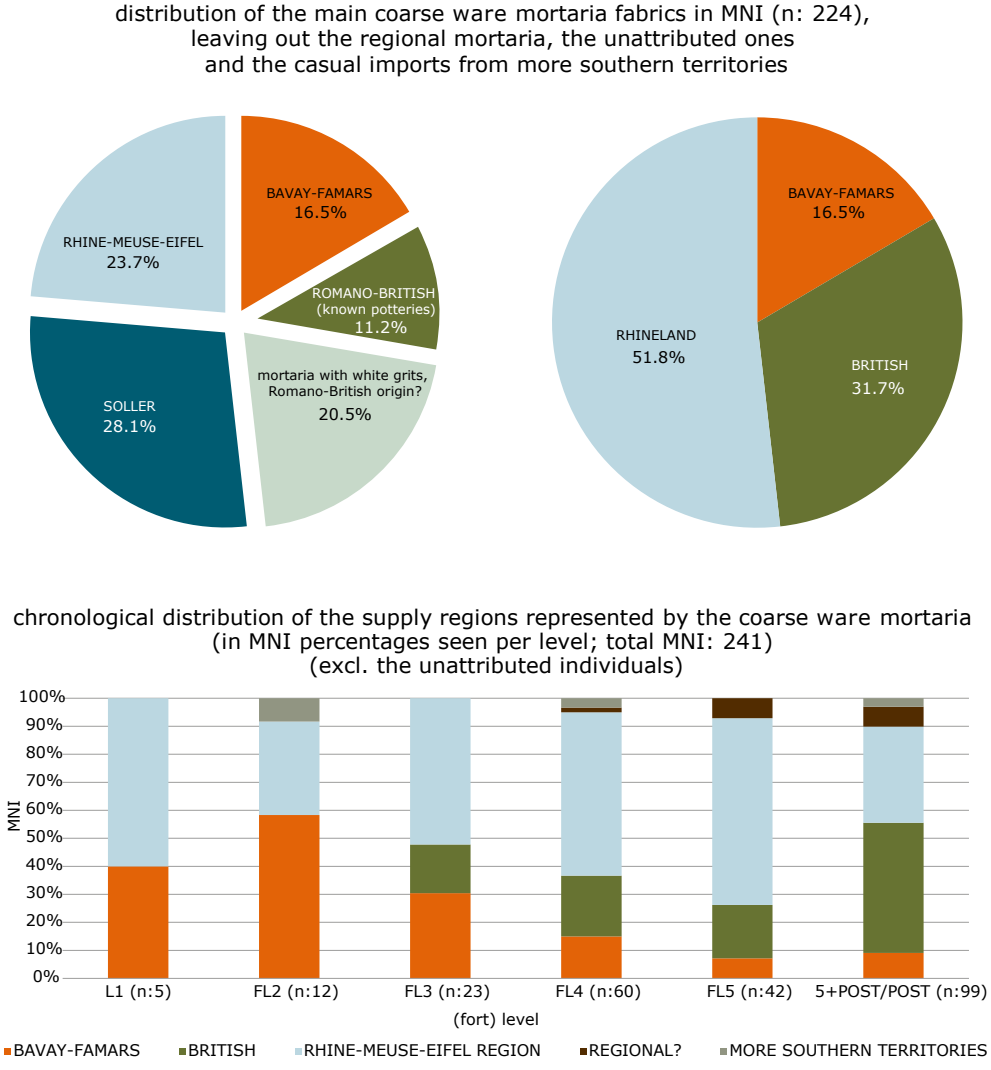

Figure 1.61. Distribution of the main coarse ware mortaria production regions at the south-west corner site, leaving out the regional mortaria, the unattributed ones and the casual imports from more southern territories. Top: in MNI counts (n: 224). Below: according to the stratified evidence, based on MNI%.

Two import regions dominate the mortarium spectrum, reflecting the major supply axes to the Oudenburg fort: the east-west axis from the wider Rhine region and the west-east axis from Britain. A south-north axis, the supply line from Bavay-Famars, was mainly significant until the middle of the 3rd century (Figure 1.61). Counting the Rhineland and Soller mortaria as a whole together with the mortaria generally identifiable as Eifel, Rhineland or from the Meuse Valley, the East absolutely dominates the supply of this kitchen tool to the Oudenburg fort, with over *c.* 48% of the total MNI (or 116 individuals). The other major supplier was Britain, with *c.* 30% of the total MNI (or 71 individuals). The Bavay-Famars production follows as the third import zone, although of lesser importance with 37 individuals or over 15%.

The distribution of the fabrics according to the level they were found, shows an evolution in the supply of the coarse ware mortaria. The Bavay-Famars supply seems to have lost its importance by the middle of the 3rd-century; at that time, British imports started to come in. In a first stage, the well-

known Romano-British potteries from the Lower Nene Valley and Oxfordshire were supplying in moderate quantities to the Oudenburg fort. The Romano-British products gained popularity from the late 3rd century onwards and became very significant during the 4th century. At that time however they consist mainly of unknown but presumed Romano-British productions. These presumed Romano-British red-ware and white-ware mortaria with white grits are obviously a late phenomenon. They appear to have been imitated in a regional production. As is discussed with the local/regional North Menapian industry, a 4th-century production in the region seems hardly possible given that the civil occupation diminished significantly (if was still present). It seems therefore evident that we should look in the wider region, perhaps in the region of Tournai or in northern France. Obviously, further research is needed to clarify this issue. The mortaria from the Rhineland, and mainly those from Soller, remained the most important imports, and this apparently throughout the fort's occupation.

11. Catalogue of the illustrated Romano-British and presumed Romano-British coarse ware mortaria of the south-west corner site

Table 1.49. Catalogue of the illustrated Romano-British (LNV WW, OXF WC, OXF WW, VER MOR) and presumed Romano-British (fabrics 1, 2, 3, 4, 6, 8) coarse ware mortaria and their presumed imitations (fabrics 5 and 7) of the south-west corner site. Catalogue numbers refer to Plates CLIII-CLIX. When it concerns joining sherds, both find levels are listed.

ill. no.	(fort) level	code	date AD	description	rim diam. (in mm)	sherd count	MNI	EVE
1.	3	LNV WW	250-400	Lower Nene Valley white ware, HP M42; horizontal rim	230	2	1	0.14
2.	3+4	LNV WW	150-400	Lower Nene Valley white ware, SW TF fig. 4.20, no. 22 (Nene Valley); flat curved rim; only base of rim/collar preserved, not the rim	314	3	1	0.28
3.	4	LNV WW	150-400	Lower Nene Valley white ware, base only; black grit	nm	1		
4.	4	LNV WW	200-400	Lower Nene Valley white ware, HP M42; horizontal rim	250	1	1	0.07
5.	4+5	LNV WW	150-400	Lower Nene Valley white ware similar to SW TF fig. 4.21, no. 35 (Nene Valley), but unusual for having almost no internal bead; ribbed, horizontal rim; black grit; heavily burnt	220	7	1	0.4
7.	5	LNV WW	250-400	Lower Nene Valley white ware, HP M42; horizontal rim; complete, small spout, black grit	240	4	1	0.16
8.	mixed	LNV WW	250-400	Lower Nene Valley white ware, HP M43; straight ribbed rim with upstanding lip	188	2	1	0.06
9.	post	OXF WC	240-400	Oxfordshire white-coated ware, Young (1977) WC 7.2; complete spout; mixed grit: white, grey, red, black white-yellowish; burnt, partially to black	190	6	1	
10.	3	OXF WW	240-400	Oxfordshire white ware, base only	nm	4		
11.	3+4	OXF WW	240-300	Oxfordshire white ware, Young (1977) M18.1; complete spout; burnt	280	4	1	0.2
12.	4	OXF WW	240-300	Oxfordshire white ware, Young (1977) M18.2; curved rim; small individual; burnt after breakage; three fitting rim sherds	220	6	1	0.09
13.	4	OXF WW	240-400	Oxfordshire white ware, Young (1977) M22.1	188	1	1	0.1
14.	4	OXF WW	240-400	Oxfordshire white ware, with curved rim	290	4	1	0.06
15.	4	OXF WW	240-300	Oxfordshire white ware, Young (1977) M17; curved rim (not measurable)	nm	2	1	0.02
16.	mixed	OXF WW	240-300	Oxfordshire white ware, Young (1977) M17.2; slightly curved rim with upstanding lip	220	4	1	0.2
17.	4/5+ post	OXF WW	240-400	Oxfordshire white ware, with curved rim; burnt	280	4	1	0.13
18.	post	OXF WW	240-400	Oxfordshire white ware, Young (1977) M22.10; base of rim chipped off (est. diam.)	270	1	1	
19.	post	OXF WW	240-400	Oxfordshire white ware, Young (1977) M17-22 (est. diam.)	170	1	1	
20.	post	OXF WW	240-400	Oxfordshire white ware, similar to the Young 1977 M22 series; curly rim with upstanding lip; burnt (est. diam.)	198	1	1	
21.	3/4/5/ post	VER MOR	280-360	Verulamium region white ware, white, layered fabric; similar to type Wilson (1984) 2697 (the latest vessel in the series); hammer-shaped rim; half of spout; burnt after breakage: sherds with and without fire traces	270	14	1	1
22.	post	British (?)		very fine fabric with orange to grey slip; fine, curved flange with upstanding rim	214	2	1	0.2
23.	post	British (?)		curved hammer-shaped rim; burnt; iron remains on surface and break	280	2	1	0.07
24.	5+post	British (?)	240-400	dense-layered fabric with very fine matrix, with abundant quartz; square rim	222	1	1	0.06
25.	post	British (?)		thick rounded rim with incised circles; heavily burnt; rim not measurable	nm	1	1	
26.	4	Fabric 1		VV 352; curved flange (incomplete) with upright rim; white grit; slightly burnt	360	1	1	0.05
27.	5	Fabric 1		VV 352; curved flange with upstanding rim; white grit; burnt; rim not measurable	nm	1	1	0.03
28.	5+post	Fabric 1		large pending, slightly curved flange with upstanding rim; large individual	460	1	1	0.09
29.	post	Fabric 1		complete spout, with wavy lines inside the spout (est. diam.)	260	2	1	
30.	mixed	Fabric 1		VV 347 - 352?; heavy curved flange/rim; white grit; burnt with black spots	380	1	1	0.07

ill. no.	(fort) level	code	date AD	description	rim diam. (in mm)	sherd count	MNI	EVE
31.	4+5	Fabric 1 or 2		half of spout; white slip	256	1	1	0.1
32.	4	Fabric 2		VV 352; curved rim; white grit, sparse	240	1	1	0.06
33.	5+post / mixed	Fabric 2		VV 352 variant; curved rim with upstanding lip; white grit; burnt, partially to black after breakage	270	2	1	0.08
34.	5+post	Fabric 2		curved rim; white grit	260	1		0.08
35.	post	Fabric 2		curly rim with upstanding lip; heavily burnt: rim surface partly vitrified; scoring; a possible volcanic glass inclusion in the fabric (est. diam.)	220	1	1	
36.	post	Fabric 2 related		VV 351 - 352?; curved rim; very rough; white grit; one repair hole underneath rim inner surface abraded; burnt; upstanding rim broken off	nm	2	1	0
37.	5+post	Fabric 3		hooked rim; white grit; base of collar completely broken off; very fine white fabric	204	1	1	0.12
38.	post	Fabric 3		hammer-shaped rim similar to SW TZ type 157, p. 169 & fig. 4.15, nos 281-4; scoring; partially burnt to black (est. diam.)	250	2	1	
39.	post	Fabric 3		vertical rim with separate upstanding lip, similar to SW TZ types 151 to 157, fig. 4.15; fabric with very pale pink core (est. diam.)	nm	2	1	
40.	post	Fabric 3		half of spout: simple, small & shallow; scoring; white grit; burnt; incomplete rim, not measurable	nm	1	1	
41.	post	Fabric 3		hammer-shaped rim similar to SW TZ type 137, p. 169 & fig. 4.14, no. 252; white grit (est. diam.)	234	1	1	
42.	post	Fabric 3		base only; burnt	nm	1		
43.	post	Fabric 3		vertical, square flange with upstanding rim, similar to SW TZ type 157, p. 169 & fig. 4.15, no. 281 (est. diam.)	204	1	1	
44.	post	Fabric 3		vertical square rim with upstanding rim, similar to SW TZ type 139, p. 169 & fig. 4.14, no. 257; white grit; fabric with pale pink core (est. diam.)	230	1	1	
45.	post	Fabric 3		base only; body with ribs; white grit; fabric with pale pink core	nm	1		
46.	post	Fabric 3		triangular rim, similar to SW TZ type 139, p. 169 & fig. 4.14, no. 256; white grit	276	2	1	0.11
47.	post	Fabric 3		base only	nm	1		
48.	post	Fabric 3		base only; white grit; burnt, partly to black; almost complete base	nm	1		
49.	3/post	Fabric 3-6		yellowish fabric; flat, curved rim, not measurable	nm	2	1	
50.	mixed	Fabric 3-6		yellowish fabric; hammer-shaped, square flange with upturned rim	178	1	1	0.05
51.	post	Fabric 3-8		square flange with upturned rim, similar to SW TZ, p. 169 & fig. 4.14, no. 254; (est. diam.)	234	1	1	
52.	post	Fabric 4		wall-sided flange with upturned rim, similar to Colchester late wall-sided Hull 1963, fig. 65, no. 9 (est. diam.)	228	1	1	
53.	post	Fabric 4 variant		form and surface look like Fabric 3, but much coarser fabric, rather fabric 4 but white version; top of square rim (not measurable) with upturned rounded rim; white grit	nm	1	1	
54.	post	Fabric 4-6		vertical, square rim with upturned rim, similar to Colchester late wall-sided Hull 1963, fig. 65, no. 9 (est. diam.)	210	1	1	
55.	5	Fabric 5		VV 352, similar to SW TZ types 131-5, p. 169, figs. 4.13-4, nos 238-49; curved collar with upstanding rim; white grit; remains of white slip; burnt to black	236	1	1	0.14
56.	5	Fabric 5		not white slipped; white grit; base of collar broken off	304	1	1	0.05
57.	5+post	Fabric 5		curved flange with upturned rim, similar to SW TZ type 141, fig. 4.14 no. 260; white grit; start of spout	216	3	1	0.22
58.	post	Fabric 5		curved flange with upturned rim, similar to SW TZ type 157, p. 169 & fig. 4.15, nos 281-4; rim not measurable; remains of white slip; burnt	nm	1	1	
59.	post	Fabric 5		curved flange with upturned rim, similar to SW TZ type 157, p. 169 & fig. 4.15, nos 281-4 (est. diam.); white slip on interior and exterior surface; burnt after breakage (black spot on side and break)	250	1	1	
60.	post	Fabric 5		very heavy base only; burnt	nm	1		
61.	post	Fabric 5		base only	nm	1		
62.	post	Fabric 5		curved flange with upturned rim, similar to SW TZ type 157, p. 169 & fig. 4.15, nos 281-4; white grit; only collar burnt (root?)	266	1	1	0.08
63.	post	Fabric 5		base of rim (not measurable) broken off, similar to SW TZ type 157, p. 169 & fig. 4.15, nos 281-4	nm	1	1	
64.	5+post	Fabric 5 variant		base only; white grit	nm	2		
65.	5+post / mixed	Fabric 5 variant		fine, long, curved flange with upturned rim, similar to SW TZ type 157, p. 169 & fig. 4.15, nos 281-4; white grit	276	3	1	0.12
66.	4/5+post	Fabric 5 variant		curved rim similar to SW TZ type 159, p. 170 & fig. 4.15, no. 287; white grit; burnt	227	2	1	0.17

ill. no.	(fort) level	code	date AD	description	rim diam. (in mm)	sherd count	MNI	EVE
67.	4+5 / post	Fabric 6		curved flange with upturned rim, similar to SW TZ types 85-7, p. 168 & fig. 4.12, nos 192-6	260	6	1	0.14
68.	post	Fabric 6		very rough, mainly white fabric; burnt; base of upturned rim broken off (not measurable)	nm	7	1	
69.	post	Fabric 6		curved flange with upturned rim; white grit (est. diam.)	192	1	1	
70.	post	Fabric 6		Curved flange with upturned rim, similar to SW TZ type 157, p. 169 & fig. 4.15, nos 281-4 (est. diam.)	260	1	1	
71.	post	Fabric 6		almost flat flange with upturned rim; burnt (est. diam.)	275	5	1	
72.	post	Fabric 6		almost flat flange with upturned rim (est. diam.); complete spout: very simple, rough fabrication; burnt	250	1	1	
73.	post	Fabric 7		brown-orange fabric with grey core; curved flange with upturned rim (est. diam.); complete spout; white grit	220	2	1	
74.	5+post	Fabric 7		curved, almost flat flange with upturned rim; almost complete spout; base of collar chipped off	284	1	1	0.07
75.	post	Fabric 7		curved flange with upturned rim	196	5	1	0.125
76.	post	Fabric 8		curved flange with upturned rim; white grit (est. diam.)	230	1	1	
77.	post	Fabric 8		curved flange with upturned rim (est. diam.)	270	1	1	
78.	post	Fabric 8	100-170	?Oxfordshire white ware Young (1977) M7.2; completely burnt, partially to black (est. diam.)	246	9	1	

4. Eifelware and other coarse oxidized wares

Sofie Vanhoutte

1. Introduction to the coarse oxidized assemblage

The coarse oxidized ware assemblage comprises the pottery fired in an oxidized atmosphere and showing (heavily) tempered fabrics. The fabric gives the pottery a rough feel mainly due to the abundant inclusions often protruding the surface (cf. Willems 2005, 71).

The coarse oxidized wares, *i.e.* mainly the *Eifelware*, are primarily considered here in light of the trade networks they represent. Only the coarse oxidized wares recovered from the Roman level itself are studied in depth, to come to diachronic information.

In total 1911 coarse oxidized sherds were collected at the south-west corner site. 'Only' 21.1% (403 sherds) was recovered from the Roman level itself. The assemblage of 1508 sherds from the post-Roman levels and from the transition level between the top of the Roman level and the dark earth shows an absolute dominance of the late Roman Mayen wares. Since this is a mainly 4th-century (and later) production, it emphasizes the considerable disturbance of the latest fort level and the high degree of absorption of material from fort level 5 into later levels. While the coarse oxidized pottery sherds from the Roman level consist mainly of fragmented material, many larger fragments were recovered from the later levels. This may be an indication that much of this material has not been moved over a long distance and supports the idea that it originally belonged to the latest fort level.

This coarse oxidized assemblage was studied based on sherd count and minimum number of individuals, mainly defined by the rims. The 403 coarse oxidized pottery fragments represent at least 119 individuals. They comprehend *Eifelware*, Eifel imitations and a few North African coarse oxidized wares next to some isolated vessels of different origins (Table 1.50; Figure 1.62).

A small selection of representative coarse oxidized forms and types is illustrated on Plates CLXVIII-CLXIX. The typologies to which is referred, are those of Niederbieber (NB) (Oelmann 1914), Alzei (Unverzagt 1916), Krefeld-Gellep (by Pirling 1966), Trier (Hussong and Cüppers 1972) and the one recorded by Brulet (1990b).

Table 1.50. Distribution of coarse oxidized fabrics within the Roman level at the south-west corner site, based on sherd count and MNI.

FABRIC	sherd count	sherd count %	MNI	MNI %
URM CO OX	111	27.5	16	13.4
SPE CO OX	13	3.2	3	2.5
MAY CO OX	223	55.3	74	62.2
EIF CO OX	14	3.5	4	3.4
EIF IMI CO	7	1.7	5	4.2
MEV CO OX	5	1.2	3	2.5
RME CO OX	14	3.5	10	8.4
NAF CO OX	15	3.7	3	2.5
LLW1 CO OX	1	0.2	1	0.8
TOTAL	**403**	**100**	**119**	**100**

2. Eifelware

The coarse oxidized pottery assemblage is dominated by the *Eifelkeramik*. The fabrics were identified under the binocular based on comparisons with clippings from ceramics from the potteries of Speicher, Mayen and Urmitz/Weissenthurm. Sherds from different Speicher potter workshops in the Speicher forest, dated to the late 3rd – 5th centuries AD, were provided by dr. Wolfgang Czysz (Bayerisches Landesamt für Denkmalpflege, Thierhaupten (G)). Sherd fragments from the pottery excavations of 1986/87 at Mayen, from the site between Siegfriedstrasse and the Genoveva Castle, dated to the 5th century AD, were sent over by dr. Lutz Grunwald from the Römisch-Germanisches Zentralmuseum in Mayen. Dr. Sybille Friedrich (Römisch-Germanisches Zentralmuseum, Mayen)

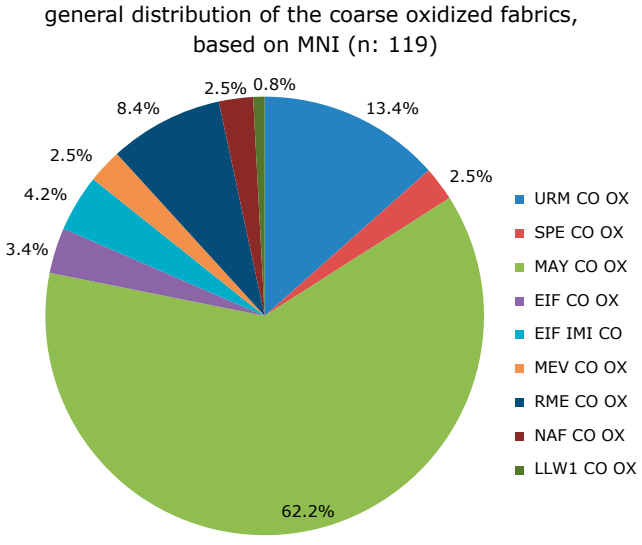

Figure 1.62. General distribution of the coarse oxidized fabrics attested at the south-west corner site within the Roman level, based on MNI.

provided clippings from Ofen I, II/III and X at Weissenthurm, site Am guten Mann-Kreis Mayen-Koblenz[105].

In total 361 sherds (89.6%) or at least 97 individuals (81.5%) of the coarse oxidized assemblage belong to *Eifelware* productions. Most of the fabrics can be attributed to the three named production centres. Of fourteen sherds, representing four MNI, their origin in the Eifel region cannot be specified due to burning or because of their indistinctive fabric in comparison to the mentioned productions.

2.1 Urmitz/Weissenthurm imports

With 111 sherds or 16 MNI the Urmitz/Weissenthurm production of the Neuwieder region in Germany (Friedrich 2012) represents respectively 27.5% or 13.4% of the *Eifelware* assemblage. This fabric can generally be described as a fabric with many smaller quartz and rock fragment inclusions in a layered structure (Plate CLXVIII: 3) (cf. Willems 2005, 88 for a detailed fabric description). Present at fort level 3 with eleven sherds but solely one MNI, the Urmitz/Weissenthurm is only of some significance from fort level 4 onwards. The production at Urmitz/Weissenthurm is widely accepted to be dated between *c.* AD 190 and 260 based on its dominant presence at Niederbieber and its absence at Alzei and other late Roman military sites (Friedrich 2012, 264; Brulet 2010c, 404; Kiessel 2008, with all concerning references; Gilles 1994, 117). Bakker (1996, 222), Kiessel (2008, 129) and Friedrich (2012, 264) however point to a continuing, limited production in the 4th century. A late dating at Oudenburg seems to be indicated by some of the forms in the Oudenburg assemblage.

The *Urmitzer* bowls from the Roman level at the Oudenburg site represent the NB 103 (one MNI), the NB 111a(?) (one MNI) and the NB 104/Alzei 28 bowl (two MNI). Although the NB 104/Alzei 28 individuals both concern burnt individuals, their layered fabric points to an Urmitz/Weissenthurm origin. One of these bowls, attributed to fort level 4, is a fine-walled version showing an L-shaped, hooked rim, resembling rim form B of Brulet (2010c, 415) but with an undercut lip like rim form F. According to the chronological classification by Brulet (2010c, 418) these rim forms can respectively be dated in the last quarter of the 3rd century and first quarter of the 4th century AD, which is in line with the presumed end date of fort period 4, around 300. The other Alzei 28 bowl belongs to fort level 5 and fits in well with a 4th-century date.

The represented dishes in the Urmitz/Weissenthurm fabric belong to the types Alzei 29 (one MNI), Alzei 34 (one MNI) (Plate CLXVIII: 2) and Pirling 128 (two MNI). The dish Alzei 29 and the dish Alzei 34 are late Roman types dated well into the 4th century (Brulet 2010c, 409 and 418). They are both recovered from fort level 5. While they confirm the 4th-century date of this level, they are *an sich* also a confirmation for the late Roman distribution of the *Urmitzer Ware*. The type Pirling 128 has known a long life with several subtypes, from the early 3rd until the first quarter of the 4th century (Brulet 2010c, 418), which is in line with the find contexts at the Oudenburg site: one found at fort level 4, the other at fort level 5. Found on top of the floor level of mortar-loam gravel situated to the north-west of the bath house (see Plate XXVIII: j), the latter fragment supports a date in the first quarter of the 4th century or not much later for fort level 5A.

The Urmitz/Weissenthurm pots are of type NB 87 (one MNI), NB 89 or transition NB 89/Alzei 27 (six MNI). One NB 87 is characterized by a painted decoration of red circles on the body (Plate CLXVIII: 1). Its sixteen fragments were found scattered over seven contexts of fort level 4. A painted geometric decoration is a known phenomenon on thin-walled pots of the Urmitz/Weissenthurm industry (Friedrich 2015, 31: Abb. 5)[106]. NB 89 pots, characterized by rim form A of the classification by Brulet (2010c, 418) and dated to the 3rd century, occurred in fort level 3 (one MNI), 4 (two MNI) and 5 (two MNI). Most likely the latter two MNI represent residual, dug-up items. Two body fragments and one base fragment of unattributed bowls or dish forms and of which is uncertain whether they represent three different bowls or dishes, show a painted brownish-red decoration on the interior. One body fragment displays straight and waivy lines, another a straight brown line; the base fragment has vague traces of radial lines.

2.2 Speicher imports

With only thirteen sherds, representing three MNI (but no rim fragment preserved), the supply of coarse oxidized products from Speicher seems to have had hardly any significance for the Oudenburg fort. The present products can possibly be considered as 'accidental' imports or casual items, brought in together with other Eifel products. The Speicher productions are characterized by a wide variety of fabrics and colours. In general, the quartz-rich Speicher fabric resembles that of the Mayen production but lacks the sedimentary rock inclusions and is completely restricted to quartz, often surrounded by iron oxides (Tomber and Dore 1998, 71; Willems 2005, 90; Brulet 2010c, 419). No exact forms can be identified in the Oudenburg assemblage of the Roman level; the three MNI (based on base fragments) represent pots or jugs[107]. Being a pottery production late Roman in date starting in the late 3rd century and ending in the late 4th century (Gilles 1994, 125), the single Speicher body fragment found at level 1 is to be considered as an intrusive find. Fort level 4 comprised nine Speicher sherds (one MNI), emphasizing the late (end) date of fort level 4. Fort level 5 only yielded three fragments (one MNI).

2.3 Mayen imports

The Mayen production, represented by 223 sherds or 72 MNI, dominates not only the Eifel assemblage (61.8% or 75.8%

105 With many thanks to prof. dr. W. Czysz, dr. L. Grunwald and dr. S. Friedrich who were so kind to send over some clippings and pottery sherds.

106 Similar pots of type NB 90 with painted red circles were also produced at the Heerlen potteries (Van Kerckhove *et al.* 2014, 260 and 262: Fig. 7, type CW OX-HEERL-P1). The fabric of the considered Oudenburg vessel can be identified as belonging to the Urmitz/Weissenthurm production though. Moreover, the date of AD 130-200 for the Heerlen pots would be too early for the Oudenburg example recovered from fort level 4.

107 Comparison under the binocular with the clippings of the respective kiln sites has enabled to revise the identification of the 'Speicher' Alzei 34 dish found in the double well OS 2562 (Vanhoutte *et al.* 2009b, 40) as a Mayen product.

depending on the quantification method) but also the coarse oxidized assemblage at the Oudenburg site in general (55.3% or 63.2% depending on the quantification method). With a variety in colours, the fabric can generally be described as very hard, with a hackly fracture and an abundant and dense temper of irregular quartz with few to many volcanic inclusions; the surface is generally very rough due to the protrusion of large inclusions (Fulford and Bird, 1975, 171-173; Redknap 1988, 5; Tomber and Dore 1998, 70; Redknap 1999, 58; Willems 2005, 90). The Roman Mayen industry and distribution is generally dated from the end of the 3rd to the middle of the 5th century AD (Unverzagt 1968, 34; Fulford and Bird 1975, 179; Gilles 1994, 119; Redknap 1999, 61; Willems 2005, 91; Grunwald 2012, 112). Stamm (1962, 103) believed that the production already started in the second half of the 3rd century AD.

The Mayen assemblage of the Oudenburg site is dominated by pots (33 MNI) and bowls (23 MNI), besides some dishes (10 MNI) and jugs (4 MNI). Only one possible lid and one beaker, presumable of the type Brulet H2, were counted.

All bowls can be attributed to the type Alzei 28 (Plate CLXVIII: 14-17). Bowl Alzei 28 (or Pirling 120) was, according to the grave finds at Krefeld-Gellep, in use during the entire 4th century (Pirling 1966, 92). The Oudenburg bowls display a variety in the rim morphology with rim types mainly characteristic for the late 3rd and first half of the 4th century[108] (cf. Brulet 2010c, 416). Worth mentioning is the presence of a very small version with vague exterior rim groove and interior rim undercut.

Eight of the ten dishes are of the type Alzei 34 (or Pirling 126), equally a type that was in vogue during the entire 4th century according to the finds at the graveyard of Krefeld-Gellep (Pirling 1966, 94). The rim types A, B and C discussed by Brulet (2010c, 417) and dated to the second and third quarter of the 4th century all occur at the Oudenburg site. One rim shows a transition between rim form A and C with a hooked block-rim and rather rounded exterior side (Plate CLXVIII: 18). Also present is a rather fine version of a Alzei 29 dish and a dish Pirling 128a.

The jugs are of type Alzei 30 variant with grooved block-rim, of type Brulet H15? (Plate CLXVIII: 4), type Pirling 109 and type Pirling 110, all represented by only one individual.

All pots but three (29 MNI) can be attributed to the lid-seated jar of the transition type NB 89/Alzei 27 or type Alzei 27 displaying a variety in rim forms between heart-shaped and sickle-shaped (Plate CLXVIII: 5-13). At the Krefeld-Gellep graveyard this was one of the most common pottery forms; there, a distinction was made between Pirling 105 and Pirling 106 with ear (Pirling 1966, 84-88). The rim profiles at Krefeld-Gellep show a large variety, as is also the case at Oudenburg. Von Petrikovits (1937, 333) saw an evolution in the rim profile from heart-shaped in the second half of the 3rd century, over triangular- or trapezoid-shaped to a sickle-shaped profile with more or less sharp inclined angle. Gilles (1994, 119) concluded to an evolution from a tendancy to more angular forms, over more or less obtuse forms from the beginning of the 4th century, to sickle-shaped profiles from the middle of the 4th century onwards.

The transition type NB 89/Alzei 27 is already present in the large waste-pit OS 4980 of fort level 4 (Plate CLXVIII: 10). Alzei 27 rim forms A, C, E, H described by Brulet (2010c, 415) can be recognized next to transitional forms[109]. Remarkable is the late, very compact rim with sharp, thin, highly raised inner lip and blocked outer lip (Plate CLXVIII: 13). Next to the dominance of the NB 89/Alzei 27 type, other pot types form a minority: Pirling 100 (two MNI), a possible Pirling 104 (one MNI) and one two-handled pot type Trier II 91b. Type Pirling 104 possibly occurred from the late 4th century onwards (Hussong 1936, 78).

The late Roman date of the Mayen products indicates that the few isolated sherds recovered from level 1 (three fragments, all from the earthen rampart which was cut by the robber trench of the later stone defensive wall), fort level 2 (four fragments, for two MNI) and fort level 3 (six fragments for two MNI) are intrusive items. Only one of the latter was found in a closed context, pit OS 80925, however, at the top of it, and being cut by the robber trench of the bath house it was possibly an intrusive item.

The start of the Mayen import is to be situated at fort period 4. Fragments designate three individuals to be attributed to fort level 4: a dish Alzei 34, a jug Pirling 110 and a pot NB89/Alzei 27. Recovered from a top layer of fort level 4, the dish fragment Alzei 34 may well have been an intrusive find since its date from the second quarter of the 4th century onwards is not in line with the other dating evidence for this level. The NB 89/Alzei 27 pot fragment displaying a rim form resembling form C of the Brulet classification (Brulet 2010c, 415), was recovered from the large waste-pit OS 4980 (see Vanhoutte *et al.* 2009c, 116) and points to a date from the late 3rd century onwards.

With sixteen sherds representing three MNI, the Mayen supply seems however hardly of much importance at Oudenburg in the late 3rd century. This changes completely at fort level 5. The Mayen presence at fort level 5 with 65 MNI should however be increased with the large share of Mayen products recovered from the post-Roman level and from the levels forming the transition between the Roman and post-Roman level (5+post level).

3. Eifel imitations

A minority of nineteen pottery sherds, representing twelve MNI, mainly quartz-rich creamy and orange to red fabrics, could not be identified with certainty. At least some of them, like the rim of a pot of transition type NB 89/Alzei 27 with a lid-seated rim profile found in the construction pit of structure OS 2562 of fort level 5, are Eifel imitations produced in the *civitas Tungrorum* (MEV CO

108 More detailed analysis of the Alzei 28 rim types, together with the ones present in the later levels, is envisaged for the future, to investigate whether more chronological data can be retrieved out of the rim type morphology.

109 Like for the Alzei 28, the Alzei 27 rim type will be investigated further with the completion of the assemblage by those rims present in the later levels.

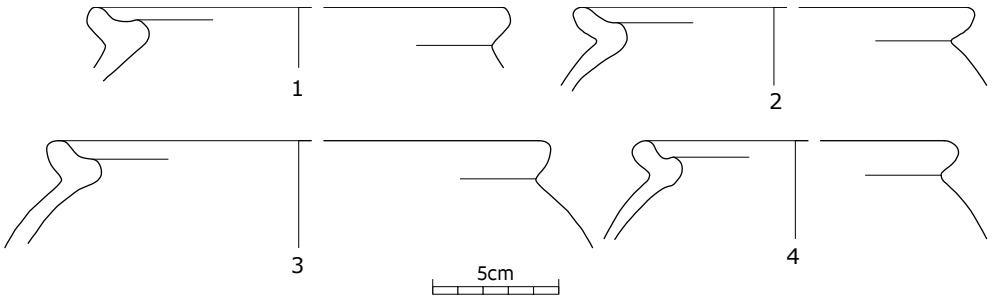

Figure 1.63. Eifel imitations from the secondary infill of the large basin OS 4923.

OX). Others can only generally be described as Rhine-Meuse-Eifel products (RME OX).

A very small assemblage of seven sherds, representing three MNI (EIF IMI CO), displays a whitish to whitish-grey fabric, often with white to yellowish margins (sometimes even yellow-orange), quartz-rich with very fine quartz, translucent to white, with some orange to red iron oxides. The most characteristic element are the long, angular, white flint inclusions which are sparse to abundant and irregularly spread in the fabric and protruding through the surface. The sherds are further characterized by a smoked surface. Two body sherds were recovered from fort level 3, one from fort level 4. The other sherds belong to fort level 5, the level to which the three individuals are attributed. The represented forms are the NB 104 bowl (one MNI) (Plate CLXVIII: 19) and the NB 89 pot (two MNI) (no. 20). The same forms are represented in the post-Roman levels and mainly in the mixed levels at the top of the Roman level at the transition to later levels. In the 5+post and post-Roman levels this fabric occurs with 34 sherds accounting for fourteen MNI. Their main occurrence in the transition level (with eighteen fragments) suggests that these Eifel imitations originally most likely belonged to fort level 5. This can of course also be valid for the other fragments in the post-Roman level. Of the fourteen MNI of these later levels, only one NB 104 can be identified; all other individuals are NB 89 pots. The typology of this production is clearly inspired by the Eifel products, not the late Mayen rim types but the common rim types from the Urmitz repertoire. Although the origin of this production could not yet be identified, the Eifel region seems to be excluded based on the fabric. White flint inclusions have also been recognized with a few late Roman vessels in reduced fabric. Fragments of three cooking pots with gully-rim (form inspired by the NB 89/Alzei 27 pot in *Eifelware*) in light grey fabric with white flint inclusions (in small quantities or abundantly) were found in the double well OS 2562: one in the construction pit, one in the shaft between both frameworks and one in the final infill of the inner well (Vanhoutte *et al.* 2009b, 41-42, 52 (Fig. 25: 28), 59, 87 (Fig. 52: 11), 88). Some 30 fragments of such pots, accounting for five MNI, were also found in the secondary infill layers of basin OS 4923 (Mignauw 2005, 152) (Figure 1.63). So far, the exact origin of this fabric is unknown, but it is clear that they are products from the (wider) region imitating Eifel pots NB 89/Alzei 27. This fabric has also been attested during recent excavations at Saint-Quentin (l'Aisne, France) and Hérin (Valencienne, Fr.) (Vanhoutte *et al.* 2009b, 42, with references to pers. comm. by respectively Xavier Deru, Université Lille 3, and Raphaël Clotuche, Inrap).

4. Some North African culinary imports

The coarse oxidized assemblage of the Roman level comprises a remarkable presence of fifteen sherds in a North African fabric, accounting for three MNI.

A large lid fragment was recovered from pit OS 72136 at fort level 1 (Plate CLXIX: 21). Its use as lid is confirmed by its smoked rim (Plate CLXIX: 21b). A sherd from the same lid, but not joining, was found at fort level 4. The lid is characterized by a hard, orange red fabric with a moderate tempering of angular, translucent quartz and a few milky-white quartz, some brown-red iron oxides and hardly any visible limestone inclusions (Plate CLXIX: 21c). The represented type is Hayes (1972) 196 and is generally dated to AD 70-250 (Bonifay 2004, 225-227; Raynaud 1993, 89). Several of such lids were recovered from the Scoglio della Sirena wreck discovered in 1990 off the coast of Crotone (I) of which the cargo is datable to the mid-3rd century (Medaglia and Rossi 2010). With the 'foot' or lid top missing, the type and therefore a more precise date for the Oudenburg lid cannot be specified[110]. The fabric of the lid has been confirmed by drs. Carina Hasenzagl (Ghent University) to be of North Tunisian origin, very similar to the fabric common with African Red Slip A production which has a strong resemblance to the African cooking wares A and CA. Neither the workshop(s) of the early African tableware nor those of the cooking wares A and CA have yet been discovered. However, the assumption that they were produced in the region of Carthage is generally accepted (pers. comm. C. Hasenzagl).

The same fabric is identified for the second vessel, a pot with S-profile, everted ribbon-shaped rim, wheel-turned ribs on the body and a flat cut base with sharp inclination to the body (Plate CLXIX: 22a/b). So far no parallel was found for its form.

A fine-walled base fragment with raised centre displays a similar fabric as the previous individuals, but with black iron oxides (Plate CLXIX: 23a-b). The outer surface of the fragment (both of base and body) is fired in a reduced way[111]. This fragment was recovered from fort level 5.

Worth mentioning is another presumed North African product found in the post-Roman level (Plate CLXIX: 24). It displays a different fabric, less hard, orange-red, with many angular quartz and large limestone inclusions. A white slip covers the surface. The form

110 Type A (with foot or marked lid top) is dated by Bonifay 2004, 227 from the Severan period onwards; Type B without 'foot' is dated earlier.

111 The inner half of the fabric is oxidized; the exterior half is reduced.

of the vessel is unclear, but the fragment may have been the foot of a miniature vessel (a miniature amphora?).

5. Some exceptional coarse oxidized products

A bowl with horizontal rim, comparable to type Vanvinckenroye (1991) 498, has a rather micaceous oxidized fabric, and may be related to the Low Lands Ware 1 industry (Plate CLXIX: 25). It was found at fort level 3. A bowl with long ribbon-shaped rim originated from the Bavay-Famars region (no. 26). The latter was found in the post-Roman level and it cannot be proven whether it is a residual item from the fort or whether it was brought in with the dark earth from outside the fort precinct. Both individuals, identified by S. Willems, can be classified as kitchen ware and represent exceptional items in the pottery assemblage at Oudenburg.

Worth mentioning is the isolated find recovered from the dark earth of a body fragment in *Rotbraun Gestrichene Keramik* or *Rotgestrichene Keramik* (identification by W. Dijkman, Maastricht). This pottery group is regarded as a late Roman derivate of the samian production (Grunwald 2012, 122; Brulet (2010e, 279); the coarse, orange fabric of the considered single sherd has put it technically in the coarse oxidized group. The *Rotgestrichene Keramik* appears to have been produced at Trier and Mayen and the start of this pottery production is dated to *c.* AD 430 (Grunwald 2012, 122; Brulet in Brulet (2010e, 280). Although caution is needed with only one sherd, this single fragment at the south-west corner site may be a piece of evidence that the final abandonment of the Oudenburg fort is to be situated after AD 430. At the same time, the almost complete absence of this ware may be an indication that the fort was abandoned not (much) later than *c.* 430 AD. However, also this has to be considered with caution: the distribution area of the *Rotgestrichene Keramik* is yet attested not further west than the Meuse Valley and the absence of this ware in Britain may indicate that neither the Oudenburg fort was supplied by this pottery group. The (so far) single sherd found at the Oudenburg fort may represent a casual item brought in together with other Eifel products.

6. The supply of Eifelware and other coarse oxidized wares and their wider significance

In general, when compared to the reduced wares, the coarse oxidized wares only represent small quantities in the pottery assemblages at the Oudenburg fort. However, in the 4th century, the supply of *Eifelware* became significant – from 0.40% of the total MNI at fort level 4 to 2.52% at fort level 5[112] – and it was the Mayen production which was almost completely responsible for this (Table 1.51; Figure 1.64). Moreover, these percentages are biased by the large residual component in the other pottery categories, such as the samian wares, reduced and handmade wares, with the latter being almost entirely residual at fort level 5. With a production dated mainly in the late 3rd and 4th century, the residual factor within the Mayen wares is far less significant. However, a large number of

FABRIC	L1	FL2	FL3	FL4	FL5	TOTAL
URM CO OX			1	7	8	**16**
SPE CO OX	*1*			*1*	*1*	**3**
MAY CO OX	1	2	2	4	65	**74**
EIF CO OX				1	3	**4**
EIF IMI CO			*1*	*1*	3	**5**
MEV CO OX		1		1	1	**3**
RME CO OX		1	3	5	1	**10**
NAF CO OX	1				2	**3**
LLW1 CO OX			1			**1**
TOTAL	**3**	**4**	**8**	**20**	**84**	**119**

Table 1.51. Distribution according to the stratified evidence of the attested coarse oxidized fabrics in the Roman level at the south-west corner site, based on MNI. Counts in grey: considered as intrusive at the level in question; counts in italic: only present with body or base fragment(s), no rim.

Eifelware has been recovered from the dark earth level as residual material which implies that our present picture is far from complete.

Although representing only small quantities, the Urmitz/Weissenthurm products appear to be the most important Eifel import at fort level 4 in the late 3rd century. With an absence of *Urmitzer Ware* at levels 1 and 2, a scarce presence at fort level 3, and a dominance at fort level 4, the imports at Oudenburg represent the latest phases of the Urmitz/Weissenthurm productions. It is generally believed that this industry produced in the period *c.* AD 190-260, but there are indications for a continuing production at least in the early 4th century. Late Roman forms in the Urmitz repertoire at the south-west corner site (a dish Alzei 29, a dish Alzei 34 and a bowl Alzei 28) and belonging to fort level 5, provide arguments for a continuing production.

In the 4th century, during fort period 5, the coarse ceramic trade from the Eifel region becomes significant with the Mayen ware dominating the Eifel supplies, especially when taken into account that a lot of the Mayen vessels recovered from the later levels most likely originated from fort level 5. At several graves of Graveyard A, a Mayen bowl, dish, pot or beaker served as grave good (cf. Mertens and Van Impe 1971). Four types can be recognized: bowl Alzei 28, dish Alzei 34, pot Pirling 100 and beaker Brulet H2. Speicher products hardly reached the Oudenburg fort and may have been brought in as casual items together with other Eifel imports.

Remarkable is the absence of Mayen vessels in the primary infill of the large basin OS 4923, in the construction slots OS 8670 and OS 7200, and in the primary infills of the inner well of OS 2562, all four contexts can be assigned to fort level 5B. In the final waste fillings of structure OS 2562, though, several Mayen vessels were recovered, but as can be deduced from *e.g.* the several cross joins with material found in the surroundings, this structure was filled in at the end of the fort's occupation or after the abandonment of the fort, with earth and waste already on site. A study in depth of the rim profiles of the Mayen vessels found in the post-Roman levels

112 This percentage is biased by the counts of the reduced wares, since these comprise a lot of residual, dug-up material from the earlier levels (as has been proven by the pottery assemblages of the key contexts: see Appendix in this volume, Section 6).

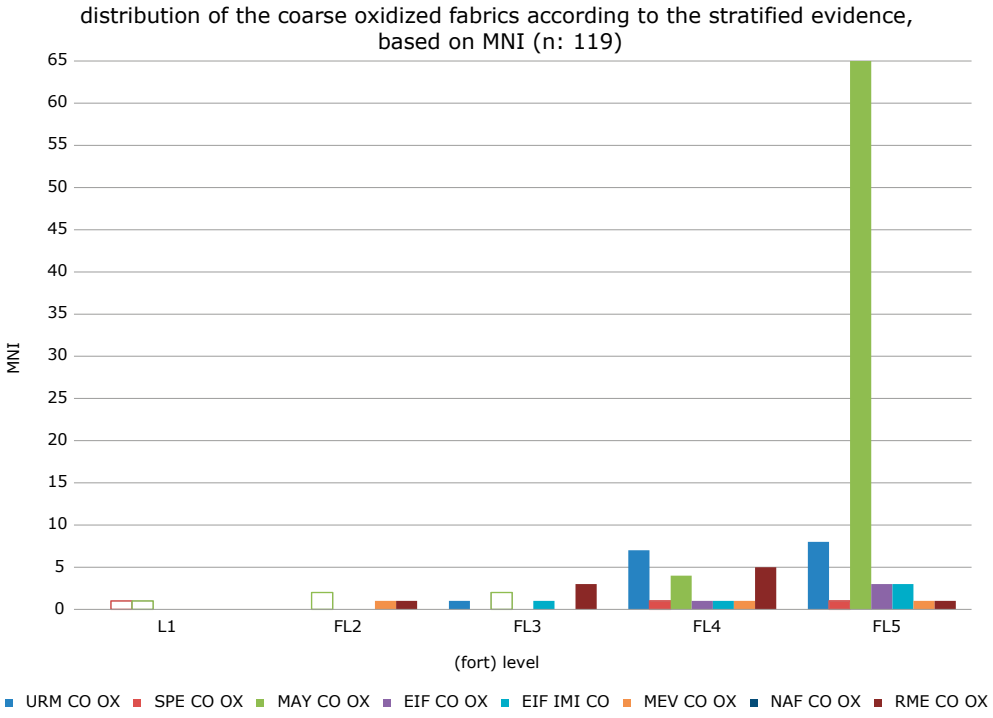

Figure 1.64. Visualization of the distribution according to the stratified evidence of the attested coarse oxidized fabrics in the Roman level at the south-west corner site, based on MNI. Blank cube: fragments considered as intrusive.

is clearly needed to come to chronological conclusions about the latest Mayen vessels[113].

Although they represent only a few isolated finds, the presence of some North African coarse products at the south-west corner site is obviously highly significant. The isolated find of a North African lid in a pit of level 1 (cross joining a small fragment dug-up at fort level 4) is possibly to be interpreted rather as a casual import brought in by a soldier as part of his personal baggage. Carrying such an ordinary culinary vessel this far seems to indicate that its possessor was most likely a native of North Africa. The presence of a base of a fine-walled vessel (a jug?) and an almost complete cooking pot at fort level 5 may be brought in in a completely different way. With the supplies of North African amphorae which became important products at the fort in the 4th century, it is possible that these two vessels came along as casual side-products.

113 **Study of the Eifelware from the post-Roman level is ongoing in collaboration with prof. dr. R. Brulet and will be published in the future.**

5. Reduced wares

5.1 The Romano-British coarse pottery, handmade and wheel-turned

Malcolm Lyne and Sofie Vanhoutte

5.1.1 Introduction to the Romano-British coarse ware assemblage

The excavations at the south-west corner site of the Oudenburg fort yielded in total 250 sherds (6954 g.) of pottery from Romano-British coarseware vessels, accounting for at least 103 individuals. It is chosen here to consider the handmade and wheel-turned component of the Romano-British coarse pottery together – the Romano-British handmade wares should, technically, be part of Chapter 1.C – as these imports cannot be analyzed separately in their significance for the Oudenburg fort. Most of the Romano-British fragments come from fort levels 4 and 5 contexts or are residual in post-Roman ones. There are none from fort levels 1 or 2 contexts (Table 1.52).

The Romano-British products only represent a minor share of the pottery assemblages at the site. Based on number of fragments, the Romano-British wheel-turned sherds only account for 0.15% of the total reduced wares, the Romano-British handmade fragments represent a similar share with 0.22% of the total handmade assemblage of the site. In terms of MNI, the percentages are not much higher: respectively the Romano-British wheel-turned vessels account for 0.38%, the handmade ones for 0.90% (Table 1.52).

Attested Romano-British fabrics are: handmade Black-Burnished Ware 1 (BB1), wheel-turned Black-Burnished Ware 2 (BB2), a silty variant of BB2 (BBS), East-Anglian Greyware (EAG), Alice Holt/Farnham Greyware (AHFA), Hampshire Grog-Tempered Ware (HGTW) and possibly also Hadham Greyware (HADG) and Thameside Kent Greyware (TSK) (cf. Figure 1.65).

In the following study in depth, the analysis is mainly based on the EVE quantification method (estimated vessel equivalent), next to sherd count and MNI (minimum number of individuals). Diagnostic pottery fragments are listed in the catalogue (Section 4 in this chapter) and are illustrated on Plates CLXX-CLXXII.

5.1.2 Distribution and chronology in relation to the stratified evidence

5.1.2.1 Fort level 3

There are only six Romano-British sherds which can be associated with contexts from fort level 3; two of them derive from level 4+5 but cross-fit with a find from level 3 (no. 1)[114], resulting in four individuals in total. Two of these individuals are in Dorset BB1 fabric of which the complete profile of a dish of Bestwall type 8/5 can be dated to between *c.* AD 220 and 290/300 (Lyne 2012) (Plate CLXX: 1). The other fragment of this dish type, a base sherd (not ill.), was found in a closed context, in the central fill layers of pit OS 80925. The homogeneous fillings indicate a rapid, complete infill after the pit lost its function. Whether this infill occurred during fort period 3 or at the end of it cannot be deduced based on the stratified evidence. Nevertheless, this OS 80925 fragment proves that the first Romano-British coarse imports, although very scarcely, did definitely come in during fort period 3. The third individual is represented by a lid fragment of Alice Holt/Farnham greyware, type 7.12 (Lyne and Jefferies 1979), and dated to *c.* AD 200-270 (no. 2). The fourth individual represents a straight-sided dish of unknown but probable British origin (no. 3).

One other fragment is less well stratified and belongs to fort level 3 or 4. It is from a developed beaded-and-flanged bowl in BB1 fabric of Bestwall type 6/4 with burnished external arcading (Lyne 2012) (no. 4). This type dates to the period *c.* AD 240-290/300.

5.1.2.2 Fort level 4

This level yielded 81 fragments of coarse pottery from British sources, representing 25 individuals (Table 1.52) (included are the fragments from a 3+4 level). The predominant fabric is Dorset BB1 which makes up 60.4% of the Romano-British pottery by EVE (72.8% by sherd count) (Table 1.53). The small number of Romano-British sherds from this fort level makes such percentages slightly suspect but there is no doubt that at fort period 4 the BB1 kilns around Poole Harbour in Dorset were by far the biggest supplier of coarse Romano-British pottery to Oudenburg.

The BB1 fragments are from Bestwall beaded-and-flanged bowl types 6/4 (*c.* AD 240-290/300) and 6/5 (*c.* AD 280-300), two each of types 6/6 (*c.* AD 290/300-370) and 6/8 (*c.* AD 270/300-370), up to ten examples of the straight-sided dish type 8/5 (*c.* AD 220-290/300) and three of type 8/12 (*c.* AD 290/300-370). Fragments from everted-rim cooking pots of Bestwall Class 1 with obtuse-lattice

114 **The listed numbers refer to the catalogue (see Section 4 of this chapter 5.1) and the accompanying drawings on Plates CLXX-CLXXII.**

Table 1.52. Proportion of Romano-British reduced wares within the total amount of reduced wares and of Romano-British handmade wares within the total amount of handmade pottery at the south-west corner site, based on number of sherds (top) and on MNI (below).

sherd count	total reduced wares	Romano-British reduced	%	total handmade wares	Romano-British handmade	%	TOTAL Romano-British
L1	257	**0**	0	698	**0**	0	**0**
FL2	1574	**0**	0	1899	**0**	0	**0**
FL3	6419	**2**	0.03	6956	**4**	0.06	**6**
FL4	14222	**22**	0.15	22799	**59**	0.26	**81**
FL5	8032	**21**	0.26	8597	**26**	0.30	**47**
TOTAL ROMAN LEVEL	30504	**45**	0.15	40949	**89**	0.22	**134**
5+POST / POST	15658	**58**	0.37	9269	**58**	0.63	**116**
TOTAL	**46162**	**103**	**0.22**	**50218**	**147**	**0.29**	**250**

MNI count	total reduced wares	Romano-British reduced	%	total handmade wares	Romano-British handmade	%	TOTAL Romano-British
L1	43	**0**	0	88	**0**	0	**0**
FL2	212	**0**	0	221	**0**	0	**0**
FL3	867	**2**	0.23	610	**2**	0.33	**4**
FL4	1959	**4**	0.20	2024	**21**	1.04	**25**
FL5	1439	**11**	0.76	964	**12**	1.24	**23**
TOTAL ROMAN LEVEL	4520	**17**	0.38	3907	**35**	0.90	**52**
5+POST / POST	3182	**25**	0.79	1193	**26**	2.18	**51**
TOTAL	**7702**	**42**	**0.55**	**5100**	**61**	**1.20**	**103**

BB1 coarse fabric, dish cat. no. 8, X10

BB1 coarse fabric, fish dish cat. no. 37, X15

COL BB2 variant fabric, carinated bowl cat. no. 16, X20

BB2 fabric, beaded-and-flanged bowl cat. no. 44, X10

BB2 fabric, jar, primary infill basin OS 4923 fort level 5 (not ill.), X15

AHFA (late production?) fabric, dish cat. no. 40, X10

Figure 1.65. A selection of attested Romano-British coarse pottery fabrics at the south-west corner site. Magnifications under the binocular (Photos Ghent University).

decorated girth bands are also present (*c.* AD 220-370) but the absence of complete profiles makes their exact types uncertain. All of these vessels could be made to fit within the period *c.* AD 270-300 but it may be possible to date their arrival even more precisely, in that there is an absence of BB1 incipient-beaded and flanged bowls of type 6/2 from the site. These are dated *c.* AD 210-280/90 and

Table 1.53. The Romano-British coarse pottery from fort level 4 at the south-west corner site: fabrics versus forms, based on EVEs and with the total sherd count.

FL 4: EVEs	Jars EVE	Bowls EVE	Dishes EVE	Others EVE	Total EVE	%	Sherd count
BB1	0.30	0.35	1.88		2.53	60.4	59
BB2		0.25	0.07		0.32	7.6	5
BBS					P		1
EAG		1.34			1.34	32.0	12
AHFA	P				P		3
HADG					P		1
TOTAL	**0.30**	**1.94**	**1.95**		**4.19**		**81**

Table 1.54. The Romano-British coarse pottery from fort level 5 and level 5+post at the south-west corner site: fabrics versus forms, based on EVEs and with the total sherd count.

FL 5/5+: EVEs	Jars EVE	Bowls EVE	Dishes EVE	Others EVE	Total EVE	%	Sherd count
BB1	0.33	0.18	0.61	0.35	1.47	48.4	25
BB2		0.05	0.22		0.27	8.9	4
AHFA	0.24	0.82			1.06	34.8	24
AHFA2					P		1
HGTW			0.03		0.03	1.0	1
TSK	0.05	0.11	0.05		0.21	6.9	3
TOTAL	**0.62**	**1.16**	**0.91**	**0.35**	**3.04**		**58**

their absence from Oudenburg suggests that BB1 pots of this level all arrived on site during the narrower time-slot *c.* AD 280/90-300.

Three complete profiles of BB1 dishes of Bestwall type 8/5 decorated with flattened arcading on the sides and scrolling on the underside (*c.* AD 220-290/300) come from the primary fill of the large waste-pit OS 4980 (see also Vanhoutte *et al.* 2009c, 131) (Plate CLXX: nos 5-7). Complete profiles of this dish type were also found in pit OS 7949 of Unit I (no. 8), the large fire layer of the end of fort level 4 (no. 9) and the cellar pit OS 8973 of Unit VIII (no. 10). Illustrated are also two undecorated BB1 dishes of Bestwall type 8/12 polished internally and externally (nos 11 and 12).

The second most important, but far less significant, Romano-British fabric from this fort level, is a fine wheel-turned grey one with <0.10 mm multi coloured quartz-sand filler and occasional larger white calcareous and brown ferrous inclusions. This probably has an East Anglian origin and is represented by two beaded-and-flanged bowls. One of these (no. 13) has 75% of its rim surviving, the other (no. 14) 59%. The presence of the greater parts of these two bowls has led to an exaggeration of the significance of these wares in the EVEs percentages.

Minority wares at fort level 4 include a fragment in Much Hadham Grey ware (no. 15) and a carinated bowl in silty fine black Colchester BB2 variant with external burnished latticing (no. 16).

5.1.2.3 Fort level 5 and 5+

Numbers of Romano-British sherds from fort levels 5 and 5+ (the transition level 5+post) are somewhat down on those from fort level 4 but the assemblage was still quantified by EVEs and numbers of sherds per fabric as it suggests changes in the sources of such pottery (see Table 1.54)[115]. Twenty-three MNI were recovered from fort level 5, fourteen MNI from the 5+post level.

The pottery assemblage from fort levels 5/5+ differs from the earlier one in having high numbers of both BB1 and Alice Holt/Farnham greyware sherds, both representing twelve MNI[116], making up a total of 83.2% of the assemblage by EVEs and 84.5% by sherd count (Table 1.54).

The BB1 wares (twelve MNI) include fragments from beaded-and-flanged bowl types 6/5 (one MNI; *c.* AD 280-300) and 6/6 (one MNI; *c.* AD 290/300-370), two examples each of dish types 8/5 and 8/9 (*c.* AD 220-290/300 and 290-330 respectively) and three of type 8/12 (*c.* AD 290/300-350/70) (illustrated vessels: Plate CLXX-CLXXI: 18-20). An everted rim-jar of uncertain Bestwall type in coarse black BB1 fabric (no. 17) has a heavily-beaded rim suggesting a *c.* AD 330/40-420 date. A base fragment of a BB1 dish shows an internal Redcliff motif and scrolling on the underside (no. 20). It can be dated *c.* AD 290-350. No parallels have been found for the small bead-rim vessel of unknown type in very fine BB1 variant (no. 21). It cannot be excluded that this is not a British product at all but in a fabric similar to BB1.

BB1 vessels are usually handmade but the straight-sided dish of Bestwall type 8/12 (no. 19) appears to be wheel-turned. Such wheel-turned BB1 vessels are not unknown; there is for example a *c.* AD 290-350 dated wheel-turned dish from the Shippams Social Club site in Chichester (Lyne *forthcoming*).

Some of this material may well be residual from the previous level but other vessels, such as the examples of bowl type 6/6 and dishes of

115 In this table the sherds from mixed levels 2 to 5 and from mixed level 4+5 are not included.

116 Six of the AHFA individuals were recovered from the transition level 5+post (5+), thus explaining the difference in numbers with Table 1.52.

Figure 1.66. a: BB1 dish of Bestwall type 8/5 from the large waste-pit OS 4980 of fort level 4 (no. 5). d: part of BB1 oval 'fish dish' of Bestwall type 9/1, recovered from the dark earth level (no. 37). b: everted-rim BB1 cooking pot of Bestwall Class 1 (with top of girth decoration), recovered from the dark earth level (similar to no. 17). c: beaded-and-flanged bowl in very fine-sanded BB2 fabric fired orange-brown with smooth black surfaces, recovered from the dark earth level (no. 44) (b, c, d: photos by K. Vandevorst, Flanders Heritage Agency).

types 8/9 and 8/12, were most likely deposited during fort period 5. There are no fragments from post AD 370 BB1 types.

The increased presence of Alice Holt/Farnham greywares (with twelve MNI) in comparison to the earlier fort level includes fragments from Lyne and Jefferies (1979) beaded-and-flanged bowls of class 5B, in most cases more specified: type 5B.4 (one MNI; *c.* AD 270-350) (no. 24), 5B.5 (one MNI; *c.* AD 270-420) (no. 25), 5B.6 (one MNI; *c.* AD 270-420) (no. 26) and 5B.8 (four MNI; *c.* AD 270-420) (nos 27-29). The assemblage also includes two everted-rim cooking pots of Class 3B.10 (*c.* AD 270-420) (nos 22-23).

A minority of the vessels are in Kent BB2 fabric. A beaded-and-flanged bowl is in this fabric (*c.* AD 240-350) (no. 30) and a straight-sided dish, polished black, is in a very fine brown-black version (*c.* AD 200-350) (no. 31). Another dish was produced at Colchester as its very fine polished black Colchester BB2 fabric indicates (*c.* AD 200-350) (no. 32). The type is paralleled there (Symonds and Wade 1999, Fig. 6.41, 48).

This assemblage also contains two rarities. The fragment of a rough-surfaced hook-rim jar is probably a late Thameside greyware variant of Pollard's type 197 (1988) and can be dated *c.* AD 300-370 (no. 33). A handmade straight-sided dish of Lyne type 6A.22 (2015) is identified as Hampshire Grog-Tempered Ware and dates *c.* AD 270-370/400+ (no. 34).

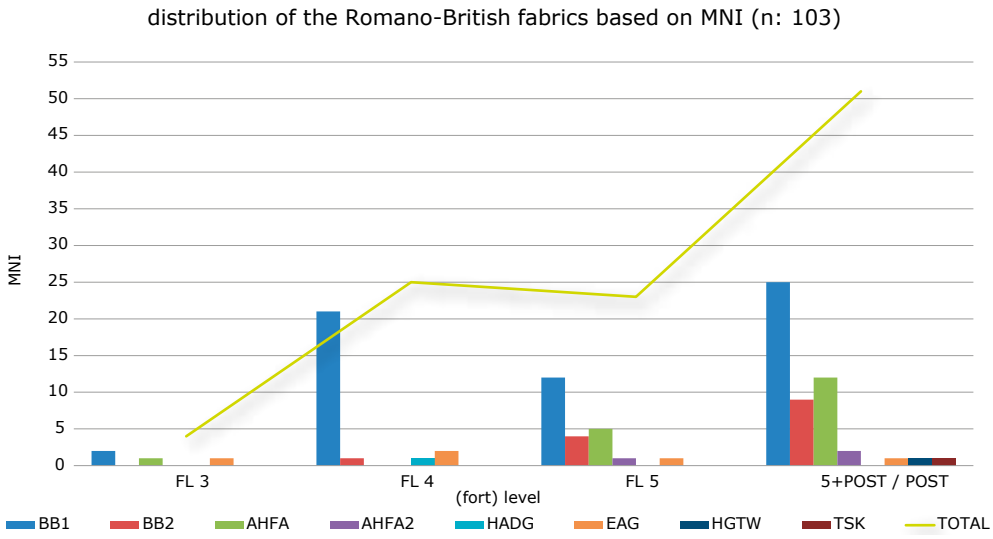

Figure 1.67. Visualization of the distribution of Romano-British coarse wares according to the stratified evidence, based on MNI.

5.1.2.4 Residual in post-Roman contexts

In total 116 residual Romano-British sherds come from post-Roman contexts[117] and include rim fragments adding up to a total EVE of 4.00. They represent 35 MNI (this is when the fourteen MNI of the 5+post level are excluded). Of this EVE, BB1 accounts for 49%, BB2 for 26%, Alice Holt/Farnham greywares for 21% and miscellaneous greywares for the rest. Both 3rd- and 4th- century material is present and includes the following forms and form variants not present in the Roman level contexts:

- An abraded beaded-and-flanged dish fragment of Bestwall type 7/3 in fine BB1 fabric, *c.* AD 300-400+ (Plate CLXXI:35).
- A dish of Bestwall type 8/9 in black BB1 fabric with internal Redcliff motif and scrolling on underside, *c.* AD 290-330 (no. 36).
- An oval 'fish dish' of Bestwall type 9/1 in black BB1 fabric with internal burnished 'diabolo' motif, *c.* AD 300-400+ (no. 37) (Figure 1.66: b).
- A lid in very-fine ?BB1 fabric with traces of burnished decoration on upper surface, *c.* AD 300-400 (no. 38).
- A beaded-and-flanged bowl of Lyne and Jefferies type 5B.8 in Alice Holt/Farnham greyware with internal black slip extending over the flange and external burnished arcading. The external burnished arcading is unusual and clearly copying that on similar BB1 beaded-and-flanged bowls. This in turn suggests a date early on in the long date-range of type 5B.8 as the BB1 industry abandoned such decoration *c.* AD 300. Therefore this example can be dated *c.* AD 270-300+ (no. 39).
- A convex-sided type 6A.9 dish variant in Alice Holt/Farnham greyware with internal burnished decoration, *c.* AD 350-400+ (Plate CLXXII: 40).

117 Not included are the sherds from the mixed level 5+post.

Table 1.55. Distribution of the Romano-British coarse production according to the stratified evidence, based on MNI.

MNI	FL 3	FL 4	FL 5	5+POST / POST	TOTAL
BB1	2	21	12	25	**60**
BB2	0	1	4	9	**14**
AHFA	1	0	5	12	**18**
AHFA2	0	0	1	2	**3**
HADG	0	1	0	0	**1**
EAG	1	2	1	1	**5**
HGTW	0	0	0	1	**1**
TSK	0	0	0	1	**1**
TOTAL	**4**	**25**	**23**	**51**	**103**

- A straight-sided dish in very coarse Alice Holt/Farnham greyware variant similar to wares produced at the Farnham Six Bells kiln site (Lowther 1955) and marketed in the London area with the more normal finer products, *c.* AD 300-400 (no. 41).
- A beaded-and-flanged bowl in BB2 variant with profuse iron-stained quartz-sand filler, *c.* AD 300-350 (no. 42).
- Three beaded-and-flanged bowls in very fine-sanded BB2 fabric fired orange-brown with smooth black surfaces, *c.* AD 270-350 (nos 43-45) (Figure 1.66: d).

5.1.3 Conclusions: Romano-British coarse pottery at the Oudenburg fort and its wider significance

The first Romano-British coarse pottery came in during fort period 3, around the middle of the 3rd century, but in very small quantities. More Romano-British coarse vessels occur from fort period 4 onwards, and – as can be deduced by including the fragments recovered as residual items in the post-Roman level – their number increased in the 4th century (Table 1.55; Figure 1.67). The Romano-British pottery sherds only form a tiny fraction of the total number of common reduced wares at Oudenburg though (Table 1.52). Although both the handmade and the wheel-turned

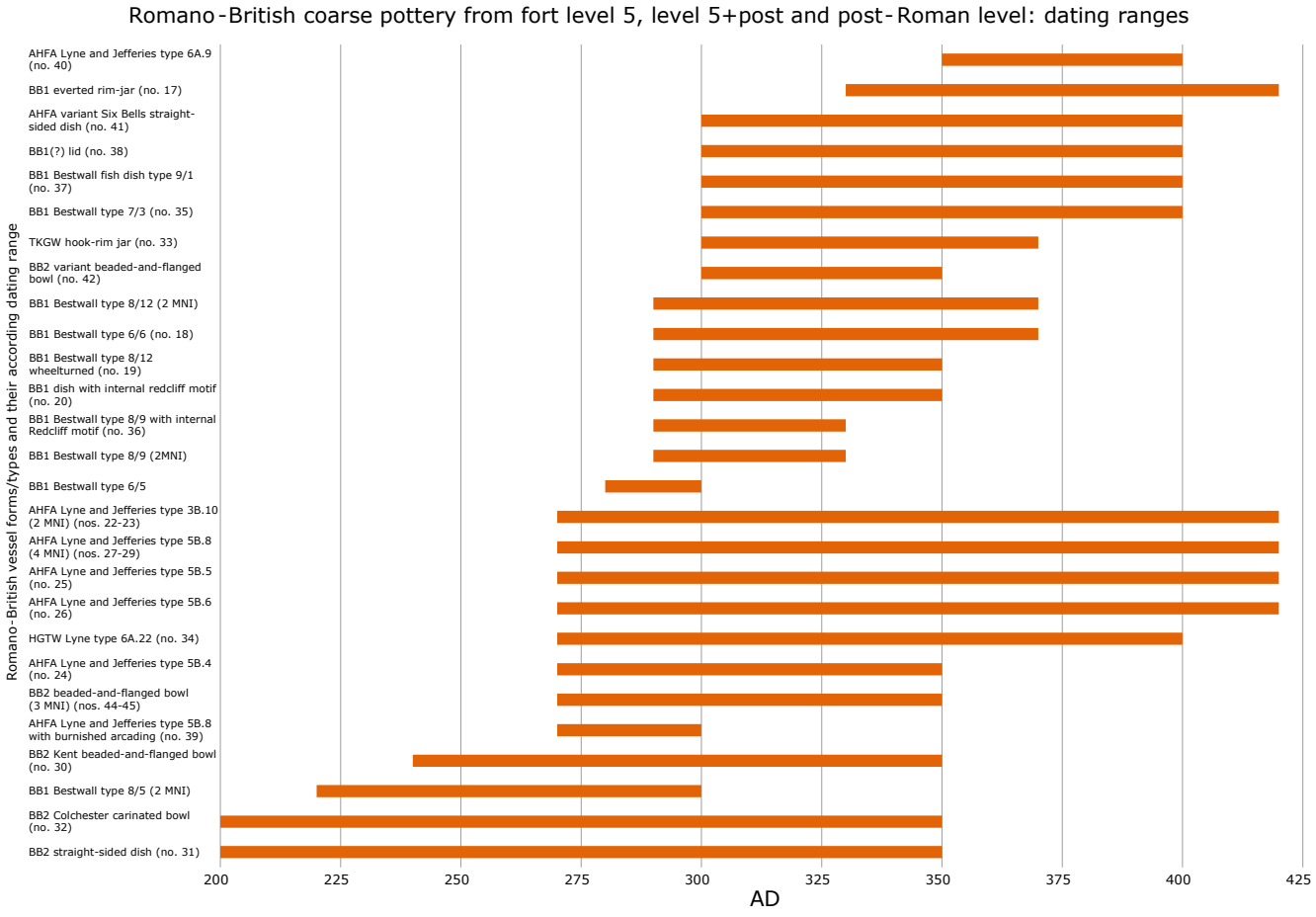

Figure 1.68. Dating ranges of the attested, 'closely' datable Romano-British coarse pottery types at the south-west corner site recovered from fort level 5 and later levels.

reduced wares were important at all fort levels, there was apparently not much need to get supplies of coarse pottery from *Britannia.* Both the handmade and wheel-turned reduced pottery are dominated by the local/regional North Menapian products (until fort period 4) (cf. Chapters 1.C.1, 1.D.1 and 1.E in this volume). Forms and decorations do point to mutual influences between the North Menapian and the Romano-British coarse ware potteries. The decorative burnishing patterns common on the 3rd-century North Menapian ceramic vessels were possibly influenced by the Romano-British Black-Burnished wares, and maybe also the other way around. Apart from their significance for the interpretation of the cross-Channel connections, the dating ranges for the Romano-British coarse pottery are an important chronological contribution for the Oudenburg fort (cf. Figure 1.68).

The BB1 imports are most significant at the Oudenburg fort. Most BB1 products appear in Gaul from the last quarter of the 3rd century onwards, with a post AD 280 date suggested by the absence of Bestwall incipient-beaded-and-flanged bowl type 6/2 on all sites other than Boulogne. Study by Lyne (unpublished) has concluded that amounts of *c.* AD 280-300 dated BB1 are quite small and largely restricted to sites in the lower Seine valley and on the high ground between Rouen and Dieppe in the final occupation levels at Totes, Grigneusville and Le Haussaye Beranger (all in France) prior to an almost total cessation of human activity in the area. A similar phenomenon is encountered in coastal areas of south-east Britain, where a significant number of villas and other sites cease to be occupied in the last years of the 3rd century and have a little BB1 associated with their final occupation.

BB1 pottery appears somewhat earlier, during the mid-3rd century, at Boulogne and on coastal sites to the east: Boulogne has produced examples of bowl type 6/2 (*c.* AD 210-280/90) and dish type 8/2 (*c.* AD 200-270). The two BB1 sherds from fort level 3 at Oudenburg indicate that a few pots were also appearing at the Oudenburg fort as early as the mid-3rd century, as was also the case at Voorburg (*Forum Hadriani*) in the Netherlands. This latter site was abandoned around AD 300-310 but has fragments of at least two dishes Holbrook and Bidwell (1991) (Dorset) type 56 or 59 from the fills of the silted up harbour (Van Kerckhove 2014, 328).

A decline in the supply of BB1 to sites in the south-east of Britain after AD 300 is not reflected in northern Gaul, where significant quantities of such wares began to arrive in such volumes as to indicate organized trade in BB1 pottery to Normandy and Brittany. A large

Figure 1.69. The Dales ware pot of type Gillam (1968) 157, found in 1977 in the northern sector of the Oudenburg fort (Photo by Y. Mans).

4th-century pottery assemblage from Bayeux has BB1 making up 15 to 20% of all the pottery present and includes rim sherds from at least 300 vessels (Delacampagne and Dufournier 1993, 40). Lillebonne near Le Havre has another 4th-century pottery assemblage with 46% BB1 (Adrian 2006, Tabl. 19) and there seems to have been regular, but more limited, supply to Rouen throughout the 4th century. Minute quantities of BB1 were traded further up the river Seine to Paris and beyond with a clear trade route indicated by a trail of a few pots up the river Yonne at least as far as Pont du Yonne (Barat *et al.* 2011). There are too few pots from Paris and further upstream for them to be the main cargo being traded and one suspects that they were being carried with much larger volumes of grain, salt or some other perishable commodity from the *civitas* of the Durotriges in *Britannia*.

This also applies to the small quantities of BB1 arriving at Oudenburg during the period AD 280-370; these vessels may also represent a small subsidiary element in mixed cargoes. Several industries based around Poole Harbour in the *civitas* of the Durotriges have left archaeological evidence, including stone quarrying, salt production, BB1 pottery manufacture and Kimmeridge shale working (Sunter and Woodward 1987). These industries appear to have been closely related, in that oil-shale waste was used to fire the pottery kilns at Worgret (Hearne 1992) and specialised 'Fitzworth' troughs made by BB1 potters were used to boil brine (Farrar 1975).

There appears to be a change in the pattern of Romano-British pottery supply during fort periods 4 and 5 at Oudenburg in that Alice Holt/Farnham greywares become more significant during fort period 5 (cf. Tables 1.53-1.54; Figure 1.67). Although the Romano-British sherd quantities are quite small, this may reflect reality in that excavations at the Pevensey and other Shore forts in Britain also display this phenomenon to a greater or lesser degree. The pottery assemblage from a *c.* AD 300-350 dated context at Pevensey has BB1 accounting for 58% of the coarse pottery and Alice Holt/Farnham greywares for a mere 2%. A later *c.* AD 370-400+ dated assemblage has 1% residual BB1 and 32% largely contemporary Alice Holt/Farnham greyware (Lyne 2009, Tabl. 55 and 59 adjusted for coarsewares only).

Noteworthy is the almost complete *olla* Hollevoet (2004, 338-339) drew attention to (Figure 1.69). The pot, handmade with wheel-turned rim, of type Gillam (1968) 157, was found during the excavation campaign in 1977 in the northern sector of the Oudenburg fort. The form and the hard fabric tempered with crushed fossil shells is characteristic for the Dales wares which were produced at Lincolnshire and in the adjacent part of Humberside (UK). The type dates to AD 250-340 (Tyers 1996b, 190). The Dales wares were mainly distributed around the different production centres and to the north. Only a few vessels are found along the British coast, namely at the Shore forts of Caistor-by-Sea and Richborough (Hollevoet 2004, 339, with references). The Oudenburg vessel clearly was not a trade product; it probably came in with its owner or was the result of gift exchange. It was found in Trench II while uncovering the north-south *cardo* of fort period 4. Although the exact context has not been registered, based on the features uncovered at the level from which the vessel has been excavated, it is likely that this pot can be attributed to fort period 4. It definitely emphasizes the close relation between the Oudenburg unit and the units at the British shore forts in the late 3rd century.

5.1.4 Catalogue of the most representative (and illustrated) fragments of Romano-British coarse pottery found at the south-west corner site

Malcolm Lyne

The catalogue numbers refer to the illustrated individuals on Plates CLXX-CLXXII.

Fort level 3

no. 1. Complete profile of a BB1 dish of Bestwall type 8/5. White-slipped (except for the upperside of the base). Context OS 70907. Another base sherd of the same type (not illustrated) was found in pit OS 80925.

no. 2. Lid fragment of Alice Holt/Farnham greyware type 7.12, fired polished black. Exterior rim diameter 190 mm. Context level OS 70910.

no. 3. Straight-sided dish of unknown but probable British origin, fired black with a pimply goose-flesh finish. Context level OS 70909.

Fort level 3 or 4

no. 4. Developed beaded-and-flanged bowl in BB1 fabric, of Bestwall type 6/4 with burnished external arcading. Exterior rim diameter 170 mm. Context level OS 1905.

Fort level 4

no. 5. Complete profile of BB1 dish of Bestwall type 8/5 decorated with flattened arcading on the sides and scrolling on the underside (Figure 1.66: a). Exterior rim diameter 200 mm. Context primary fill of the large waste-pit OS 4980.

no. 6. Complete profile of BB1 dish of Bestwall type 8/5 decorated with flattened arcading on the sides and scrolling on the underside. Exterior rim diameter 190 mm. Context primary fill of the large waste-pit OS 4980.

no. 7. Complete profile of BB1 dish of Bestwall type 8/5 decorated with flattened arcading on the sides and scrolling on the underside. Exterior rim diameter 170 mm. Context primary fill of the large waste-pit OS 4980.

no. 8. Complete profile of BB1 dish of Bestwall type 8/5 decorated with flattened arcading on the sides and scrolling on the underside. Exterior rim diameter 190 mm. Context pit OS 7949 Unit I.

no. 9. Complete profile of BB1 dish of Bestwall type 8/5 decorated with flattened arcading on the sides. Exterior rim diameter 320 mm. Context layer OS 70006, part of large fire layer, end fort level 4.

no. 10. Complete profile of BB1 dish of Bestwall type 8/5 decorated with flattened arcading on the sides and scrolling on the underside. Exterior rim diameter 250 mm. Context cellar pit OS 8973, cross-fit with level OS 8959.

no. 11. Undecorated BB1 dish of Bestwall type 8/12 polished internally and externally. Exterior rim diameter 170 mm. Context level OS 7937.

no. 12. Undecorated BB1 dish of Bestwall type 8/12 polished internally and externally. Exterior rim diameter 200 mm. Context primary fill of the large waste-pit OS 4980.

no. 13. Beaded-and-flanged bowl in wheel-turned grey fabric, probably of East Anglian origin. Exterior rim diameter 180 mm. Context level OS 80963/80942.

no. 14. Beaded-and-flanged bowl in wheel-turned grey fabric, probably of East Anglian origin. Exterior rim diameter 180 mm. Context large fire layer OS 7965 demarcating the end of fort level 4.

no. 15. ?Bowl sherd in Much Hadham Grey ware with a rivet hole from a repair. Context layer OS 1117.

no. 16. Carinated bowl (Drag. 30 copy) in silty fine black Colchester BB2 variant with external burnished latticing. Exterior rim diameter 220 mm. Non-fitting wall sherd, but likely to be from the same individual. The rim sherds come from the primary fill of the large waste-pit OS 4980 (see also Vanhoutte *et al.* 2009c, 124 and Fig. 23); the non-fitting wall sherd was found in level OS 22947.

Fort level 5 and level 5+

no. 17. Everted-rim jar of uncertain Bestwall type in coarse black BB1 fabric. Exterior rim diameter 140 mm. Context OS 8670, fill of construction slot fort level 5.

no. 18. Beaded-and-flanged bowl of Bestwall type 6/6 with untidy external burnished arcading, in coarse black BB1 fabric. Exterior rim diameter 150 mm. Context primary fill of large basin OS 4923 fort level 5.

no. 19. Straight-sided dish of Bestwall type 8/12 in coarse black BB1 fabric. Exterior rim diameter 270 mm. Cross-fit between sherds coming from contexts pit OS 10908/8924A, OS 4923-secondary fill large basin and level 8920, fort level 5.

no. 20. Fragment from base of BB1 dish with internal Redcliff motif and scrolling on underside. Context level OS 8914, fort level 5.

no. 21. Small bead-rim vessel of unknown type in very fine BB1 variant. Exterior rim diameter 35 mm. Context fill of construction slot OS 8670, fort level 5.

no. 22. Everted jar rim of ?Lyne and Jefferies type 3B.10 with black slip, in Alice Holt/Farnham greyware. Exterior rim diameter 160 mm. Context level OS 8907 of fort level 5 or later date.

no. 23. Cavetto-rim jar of Lyne and Jefferies type 3B.10 with similar slip, in Alice Holt/Farnham greyware. Exterior rim diameter 170 mm. Context level OS 8905A, fort level 5.

no. 24. Beaded-and-flanged bowl of Lyne and Jefferies type 5B.4 with internal white slip extending over flange, in Alice Holt/Farnham greyware. Exterior rim diameter 230 mm. Context level OS 8905A, fort level 5.

no. 25. Beaded-and-flanged bowl of Lyne and Jefferies type 5B.5 with internal black slip, in Alice Holt/Farnham greyware. Exterior rim diameter 180 mm. Context OS 22920, fill of construction pit of double well (Vanhoutte *et al.* 2009c, Fig. 17,1), fort level 5. A rim fragment of another or the same 5B.5 bowl came from road level OS 8937 of the same fort level 5A (not illustrated).

no. 26. Beaded-and-flanged bowl of Lyne and Jefferies type 5B.6 with similar internal slip extending over the flange, in Alice Holt/Farnham greyware. Exterior rim diameter 160 mm. Context OS 10908/8924A, subsidence on top of pit level 4.

no. 27. Beaded-and-flanged bowl of Lyne and Jefferies type 5B.8, in Alice Holt/Farnham greyware. Exterior rim diameter 220 mm. Context level OS 8902. Level 5+post.

no. 28. Beaded-and-flanged bowl of Lyne and Jefferies type 5B.8 with internal black slip, in Alice Holt/Farnham greyware. Exterior rim diameter 180 mm. Context OS 10908/8924A, subsidence on top of pit level 4.

no. 29. Beaded-and-flanged bowl of Lyne and Jefferies type 5B.8 with internal black slip and horizontal burnished bands on exterior, in Alice Holt/Farnham greyware. Exterior rim diameter 210 mm. Context level OS 8907. Level 5+post.

no. 30. Beaded-and-flanged bowl in Kent BB2 fabric. Exterior rim diameter 230 mm. Context level OS 8914, fort level 5.

no. 31. Straight-sided dish in very fine brown-black BB2 fabric fired polished black. Exterior rim diameter 250 mm. Context level OS 8907. Level 5+post.

no. 32. Dish in very fine polished black Colchester BB2 fabric. Exterior rim diameter 250 mm. Context level OS 8907. Level 5+post.

no. 33. Fragment from a rough-surfaced hook-rim jar fired black with profuse <0.30 mm quartz-sand filler and sparse coarser brown ferrous and white calcareous inclusions. Probably a late Thameside greyware variant of Pollard's type 197 (1988). Exterior rim diameter 200 mm. Context level OS 8907. Level 5+post.

no. 34. Handmade straight-sided dish of Lyne type 6A.22 (2015) in Hampshire Grog-Tempered Ware, fired black with profuse orange and white crushed-grog filler. Exterior rim diameter uncertain. Cross joining sherds from context levels OS 8902 and OS 4960. Level 5+post.

Residual in post-Roman level

no. 35. Abraded beaded-and-flanged dish fragment of Bestwall type 7/3 in finish BB1 fabric. Exterior rim diameter indeterminate. Context level OS 7950A, dark earth.

no. 36. Dish of Bestwall type 8/9 in black BB1 fabric with internal Redcliff motif and scrolling on underside. Exterior rim diameter 200 mm. Context level OS 4000P, dark earth.

no. 37. Oval 'fish dish' of Bestwall type 9/1 in black BB1 fabric with internal burnished 'diabolo' motif. *c.* AD 300-400+ (Figure 1.66: d). Context level OS 4000J, dark earth.

no. 38. Lid in very-fine ?BB1 fabric with traces of burnished decoration on upper surface. Exterior rim diameter 210 mm. Context level OS 4002, dark earth.

no. 39. Beaded-and-flanged bowl of Lyne and Jefferies type 5B.8 in Alice Holt/Farnham greyware with internal black slip extending over the flange and external burnished arcading. Exterior rim diameter 220 mm. Context level OS 4000L, dark earth.

no. 40. Convex-sided type 6A.9 dish variant in Alice Holt/Farnham greyware with internal burnished decoration. Exterior rim diameter 230 mm. Cross joining sherds from contexts level OS 2000G/4000J, dark earth.

no. 41. Straight-sided dish in very-coarse Alice Holt/Farnham greyware variant similar to wares produced at the Farnham Six Bells kiln site (Lowther 1955). Exterior rim diameter 250 mm. Context level OS 7000E, dark earth.

no. 42. Beaded-and-flanged bowl in BB2 variant with profuse iron-stained quartz-sand filler. Exterior rim diameter 195 mm. Context level OS 8903/8913, dark earth.

no. 43. Beaded-and-flanged bowl in very-fine-sanded BB2 fabric fired orange-brown with smooth black surfaces. Exterior rim diameter 160 mm. Context OS 4923-secondary fill of large basin.

no. 44. Beaded-and-flanged bowl in very-fine-sanded BB2 fabric fired orange-brown with smooth black surfaces (Figure 1.66: c). Exterior rim diameter 220 mm. Context level OS 7901, dark earth.

no. 45. Beaded-and-flanged bowl in very-fine-sanded BB2 fabric fired orange-brown with smooth black surfaces. Exterior rim diameter 210 mm. Context level OS 2000G, dark earth.

5.2 Imported greywares from the North of France

Sonja Willems and Sofie Vanhoutte

5.2.1 Introduction to the northern French assemblage

From the pottery of the Roman level itself at the south-west corner site of the Oudenburg fort, 263 fragments were put aside as coming from more southern territories in comparison to local/regional North Gaulish productions. Their difference with the local or regional samples was clear, whether it was by rim form, surface treatment or fabric.

Six different productions were distinguished in the assemblage of which the potteries are all localized in the present northern part of France, largely encompassing an area from Normandy to the Champagne-Ardennes region. They include productions from the *civitates* of the Nervii, the Atrebates, the Ambiani, the Veliocassi and the Remi. Twenty-eight pottery sherds representing thirteen individuals were not attached to a specific production site. They all show a sandy white clay, a feature typical of several production sites in France, from the Champagne region in the east to the Cambrai and Arras region, as well as the La Calotterie potteries in the west. Combined with their overall form spectrum, they can be connected to French productions.

Not counted in the present group, is a small assemblage of some unattributed 30 fragments which are characterized by a surface with a very rough feel. Their fabric is dark-grey, sometimes with a light-brown or red-brown core, moderately tempered with fine, opaque grey, subangular quartz grains, white mica, sparse black iron-rich grains and calcite. The fragments are present in fort level 3, 4 and 5 contexts. In the publication of the pottery assemblage of the large waste-pit of fort level 4 (Vanhoutte *et al.* 2009c, 123), this pottery has been described as 'Ardres reduced ware' (ARD RE)[118], however, although this is not impossible, its production at Ardres has so far not been proven. Nevertheless, the fabric has similarities with the fabric recognized at Ardres by Florent and Cabal (2004). Significant quantities of this fabric have been found at Thérouanne, the capital of the *civitas Morinorium*, and at Boulogne (Dhaeze and Seillier 2005, 631). However, the localization of its production centre remains for now unknown. Recent excavations of several pottery kilns at Thérouanne could change our knowledge about this pottery group[119].

In general, one can say that the northern French productions only represent a very low percentage of the coarse reduced wares from the Roman level (77 individuals within a total of 4520 individuals of the Roman level, hence only 1.7%). In the post-Roman and mixed levels, more of these imports were found but these have not yet been studied. Since it is thought that much material from fort fort level 5 has been dug-up in mainly the bottom layers of the post-Roman level, further investigation of these pottery fragments will certainly be considered for future research. In the light of the huge presence of the local/regional handmade and wheel-turned reduced cooking wares, next to fine reduced local/regional tableware, the imports in question are of low significance, especially compared to, for instance, fine ware imports. The presence of the northern French products merely illustrates the contact Oudenburg might have had with merchants from the South, and even more probable, with soldiers coming from garrisons stationed for instance at Boulogne-sur-Mer. Nevertheless, the presence of certain products at fort levels 4 and 5 are very important for the research on pottery productions in northern France, since they indicate which potteries were still actively producing.

5.2.2 The Bruay-La-Buissière productions

In total 169 pottery sherds for a total of 39 individuals were identified as certainly coming from the Bruay-La-Buissière kilns. The export of Bruay-La-Buissière products, commonly misidentified as Arras wares, is not surprising. The site of Bruay was one of the major pottery industries, situated north of the *civitas* capital Arras, in the Atrebates region (Blamangin 2019). Distribution maps have shown its major export to the West, probably crossing the Channel to *Britannia* and to the North, in this manner blocking the Arras productions (Chaidron *et al.* 2010). Two different fabrics can be recognized in the Oudenburg products, namely a sandy variant used for cooking wares and a very fine variant for tableware beakers (see Figure 1.71). The sandy fabric contains up to 25% large mono-cristalline rounded quartz inclusions, but also glauconite and white grog. Next to these larger inclusions, finer inclusions of mica, quartz, glauconite and iron oxide complete the spectrum. The clay is silicium-based. The second fabric variant is a very fine one, also a silicium-based clay, containing white grog, iron oxides, mica and glauconite, all of very small size (Borgers, in Willems 2019).

Popular forms for export to Oudenburg were the beakers and pots (Plates CLXXIII-CLXXIV).

5.2.2.1 Beakers

The beakers (at least sixteen individuals) are long-necked, straight or bulging, called 'truncated pots'. The difference between straight and bulging is a matter of chronology. The straight necks are mostly found in fort levels 2 and 3 (nos 1-3 (fort level 2), 4-5 (fort level 3); one rim from pit OS 80925: Plate CCCXCIX, 33). The bulging

118 Vanhoutte *et al.* 2009c identified eleven sherds, accounting for seven MNI, as 'Ardres reduced ware'. However, further fabric analysis has concluded to another origin for four of these individuals. One of the individuals (Vanhoutte *et al.* 2009c, 122: Fig. 21, 7) appears to be a Bruay-Labuissière product; three other individuals (idem, 122: Fig. 21, 18; 124: Fig. 22, 1) can now be recognized as from La Calotterie.

119 Ongoing research of the archaeological service of the Department Pas-de-Calais.

ones appear at fort levels 4 and 5 (Plate CLXXIII: 8-11 (fort level 4), 12 (fort level 5)).

Straight necked beakers found in fort levels 4 (*e.g.* nos 6[120] and 7) or 5 must probably be seen as residual material. In Tuffreau-Libre's article on the material from one of the kilns, these truncated pots are classified as type IIb, dated to the first half of the 2nd century AD (Tuffreau-Libre 1980a, 99-100). Bayard (1980, 190) has classified this type as his type 4. On the consumption site Amiens 'Vanmarcke' the beakers with vertically straight necks are still present in contexts dated to the end of the 2nd and the first half of the 3rd century (Bayard 1980, 171, Pl. 14). Larger variants (cooking pots), type Bayard 25b, are seen up until the beginning of the 3rd century. The contexts from Oudenburg suggest that all pots with straight necks were still in use at least until the middle of the 3rd century, which corresponds with the data from the Amiens contexts.

The beakers with a bulging neck are classified as Tuffreau-Libre (1980) type IIa, Bayard (1980) 31 or Bruay type F2a or B (Roger 1972). Illustrated examples are nos 8-12[121]. Another example was recovered from fire layer OS 7957/7971 (Plate CDXXXVII: 92), marking the final layers of fort level 4. The bulging of truncated necks is a phenomenon observed on several North Gaulish sites from the late 3rd century onwards, for instance at Famars (Willems *et al.* 2017a). The bulging is less noticed on sites more to the south, like Amiens or sites in the Viromandui region (Vermand), although examples exist, for instance in contexts from the period AD 320-350 at Saint-Quentin (Bayard *et al.* 2010, Fig. 14: nos 2192-7). Its appearance from the late 3rd century onwards and continuing in the 4th century corresponds well with the presence of these bulging beakers at fort levels 4 and 5.

Two truncated beakers are of a different type, with rounded bodies and decorated with knife-trimmed decoration (nos 13-14). This sort of beaker is an early type, found in levels 1 (no. 13) and 3 (no. 14). A small rim fragment with the top of the knife-trimming decoration was preserved in context OS 7957/7971 (Plate CDXXXV: 49). They are not comparable to Bayard type 3 beakers found in the Menen contexts in the south of West-Flanders for instance (Dhaeze *et al.* 2015), where they seem to come from the Tournai/South-Menapian region. They resemble the Bayard type 3 beakers found at Amiens, clearly imported from the Atrebates region (Bayard 1980, 191, Pl. 24). According to Bayard their date stretches from at least the middle of the 2nd century until the middle of the 3rd century at its latest. According to this author, these beakers lived on during the 4th century on the British sites, for instance at Colchester (form 395) (Bayard, 1980, 189). It could reflect intensive contacts between the Continent and *Britannia,* which would have influenced the production of these beakers.

5.2.2.2 Pots

A second important group of the Bruay-La-Buissière production comprises different variants of large bulging pots. The functional separation between beakers and pots is most of all based on volume since their surface treatment is very similar to that of the smaller tableware beakers, namely intensive burnishing or decorative burnished lining. Their bulging upper parts are still more inwards than the lower parts, and they must be seen as proto two-lobed beakers, types Tuffreau-Libre (1980) IIc and IIb. The example from Oudenburg (no. 15), with knife-trimming decoration, was found at fort level 2 which corresponds well to the idea of an early form of bulging neck pots or double-lobed pots. Another example (no. 16) shows a bulging neck and an everted rim, close to the bulging pots. As several variants of the double-lobed beaker exist, this Oudenburg individual possibly belongs to the same group. A close parallel was found in context VI from Amiens 'Chantier du Centrum' (1977), dated before the middle of the 3rd century (Bayard 1980, 176, Pl. 18: 9), which corresponds well to the date of the Oudenburg find context at fort level 2.

The double-lobed beaker Tuffreau-Libre (1980) type IIc is known in contexts dated from the late 3rd century onwards (Tuffreau-Libre 1980a). In Tuffreau-Libre's article on one of the kilns from Bruay-La-Buissière (Tuffreau-Libre 1980b, Fig. 14, 307) she refers to these specific pots as being found in the kilns excavated in 1971. In the first typology of the Bruay productions by Roger (1972), following the extensive 1971 digs, these are classified under types F2 b, c and d (and dated there to the 2nd century, which seems early). An almost complete beaker of this type was found in the filling-in of the well OS 22926 of fort level 4 (no. 17). Also, the pit OS 7949 of Unit I of fort level 4 contained an example (no. 18). Worth mentioning here is the complete profile recovered from the post-Roman level (no. 19), which was found in the top fillings of the robber trench of the stone defensive wall at the west side of the site. The discovery of an almost complete beaker at this specific location can at least be called remarkable and suggests a specific deposition.

Another example, of which the lower part is lacking (no. 20), was found in a subsidence level covering the primary fillings of the large waste-pit OS 4980 and attributed to the very end of fort level 4 or fort level 5. It could belong to a double-lobed pot, Tuffreau-Libre (1980) type IIb, typical of the 4th century (Tuffreau-Libre 1980a).

The rest of the repertoire is constrained to a few examples of other types of pots, bowls and a lid. It includes a pot with concave neck from fort level 2 with a burnished surface (no. 21), a pot type Bayard 32 (Bayard 1980) from fort level 3 with decorative burnished lattice decoration (no. 22), a pot with concave neck and everted flattened rim of an unknown type from fort level 4 (no. 23) and a pot from fort level 5 imitating Eifel coarse wares of type Alzei 27 (Plate CLXXIV: 24). Both concave necked pots (nos 21 and 23) are of types which, chronologically seen, do not yield much information, as they stay popular all along the Roman and late Roman periods. Type Bayard 32 (no. 22) is typical of the end of the 2nd and the first half of the 3rd century. It was found at fort level 3, which corresponds well to the dating in the find contexts from Amiens (Bayard 1980). The Alzei 27 imitation form (no. 24) has been noticed on most of the late Roman sites in the North of France, for instance at Saint-

120 **Beaker no. 6 was found in the large waste-pit OS 4980 of fort level 4 and has been catalogued in the publication of its pottery assemblage under the more general name 'Atrebatian reduced ware', pointing to the *civitas* of the Atrebati to which the pottery kilns of Bruay-Labuissière belong (Vanhoutte *et al.* 2009c, 122: Fig. 21, 10).**

121 **Beaker no. 11 originates from the large waste-pit OS 4980 of fort level 4 and has been wrongly identified in the publication as Ardres reduced ware (Vanhoutte *et al.* 2009c, 122: Fig. 21, 17).**

Quentin in find contexts dated to AD 390-410 (Bayard *et al.* 2010, 185 and Fig. 21). It is not surprising that this rim was found at fort level 5, which is *an sich* very interesting since it confirms an ongoing production at Bruay at the end of the 4th century.

5.2.2.3 Bowls

The tableware and cooking bowls are represented by eight individuals. Most of them belong to the carinated type with a straight upper part, becoming bulged later, a similar evolution as noticed for the pot and beaker types. The straight neck bowls stay popular all along the 3rd century, and are rather useless for chronological interpretation. There is a small evolution in the rim forms though, from flat everted horizontal rims to more rounded rims or crooked rims. The bowl with the flat horizontal rim (no. 25) is clearly still an early example. A second bowl, found at the same level, shows a more developed rim, but the straight upper part indicates an early date as well (no. 26). By the end of the 3rd century the necks begin to bulge, as seen on the individual of fort level 4 (no. 27). Finally, a carinated bowl, also found at fort level 2, shows a crooked rim and a rather rounded bulging neck (no. 28). It is close to Bayard type 19 but with a shorter neck. Bayard type 19 is typical of the end of the 2nd and the first half of the 3rd century which corresponds well to the dating of the find context at Oudenburg.

Also produced at the Bruay-La-Buissière workshops are a slightly carinated bowl with straight rim (no. 29) and an S-shaped bowl with a very rounded body (no. 30). The bowl with the vertical upright rim (no. 29) has received a burnished decoration consisting of lines on the outside and lines and a radial decoration on the inside. The decoration is rather unusual for the Bruay-La-Buissière productions as no similar examples are known, but the fabric suggests this origin. The decoration of bowls and plates with radial burnished lines is typical of late-Roman contexts after AD 260 and has been noticed on several consumption sites in North Gaul, like Famars (Willems *et al.* 2017a), Noyelles-lès-Seclin (Willems 2015) and La Calotterie (Ketels 2001). The form itself is known from late Roman contexts for instance at Amiens (Bayard *et al.* 2010, 174, Fig. 10). The Oudenburg bowl was recovered from the filling-in of well OS 22926 of fort level 4 which corresponds well with the popularity of the burnished radial decoration from the late 3rd century onwards. The bowl with wide, rounded body and an everted rim which gives it an S-shaped overall form (no. 30), was recovered from the large waste-pit of fort level 4[122]. Such S-shaped bowls are found in late contexts at Amiens (Bayard *et al.* 2010, 147, Fig. 10). This type seems to be an evolution of type Bayard 21 which is dated to the end of the 2nd and the first half of the 3rd century.

5.2.2.4 Lid

A final Bruay-La-Buissière product from the Roman level at the south-west corner site is a lid knob with three perforations (no. 31), also recovered from the filling-in of well OS 22926 of fort level 4.

5.2.3 The productions from La Calotterie

The kiln site of La Calotterie is situated on the border of the Morini and Ambiani *civitates*, on the south side of the river Canche in Ambiani territory. The site is known to have been producing pottery from at least the end of the 1st century until the Middle Ages, seemingly without interruption (Ketels 2016; Thuillier *et al.* 2015). The Roman productions are characterized by a very granular sandy fabric containing large quartz (Chaidron *et al.* 2010), giving its surface a very coarse look. Petrographical and chemical analysis has only been performed for medieval productions which are macroscopically very close to the Roman fabrics. For a characterisation of fabrics we therefor refer to a recent article concerning the Carolingian productions from La Calotterie (Thuillier *et al.* 2015). The sandy fabric, also present at Oudenburg, is characterized by abundant translucid small-sized well-sorted white and pink quartz inclusions (Figure 1.71). Chemical analysis has shown that the fabric is of homogenous composition, poor in iron oxides and very rich in quartz inclusions, up to 78%. The origin of the raw material is thought to come from the St. Aubin clays, with sand inclusions added to the clay. The pottery site is situated on a plateau characterized by the presence of sandy clay, Ostricourt sands and a layer of kaolinite rich clays (Couppe *et al.* 1977). At the late Roman period the potters chose this kaolinite-based (thus white) clay, instead of the sandy clay, giving the pottery a neater look. A production of fine tableware, decorated with knife-trimming, emerged at that time. Their fabric is characterized by a very fine white matrix and a bluish grey surface. Other productions, using a white clay, have been identified all along the coast of the Morini and the Ambiani, and are classified within a large group of coastal productions ('PBL, pâte blanche du littoral') of which the kiln sites are yet to be discovered. Examples of these productions are known at Attin and Quend (Chaidron and Willems 2016) at the end of the 4th century, and at Beutin, a pottery production site situated on the other side of the river Canche (Flahaut 2016 and ongoing research).

At the south-west corner site of the Oudenburg fort, twelve individuals, for a total of 22 pottery sherds have been identified as coming from the La Calotterie kilns. It is surprising that the fine late Roman tableware is absent from the repertoire at Oudenburg. Only one beaker, a flagon, and two bowls have been counted; the other forms are all pots.

The beaker (no. 32) is characterized by a long bulging neck and a clear transition to the very short lower part of the vessel. The neck is decorated with areas of burnishing, but no knife-trimming is observed on the transition zone. The overall form of the beaker corresponds well with 4th-century beakers from La Calotterie. Ketels classifies them under type 29 and dates them to the end of the 3rd or beginning of the 4th century (Ketels 2001; 2016). Examples have been found both at Attin and Quend in find contexts from the beginning of the 4th as well as from the end of the 4th – beginning of the 5th century (Chaidron and Willems 2016, 176: Fig. 2; 280: Fig. 5; 286: Fig. 10). The beaker from Oudenburg is very similar (in type) to the beakers at Quend dated to the beginning of the 4th century, but was discovered in a find context from fort level 3. Maybe the lack of knife-trimming decoration points to a chronological difference, this one being an earlier variant.

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122 Vanhoutte *et al.* 2009c, 123, described there under the more general term 'Atrebatian reduced ware'.

A flagon (of which the rim is missing) (no. 33) has a fabric that is not easily identifiable because of the burnt matrix. As kaolinite rich clay seems to have been used, it is classified in the La Calotterie group, since it is close to some known 4th-century examples of this production. It could, though, belong to the larger group of white clays from the coastal zone. Comparisons were found in several funerary contexts in the region, namely at Beutin (Flahaut 2016) where the author also references to examples from Etaples or Marenla where three examples were found in three different graves dated to the 4th century (Piton 2006). In the pottery study by Dubois (Dubois, in Piton 2006, 13-19) an interesting link is made to the Alice Holt-Farnham potteries where flagons with burnished lines on the neck were also produced. They belong to Class 8 (Lyne and Jefferies 1979, 51: Fig. 40) or Fulford (1975) type 20. The production at the Alice Holt Forest and Farnham sites runs from the 1st to the 4th centuries AD, but no further information is given concerning the chronology of this particular type of vessel. The fact that the Oudenburg flagon of presumed La Calotterie production was found in a fort level 5 context, namely the primary infill of the inner well of the double well structure OS 2562 rather indicates a late chronology, which is in correspondence with the examples from the late Roman funerary sites in France. Two bowls from La Calotterie are known from the Roman level at the south-west corner site, one with an inwardly turned body and a slightly carinated top rim (no. 34) and a carinated bowl with a gully-rim (no. 35). Bowls with an inwardly turned body and a slight carination are known from late Roman contexts, for instance at Amiens (Bayard *et al.* 2010, Fig. 10). At Oudenburg it is not surprising to find the no. 34 bowl in a fort level 5 context. Carinated bowls with an inner gully-shaped rim, like bowl no. 35, are known from contexts at Saint-Quentin dated around AD 340-360 (Bayard *et al.* 2010, Fig. 16, nos 2103-2), and at Attin as well as at Quend, where they are dated to the beginning of the 4th century. At the latter site, it is a large storage jar instead of a bowl that is characterized by such an inner gully (Chaidron and Willems 2016, Fig. 13). The form of the rim and the neck are comparable though. Even if these carinated bowls are not classified in the Ketels (2001; 2016) typology, their surface treatment and fabrics point to a coastal provenance around La Calotterie. Their form spectrum is typical of 4th-century French contexts, on the coast but also inland. This corresponds well with the find context of the Oudenburg bowl (no. 35), namely the construction pit of the double well OS 2562 of fort level 5.

Four pots, of which three were recovered from the large waste-pit OS 4980 of fort level 4[123] and one from the construction pit of the double well OS 2562 of fort level 5, were also produced at La Calotterie (nos 36-38). They display a small beaded or triangular everted rim and no neck. Parallels are recorded at Attin (Chaidron and Willems 2016, Figs 11 and 14) and at Saint-Quentin (Bayard *et al*. 2010, Fig. 22) in a find context dated to AD 390-410. They might represent a type that already started at an earlier date as the two pots from the primary infill of the large waste-pit OS 4980 should be dated to the later 3rd century based on the stratified evidence.

123 **Pots nos 36, 37 and 38 were described in Vanhoutte *et al.* (2009c, 122: Fig. 21, 18; 124: Fig. 22, 1) as 'Ardres reduced wares'. Further fabric analysis based on new insights into the pottery production of La Calotterie has enabled us to recognize them as La Calotterie products.**

5.2.4 Cambrai region productions

Six individuals for a total of eleven sherds can be attributed to the Cambrai region productions. Pompeian red plates produced in this region indicate that production continued well into the 4th century, as examples from Oudenburg, but also at Cambrai testify to (cf. Geoffroy 1997, Fig. 11). The Cambrai late grey wares are characterized by a very fine silt-sized matrix made with a silicium rich clay (Figure 1.71). The surface is very fine, often burnished, and of a light grey color. The matrix contains large amounts of mono-cristalline quartz inclusions, iron oxides and small-sized glauconite (Borgers, in Willems 2019 and ongoing research). The repertoire represented by the Cambrai region products includes three dishes, a possible bowl (not ill.) and two pots.

The three dishes (Plate CLXXIV: 39-41) are all of the same type, namely a carinated plate with a rounded or triangular rim. This kind of dish became popular at the beginning of the 2nd century as shown by examples from the consumption site at Famars (Willems *et al.* 2017a). The type stays in production for several centuries as examples from late Roman contexts at Saint-Quentin suggest (Bayard *et al.* 2010, Fig. 20: find context dated to AD 390-410). The Oudenburg examples were found in the large waste-pit OS 4980 of fort level 4 (nos 40-41[124]) and the construction pit of the large basin OS 4923 of fort level 5 (no. 39), which makes it difficult to assess whether these plates are residual items or not. When one compares to contexts from Reims, these dishes are comparable to the Reims A1 type, present in periods VIII to X, from the first part of the 2nd century onwards till the second half of the 3rd century (Deru 2014). The low numbers of dishes counted in the contexts at Reims indicate that it was probably not a typical Champagne region form but rather inspired by Nervian and Viromandui forms.

The pot (no. 42) displays a ribbon-shaped but crooked rim with several mouldings which is a typical rim of the late 3rd and 4th century repertoire. Similar forms are found in late contexts in the North of France, for instance at Amiens (Bayard *et al.* 2010). The Oudenburg pot was found unstratified, but must have belonged to fort levels 4 or 5.

5.2.5 Arras productions

As expected, the Arras region products are very rare at Oudenburg, as they were blocked during the 3rd century by the industry of Bruay-La-Buissière, also situated in the Atrebates region but more to the north. Arras fabrics are easily recognizable by their kaolinite rich clay and layered matrix caused by abundant quartz (Figure 1.71). It is the combination of this layered kaolinite-based matrix with a high firing temperature, giving it a sort of glazed structure, that makes them so easily distinguishable from other productions. Like Cambrai, the matrix contains abundant rounded mono-cristalline quartz, grog, iron oxides and glauconite (Borgers, in Willems 2019). The larger inclusions represent 25% of the surface, giving the fabric a heterogeneous look and irregular break. The Arras fabrics are very comparable to those of the Cambrai region because of their light grey colour and abundant quartz, but the quartz inclusions

124 **Cf. Vanhoutte *et al.* 2009c, 124: Fig. 22, 3.**

are of superior size in the Arras wares. A slight difference in firing techniques is also identifiable, namely a slow cooling process that gives a lighter surface colour than the core of the break which is of a deeper grey. The distinction between core and fringes of the fresh break is less neat than in the Cambrai products where the cooling process seems to have been faster yielding neater fringes.

Two individuals from the Roman level at the Oudenburg site, for a total of 24 fragments, were recognized as coming from the Arras region. Only a foot of a tableware beaker (no. 43) and a bowl (no. 44) could be identified. The form of the latter is comparable to the bowl in the La Calotterie fabric no. 34, although the Arras bowl has slightly straighter wall-sides. Its overall form is inwardly turned, with a small carinated shoulder. Its outer surface is decorated with burnished lining. It is exactly the same type as several examples from the late Roman contexts of Amiens (Bayard *et al.* 2010, Fig. 10). The beaker belonged to the first infilling of the inner well of the double well structure OS 2562 of fort level 5, while the bowl was found in its very last fillings.

5.2.6 Champagne productions

Four individuals for a total of only five sherds were recognized as Champagne region products, namely a large dish or shallow bowl, a cooking bowl and a pot, and an unidentified form, maybe a dish.

The fabrics encountered at Oudenburg all show a white kaolinite-based matrix (Figure 1.71). They correspond to group RUB-CHAM2, characterized by a fabric containing 15-20% of medium rounded mono-cristallline quartz inclusions. Other inclusions consist of grog and iron oxides, but these are very rare. The matrix often shows a marked layered structure (cf. Biegert *et al.* 2004). The surface is of a very dark grey bluish colour, rather pimply, caused by the abdundant quartz inclusions.

The large dish or shallow bowl with burnished inner and outer decorative lining (Plate CLXXV: 45) is probably a variant of type Reims J24 (Deru 2014) showing a rim much more inwardly turned than the example found at Oudenburg. Bowls of type Reims J24 seem to become straighter in late contexts at Reims from period XIII onwards, *i.e.* AD 370-420. The Oudenburg example however belongs to fort level 4 and can be dated to the late 3rd century based on the stratified evidence.

The cooking bowl (no. 46) is a Reims J2 form, emerging during period IX (AD 150-230/240), most popular during period XI (AD 280-320) and in decline from period XII onwards (AD 310-380) (Deru 2014). The Oudenburg example was recovered from a fort level 2 context, in line with the initial phase of this form.

A pot with internal gully from the Champagne region (no. 47), close to Reims P10 forms, may also correspond to a non-identified pot form from period XIII at Reims, dated to AD 370/380-420, where it did not receive a typology number (cf. Deru 2014). The Oudenburg individual was recovered from the construction pit of the large basin OS 4923 of fort level 5, which can be attributed to fort period 5B, dated to post AD 380. This is totally in line with the find context at Reims.

5.2.7 Products made with kaolinite rich clays

Fourteen individuals for a total of 28 sherds cannot be attributed to a specific production but are characterized by a white firing clay. Their white clay matrix probably indicates the use of kaolinite rich clays (cf. Figure 1.71). This may point to northern French productions around La Calotterie or other regions using kaolinite rich clays (characterized by a high level of aluminium and titanium in contrast to a low level of iron oxides) such as Arras or the Champagne region, where this has been demonstrated by chemical and petrographic analyses (Borgers, in Willems 2019). Different variants have been encountered in these regions, and also in the Oudenburg material, without researchers being able to distinguish clear groups.

The forms all belong to the late Roman repertoire. Most of them (eight individuals) belong to pots (Plate CLXXV). Almost all of them find parallels in the late Roman repertoire in Picardy:

- no. 48 (fort level 5+post, final infill of double well OS 2562): beaker with moulded beak-like rim: parallel for the rim found in a pot from Attin (Chaidron and Willems 2016, Fig. 13, no. 4);
- no. 49 (fort level 4): pot with everted rim and rounded body, parallel to Quend, early 4th century (Chaidron and Willems 2016, Fig. 5, no. 8);
- no. 50 (fort level 5): pot with moulded gully-like rim: parallels in the repertoire from the south of Picardy during the 4th century (Bayard *et al.* 2010, Fig. 25, no. 26);
- no. 51 (fort level 5): pot with almond-shaped rim, small neck: parallels at Quend, early 4th century (Chaidron and Willems 2016, Fig. 7, no. 4), as well as several examples at Attin;
- no. 52 (fort level 5): pot with inner gully: similar to examples from Attin (Chaidron and Willems 2016, Fig. 15), dated between AD 390 and 410/430, but also from Quend dated to the beginning of the 4th century;
- no. 53 (fort level 5): pot with hooked everted banded rim: parallels at Attin for example (Chaidron and Willems 2016, Fig. 13, no. 6);
- no. 54 (fort level 5): pot with a straight ribbon-shaped everted rim: parallels at Quend, early 4th century (Chaidron and Willems 2016, Fig. 2, no. 4).

Pots nos 48, 50-52 and 54 were all retrieved from the final infills of the inner well of the double well structure OS 2562 of fort level 5. Pot no. 53 belonged to the shaft in between both frameworks from this context, a closed-off level which came into existence immediately after the installation of the inner well and thus firmly dated by the dendrochronological analysis of the wood with a *terminus post quem* of AD 379/380.

Besides pots, also some cooking bowls display the kaolinite-rich clay fabric. A presumed cooking bowl with long everted rim, no neck and with bulging body (no. 55), also found in the final infill of the

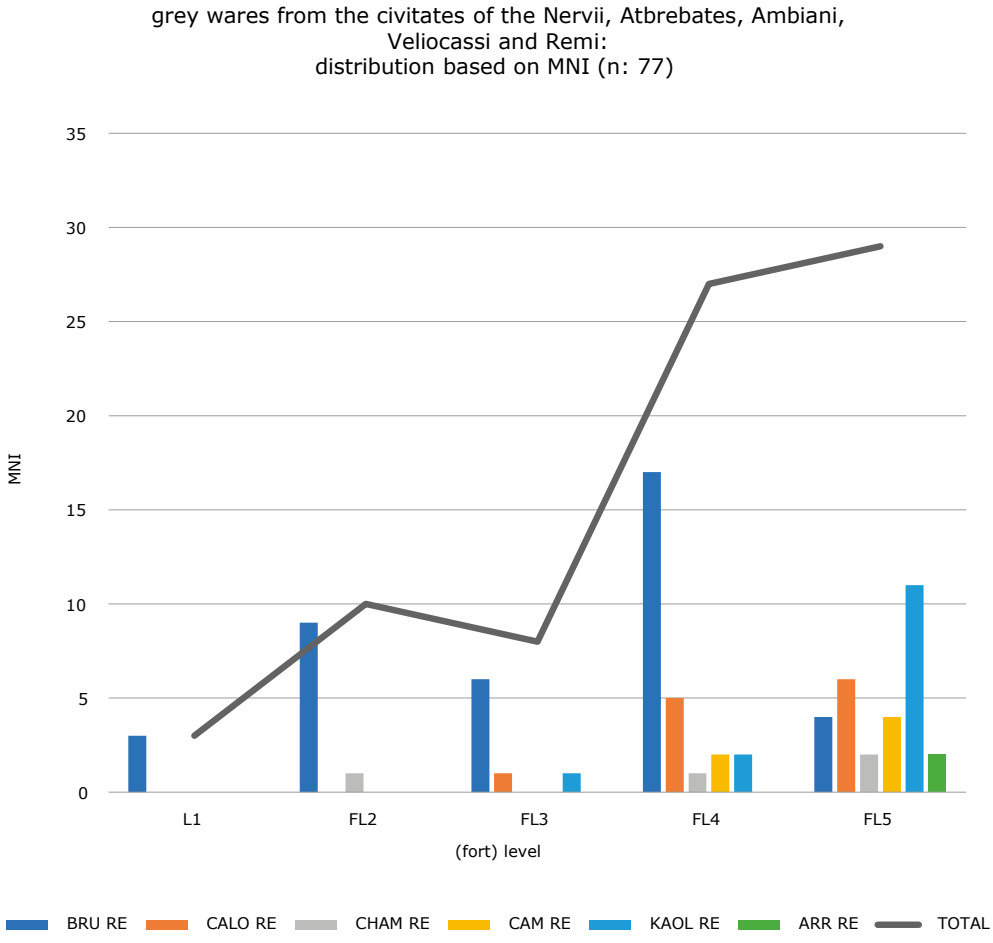

Figure 1.70. Visualization of the distribution of the greywares from current northern France in the Roman level, based on MNI.

OS 2562 context, finds parallels at Quend, in early 4th-century contexts (Chaidron and Willems 2016, Fig. 6: 3-4). Another bowl (no. 56) was found in the post-Roman level and shows an inwardly turned rim with a lining accentuating the inner rim. Parallels are equally known at Quend in early 4th-century contexts (Chaidron and Willems 2016, Fig. 2: 7).

All these examples and the fact that they so easily find parallels within the coastal repertoire at Attin and Quend, south of La Calotterie, indicate a link with this particular region. Some of the fabrics certainly belong to what are called the white coastal productions ('*PBL, pâte blanche du Littoral*'), not identified as belonging to the La Calotterie products (cf. Chaidron and Willems 2016, 281). Other parallels, both in form and fabric, are found at Beutin, again a coastal site within the same region (cf. Flahaut 2016).

5.2.8 Two 'oddities'

A very interesting find comes from fort level 3: a beaker imitating a Normandy product (Plate CLXXV: 57). The beaker type is identified as typical for the Lyons-la-Forêt kilns. Its fabric, however, characterized by a fine matrix with rare large quartz and some mica (Figure 1.71), could not be recognized as from Lyons-la-Forêt by Y.-M. Adrian (pers. comm.) (cf. Adrian 2013). The production of beakers and carinated bowls with a decoration of burnished lines is typical of this particular kiln site (Adrian 2013, 446-447, Fig. 15)

Table 1.56. Distribution of greywares imported from northern France within the Roman level according to the stratified evidence, based on MNI; x: only body fragments in the Roman level.

fabric/MNI	L1	FL2	FL3	FL4	FL5	TOTAL MNI
BRU RE	3	9	6	17	4	**39**
CALO RE			1	5	6	**12**
CHAM RE		1		1	2	**4**
CAM RE			x	2	4	**6**
KAOL RE		x	1	2	11	**14**
ARR RE					2	**2**
TOTAL	**3**	**10**	**8**	**27**	**29**	77

and is unknown in the repertoire of the other Normandy kiln sites. Only two beaker types, with little chronological evolution, are produced during almost two centuries, disappearing by the middle of the 3rd century. The earlier beakers have a rounded body form, while the later ones became more elongated. The earlier ones also show an upper horizontal burnishing combined with a vertical burnishing on the lower part, while the late examples only show the vertical burnishing. The example from Oudenburg has this horizontal burnishing and a rather bulging profile which would indicate a date to the early 2nd century. However, it was found in a fort level 3 context and the size of the preserved fragment (almost half of the beaker) contradicts that it would be a residual

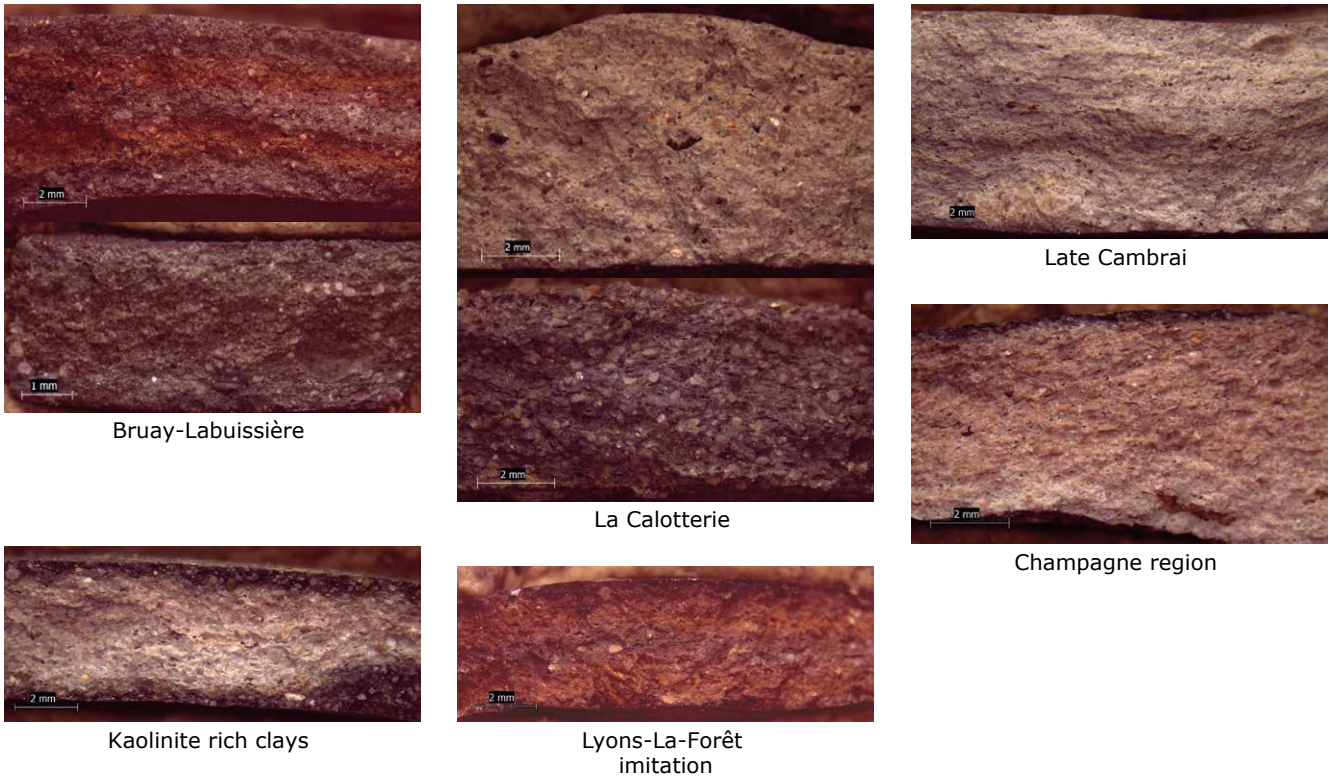

Figure 1.71. Attested fabrics from greywares imported from current northern France; samples from the Oudenburg site. Magnifications under the binocular (Photos by S. Willems).

piece. It is therefore more likely that this beaker represents an intermediate type, already displaying a finer shape but still with the early decoration. Of course, one must bear in mind that the Oudenburg example is an imitation. The presence of these Lyons-la-Forêt type beakers in Romano-British contexts, for instance at the New Fresh Wharf site in London where two such individuals were found (Richardson 1986, 123: I.162 and I.163), already pointed to close contacts between the Belgian, British and Normandy coastal regions. Where this Oudenburg imitation was produced, remains so far unknown.

An oddity in the handmade assemblage is a roughly made item used as lid (Plate CLXXV: 58). It was found in context OS 30916, a level in the earthen rampart attributed to fort level 1. The form can be recognized as a Morini cup (cf. Vidal *et al.* 2014). By making perforations in the base it was reused here as a lid, confirmed by the soot on the exterior and interior of the rim. A possible second example, a fragment of the base of such a cup, could be identified in the pottery assemblage of the construction pit of well OS 22926 of fort level 4 (Plate CDXVI: 56). Cups and platters with straight flaring wall-sides seem to be typical for the Morini region, a continuing tradition according to Augustan to 3rd-century contexts (Vidal *et al.* 2014). A Menapian origin in the region of the valley of the Deule can also be considered since an example from Villeneuve d'Ascq, from an early Roman context (Clotuche 2004), shows a clear resemblance with the Oudenburg example. However, as the form is also rare for that region, it might as well have been imported from the Morini region. The coarse rather soft fabric of the Oudenburg cup is grog-tempered and resembles the coarsest fabric variant in the North Menapian spectrum. Further fabric analysis in comparison to hand specimen of original Morini cups should determine whether it concerns imports or imitations. However, its reuse as lid favours the identification as a casual import for which, once at the Oudenburg fort, the original function may have not been valid anymore. Maybe these cups or their model (in case of imitation) belonged to the personal baggage of a soldier originating from the Morini region. Another possibility is that it was a casual item that came in along with other imports.

5.2.9 Conclusions from the imported greywares from the North of France

Although the greywares from southern territories in current Northern France could not at all compete with the North Menapian products (in general only 1.7% of the MNI of the reduced wares of the Roman level), they continued to come in throughout the military occupation. Through time, different pottery productions were in play, giving evidence of changes in the distribution network via the south-north supply axis.

The Bruay-La-Buissière products were at the Oudenburg fort clearly the most important group of greywares imported from northern France (Table 1.56; Figure 1.70). They occur throughout all the Roman levels and are particularly significant for fort level 4. From fort level 4 onwards, we can clearly notice a higher degree of imported greywares coming from northern

France. Before that period, imported greywares from the *civitates* of the Nervii, the Atrebates, the Ambiani, the Veliocassi and the Remi seem sporadic chance arrivals. During fort levels 1, 2 and 3 it is mainly the Bruay-La-Buissière production that arrived at Oudenburg, except for some isolated vessels from other pottery productions. Arras products were blocked by the 3rd-century Bruay imports which were probably also distributed to *Britannia*. A survey by the authors through the pottery of the southern mid-Roman graveyard at Oudenburg (site ET14) has shown that until late in the 2nd century the Arras wares were well-represented. The change in the distribution network in favour of Bruay-La-Buissière may not only be chronologically explained but may also have been military-influenced. Only at fort period 5, from the 4th century onwards, some Arras vessels again reached the Oudenburg fort. In the late Roman period, mainly the products from La Calotterie and the white kaolinite-rich clay products, probably originating from the same region, took over from Bruay.

The products from the *civitates* in question possibly do not (all) imply trade. It is very likely that some were brought in as personal belongings along with soldiers coming from that region and/or as casual items that came along with other trade products which passed the production region in question. The evolution to more imports from northern France from fort level 4 onwards could reflect more intensive contacts between Roman military bases during this period, and more movement of army units. However, it is important to consider that fort periods 4 and 5 (later 3rd century until early 5th century) cover a much wider time-span than fort levels 1 to 3, which could also partly explain the higher numbers.

From the end of fort period 4 onwards, other North Gaulish fabrics start to occur in the pottery assemblages. They cannot be identified as North Menapian and can neither be recognized as coming from the regions discussed here. It is very likely that they originate from the region in-between, namely the south of the *civitas Menapiorum* where the kilns however are not known so far.

5.3 Low Lands Ware

Sofie Vanhoutte

The Low Lands Ware 1 fabric has been defined by De Clercq and Degryse (2008) as the product of one or more major pottery centres probably situated on the Tegelen clay formation outcrop at the Brabantse Wal, near the Scheldt estuary in the Bergen-op-Zoom area in the Netherlands. The core distribution of this ware is clearly related to the river system as it covers the lower Rhine, Meuse and Scheldt valleys. Low Lands reduced ware vessels are rather rare to the west of the Scheldt. The Low Lands Ware 1 includes tablewares and fine wares (dishes, flagons, beakers) as well as jars and containers from the Holwerda (1923) 139-142 type series. This industry was first believed to cover a chronological range from AD 60 to at least 270 (De Clercq and Degryse 2008) but recent research suggests continuity into the 4th century (unpublished material; pers. comm. V. Van Thienen and W. De Clercq).

Oudenburg and the Coastal Plain were situated outside the main distribution zone of the LLW1 industry, but some reduced vessels sporadically did find their way there. They only represent a very small minority of the fine and coarse reduced wheel-turned vessels.

In key context OS 30916 of fort level 1, a LLW1 Holwerda 141a container has the typical second half of the 2nd century rim (Plate CCCLXXXIV: 38). A Holwerda 142, found in the large waste-pit OS 4980 of fort level 4, has a typical 3rd-century bending rim (Vanhoutte *et al.* 2009c, 122: Fig. 21, no. 9). The same context OS 4980 yielded four, and well OS 22926 of the same level two, S-profiled bowls in LLW1 fabric which can be seen as Chenet 342 prototypes (for OS 4980: Vanhoutte *et al.* 2009c, 110: Fig. 13, 11-14; for OS 22926: Plate CDXXI, 45-46). They closely resemble examples in the same fabric found in contexts at Breda dated to AD 250-300 (van Enckevort 2004, type Vt 76-77). The LLW1 pot with everted rim from the construction pit of well OS 22926 (Plate CDXV: 21) and a fine reduced beaker in its waste fillings (Plate CDXIX: 13) form exceptions in the Oudenburg assemblage. In contrast to these minorities in reduced wares, flagons in Low Lands ware I were very popular at the Oudenburg fort (see Chapter 1.B.2 in this volume).

5.4 Late Roman *terra nigra*

Vince Van Thienen

5.4.1 An introduction to the 'late Roman *terra nigra*'
Vince Van Thienen and Sofie Vanhoutte

The excavations at the Oudenburg fort yielded, evidently, a large amount of late Roman reduced wares. In general, it has proven difficult to classify late Roman reduced wares into clearly distinctive groups. Overall issues with their classification include: the poor state of knowledge on late Roman pottery productions, multiple shared characteristics concerning production techniques and vessel shapes between different productions or 'wares', and a sometimes large variation between same-type vessels from one (assumed) production or ware. For example, the double-lobed beaker type Brulet B4.2 has a late *terra nigra* variant and a 'fine sombre' variant at the Tournai site (Brulet *et al*. 2012, 152-155), but are classified in many other studies in the general category of the 'reduced wares'. Another example is the Chenet 342 foot-vessel which is often classified as '*terra nigra*-like'.

Moreover, in literature there appears to be no consensus to what can be classified as late *terra nigra* within the reduced wares (cf. also Van Thienen *et al.* 2017, 87). As a result, typological distinctions are often limited to a specific site or micro-regional level. Usually, the classification in different groups and the distinction of a 'late Roman *terra nigra*' group is based on the perceived quality of the pottery, the technique in obtaining a metallic appearance and its different fabrics (*e.g.* Brulet *et al.* 2010; Brulet *et al.* 2012, 151)[125] or the vessel shapes (for instance see the work of Pirling on the burial goods from Krefeld-Gellep, cf. *e.g.* Pirling and Siepen 2006). Late Roman *terra nigra* forms classified by Brulet *et al.* 2012 are beakers, bowls and cups. An overarching interregional classification and understanding of the reduced wares in the late Roman period is still lacking.

Recently the term 'late Roman *terra nigra*' has been suggested as a general name, comprising several fabric groups. Geochemical and petrographic analyses have evidenced at least two distinct major production areas in Westphalia and the Low Countries next to several smaller production workshops for the Chenet 342 foot-vessel (Van Thienen *et al.* 2017; see also further).

Many so-called late Roman *terra nigra* beakers were found as grave goods in the graves of Oudenburg Graveyard A (Mertens and Van Impe 1971). Beakers with pear shaped body type Brulet B2.6/7 were present in graves 23 (no. 4), 112 (no. 5) and 178 (nos 1 and 2), beakers with beaded neck type Brulet B3.1 in graves 3 (no. 3), 84 (no. 6), 115 (no.1) and 199 (no. 3[126]). The most popular reduced beaker at Graveyard A was the double-lobed beaker type Brulet B4.2. Also at other late Roman graveyards, such as Tongeren, Bavay and Tournai (Rue Perdue), this type is well-spread (Brulet *et al.* 2012, 152).

At the south-west corner site, the late Roman double-lobed beaker type is mainly present in the infill of the inner well of structure OS 2562 of fort level 5 (see Vanhoutte *et al.* 2009b, 85: nos 22-25), and in 5+post and later levels. In the Oudenburg pottery studies such beakers are classified as (fine) reduced wares, though. One individual recovered from the infill of the large basin OS 4923 of fort level 5B and characterized by a metallic appearance, can be identified as a late Roman *terra nigra* beaker of a type close to Brulet B4.3 (cf. the Appendix in this volume, Section 6.2.2). The study in depth of the assemblage of the double well OS 2562 shows a significant sample of the reduced spectrum of fort period 5 (Vanhoutte *et al.* 2009b). It is the largest find context of fort level 5 whereby the different structures represent both phase 5A and phase 5B. The reduced spectrum with an important share of late Roman *terra nigra* is discussed in the Appendix of this volume, Section 6.2.5.

5.4.2 A petrographic exploration of the late Roman *terra nigra* foot-vessels
Vince Van Thienen

5.4.2.1 Introduction to and aim of the petrographic study
In an interregional study to characterize the pottery group known as 'late *terra nigra*' or 'late Roman *terra nigra*', it was attempted to shed some light on the observed variation within this large ceramic group, specifically for the so-called late Roman *terra nigra* foot-vessels. These foot-vessels have a widespread distribution in northwestern Europa, both within the Roman and Germanic territories, which initially led to the discussion whether these are Roman vessels that found their way to Germanic settlements through trade or Germanic vessels that were carried by immigrants into the Roman provinces. On both sides of the Rhine, earlier foot-vessels are known in both wheel-turned and handmade techniques, and given the large variation in shape, finishing techniques and fabrics of these reduced late Roman foot-vessels, it became necessary to add new information to their study.

The ceramic vessels were examined based on their shape, fabric, geochemical and mineralogical composition, and distribution pattern (Van Thienen *et al.* 2017). As part of this study, 24 samples were taken from the assemblage of the Oudenburg south-west corner fort site. Specifically, from wheel-turned S-profiled foot-vessels (cups and beakers) made in a relatively fine reduced grey ware, collected from three key contexts of fort level 5 (double well OS 2562, basin OS 4923, construction slot OS 8670) and one from hearth level OS 7927.I of fort level 4. The objective here was to

125 **In the study by Brulet *et al.* 2012 of the late Roman pottery at the site of the cathedral Notre-Dame at Tournai, a division was made between '*terra nigra* tardive', 'céramique fine sombre', 'céramique fine sombre grise granuleuse' and 'céramique commune sombre'.**

126 **No. 2 in the description of the grave: Mertens and Van Impe 1971, 211.**

Table 1.57. Number of foot-vessel samples from the Oudenburg south-west corner site per foot shape group, after the model created by Heeren on the material from Wijk bij Duurstede – De Geer (NL).

foot shape group	description of foot shape	# Oudenburg samples	illustrated vessels (Plate CLXXVI)
1	conical, hollow from below, massive from inside, with a high elevation	1	LRTN 25
2	conical to cylindrical, massive	2	LRTN 21 and 33
3a	cylindrical, hollow, with a slight elevation	10	LRTN 6-9, 22, 30-32, 36, 37
3b	cylindrical, hollow, with a medium elevation	3	LRTN 5, 10, 23
4	cylindrical to square, hollow, flat	3	LRTN 24, 34, 35
U	undeterminable	5	

Table 1.58. Number of foot-vessel samples from the Oudenburg south-west corner site per surface-fabric group. These surface-fabric groups are identified based on the observations of 83 late Roman *terra nigra* foot-vessels from Belgium and the Netherlands (Van Thienen 2016).

surface-fabric group	description of surface and fabric properties	# Oudenburg samples
Light Metallic (LM)	metallic hue with light bright burnished surface	1
Dark Metallic (DM)	metallic hue with dark (smoked) burnished surface	3
Dull Light Grey (DLG)	dull light grey surface (darker than white and grey), no coating, grey to brown core	2
Dull Grey (DG)	dull greyish surface (lighter than dark, darker than light grey) and grey core	3
Dull Dark (DD)	dull dark surface and core, due to complete reduced firing conditions	1
Dark Coated (DC)	dark surface with lighter core, due to firing conditions	8
Dark 'Sandwich' (DS)	layered with different core and edge, plus dark (smoked) coating	5
White (W)	white or pale paste on surface and core	1

select the total diversity of foot-vessels and fabrics observed among the reduced pottery from Oudenburg, and more specifically to have a selection that represented the complete variety of foot-shapes (Plate CLXXVI).

Of these 24 samples, several outer surfaces have a burnished or metallic appearance, others have a rather dull appearance that remains close to the light or dark grey colour of the core fabric. Given the degree of fragmentation, only five sherds could reliably be identified as type Chenet 342. For the remaining nineteen sherds, it was not possible to identify them with certainty as type Chenet 342, Gellep 273/274, or another late Roman type of foot-vessel (Plate CLXXVI; the illustrated vessels of which the samples were taken, are numbered according to their sample no.).

Given the difficulties in classifying late Roman reduced pottery, it was decided to record a number of different properties to explore and characterize the complete range of these S-shaped foot-vessels. First the vessel shape, fabric and surface properties were examined, followed by a petrographic analysis to determine their mineralogical composition. A thin section was made of each of the 24 selected samples by reducing a ceramic clipping of each sherd to a thickness of 0.03 mm to examine it under a polarizing microscope. At this thickness, the ceramic properties of pottery can be observed to identify its composition to explore the production techniques and provenance of the clay (cf. Quinn 2013).

5.4.2.2 Vessel shape, fabric and surface observations

As a first step, all bases were classified according to the foot-shape model (Table 1.57) based on the study of the ceramic material from Wijk bij Duurstede – De Geer (NL) (Heeren *forthcoming*). Most vessels contain cylindrical hollow bases with a flat or elevated centre (16 examples of 24), while a minority had a conical massive foot (3 examples of 24). The remaining five samples derived from highly fragmented vessels for which the foot shape could not be determined.

Secondly, the rim- and foot-diameters were recorded and reconstructed to estimate the variation in size of these foot-vessels. The rim-diameters could only be reliably reconstructed for five vessels, with a minimum-maximum of 12 to 20 cm and an average of 15 cm. The foot-diameter could be determined for nineteen vessels, with a minimum-maximum of 4 to 8 cm and an average of 5.5 cm. In the study of late Roman foot-vessels from Pas-de-Calais, Seillier (1991) demonstrated a chronological evolution in the ratio between width and height for the Chenet 342 type: the earliest vessels (second half 4th century – first half 5th century) have a variable width and the height of the vessel is close to the rim-diameter in size. The later vessels (mid-5th century) have a shorter height than their rim-diameter. Unfortunately, no complete heights could be reconstructed for the Oudenburg samples.

Thirdly, the various surface and fabric properties of the Oudenburg samples were studied and compared with reduced foot-vessels gathered from late Roman sites in Flanders and the Netherlands (59 samples from 17 sites: see Van Thienen 2016, 255, Fig. 92). Some groups were distinguished based on surface and fabric properties (Table 1.58). Most reduced foot-vessel fragments from Oudenburg have a dark grey to black surface (20 examples of 24). Some are burnished to create a smoother finish ('dark coated' or 'dark 'sandwich"). No real added slip layers were observed, except for sample LRTN 10 and possibly LRTN 09. Most dark dull-surfaces ('dull dark') have been smoothened without burnishing. The grey

Table 1.59. Summary descriptions of the petrographic groups, based on 83 thin sections from late Roman *terra nigra* foot-vessels from Belgium and the Netherlands (Van Thienen 2016; Van Thienen *et al.* 2017), with number of foot-vessel samples from the Oudenburg south-west corner site per petrographic group.

LC-Group		# Oudenburg samples	clay matrix	max grain (mm)	inclusions	inclusion variation
LC - 1	A	-	sorted clay rich in silt	0.3 - 0.9	small amount of dark minerals, microcrystaline grains, varying amounts of muscovite	
	A1	1				higher amount of muscovite
	B	-	coarser sorting			
	C	1	less silt			
	D	4				larger amount of microcrystaline grains
LC - 2		8	medium clay coarse rich in sand	0.4 - 0.5	few dark minerals	
LC - 3		1	sorted clay very rich in silt	0.4 - 0.6	large amount of brown grains (possible glauconite)	
LC - 4	A	5	medium coarse clay with varying sorting	0.5	no dark minerals, large amount of microcrystaline grains	
	B	3				grog tempered
U	LRTN 08	1	unsorted with fine sand and sand	1.4	rock fragments	mica-rich

and light grey sherds ('dull grey' and 'dull light grey') are clearly related to the darker sherds, with similar properties. A few contain a metallic hue: three dark ('dark metallic') and one light ('light metallic'). All sherds have been fired in reduced firing conditions and in most cases a gradual colour transition can be seen from core to edge on a fresh break ('dull dark', 'dull grey' and 'dull light grey'). Although some samples have a stronger contrast between a (light) grey core and a dark edge or surface ('dark sandwich' and 'dark coated'). Only one sherd contained a near-white colour in both the core and on the surface ('white'). From these observations it can be concluded that the surface and fabric properties are related, but can vary strongly between vessels. It is clear that in most cases a dark appearance was preferred, with little regard to a formal or standardized technique to obtain it. This is something that can also be seen in the overall vessel shapes: the goal is to obtain a certain general shape, regardless of the manner in which it is made.

5.4.2.3 Petrographic groups of late Roman foot-vessels in wheel-thrown reduced ware at Oudenburg

The next step was to move beyond studying the macroscopic ceramic properties and consider the mineralogical composition of the selected samples by using ceramic petrography. Thin sections of the 24 samples were studied under a polarizing microscope and classified within the 'Low Countries petrographic groups'[127] that were observed in the study of late Roman *terra nigra* foot-vessels from Belgium, the Netherlands and Germany (cf. Van Thienen *et al.* 2017; Van Thienen 2016, 249-253) (Tables 1.59-1.60; Figure 1.72).

In general, the 'Low Countries late Roman *terra nigra* ware' is characterized by a fine to medium coarse clay matrix, dominated by quartz, mostly rich in silt or fine sand grain sizes without added temper. Furthermore, microcrystalline grains such as chert, siltstone and polycrystalline quartz are frequently encountered, as well as the presence of mica, mainly muscovite flakes, and iron oxide. Additionally, (plagioclase) feldspars, dark minerals (amphibole and pyroxene), clay pellets and isotropic minerals are common inclusions. Less frequent are inclusions of zircon, biotite and hornblende. On occasion, some plant material can be observed, although this appears to be a natural occurrence in the clay rather than an added temper, especially when compared with intentional plant-tempered handmade pottery (cf. Chapter 1.C.2 in this volume). The encountered grog grains amount to no more than singular appearances in the thin sections (with the exception of sample LRTN04). All in all, these singular grog inclusions do not appear to be intended as a temper, but are most likely accidental inclusions. Again, the difference in comparison with grog-tempered handmade pottery is significant. No other added temper material has been observed. Overall, the ware structure is homogenized to well homogenized and the non-plastics have an average maximum grain size of 0.4-0.6 mm.

The grouping presented here is based mainly on the clay coarseness and sorting, as well as the mineralogy and other inclusions. The differences in mineralogy was given priority over the coarseness, given that the latter may be the reflection of different depths in the same clay bed (pers. comm. O. Stilborg). The samples from Oudenburg can be classified within the following petrographic groups (see Figure 1.72 for representative photomicrographs of thin sections per petrographic group).

127 **The Low Countries petrographic groups were created in collaboration with Ole Stilborg, SKEA/Stockholm University.**

Table 1.60. Schematic descriptions of the Oudenburg late Roman *terra nigra* foot-vessels thin sections. Legend: F = fine, M = medium coarse, C = coarse, S = sorted, U = unsorted, -- = very few, - = sparse, * = common, + = rich, ++ = abundant, A/P = amphiboles/pyroxenes (dark minerals), Z = zircon, Mu = muscovite, Bi = biotite, iso = isotropic material, cp = clay pellets, Fs = feldspars, Fe = iron, nat = natural, hom = homogeneous, het = heterogeneous.

ID	PG	coarseness	sorting	silt	fine sand	sand	mica	iron oxide	clay pellet	minerals	chert	poly-crystalline quartz	plant	rock fragment	grog	temper	max grain	fabric structure
LRTN 10	LC - 1A1	F	S	++	--		*	*	*	A/P, Mu+, Z						nat	0,4	well hom
LRTN 06	LC - 1C	F	S	*	*		*	*		A/P, Mu, Z						nat	0,7	well hom
LRTN 22	LC - 1D	M	S	-	+	+	*	+		Mu, iso, Fs	++	*				nat	0,45	hom
LRTN 24	LC - 1D	M	S	+	*		-	*		A/P, Mu, Z, iso	+	*				nat	0,5	well hom
LRTN 25	LC - 1D	F/M	S	+	+		-	+	-	Mu, iso	++					nat	0,12	well hom
LRTN 26	LC - 1D	M	S	+	+		+	*		Mu, iso	+	*				nat	0,45	well hom
LRTN 07	LC - 2	F	S	+	+		--	-				*	-			nat	0,35	well hom
LRTN 27	LC - 2	M	S	-	++		*	*	*			*				nat	0,3	well hom
LRTN 30	LC - 2	M	S	*	+		*	*		A/P, Mu						nat	0,5	well hom
LRTN 31	LC - 2	M	S	+	+		*	*		A/P, Mu, Z						nat	0,35	well hom
LRTN 32	LC - 2	M	S	-	++		*	+	*	Mu, iso		*			*	nat (grog?)	0,35	hom
LRTN 34	LC - 2	M	S	*	+		*	*		Mu						nat	0,4	well hom
LRTN 35	LC - 2	M	S	-	+		-	*		Fs, iso	*	*				nat	0,4	well hom
LRTN 36	LC - 2	F/M	S	+	-		*	*	*	Mu, iso	*	*				nat	0,2	well hom
LRTN 09	LC - 3	M	S	+	+		*	*	*	A/P, Mu, Bi, iso						nat	0,4	well hom
LRTN 05	LC - 4A	M	S	+	+		*	*		Mu, Bi	*					nat	0,5	hom
LRTN 23	LC - 4A	M	S	*	+		*	*		iso	+					nat	0,5	well hom
LRTN 28	LC - 4A	M	S	+	-		*	*		Mu, Fs	+	*				nat	0,4	hom
LRTN 29	LC - 4A	M	S	+	+		*	*	*	Mu, iso, Fs	*	*				nat	0,3	hom
LRTN 37	LC - 4A	F/M	S	+	-		+	+		Mu, iso	*					nat	0,45	well hom
LRTN 04	LC - 4B	M	S	+	+		*	*		Mu		*	--	*	+	grog	2,5	well hom
LRTN 21	LC - 4B	F	S	+	++		--	-		Mu, iso	+	*			+	grog	0,3	well hom
LRTN 33	LC - 4B	M	S	+	+		-	*	*	iso		*			*	nat	0,4	well hom
LRTN 08	U	M	U	+	*	-	+	*		Mu, Fs	*			*		nat	1,2	well hom

Group LC-1 (LRTN 06, 10, 22, 24, 25, 26)
The samples belonging to the Low Countries petrographic group 1 (LC-1) are characterized by sorted clays rich in silt, predominantly containing quartz with a limited amount of dark minerals (often including some grains of zircon and isotropic minerals). The amount of muscovite (white mica) varies and can be high in some samples. Most thin sections contain a few microcrystalline grains (chert/siltstone). The clays are probably levigated (wet sorting of clay), as is indicated by the even sorting (Quinn 2013, 154), although it is not impossible to find this quality in natural clay. Subgroups 1A and 1A1 fit the description above and are subdivided based on their difference in sorting. The maximum grain size varies from 0.3 to 0.9 mm. The subgroup 1A1 is further characterized by a large amount of muscovite mica. Subgroup 1B distinguishes itself by a high content of silt with a maximum grain size of 0.5 mm, whereas 1C has less silt. The final subgroup 1D is defined by a large amount of microcrystalline grains. Among the Oudenburg samples, four belong to subgroup 1D, one to 1A1 and one to 1C (Table 1.59). The petrographic subgroups LC-1A or 1B have not been identified among the Oudenburg samples.

Group LC-2 (LRTN 07, 27, 30, 31, 32, 34, 35, 36)
The second petrographic group LC-2 differs mainly from LC-1 by its medium coarse, fine sand rich sorting and very few dark minerals. The maximum grain size is fairly consistent around 0.4 – 0.5 mm. Noteworthy is that this petrographic group occurs exclusively in the samples taken from Oudenburg (Van Thienen 2016, 255, Fig. 92).

Group LC-3 (LRTN 09)
Group LC-3 shares many similarities with LC-1, characterized by sorted clay with a very high amount of silt, which leaves little room for clay, *i.e.* that this clay would have had a fairly low plasticity (pers. comm. O. Stilborg). In addition, the fabric distinguishes itself from the other groups by the presence of brown grains (isotropic in crossed polars), which is most likely altered glauconite affected by the firing temperature. The maximum grain size averages 0.4-0.6 mm. With only one sample (Table 1.59), this group can be seen as an outlier.

Group LC-4 (LRTN 04, 05, 21, 23, 28, 29, 33, 37)
The group LC-4 has the same medium coarse clay as LC-2, although with a more varied sorting and characterized by the absence of dark minerals. Additionally, large amounts of microcrystalline grains (chert/polycrystalline quartz) can be found in these samples. The latter corresponds with subgroup LC-1D, although the clay coarseness differs. Maximum measured grain size for this group is 0.5-0.6 mm. LC-4 has been divided in two subgroups:

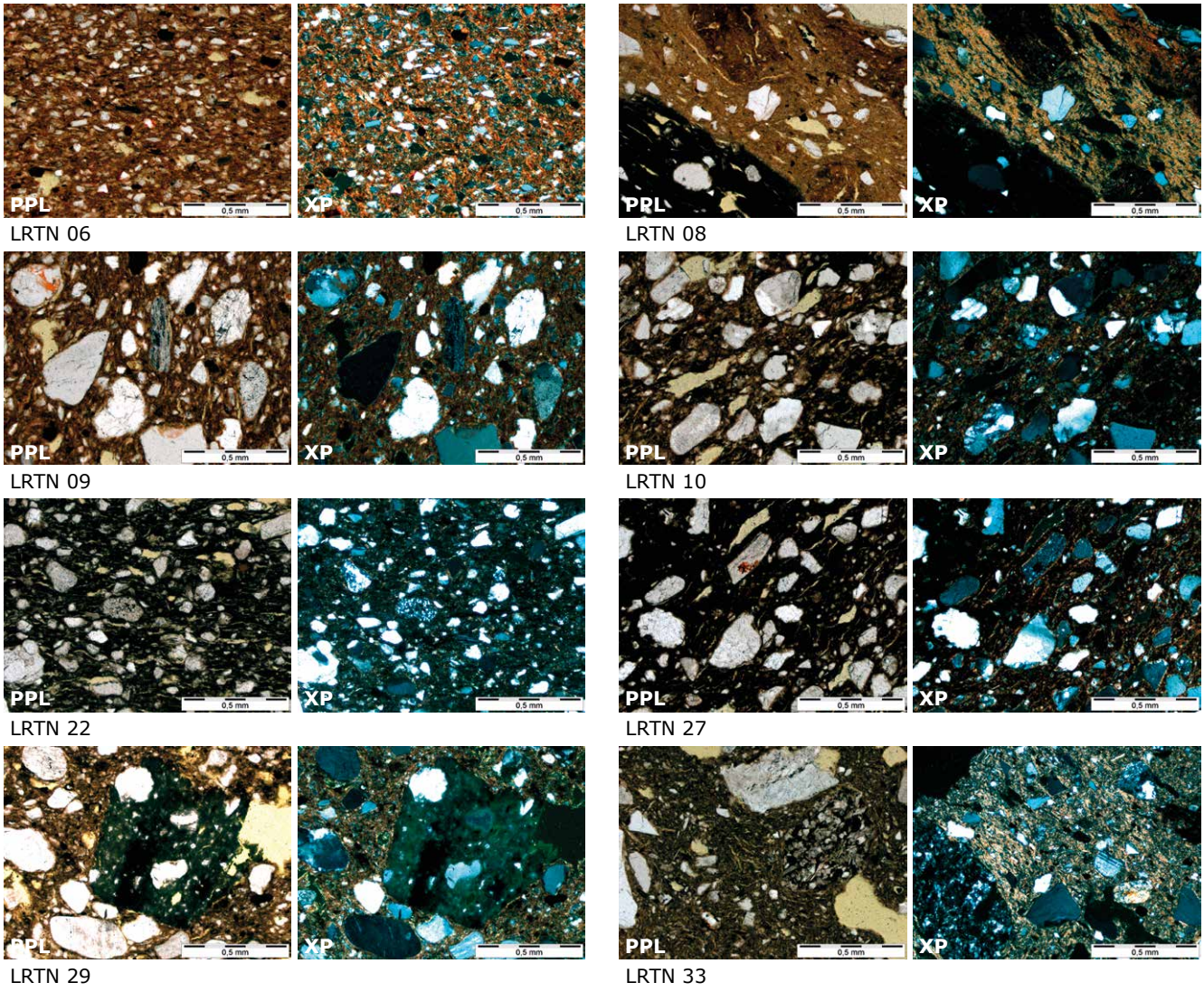

Figure 1.72. Photomicrographs in plane polarized light (PPL) and crossed polars (XP) of the petrographic (sub)groups in the thin sections from the Oudenburg late Roman *terra nigra* foot-vessels: LC – 1A1 = LRTN 10; 1C = LRTN 06; 1D = LRTN 22; LC – 2 = LRTN 27; LC – 3 = LRTN 09; LC – 4A = LRTN 29; 4B = LRTN 04; U = LRTN 08.

LC-4A corresponds with the description given here and LC-4B is characterized by a possible addition of grog. It is not clear if this is an intended grog-temper, since it is only present in three samples, and all grog inclusions are in a vitrified state (meaning exposed to a very high temperature). In two thin sections, only a single grain occurs, but in the case of LRTN04 a large grain of 2.5 mm is accompanied by a few other smaller grog grains. These smaller grog grains appear similar in composition and are not fired to a higher temperature than the surrounding clay matrix. The large grog grain would have been noticeable in the preparation process and is in this case the best indication for a deliberate grog-tempering. Grog-tempering is quite common for handmade pottery and has been observed multiple times in samples from Oudenburg (cf. Chapter 1.C in this volume). Interestingly, LC-4B is again a group that appears exclusively among the Oudenburg samples. It is possible that these foot-vessels were produced in a technique more closely related to that of the handmade pottery.

Outlier (LRTN 08)

Finally, one sample from Oudenburg proved to have a unique fabric, in the sense that this outlier could not be grouped with the other samples from Oudenburg, or any of the seventeen other sampled sites from Flanders and the Netherlands for that matter. LRTN08 is made from an unsorted clay with a fine sand and sand content (maximum grain size of 1.4 mm) characterized by rock fragments of quartzite, granite, sand stone and a metamorphic rock. It also contains more mica than most of the other samples. Three possible explanations present themselves: the first possibility is that this sample is unique, *i.e.* one of a kind; the second and most likely explanation is that it is an underrepresented variation of one of the petrographic groups or part of a group unknown so far (maybe with a different provenance); the third option is that the sample does not belong to the same ware or typology. Since LRTN08 has a dark surface and light core (surface/fabric group DS) and a hollow cylindrical foot with a slight elevation (foot-shape 3A), both

Table 1.61. The Oudenburg late Roman *terra nigra* foot-vessel samples (n=24), sorted according to petrographic group, and combined with chronological data and vessel characteristics.

thin section ID	petrographic group	find context	fort level	vessel type	surface-fabric group	foot shape	rim diameter (cm)	foot diameter (cm)
LRTN 10	LC - 1A1	OS 8670 west-east construction slot (m)	FL5B	Chenet 342a	DM	3b	17	5.4
LRTN 06	LC - 1C	OS 2562 double well: construction pit	FL5A	-	LM	3a	-	4.3
LRTN 22	LC - 1D	OS 2562 double well: structure level 4 (waste infills)	FL5B - post	-	DC	3a	-	4.4
LRTN 24	LC - 1D	OS 4923 basin: primary infill	FL5B	-	DC	4	-	5.7
LRTN 25	LC - 1D	OS 4923 basin: primary infill	FL5B	-	DC	1	-	6.2
LRTN 26	LC - 1D	OS 4923 basin: construction pit	FL5B	Chenet 342	DG	-	20	-
LRTN 07	LC - 2	OS 2562 double well: structure level 6 (shaft in-between both frameworks)	FL5B	-	W	3a	-	5.7
LRTN 30	LC - 2	OS 4923 basin: construction pit	FL5B	-	DLG	3a	-	4
LRTN 31	LC - 2	OS 4923 basin: construction pit	FL5B	-	DG	3a	-	5
LRTN 32	LC - 2	OS 4923 basin: construction pit	FL5B	-	DS	3a	-	5.7
LRTN 34	LC - 2	OS 4923 basin: construction pit	FL5B	-	DC	4	-	8
LRTN 35	LC - 2	OS 4923 basin: construction pit	FL5B	-	DS	4	-	7.7
LRTN 36	LC - 2	OS 4923 basin: construction pit	FL5B	-	DM	3a	-	5
LRTN 27	LC - 2	OS 4923 basin: construction pit	FL5B	Chenet 342	DM	-	12	-
LRTN 09	LC - 3	OS 2562 double well: construction pit	FL5A	-	DC	3a	-	5.7
LRTN 23	LC - 4A	OS 2562 double well: structure level 4 (waste infills)	FL5B - post	-	DLG	3b	-	5.6
LRTN 05	LC - 4A	OS 2562 double well: construction pit	FL5A	-	DS	3b	-	6.5
LRTN 37	LC - 4A	OS 4923 basin: construction pit	FL5B	-	DG	3a	-	4.8
LRTN 29	LC - 4A	OS 4923 basin: construction pit	FL5B	Chenet 342	DC	-	14	-
LRTN 28	LC - 4A	OS 4923 basin: construction pit	FL5B	Chenet 342	DC	-	12	-
LRTN 21	LC - 4B	OS 2562 double well: structure level 4 (waste infills)	FL5B - post	-	DC	2	-	5.5
LRTN 33	LC - 4B	OS 4923 basin: construction pit	FL5B	-	DS	2	-	4.2
LRTN 04	LC - 4B	OS 7927 hearth	FL4	-	DD	-	-	-
LRTN 08	U	OS 2562 double well: structure level 2 (primary infill)	FL5B	-	DS	3a	-	5.5

common features among the Oudenburg foot-vessels, the third option seems rather unlikely.

5.4.2.4 Interpretation and discussion of the foot-vessels

Ceramic variation and production modes

A number of conclusions can be drawn from these results (Table 1.61). First of all, it appears that there is a relative large variation among the reduced foot-vessels from the Oudenburg assemblage. There is no clear correlation evident between the (1) foot-shape, (2) surface and fabric properties and (3) the petrographic groups. This could be seen as evidence that these foot-vessels have been produced in different workshops. Alternatively, it could be interpreted that the pottery was made with inconsistent production techniques, or fabricated by a large number of people which resulted in a production characterized by many small variations. Additionally, a difference over time might also contribute to the observed variation, but no such chronological distinction can be made with the current samples.

It is not possible to successfully explain the observed variation based on the 24 samples from Oudenburg alone. The results from Oudenburg can however be aligned with those from the late Roman *terra nigra* foot-vessels in general (Van Thienen *et al.* 2017). Here it was considered that the large fabric variation can be understood as evidence for multiple workshops and various production modes, without one specific central production.[128] Overall, it was concluded that the social practice associated with the vessel was more important than the physical vessel itself. This indicates that the vessel ware, production technique, finishing and decoration is determined by the workshop or potter on the one hand, and the economic means and access of the consumer on the other hand. Larger workshops or high-skilled potters might have been able to produce and offer foot-vessels in different ways: reduced, oxidized, coarse, fine, small, large, smooth, burnished, metallic, decorated, etc. The end product

128 Of the different productions of the late Roman terra nigra foot-vessels that were studied (Van Thienen *et al.* 2017), the Westphalian 'Hellweg ware' displayed the largest internal consistencies in fabrics and vessel shapes (Agricola 2018).

could then have depended on the consumer's need, financial means or access. Alternatively, a small workshop or individual potters could have been producing this type of pottery for a single settlement or community. Furthermore, similar foot-vessels in handmade techniques suggest that some could also have been produced in a more domestic context. In general, concerning reduced foot-vessels, it seems very likely that a range of production modes were present in the late Roman world.

When considering the fort at Oudenburg, the most likely production mode would be Peacock's estate and military production, which involves one or more (semi)professional potters creating products for an organization such as the military or a villa estate (Peacock 1982). While it seems plausible that a pottery workshop would be situated in the vicinity of a fort or military controlled site, this is not necessarily the case. An existing pottery production site could also have manufactured pottery for one or more military sites. The results from the thin section analysis can aid us here on two levels. First, the provenance of the clay used to make the foot-vessels found at Oudenburg can be investigated to explore how many workshops were potentially involved and where these could have been located. Second, by considering the various technological markers that are observed in the thin sections, suggestions can be made concerning the production organization and the skills of the potters.

Provenance

Assigning a clay source provenance in thin section petrography is based on the mineralogical properties of the ceramic's paste. Given that in most cases no added temper was observed, all mineralogical information can be seen as reflecting the composition of the clay source. Evidence of levigation (wet sorting) has been observed, indicating that in some cases the coarsest fraction might have been cleaned out (cf. Quinn 2013, 156). This means that we might not have the complete mineralogical profile of the source clay. Nevertheless, some mineralogical information can help verify if local clay sources should be considered or excluded as possible extraction sites.

In every petrographic study, the question arises of what can be called 'local' (cf. Druc 2013). Local can be defined here as 'in the immediate vicinity of the Roman fort at Oudenburg', with the assumption that a local pottery production involves members of the military community or potters operating in a close proximity to the fort. As such the production site can be assumed to have been located in, near, or at a short distance from the fort with easy access for the transportation of goods and/or raw materials.

Within a radius of *c.* 12 km around the fort, there are already a number of Quaternary and Tertiary clay sources, with two Tertiary deposits that potentially match the clay used for the reduced foot-vessels: (1) the Member of Egem from the Tielt Formation and (2) the Member of Pittem from the Gentbrugge Formation. The Egem Member is characterized by very fine sand and layers of clay and sandstone, containing glauconite and mica. The Pittem Member is characterized by a sandy clay with local sandstone outcroppings, containing mica and sporadic glauconite (Jacobs *et al.* 2004). Based on these descriptions the samples belonging to the Low Countries petrographic groups LC-1 and LC-3 share some characteristics with the Egem Member, although no glauconite has been observed in the thin sections of LC-1. The mineralogical signatures from groups LC-2 and LC-4 have more in common with the Pittem Member. However, only by direct comparisons can it be assessed if these two clay sources match the clay used for the reduced foot-vessels from Oudenburg.

Additionally, there is a second potential source area for the samples from the petrographic group LC-1. Large similarities have been observed between the mineralogical composition of LC-1 and the Low Lands Ware 1 fabrics (Van Thienen 2016, 257). The composition of LLW1 is characterized by quartz, opaque minerals (mainly iron oxides), garnet and muscovite mica. Sporadically, fragments of sandstone, grog and organic material can be observed (De Clercq and Degryse 2008). De Clercq and Degryse concluded that LLW1 was produced with clays from the Brabantse Wal near Bergen op Zoom in the southern Netherlands. A possible transport route to Oudenburg along the North Sea coast can be imagined.

Production techniques

Besides provenance indicators, some technological markers have also been observed in the thin sections. The most significant technological observation is the use of levigation in the clay preparation process of LC-1. This implies the presence of professional workshop facilities, consistent with a larger pottery workshop. A second observation relates to the variation between all four groups and their subgroups (Table 1.59). For the LC-1 subgroups, the variation is relatively small, and most likely explained by natural variability and minor differences in the clay preparation process. The differences between LC-2, LC-3 and LC-4 are larger, and they also have less internal consistency (as far as it is possible to make this statement on a limited number of samples). A first explanation is that they were produced at multiple workshops. Alternatively, in the case that it is assumed that the foot-vessels produced in LC-2/3/4 are the result of one (local) production site, it would indicate that the differences are most likely related to a combination of natural variation of the clay and the involvement of multiple potters in the production. Additionally, differences in skill can also play a role here, for which evidence might be found in the relative coarseness of LC-2 and LC-4. This might indicate that the clay preparation process for LC-2 and LC-4 was carried out with less skill and less professional facilities at hand.

Evidence for different productions?

At this point, it is not possible to provide a conclusive statement regarding the number of pottery productions and clay sources represented in the foot-vessel assemblage from Oudenburg, nor where they were located. A number of limiting factors have to be taken into account: First, the limited and non-exhaustive sample size means that the results can only be considered as a first indication. Second, the sedimentary clays used to produce this type of pottery are common in Flanders and the southern Netherlands. Without direct comparisons with the raw material, or evidence for pottery productions such as kilns and wasters, a definitive answer concerning the provenance of the clay sources cannot be provided. And third, the production and clay preparation process

also has to be taken into account. Processes such as clay cleaning, sieving and levigation can alter the characteristics of the extracted clay and even remove key minerals from the coarse fraction. While this gives us some indication of the production process, it limits the interpretations concerning provenance. Nevertheless, some conclusions and suggestions can be made.

For the LC-1 samples, we can conclude that most of the evidence points towards imported vessels from a larger production site. Based on the mineralogical similarities with LLW1, a location near Bergen op Zoom and the use of clays from the Brabantse Wal can be suggested.

In the case of the LC-2 samples, a local small production seems more likely based on the exclusive presence of this petrographic group among the samples from Oudenburg and their relative coarseness compared to LC-1. Furthermore, local Tertiary deposits can be proposed as a possible clay source, although this needs to be confirmed by a direct comparison.

The one sample from LC-3 can be seen as an outlier and as such is more difficult to interpret. Other samples have been found among vessels from Rijswijk – De Bult (three samples), Wijk bij Duurstede – De Geer (one sample) and Breda – Steenakker (one sample), all sites in the Netherlands (Van Thienen 2016, 254-255). Based on this limited distribution, it is impossible to state if a production should be placed at one of these sites, at Oudenburg, or another unknown site. The presence of glauconite in this group does provide a link to Tertiary clay sources in western Belgium, although multiple Formations and Members could be considered as a potential match and do not provide us with a specific location. The lack of micaceous clay excludes the possibility that it is an underrepresented variation of LC-1. The presence of more (and recognizable) glauconite does suggest that a different clay source or outcrop layer was used to produce LC-3 than for LC-2 and LC-4.

The LC-4 samples fit more closely with the image from LC-2, arguing for a production set in a smaller local workshop. While their general mineralogical characteristics could also possibly match the local Tertiary clay deposits, further indications come from subgroup LC-4B. It occurs exclusively at Oudenburg, and its coarseness and grog-content suggests a less professional production mode, smaller workshop environment, or less skill on the account of the potter(s).

5.4.3.4 Conclusion: a mixed supply of foot-vessels at Oudenburg

Based on the provenance and technological indicators, it appears that two different production modes can be proposed for the late Roman *terra nigra* foot-vessels found at Oudenburg. On the one hand there is the (relatively) professional production LC-1 that might be located at the (former, mid-Roman) LLW production site near Bergen op Zoom and could have been imported along the coast to Oudenburg. On the other hand there are potential smaller productions LC-2/3/4 that were made in a less professional production environment. The relative coarseness compared to LC-1 might indicate that the potters were less skilled or that there was no standardized practice, so that every potter made a slightly different product. It is unclear if these three petrographic groups represent the same or different workshops, or where these productions were located. Based on some mineralogical similarities, a location in or near the fort itself cannot be excluded. However, other locations in western Flanders and the southern Netherlands also provide clay sources that could have been used to produce the foot-vessels found at Oudenburg. Direct comparisons between the natural clay and the pottery are necessary to come to a more conclusive answer.

If these foot-vessels have been made at different production sites, then a number of questions arise to explain their presence at the late Roman fort of Oudenburg. Is there a chronological shift between productions? Was the supply of imported pottery unreliable and complemented with local products? Could there have been a status difference between officers who had access to imported wares and other members of the military community who only had access to local products? Furthermore, how do we need to see the mobility of this type of pottery: were the imported vessels part of a general military supply, were they acquired at a market, or were they perhaps travelling as personal belongings with (coastal) military units? And finally, how do we have to see this close relation between different productions: could different workshops produce their own version of a popular drinking vessel, did professional potters travel to forts to make them, or did some communication exist between potters from different military communities and workshops?

Concerning the last question, it can be pointed out that the function of the foot-vessel is currently considered to have been more important than the appearance and materials of the foot-vessel itself. Their general cup and beaker forms suggest that these foot-vessels can be placed in the communal drinking culture. Collective drinking is often an intrinsic part of social interactions and enforces group identities (De Clercq 2009, 457-458). It can be assumed that collective drinking was a central part of the social life in and around the military fort of Oudenburg. Also the North Menapian stud-beakers are considered in such a context (see Chapter 1.C.1 in this volume). Within a collective drinking atmosphere, the choice of drink would have been equally important (if not more) as the vessel quality to express social status and personal identity aspects. Participating in the drinking would have been more important than the vessel that was used for it. Here we might conclude that for that reason each production could have made their own version of this popular drinking vessel. Nevertheless, many questions still remain for further study on the production and mobility of these late roman reduced vessels.

C. Local and imported handmade wares

1. North Menapian handmade wares

Wim De Clercq and Sofie Vanhoutte

Within the Oudenburg pottery assemblage a very important share is taken by pottery from regional origin, the so-called 'North Menapian pottery'. This ware consists of both a handmade (NOM HA) and a wheel-thrown equivalent (NOM RE). For the readers convenience however, the two categories and typologies will be discussed separately first (Chapter 1.C.1 and 1.D.1 resp.), after which a wider and comparative discussion and joint typology of the industry will be provided (Chapter 1.E).

Besides the North Menapian handmade ware, the handmade pottery assemblage from the Oudenburg fort also comprises a small, though significant, Romano-British handmade share. It is chosen to consider the handmade and wheel-turned component of the Romano-British coarse pottery jointly, as these imports are preferably analyzed together in their significance for the Oudenburg fort. For the study of these Romano-British handmade wares, where their distribution is compared to that of the North Menapian handmade wares, we refer to Chapter 1.B.5.1 in this volume.

1.1 Origins

The North Menapian handmade pottery tradition (NOM HA) is firmly rooted in local pottery traditions which can be traced back to the first half of the 1st century AD in the region, and to the late Iron Age for the adjacent territories further inland.[129] For the period between BC 50 and AD 150 the North Menapian area represents two distinctive 'style-groups' evolving through time and geography: the group 'Zeeland' and the group 'Aalter'. Although these groups share several typological characteristics such as the abundant occurrence of the wide-mouthed jar De Clercq P2-4 and S-shaped bowls K1-2, they are both defined by the combined use of fabrics, forms and decorative patterns, specific to one of the groups only (De Clercq 2009).

In the middle or the third quarter of the 2nd century AD, a new pottery style called 'Kustgebied' emerged in the Menapian coastal plain and its adjacent Pleistocene hinterland, corresponding with 'Kustaardewerk' (Thoen 1978) or 'Vlaams-Romeins aardewerk' / 'Flemish-Roman ware' (Trimpe-Burger 1997). Typologically and technologically, this group clearly roots in the earlier Aalter-group (*e.g.* fabric), but it also distinguishes itself by a specific typology, which in its turn is reflected in the wheel-thrown equivalent (NOM RE; see further: Chapter 1.D.1). Through time and contrary to many other regions, handmade wares keep reflecting significant numbers in sherd counts of North Menapian ceramic assemblages, with a 20% share as a frequently attested minimum. During the 3rd century sheer numbers of handmade wares are even increasing again (De Clercq 2005). This pattern can be observed in the sandy area between coastal plain and river Scheldt, but also in the coastal area itself and it could account for an increasing regionalisation (De Clercq 2005; 2009).

1.2 Fabric and surface treatment

The handmade fabric NOM HA macroscopically contains quartz, clay-pellets, grog and charred plant remains. According to granulometry the handmade fabrics can be subdivided into three main categories with subfabric 1 being fine-textured, subfabric 3 being very coarse (Figure 1.73). This choice was presumably a functionally-related technological one, a phenomenon already noticed in earlier pottery contexts of the same region (De Clercq 2005; 2009). In the handmade assemblage, many vessels were finished on a slow-wheel or turntable, based upon the irregular marks shown on the surface of the pottery. Both high-quality (with thorough wheel-turning finish) and more roughly made vessels are present. Manual intervention is often visible on the interior surface of the vessel, at the connection of the rim and the vessel body, or at the transition between base and body.

Characteristic is the abundant decoration in the handmade assemblage. While comb-score lines were most popular in the late 1st and 2nd centuries, the finishing of burnishing appears to become more and more important. Most of the vessels show patterns of burnishing which can be intense, covering the complete surface, or forming decorative schemes with vertical, horizontal or intersecting lines or zones. These decorative patterns were often applied in mutual combination or next to other decorations such as comb-scoring or – more sparsely used – grooves (see for an overview of the decorations occurring in the later 3rd century: Vanhoutte *et al.* 2009c, 132-134). The diversity and intensity in burnished patterns seems characteristic for the late 2nd and the 3rd centuries AD in the northern part of Flanders and the coastal region in particular (*e.g.* also at the site of Plassendale III near Ostend: Vanhoutte and De Clercq 2007).

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129 Cf. for the region between Leie and Scheldt: Vermeulen 1992. Cf. for a Flavian to early 2nd-century assemblage at Varsenare, near Oudenburg: Hollevoet 2002a; cf. for two late Iron Age pottery groups (*c.* 200-50 BC) and an early Roman (Augustan-Tiberian) assemblage at Aalter (further inland between Bruges and Ghent): De Clercq *et al.* 2005a.

Figure 1.73. Examples of the three main subfabrics in the North Menapian handmade pottery according to granulometry. NOM HA 1: fine-textured; NOM HA 2: with medium-sized inclusions; NOM HA 3: very coarse. Magnification under the binocular, resp. 8x, 12x, 8x (taken from Vanhoutte *et al.* 2009c, 117: Colour Plate 2).

1.3 Typology

The typological spectrum of vessel forms produced in handmade pottery is extensive and diverse: dishes, bowls, open and closed jars as well as beakers were produced with an increasing variety noticeable from the 1st to 3rd century. A first typology for the mid-Roman North Menapian pottery was developed in 2009 based on the pottery types present in the OS 4980 assemblage, the pottery content of the large waste-pit of fort level 4 (Vanhoutte *et al.* 2009c, 135: Fig. 35) and integrated in a wider comparative framework on North Menapian pottery traditions along the coast and in the hinterland (De Clercq 2009). A further, preliminary elaboration of this typology was presented in 2011 at the SGRP Congress after the study of a selection of sites and pottery assemblages in the North Menapian area (De Clercq and Vanhoutte 2011).

A further developed typology is presented here based on the North Menapian handmade pottery assemblages of the successive fort levels of the Oudenburg fort (Table 1.62; Figure 1.74; Plates CLXXVII-CLXXXVI). Instead of using the division dish-bowl-beaker-pot, this typology takes the body form as starting point and the rim type as second criteria. It subsequently seeks the functional forms in which these characteristics are present. This system also has the advantage that any 'new' type can be inserted into the typology with a new coding. A concordance table is included to clarify the associations with the 2009 typology and the former typology made by Thoen (1978, taken over in Thoen 1987) for his 'Coastal pottery' (LOK) (Table 1.63).

The 'body-rim' classification has been related to a functional division in basic forms: dish, bowl, beaker, pot, bottle, lid. Furthermore, the pot is divided into 'open pot' and 'closed pot'. The differences between the functional forms are based on metric rules, inspired by the ones recorded for the typology of earlier North Menapian handmade wares (De Clercq 2009, 406), but with modifications prescribed by the character of the, chronologically defined, assemblage in question here. The common principles for a functional division of pottery, in fact an artificial taxonomical structure, are diverse (*e.g.* Rice 1987, 215-220). In the typology presented here, the classification into dish-bowl-beaker-pot-bottle is based on the following empirical rules, specifically intended for use for this pottery category. When the total height of the vessel is ≥50% of the maximum diameter, the vessel is a pot, bottle or beaker. With a rim diameter ≥66% of the maximum diameter, the pot is an open pot; with a rim diameter between 33% and 66%, it concerns a closed pot. A pot with a rim diameter ≤33%, is a bottle. When the total height of the vessel is ≤50% of the maximum diameter, the vessel is a dish or bowl. A height of ≤33% of the maximum diameter points to a dish, a height of >33% to a bowl. A beaker is characterized by its oblong form. The height of a beaker is always >110% of the maximum diameter, with a rim diameter <66% of the maximum diameter.

This North Menapian typology shows forms and types present at the Oudenburg fort in the period AD *c.* 180-270/300 and is primarily based on the assemblages of the key contexts selected from the Oudenburg south-west corner site.

The typology presented here is not constructed as a chronological system and should not be used as such. To ascertain the presence/absence of certains forms and types in a given period, further detailed study of all pottery assemblages of the different fort levels should be integrated with other contexts (*e.g.* of the civil settlement of Oudenburg and other sites in the North Menapian region). Nor is it our intention to go into more detail on the distribution of the different types in the North Menapian territory.

1.4. Some type-fossils in the NOM HA group

The so-called 'stud-beakers' and 'stud-pots', classified as NOM HA pot III.9st and NOM HA pot III.10st, certainly deserve closer attention, as they are a distinctive group of vessels, characteristic for the NOM HA group. The type apparently emerged during the middle or second half of the 2nd century in the coastal area or its immediate hinterland, and it continued well into the later third century (Vanhoutte *et al.* 2009c). The distribution of these stud-beakers and stud-pots is limited to the North Menapian region as finds are identified in a region that stretches from the central area of the Belgian coastal plain up until the isle of Walcheren and the area of the Eastern Scheldt (Oosterschelde) mouth, now in The Netherlands (De Clercq 2009, 447). The form was also produced

Table 1.62. Forms and types in the North Menapian handmade pottery in the period AD *c.* 180-270/300, as assessed in the Oudenburg assemblage, and primarily based on the assemblages of the key contexts selected from the Oudenburg south-west corner site (see Plates CLXXVII-CLXXXVII). The listed types in italic are the specific types occurring at the Oudenburg site. Missing type and subtype numbers point to types and subtypes only occurring in the North Menapian wheel-turned group (see Chapter 1.D.1, cf. Table 1.67).

TYPE I: FLARED FORM
I.1. straight, oblique wall; everted, rounded rim
NOM HA dish I.1
TYPE II: IN-TURNED FORM
II.A.1 strongly incurved, profiled rim (with exterior cordons)
NOM HA pot II.A.1 - closed
NOM HA (storage) pot II.A.1 - closed
II.A.2 convex body with upright, plain rim (variant: thickened rim at the inside)
NOM HA dish II.A.2 (small-based and large-based version)
II.A.3 convex body with in-turned, plain rim (with or without pouring lip (p))
a: without bend
b: with bend (angular shoulder, sharply carinated to the inside)
NOM HA dish II.A.3a (small-based and large-based version)
NOM HA dish II.A.3ap
NOM HA dish II.A.3b
NOM HA bowl II.A.3a
NOM HA bowl II.A.3ap
NOM HA bowl II.A.3b
II.A.4 convex body with inturned rim with bend pronounced on the exterior (rib) (=lid-seated rim) (with or without studs on the shoulder (st))
NOM HA dish II.A.4
NOM HA bowl II.A.4
TYPE III: OUTCURVED FORM
III.1 everted, bending rim, no neck, globular body
NOM HA pot III.1 - open
NOM HA pot III.1 – closed
III.2 everted rim, short neck, S-profiled globular body
NOM HA pot III.2 - open (small and large version, high and low version)
NOM HA pot III.2 – closed
NOM HA (storage) pot III.2 – closed
NOM HA bottle III.2
NOM RE pot III.2 – open
NOM RE pot III.2 – closed
III.5 everted long lid-seated rim, approaching the maximum diameter of the vessel, S-profiled globular body
NOM HA pot III.5 – open (smaller and larger version)
III.6 short everted, out-turned rim, ovoid body
NOM HA pot III.6 – open
III.8 short, slightly everted rim, short concave neck, globular body
NOM HA pot III.8 – open
NOM HA pot III.8 – closed
III.9 short, slightly everted rim, tall upright, slightly concave neck, globular body
with studs (st): so-called 'stud-'beaker"
NOM HA beaker III.9 (small and large size)
NOM HA pot III.9 – closed
NOM HA pot III.9st - closed
III.10 short, slightly everted rim, short concave neck, no pronounced shoulder, globular body
(so far) only known with studs on upper half body (st)
NOM HA pot III.10st – closed
TYPE VII: LID
VII.1 rounded rim
NOM HA lid VII.1

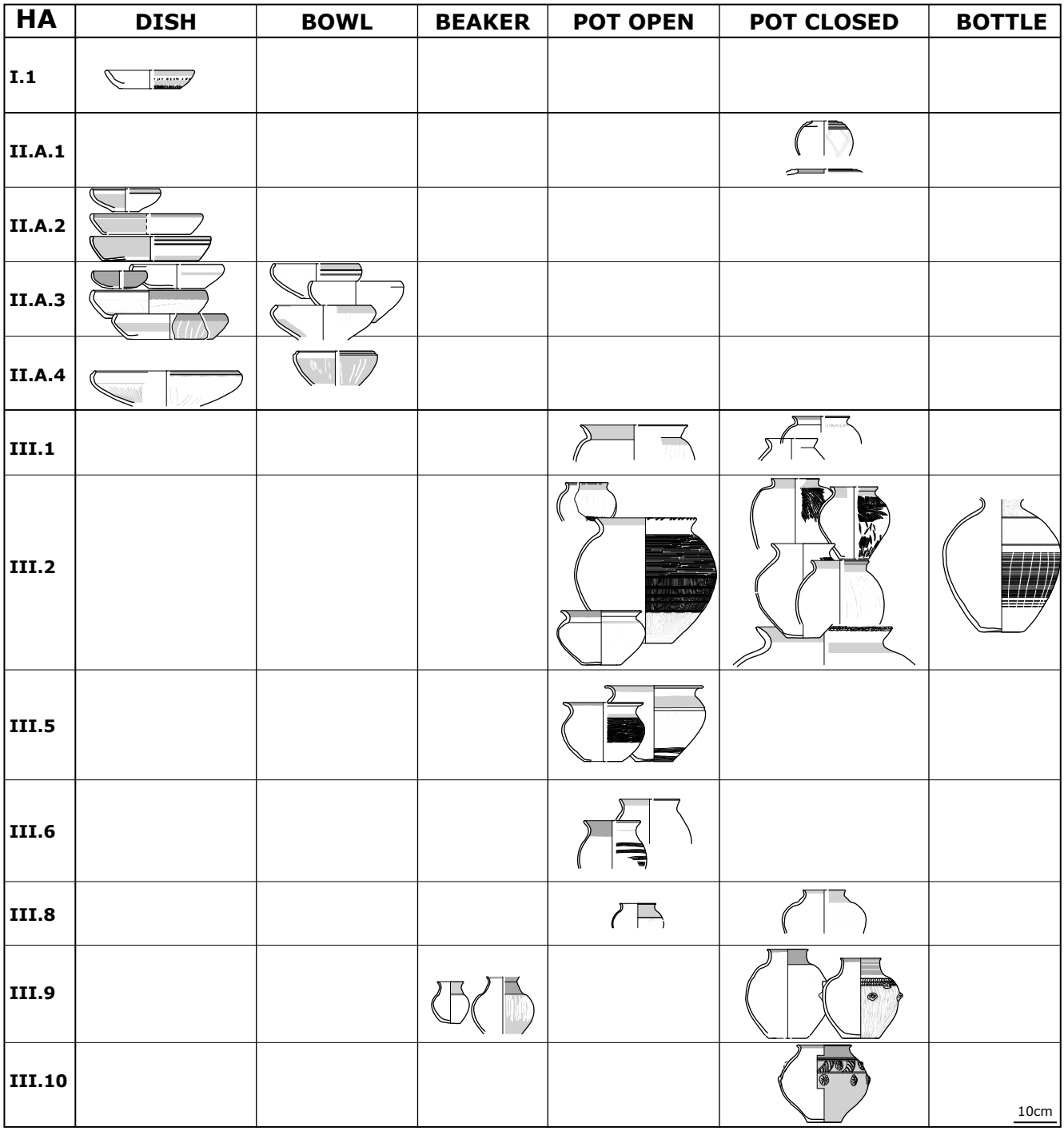


Figure 1.74. Visualization of Table 1.62: forms and types in the North Menapian handmade pottery in the period AD *c.* 180-270/300, as assessed in the Oudenburg assemblage, and primarily based on the assemblages of the key contexts selected from the Oudenburg south-west corner site. All types are illustrated on Plates CLXXVII-CLXXXVI.

in wheel-thrown, fine reduced version in beaker form (cf. NOM FR beaker III.9st).

On these beakers/pots of type NOM HA pot III.9 or III.10, usually one row of three or four studs or bosses was applied to the shoulder after the vessel was formed and decorated with diverse burnishing patterns, but also two rows of alternating studs frequently occurs (cf. Figure 1.76). The studs were probably applied to the pot to improve the grip but also had a decorative function as they are often burnished and finished in a delicate way. Applied elements on handmade vessels are not unknown in Northern Gaul though (cf. Herbin 2002). However, these North

Table 1.63. Concordance between the North Menapian handmade pottery typology presented here, the earlier – more limited – North Menapian pottery typology presented in Vanhoutte *et al.* 2009c (based on the pottery of the large waste-pit OS 4980 of fort level 4) which laid the foundation, and the 'Kustaardewerk' typology presented by Thoen (1978/1987).

NOM TYPOLOGY NEW	NOM TYPOLOGY Vanhoutte *et al.* 2009c	TYPOLOGY LOK Thoen 1978
NOM HA BEAKER III.9	NOM HA TYPE 2	no type
NOM HA POT II.A.1	NOM HA TYPE 1	no type
NOM HA STORAGE POT II.A.1	no type	no type
NOM HA POT III.1	< NOM HA TYPE 10	< LOK TYPE 2a
NOM HA POT III.2 closed	NOM HA TYPE 10	LOK TYPE 2a/3
NOM HA POT III.2 high open	NOM HA TYPE 10	LOK TYPE 2a
NOM HA POT III.2 low open	NOM HA TYPE 9	LOK TYPE 2b
NOM HA STORAGE POT III.2	NOM HA TYPE 13	no type
NOM HA BOTTLE III.2	< NOM HA TYPE 10	no type
NOM HA POT III.5	< NOM HA TYPE 10	< LOK TYPE 2a
NOM HA POT III.6	NOM HA TYPE 11	no type
NOM HA POT III.8 closed	no type	no type
NOM HA POT III.8 open	no type	no type
NOM HA POT III.9	no type	no type
NOM HA POT III.9st	< NOM HA TYPE 3	no type
NOM HA POT III.10st	NOM HA TYPE 3	no type
NOM HA DISH I.1	< NOM HA TYPE 4	< LOK TYPE 7
NOM HA DISH II.A.2	< NOM HA TYPE 4	< LOK TYPE 7
NOM HA DISH II.A.3a	< NOM HA TYPE 4	< LOK TYPE 7
NOM HA DISH II.A.3ap	NOM HA TYPE 5	< LOK TYPE 7
NOM HA DISH II.A.3b	< NOM HA TYPE 4	< LOK TYPE 7
NOM HA DISH II.A.4	< NOM HA TYPE 4	no type
NOM HA BOWL II.A.3a	NOM HA TYPE 6	no type
NOM HA BOWL II.A.3ap	< NOM HA TYPE 6	no type
NOM HA BOWL II.A.3b	NOM HA TYPE 6	LOK TYPE 4a
NOM HA BOWL II.A.4	NOM HA TYPE 7 AND 8	LOK TYPE 1
NOM HA LID VII.1	no type	no type

Menapian stud-beakers and stud-pots are distinctive by the combination of the studs with the globular form, the elaborate burnished decoration and the frequently attested black (resin) coating on the neck and rim. These elements make them very characteristic for North Menapian ware. Often, the area of the stud row(s) is decorated with geometric patterns of burnished or incised lines, in some cases forming very characteristic triangular sections filled in with impressed dots, a decoration that even recalls the style group 'Aalter' where this kind of decoration already occurred from the late Iron Age onwards.

Stud-beakers were probably used for drinking and serving liquids. For the larger pot versions De Clercq (2009, 441) suggests a function as collective drinking beaker, with the studs enabling and facilitating the passing of the vessel from one person to another. That these large stud-pots/beakers had a specific significance, seems to be indicated by their occurrence as ritual deposit. A complete, very large, decorated stud-pot was found in the bottom fill of one of the 3rd-century wells (well WAP10) at the border of the settlement to the east of the fort (site Belleroche (ET28); Dyselinck *et al.* 2020) where it clearly acted as a placed closure deposit (Figure 1.77).

The small globular bowl NOM HA pot II.A.1, with profiled rim and burnished lattice decoration on the wall and with black coating on the outside of the rim (Figure 1.75: d) can be considered – both in decoration as in surface treatment – as a closely related form to the stud-pots (Vanhoutte *et al.* 2009c). Recalling decoration patterns in the style group ' Zeeland', the impressed serrated motive also seems to be rooted in the native tradition.

An interesting remark can be made about the lids in the repertoire. While lids occur regularly in the reduced group, handmade lids are extremely rare and only appear with plain, rounded rim (NOM HA lid VII.1). Their rarity seems to be a distinctive characteristic for the coastal North Menapian handmade group, since handmade lids are abundant in handmade pottery assemblages in the adjacent hinterland region between Ghent and Bruges.

This North Menapian handmade pottery production is further discussed in relation to the North Menapian reduced pottery in Chapter 1.E, where we will elaborate on its significance, the influences and interactions.

Figure 1.75. Some examples of North Menapian types attested at the Oudenburg south-west corner site: a. NOM HA open pot III.2; b. NOM HA open pot III.5. Both vessels were found in the large waste-pit OS 4980 of fort level 4. c. NOM HA dish II.A.3ap; d. NOM HA closed pot II.A.1.

Figure 1.76. Two so-called stud-beakers. a: NOM HA closed pot III.10st; b: NOM HA closed pot III.9st. Both were thrown into the well OS 22926 (structure level II) of fort level 4 after its abandonment.

Figure 1.77. At the settlement site Belleroche (ET28), *c.* 500 m to the east of the fort, one of the wells yielded this very large North Menapian stud-beaker, clearly placed in the well as closure deposit. The well is dated through dendrochronological analysis of the wood after AD 216/217 (*tpq*) (Photos ©BAAC: Dyselinck 2020, 87: Fig. 76 (= a), 145: Fig. 113 (=b)).

2. Late Roman (Germanic-style) handmade pottery

Vince Van Thienen

2.1. Introduction to the late Roman handmade pottery

Vince Van Thienen and Sofie Vanhoutte

Coarse late Roman handmade pottery differ clearly from the North Menapian products outlined above in vessel shapes, finishing techniques, decoration and fabrics, despite sharing a handmade production technique with some. In general, the late Roman handmade pottery is much coarser with a rougher finish and its vessel repertoire is limited to simple, functional pots, bowls and cups. In the sherds studied from Oudenburg there is little evidence for the use of a slow-wheel or turning table to finish the late Roman pottery and no decorations have been observed.

The coarse late Roman pottery makes its earliest appearance in the pottery assemblage of the south-west corner site in the final waste fillings of well OS 22926, dated to the final end of fort period 4. In total, some ten late Roman handmade fragments can be attributed to fort level 4. In features of fort level 5, more late Roman coarse handmade fragments occur, but their numbers remain very low. Although this assumes a scarce presence of this pottery during the final fort period of the 4th – early 5th century, a closer look to the handmade pottery of the transition level 5+post and of the first levelling layers after the abandonment of the fort, changes this perception as it shows a much higher proportion of this pottery. The secondary infill of basin OS 4923 of fort level 5B, consisting of demolition debris layers of the bath house of fort level 5A, yielded no less than 89 late Roman handmade fragments of which many of large size. This level was also characterized by the presence of a large number of Mayen vessels. The late Roman handmade pottery mainly consists of pots with more or less S-profiled body, short neck and everted or upstanding rim (Figures 1.78-1.79). These forms can also be recognized in the early medieval repertoire of the region (see Hollevoet 1993a, 198-199; Hollevoet 2006, 244), but they can also be found in earlier Roman phases, as evidenced by the pottery found at the rural site of Zele, east of Ghent. There, the pottery is characterized by a coarse plant temper, believed to have belonged to Germanic settlers from the late 3rd century, given parallels with material from the Frisian area in the northern Netherlands (see De Clercq & Taayke, 2004, 57-71; De Clercq 2009, 461-462).

While the features of fort level 5 only yielded a limited number of late Roman handmade pottery, the levelling layers covering the Roman level indicate in contrast a significant presence. The several cross joining sherds with the post-Roman level as could be evidenced mainly by the samian wares and the mortaria, and the indications that the secondary infills of structure OS 2562 consisted of earth (with pottery) of the surrounding levels (cf. Volume I, Chapter II.5), are arguments to believe that the top of fort level 5 – the level of the latest phase of fort level 5B – had been largely dug away after the (military) abandonment of the fort, mainly to level the area and to fill in the depressions and pits on site. Therefore, one can assume that (at least part of) the late Roman handmade pottery found in this transition level originally belonged to the final fort occupation. This resulted in a very limited presence of this late Roman handmade pottery at fort level 5A (next to already some single sherds at fort level 4), while at fort level 5B this pottery is rather well-represented.

The traditional interpretation for late Roman handmade ceramics, *c.* late 3rd to early 5th century, is that they are Germanic products brought along with immigrants from the Germanic territories and as such must have a provenance located beyond the Rhine. To investigate this assumption, a petrographic analysis was carried out on twenty samples of handmade pottery from fort levels 5A, 5B and the post-Roman level. The analysis did not reveal direct mineralogical evidence that tied the sampled pots to the suspected Frankish-Germanic territories north and northeast of the Lower Rhine. While this does not exempt the possibility that they are Germanic products, the results here indicate that a local or regional production has to be considered as a more likely scenario.

Figure 1.78. Late Roman handmade pottery fragments recovered from the secondary infill of the large basin OS 4923 of fort level 5B (Photos by F. Lagae, composition by S. Vanhoutte, digitizing by S. Mazereel).

2.2. Compositional summary based on polarizing microscopy (fabric)

A total of twenty samples have been selected from various contexts from fort levels 5A, 5B and the transition level 5+post (Table 1.64). A thin section has been made from each sample to study its mineralogical properties under a polarizing microscope to investigate the provenance and production techniques of the late Roman handmade pottery. Given the coarse heterogeneous fabrics of late Roman handmade pottery in general, the samples were divided per major geological class based on the mineralogical evidence in the fabric (sedimentary, metamorphic, volcanic, plutonic), and per tempering technique based on the presence of non-mineralogical inclusions (Van Thienen, Goemaere, De Clercq *forthcoming*). Observed tempering materials include grog (crushed pottery) and shells. The absence of a tempering agent is classified as untempered.

The geological classes inform us on the provenance of the clay used to make these handmade pots. In general, seventeen out of the twenty thin sections can be identified as having been made solely from sedimentary clays. Two samples contain volcanic inclusions and metamorphic inclusions were encountered in one sherd (see Section 6 of this chapter). Given that Oudenburg is set within a sedimentary coastal landscape, the sherds with a sedimentary origin are initially considered as possible representatives of local or regional productions, although they can also originate from neighbouring regions in the rest of the Low Countries, whereas the three others represent a clear non-local provenance (see below for a further discussion on provenance).

Among these seventeen sherds made from a sedimentary clay, a rather large variation can be observed in their composition (Figures 1.80-1.81), despite having been made according to the same general 'recipe' (cf. Quinn 2013) of a predominantly quartz-rich sedimentary clay tempered with crushed up ceramics, also known as grog or *chamotte*. Of these grog-tempered fabrics, the bulk contains grog-inclusions from different types of pottery that vary in composition (as seen in thin section under a petrographic microscope) and colour (observed in hand-specimen under a stereoscopic microscope). Shell is the only other type of tempering agent that has been observed and was encountered in just one thin section (LRHM52). Four sherds made from a sedimentary clay proved to be untempered.

The two sherds with volcanic inclusions are interesting because of their clear exotic provenance. One derived from the primary infill of basin OS 4923 of fort level 5B (LRHM36), the other from a construction ditch of a palisade also from fort level 5B (LRHM41), both dating to the late 4th century (+AD 380) or even later. Both sherds have a heterogeneously composed, reduced coarse fabric characterized by a mixture of rounded volcanic and sedimentary (limestone) rocks inherent to the clay, indicating that their provenance might be sought in a secondary volcanic clay, which is not found in or around Oudenburg. The Eifel region has been suggested as a potential provenance (cf. Bouquillon *et al.* 1994; De Paepe and Van Impe 1991, Group B); this has yet to be confirmed by comparative petrographical analysis. Additionally, the coarseness of the fabric and the large-sized inclusions point towards the intentional selection of a coarse clay by the potter, resulting in a very heterogeneous fabric. The vessel type and use of the pottery could not be reconstructed from these two curved body sherds.

The sherd with metamorphic rock inclusions (LRHM53) is another interesting outlier, found in the waste infills of the double well OS 2562 from fort level 5B, of which the abandonment is to be situated in the first decades of the 5th century. The fabric is quite heterogeneous (RED-OX), characterized by inclusions of highly evoluted sandstone and large rounded quartz minerals. As with the volcanic inclusions, the roundedness of the rock inclusions points towards them naturally occurring in the clay, rather than to have been added as a crushed-rock temper. The type of fabric is similar to sherds gathered from the sites of Meldert-Zelemsebaan (Smeets and Steenhoudt 2012) and Neerharen-Rekem (De Boe 1983) in *Germania Inferior*. Their thin sections indicate that they were produced not far from their source area, what in this case would also be non-local to Oudenburg. Initially, all late Roman handmade pottery with metamorphic and plutonic inclusions were considered to have a provenance in the Elbe-Weser region in northwest Germany (De Paepe and Van Impe 1991, Group A). This sample, however, lacks plutonic inclusions which indicates that other source-areas with highly evoluted sandstones such as the Rocroi and Stavelot-Venn massifs or Taunus range should be investigated (pers. comm. Eric Goemaere).

2.3. Provenance and production techniques

The exotic geological provenance for handmade pottery is an interesting feature, because it prompts the question of how it got from the source-area to Oudenburg. In general, coarse handmade pottery is not considered to have been a likely trade-item, even in the late Roman period. More likely options include exchange and mobility on the level of persons and groups, which would point to a direct or indirect link between the volcanic and metamorphic source areas and Oudenburg. Given that only three out of twenty samples represent an exotic provenance of mid-range to long range distance (Figure 1.82), and the rather mundane nature of most handmade pottery in the Roman period (*e.g.* vessels for cooking, eating or storage), it seems most likely that these pots once were part of the material culture used by one or more individuals who came from these remote areas and took their belongings with them. Or at least one or more individuals had been at the source area to acquire a local pot by exchange or as a gift, produced a handmade pot themselves at this location, or received a vessel from a third party through gift-exchange.

The bulk of the fabrics consist of a sedimentary clay which could possibly contain local productions from the region around Oudenburg or neighbouring areas in western Flanders and the southwestern Netherlands, although this does not necessarily have to be the case. All seventeen thin sections have quartz as the dominant mineral constituent, with only a limited number of observations of muscovite mica or feldspar grains. Organic matter occurs frequently, mostly naturally embedded plant matter, as do clay pellets and iron oxide concentrations or iron-rich clay pellets (semi-plastics). Additionally, some thin sections contain inclusions that could be identified as chert, siltstone, grainstone, limestone and glauconite. Only one sample is clearly shell-tempered, most are tempered with grog or contain multiple grog fragments, and one sample contains both grog and crushed limestone.

In two thin sections, the abundance of grog makes it the prime characteristic of the fabric. Moreover, in almost all grog-tempered sherds, the composition of these crushed ceramic fragments differs from each other or the general composition of the thin section. This means that several pots from potentially different pottery types were crushed up together to be added as a temper to these ceramics. The most plausible scenario for this 'recycling' phenomenon is that the potters had access to a range of pottery waste, perhaps specifically collected or in the form of a waste context. The wide range in fabrics and their coarse, heterogeneous nature might imply that non-specialists could create their own pots and that this pottery-making was situated rather on the level of 'household production' or 'household industry'

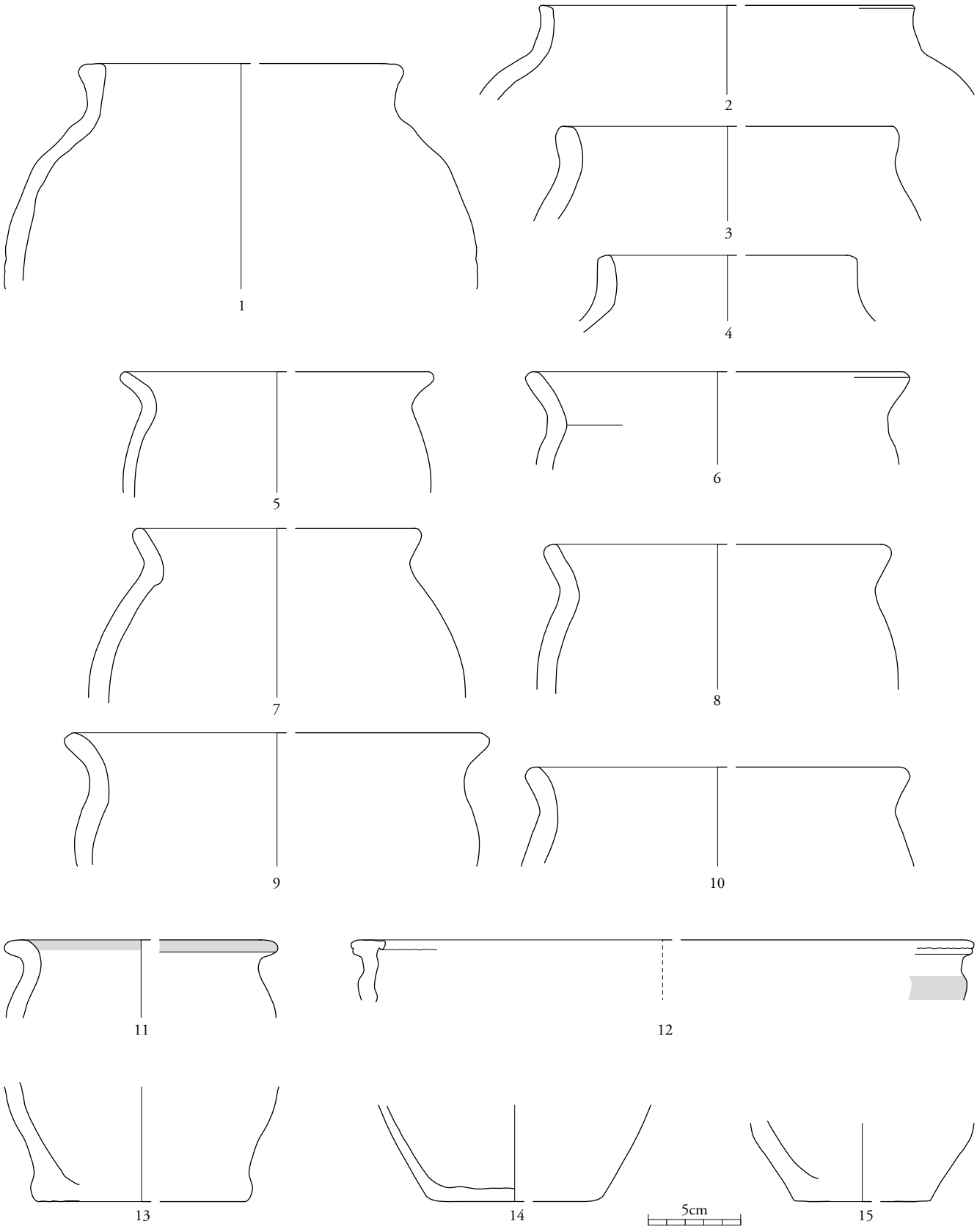


Figure 1.79. Drawings of a selection of late Roman handmade pottery fragments recovered from the secondary infill of the large basin OS 4923 of which several are represented on the previous figure (drawings by S. Mazereel, composition by S. Vanhoutte).

Table 1.64. Overview of the thin sections of the sampled selection of late Roman handmade wares of the Oudenburg south-west corner site. Petrographic classes: (S)sedimentary=non-plastics derive only from sedimentary rocks (main and characteristic constituents vary and are incorporated in the petrographic code); (V)volcanic=non-plastics derive from volcanic rocks (V2=volcanic and siliclastic rock fragments and volcanic minerals take up 5 to 25%); (M)metamorphic=non-plastics derive from metamorphic rocks (MLG=low grade metamorphic rocks) (q=quartz; ca=carbonate; g=grog; sh=shell; re=recycled; Fe=iron).

thin section ID	petrographic code	petrographic class	temper	find context	(fort) level
LRHM033	Gq (re)	sedimentary	grog	OS 4923 basin: primary infill	FL5B
LRHM034	Gq (re)	sedimentary	grog	OS 4923 basin: primary infill	FL5B
LRHM035	Sq	sedimentary		OS 4923 basin: primary infill	FL5B
LRHM036	V2sqca	volcanic		OS 4923 basin: primary infill	FL5B
LRHM037	Sgre (Fe)	sedimentary	grog	OS 4923 basin: secondary waste infills	FL5B or post
LRHM038	Sqcag	sedimentary	grog	pit through secondary waste infills basin OS 4923	post
LRHM039	Sqg	sedimentary	grog	OS 8670 N-S construction ditch	FL5B
LRHM040	Sqg (re)	sedimentary	grog	OS 8670 N-S construction ditch	FL5B
LRHM041	V2sqca (g)	volcanic		OS 8670 N-S construction ditch	FL5B
LRHM042	Sqg (re)	sedimentary	grog	OS 8924A/10908 pit/subsidence	FL5B
LRHM043	Sqg (re)	sedimentary	grog	OS 8924A/10908 pit/subsidence	FL5B
LRHM044	Sq	sedimentary		OS 8924A/10908 pit/subsidence	FL5B
LRHM046	Sq	sedimentary		OS 7200 construction slot stable	FL5B
LRHM047	Sqg (re)	sedimentary	grog	OS 44940 secondary infill pit FL4	FL5
LRHM048	Sqg (re)	sedimentary	grog	OS 44940 secondary infill pit FL4	FL5
LRHM049	Sqg (re)	sedimentary	grog	OS 2951 level (no closed context)	FL5
LRHM050	Sq	sedimentary		OS 2951 level (no closed context)	FL5
LRHM051	Sqg (re)	sedimentary	grog	OS 2562 double well: structure level 4 (waste infills)	FL5B - post
LRHM052	Sqsh	sedimentary	shell	OS 2562 double well: structure level 4 (waste infills)	FL5B - post
LRHM053	MLG	metamorphic		OS 2562 double well: structure level 6 (shaft in-between both frameworks)	FL5B

(cf. Peacock 1982). This contrasts with the North Menapian 'industry' of the mid-Roman period (until the late 3rd century).

A final observation is the repeated occurrence of multiple vitrified grog grains or a partly vitrified matrix of the sherd fabric. Vitrification means that the matrix of the sample, or the grog inclusion, has a glassy and anisotropic appearance under crossed polars (XP), usually presented here as a dull homogenous grey matrix that demonstrates no optical activity (loss of birefringence) with bright inclusions (usually quartz grains). A vitrified matrix suggests a high firing temperature, usually higher than 800-850° C, although the degree at which a matrix vitrifies is dependent on its composition (cf. Quinn 2013, 190-191). Among the Oudenburg handmade pottery thin sections, samples occur that contain only vitrified grog inclusions, or a mixture with non-vitrified grog. Most vitrified grog grains are quite rounded[130] and range from 0.2 to 1.5 mm. It is not yet clear if these grains represent fragments of misfired ceramic vessels, or ceramics (repeatedly) exposed to high temperatures. One thin section (LRHM37) contains a high iron content, some of it associated with the vitrified grog, pointing potentially to crucibles or an overlap with an iron production setting. The presence of a (partially) vitrified sherd might indicate problems with controlling the temperature range or the conditions in the firing process. The vitrified grog grains could thus also be from overfired vessels that were crushed to serve a secondary function as a tempering raw material for following productions.

2.4. Discussion: what is local?

In every petrographic study, the question arises of what can be called 'local' (cf. Druc 2013). In this case, the largely, more homogeneous, sedimentary geology of the Low Countries results in a less precise provenance than for instance in heterogeneous mountainous areas. Without comparative raw clay material extracted from the vicinity of Oudenburg or reliable samples from a local Roman production during the Roman period, establishing an exact local geological provenance is near impossible.

In an archaeological, more cultural sense, 'local' can be seen as a product made in a local pottery tradition, *i.e.* according to practices from Gallo-Roman groups in the northern Menapian/*Belgica Secunda* region. According to De Clercq (2009), the most common North Menapian handmade fabric group contains quartz, clay-pellets, grog and charred plant remains (macroscopically visible) and is characterized by glauconite (microscopically identified) (cf. also Chapter 1.C.1 in this volume). In that aspect, much of the Oudenburg late Roman handmade pottery can be interpreted as having been made according to a local traditional practice that had been in place throughout the entire Roman period, *i.e.* selecting a

130 The roundedness of the grains would normally argue against intentionally crushed up elements, although it is possible that the vitrification made the pottery sherds more brittle and thus as grog more prone to occur in a rounded rather than angular shape.

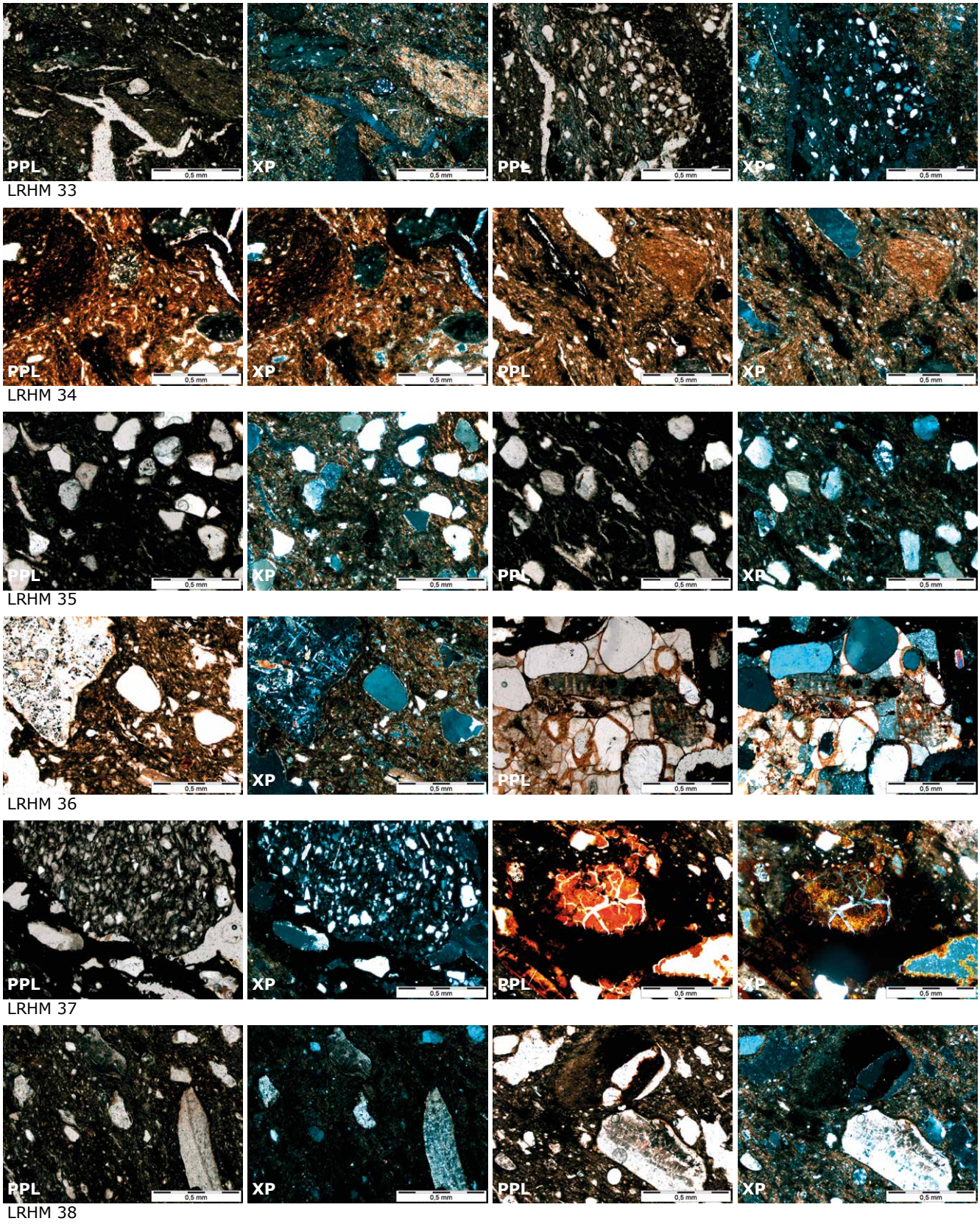


Figure 1.80. Photomicrographs in plane polarized light (PPL) and crossed polars (XP) of late Roman handmade pottery thin sections (sample numbers LRHM-33-34-35-36-37-38).

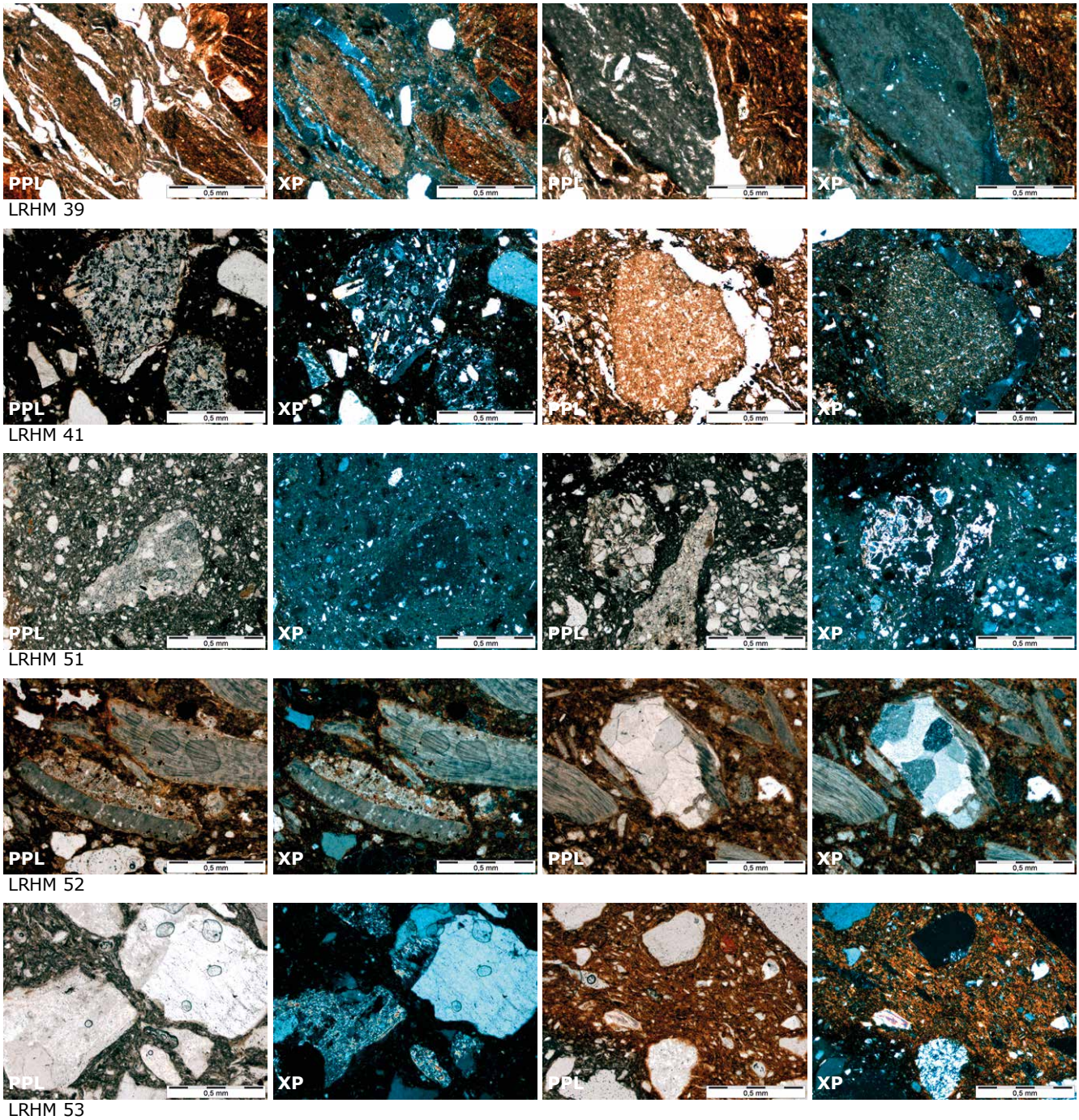


Figure 1.81. Photomicrographs in plane polarized light (PPL) and crossed polars (XP) of late Roman handmade pottery thin sections (sample numbers LRHM-39-41-51-52-53).

quartz-rich (sandy) clay and using grog and clay-pellets as tempering agents. However, this recipe was not exclusive to this specific region, but is a quite common technique which is also known from other parts in the Low Countries (Van Thienen 2016) and south-east Britain (Gerrard 2013). The tempers used for clays are, in part, determined by accessibility and relative abundance of raw materials, as well as their workability and effects in the production process. Thus, tempering a fine sedimentary clay with quartz-rich sand, crushed pottery and plant material is a common technique in landscapes similar to that of northern *Belgica Secunda*.

An initial estimation of the likeliness of a local or regional production can be assessed to compare the material with the characteristics of other known clays that have been used during the Roman period for local or regional pottery productions in the northern region of *Belgica Secunda* (former Menapian territory). In this case, we can

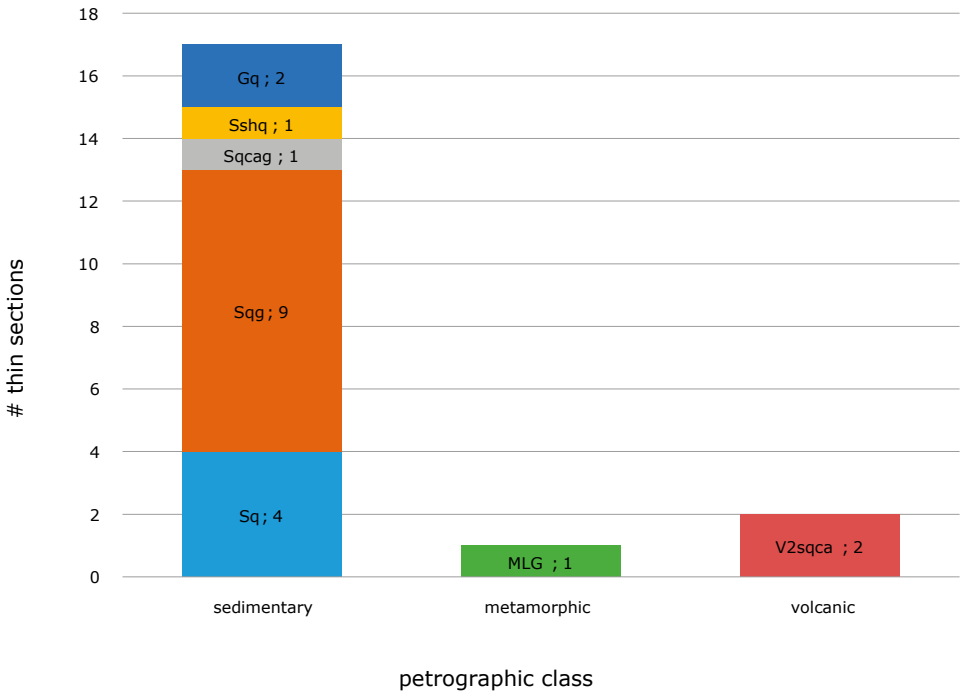


Figure 1.82. Bar chart illustrating the frequency of petrographical fabric compositions of the sampled late Roman handmade pottery (n=20) based on the major geological class, dominant mineral constituents and tempering agents.

compare the late Roman handmade pottery with the Low Lands Ware and the North Menapian handmade pottery. The Low Lands Ware was produced using clay from the Tegelen Formation on the *Brabantse Wal* at the Eastern Scheldt (Oosterschelde), characterized by mica-rich clays (De Clercq and Degryse 2008). The same clay formation was possibly also used to produce some of the late Roman *terra nigra* foot-vessels (see Chapter 1.B.5.4 in this volume). For the North Menapian pottery, clays from the Asse Formation were used that outcrops along the Oedelem-Zomergem cuesta (between Brugge and Ghent), characterized by glauconite-rich clays (De Clercq 2009; cf. Chapter 1.C.1, 1.D.1 and 1.E in this volume). No mica-rich or glauconite-rich fabrics were observed among the late Roman handmade pottery, indicating that these clays were no longer in use during this period. De Paepe and Van Impe suggested a close source-to-site model for the late Roman handmade pottery, but as evidenced by the exotic samples, this does not necessarily have to be the case. Additionally, the close source-to-site model can be argued to be more applicable in a rural context than in the military context of Oudenburg. It can be concluded that the sedimentary fabrics of the late Roman handmade pottery could possibly have been made from clays in the surrounding regions of Oudenburg, although it seems more likely that they were not made at the fort, unless the necessary clays were transported there.

2.5. Discussion of identity, mobility and migration

Handmade pottery in the late Roman period is generally considered a Germanic product, although that is not necessarily the case. Too often, the faulty reasoning is maintained that late Roman handmade pottery is Germanic and Germanic (handmade) material has to be dated to the late Roman period corresponding to the historically documented Frankish and Saxon migrations (Van Thienen 2017b). As shown from the petrographic results, the bulk of the samples analyzed here were made with clays deriving from local or regional sources, and often according to 'local' Gallo-Roman practices as the grog and vegetal temper evidence. However, these practices could have been transmitted to non-local people, Germanic or Roman, that had little experience in dealing with the fine sedimentary clays that were used in the northern landscapes of *Belgica Secunda*. This transmission could be either by learning from locals or by copying or imitating the local pottery, with varying degrees of success. An argument here might be the vitrified ceramics and grog inclusions that make the pottery appear non-professional and poorly made. Alternatively, although less likely, an ecological and functional determinism could be argued that resulted in the application of similar production techniques based on the availability of local raw materials, meaning that non-local potters came to use the same techniques and tempering materials to make these handmade pots independently from local traditions.

On the question whether or not the handmade pottery analyzed here is Germanic material, we have to maintain a differentiated perspective on the production, mobility and consumption of these goods. As mentioned above, a close source-to-site distance is assumed for the production of this type of pottery (De Paepe and Van Impe 1991). This could hold true for the samples consisting solely of sedimentary elements, given that the handmade vessels are mostly related to household production and consumption or could be involved in local craft activities at the fort site, such as metal production. Yet, the fabric and mineralogical discrepancies with other known local and regional Roman productions rather indicates that they were not made locally, or at least not at the same sites as the earlier Gallo-Roman productions. As for the three exotic samples, alternative explanations have to be provided, given that volcanic and metamorphic inclusions do not naturally occur in the regionally available clay sources. Thus, some type of

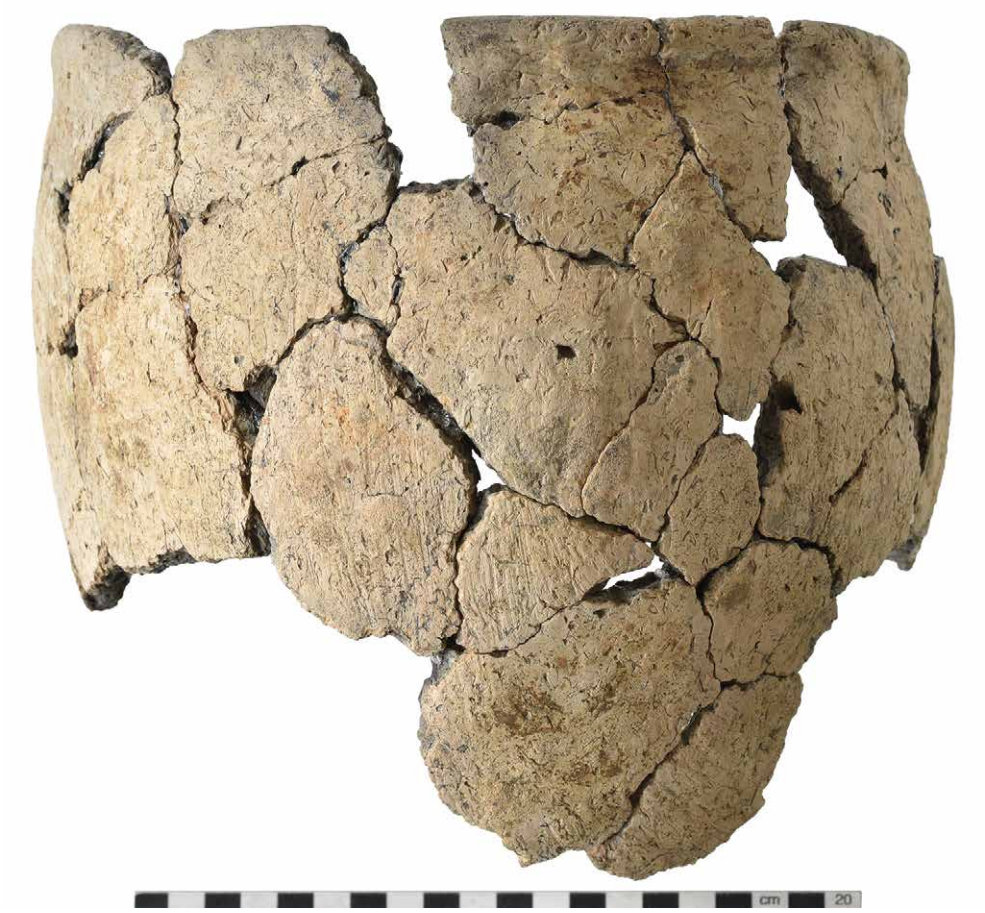


Figure 1.83. Large chaff-tempered pot recovered from the lowest layers of the dark earth level at the south-west corner site.

mobility was necessary for these pots to arrive at Oudenburg. As this type of pottery is less likely to have been traded as an imported material, even in the late Roman provincial world, direct or indirect exchange cannot be excluded. Most likely, the material travelled with mobile individuals or communities, which points in the direction of Roman military groups and Germanic immigrants. This includes Germanic settlers from across the Rhine (most likely east), Germanic soldiers in the Roman army (officials or mercenaries), Gallo-Roman soldiers that travelled to and from the Rhine frontier, or Roman soldiers from other provinces altogether.

A final aspect that has to be considered here, is the potential link with Anglo-Saxon groups and pottery based on the presence of chaff-tempered handmade pottery in Oudenburg. Although this category was not sampled for petrographic analysis, it is relevant to discuss it here nonetheless as a few rim fragments in chaff-tempered ware were found at fort level 5B. These rims are paralleled by a complete pot-profile that could be reconstructed from fragments recovered from the lowest layers of the dark earth level (Figure 1.83). They all represent wide open egg shaped pots with ovoid body and slight S-shaped profile or upstanding rim. Before the late Roman period, this plant-tempering technique was only used for briquetage material within the context of salt-making sites. The North Menapian fabrics were also characterized by some vegetal tempering, but always in very low proportions to the other inclusions. The earliest chaff-tempered wares in the wider region are known from the above mentioned late 3rd-century site at Zele, and could undoubtedly be related to Germanic pottery traditions (De Clercq and Taayke 2004; De Clercq *et al.* 2005, 209-216; De Clercq 2009, 461-462). Also at Aardenburg this pottery has been attested (site 'weide De Smet', excavation by J. Trimpe Burger (Dhaeze 2011)). The chaff-tempered sherds might be related to these earlier Germanic vessels, but can also be seen in relation to to 'HS type A', a type of undecorated large pot occurring in large parts of northwestern Europe (after the Hessens-Schortens ware of Weiche Grauware, like Krol *et al.* 2020, 435: Fig. 6, 97e). Based on research by Krol *et al.* (2020) by means of a large radiocarbon analysis program on several samples of 'Anglo-Saxon style pottery', this type 'HS type A' can be dated *c.* AD 400-650. The fragments at fort level 5B establish that this pottery was certainly in use at Oudenburg in the late 4th – early 5th century, although in very small numbers. In the post-Roman level, in total 872 chaff-tempered ware fragments were found. However, this type of pottery continued to be important in the wider coastal region and is mainly indicative for early medieval sites in the area (Hamerow *et al.* 1994; Hollevoet and Hillewaert 2019, 107). It is therefore uncertain how the individuals found in the 5+post and post-Roman levels are to be understood. To what degree do they represent dug-up material from fort level 5B, and within this context: is this pottery then from integrated

Germanic/foreign soldiers turning into 'local population' after disintegration of Roman systems or control? Or does the pottery that originates from these later levels came on site after the military function of the fort stopped? Does it represent as such pottery from remaining people, or pottery from newcomers after the abandonment of the fort?

Hamerow *et al.* (1994) consider this pottery in the period of the 5th and 6th centuries as an Anglo-Saxon phenomenon (Hamerow *et al.* 1994; Hollevoet and Hillewaert 2019, 107). Yet, it is important not to equate all Germanic traditions and groups. Migrations in northwestern Europe, certainly by the end of the 4th and during the 5th century, took place in a large migration-network, involving different cultural groups and different types of migration.

In conclusion, can we deduce from the ceramic composition if this is Germanic or (Gallo-)Roman handmade pottery? Not really. The bulk of the samples was most likely made locally or *in situ* to accommodate for daily activities concerning cooking, food preparation and storage, or craft activities. While the technique recalls Gallo-Roman practices, it does not exclude non-locals of making or using the pottery. For the three exotic samples, the mobility of the military-related groups provides the best explanation here. Based on the presence of volcanic and metamorphic rock material, and the absence of plutonic inclusions, the mineralogical clues in the handmade pottery point to the Eifel and Rhine areas to the east, rather than to the north.

2.6. Appendix: Fabric and petrographic descriptions of a selection of eleven samples representing the total variation

Cf. Figures 1.80-1.81

LRHM33 – Gq (re)

Summary: A heterogeneous coarse fabric (RED) consisting of a sedimentary clay containing mainly quartz and few silt- or grainstone fragments. Characterized by an abundance of grog temper with various compositions, including vitrified fragments.

Hand-specimen: The fresh fracture has an even grey colour with brown-grey spots from the inclusions, indicating a reduced firing atmosphere. Under the stereomicroscope, large angular grey and brown-grey inclusions are visible, consisting mostly of grog fragments. The matrix is poorly sorted and contains a high number of elongated pores.

Thin section: The sample is dominated by grog inclusions with various compositions, added to a fine clay consisting of a bimodal quartz population. The coarse fraction consists mainly of rounded quartz grain, ranging in the fine sand and medium sand size, and few siltstone or grainstone fragments. The small fraction contains quartz grains of silt size and muscovite mica. Frequent planar voids and vughs are present. Multiple fragments of various compositions are encountered for the grog grains. Mainly three distinct compositions could be observed: rounded vitrified sherds with small rounded quartz; partly vitrified sherds with larger sub-angular quartz and rare mineral inclusions with third order interference colours; and sherds with a high optical activity, rather diffuse boundaries, very fine quartz and few opaques. Some of the optically active grog-fragments demonstrate a higher plasticity associated with clay pellets, which could be due to the incomplete hydration and mixing of powdered clay (Quinn 2013, 171-173) as a temper in the base-clay.

LRHM 34 – Gq (re)

Summary: A heterogeneous coarse fabric (RED) consisting of a sedimentary clay containing mainly quartz and some organic matter. Characterized by an abundance of grog temper with various compositions, including vitrified fragments.

Hand-specimen: The fresh fracture has an even grey colour with brown-grey spots from the inclusions, indicating a reduced firing atmosphere. Under the stereomicroscope, large angular grey and brown-grey inclusions are visible, consisting mostly of grog fragments. The matrix is moderately sorted and contains a high number of elongated pores.

Thin section: The sample is dominated by grog inclusions with various compositions, added to a fine clay consisting of a bimodal quartz population. The coarse fraction consists mainly of rounded quartz grain, ranging in the fine sand and medium sand size, and some organic matter (likely plant). The small fraction contains quartz grains of silt size and muscovite mica. Frequent planar voids and vughs are present. Multiple fragments of various compositions are encountered for the grog grains. Mainly two distinct compositions could be observed: rounded vitrified sherds with small rounded quartz; and sherds with a high optical activity, rather diffuse boundaries, very fine quartz and few opaques. Some of the optically active grog-fragments demonstrate a higher plasticity associated with clay pellets, which could be due to the incomplete hydration and mixing of powdered clay (Quinn 2013, 171-173) as a temper in the base-clay.

LRHM 35 – Sq

Summary: A moderately heterogeneous, medium coarse fabric (RED) consisting of a sedimentary clay two quartz populations, organic matter, and large clay pellets possibly due to poor clay mixing.

Hand-specimen: The fresh fracture has a light grey colour (*c.* 80%), indicating a reduced firing condition, with a light yellow-brown band (*c.* 20%) at the outer edge of the sherd. Under the stereomicroscope, small to medium sub-rounded transparent to translucent quartz grains are visible in the light grey part of the fabric, as are some darker plant matter or charcoal, and brown rounded inclusions that might be grog or clay pellets. The matrix is poorly sorted and contains frequent round pores. The smaller yellow-brown part has a finer, moderately sorted matrix with fine angular transparent to translucent quartz grains.

Thin section: The coarse fraction (fine to medium sand size) contains rounded quartz, some chert or siltstone and few feldspars. The fine fraction consists mainly of fine quartz (silt), muscovite mica and iron oxides. Additionally, some large clay pellets and organic

matter can be observed. The larger clay pellets contain the same composition as the fine fraction of the matrix, surrounded by planar voids, indicative of poor clay mixing.

LRHM36 – V2sqca

Summary: A very heterogeneous coarse fabric (RED) consisting of rock inclusions from volcanic and sedimentary sources. The roundedness of most rock inclusions indicates that these fragments are more likely to have been inherent to the clay, rather than added to it. Given the coarseness of these inclusions, the potter had to be aware of them and most likely intentionally selected a coarse clay. The Eifel region has been suggested as a potential provenance (after Bouquillon *et al.* 1994, De Paepe and Van Impe 1991), this has yet to be confirmed.

Hand-specimen: The fresh fracture has an uneven dark grey colour with light brown or light grey spots, indicating a reduced firing atmosphere. Under the stereomicroscope, large (sub-)angular grey and orange-red inclusions are visible, embedded in a very poorly sorted matrix with large elongated pores or cracks.

Thin section: Frequent quartz from two populations with different sources were observed: rounded quartz (medium to coarse sand size) from limestone carbonate and (sub-)angular quartz (very fine to fine sand size) from fossiliferous limestone. Few inclusions of volcanic rock (5-25%), very few muscovite mica, chert, limestone, and bioclastic grainstone inclusions. Additionally, some ghost fossils (oids) have been observed. The matrix is very poorly sorted, optically active with very frequent elongated planar voids.

LRHM37 – Sqg (Fe)

Summary: A very heterogeneous coarse fabric (RED) characterized an abundance of large grog grains and a heavy iron content, set in a sedimentary clay containing a bimodal quartz population. The iron inclusions exceed what can be expected of a natural phenomenon, supported by large angular fragments. However, it does not appear to be a proper slag-temper, but rather associated with the grog-temper. It can be suggested that the crushed pottery was used in the production of iron objects and recycled into other vessels also related to iron-production. The vitrified state of some grog grains would support this idea, which is not unlikely given the attested iron-production activities at the site.

Hand-specimen: The fresh fracture has an uneven dark to light grey colour, indicative of a reduced firing atmosphere, intersected with orange-red spots and streaks and characterized by large (sub) angular grog inclusions (*i.e.* crushed potsherds) in light grey, dark grey and 'orange-red' colours. Upon a closer examination under the stereomicroscope, it is evident that the yellow-orange-red resemble rust and point towards a heavy iron content that is unlikely to resemble a natural occurrence. The 'orange-red' grog fragments are grey potsherds coated with iron residue. The matrix is poorly sorted with elongated pores or cracks.

Thin section: The thin section is characterized by (1) the abundance of large and diverse grog grains, and (2) the heavy iron content. Only frequent quartz and few muscovite mica flakes are observed as mineral constituents. The quartz population appears to be bimodal. The large fraction consists of medium sand-sized rounded grains (*c.* 0.1-0.5 mm). The smaller fraction consists of silt to very find sand-size sub-rounded quartz. The matrix is very poorly sorted with planar voids.

(1) The grog inclusions demonstrate a large variation. For instance, the following were observed in thin section:

- An angular grog fragment of *c.* 0.8 mm in width, bimodal: large rounded quartz grains (fine sand size) and sub-rounded smaller quartz (silt – very fine sand), muscovite, some iron and possibly glauconite.
- A rounded grog fragment of *c.* 1.5 mm width, dominant rounded quartz (very fine – fine sand), muscovite, optically inactive matrix (high temperature, vitrification).
- A rounded grog fragment with poor optical activity, consisting of few small rounded quartz (very fine sand), a large rounded (0.3 mm) rock inclusion (possibly a weathered sedimentary rock), and a grog temper. The latter is referred to as grog-in-grog. The embedded smaller sub-angular grog grain contains some rounded quartz grains.

(2) The common iron inclusions are unevenly distributed, consisting mainly of rounded or angular, often fractured iron fragments, ranging up to 0.5-1.0 mm in size. In general, much of the thin section is opaque due to the presence of iron in fragments, nodes and iron-rich segments of matrix. Some of these fragments or concentrations appear to be associated with the grog grains. By adjusting the ISO values, shutter speed and exposure time of the digital camera attached to the polarizing microscope, some of the opaque fragments appear red and reveal their microstructure. While the iron inclusions are frequent, it does not come across as an intentional slag-temper that has been added, but rather as a by-product of the grog temper and possibly a contamination of the vessel's function.

LRHM38 – Sqcag

Summary: A very heterogeneous fabric (RED) characterized by a fine base-clay, consisting of mainly fine quartz grains, and a coarse fraction of limestone, evoluted sandstone, quartz and grog inclusions. Given the size and roundness of most rock inclusions, as well as the organic matter, it seems more likely that these inclusions occur naturally in the clay or were added as a raw material from a weathered context (transportation by water or wind causing the roundness of the grains), perhaps as a sand temper. The outspoken bimodality points to the latter as the best option, supported by the presence of large grog grains. Overall, it appears as if a fine clay has been heavily tempered, with sand consisting mainly of rock detritus, grog and plant material, to produce a much coarser fabric.

Hand-specimen: The fresh fracture has a dark grey-brown colour, indicating a reduced firing atmosphere. Under the stereomicroscope, few small to medium rounded translucent quartz grains are visible, a number of grey grog fragments and white calcareous inclusions

(most likely limestone), as well as some iron oxide. The moderately sorted matrix contains few elongated planar voids.

Thin section: The dominant constituents of the coarse fraction (fine to coarse sand size) consist mainly of limestone (rounded to sub-angular), rounded evoluted sandstone, rounded quartz, grog, clay pellets and organic matter (plant stems?). The small fraction consists mainly of quartz (silt size). The matrix is poorly sorted, with an uneven distribution of opaques (iron oxides), partly vitrified, and interspersed with round and elongated pores (inclusion ghosts and drying cracks).

LRHM39 – Sqg

Summary: A heterogeneous fabric (RED) consisting of a sedimentary clay tempered with sand and vitrified grog grains. The fabric was poorly mixed, the edges are more poorly sorted and have a higher porosity than the core, and was likely exposed to a decreasing temperature during the firing.

Hand-specimen: The fresh fracture has a light grey core with uneven brown-grey edges and some yellow-brown zones. Indicative of fluctuations in the reduced firing conditions. Under the stereomicroscope, many angular white, grey and brown inclusions of varying sizes can be observed. Overall, the sherd has a high porosity, consisting of elongated voids in various directions. The matrix is moderately sorted in the core and poorly sorted in the surrounding zones.

Thin section: The fine fraction consists of fine silt-size quartz grains and some small mica flakes. The coarse fraction consists mainly of rounded mono- and polycrystalline quartz (0.1-0.5 mm), vitrified grog grains, large clay pellets and possibly glauconite. The larger quartz fraction appears to have been added as a temper. The clay pellets might derive from poor mixing due to differences in the clay hydration (Quinn 2013, 171-173). The matrix varies in optical activity: the edges have a higher activity than the core of the sherd, pointing towards a decreasing temperature during the baking process. The matrix varies in degree of sorting and porosity.

LRHM41 – V2sqca (g)

Summary: A heterogeneous medium-coarse fabric (RED) consisting of rock inclusions from volcanic and sedimentary sources. The roundedness of most rock inclusions indicates that these fragments are more likely to have been inherent to the clay, rather than added to it. Given the coarseness of these inclusions, the potter had to be aware of them and most likely intentionally selected a coarse clay. The Eifel region has been suggested as a potential provenance (after Bouquillon et al 1994, De Paepe and Van Impe 1991), this has yet to be confirmed.

Hand-specimen: The fresh fracture has a gradually shifting light to dark grey colour from edge to edge, indicating a reduced firing atmosphere. Under the stereomicroscope, small and medium (sub-) rounded white and grey inclusions are visible, embedded in a poorly sorted matrix with small to medium elongated pores.

Thin section: Frequent quartz, few volcanic rock (5-25%), muscovite mica and limestone inclusions. Bimodality: (1) very fine to fine sand size, sub-rounded quartz and muscovite, and (2) medium to coarse sand size, rounded quartz, limestone and volcanic rock. Additionally, one highly vitrified grog fragment (or clay pellet?) was observed as well as some ghost fossils (oids). The matrix is (very) poorly sorted with frequent elongated voids.

LRHM51 – Sqg (re)

Summary: A very heterogeneous fabric (RED-OX) consisting of a sedimentary clay that predominantly consists of quartz, with an added grog temper consisting of several different types of ceramics.

Hand-specimen: The fresh fracture has a wide light grey core with uneven orange edges, indicating production in a mainly reduced firing atmosphere and finishing under oxidized conditions. Under the stereoscopic microscope, large rounded to sub-rounded inclusions of various grey, yellow and brown colours are visible, in an undulating fine matrix with a large frequency of small elongated pores.

Thin section: The dominant constituents are sedimentary quartz grains (sub-rounded, silt to fine sand size) and grog inclusions (sub-angular to rounded, coarse sand size). The grog inclusions vary in mineralogical composition (quartz, mica, possibly feldspar, calcite), building technique (relic coil observed), shape and size. Additionally, few clay pellets, opaque (iron) concentrations and plant inclusions were observed. The matrix varies in sorting and optical (in)activity, with small elongated pores, although the degree of porosity also varies within the thin section.

LRHM52 – Sqsh

Summary: A moderately heterogeneous fabric (RED) characterized by shell and limestone inclusions. The angularity and size of the inclusions indicate that these fragments have most likely been crushed and added to the clay as a temper. Shell-tempered pottery already occurred in the coastal plain before the late Roman period, however very scarcely, as some fragments at the late 2nd – early 3rd-century site Plassendale near Ostend demonstrate (Vanhoutte and De Clercq 2006, 101). Shell tempers have been observed in late Roman pottery in the Pas-de-Calais region (Arras, Boulogne, Vron) that were made with coastal sediment (Bouquillon et al 1994), but also have been found in more inland sites in Belgium (Erps-Kwerps, Liberchies, Maaseik, Montaigle, Neerharen-Rekem, Oudenaarde-Melden), the Netherlands (Tiel-Medel, Tiel-Passewaaij, Ressen-Bemmel, Wijk bij Duurstede-De Geer, Geldermalsen-Hondsgemet, Ede-Wageningen) and Germany (Emmerich-Praest) (after datasets from De Paepe-Van Impe, Degryse-Opsteyn and Heeren, see Van Thienen 2016, 211). This wide distribution demonstrates that shell tempers are not necessarily produced near the site where they were found. It is thus possible for the shell-tempered sherd to have been made in the coastal plain near Oudenburg, but can also have a different provenance.

Hand-specimen: The fresh fracture has a brown-grey to dark grey colour as the result of a reduced firing atmosphere. Under the stereomicroscope, large elongated and angular white and brown shell inclusions are abundantly visible, as well as smaller translucent to white-opaque sub-rounded mineral inclusions (most likely rock fragments and quartz grains), set in a moderately sorted matrix with a high frequency of elongated and rounded pores.

Thin section: The thin section is dominated by a shell temper. Mostly large elongated, curved and (sub)angular shell fragments, between *c*. 0.1 and 1 mm in size. Only one type of shell has been observed with one or two layers, consistent with the ones observed by De Paepe and Van Impe (1991, 162) from Liberchies: '*In general, they consist of two distinct layers: a thin outer layer, with crudely columnar crystals arranged perpendicular to the shell surface, and a finely fibrous inner layer with carbonates oriented nearly parallel to the shell margin*.' Based on these characteristics, De Paepe and Van Impe suggest that these shell fragments stem from mollusks, although brachiopods cannot be ruled out. Additionally, some limestone fragments could be identified, with one particularly angular example containing a similar shell fragment, indicating that crushed fossiliferous grainstone (fired below 850°C) was added to the clay. Besides shell and limestone fragments, subrounded quartz, occasional clay pellets and iron oxides were observed. The matrix is poorly sorted with unevenly distributed inclusions and frequent planar voids, mainly encircling the shell and limestone fragments.

LRHM53 – MLG

Summary: A very heterogeneous fabric (RED-OX) characterized by metamorphic rock inclusions and large rounded quartz minerals. The roundedness of most rock inclusions indicates that these fragments are more likely to have been inherent to the clay, rather than added to it. Given the coarseness of these inclusions, the potter had to be aware of them and most likely intentionally selected a coarse clay. The type of fabric belongs to the main Metamorphic group encountered in the study of late Roman handmade pottery (Van Thienen 2016; Van Thienen, Goemaere, De Clercq *forthcoming*), and can be associated with sherds gathered from the sites of Meldert and Neerharen-Rekem in Germania Inferior. Their thin sections indicate that they were produced not far from their source area, what in this case would be non-local to Oudenburg. Initially, all late Roman handmade pottery with metamorphic inclusions were categorized under group A of De Paepe and Van Impe, with a provenance in the Elbe-Weser area in northwest Germany. This sample, however, lacks plutonic inclusions and the occurrence of low-grade metamorphosed rock fragments might indicate that another source-area such as the Rocroi and Stavelot-Venn massifs or Taunus range should be investigated (pers. comm. Eric Goemaere).

Hand-specimen: The fresh fracture has a light and dark grey colour with one orange edge, corresponding with the outer surface, indicating a mix of reduced and oxidized firing conditions. Under the stereomicroscope, large rounded translucent to white or grey (opaque) inclusions are visible, most likely rock fragments and quartz grains, in a poorly sorted matrix with small elongated pores.

Thin-section: The dominant constituents of the coarse fraction consist of (sub-)rounded quartz grains and rock fragments of highly evoluted sandstone from a metamorphic source, ranging in size between medium and very coarse sand. The fine fraction consists mainly of quartz, with muscovite mica, and few organic inclusions. A potential grog-fragment has been observed. The matrix varies in sorting and degree of porosity. The optical activity shows that part of the matrix appears vitrified, indicating two different firing temperatures in addition, or in correspondence to, the two different firing atmospheres (RED-OX).

D. Local wheel-thrown wares

1. North Menapian grey wares

Sofie Vanhoutte and Wim De Clercq

1.1 Fabric

Next to the handmade wares NOM HA the wheel-turned group NOM RE constitutes the second pillar of the North Menapian pottery tradition. The reduced wheel-turned North Menapian wares, both the coarse reduced component as its fine reduced variant[131], are characterized by a hard, grey coloured fabric with a slightly irregular fracture (Figure 1.84). In some cases the fabric shows a pale grey core with brown margins and grey surfaces. The fabric is mainly defined by well-sorted quartz in moderate to abundant quantities. Also included in the fabric are black grog, organic (vegetal) matter, sparse feldspar and glauconite grains. The coarse products display the same fabric as the fine reduced group but with a coarser tempering and with the additional use of clay-pellets (Vanhoutte *et al.* 2009c, 118, 125-126) (Figure 1.84). Petrographic research by Degryse (KULeuven) and De Clercq (Ghent University) gave evidence of parallels between this fabric and the one of medieval pottery productions made on and from the glauconite-containing tertiary clay-formation of Asse, surfacing immediately south-east of Bruges and south of Aardenburg on the *cuesta of Oedelem-Zomergem* (De Clercq and Vanhoutte 2011; see also Chapter 1.E in this volume).

1.2 Typology

The North Menapian wheel-turned pottery emerged in the late 2nd century. It represents a large set of forms including drinking beakers, dishes, bowls, jars and lids.

A first typology for the mid-Roman North Menapian pottery, both the handmade and reduced component, was developed in 2009 based on the pottery types present in the OS 4980 assemblage, the pottery content of the large waste-pit of fort level 4 (Vanhoutte *et al.* 2009c, 135: Fig. 35). A further, preliminary elaboration of this typology was presented in 2011 at the SGRP Congress after the study of a selection of sites and pottery assemblages in the North Menapian area (De Clercq and Vanhoutte 2011).

As for the North Menapian handmade pottery, a typology for the wheel-turned component is presented here (Table 1.65; Figure 1.85; Plates CLXXXVIII-CXCV). It is elaborating further on the first typology developed in 2009 (Vanhoutte *et al.* 2009c, 135: Fig. 35; see before, Chapter 1.C.1, Section 3) and is based on the North Menapian pottery assemblages of the successive fort levels of the Oudenburg fort (primarily those of the south-west corner site), covering the period *c.* AD 180 – 270/300. The North Menapian reduced (wheel-turned) pottery typology is based on the same classification system, principles and coding as the North Menapian handmade typology presented in Chapter 1.C.1., Section 3. Here as well, a concordance table is included to clarify the associations with the 2009 typology and the former typology made by Thoen (1978/1987) for his 'Coastal pottery' (LOK) (Table 1.66). As for the handmade counterpart, the presented North Menapian reduced (wheel-turned) typology is not intended as a chronological system and should not be used as such, nor is it our intention here to go into more detail on the distribution of the different types in the North Menapian territory. The presented typology shows the forms and types in the North Menapian reduced group in the period *c.* AD 180 – 270/300 at Oudenburg.

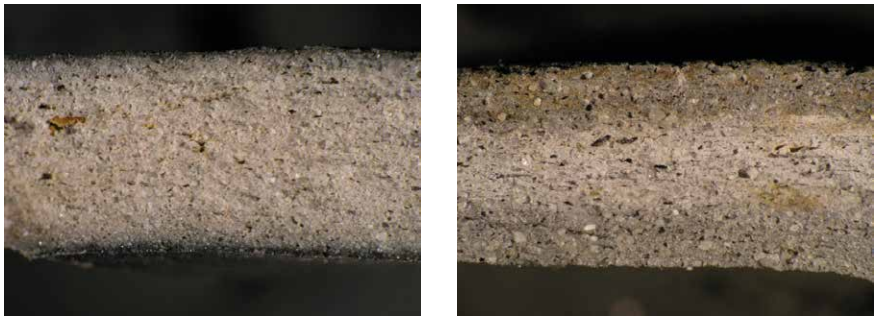
This North Menapian reduced pottery production is further discussed in relation to the North Menapian handmade pottery in Chapter 1.E, where their significance, influences and interactions will be elaborated on.

131 **While these were separated as much as possible during the inventory of the ceramics, it was decided here to count them as one group, for several reasons. Displaying the same basic fabrics – although the fine reduced group mostly shows finer versions – but with a finer or coarser finishing of the exterior walls, their distinction is merely a functional one. The fine reduced group comprises the beakers, while the coarse reduced group consists of all other vessel forms. In other words, the function of the vessel decided whether the fabric was made somewhat smaller or coarser, whether the walls were made thinner or thicker and whether the exterior wall was finished more extensively or less. Some 'fine reduced' vessels were not completely burnished and have local parts, *e.g.* near the base, which were not that thin-walled. On the other hand, some 'coarse reduced' vessels have rather thin-walled parts and show a complete burnishing. The line between the two groups is thin, and an attempt for a strict division leaves a large share of body fragments unidentified. Therefore, all reduced wheel-turned pottery sherds are counted as one group and types within this group are discussed separately in the analysis as 'fine reduced' or 'coarse reduced', cf. Volume I, Chapter V.2, Tables 7 and 8.**

Table 1.65. Forms and types in the North Menapian reduced pottery in the period AD *c.* 180-270/300, as assessed in the Oudenburg assemblage, and primarily based on the assemblages of the key contexts selected from the Oudenburg south-west corner site (see Plates CLXXXVIII-CXCV). The listed types in Italic are the specific types occurring at the Oudenburg site. Missing type and subtype numbers point to types and subtypes only occurring in the North Menapian handmade group (see Tables 1.62 and 1.67).

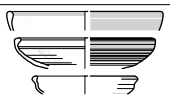
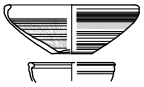
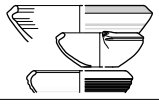
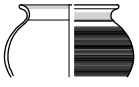
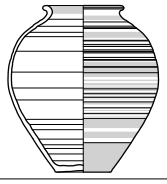
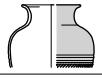
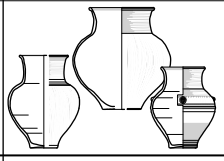
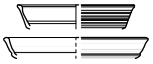
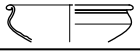
TYPE II: IN-TURNED FORM	
II.A. in-curving-walled	
II.A.1 strongly incurved, profiled rim (with exterior cordons)	
	NOM RE (storage) pot II.A.1 – closed
II.A.2 convex body with upright, plain rim (variant: thickened rim at the inside)	
	NOM RE dish II.A.2
	NOM RE dish II.A.2var.
	NOM RE bowl II.A.2var.
II.A.3 convex body with in-turned, plain rim (with or without pouring lip (p))	
a: without bend	
b: with bend (angular shoulder, sharply carinated to the inside)	
	NOM RE dish II.A.3a
	NOM RE bowl II.A.3a
	NOM RE bowl II.A.3ap
	NOM RE bowl II.A.3b
II.A.4 convex body with inturned rim with bend pronounced on the exterior (rib) (=lid-seated rim) (with or without studs on the shoulder (st))	
	NOM RE dish II.A.4
	NOM RE bowl II.A.4st
II.A.5 convex body with in-turned collared rim (with or without knob(s?) on the rim exterior (K))	
	NOM RE bowl II.A.5
	NOM RE bowl II.A.5K
II.A.6 flat-collared/wall-sided rim (imitation of North-French type)	
	NOM RE bowl II.A.6
II.B. carinated	
II.B.1 slightly inturned, upright, rounded rim	
	NOM RE pot II.B.1 – open (presumably not a bowl, although no complete profile is preserved)
TYPE III: OUTCURVED FORM	
III.2 everted rim, short neck, S-profiled globular body	
	NOM RE pot III.2 – open
	NOM RE pot III.2 – closed
III.3 cf. III.2, with lid-seated rim, with small interior lid groove at top of rim	
	NOM RE pot III.3 – open
III.4 cf. III.2, with lid-seated rim, with deep interior lid groove	
	NOM RE pot III.4 – closed
III.6 short everted, out-turned rim, ovoid body	
	NOM RE pot III.6 – closed
III.7 everted rim, slightly concave neck, ovoid body	
	NOM FR beaker III.7
III.8 short, slightly everted rim, short concave neck, globular body	
	NOM FR pot III.8 – open
III.9 short, slightly everted rim, tall upright, slightly concave neck, globular body	
with studs (st): so-called 'stud-'beaker"	
	NOM FR beaker III.9
	NOM FR beaker III.9st
TYPE IV: CARINATED FORM	
IV.1 everted upper wall, flattened rim, often with chamfer	
	NOM RE dish IV.1
	NOM RE bowl IV.1
IV.2 everted upper wall, thickened or rounded bead rim; upper wall is shorter than lower wall	
	NOM RE dish IV.2
	NOM RE bowl IV.2
IV.3 upright to slightly everted upper wall, short horizontal rim; upper wall is higher than lower wall	
	NOM RE bowl IV.3
IV.4 slightly convex upper wall, thickened bead rim, horizontal burnishing on the body: imitation of North-French type	
	NOM RE bowl IV.4
IV.5 inturning upper wall, hooked/curled rim, horizontal burnishing on the body: imitation of North-French type	
	NOM RE bowl IV.5

TYPE V: TRUNCATED FORM
V.1 tall, straight neck, short, everted rim, globular body, high foot: imitation of North-French type 'gobelet tronconique'
NOM FR beaker V.1
TYPE VI: BULGING FORM
VI.1 truncated pot with slightly bulding neck, thickened, rounded, bending rim, burnishing on the body: imitation North-French product
NOM RE pot VI.1 – open
VI.2. globular body, no neck, thickened, rounded rim, horizontal burnishing on the body: imitation North-French product
NOM RE pot VI.2 – open
TYPE VII: LID
VII.1 rounded rim
NOM RE lid VII.1
VII.2 cut-off rim
NOM RE lid VII.2
VII.3 profiled rim
NOM RE lid VII.3



NOM FR NOM RE

Figure 1.84. Example of the North Menapian fine reduced fabric (NOM FR) and of the North Menapian coarse reduced fabric (NOM RE). Magnification of 15x under the binocular (taken from Vanhoutte *et al.* 2009c, 117: Colour Plate 2).

RE	DISH	BOWL	BEAKER	POT OPEN	POT CLOSED	BOTTLE
II.A.1						
II.A.2						
II.A.3						
II.A.4						
II.A.5						
II.A.6						
II.B.1						
III.2						
III.3						
III.4						
III.6						
III.7						
III.8						
III.9						
IV.1						
IV.2						
IV.3						
IV.4						
IV.5						
V.1						
VI.1						
VI.2						10cm

2. Two large beakers with an Oudenburg-Aardenburg-*Britannia* link

Sofie Vanhoutte and Sonja Willems

The 'real' *terra nigra* of the High Empire is not recognized at the site, which is not very surprising given the mainly late fort occupation. Most (mid-Roman) grey, fine-walled vessels with – sometimes very high-quality – burnished surface from the site can be identified as the fine reduced variant of the North Menapian production and are classified as such. This fine reduced North Menapian component comprises several subfabrics, with varying hardness and quality of surface finishing. No *terra nigra* import from the South could be detected.

Thirty-five fragments, representing two MNI, can be set aside as similar to *terra nigra* products though. They have a fabric that resembles the ones from the local fine reduced wares. The only one of which the profile can be identified, is a large beaker of which fragments were found scattered over several contexts from fort levels 2 and 3. The fragments were easily recognized by their incised decoration *ante cocturam*, in the shape of lozenges of type 'Renault'. Both individuals are decorated in the same way. The form has no real comparison in the common *terra nigra* typologies, as the one by Deru (1996) and Ben Redjeb (1985; for Picardy). The Oudenburg individual of which a large part of the profile was preserved (Figure 1.86), finds its closest parallels in the biconical jars or beakers with long, concave neck. However, the body shows ridges instead of a bend. The decorative pattern is situated on the flattened part of the body, demarcated by projections at the top and the bottom. The (missing) foot was probably rather high and developed.

While vessels with incised decoration are rather rare on the Continent, they do occur more frequently in *Britannia*. Both the London-Essex stamped wares and the 'London ware' style are characterized by their use of this kind of decoration next to stamped and rouletted decoration (Tyers 1996b, 169-171). Especially the fabric of the latter production, described by Tyers as '*a hard, smooth-textured micaceous fabric, with a slightly laminar fracture, dark grey-brown core with dark-grey or black slip on finely burnished surfaces*' appears to be very similar to that of the Oudenburg vessel. However, on the London ware the longitudinal incisions are accompanied with semi-circles. According to the horizons of Deru (1996) as well as according to the chronology by Tyers (1996b), the vessels with incised decoration occur mainly from the last third of the 1st century and during the whole 2nd century.

One seemingly identical vessel, having the same form and decoration, was found in the civil settlement at Aardenburg, at the site 'Hof Van Buize II' located at *c.* 400 meters south-east of the presumed eastern gate of the Roman fort (de Visser 2001, 154 and Fig. 9.86). Only nine body fragments were found, recovered from a hearth structure (context 5) which was part of a workshop area. The function of the large number of hearths remains unclear but ceramic production is excluded as a possibility. Interpretations given by de Visser are the production of a local fish sauce or the roasting of shells for the production of lime (de Visser 2001, 213-216). The accompanying samian ware in the find context dates the Aardenburg vessel in the first quarter of the 3rd century, which is largely in line with the phasing of the Oudenburg vessel(s) in fort periods 2 and 3.

The fabric of the Oudenburg individual that can be assigned to fort period 2, is very sandy, within a rather heterogeneous matrix with voids (Figure 1.87a). The milky-white and opaque quartz and especially the presence of red grog are characteristic. The milky-white quartz might refer to the local products of the North Menapian coarse reduced wares. Its 'sandwich' colour represents different stages in the firing and cooling process, from reduced over oxidized to reduced.

The fabric of the beaker that can be assigned to fort period 3, is also very close to the North Menapian fabric, but in contrast to the fabric of the first individual the red grog inclusions are lacking here (Figure 1.87b).

With these two isolated finds known at Oudenburg and the single vessel known at Aardenburg, both dated to the first half of the 3rd century, one may assume that they represent local/regional imitations of perhaps the British London Ware style. A cautious hypothesis is that these vessels were made by soldiers/potters who got influenced by seeing these London ware pots through contacts or who were first stationed in *Britannia* and later relocated to the Oudenburg or Aardenburg fort.

Figure 1.85 (opposite page). Visualization of Table 1.65: forms and types in North Menapian reduced pottery in the period AD *c.* 180-270/300, as assessed in the Oudenburg assemblage, and primarily based on the assemblages of the key contexts selected from the Oudenburg south-west corner site. All types are illustrated on Plates CLXXXVIII-CXCV.

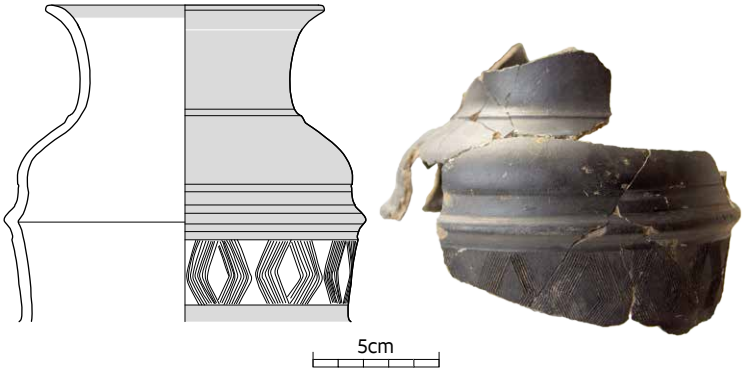
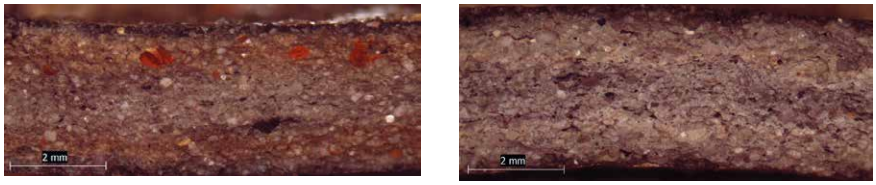


Figure 1.86. The *terra nigra*-like beaker from fort level 2 at the south-west corner site of the Oudenburg fort.



a b

Figure 1.87. Left: fabric of the fort level 2 beaker and illustrated as Figure 1.86. Right: fabric of the fort level 3 beaker (Photos by S. Willems). Both beakers were found at the south-west corner site of the Oudenburg fort.

Table 1.66. Concordance between the North Menapian reduced pottery typology presented here, the earlier – more limited – North Menapian pottery typology presented by Vanhoutte *et al.* 2009c (based on the pottery of the large waste-pit OS 4980 of fort level 4) which laid the foundation, and the 'Kustaardewerk' typology presented by Thoen (1978/1987).

NOM TYPOLOGY NEW	NOM TYPOLOGY Vanhoutte *et al.* 2009c	TYPOLOGY LOK Thoen 1978
NOM FR BEAKER III.7	no type	no type
NOM FR BEAKER III.8	NOM FR TYPE 4	no type
NOM FR BEAKER III.9	NOM FR TYPE 1	LOK TYPE 8
NOM FR BEAKER III.9st	NOM FR TYPE 3	LOK TYPE 9
NOM FR BEAKER V.1	no type	LOK TYPE 10
NOM RE STORAGE POT II.A.1	no type	no type
NOM RE POT II.B.1	NOM RE TYPE 1	no type
NOM RE POT III.2 closed	NOM RE TYPE 15	LOK TYPE 2a
NOM RE POT III.2 open	NOM RE TYPE 15	LOK TYPE 2a
NOM RE POT III.3	NOM RE TYPE 16	< LOK TYPE 2a
NOM RE POT III.4	no type	no type
NOM RE POT III.6	no type	no type
NOM RE POT VI.1 open	no type	no type
NOM RE POT VI.2 open	no type	no type
NOM RE DISH II.A.2	no type	LOK TYPE 7
NOM RE DISH II.A.2var.	no type	LOK TYPE 4b
NOM RE DISH II.A.3a	NOM RE TYPE 3	no type
NOM RE DISH II.A.4	NOM RE TYPE 6	no type
NOM RE DISH IV.1	NOM RE TYPE 11	no type
NOM RE DISH IV.2	no type	no type
NOM RE BOWL II.A.2var.	NOM RE TYPE 4	no type
NOM RE BOWL II.A.3a	NOM RE TYPE 5	no type
NOM RE BOWL II.A.3ap	< NOM RE TYPE 5	no type
NOM RE BOWL II.A.3b	NOM RE TYPE 8	LOK TYPE 4a
NOM RE BOWL II.A.4st	NOM RE TYPE 7	no type
NOM RE BOWL II.A.5(k)	NOM RE TYPE 9	no type
NOM RE BOWL II.A.6	NOM RE TYPE 10	no type
NOM RE BOWL IV.1	no type	LOK TYPE 5
NOM RE BOWL IV.2	NOM RE TYPE 12	no type
NOM RE BOWL IV.3	NOM RE TYPE 13	LOK TYPE 6
NOM RE BOWL IV.4	no type	no type
NOM RE BOWL IV.5	no type	no type
NOM RE LID VII.1	NOM RE TYPE 17	no type
NOM RE LID VII.2	NOM RE TYPE 18	no type
NOM RE LID VII.3	NOM RE TYPE 19	no type

E. The North Menapian pottery group. Reviewing an important 2nd- and 3rd-century local/regional ceramic industry

Sofie Vanhoutte and Wim De Clercq

1. The North Menapian pottery industry: biography, general characteristics and distribution

The North Menapian pottery (both handmade and wheelthrown, as in Chapter 1.C.1 and Chapter 1.D.1) was already identified by Thoen (1978) in the coastal plain as '*Kustaardewerk*'/'Coastal pottery' and by Trimpe Burger (1997) in Zeeland and at the Aardenburg fort as '*Vlaams-Romeins aardewerk*'/'Flemish-Roman Ware'. However, according to more recent petrographical analysis by De Clercq (Ghent University) and Degryse (KULeuven), this pottery was not produced in the coastal plain itself, but more likely on the tertiary outcrop of the Asse clay formation, or at least the potters used clays originating from that region (Vanhoutte *et al.* 2009c; De Clercq and Vanhoutte 2011; cf. Chapter 1.D.1.1). This clay-formation is located on the *cuesta of Oedelem-Zomergem,* which surfaces to the south-east of Bruges and to the south of the Aardenburg Roman fort. To date, no kilns or wasters have been brought to light yet. The North Menapian pottery was fired in a reduced atmosphere, producing a black or dark-grey surface and core; in the wheel-turned group the latter is often lighter than the surface. Fabrics of NOM HA and NOM RE have been described more in detail in Chapter 1.C.1, Section 2, and Chapter 1.D.1, Section 1.

As already indicated for the North Menapian handmade pottery, the industry seems to have evolved from a local 1st-century AD tradition and became prominent both typologically and quantitatively from the middle/third quarter of the 2nd century AD onwards. At that moment, a wheel-turned tradition emerged and grew parallel with the handmade tradition made in the same fabric and producing similar types, although it cannot be ascertained with certainty yet if the wheel-turned tradition emerged directly out of the handmade one. It might also be that the first was introduced to the region independently of the latter (*e.g.* by the Roman army) and that both traditions influenced one another (see further).

The core distribution area of this ceramic industry covers the area between the mouth of the Scheldt in the north, Oudenburg in the west and the northern part of Sandy Flanders in the south and east, a region corresponding with the northern part of the *civitas Menapiorum*. Based on the distribution pattern of this ware, the name 'North Menapian' was introduced, indicating geographical significance and by no means implying any ethnical connotation (De Clercq 2009, 422). The area is bordered to the north and east by the distribution area of the Low Lands Ware, the ceramics produced near Bergen-op-Zoom (NL). On the isle of Walcheren (NL) both industries seem to have delivered their products to consumers in high numbers. Other transition zones are less visible as distribution patterns seem to be well delineated.

This North Menapian industry has been discussed extensively in light of the study of the pottery assemblage of the large waste-pit OS 4980 from fort level 4 (Vanhoutte *et al.* 2009c). De Clercq and Vanhoutte (2011[132]) elaborated further on the subject through the study of the North Menapian pottery group in a wider temporal and spatial perspective, based on a selection of 26 pottery complexes found at nine different sites in the North Menapian area – both military and civilian sites – covering more or less the 1st to 3rd centuries AD.

2. Stylistic influences and interactions in the North Menapian pottery group

The North Menapian pottery group was clearly rooted in the native repertoire of forms, with globular (cooking) pots and curved-walled bowls, and decorative styles, like comb-scoring and fingertip impressions on the rim (cf. De Clercq 2005; 2009). We already highlighted the connection both in shape and fabric of the handmade and wheel-thrown components but in view of the absence of production sites, it cannot be stated with certainty that the wheel-thrown pottery industry emerged out of the handmade one. One should also account for an external (*e.g.* military) introduction of the wheel-thrown technique in the area, which in its turn stimulated the further development of the handmade wares, or induced a typological interaction. In any case, both wares co-existed both in civilian and military context and the grey wares did not replace the handmade ones.

The North Menapian industry not only refers to the native repertoire. Mainly new forms and decorations from the second half of the 2nd century AD onwards, remind one of the more classic Roman pottery spectrum and some Romano-British wares.

The form of the beakers type III.9, both in handmade and in wheel-turned techniques, recall earlier thin-walled forms in North Gaulish *terra nigra* (Deru 1996, types P46-53) (Figure 1.88: b).

132 **Summary of unpublished paper for the Study Group of Roman Pottery Congress in Amsterdam, 24th of June 2011.**

Figure 1.88. a: two NOM FR beakers V.1; b: a NOM FR beaker III.9st, a so-called stud-beaker, from the large waste-pit OS 4980 of fort level 4.

Figure 1.89. A NOM RE bowl IV.3 (Photo by F. Lagae).

Other North Menapian forms resemble North French types. Both the carinated bowls NOM RE IV.4 and IV.5 recall the Northern French 'bol caréné' (cf. for IV.4: Tuffreau-Libre 1980a, 53: type 'bol caréné' IIa and IIb; for IV.5: idem, 47: type VIIa). The NOM RE beaker V.1 (Figure 1.88: a) relates to the North French 'vase/gobelet tronconique' (cf. Tuffreau-Libre 1980a, 100: type 'vase tronconique' IIIc). Also the NOM RE open pot types VI.1 and VI.2 recall forms in the Northern French repertoire, very similar to *e.g.* types from the Bruay-Labuissière kilns (cf. Clotuche and Willems 2012, 72: Fig. 14). The bowl with vertical wall-sided rim (NOM RE bowl II.A.6), a rare type in the North Menapian assemblage, can also be recognized in the North French repertoire, for example at Famars as type Ner J6 (Blondiau *et al.* 2001). The horizontal linear burnishing, typical for several North Menapian forms, is also common for many North French types. The many resemblances between the North Menapian reduced wares and North French products more likely indicate that they derived from the same prototypes, possibly brought in by the military, rather than that imitation between these productions are in play. The same process may account for the correspondence between the carinated bowls with horizontal rims NOM RE bowl IV.3 (Figure 1.89), an index fossil in the NOM group, and forms in the BB1 repertoire (cf. Holbrook and Bidwell (1991) (Dorset) BB1 type 39.2, 39.4).

Mainly within the North Menapian handmade group, similarities can be recognized with the Romano-British Black-Burnished industry and the continental BB-imitations along the Channel coast further south (see for the latter: Tuffreau-Libre *et al.* 1995) (De Clercq and Vanhoutte 2011). Certain forms like type NOM HA pot II.A.1, dishes resembling the Holbrook and Bidwell (1991) (Dorset) type 58 (cf. NOM HA dish I.1), jars with wide, everted rims sharply carinated to the wall (NOM HA pot III.1), and the use of black coating[133] on some vessels (on rim and/or shoulder) and the application of burnishing patterns know their counterparts in the (handmade) BB1-production. The shoulderless pot NOM HA pot III.1, with globular body and rim sharply carinated to the outside, is a form typical of the coastal area and does not occur in inland handmade fabrics. As already pointed at in Vanhoutte *et al.* 2009c (with references), the absence of a shoulder relates this form to BB1 and BB2 cooking pots or similar forms from other continental coastal areas, such as a distinctive group decorated in

133 **Chemical analysis of the black coating on the rim of handmade wares from Aalter and Kluizendok (near Ghent), two sites more inland, has indicated that the coating was made of birch or spruce tar (De Clercq 2009, 169). Complementary research on some samples from the Oudenburg site of handmade wares and flagons with black coating has yielded the same result (research organized by De Clercq; pers. comm.).**

comb-scored patterns and with a burnished rim in the Yser-Aa estuarine zone on both sides of the modern French-Belgian border (*e.g.* Roumegoux and Termote 1993, Fig. 51; Hannois 1996, Fig. 2; Bouche and Michel 2004) and a similar group in the northern part of the *civitas Morinorum* (Florent and Cabal 2004; Dhaeze and Seillier 2005, 631, Fig. 32).

Amongst grog-tempered coarse wares listed by Pollard for East Kent, his types 45 and 46 (see Pollard 1988, 53: Fig. 15), characterized by lugs on the shoulder, may well be attributed to the North Menapian tradition (the stud-'beakers' NOM HA pot III.9st and III.10st). The examples Pollard discussed, were found at Richborough in unstratified and (according to his findings) late 1st – early 2nd-century contexts, with only two other specimens elsewhere in Kent at Eastry and Birchington. Pollard found parallels at Vindonissa (G) and in late Iron Age material from Lincolnshire, but not in south-east Britain, therefore suggesting that '*the possibility that they were brought into Richborough by military units as personal possessions or quartermasters' stores should not be overlooked*' (Pollard 1988, 45). Since the dating of the stud-beakers found at Kent is arbitrary, these vessels may well have been North Menapian (brought in by military personnel?) or influenced by the North Menapian products. Worth mentioning is the presence at Richborough of some pots that would easily fit in in the North Menapian typology based on form and decoration, *e.g.* the open pot no. 29 on Plate XXII of the first Richborough report (Bushe-Fox 1926) with vertical comb-scoring on the upper half of the body, an identical type as open pot NOM HA III.2. A comparative study of fabrics should be a topic for future research.

3. North Menapian products and their dominance in the pottery assemblages of the Oudenburg fort

The combined presence of both handmade and wheel-turned North Menapian pottery quantitatively and typologically dominates the pottery assemblages until fort period 4, the late 3rd century AD, indicating the strong persistence of a regional pottery tradition in supplying the Oudenburg soldiers with ceramic vessels for at least a century.

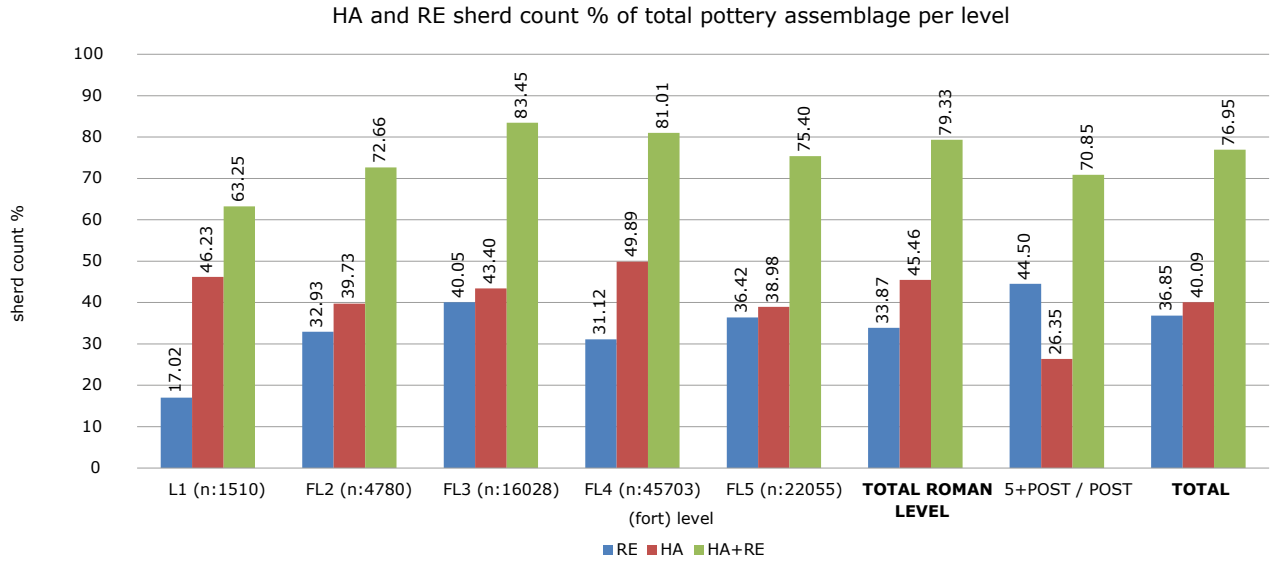
At every fort level, both handmade and wheel-turned pottery prevail significantly in the pottery assemblages of the south-west corner site of the Oudenburg fort. When the total Roman assemblage is considered, the handmade and wheel-turned reduced wares together account for *c.* three quarter of the assemblage, whether based on sherd count or minimum number of individuals (Figure 1.90). When only the Roman level is taken into account, leaving out the pottery fragments recovered from the transition level 5+post and the post-Roman levels, this group even reaches almost 80% in sherd count and 78% in MNI count of the total pottery assemblage. The counts are highest at fort levels 3 and 4 with proportions slightly over 80% for each of both quantification methods.

Both the handmade and wheel-turned pottery are dominated by the North Menapian pottery industry. Only small portions are represented by Low Lands Ware 1 (see Chapter 1.B.5.3), imported greywares from the North of France (see Chapter 1.B.5.2) and Romano-British coarse pottery (see Chapter 1.B.5.1). In fort level 4 some individuals in a regional /'North Gaulish' reduced fabric of so far unknown origin appear in the assemblage, a fabric that eventually at fort level 5 dominates the reduced assemblage. In the final levels also handmade wares in 'Germanic style' make their appearance (see Chapter 1.C.2).

At level 1, the handmade pottery clearly prevails over the reduced wheel-turned pottery, both in sherd count (*c.* 46% versus *c.* 17% of the total pottery assemblage of level 1) and in MNI count (*c.* 49% versus *c.* 24% of the total pottery assemblage). From fort level 2 onwards, their shares become more equal, with at that level handmade pottery accounting for *c.* 40% or *c.* 37% and reduced wheel-turned pottery for *c.* 33% or *c.* 36%, depending on the quantification method. At fort level 3, the level with the highest share of the total reduced group in the pottery assemblage (*c.* 83.5% of the sherds, *c.* 82% of the MNI), the MNI % of the reduced wheel-turned pottery exceeds that of the handmade pottery, with *c.* 48% versus *c.* 34%. The sherd count % is more equal, which may be explained by more handmade vessels of larger volume, as can be deduced from their presence in the key context assemblages of this fort level 3 (see the Appendix in this volume, Section 4). Fort level 4 shows a similar total share for this category in the pottery assemblage. Even still at fort period 4, dated in the later 3rd century AD, the handmade pottery remains very prominent, reaching even *c.* 50% of the total sherd count and *c.* 41% of the total MNI count. Based on MNI, the reduced wheel-turned pottery is equally important in that period (*c.* 40%). Of course, on such a site with a very long occupation history the pottery assemblage of every level evidently comprises (a lot of) dug-up sherds from the previous level. The residual material within the reduced category is difficult to distinguish – within the North Menapian pottery of the late 2nd – 3rd century even not possible –, given the considered narrow time frames. This residual component is definitely there, but does not bias the previous analysis though. After all, residuality characterizes every level and the counts are made on pottery assemblages that increase through time, from level 1 to fort level 4.

The persistent high share of handmade pottery at fort level 5 demonstrates the enormous residuality at the site. The study of the fine wares of the double well OS 2562 of fort level 5 gave evidence of the substantial residual component on the site, and definitely at this level (Vanhoutte *et al.* 2009b, 97-99). The North Menapian handmade pottery in the late Roman assemblages of the site, still the dominant pottery group, represents the North Menapian pottery repertoire of the 2nd and 3rd century (already well-known, cf. Thoen 1978; Vanhoutte and De Clercq 2006; Vanhoutte *et al.* 2009c), and should be interpreted as dug-up material.

For every fort level, key contexts – stratigraphically, quantitatively and qualitatively reliable contexts – were selected in order to obtain more insight into the chronology of the successive fort levels and into the character of the respective find assemblages (see the Appendix in this volume). The key context pottery assemblages can therefore be considered as representative to consider the fabric composition of the handmade (and reduced wheel-turned) group. The five key contexts of fort level 1,



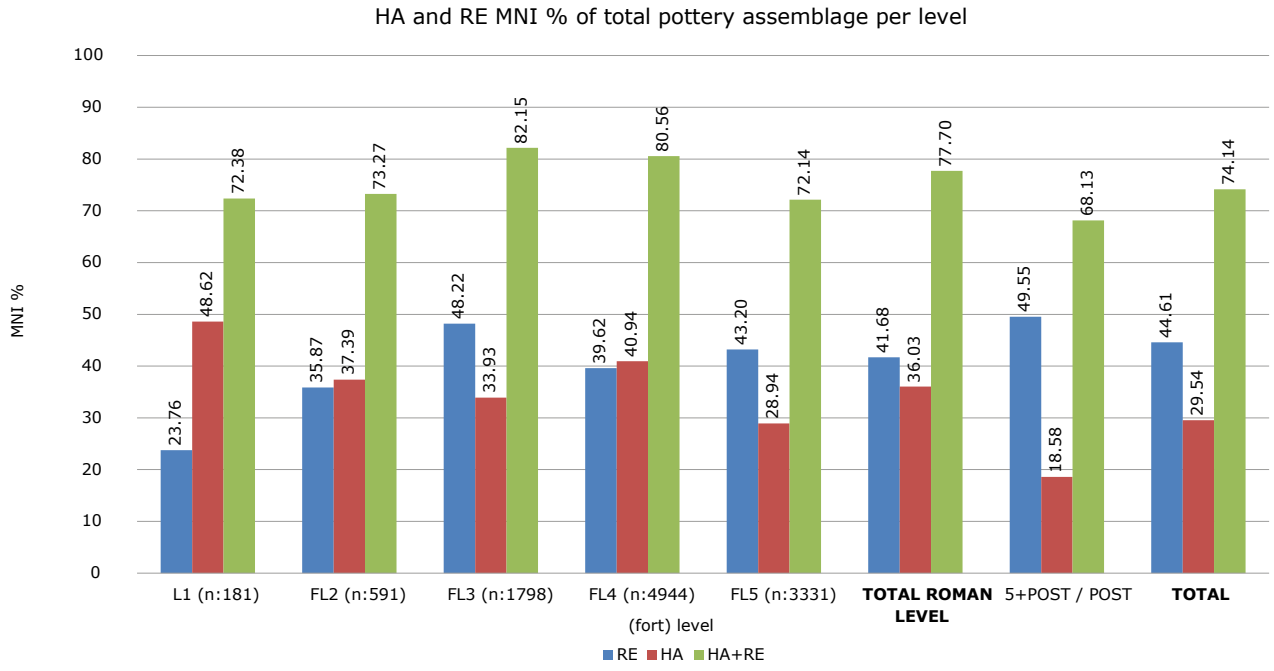


Figure 1.90. The shares of handmade and reduced wheel-turned pottery in the total pottery assemblages according to the stratified evidence, of which both are completely dominated by the North Menapian products. Top: distribution in sherd count percentage. Below: distribution in MNI percentage.

representing 60 MNI handmade wares and 25 MNI reduced wheel-turned pottery, reveal that all but one individual (from Bruay-Labuissière) are North Menapian products. All handmade pottery (33 MNI) of the key contexts of fort level 2 are of North Menapian production, while of the reduced wheel-turned pottery (38 MNI) only five vessels are from Bruay-Labuissière and one from the Champagne region. All handmade (50 MNI) and reduced wheel-turned (52 MNI) pottery of the four key contexts of fort level 3 are North Menapian products, except for only one Bruay-Labuissière vessel. The key contexts of fort level 4, representing 393 MNI handmade wares and 444 MNI reduced wheel-turned pottery, give evidence of the growing importance of other productions. While only nine handmade individuals are not a North Menapian product, 53 reduced wheel-turned vessels are clearly of another production (or 12%). Certainly, not all fabrics present at the respective levels are included in the key context assemblages. These fabrics are however rarities in the assemblage, as can be deduced from the dominance of the North Menapian products, certainly until fort level 4.

4. Towards an integrated North Menapian typology

From the mid/third quarter of the 2nd century AD, the North Menapian handmade and reduced pottery productions co-existed and further developed, producing – for a large part – similar forms and types, while certain forms and types were only made in one of the two techniques. The correspondence between several types and decorations makes clear that both components influenced each other.

This becomes clear when presenting both typologies in an integrated North Menapian typology in which both the handmade and wheel-turned component are shown at the same level, based on the given that several of their types display the same form and shape and show mutual influences in types (Table 1.67; Figure 1.91).

As already discussed for the North Menapian handmade typology presented here (Chapter 1.C.1, Section 3), instead of using the division dish-bowl-beaker-pot, this typology takes the body form as starting point and the rim type as second criterion ('body-rim' classification). It subsequently seeks the functional forms in which these characteristics are present. This way, parallels between the different production techniques – handmade versus wheel-turned – become clear and visible. This system also has the advantage that any 'new' type can be inserted into the typology with a new coding.

This North Menapian typology shows forms and types present at the Oudenburg fort in the period AD *c.* 180-270/300 and is primarily based on the assemblages of the key contexts selected from the Oudenburg south-west corner site. For a typology covering the preceding period, we refer to the one developed by De Clercq (2009). The typology presented here is representative for the Oudenburg fort and within this specific timeframe and cannot be used as a typochronology for the North Menapian region. To ascertain the presence/absence and distribution of certain forms and types in a given period, further detailed study of all pottery assemblages of the different fort levels should be integrated with other contexts from Oudenburg (*e.g.* of the civil settlement) and from other sites in the North Menapian region.

Table 1.67. Forms and types in the North Menapian pottery in the period AD *c.* 180-270/300, as assessed in the Oudenburg assemblage, and primarily based on the assemblages of the key contexts selected from the Oudenburg south-west corner site: handmade vs wheel-turned (reduced). The listed types in italic are the specific types occurring at the Oudenburg site.

TYPE I: FLARED FORM	(only in handmade technique)
I.1. straight, oblique wall; everted, rounded rim	
	NOM HA dish I.1
TYPE II: IN-TURNED FORM	(both in handmade and in wheel-turned technique)
II.A. in-curving-walled	
II.A.1 strongly incurved, profiled rim (with exterior cordons)	
	NOM HA pot II.A.1 – closed
	NOM HA (storage) pot II.A.1 – closed
	NOM RE (storage) pot II.A.1 – closed
II.A.2 convex body with upright, plain rim (variant: thickened rim at the inside)	
	NOM HA dish II.A.2 (small-based and large-based version)
	NOM RE dish II.A.2
	NOM RE dish II.A.2var.
	NOM RE bowl II.A.2var.
II.A.3 convex body with in-turned, plain rim (with or without pouring lip (p))	
a: without bend	
b: with bend (angular shoulder, sharply carinated to the inside)	
	NOM HA dish II.A.3a (small-based and large-based version)
	NOM HA dish II.A.3ap
	NOM HA dish II.A.3b
	NOM HA bowl II.A.3a
	NOM HA bowl II.A.3ap
	NOM HA bowl II.A.3b
	NOM RE dish II.A.3a
	NOM RE bowl II.A.3a
	NOM RE bowl II.A.3ap
	NOM RE bowl II.A.3b
II.A.4 convex body with inturned rim with bend pronounced on the exterior (rib) (=lid-seated rim) (with or without studs on the shoulder (st))	
	NOM HA dish II.A.4
	NOM HA bowl II.A.4
	NOM RE dish II.A.4
	NOM RE bowl II.A.4st
II.A.5 convex body with in-turned collared rim (with or without knob(s?) on the rim exterior (K))	
	NOM RE bowl II.A.5
	NOM RE bowl II.A.5K
II.A.6 flat-collared/wall-sided rim (imitation of North-French type)	
	NOM RE bowl II.A.6
II.B. carinated	
II.B.1 slightly inturned, upright, rounded rim	
	NOM RE pot II.B.1 – open (presumably not a bowl, although no complete profile is preserved)
TYPE III: OUTCURVED FORM	(both in handmade and in wheel-turned technique)
III.1 everted, bending rim, no neck, globular body	
	NOM HA pot III.1 – open
	NOM HA pot III.1 – closed
III.2 everted rim, short neck, S-profiled globular body	
	NOM HA pot III.2 – open (small and large version, high and low version)
	NOM HA pot III.2 – closed
	NOM HA (storage) pot III.2 – closed
	NOM HA bottle III.2
	NOM RE pot III.2 – open
	NOM RE pot III.2 – closed
III.3 cf. III.2, with lid-seated rim, with small interior lid groove at top of rim	
	NOM RE pot III.3 – open

III.4 cf. III.2, with lid-seated rim, with deep interior lid groove	
	NOM RE pot III.4 – closed
III.5 cf. III.3, with long rim, approaching the maximum diameter of the vessel	
	NOM HA pot III.5 – open (smaller and larger version)
III.6 short everted, out-turned rim, ovoid body	
	NOM HA pot III.6 – open
	NOM RE pot III.6 – closed
III.7 everted rim, slightly concave neck, ovoid body	
	NOM FR beaker III.7
III.8 short, slightly everted rim, short concave neck, globular body	
	NOM HA pot III.8 – open
	NOM HA pot III.8 – closed
	NOM FR pot III.8 – open
III.9 short, slightly everted rim, tall upright, slightly concave neck, globular body	
with studs (st): so-called 'stud-'beaker'	
	NOM HA beaker III.9 (small and large size)
	NOM HA pot III.9 – closed
	NOM HA pot III.9st – closed
	NOM FR beaker III.9
	NOM FR beaker III.9st
III.10 short, slightly everted rim, short concave neck, no pronounced shoulder, globular body	
(so far) only known with studs on upper half body (st)	
	NOM HA pot III.10st – closed
TYPE IV: CARINATED FORM	(only in wheel-turned technique)
IV.1 everted upper wall, flattened rim, often with chamfer	
	NOM RE dish IV.1
	NOM RE bowl IV.1
IV.2 everted upper wall, thickened or rounded bead rim; upper wall is shorter than lower wall	
	NOM RE dish IV.2
	NOM RE bowl IV.2
IV.3 upright to slightly everted upper wall, short horizontal rim; upper wall is higher than lower wall	
	NOM RE bowl IV.3
IV.4 slightly convex upper wall, thickened bead rim, horizontal burnishing on the body: imitation of North-French type	
	NOM RE bowl IV.4
IV.5 inturning upper wall, hooked/curled rim, horizontal burnishing on the body: imitation of North-French type	
	NOM RE bowl IV.5
TYPE V: TRUNCATED FORM	(only in wheel-turned technique)
V.1 tall, straight neck, short, everted rim, globular body, high foot: imitation of North-French type 'gobelet tronconique'	
	NOM FR beaker V.1
TYPE VI: BULGING FORM	(only in wheel-turned technique)
VI.1 truncated pot with slightly bulding neck, thickened, rounded, bending rim, burnishing on the body: imitation North-French product	
	NOM RE pot VI.1 – open
VI.2. globular body, no neck, thickened, rounded rim, horizontal burnishing on the body: imitation North-French product	
	NOM RE pot VI.2 – open
TYPE VII: LID	(only lid VII.1 also in handmade technique)
VII.1 rounded rim	
	NOM HA lid VII.1
	NOM RE lid VII.1
VII.2 cut-off rim	
	NOM RE lid VII.2
VII.3 profiled rim	
	NOM RE lid VII.3

10cm	DISH		BOWL		BEAKER		POT OPEN		POT CLOSED		BOTTLE	
	HA	RE	HA	RE	HA	RE	HA	RE	HA	RE	HA	RE
I.1												
II.A.1												
II.A.2												
II.A.3												
II.A.4												
II.A.5												
II.A.6												
II.B.1												
III.1												
III.2												
III.3												
III.4												

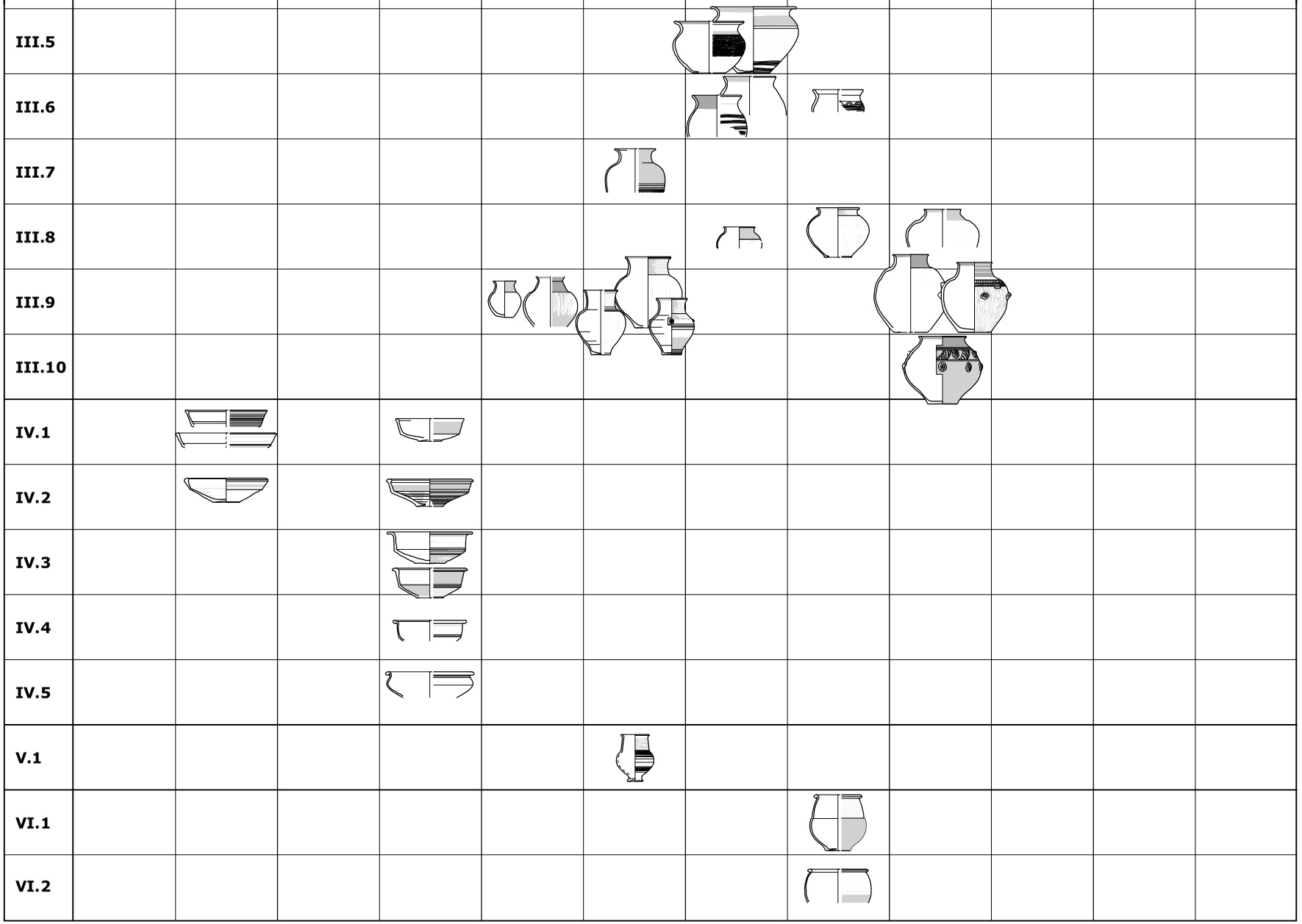


Figure 1.91. Visualization of Table 1.67: forms and types in North Menapian reduced pottery in the period AD *c.* 180-270/300, as assessed in the Oudenburg assemblage, and primarily based on the assemblages of the key contexts selected from the Oudenburg south-west corner site. All types are illustrated on Plates CLXXVII-CXCV.

2. The coins

Sofie Vanhoutte and Johan van Heesch

1. Introduction to the numismatic assemblage

At the south-west corner site of the Oudenburg fort, 1740 Roman coins[134] were collected[135]. Of these 1740 coins, 1203 originate from the Roman level (69.1%)[136], 410 from the post-Roman level (incl. the finds from deposits that were mixed with post-Roman material) (23.6%), and 127 coins were recovered as stray finds (7.3%). The origin of the finds in the post-Roman level is uncertain (cf. Volume I, Chapter II, Section II.2.3); a proportion may have been brought in from outside the fort precinct together with the accumulation of the 'dark earth', another part may be residual, dug-up coins from the Roman level underneath. Even so, it is important to consider all coin data to gain insight in the fort chronology and its place within the context of the Roman occupation at Oudenburg in general, since even the residual finds can yield chronological information. As it is believed that the extramural (civil) occupation only lasted until the 260s, it can be assumed that all late Roman coins reflect the military activities from or related to the fort.

Most of the coins were recovered by eye by excavators; 83 coins were metal detected finds, mostly from spoil, some from *in situ* layers. Another 61 coins were found within processed soil samples.

As is the case for all metal finds of this site, most of the coins were in a very bad condition. Being heavily corroded, labour-intensive conservation, although even not always with a successful result, was needed on all coins before identification could take place. As a consequence of the very bad condition of most of the coins, identification could very often not or only partly be made[137], the latter based on some poorly preserved characteristics. Due to this poor preservation, an analysis of the origins of the coins in light of coin production or a study on the coin 'wear' are not possible.

2. General overview of the coin data

The present study focusses on the coins collected at the south-west corner site of the Oudenburg fort, but links are made to older coin finds at Oudenburg[138]. The research in 1956-57 and 1960 on the fort defences only yielded one coin, an issue of Crispus minted at Lyon and dated to AD 320-324 (Lallemand 1966, 117). The excavations in 1977 on the fort precinct by J. Mertens and his team yielded 115 coins, of which 49 could be identified (66 coins and fragments were unidentifiable). Of these 49 coins, 25 issues are attributed to 2nd-century periods: AD 96-117 (1), AD 117-138 (7), AD 138-161 (9), AD 161-180 (7) and AD 180-192 (1). The remaining 24 coins were dated in the period AD 260-275; however, twenty-one of them are copies, mainly of Tetricus I and II, and should rather be situated in the following period 275-294 (see further) (for the identifications: van Heesch 1991, 27-28, 277-278).

The excavations near the north-east corner of the fort (site Kapellestraat, ET24) yielded 59 coins. The earliest coins are two *sestertii* of Trajanus; other *sestertii* are issues of Hadrianus, Antoninus Pius (2), Faustina I, Lucius Verus and Julia Domna. The 3rd century is represented by Postumus (four double *sestertii*, one possible and three certain copies of a double *sestertius*, one copy of an *antoninianus* or double *sestertius*), four late 3rd-century *antoniniani*, and one *antoninianus* of Probus, minted at Lyon in AD 277. The 4th century at this site only includes two coins: a *nummus* of Helena (Trier, 337-340) and an AES-4 *Salus reipublicae*, minted at the end of the 4th century (van Heesch and Stroobants, in Vanhoutte *et al.* 2014, 190-196).

134 From the post-Roman levels, also fourteen medieval coins were collected: see Volume I, Chapter II, Section II.2.3 (medieval coins listed in footnote 11).

135 Only two key contexts could be studied in depth (well OS 22926 (fort level 4), and 'double' well OS 2562 (fort level 5), the latter published: Vanhoutte *et al.* 2009b). Although all other coins were not the subject of a study in depth, it is believed that because of the bad condition of the coins this would in most cases not yield extra information.

136 Level 1: 1; fort level 2: 8; fort level 3: 23; fort level 4: 827; fort level 5: 344.

137 Therefore and for budgetary reasons, the last batch of non-cleared 335 coins were first X-radiated to ascertain their degree of conservation. This was prepared by L. Linders and assistants (Flanders Heritage Agency) and was executed at the firm Vinçotte (Vilvoorde). This resulted in a selection of *c.* 25% of this batch of coins for further conservation; the remaining *c.* 75% were too badly conserved to ensure result after conservation and were therefore decided to leave as 'unidentifiable'.

138 The coin identifications of the other excavations were not integrated in the coin diagrams, since the older coin finds could not be re-studied and other methods of classification were used. Where possible, the data are integrated in the analysis.

Figure 2.1. Small coin hoard 1, with detail to the right.

Figure 2.2. To the left: small coin hoard 2. To the right: small coin hoard 3. Both recovered from the final level of fort level 4.

2.1 Small coin hoards

The coin assemblage at the south-west corner site contains ten small coin hoards, most of them likely to have been contents of purses, representing in total (only) 117 coins. Six of these coin hoards were found at fort level 4; two were recovered in the post-Roman level and two were collected as stray finds:

- **Coin hoard 1** (fort level 4, from the primary infill of large waste-pit OS 4980) (Figure 2.1): two connected piles (more or less still in their original form due to corrosion) of in total 32 low quality silver coins, with two identifiable coins of Gallienus: one early *antoninianus* type Elmer (1941) 59c, dated to AD 257-258[139], and one late *antoninianus* type Göbl (2000) 712, dated to AD 267-268[140].

- **Coin hoard 2** (fort level 4, from fire layer OS 7957/7971 (final level of fort level 4)) (Figure 2.2, left): some 30 very corroded low-quality silver coins, clustered together, but too corroded to identify.

- **Coin hoard 3** (fort level 4, also recovered from fire layer OS 7957/7971 (final level of fort level 4)) (Figure 2.2, right): at least ten coins, connected together (due to corrosion), most likely all radiate copies.

- **Coin hoard 4** (found unstratified): four official *antoniniani*, connected together (due to corrosion), dated to AD 250-260 or 275-280.

- **Coin hoard 5** (fort level 4, from the waste infills of well OS 22926): nineteen, heavily corroded, connected coins of low quality silver dated to the second half of the 3rd century. The identifiable coins all belong to the period after *c.* AD 266.

139 Only back side identifiable: trophy and two prisoners sitting.
140 Only back side identifiable: winged Pegasus.

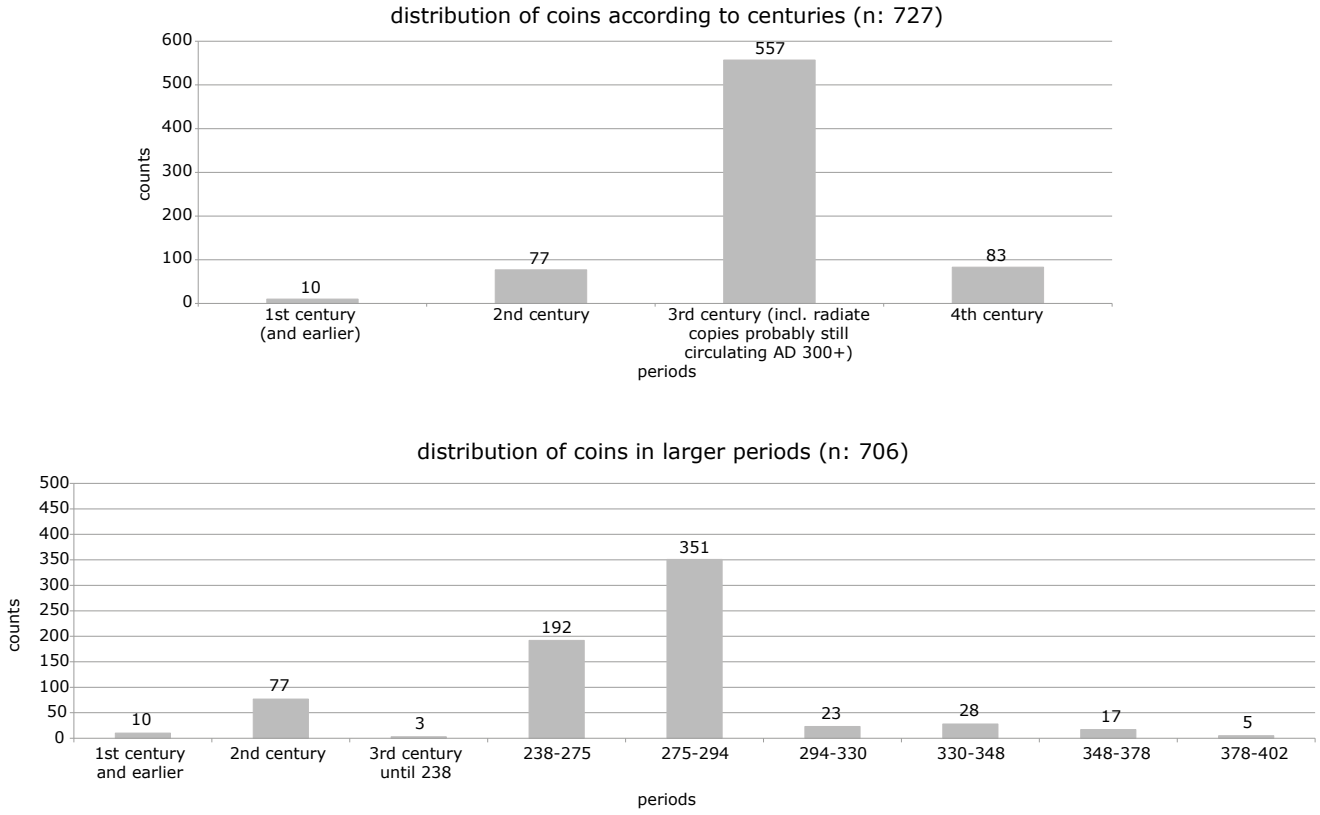


Figure 2.3. Top: general classification in centuries of the coins of the south-west corner site of which identification by century was possible. Below: chronological distribution of the coins of the south-west corner site, in large periods. Only 706 coins could be identified according to this periodization.

They all are likely to be *antoniniani* or copies of Gallienus (AD 260-268), Postumus (AD 260-269) or Claudius II (AD 268-270). Four coins have a diameter of *c.* 22 mm and are presumably heavy corroded older *antoniniani* (AD 215-260)[141].

- **Coin hoard 6** (fort level 4): a pile of five connected coins, but no identification is possible due to corrosion.
- **Coin hoard 7** (fort level 4): five connected coins, due to corrosion only datable to the 3th-4th century.
- **Coin hoard 8** (found unstratified): five undetermined *antoniniani*, connected together (due to corrosion).
- **Coin hoard 9** (post-Roman level): a small pile of three coins, unidentifiable.
- **Coin hoard 10** (post-Roman level): four unidentifiable issues, connected together due to corrosion.

2.2 Loose coins

All other coins recovered from the south-west corner site can be considered as isolated coin losses. However, the presence of several coins connected per two and some concentrations of coins in levels indicate that they originally may have been part of dispersed coin hoards. The coin hoards are not included in the presented diagrams; these only include the 1623 loose coins.

Most of the assemblage consists of copper alloy coins[142]. Only three *denarii* (silver), one silver *antoninianus* of Gallienus or Valerianus and one iron 2nd-century copy of an *as* were counted. Billon ('bad silver', silver with a majority of copper alloy content) is more common in the assemblage: apart from hoards 1, 2 and 5, all consisting of billon coins, another *antoninianus* and a *nummus* of billon are listed[143].

In the case of only 238 coins the emperor/emperess/ruler could be identified. The coins of the southwestern corner site are classified according to the periodization which Lallemand (1989, 18) has presented for the region and which has also been applied by van Heesch (1998, 22-23) (Figure 2.4, representing 676 coins; 947

141 Identification based on metal, thickness and diameter.

142 It is however important to take into account the bad preservation of the coins, making it often hard to determine at first sight with absolute certainty the material the coin was made of. Confusion between copper alloy and billon is therefore possible. After *c.* AD 270 (official) bronze coins were no longer minted; however, the bad preservation of the new coins with very low silver proportion gave them the impression of being of copper alloy (and were as such catalogued).

143 It is however possible that the assemblage contains more billon coins; the bad preservation of several pieces may have identified them wrongly as being of copper alloy.

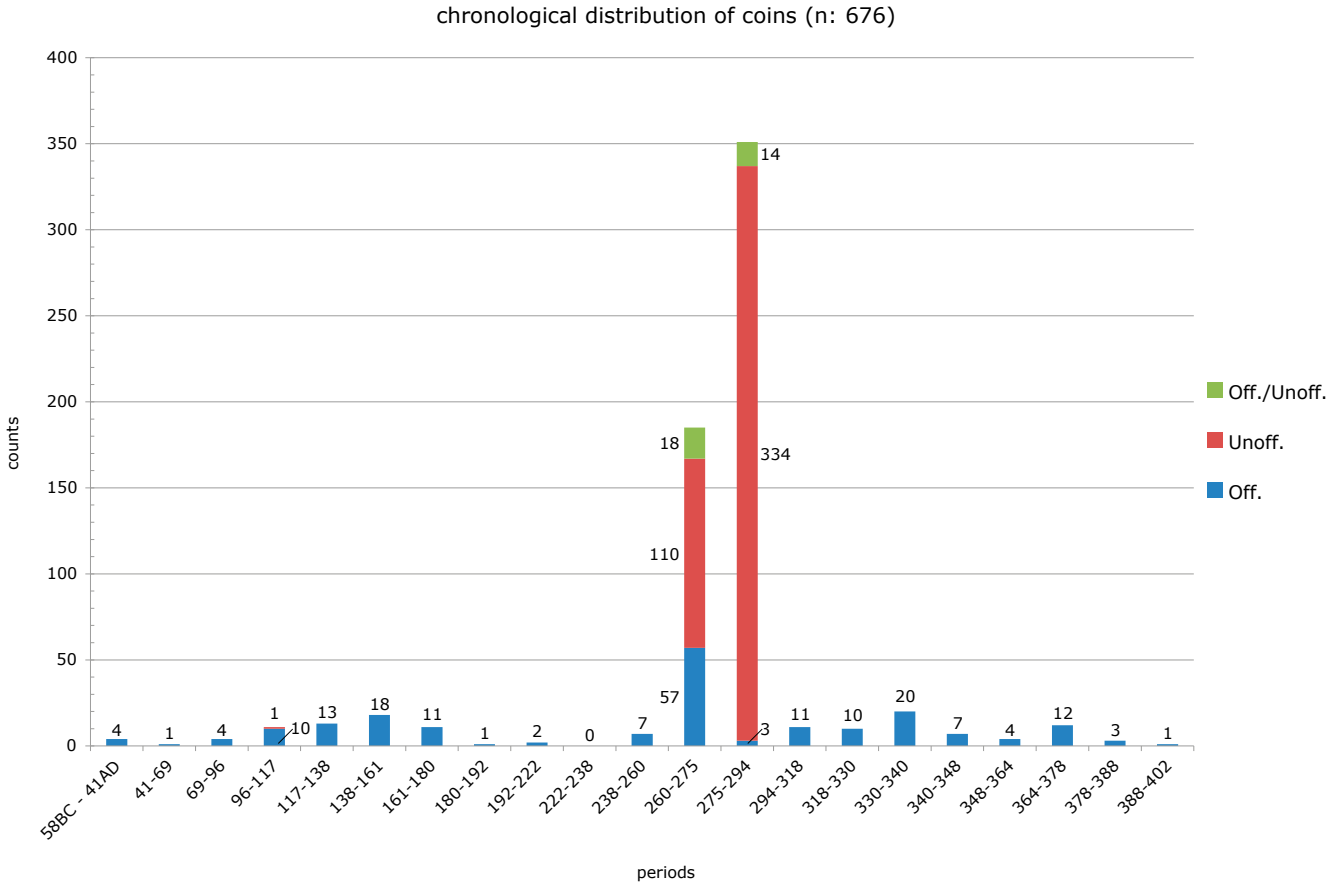


Figure 2.4. Chronological distribution of the coins of the south-west corner site according to the periodization by Lallemand (1989) / van Heesch (1998). Only 676 coins could be identified according to this periodization.

coins are not classifiable according to this periodization[144])[145]. As for the copies of the late 3rd century, it was decided to classify the copies of the Tetrici not in the period of their prototypes (as is mostly the case in numismatic studies), but in the successive period, from AD 275 onwards, since these coins were mainly minted and in circulation after AD 275 (Van Heesch 1998, 23)[146]. In that respect these coins form one of the index fossils to date the end of fort level 4. To include as many coins as possible (with the aim of increasing the sample), a broader periodization is also presented, integrating 706 coins (Figure 2.3, below). An overview by centuries represented by the loose coins shows a general overview of the coin spectrum of the site with a maximum of identified coins included (Figure 2.3, top, 727 coins included).

144 *E.g.* 42 coins identified as '*antoninianus* AD 266-300' or '*antoninianus* or imitation AD 266-300' cannot be included in this classification.

145 The periodization ends at AD 402, as this is the date around which there has been an almost complete cessation of the large-scale minting of copper alloy coins in the West.

146 Doyen even states that for Reims no imitation of a prototype in the period 268-275 was found in a context which can be undoubtedly assigned to that period (Doyen 2007, 378). It is however important to take into account that many site studies classify these copies within the period AD 260-275. That was also the reason why van Heesch chose to equally classify them in that period in his 1998 publication (van Heesch 1998, 23).

3. First-century and earlier coins, and their relationship to the stratified sequence

The 1st century is represented in the coinage by Augustus (three *asses*), Augustus/Tiberius (one *as*), Nero (one *as*), Titus (one *sestertius*), Domitianus (two *sestertii*) and one undetermined *sestertius*. Since a civil occupation started at Oudenburg in the second half of the 1st century AD (Creus 1975), it is not surprising that at least ten coins are assignable to this century. The presence of the three *asses* of Augustus, especially the one from the workshop Nîmes I and the one from the workshop Lyon I, is remarkable since these early coin series disappeared very quickly out of circulation, based on the well-dated assemblages of Roman camps along the Rhine (van Heesch 1998, 64). They are definitely related to the civil settlement of Oudenburg, even then being already old coins still in use. The *as* of Nero and the aforementioned coins are likely to represent residual finds from the earliest phase of the civil settlement. Since there are no indications that the civil settlement of Oudenburg, of which the earliest phase was found underneath the late Roman cemetery (Graveyard A) *c.* 400 m to the west of the fort, expanded as far east in its initial phase, these coins probably circulated (and travelled) over time.

Coin hoards have proven that *sestertii* from the Flavian emperors until Commodus still circulated in our region until the reign of

Postumus (AD 260-269), and even until Tetricus (AD 271-274) (van Heesch 1998, 97, 99, see also 102). Doyen has shown that at Reims such *sestertii* were still in use until the monetary reformation of AD 294 (Doyen 2007, 264). The loss of the *sestertii* of Titus and of Domitianus can therefore not be dated: they can either be residual finds from the civil settlement[147] or they can have been circulating still during the fort occupation in the late 2nd or 3rd century.

4. Second-century coins and their relationship to the stratified sequence

It is difficult to interpret all 80 2nd-century coins. The 2nd-century coin spectrum consists of Domitianus/Trajanus (one *as*), Trajanus (one *as*, one *as* or *dupondius*, one *dupondius*, five *sestertii*), Hadrianus (one *as*, one *as* or *dupondius*, five *sestertii*), Sabina (one *sestertius*), Faustina I (one *as*, one *sestertius*), Antoninus Pius (one *as*, one *denarius*, fourteen *sestertii*), Faustina II (one *as*, one *as* or *dupondius*, one undetermined), Faustina I or II (one *as*), Lucius Verus/Marcus Aurelius (one *sestertius*), Marcus Aurelius (one *as*, five *sestertii*), Commodus (three *sestertii*), undetermined (one *dupondius*, four *asses* or dupondii, twenty-one *sestertii*, one undetermined), and one undetermined iron copy of an *as* dated to the start of the 2nd century. Of the 80 identified 2nd-century coins of the site, 60 finds are *sestertii*, types which were potentially still circulating until *c.* AD 270 (cf. *supra*). Some 2nd-century coins will have been residual items from the earlier civil settlement, but amongst the *sestertii* it is not possible to distinguish the residual ones and the ones still in circulation.

Based on the stratified evidence, none of the 2nd-century coins can be attributed to the start level of the fort occupation (fort level 1), making it impossible to define the beginning of the military occupation at Oudenburg based on the coin loss. Only one coin derives with certainty from level 1, namely an *as* or *dupondius* which can only be dated generally to the 1st to 3rd century.

5. Third-century coins and their relationship to the stratified sequence

The beginning of the 3rd century is hardly represented in the coinage, with one *sestertius* of Septimius Severus (AD 193-211) and one silver *denarius* of Julia Domna (AD 193-211). The latter, a residual coin at fort level 5, must presumably have been disturbed from one of the first fort levels since the *denarii* went out of circulation in the 250s as the result of the minting in large numbers of *antoniniani* by Gordianus III (AD 238-244) (van Heesch 1998, 199).

Not only the beginning, but the total first half of the 3rd century AD hardly provided coins at the site. A similar dip in the coin loss is seen at Aardenburg (see Chameroy 2013, 81). Van Heesch considers this as a typical phenomenon at settlements in *Gallia Belgica* (van Heesch 1998, 108-109). Bronze coins barely reached the region in the 3rd century prior to Postumus. From Commodus or Septimius Severus onwards, bronze coins apparently were no longer important as payment for the soldiers and mainly silver and gold were used (van Heesch 1998, 184). Obviously, these silver and gold coins were lost less frequently. After all, as is well-established, coin loss at this time and in other periods was heavily influenced by the availability of low-value currencies (cf. Casey 1986, 69-74). It seems that 2nd-century *sestertii*, still circulating at that time, were sufficient for the daily transactions (van Heesch 1998, 105). This situation in the region is in contrast to the first half of the 3rd century in *Britannia* and the Danube provinces, where the troop concentrations were well-supplied with Severan coins (van Heesch 1998, 109-110, see also Kemmers 2009).

Nevertheless, comparison with the chronological ranges from the samian stamps and decorations, offers an alternative explanation. As the samian data strikingly also show a dip in the period AD 205-215 (see Chapter 1.A.1 in this volume, Section 11.7), the coin loss dip in the first half of the 3rd century AD may partly be explained by a period of non-activity at the site.

In the coin spectrum of the Oudenburg site the period AD 238-260 includes at least seven coins. An *antoninianus* of Gordianus III (238-244), originating from fort level 3, produces a *terminus post quem* date for this fort occupation. Since the coins of Gordianus III and of Philippus I were taken out of circulation by Postumus (van Heesch 1998, 185), this Gordianus III issue with its high value most likely did not longer belong to the common purse after 260. All other coins of this fort level 3 are older (except for two intrusive finds[148]) and mainly not identifiable. The absence at this fort level 3 of Gallienus (253-268) and the Gallic Empire (260-274), with the latter coins so numerous at the subsequent level, is an extra indication that this fort occupation most likely pre-dates AD 260, probably even AD 253.

This period AD 238-260 is furthermore represented at the site by coins of the early Gallienus or co-ruler (two *antoniniani*), Valerianus I (AD 253-260) (one *antoninianus*), Gallienus/Valerianus (one silver *antoninianus*) and two undetermined *sestertii* showing characteristics for this period, all belonging to fort level 4 or later levels.

The coin assemblage at the Oudenburg site shows a marked increase in the coin loss in the second half of the 3rd century from AD 260 onwards. This is again a general phenomenon, not only in Gaul but also in Britain, in the Rhine and Danube provinces, Spain, Northern Italy etc., mainly in the period AD 260-275 (van Heesch 1998, 127). After AD 250 major changes took place in the Roman Empire, politically, economically and on a monetary level. The threat from outside the Roman borders increased and internally the Roman Empire was menaced by repeated famines, the plague, the increasing power of military leaders and related usurpations. At the same time

147 **From the excavations in the 1960s on the late Roman Graveyard A under which remains of the civil settlement were uncovered, no Flavian coins were found (van Heesch 1998, 112).**

148 **An issue of the Tetrarchy and a Constantine coin must represent intrusive finds, since this level did not provide any coin from the period AD 260-275 nor any of the late 3rd-century copies which are so abundantly found in the subsequent fort level 4.**

Table 2.1. Proportions of official and unofficial coins of the Gallic Empire versus the Central Empire at the south-west corner site.

	Postumus	Victorinus	Tetricus I/II	Victorinus / Tetricus	Gallienus (after 260)	Salonina	Claudius II	Gallienus / Claudius II
off.	14	1	5	2	7 or 8	1	4	2
unoff.	8		88				4	
total	22	1	93	2	7	1	8	2
	118 (30 when the 88 Tetricus copies are excluded)				**18 or 19**			

there was a lack of precious metals caused by the exhaustion of several mines and the loss of some mining areas to invaders. Since there was a dramatic increase in expenditure due to pay raises and subsidies to barbarian tribes, constantly new solutions needed to be found to satisfy the needs (van Heesch 2004, 252). This all had an enormous influence on the monetary system and according to van Heesch, this coin loss increase is mainly the reflection of this major economic recession. The increasing coin degradation led to a very high inflation from *c.* AD 270, only temporarily remedied by the coin reforms by Aurelianus in AD 274 (van Heesch 1998, 127). The use of large amounts of small change, *antoniniani* and copies with minimal value, for daily transactions but also for interregional trade, led evidently to a high coin loss.

Of the period AD 260-274[149], to which 185 coins of the site are assigned, only 41 coins can be classified according to reign. The identifiable ones of the Gallic Empire are issues of Postumus (260-269) (ten official issues: seven *antoniniani*, one *as* or *dupondius*, one *sestertius*, one double *sestertius*, next to three copies (of a *sestertius* and of two double *sestertii*), Victorinus (269-271) (one official *antoninianus*), Tetricus I and II (271-274) (five official *antoniniani*), Victorinus/Tetricus (two official issues: one *antoninianus* and one undetermined). The legitimate Central Empire is represented by Claudius II (268-270) (four official *antoniniani*, four copies of which two *divo Claudio*, one undetermined), (late) Gallienus (seven official *antoniniani*, maybe eight), Gallienus/Claudius II (two official *antoniniani*), Salonina (253-268) (one official *antoninianus*). This results for this site in eighteen official coins from the Gallic Empire versus fourteen official coins from the Central Empire. Added with the coins found at the northeastern site Kapellestraat (ET24) (see van Heesch and Stroobants, in Vanhoutte *et al.* 2014), this results in twenty-two official coins from the Gallic Empire versus fourteen or fifteen from the Central Empire (Table 2.1). The clear presence of Postumus coins (in total twenty-two: fourteen official issues and eight copies) is not surprising. Roman bronze coins hardly reached the region during the 3rd century. The need for small change resulted in a large exercise in bronze coin minting by Postumus (van Heesch 1998, 135). According to Kiernan, regular issues of Postumus' bronze coins ceased within the first four years of his reign. The unofficial copies were produced in large numbers until at least AD 270 and can be understood as crisis money in response to the need for small change (Kiernan 2009a, 625, 644).

At the Aardenburg fort, the excavations also yielded a strong share of Postumus coins, of which twenty-one official coins (Chameroy 2013, 83). The rate of the official coins from the Gallic Empire versus the coins of the Central Empire indicates the significance that Aardenburg, and also Oudenburg, must have had during the reign of Postumus. Doyen demonstrated that the bronze coins of Postumus, both the official ones and the copies, kept on circulating until the coin reformation of AD 294 (Doyen 2007, 264). The dating of the coin losses of the Gallienus, Claudius II and *divo Claudio* coins is however problematic. After Probus, *c.* AD 282, the north of Gaul became well-provided with these *antoniniani*. The official coins of Victorinus and Tetricus (I and II) at the Oudenburg site give strong evidence that the fort remained active at least during the entire Gallic Empire. The period AD 260-274 coins are all attributed to fort level 4 or later levels.

The impressive peak in the coin loss in the period AD 275-294 is entirely due to the large number of radiate copies. Only three undoubted official coins were counted datable to this period, of which only one could be identified to a specific reign: an official *antoninianus* of Probus (276-282), a residual find in a mixed level (level 5+post). Another Probus coin, dated to AD 277 and found at the north-east corner site (site Kapellestraat, ET17), is likely to have been the closing coin of a dispersed and disturbed coin hoard with Postumus coins. A total of 33 coins was found in a restricted area. Nine of the issues are attributed to Postumus (four official issues, five copies). The large number of 2nd-century *sestertii* may also have belonged to the coin hoard (van Heesch and Stroobants, in Vanhoutte *et al.* 2014, 192-196). These 2nd-century *sestertii* still circulated at the time in large numbers and they were often potted (that is to say, set aside in collections by owners) because of their high coin value, especially after the devaluations of the 'silver coins' *c.* AD 266 (van Heesch 1998, 99-105; see Doyen 2007, 257-265 for a recent synthesis). It is of course difficult to determine which coins were part of the coin hoard and which were not. The *antoniniani* and their copies of the late 3rd century (four in total) may also have belonged to the coin hoard since mixed coin hoards of *antoniniani* and *sestertii* were not unusual, but this is impossible to stipulate with certainty (van Heesch and Stroobants, in Vanhoutte *et al.* 2014, 195).

Both Probus coins (276-282) can be assigned to fort level 4 and serve as *terminus post quem* evidence for the final phase of this period. However, two coins assignable to the Tetrarchy (*c.* AD

149 **It is important to take into account that the classification of the coins into the periods AD 260-274 and AD 275-294 cannot be considered unconditionally. Based on size, form and material, several undetermined *antoniniani* and imitations were classified either within the period 260-274 or within the period 275-294.**

294-310) (one intrusive find in an older level and one unstratified find) may also originally have belonged to this fort level 4. Coins from the Tetrarchy are generally rare and the determining factor therefore is the monetary system. Due to their size and value these coins were hardly ever permanently left or lost. In this period the 3rd-century *antoniniani* and their copies, mainly the coins minted after *c.* AD 270, kept on circulating (van Heesch 1998, 167).

Apart from these official coins, the period AD 275-294 at the south-west corner site is almost entirely filled with the many copies of Tetricus I and II. At the site, 88 copies are undoubtedly representing these rulers; another 246 are very likely to be attributed to them. As already mentioned, also the excavations in 1977 in the northern sector of the fort yielded a considerable number of these copies. The coin degradation from AD 268 onwards led to a monetary reformation by Aurelianus after he brought under control the Gallic Empire in AD 274. The new coinage however hardly circulated in the North-West of Gaul (or Britain) and mainly copies of Tetricus I and II, which were apparently not withdrawn from circulation by the Central Empire, dominated the coin circulation in the region (King 1981, 93). Shortly after the fall of Tetricus I (AD 274) old bronze coins were probably re-used as raw material for manufacturing copies of *antoniniani*, containing no silver. These copies, also called 'barbarous radiates', acted as small change in the late 3rd and early 4th century (van Heesch and Weinkauf 2016). They were mainly minted after the reigns of the Tetrici, after AD 274; therefore they are classified here in the period AD 275-294. These unofficial copies were likely to have been minted by local important landowners[150]. New coins seem to have been hardly supplied to the North of Gaul; the copies appear to have been generally accepted and can be considered as 'crisis money', tolerated by the government, and only after a while forbidden by them. In the beginning, these copies were very recognizable and heavy, but probably right after the reign of Probus (AD 276-282) their diameter and weight decreased (van Heesch 1998, 135). Doyen for Reims and Gricourt *et al.* for Bliesbruck concluded that they were still produced after AD 295 and probably until *c.* AD 310 and circulating until at least AD 335 (Doyen 2007, 378; Gricourt *et al.* 2009, 660, 662). However, a recent study on the coin finds of the Rue Perdue cemetery at Tournai demonstrates that the role of the radiate copies in the early 4th century was apparently 'extremely reduced'. There are even indications that they might have been already banned from circulation before the end of the 3rd century (and at least by AD 313 at the latest) (van Heesch and Weinkauf 2016, 110-114). The period AD 275-294 coins are all attributed to fort level 4 or later levels.

Fort level 4 yielded in total 726 loose coins (44.7% of the 1623 loose coins found at the site), apart from six coin hoards (representing 101 coins in total). About 552 of the loose coins belong to an area of fire layers of *c.* 32 m² situated in the south-east corner of Unit II but stretching further south passing the southern limit of this workshop (see Volume I, Chapter II, Section II.4.6.2.a); 60 coins found on top and in the covering layers can be added and result in a concentration of 612 loose coins. Three coin hoards also belonged to this fire level (coin hoards 2, 3 and 7) and result in a final total of 657 coins. This concentration of coins warrants specific attention here. The loose coins within this concentration consist of Hadrianus (one *as*, one *sestertius*), Antoninus Pius (two *sestertii*), Faustina II (one *as*), Gallienus? (one *antoninianus*), Claudius II (two copies of *antoniniani*), Postumus (one copy of a double *sestertius*), Victorinus/Tetricus (one *antoninianus*), Tetricus I/II (one *antoninianus*, 28 copies, one undetermined), undetermined (seven *sestertii*, one *as* or *dupondius*, one copy of a *dupondius*, fourteen *antoniniani*, fourteen *antoniniani* or copies, 275 copies, 260 undetermined). One of the copies possibly belongs to the category of the '*minimissimi*'. In total, two so-called '*minimissimi*' (by Gricourt *et al.* 2009, 631) can be distinguished in the coin assemblage of the south-west corner site: one at this fort level 4 (diam. 0.75-0.9) and one unstratified find (diam. 0.6-0.7). These small copies, 'classe 4' of Doyen (2007, 283) with a diameter of 0.7 to 0.9 cm, are considered as the last phase in the minting of copies. They are dated by Mattingly (1936) in the period AD 296-305, by Gricourt *et al.* to AD 306-310 (see Gricourt *et al.* 2009, 631 with references). The presence of such a copy at the top of fort level 4 probably should move the dating of the end of this period further ahead to at least the very end of the 3rd or even the beginning of the 4th century. However, the dating for these minimal radiate copies could not be confirmed (yet) for our region and a precise chronology for this type is very difficult. Besides, we should be cautious to draw major conclusions from just one coin; being so small, it can easily be an intrusive find from fort level 5.

A large proportion of this concentration of 612 coins, although wide-spread but found in a restricted area, is likely to be (for the most part) the remains of a dispersed coin hoard. There are no indications – no specific production waste or tools were found – to relate these finds to a local coining workshop. An extra argument to identify this wide cluster of coins as the remains of a hoard, is the presence of three small coin hoards within this fire level: coin hoards 2, 3 and 7. In total, six of the ten coin hoards found at the south-west corner site belong to fort level 4. Apart from the small coin hoards 2, 3 and 7, these comprise coin hoard 1 (found in the primary filling of the large waste-pit OS 4980 which yielded also brooch production waste), coin hoard 5 (found in the infill of well OS 22926) and coin hoard 6 (found in a layer, not a closed context). What these small coin hoards represent, is not clear. Are these all lost purses or are they scrap for reworking? Since they were all found in the vicinity of the fire places and furnaces, the latter is not unlikely. However, the low value of these coins would not be so attractive for reworking.

The increasing coin loss at Oudenburg at the end of the 3rd century can be compared with that of large cities and *vici* like Bavay, Tournai, Tongeren, Namen and Liberchies, and *villa* domains in the vicinity of Tournai and Cambrai. This large coin loss may not only reflect the inflation and the growth of the coin stock, but also the position and the significance these places had in a period when other *vici* and *villae* did not or barely survived the period of the Gallic Empire (van Heesch 1998, 146-147). While it is clear that the Oudenburg fort started under Postumus (AD 260-269), the end date is more difficult to determine with the radiate copies still circulating until at

150 Doyen 2007, 288-290 lists the sites at *Britannia, Gallia Belgica, Germania Superior* and *Gallia Lugdunensis* where workshops are found where imitations of the late 3rd century were struck.

least AD 294. That the Oudenburg fort continued to be occupied after the Gallic Empire ended, is clear, based on the two Probus (276-282) coins. It is very likely that the Tetrarchy coins (*c.* AD 294-310) should be related to this fort level. This may be confirmed by the presence of the two *minimissimi*, of which one was found at level 4 (although this one is rather large), pushing the end date of level 4 possibly further to at least *c.* AD 300 although their attribution to fort level 4 is not certain (see *infra*).

The coin evidence from both the Oudenburg and the Aardenburg fort indicate that the end of their late 3rd-century occupation is most likely related. Chameroy believes that the comparable rate of Victorinus and Tetricus copies at Aardenburg (19 official coins vs. 65 copies or a rate of 0.29) versus other sites at *Gallia Belgica* points to a coin circulation at Aardenburg until at least the mid-280s (Chameroy 2013, 84). The two known coin hoards from Aardenburg (A and B) contain many copies and are likely to have been closed off after the Tetrici (van Heesch 1998, 137). Chameroy concludes from the proportion of copies in coin hoard A that a closing off of the hoard, and of the fort, cannot be dated prior to the early 280s. As a plausible end of the Aardenburg fort he suggests the context of the campaign of Maximianus (AD 285-305) (Chameroy 2013, 84). The absence of 4th-century coins at Oudenburg fort level 4 may be an argument, although not conclusive, for dating the end of fort period 4 not later than the start of the 4th century. From both Aardenburg and Oudenburg, no issues of Carausius (AD 286-293) or of Allectus (AD 293-295/6) were found, confirming the fact that these forts were not part of the British Empire.

6. Fourth-century coins and their relationship to the stratified sequence

The 4th-century coins all belong to fort level 5 or later levels[151]. Apart from the two Tetrarchy coins, the period AD 294-318 is represented by Licinius (310-315) (one *nummus*), Constantine I (306-337) (seven *nummi*, one half-*nummus*), House of Constantine (one *nummus*) and three undetermined coins dated to the start of the 4th century based on size, form and material. Coins from the period AD 294-318 are generally very rare. These coins are rather large and heavy and would not have been lost easily. The 3rd-century *antoniniani* and their copies, mainly those minted after *c.* AD 270, still circulated in these periods as small change (van Heesch 1998, 167).

The period AD 318-330 at the south-west corner site is represented by Constantine I (two *nummi*), Constantine I/II (one *nummus*), Constantine II (one *nummus c.* 320), Crispus (317-326) (one *nummus*), one *nummus* type *Victoriae Laetae Princ Per*, and one undetermined coin. Also this low coin loss is a general phenomenon, largely due to the same monetary reasons as the previous period (van Heesch 1998, 167).

In the following period, AD 330-340, the coin loss at the south-west corner site increased (26 coins). The identified emperors are Constantine I (one *nummus Gloria Exercitus*-two standards, one undetermined *Gloria Exercitus*-one standard), Constantine II (337-340) (two *nummi*) and Helena (337-340) (one *nummus*). The *Gloria Exercitus* type is furthermore represented by twelve undetermined coins (with three issues 'one standard' and three issues 'two standard'). A peak in the period AD 330-340 is seen in the whole Roman Empire. Constantine I renewed the coin stock completely (AD 330-335) and for the first time since the last quarter of the 3rd century, low denominations in large numbers were again brought into circulation, which were of course more readily lost. The increasing coin supply was likely to have been a consequence of the firmer militarisation in the north of Gaul during this period. The garrisons of the newly built forts along the road between Bavay and Cologne, together with those in the renovated Rhine Limes forts, and the related administration, all needed a large coin supply (van Heesch 1998, 167).

The following strong dip – only one presumed *nummus Victoriae DDAUG Q NN*, possibly of Constantine II, can be assigned to the period AD 340-348 with certainty – is also a very general phenomenon in northern Gaul, *Germania* and *Britannia*, in contrast to the Mediterranean regions where these coins are found in large numbers. No copies were detected within the 4th-century coin assemblage at the Oudenburg site[152], although the period AD 330-340 in northern Gaul, *Britannia* and the Lower Rhine region was characterized by a large copy peak, likely to be the result of a chronic deficiency of coins or a strong inflation. However, the phenomenon seems to be more prominent at the rural settlements than at the *vici* or the military sites (van Heesch 1998, 169).

Only three coins of the assemblage of the south-west corner site can be assigned to the period AD 348-364, of which only one can be attributed to a specific reign: an AES-3 of Constantius II or Constans (*Fel Temp Reparatio*). Generally, in Gaul, *Britannia* and *Germania*, the coin loss remained very low, although there was a small increase. This period is characterized by coinage reformations, new denominations of higher value and a deficiency of small change (van Heesch 1998, 169).

It is only with Valentinianus and Valens (AD 364-378) that the bronze coin production increases again, and this is also visible, although to a limited extent, in the Oudenburg coin spectrum. Here, this period is represented by Valens (two AES-3 of which one *Gloria Romanorum*, two undetermined), Gratianus (367-383) (one AES-3 *Gloria Romanorum*, one undetermined) and two AES-3 *Securitas Reipublicae*. These coins confirm the considerable coin loss already noticed for Oudenburg based on the older finds at the late Roman Graveyard A and the surface finds at the location of the mid-Roman graveyard south of the fort (van Heesch 1998, 278). In this period, not all settlements show the same pattern. The same increase in coin loss is seen at the *villa* (?) of Blandain, the presumed *villa* at Péronnes-lez-Antoing and the *civitas* capital Tournai (all in Belgium), and at the forts along the Rhine. This reflects probably the expanding minting related to the increase of troops and the active

151 **Except for COIN0994. Since no 4th-century coin was found at level 4, the *nummus* found at level 2/3 must be regarded as an intrusive find.**

152 **However, it is important to keep in mind that most of these coins were very badly preserved and that they could not be analyzed in detail. It is possible that a thorough study would alter this result slightly.**

border strategy of Valentinianus I with the reinforcement of the Rhine Limes following the threats of the Alamanni (AD 366) and the invasions of the Franks and Saxons (AD 368-369) (van Heesch 1998, 170, 186). The defence system along the Bavay-Cologne road seems to have been occupied not more than very sporadically from the Valentinian period onwards – only Liberchies II knew a reoccupation after AD 380 – (Brulet 2008, 241) and all focus was now given to the *limes* borders.

Subsequently, the period AD 378-388 shows again a coin loss dip at Oudenburg, with only three coins at the south-west corner site: issues from Gratianus (AES-4 *Reparatio Reipub*), Theodosius I (379-395) (undetermined *Reparatio Reipub*) and Magnus Maximus (383-388) (AES-2). All sites in the North of Gaul show a low coin loss in the period AD 378-388, largely related to the high value of the AES-2 brought in circulation from AD 381 (van Heesch 1998, 170).

At the south-west corner site, only two undetermined AES-4 can be assigned to the final period, AD 388-402. The coins from this period are in general very rare, due to a production decrease and supply problems resulting in a limited use. By contrast, the fort at Richborough yielded a remarkable huge amount of coins of the House of Theodosius (AD 388-402): no less than 22,822 *nummi* (Reece 1991), and even two *nummi* struck for Honorius (*c.* AD 421-423) (Walton and Moorhead 2016, Section 3.3). The interpretation of these finds is still debated; either way they point to the very special function Richborough still had in the early 5th century.

The coin spectrum of the 4th century at the Oudenburg site largely follows the general monetary trends in the region of northern Gaul and reflects in general the small change policy of the Empire. It is therefore difficult to define possible interruptions in the occupation[153]. Only four coins of the 4th century can be related to fort period 5 with certainty based on stratified evidence: Licinius (308-324) (*nummus*), Constantine I (*nummus*), *Victoriae Laetae Princ Per* (*nummus*), *Securitas Reipublicae* (AES-3). However, obviously all 4th-century coins found in the post-Roman levels or at the top of the Roman level mixed with deposits from the post-Roman level, are related to the occupation of fort period 5. The many late 3rd-century copies at this level can either be small change still circulating in the first decades of the 4th century or residual finds from the previous period. Purely based on the coinage, it is not possibly to verify an interruption between fort periods 4 and 5.

153 It is only when the coin loss differs strongly from the general pattern, that peaks and dips in the occupation of a site can be derived (van Heesch 1998, 170).

3. The metal finds

Sofie Vanhoutte
With a case-study on the crossbow brooches by Vince Van Thienen

1. Introduction to the metal assemblage

The south-west corner site yielded a vast amount of Roman metal finds. Both copper alloy and iron items are represented in large quantities: 46,083 items in iron were counted, 4,149 in copper alloy (excl. coins)[154]. These counts also comprise the items found in the post-Roman levels; the character of these finds, however, point to a Roman date. Their context makes it impossible to allocate their original source though: were they dug up from the local fort site or brought in with other waste from outside the fort, either waste from the fort or from the civil settlement? The nature, size and preservation of many of the catalogued items makes it very likely, though, that they did not move over a large distance and that at least a large part of them can be interpreted as dug-up items from the fort precinct.

In general, the metal finds of the Oudenburg site are characterized by heavy corrosion; however, their original contours were in most cases still preserved within the different corrosion layers. As a consequence, the majority of these finds – mainly those in iron – were not identifiable with the naked eye. This resulted in a very demanding conservation process with inevitable focus on selective cleaning[155] [156]. In combination with different imaging techniques such as mainly X-radiation analysis[157] and some selective computerised tomography and μ-CT-scanning[158], a maximum of archaeological information from the totality of the assemblage was achieved and decisions were made for further conservation, whether active or preventive[159].

The importance of a thorough study of the Oudenburg metal assemblage is beyond dispute: both in terms of quantity and diversity, this assemblage represents a reference collection for the late 2nd to early 5th century of the region. Therefore, a full range of items is represented, including the variety of fittings and miscellaneous items (see further: categories J and K). Except for Roman jewellery finds, our knowledge on Roman metal in the region is very limited and one has to rely mainly on British and German metal studies for their classification and typology. The stratified context at the Oudenburg site makes the study of the metal assemblages very valuable: large assemblages can be analyzed contextually and chronologically, which offers the opportunity to compare with other forts in the North Sea and Channel region. On an object level, the study yields results on typochronological evolutions. On a site level, the metal finds give evidence of the evolution in the activities of the fort inhabitants and in the functionality of this south-west corner of the fort. In the analysis below the focus lies on what information the metal assemblages represent in terms of the functionality of the south-west fort corner during the successive fort periods.

2. Functional classification

The Oudenburg metal finds are catalogued and presented according to the functional classification proposed by a French collective of metal specialists in France (Briand *et al.* 2013). Their functional classification in domains and categories has been slightly modified given the character of the Oudenburg assemblage (Table 3.1). The same classification and coding has equally been applied in

154 Not included in these numbers are eight copper alloy items from the post-Roman level which can be identified as medieval; one iron item and 25 copper alloy specimen are more recent finds.

155 The author wishes to thank Frans Debuyser, who deserves a great deal of credit for patiently cleaning and conserving most of the metal finds and coins of the Oudenburg site. I am also indebted to the successive conservators-restorators at the Institute for Archaeological Heritage/ Flanders Heritage Agency for their contribution in organizing the Xray scanning and their overall help during the conservation process. A special thanks goes to Natalie Cleeren, former conservator-restorer at the Institute, for her input and continuous help.

156 In total, 1018 items in copper alloy were cleaned, representing almost one quarter of the copper alloy assemblage. The selective approach regarding the iron assemblage resulted in 404 representative items in iron which were completely or partially cleaned, accounting for 0.87% of the total assemblage.

157 All copper alloy finds and *c.* three quarter of the iron assemblage were X-rayed.

158 With thanks to dr. Manuel Dierick of the Centre for X-ray Tomography at the Institute for Nuclear Sciences at Ghent University for the opportunity to scan some specific metal items.

159 For an overview of the applied conservation strategy: see Cleeren and Vanhoutte (2006; 2015). The conservation approach of the iron assemblage of Oudenburg has also been discussed in Cleeren *et al.* 2013.

Table 3.1. The functional classification in domains and categories, mainly taken over from Briand *et al.* 2013, with modifications given the character of the Oudenburg assemblage.

	DOMAIN	CATEGORIES	FUNCTION	DEFINITION
A	**military life**	military equipment / military dress	to equip oneself and to use for fighting	equipment and arms, incl. those that can be used for hunting
B	**personal life**	ornament and dress	dressing, appearing	all elements of dress and accessories
		body care	taking care of oneself	items related to cosmetics, hygiene and medecine
C	**crafts / production / relation to natural resources**	crafts	extraction, transformation, production	items related to extraction, production and transformation of natural resources and agro-pastoral products, incl. primary materials, craft tools and utensils
		hunting and fishing	supply of food	objects serving exclusively for fishing and hunting
		agro-pastoral	production of food	items related to the exploitation of the soil, maintenance of landscapes and open space, animal husbandry, agriculture, incl. agro-pastoral tools
D	**domestic life**	culinary activity	to prepare and conserve food, to cook, eat, drink	objects of the culinary atmosphere, from preparation to consommation and storage
		lighting, heating	lighting, heating	items related to the production of warmth, heat and light
		furnishing	organizing, arranging, tidying	furnitures, their decoration, also their elements of assembly and their systems of closing (locks, keys, ...)
		vessels		all vessels not classifiable as culinary items, incl. all their elements
		household utensils		items not classifiable in the other categories, like knives, clasp-knives, sewing needles, ...
E	**social life**	entertainment	entertaining, celebrating	counters, toys, ...
		music	entertaining, celebrating, believing, honoring, signaling	instruments
		writing (is also exchange)	writing, drawing, communication	items related to writing
F	**spiritual life**	statuary (is also domestic life / social life)	representation, believing, honoring, decorating	3-dimensional representations of all sizes
		beliefs and funerary world	believing, honoring, praying, devoting	items related to magic, divination, religion, rites, cultual and funerary practices
G	**trade, exchange**	counting, measuring, exchanging	trading, exchanging	items related to commerce, trade, measuring (steelyards, weights, tokens, ...)
H	**transport**	navigation	transport, moving oneself	infrastructure and items related to transport on water
		equipment related to animal	transport, moving oneself	harnass elements (like spurs), animal equipment fittings
		vehicle	transport, moving oneself	elements of yokes, wheels and terrestrial vehicles
I	**immovable property**	structure (rough shell)	living, accomodation	nails, ironwork, elements used for the construction and the arranging of the building
		joinery, framery	protecting oneself, circulation	joinery, door-and windowframing, incl. nails and fittings for the realisation and the functioning of buildings and rooms
		hydraulics	conduction and storage of water	objects related to the management of water
J	(structural) fittings (unclassifiable)	unclassifiable nails, fittings, joinery and framery items		fittings of which cannot be determined to which find domaine they belong
K	**miscellaneous**			identified items of which the precise function cannot be determined
				items of which the identification is not known

cataloguing the finds in worked bone/horn/antler/ivory, to enhance the overview of and the search for finds represented by each domain.

From most of the nails, fittings, joinery and framery items it cannot be determined whether they belonged to furnishing (domestic life) or whether they represent constructional elements of immovable property. Therefore it has been chosen to classify them separately as (structural) fittings (J). Only fittings which can undoubtedly be identified as construction elements are classified under immovable property (I).

This functional classification is not always straightforward as several types of items have dual or multiple purposes and can belong to different domains and categories. The overview of the functional domains demonstrates that the copper alloy items mainly yield information on a military, personal and domestic level, on crafts/production (*i.e.* mainly bronze working) and on transport. The iron assemblage mainly contains information on military life, domestic life and/or immovable property, in addition to a significant contribution in the area of crafts/production, mainly in the form of tools[160].

Representative items are listed in the catalogues; the catalogue of the illustrated copper alloy finds is included as Section 7 of this chapter, the catalogue of the illustrated iron finds as Section 8. For each item in the catalogue comparable finds are listed where possible and to the extent necessary to understand the chronological significance

160 **I am greatly indebted to dr. Malcolm Lyne for his enormous help in identifying many finds through several sessions, and to Nicolas Tisserand (INRAP) for his feedback on the catalogued items.**

and the area of distribution of the considered find type. In this respect a special focus has been given to the occurrence at the other North Sea and Channel forts. The literature study in the catalogue has not the intention to be exhaustive. As with the study of the pottery, items of which the context and the attribution to a specific level is uncertain, are counted in with the latest level in question (*e.g.* finds from level 4+5 are counted to level 5). References to typologies, geographic distribution and similar finds are listed in the catalogue and will not all be repeated here.

3. The copper alloy assemblage

3.1 The copper alloy assemblage in general

Of the in total 4,150 copper alloy items (CA), 866 are diagnostic and were catalogued in detail. Table 3.2 shows the overview of their classification in domains and categories and according to the (fort) level in which they were found. The in Section 7 of this chapter presented catalogue, only lists the illustrated, representative items – 496 in total – which cover all the represented types of objects[161] (Plates CXCVI-CCLV). The remaining 3,284 items that were not catalogued in detail, mainly concern copper alloy sheet, whether or not riveted, fragments of rods, bars, shafts, stems, amorphous pieces and undetermined fragments, next to 69 items identified as slag material. Of the 866 catalogued items, 202 were found in the (mixed with) post-Roman level; 91 of the latter were recovered from the transition levels (5+post) between the Roman and post-Roman levels and were most likely either still situated at the top of fort level 5 or dug up from that level.

A striking 51.2% of the catalogued items (representing 443 items) – and this proportion is representative for the total amount of uncovered copper alloy items – belongs to fort level 4. Certainly, this is mainly due to the function of the south-west corner site as a workshop area during that period. Apart from the attested brooch and bracelet production, more copper alloy items will have been produced and/or repaired in these workshops and many others will have been used as scrap material.

Of a lot of fittings, links and rings the function is not traceable; non-ornamental links were used for various purposes (cf. illustrated examples on Plate CCLIII). Some may have been related to handles and hinges of furniture, others with parts of the horse harness such as the bridle and bits.

3.2 Military equipment and military dress

Twenty-one copper alloy items of the south-west corner site can be unambiguously identified as military items, whether as part of military equipment (six items) or of military dress (fifteen items) (Plates CXCVI-CXCVII). No such finds can be assigned to level 1; military accessories are however clearly present in the later fort levels.

Fort level 2 yielded a pelta-shaped scabbard chape (CA.A01) of a well-known 3rd-century type (see Miks 2007, Taf. 247; Oldenstein 1976, Taf. 20). Item CA.A10 can be identified as an element of a cuirass hinge, part of a *lorica segmentata*.

To fort level 3 a simple, 3rd-century baldric *phalera* (CA.A14) can be assigned, as also a scabbard runner (CA.A03) of a type current for the third quarter of the 2nd to the third quarter of the 3rd century (Miks 2007, 300; Oldenstein 1976, 109).

Six military items belong to fort level 4. A large *phalera* (CA. A09) – a sculpted disc depicting most likely the head of a god – can be recognized as a military decoration given to a soldier (most often high-ranked) or a unit as an award for distinctive conduct in action[162]. Three baldric *phalerae* (CA.A14, A15, A16) are of the current 3rd-century type; a fitting (CA.A11) can be identified as the back side element of such a *phalera*. The two items CA.A04 and A05 represent helmet cheek fragments. They probably belonged to Intercisa type-like helmets, possibly related to the subtype of Worms, and usually related to infantry (cf. Bishop and Coulston 2006, 210, 211: Fig. 134, 4; Fischer 2012, 158-160), although the fragments are small to be certain.

At the north-east corner site (site Kapellestraat (ET17)) level 6 yielded some remarkable *militaria* (Vanhoutte *et al.* 2014, 218-219). This level can be identified as fort level 5; however, from the study of the other find categories at this site (mainly the coins and pottery) it could be concluded that this level largely consisted of dug-up material from the earlier level, fort level 4. A miniature *beneficiarius* lance head probably functioned as a belt strap-end[163] (Figure 3.1). Such items appeared from the end of the 2nd century onwards, but were mainly popular in the 3rd century (Bishop and Coulston 2006, 152-154, 182-184; Oldenstein 1976, 157). They were not only attributed to *beneficiarii*, but also to *frumentarii* and *speculatores* – all privileged soldiers with significant responsibilities (see D'Amato and Summer 2009) –, and acted as indications of their rank and position (Stephenson 1999, 104) and as symbols of imperial power (Oldenstein 1977, 153-157). Other military dress accessories found at this level at the north-east site are a *lorica* fastener and two profiled longitudinal items which can be recognized as a specific type of strap-end of multi-leg trimmings, either as part of military dress or horse gear (cf. Oldenstein 1977, 145-146).

At fort level 5 at the south-west corner site, five military items were recovered. Two round baldric *phalerae* with central boss (CA.A17 and A18) represent a type known for the 3rd century. The two

161 The non-illustrated items of the original catalogue all represent items which have a very close parallel in the illustrated assemblage.

162 These military distinctions were awarded in sets of five, seven or most often nine discs (Maxfield 1981, 92).

163 Such miniature lance heads functioned as a baldric or belt element: on the belt as strap-end or decorative fitting, on the baldric as *phalera* or military decoration (Stephenson 1999, 104). The absence of studs and the round-sectioned hollow end of the Oudenburg item assumes it was used as strap-end.

Table 3.2. Classification of the catalogued copper alloy assemblage of the south-west corner site, into domains and categories, and according to their find level. 'POST' stands for the post-Roman level. Illustrated finds on Plates CXCVI-CCLV.

find domain / category	item (found complete or as fragment)	cat. nos CA.	TOTAL n	L1	FL2	FL3	FL4	FL5	FL5+POST/ POST
military life									
military equipment									
	scabbard chape	A01-02	**2**		1				1
	scabbard runner	A03	**1**			1			
	helmet fragment (or presumed)	A04-06	**3**				2		1
military dress									
	phalera (as military decoration)	A09	**1**				1		
	cuirrass hinge	A10	**1**		1				
	baldric fitting	A11	**1**				1		
	baldric phalera	A12-20	**9**			1	2	5	1
	strap-end	B009-011	**3**						3
military life / transport									
	spur (?)	A07-08	**2**					1	1
	horse trappings / belt mounts	A/H21-95	**76**	1		6	35	15	19
transport									
equipment related to vehicule									
	yoke ring	H01-033	**33**			1	9	10	13
	charriot fitting	H34-35	**2**				1		1
equipment related to animal									
	harness bell	H36-37	**2**				1	1	
navigation?									
	ship nails (?)	H?38-43	**6**				2		4
personal life									
ornament and dress									
	brooches	B012-70, 104-192	**162**		4	7	82	25	44
	buckle (with or without buckle plate)	B001-005, 007	**6**				1	1	4
	buckle plate	B006, 008	**2**				1		1
	bracelet	B233-248, 255-269	**31**			2	16	4	9
	finger ring (incl. key ring (is also furnishing))	B270-277	**8**		1	2	1	1	3
	hair pins	B279-287	**10**				2	6	2
body care (medicine or toilet implement)									
	probe	B289-293	**5**			1	2	1	1
	tweezer	B294-296	**3**			1	1		1
	mirror	B288	**1**				1		
domestic life									
culinary activity (eating / drinking)									
	spoons	D117-120	**4**			1	1	2	
	vessel (or fragment)	D046, 64, 72-116, 154-224							
	- baking tin?		**1**				1		
	- bowl		**5**			1	3		1
	- bucket		**15**			1	7	1	6
	- casserole		**1**				1		
	- cauldron		**1**				1		
	- plate		**6**				4		2
	- dish		**2**				2		
	- dish/bowl		**1**				1		

find domain / category	item (found complete or as fragment)	cat. nos CA.	TOTAL n	L1	FL2	FL3	FL4	FL5	FL5+POST/ POST
	- jug		**4**				2	1	1
	- patera / sieve		**2**				1	1	
	- dipper		**1**					1	
	- sieve or dipper		**8**				5	1	2
	- sieve		**33**		3		13	11	6
	- vessel undetermined		**38**		2	3	17	7	9
household utensils									
	knife scabbard	D065	**1**				1		
	knife handle	D066-67	**2**						2
	sewing needle (incl. one unfinished needle)	D068-71	**4**				3	1	
lighting									
	candlestick	D001-004	**4**				3		1
furnishing									
	key (excl. key rings)	D052-57	**6**			1	1	3	1
	decorative nail (lock pin or other)	D005-021, 143-146(?)	**21**			1	13	4	3
	decorative fitting	D022-26	**5**				2	2	1
	furniture handle (or presumed handle fragment)	D027-31, 35, 37-44, 147-151	**19**			1	11	4	3
	box or chest sheet fitting	D045, 47-51	**6**				2	2	2
	furniture hinge	D059-62	**4**				2	2	
	? furnishing or charriot fitting	D022	**1**				1		
furniture / vessel									
	chest or vessel handle	D033-034	**2**				1	1	
	footstand	D063	**1**		1				
	? chest/vessel/helmet carrying handle	D032, 036	**2**				1		1
crafts (repair) / domestic life									
	repair plate (reparation of vessels)	D/C121-124, 126, 128-141, 153	**22**				9	7	6
crafts - production									
bronze production in general									
	slag material and production waste	C01-06	**6**	1			5		
brooch production									
	failed or untwisted brooch product	B/C071-103, 193-232	**123**			1	101	12	9
bracelet production									
	failed product	B/C249-254	**6**				3	1	2
textile working									
	netting needle (textile working + fishing)	C07-22	**16**				10	2	4
	weaving comb	C23-24	**2**				2		
trade, exchange									
	steelyard elements	G01-15	**13**				7	5	1
	steelyard weight/cursor	G13-14	**2**				1	1	
social life / exchange									
writing implements									
	stylus	E01-02	**2**				1		1
	wax spatula	E03	**1**				1		
spiritual life									
	statuary	F01-04	**4**				3	1	
	cymbal (is also social life)	E/F05	**1**				1		
immovable property									
	hydraulics	I01	**1**						1

find domain / category	item (found complete or as fragment)	cat. nos CA.	TOTAL n	L1	FL2	FL3	FL4	FL5	FL5+POST/ POST
miscellaneous		J-K							
	machinery fragment?	K01	**1**					1	
	link		**63**	1	2	2	24	16	18
	fitting		**18**				7	3	8
	binding		**4**				3	1	
	chain fragment		**2**				1	1	
	undetermined	K	**9**				5	3	1
TOTAL			**866**	**3**	**15**	**34**	**445**	**168**	**201**

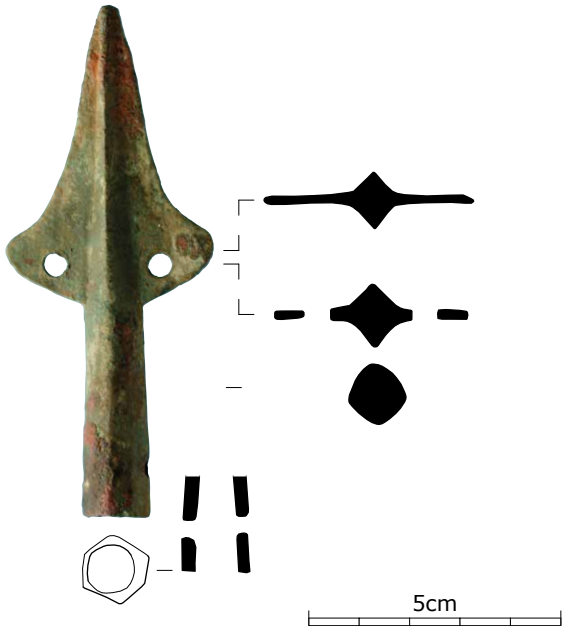


Figure 3.1. The miniature *beneficiarius* lance found at the north-east fort site Kapellestraat (Vanhoutte *et al.* 2014, 218: Fig. 62, 1).

enamelled mounts (CA.A19 and A20) are baldric *phalerae* and are dated to the 3rd-4th centuries. The miniature shield (CA.A12) can be recognized as a late Roman baldric fitting. Three strap-ends, two definitely (CA.B009 and B011) and one most likely (B010) of the late amphora-shaped type, can, although not recovered from within the Roman level itself, definitely be assigned to fort level 5 as they date to *c.* AD 350-390 according to Keller (1971, 65-66).

Another three military items were recovered from the post-Roman levels. Very significant is the fragment of a very late type of scabbard chape, dated by Miks (2007, 415-418) to the end of the 4th – end 5th/early 6th century. An openwork disc-shaped (baldric?) *phalera* (CA.A13) remains unparalleled but similar openwork fittings are known with two to four attachment lugs, generally seen as horse gear trappings. Fastening elements are lacking at the Oudenburg item, but may have consisted of, not preserved, small studs or loops on the back, which favours an identification as part of the military dress for this piece. The sheet fragment with undefined sculpting (CA.A06) may have been part of a cavalry helmet.

3.3 Indications for cavalry and (military) transport

To the listed military items, two presumed spur fragments can possibly be added; one fragment was recovered from fort level 5 (CA.A07), the other from the post-Roman level (CA.A08) (Plate CXCVI). Furthermore, the south-west corner site yielded a considerable amount of 76 trappings, all (presumably) horse gear mounts, representing different types (CA.A/H21-95)[164] (Plates CXCVIII-CCIII). The common round mounts account for 48 examples – small, medium and large sizes are present –; other identifiable types are shell-shaped, disc-and-foliated, vulva-shaped/hexagonal, pelta-shaped, lunula-shaped (mount or pendant), rectangular, large oval, shield-shaped and dolphin-shaped (Table 3.3).

These trappings are generally accepted as being decorative horse gear fittings (cf. *e.g.* Nicolay 2007), an identification confirmed not only by depictions (however scarce, see Zwart 1998, 81) but also by *in situ* finds such as in the Beuningen horse burial (NL) (late 1st – 2nd century AD) (Zwart 1998) and in the *tumulus* grave at Celles-les-Waremme (B) (late 2nd – first half 3rd century AD) (Massart 2000)[165]. The large quantity and the size of several of the Oudenburg mounts certainly assumes that at least most of them originally decorated horse gear; in addition, the large lunula-shaped mount (CA.A/H74) and the large oval fitting (CA.A/H76) would only fit on broad bridle straps. Although also known at civil sites and not exclusively reserved for the military (cf. Nicolay 2007), these horse gear trappings at the Oudenburg fort, certainly those found in the Roman level, can be seen as representative(s) of military transport and can be considered as indications for the presence of cavalry in the fort.

164 **In literature these trappings are sometimes referred to as *phalerae* (see *e.g.* Bishop and Coulston 2006, 162). Here it is chosen – to avoid confusion – to reserve this term for the military decorations and the baldric fittings.**

165 **It is, however, necessary to point to the finds in a grave at Cabriana (Burgos, Spain) (see Aurrecoechea Fernández 1996, 140: Fig. 20) which demonstrate that, mainly the smaller-sized, mounts such as the pelta and shell mounts could also decorate (military) belts. This might have been only a late Roman fashion and 2nd- and 3rd-century trappings were most likely only used to decorate the horse harness.**

mount	TOTAL n	L1	FL2	FL3	FL4	FL5	FL5+POST/POST
large round	**8**	1			4	1	2
medium round	**18**				9	5	4
small round	**21**			3	11	4	3
dolphin-shaped	**1**			1			
disc-and-foliated	**5**				3	1	1
lunula-shaped	**2**					2	
pelta-shaped	**3**			1			2
shell-shaped	**6**				3	1	2
shield-shaped	**1**				1		
vulva-shaped/hexagonal	**5**			1	1	1	2
rectangular	**1**						1
large oval	**1**				1		
undet.	**4**				2		2
TOTAL	**76**	**1**	**0**	**6**	**35**	**15**	**19**

Table 3.3. Overview of the numbers of horse gear trappings recovered from the south-west corner site, per type, according to the level of their find context.

All the types represented by the trappings can be dated to the second half of the 2nd and 3rd century; only for the shell-shaped type parallels are known until the first half of the 4th century. However, although it cannot be excluded that they are all dug-up items, the occurrence of seventeen mounts at fort level 5 may indicate that the mid-Roman mount types still continued to be used in the 4th century; the presence of another nineteen mounts in the 5+post- and post-Roman level, of which five items can certainly be assigned to the transition level 5+post and most likely belonged to fort level 5, strengthens this idea. To level 1 only one mount can be assigned (of the large round type (CA.A/H44)). Fort level 2 yielded none, but this may possibly be due to the function of this corner area where at that time a military hospital was located. While six mounts can be assigned to fort level 3, no less than 35 items belonged to fort level 4, mainly found at and near the workshops, maybe some to be repaired or to be used as scrap metal for remelting. Several damaged mounts may be an indication for this, although it cannot be excluded that these just suffered through time from their burial in the ground. An exception to this group is formed by a deposition of five horse gear trappings within building Unit IX and found to the south-west of hearth 38. In a small, shallow pit (preserved to a depth of 14 cm, see Plate CDLXXXIX: section 8/45) a small round mount (CA.A/H29), a medium round one (CA.A/H43), a large round one (CA.A/H47), a shell-shaped one (CA.A/H54) and a disc-and-foliated mount (CA.A/H68) were buried together. Again, also at the north-east site (site Kapellestraat (ET17)), a large amount of horse gear fittings can be attributed to fort level 4 (although mainly recovered from the later level, however most likely residual material as already discussed) (cf. Vanhoutte *et al.* 2014, 236).

Horses were probably also the carriers of the two harness bells (CA.H36-37) (Plate CCLII) found at the south-west corner site, one at fort level 4 (CA.H36), the other at fort level 5 (CA.H37). Bells of this size were attached to the halters or collars of cavalry, domestic and draught animals (Crummy 1983, 127; see also Allison *et al.* 2005, 8.2.2), possibly for apotropaic reasons (Gusman 1900, 127-128; Bös 1959, 25). Their function as part of horse gear is evidenced by depictions and horse burials as for example the one found at Beuningen (NL), probably to be dated in the late 1st or 2nd century (Zwart 1998, 82: Fig. 5).

Another significant assemblage is that of the 33 bridle rings (CA.H01-H33), elements of yokes of chariots or carts and used to guide the reins (Plates CCXLVI- CCLI). These bronze yoke rings were placed in the centre of the raised parts of the yoke above the neck of both the draught animals. The lower part of the yoke element, either formed by a pin or a ring, penetrated through the yoke. The lower ring element, or in case of yoke CA.H23 the side rings, were used to fasten the V-shaped, iron collar which hung under the horse's neck (Nicolay 2007, 221). The two charriot fittings (CA.H34-35), one of fort level 4 and one of the post-Roman level, can be related (Plate CCLII). One yoke ring can be assigned to fort level 3, nine to fort level 4, ten to fort level 5 and thirteen to the post-Roman level. Several of such yoke rings were found in the 1970 and 1977 excavations in the northern sector of the fort[166] (Figure 3.2). Also at the Aardenburg fort a significant assemblage of fourteen bridle rings has been found (Besuijen 2008, 74). Although yokes were associated with different draught animals, not only horses, but also, and mainly, oxen and mules (cf. Junkelmann 1990, 68; Raepsaet 2002), the association of decorative horse gear trappings and yoke components at several cart burials unearthed in *Pannonia* and at a horse burial at Frenz in Germany have demonstrated the use for carts of draught horses. Their yoke and also their harness were richly embellished with fittings, in the same way as the cavalry mounts (cf. Nicolay 2007, 223 with references).

Similar bronze spikes as items CA.H?38-43 (Plate CCLII) were found at the Richborough fort (cf. Lyne 1996, 148: Fig. 1, 1-4) and have been identified by Lyne as originating from shell-first constructed galleys of Mediterranean type. He interprets the used and extracted bronze nails which have been found at Richborough throughout the Roman level as deriving from the breaking up of old *Classis Britannica* ships (Lyne 1996, 147). At the Oudenburg site these spikes appear to be a late phenomenon, with two examples found in a (presumed) fort level 4 context, and another four items which can be generally attributed to the post-Roman level. With the possibility to reach the Oudenburg fort walls closely by ship in the late Roman period, the identification of these spikes as ship nails

166 It appeared not possible to link them to a specific stratified context.

Figure 3.2. Yoke rings uncovered in the northern sector of the Oudenburg fort during Mertens' excavations in 1977 (site ET11) (Unpublished material, Archive NDO J. Mertens, Flanders Heritage Agency). The large yoke ring to the right knows three similar examples from the cart burial of Long Pont (province of Brabant Walloon (B)) dated to the first half of the 3rd century AD (Mariën 1979) (however not identical with a slightly other shape of ornament below the bell-shaped part).

is not impossible. The Oudenburg find contexts, however, cannot contribute to the validation of this interpretation.

3.4 Personal life

In total 226 items can be related to the personal life of the fort inhabitants. They consist mainly of ornament and dress accessories: 162 brooches, five buckles, two, possibly three buckles with belt plate, 31 bracelets and (presumed) bracelet fragments, eight finger rings, nine or ten complete or fragmentary hair pins. Two of the finger rings, namely the key-rings, enter the domestic atmosphere as they were used to lock small furniture, like a chest or box. Eight items are related to body care: five probes, three tweezers and one small mirror.

3.4.1 Brooches

The south-west corner site yielded in total 162 (finished) brooches but there is no large variety in types (Table 3.4; Plates CCV-CCIX). The high number of brooches is biased by the brooch production on the site during fort period 4 which evidently resulted in a lot of end products and an overrepresentation of the brooch count (see also further). The production in question only concerns the 'simple one-piece sprung brooch' with wire bow[167], recently described as 'wire brooch with a more or less angular bow[168] and spring with three or four coils and internal chord' by Heeren and van der Feijst (2017, 123-126) (type 45a8). In total 131 brooches of this type were recovered (CA.B043-70, B104-192). As this type was made at the workshops of fort period 4, as evidenced by production waste at the corresponding level (see further), this evidently resulted in a large number of this type at this fort level (73 brooches). It was clearly a series product; often the coils appear to be made very carelessly. This brooch type seems to have been a standard element of the military dress at least from fort level 2 onwards: a simple brooch to fasten the coat, not a dress item used as *insignia*. The nineteen brooches of this type at fort level 5 and the 29 examples in the 5+post- and post-Roman level are probably dug-up items.

Another important brooch group is that of the crossbow brooches, represented by sixteen examples at the south-west corner site (CA.B012-027) (Table 3.5) (see also Section 4 in this chapter for a detailed study by V. Van Thienen). These crossbow brooches appear at the site from fort level 4 onwards. The crossbow brooches recovered from fort level 4 belong to the 'light' type and are all dated prior to AD 280/300[169].

Based on the combination of archaeological, art historical and historical evidence, Van Thienen (2016a; 2016b; 2017) has demonstrated that the crossbow brooch was in its initial phase an

167 Bayley and Butcher classify this type as 'simple one-piece sprung brooch' (Bayley and Butcher 2004, 53: type T10-11), Guillaumet as 'fibule à resort nu et corde interne' (Guillaumet 1993, 23) and Böhme and Riha as 'Eingliedrige Drahtfibeln mit unterer Sehne' (Böhme 1972,13; Riha 1994, 56). Böhme (1972) identifies it as type 14 in his typology, Almgren (1897) as type 15.

168 The more or less angular bow is the distinctive characteristic in comparison to the earlier 'Nauheim derivatives' (see further).

169 Van Thienen (2016) dates this early type prior to AD 280. Heeren and van der Feijst (2017, 175-178), who classify this type as 'brooch with long hinge-arms', conclude to a date between *c.* AD 240 and 280/300.

Table 3.4. Overview of the brooch types and their numbers at the south-west corner site, according to the level at which they were found (cf. Plates CCV-CCIX).

general brooch type	cat. no.	TOTAL n	L1	FL2	FL3	FL4	FL5	FL5+POST/POST
simple one-piece sprung brooch with wire bow	B043-70, 104-192	**131**		3	7	73	19	29
arched bow brooch	B034	**1**				1		
bow brooch with knobbed foot (?)	B037	**1**				1		
bow brooch undet.	B036	**1**					1	
Nauheim brooch (?)	B028	**1**						1
eye brooch	B029	**1**						1
Hod Hill brooch	B030	**1**						1
annular brooch	B039-040	**2**				1		1
penannular brooch	B041-42	**2**				1	1	
crossbow brooch	B012-027	**16**				5	3	8
enamelled plate brooch	B033	**1**						1
hinged plate brooch with enamel decoration	B031-32	**2**		1				1
circular gilt brooch	B035	**1**						1
brooch undet.	B038	**1**						
TOTAL		**162**	**0**	**4**	**7**	**82**	**24**	**44**

Table 3.5. Overview of the crossbow brooches recovered at the south-west corner site.

crossbow brooch	crossbow brooch type based on Riha (1979) and Keller-Pröttel-Swift (KPS) (Keller 1971, Pröttel 1988, Swift 2000)	KPS date of brooch type	proposed date of brooch	(fort) level of find context
CA.B012	type 0 - 'Armbrustscharnierfibel' (Riha 6.4.3)		< AD 280	4
CA.B013	type 0 - 'Armbrustscharnierfibel' (Riha 6.4.2)		< AD 280	4
CA.B014	type 0 - 'Armbrustscharnierfibel' (Riha 6.4.3)		< AD 280	4
CA.B018	type 0 - 'Armbrustscharnierfibel' (Riha 6.4.3)		< AD 280	4
CA.B020	type 0 - 'Armbrustscharnierfibel' (Riha 6.4.4)		< AD 280	4
CA.B019	type 0 - 'Armbrustscharnierfibel' (Riha 6.4.3)		< AD 280	5
CA.B015	type 0 - 'Armbrustscharnierfibel' (Riha 6.4.2)		< AD 280	4+5
CA.B016	type 0 - 'Armbrustscharnierfibel' (Riha 6.4.4)		< AD 280	5+post
CA.B017	type 0 - 'Armbrustscharnierfibel' (Riha 6.4.2)		< AD 280	post
CA.B023	type 1 - light crossbow brooch, KPS 1(A) (~ Riha 6.5.1)	AD 280-320	AD 250-300	5
CA.B021	type 1 - light crossbow brooch, KPS 1(B) (~ Riha 6.5.1)	AD 280-320	AD 250-300	5+post
CA.B022	type 1 - light crossbow brooch, KPS 1(A) (~ Riha 6.5.1)	AD 280-320	AD 250-300	post
CA.B024	type 2 - early developed crossbow brooch - light crossbow brooch, KPS 2i	AD 300-340	AD 280-320	post
CA.B025	type 2 - early developed crossbow brooch - light crossbow brooch, KPS 2i	AD 300-340	AD 280-320	post
CA.B026	type 2 - early developed crossbow brooch - light crossbow brooch, KPS 2iii	AD 335-365	AD 350-400	unstratified
CA.B027	type 2 - early developed crossbow brooch - light crossbow brooch, KPS 2iii unfinished/ failed?	AD 350-415	AD 300-410	post

attribute to military dress owned by common soldiers. During the 4th century, however, this type of brooch changed into an important attribute of the military and administrative body of the late Roman Empire and turned into a symbol of high ranking. These are the so-called *Zwiebelknopffibeln* (cf. Keller 1971) or 'developed crossbow brooches' (cf. MacKreth 2011; Bayley and Butcher 2004; Swift 2000a). At the end of the 4th century this brooch type finally became an attribute worn by consuls and members of the senatorial class and as such symbolised Roman power (Van Thienen 2016; 2017; see also Section 4 in this chapter). Only four crossbow brooches recovered at the south-west corner site are likely to be assigned to the 4th century. Although three were recovered from the post-Roman level (CA. B024; CA.B025; CA.B027) and one was found unstratified (CA. B026), all four most likely belonged to fort period 5.

Thirty-three of such late crossbow brooches were found at Graveyard A and this significant number implies the presence of several high-ranked soldiers at the Oudenburg fort, during fort period 5A as well as during fort period 5B (see Volume I, Chapter IV.3.2).

The remaining fifteen brooches cover types which are represented by only one or a few examples. Some of them may have had a specific military connection. The 3rd-century arched bow brooch CA.B034 with knobbed plate on the upper bow recovered from fort level 4 – only as a fragment, but a complete example was found at the north-east corner site Jacali (ET17) – has a close parallel at the Aardenburg fort. It is believed to have been a typical British product with military connection (Van Thienen 2011, supported by Heeren and van der Feijst 2017, 172). A military connection can

also be attributed to the 3rd-4th century intaglio brooch CA.B035 with its eagle motif, although found in the post-Roman level as a dug-up item. It knows a close parallel at the Richborough fort (see Busche-Fox 1949, Pl. XXXV, 89). A military link has also be assumed for the penannular brooch Fowler (1960) type D (Heeren and van der Feijst 2017, 186), at the Oudenburg site represented by brooch CA.B042. This type is dated to AD 250-350, and recovered from fort level 5 it may well have been a 4th-century example.

The hinged plate brooch with enamel decoration from fort level 2, CA.B032, and the presumed bow brooch with knobbed foot from fort level 4, CA.B037, both dated at the latest to the second half of the 2nd century AD, must have been dug up from fort level 1 or from pre-fort structures. Another five brooches were found in the post-Roman level. The possible Nauheim brooch CA.B028 (BC 50 – AD 100), the Eye brooch CA.B029 (second half 1st century AD), the Hod Hill brooch CA.B030 (1st – first half 2nd century AD), the hinged plate brooch with enamel decoration CA.B031 (2nd century AD?) and the enamelled plate brooch with a two-piece spring CA.B033 (2nd – early 3rd century AD) may all have been brought in together with the earth from outside the fort (see Volume I, Chapter II.2.3).

3.4.2 Buckles and belt plates

At the south-west corner site nine buckles and/or buckle plates were unearthed (CA.B001-008) (Plate CCIV). Only three items could be collected from the Roman level itself. Although Nicolay (2007) dates the buckle-type of CA.B002 in the mid-Roman period, most parallels, like *e.g.* in a mid-4th-century grave at Krefeld-Gellep (G) (Pirling 1979, Taf. 79, 7) and in the late 3rd-century Neupotz assemblage (Künzl 1993, J 102) refer to the late Roman period, which is in line with the Oudenburg find context at fort level 5. Apart from an undefined, presumed, annular buckle, the other (presumed) belt element collected in the Roman level is the half of a hexagonal (?) plate with volute design with blue glass inlay CA.B008. No parallels were found in literature, but the form and the decoration recall the late Roman richly decorated chip-carved belt plates of *e.g.* Graveyard A, grave 3. However, found in the fire layer dated to the end phase of fort level 4 (late 3rd century), this example would represent a very early type.

The other five buckles and/or buckle plates were not recovered from the Roman level itself, but their late date implies that they must be attributed to fort period 5. For the, badly preserved, late Roman rectangular buckle plate CA.B006 of type Simpson (1976) Group I parallels are known at graves 57, 68 and 104 at Graveyard A (Mertens and Van Impe 1971). Special attention should be drawn to the buckle with attached plate CA.B005. The belt-buckle in its totality can be recognized as a very stylized version of buckle type Sommer (1984) Sorte 1, Form C, Typ e (buckle with four animal-heads and with rectangular plate). The buckle itself may be a more stylized version of the buckle with confronted dolphins of type Chadwick Hawkes and Dunning (1964) 1A, of which a larger example was found in the late Roman levels of the Richborough fort (Lyne 1999a, 107: 4). For the incised leaf-decoration no parallels were found but it seems to imitate chip-carved leaf-decoration well-known on late Roman belts (see *e.g.* belt plate of grave 3 at Oudenburg Graveyard A (Mertens and Van Impe 1971, Pl. II, 1a, 4a)). It seems very likely that this item represents a local imitation. For the decorated, presumed ring-buckle CA.B004 no exact parallels were found but it may have formed part of a ring-buckle with trapezoid joining plate of which only rare examples are known, mainly in the Danube region (see Nowothnig 1970, 139-142). As such, this item could be related to the jewellery with connections to eastern regions found at Graveyard A (see Volume I, Chapter IV.3.2.4). The oval frame buckle CA.B007, found unstratified, stands out by its very late date. This buckle can be dated at the earliest in the early 5th century but continued to be in use as a Merovingian type of buckle. It is therefore unclear whether it should be attributed to the latest fort inhabitants of the first third of the 5th century or to later newcomers.

3.4.3 Bracelets, finger rings and hair pins

Thirty-one bracelets or fragments of (presumed) bracelets were recovered (Table 3.6) (Plate CCXII-CCXIV)[170]. Except for two fragments at fort level 3, bracelets occur mainly from fort level 4 onwards.

Only three specifically late Roman bracelet types are represented: the three-strand twisted cable bracelet datable to the second half of the 4th century (CA.B265), the simple flat bracelet with zigzag notched edge (CA.B261) and the grooved strip-bracelet with hook-and-eye fastening (CA.B262-263), the latter both types dated to AD 275-400 which is in line with their find contexts.

Seventeen bracelets can be identified as of the snakeshead type, a general term covering several subtypes (see *e.g.* Swift 2000a). The imitation of the form of a snake in bracelets was found in the earlier Roman period throughout the Roman Empire and in regions beyond the border as well. The type became gradually less realistic and evolved, especially outside the Empire, into very stylized types (Swift 2000b, 63; see Swift 2000a, 153 ff.). The four rutted bracelets CA.B233-236 with small (animal?) heads, found clustered in the large waste-pit OS 4980 of fort level 4 and most likely worn together, should be seen separately from the other snakeshead bracelets. They represent imported jewellery, in contrast to the locally made snakeshead bracelets which are characterized by their uniformity. With the latter the stylized snakeshead is only marked by longitudinal grooves; the rest of the bracelet is kept plain, as is best visible on the complete bracelets CA.B237 and B238. As evidenced by unbent and cut bracelet fragments, this type – type Oudenburg 1 – was made at the fort precinct (see further: Section 3.6.2 in this chapter) and it should be emphasized that the numbers of the finished bracelets of this type are as such an overrepresentation. A similar bracelet was found in the Belgian coastal plain at the Roman rural site at De Panne, generally dated to the second half of the 1st – first half of the 3rd century AD (De Loë 1939, 148). A very close parallel is known from Tongeren, Koninksem (south-west graveyard of Tongeren) where it was found as stray find and therefore only generally datable to the 2nd to 4th centuries (De Laet 1980, nr. 231). Very interesting in light of the coastal context are the two snakeshead bracelets found in the silted up layers of the harbour of *Forum Hadriani* (Voorburg) and

170 I would like to thank dr. Kathy Sas for the identification of the bracelets and her feedback on the Oudenburg jewellery in general.

Table 3.6. Overview of the bracelet types and their numbers at the south-west corner site.

bracelet type	dating of type	cat.nos	TOTAL n	L1	FL2	FL3	FL4	FL5	POST/ 5+POST	unstrat.
snakeshead bracelet (Oudenburg 1) (local production)	3rd-4th C.	B237-248, 268	**13**			1	6	2	1	3
snakeshead bracelet (stylised animal heads) (import)	3rd-4th C.	B233-236	**4**				4			
two-strand twisted cable bracelet	2nd-4th C.	B264, 266	**2**			1		1		
three-strand twisted cable bracelet	2nd half 4th C.	B265	**1**					1		
simple round-sectioned open bracelet	1st-4th C.	B255-257, 259, 267	**5**				3		2	
simple flat bracelet with zigzag notched edge	AD 275-400	B261	**1**				1			
grooved strip-bracelet with hook-and-eye fastening	AD 275-400	B262-263	**2**					1	1	
bracelet undet.		B258, 260, 269	**3**				1		2	
TOTAL			**31**	**0**	**0**	**2**	**15**	**5**	**6**	**3**

which show close similarities to type Oudenburg 2, discussed below (Section 3.6.2). At Voorburg, they have been dated on typological grounds to the late 2nd – early 3rd century, based on the typology by Riha (1990, 56) (Hoss 2014, 622).

The small assemblage of eight finger rings displays a variety of types (Plate CCXV). The two key-rings CA.B275 and B276 are to be considered together with the lock items recovered from the same find levels, respectively fort levels 3 and 4. Worth drawing attention to is finger ring CA.B271. It was most likely recycled from part of a zigzag notched bracelet, a popular type in the second half of the 3rd and 4th century (Sas 1999, 174-175). Swift has demonstrated for Britain that the modification of late Roman bracelets and their subsequent re-use as smaller rings was part of a wider phenomenon of re-use, repair and recycling from the later 4th century onwards (Swift 2012). Being recovered from fort level 5, the Oudenburg ring can probably be seen as an illustration of this phenomenon. The finger ring with deteriorated glass bezel CA.B272, collected as a stray find, has a parallel in grave 191 at Graveyard A which can be dated after AD 388 (Mertens and Van Impe 1971, Pl. LIX: 9) and is therefore likely to be associated with fort level 5B. Also finger ring CA.B273, recovered from the post-Roman level, belonged to fort level 5B; this late type has been dated by Clarke (1979) in the period AD 360-370/380.

The copper alloy hair pins (Plate CCXV) are of course to be considered together with the bone and jet(-like) hair pins. Cool (1990, 150) has pointed to pictorial and burial sources which bear witness of the use of metal hair pins to secure and decorate the hair arrangements of women and girls. At the Oudenburg site they only occur from fort level 4 onwards. Only hair pin CA.B280 with the faceted cuboid head is of an undoubtedly late Roman type, and this is in line with its find context at fort level 5. Hair pins CA.B281 and B287 show types which were in use throughout the Roman period but which were very popular in the late Roman period (Cool 1990, 151-154). Both were recovered from fort level 5.

3.4.4 Body care

A few probes, tweezers and a mirror refer to body care (Plate CCXVI). Whether the four scoop probes CA.B289-292 should be seen as medical instruments or as toilet implements in general is unclear. It is tempting to associate them with the military hospital of fort level 2 and to consider them as dug-up items from that level. The ear probe CA.B293 and the tweezers CA.B294-296 were definitely multi-purpose (cf. Riha 1986, 33) and could well have served for the personal hygiene of soldiers[171].

The small round, slightly curved, plate CA.B288 can be identified as a hand mirror, originally held in a wooden frame. At least one side must have been originally silvered or tinned to achieve a reflective surface. According to Deschler-Erb (1996, 65) these framed mirrors were only in use in the 1st and 2nd centuries AD. However, the good preservation of the Oudenburg find in the infill of the fort level 4 well OS 22926 suggests a longer use. Lloyd-Morgan (1981) concluded from burial finds that such mirrors were mostly in use by women.

3.5 Domestic life

Two hundred items are related to domestic life. Four spoons (Plate CCXL) and 118 vessels or vessel fragments (Plates CCXXVIII-CCXXXIX) belong to the general culinary atmosphere. Sixty-one elements of furnishing, four chest or vessel (or helmet?) handles[172] and one decorative fitting of furnishing (or chariot?) can possibly be added to this domain (Plates CCXX-CCXXV, CCXXVII). Seven items can be classified as household utensils. Four items represent lighting devices.

171 **At Graveyard A graves 64 and 71 both contained a tweezer (Mertens and Van Impe 1971). The other grave goods nor the skeleton remains were conclusive about the gender of the deceased.**

172 **Of certain drop handles it cannot be determined whether they should be identified as helmet carrying handles or as furniture handles (see Allison 2013, 69 with references).**

Figure 3.3. The decorated jug handle recovered in the northern sector during Mertens' excavations in 1976 (unpublished material, Archive NDO J. Mertens, Flanders Heritage Agency) is an illustration of the high-quality bronze tableware of the army unit. It can be identified as part of a '*Bauchige Kanne mit trifoliarer Mündung*' Bienert (2007) Form 4, type Millingen, with the attachment showing a mask, and is generally dated in the second quarter of the 1st – late 3rd century AD (Bienert 2007, 38).

Bronze vessels were considered as luxury wares since there was a considerable amount of costly metals involved in producing them. They had a long life-span and were likely favourable items for remelting when worn or damaged. Such use as scrap metal and the need for repair of such vessels are likely explanations for their predominant presence at fort level 4. The 22 loose repair plates (CA.D/C121-124, 126, 128-141, 153) recovered from the site, not surprisingly all from find contexts belonging to fort level 4 or later levels, should most likely be seen as related (Plate CCXLI). They were probably used to repair vessels (cf. *e.g.* Bienert 2007, 157) at the workshops of fort level 4.

The large amount of sieve fragments is interesting, although misleading: they probably belonged to a lot less individuals. Nevertheless, the number of sieve or dipper handles with splayed terminals and in most cases with fin-shaped side-lobs do point to a significant use of wine dippers and strainers (Plate CCXXIX-CCXXXII). Apart from some body fragments at fort level 2, the sieve and dipper fragments mainly occur at fort level 4. Based on the number of handles, at least six sieves and dippers can be attributed to fort level 4, at least three to fort level 5. Such colanders were basin-shaped with perforations arranged in patterns and with flat handles. The Oudenburg examples represent the type with cylindrical body, sharp transition between body and slightly rounded base, and rather short handle; this type is generally dated by Bienert (2007, 98 and 106) to the 3rd-4th/5th centuries. The form of the sieve was adjusted to that of the dipper so the colander could fit into the *patera* as a set and they could be picked up as one vessel (Allason-Jones and Miket 1984, 152). They were widely in use and Koster noted that, in contrast to earlier burials in which they occurred solely as drinking service, by the 3rd century dippers and strainers appeared to have become more general household vessels (Koster 1997, 46). By then they were probably no longer only used in the preparation of wine (for sifting defilements such as seasoning from imported wine prior to consumption or for the cooling of wine), but in many kitchen activities such as purifying, soaking and boiling of food (Bienert 2007, 98).

The Westland type of cauldron CA.D088 and the Henmoor bucket CA.D090-091 – to the latter type several other bucket elements belong, all from fort level 4 or later levels – represent wide-spread vessel types with a main popularity in the 3rd century (cf. Koster 1997, 71 for the Westland cauldron; cf. den Boesterd 1956, 44-45, Bienert 2007, 146 for the Henmoor bucket) (Plate CCXXXIII-CCXXXIV). The complete cauldron CA.D088 was found in the large waste-pit OS 4980 of fort level 4 with a plate with mussel-shaped ribbed body set inside, and next to the Henmoor bucket CA.D090-091, clearly a deposition with a specific meaning (see the Appendix in this volume: Section 5.2).

Knives to which the copper alloy handles CA.D066-067 and the scabbard CA.D065 belonged, represent miscellaneous (household) utensils (Plate CCXXVII), as is also the case for the recovered iron knives IR.D008-013 (see further). The specific function of the sewing needles CA.D068-070 is neither clear (Plate CCXXVIII); they may have been personal tools for the repair of clothing. The rough appearance of item CA.D071 seems to indicate that it concerns an unfinished product; found at the workshop area of fort level 4, it may well have been produced there.

Items CA.D001-003 and possibly also CA.D004 represent lighting devices (Plate CCXIX). Together with a few iron lighting instruments (see further) and one possible oil lamp in Lower Nene Valley ware (see Chapter 1.A.2 in this volume: cat. no. 96), they represent a striking low number of lighting devices at the site. It may assume that other forms of lighting existed. The possibility that small ceramic bowls and dishes were used

to function as lamp holder should be further investigated, as several examples of these forms in North Menapian handmade pottery and reduced wheel-turned wares are characterized by heavy rooting on the inside of the vessel.

Furniture elements and accessories are well represented at the site. They comprise handles, studs, decorative nails, hinges, fittings and keys. The copper alloy elements are mainly attributed to small furniture, like cupboards, chests, caskets and trunks (see *e.g.* the reconstructions of caskets by Riha 2001). Lockable small chests or caskets were used for storage and safe-keeping of valuables, such as money, jewellery and documents. In most cases, small chests or caskets had refined decorative handles, such as for example the so-called dolphin handles CA.D027-029 (Plate CCXXII). Another widely distributed handle type is that with a bulge in the middle of the handle bow (see Plate CCXXIII) which can also be related to small, thin-walled chests (Riha 2001, 28-29). The sheet fittings CA.D045, D047-051 represent box or chest fitting plates (Plates CCXXIV-CCXXV). They could be part of the lock fitting plate or of another decorative panel, similar to the lock plate but without lock hole and used as counterpart of the lock plate (cf. Riha 2001, 64-65). Different types of studs existed. Studs CA.D005-008, D011-017 (Plate CCXX-CCXXI), D144-146 (not ill.) are furnishing studs, characterized by a rectangular shaft and a large, round head. Some shafts have a hole through their end, presumably for extra fixture using a small nail. Studs were used to attach the lock fittings and decorative fittings to chests and caskets (Allason-Jones 1985, 102[173]; Riha 2001), in some cases to other furniture objects, like door panels or larger furniture (Quérel and Feugère 2000, 160). The copper alloy keys (CA.D052-057) (Plate CCXXVI), and certainly the key-rings (CA.B275 and B276) (Plate CCXV), also belonged to lockable chests or caskets.

3.6 Production of copper alloy items

The evidence at fort level 4 clearly points to metalworking at the workshops of the south-west corner area of the fort during the late 3rd century (see Volume I: Chapter II.4.6, Section II.4.6.2.c). Within the context of bronze working, definitely brooches and bracelets were locally produced[174]. Of many other items the production and certainly the repair can be assumed at these workshops. A quick-scan with a mobile XRF[175] of a selection of objects revealed that (all?) copper alloy products made at the Oudenburg workshops consisted of brass[176], a copper alloy containing more than 15% zinc and as such easily beaten and lengthened and therefore very suitable for making one-piece sprung brooches, bracelets and probably several other objects. This alloy was also popular for its colour: when well-polished, brass will much resemble gold (Guillaumet 1996, 99; see also Sas and Vilvorder 2002). Assumed non-locally made objects, at least so far as a sample of items has shown, were made in bronze or another copper alloy.

3.6.1 Brooch production

At the south-west corner site in total 123 brooch items can be identified as semi-manufactures and waste products of the production of simple one-piece sprung brooches with wire bow (Plates CCX-CCXI). They represent the different stages in the production process. Only one type of brooch was made at Oudenburg: the simple type in one piece, made of one piece of wire, characterized by a bilateral four-coil spring, an internal chord and a rod bow (see the finished brooches above: Section 3.4.1). Pit OS 7949, containing several of these brooch semi-manufactures and waste products (Figure 3.4), even pinpoints the localisation of (one of the workshops of) this brooch production at Unit I, at its initial phase datable to *c.* AD 260-270.

At the site 131 complete examples or fragments of simple one-piece sprung brooches with wire bow as finished item were recovered (see Section 3.4.1 in this chapter; Plate CCIX). The completely preserved brooches vary in size from 3.3 to 7.1 cm, with the largest portion having a length between 4.0 and 5.0 cm. The only decoration which was applied on this type of brooch is one or more series of incised lines or small grooves across the bow, occurring on fifteen brooches and on one untwisted brooch item (CA.B/C88). This decoration in fine grooves is of much interest, since it could only have been made by a small chisel by rolling the rod[177]; it was therefore already applied before the brooch was twisted (which is confirmed by item CA.B/C88).

The initial forms of the brooch semi-manufactures show very rudimentary rods on which the fastening device of the brooch has been slightly roughed out, with little to differentiate the future bow and pin (CA.B/C071-073; CA.B/C074-079 represent one stage further). Later stages in the production process yielded fully beaten-out but still unwound brooches (CA.B/C080-095), next to fragmentary waste products such as CA.B/C96-103.

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173 However, Allason-Jones warns about the multipurpose function such items could have: for attaching lock plates to boxes, but also as pommels for daggers, as hinges for *dolabra* sheats, and as furniture or door studs (Allason-Jones 2011a, 8). The large quantity of furniture elements at the site and mainly the uniformity of the 'bell'-studs make it very likely that these studs should be related to furnishing.

174 A first overview of the Oudenburg brooch production has been published in 2009 (Vanhoutte 2009a).

175 With thanks to L. Linders, conservator-restorer at the Flanders Heritage Agency, for conducting this analysis.

176 However, an archaeometrical analysis on a few copper alloy slag samples of the same level within the context of a bachelor thesis at the KULeuven under supervision of prof. dr. P. Degryse, concluded on the contrary that the copper alloy processing did not involve brass (Plas 2016). Plas pointed to the difficulty in drawing clear conclusions from the chemical composition of the artefacts though, as they all appeared to be more or less contaminated by other materials such as sand, clay, crucible material, probably through their burial in the ground. How the difference between the results from the semi-manufactures and end products on the one hand and the bronze slag on the other hand should be explained (different productions?), can only be resolved through further analysis.

177 With thanks to metal specialist J. Van Cauter (Erfpunt, Onroerend Erfgoed Waasland) for pointing out.

Figure 3.4. Rudimentary semi-manufactures (top left), still unwound brooches (top right) and brooch production waste (below) from pit OS 7949, fort level 4.

In literature these simple brooches are very often designated as 'Nauheim derivatives' and are then dated, often too narrow, to the 1st century AD (see *e.g.* Bayley and Butcher 2004, 147). Heeren and van der Feijst (2016, 124: type 45a8) acknowledge the many resemblances with the late La Tène wire brooch, but point to some minor details by which they can be differentiated, like the more angular bow. The type has already been recognized by Riha at military and civilian sites in Gaul and in the Rhineland and there dated until the late 3rd century AD[178] (Riha 1994, 56). Böhme and Riha call them '*Soldatenfibeln*' ('soldiers' brooches'; since they are so common in army camps) but they note that they were not exclusively reserved for soldiers. This has also been demonstrated by Heeren and van der Feijst (2017, 126) who point to the many finds at civil settlements in the Low Lands. It seems to have been the most common type there in the 2nd century AD (see Waasdorp and Kersing 1999, 74[179]; Heeren and van der Feijst 2016, 126). Böhme already mentioned that this type was the dominant form in the first half of the 2nd century AD and especially popular in the western provinces (Böhme 1972, 13-14). The production of these bow brooches at the Oudenburg fort *intra muros* gives evidence that this simple one-piece sprung brooch continued to be made at least until the late 3rd century. Of the 123 items which can be undoubtedly identified as brooch production waste, 101 examples belong to fort level 4. Only one fragment of an untwisted brooch is assigned to an earlier level (fort level 3), but may well be an intrusive find (CA.B/C193).

Identical wire brooches were found at the Aardenburg fort, some also with the incised line decoration (cf. Besuijen 2008, Pl. VII-VIII), without indications for brooch production at the site though. Since it concerns such an 'easy' production, a local production at the Aardenburg fort can be supposed, although so far invisible in the archaeological record.

As no remains of moulds were encountered, and the use of the lost-wax technique is very unlikely for such a simple form, it appears that the technique of casting into sand was used, a technique that could only be applied for casting very simple forms (Furger 1989, 55). Sand was mixed with a binding agent and was pressed around a rod-shaped object. After the careful removal of this object, the molten copper alloy could be poured into the cavity (Montandon 1997, 4).

Semi-manufactured brooches are known from the Raetian fort at Moosberg (Murnau) (G) and at the 1st- and 2nd-century fort of Brough-under-Stainmore (Verterae) (UK). Traces of workshops with semi-manufactured brooches and numerous 2nd-century end

178 **Such brooches have been found for example at the Saalburg and at Zugmantel (G) (Böhme 1972, 13-14), and at Augst and Kaiseraugst (CH) (although with a more angular bow) (Riha 1994, 56-59), classified there as 'Almgren type 15'.**

179 **These bow brooches from the native settlement of the Cananefates on the Scheveningseweg near The Hague (NL), dating to the first half of the 2nd century AD, were decorated with series of incised lines, just like the brooches from Oudenburg.**

products have been excavated at Kirkby (Bravoniacum), Traprain Law and Richborough (UK) as well (Gralfs 1994, 41, 43). Failed castings of brooches are also known from the garrison towns of Regensburg, Dalkingen, Pfünz, Eining (G), Schützen am Gebirge (AT), Brigetio (HU) and Timgad (DZ) (Gshwind 1997, 618). Worth drawing attention to here, although not as evidence for brooch production but as another example of the production of small military material at a fort in the North Sea frontier region, is the mould with the remains of a scabbard runner recovered from the site of the presumed *castellum* at Scheveningseweg (near The Hague, NL) (Waasdorp (red.) 2012, 137). None of the above mentioned examples of brooch production can illuminate how the Oudenburg brooches were made though, as they all relate to the casting of brooches in moulds.

The best reference for evidence of a production process comparable to that at Oudenburg comes from the much earlier, civilian context of the *oppidum* of Bibracte (F)[180]. Excavations at Bibracte (1865-1904) brought to light brooches and brooch-making waste, studied in detail by Guillaumet (1993, 5). Between 1984 and 1992, a roofed-over bronze worker's workshop was excavated immediately outside the rampart of the *oppidum*, covering an area of 35 m^2, active between BC 30-25 and *c.* AD 10 (Pernot 1998, 52 and 54-55; Montandon 1997, 6-7; Guillaumet 1996, 93-96). Finds of brooch-making waste and semi-finished brooches made clear that these were produced on the spot. Comparable brooch finds are known from Basel, Bern (CH), Argenton-sur-Creuse and Mailhac dans l'Aude (F) (Guillaumet 1993, 10-11). Brooches in all stages of production were also found at the artisan's quarter of a native Germanic settlement of the early Roman period near Warburg-Daseburg in Westphalia (G) (Günther 1983, 13-18,21-23 and 30). But it is the similarity between the Oudenburg output of the later 3rd century and the finds from Bibracte of the different stages in de production process, that is particularly notable.

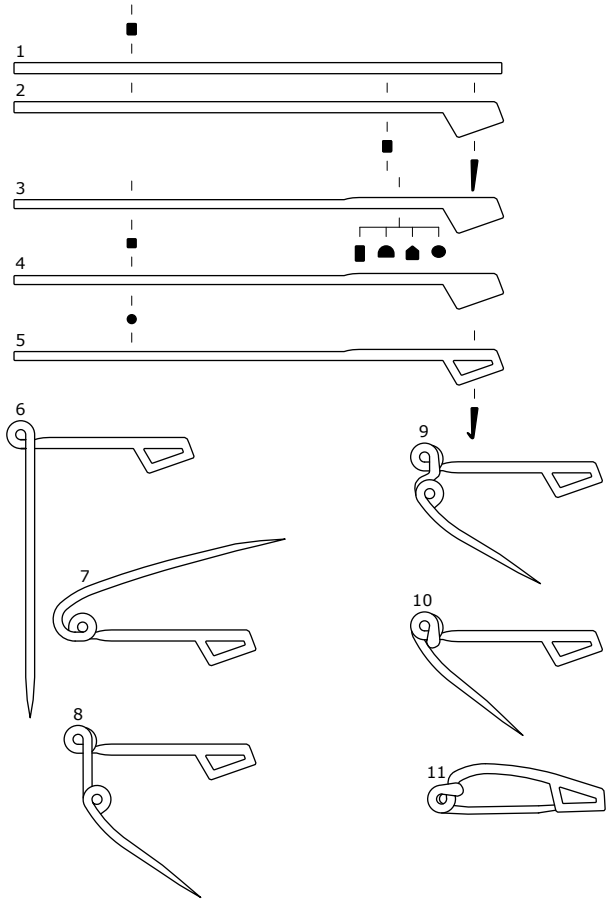

Figure 3.5. Schematic overview of the making of a bow brooch in one piece with an internal chord as could be deduced from the archaeological evidence at Bibracte. From: Guillaumet 1993, Pl. 7.

To manufacture the brooches, the technique of beating was applied. The (sand) casting yielded only a very rudimentary semiproduct, a small rod corresponding in volume to the end product. Like at Bibracte (Figure 3.5), the various stages in the process are clearly recognizable among the Oudenburg semimanufactures. First the wire of the pin and spring were formed by hammering, as at the other end the bow and the foot. Then the spring was coiled and the pin sharpened. Every episode of cold beating was alternated with reheating, annealing the piece. That way recrystallisation returned to the metal the elasticity that had been partially lost by the hammering (Guillaumet 1993, 10; for a more detailed explanation, see Chardron-Picault and Pernot 1999, 156-157).

3.6.2 Bracelet production

Besides the 31 (finished) bracelets (see Section 3.4.3 in this chapter), six bracelet fragments clearly represent waste products of bracelet production (CA.B/C249-254) (Plate CCXIII). The very corroded, but presumed bracelet waste product CA.B242 – mind the abnormal curve of the fragment – was recovered from the pit OS 7949 belonging to the initial phase of workshop Unit I in which also a lot of brooch production waste was found. It indicates, together with another three semi-finished bracelet products at fort level 4 (CA.B/C249, B/C253-254, and probably also B/C250), that these bracelets were manufactured at these workshops already during the first phase of fort period 4, *i.e.* in the 260s and/or in the following decade.

All but one item are defined by shallow longitudinal grooves at the heads while the rest of the bracelet is left plain; this subtype is called type Oudenburg 1. A waste product of type Oudenburg 1 was also found in the 1970 trench more to the north at the west side of the fort (ET07, Trench II; unpublished material NDO Archive J. Mertens). The cut, unbent bracelet fragment CA.B/C251 shows the same type and form but distinguishes itself by its more complex and detailed groove decoration; this subtype is therefore classified as type Oudenburg 2, a more refined version. When compared to the typology of Augst and Kaiseraugst, this type is closest to the *Schlangenkopfarmringe* of type 3.10.2 '*bandförmig, mit rautenförmigen Köpfen*' (Riha 1990, 56). For further discussion on the significance of these snakeshead bracelets at the Oudenburg site: see Volume I, Chapter V.3.3.3.

180 Closer by there are indications of brooch production at a bronze-caster's workshop at Blicquy (Amand 1975), but the modest number of brooches and the diversity of types offer little evidence with regards to the production process.

3.6.3 Slag material

Besides the semi-manufactures of the bronze working activities at the workshops of fort level 4, another 69 items of the copper alloy assemblage can be identified as bronze working waste in the form of either melting copper alloy or copper alloy slag (Plate CCXVII). Apart from a fragment of a melting pot of level 1 (CA.C04) and a few small fragments from fort levels 2 (one item) and 3 (four items), twenty-one items can be assigned to level 4, likely to be increased (at least) by nine with the items found in level 4+5. Worth drawing attention to are the findings whilst examining nineteen cases of block-lifting (of items that appeared to be too corroded on the field) from the burnt down workshop Unit V of fort level 4. While the Xray images revealed that these items were mostly copper alloy sheets and fittings which could not be identified further, the attached earth revealed the presence of bronze droplets and trails, casting waste from the spot. An archaeometric study on a small sample of 'bronze' slag material (Plas 2016) has given additional evidence that copper alloy was not only worked but also cast at the workshops of fort level 4 (see for further discussion: Volume I, Chapter II, Section 4.6.2.c).

3.7 Other crafts

Most of the tools were made in iron (see further). In the Oudenburg copper alloy assemblage only implements related to textile working are represented. Sixteen netting needles were recovered (CA. D07-22), characterized by both ends as a fork-like feature (Plate CCXVIII). It is generally accepted that they were presumably used to repair fishing nets; however, Wild (1970, 73) and Deschler-Erb (1996, 46) also mention other specific weave and hand-knotted work as possibilities. The presumed weaving combs CA.C23-24 from fort level 4 may be related to the latter (Plate CCXVIII). Crummy (2011, 86) interprets the netting needles as formers or spacers around which the net was knotted to produce a mesh of constant size. With the large amount of lead net weights recovered from the site (cf. Dütting and Hoss 2014), it is very likely that the netting needles are related to fishing activities. Fish remains are not abundantly present at the site and the striking total absence of gadiforms indicates that there was no fishing in open sea. In contrast, flatfishes dominate and this implies that fishing mainly occurred in coastal waters, tidal channels and mouths of creeks, hence not far away from the fort (Ervynck *et al.* 2017). Interestingly, the netting needles revealed to be of brass, just like the locally made brooches and bracelets, and in contrast to the other (imported) objects that appear to be of bronze or another copper alloy. This presumably indicates that also the netting needles were produced at the Oudenburg workshops, the more since they appear only from fort level 4 onwards (with ten examples in the workshop area).

3.8 Trade and exchange

Fourteen items can easily be recognized as belonging to scales (Plates CCXLIV-CCXLV). Both fine scales (CA.G02-06) as large examples of steelyards with wooden measuring bar and bronze ends (CA.G05-06, 08-09) are present (cf. Büttner and Schlefhofer 2019; Garbsch 1994; Franken 1989, 100-102). These finds belong to fort level 4 and later levels. The same is true for eleven iron items, recognized as parts of weighing instruments; they also occur from fort level 4 onwards, with some in later levels (see further). Most likely the scales and steelyards are linked with the workshop activities at fort level 4. The fine scales may be linked with the metalworking activities as these must have involved the measuring and weighing of certain products. The large steelyards may well have been related to the cereal stocks which appear to have been close by (see Volume I, Chapter II, Section 4.6.2.c). Were the steelyards used to make rations for the soldiers? It is very likely, though, that the scales and steelyards represent trade or another kind of exchange as well and that the workshop area also had a market function, as a lot of products in copper alloy were made and repaired here.

3.9 Communication

Two copper alloy *styli* (CA.E01-02) and one handle of a wax *spatula* (CA.E03) refer to communication (Plate CCXLII). *Stylus* CA.E02 and the wax *spatula* CA.E03 were found in the Roman level and both belong to fort level 4. Two more *styli* were made in iron; one of them was also recovered from fort level 4, the other in the post-Roman level (see further).

3.10 Spiritual life

A remarkable find is the cymbal (CA.E/F05) recovered from the pit to the south of the large waste-pit OS 4980 of fort level 4, more specifically from a layer which also filled in the OS 4980 context in the final phase of fort period 4 at the end of the 3rd century (Plate CCXLIII). Only a few of such cymbals are known; the nearest example was found at Famars (cf. Fort and Tisserand 2011; Tisserand 2013). Cymbals were used in pairs, one in each hand. This music instrument was associated with religious ceremonies, mainly with rituals related to mother cults. One of the two cymbals found at Autun and the cymbal known at Grozon, both in France, bear dedications, one to an indigenous goddess, the other to Cybele (Fort and Tisserand 2011). Found at fort level 4 in a layer representing the end of the workshops, it may have been an object that needed repair. Nevertheless, the cymbal points to the practice of a mother cult at the fort in the late 3rd century AD. Two statuettes, the foot of a third one and a possible fourth statuary fragment are also related to spiritual life. They are discussed in Chapter 7 in this volume.

3.11 Immovable property

Most elements belonging to immovable property would have consisted of iron. One copper alloy item can undoubtedly be attributed to this domain, namely the water tap CA.I01, unfortunately a stray find (Plate CCLII). It may have once belonged to the hydraulics of the bath house of fort level 5A. The same link is a possibility for item CA.K01 of fort level 5 (Plate CCLIV). This large, thick copper alloy sheet fragment with the edge enclosed in a broad iron strip may have been part of a machine, perhaps related to the water heating system of the bath house.

4. Case study. Crossbow brooches at Oudenburg: typological, geochemical and morphometric analyses

Vince Van Thienen

4.1 Introduction to the assemblage and aim of the study

A total of sixteen crossbow brooches were found during the excavation of the south-west corner site of the Oudenburg fort (Plate CCV-CCVI; Table 3.5). Nine of them can be identified as 3rd-century bow brooches with hinge mechanism, better known as *Armbrustscharnierfibeln* in German terminology (Riha 1979). These are generally considered as the direct predecessors of the late Roman *Zwiebelknopffibeln*, and can be ascribed to the more general category of 'light crossbow brooches' in the English terminology (*e.g.* Hull and Hawkes 1987; Bailey and Butcher 2004). The remaining seven brooches can typologically be placed in the late 3rd or early 4th century, mainly as type 1 and 2 crossbow brooches. The typological identification of these brooches is based on their stylistic traits according to the typology of Swift (2000), which builds on Keller's original typology (1971) and the modifications made by Pröttel (1988).

Crossbow brooches are among the most frequent metal finds in late Roman military contexts with an Empire-wide distribution. Despite this wide distribution, the number of attested production locations of crossbow brooches is very limited. Only in Socchieve, Italy, a small production site could be confirmed based on moulds and lead models of crossbow brooches (Giumlia-Mair *et al.* 2007). In addition to the alleged state regulated production centre in Pannonia, the manufacturing and/or finishing of crossbow brooches is assumed at military forts, but has not yet been confirmed (Van Thienen 2021).

At Oudenburg, the production of one-piece sprung brooches with wire bow in the later 3rd century has been attested at the metal workshops within the *castellum* of fort period 4 (Vanhoutte 2009; cf. Section 3.6.1 in this chapter). The find of semi-manufactured and finished products is supported by the evidence from the hearths, furnaces, metal drips and filings in copper alloy, lead and iron. So, in theory, it is possible that crossbow brooches were made at these metal workshops. Yet, finding direct evidence in Roman forts is a challenge, reinforced by the recycling behaviour in workshops where failed products could be melted down again and crucibles could serve as a grog-temper in other ceramics (as evidenced for example by the petrographic analysis of late Roman handmade pottery, cf. Chapter 1.C.2 in this volume). Nevertheless, a detailed study of the style and composition of the crossbow brooches found at the fort can reveal information about their production mode which can lead to insights about their manufacturing provenance.

To accomplish this aim, all stylistic and decorative traits were recorded per brooch-feature to assess the variability and standardisation in their manufacture and finishing practices. This includes measurements of their different features as well as their overall dimensions (Van Thienen 2015). Furthermore, these brooches were analyzed by X-Ray Fluorescence spectroscopy[181] to investigate the general alloy composition (Van Thienen and Lycke 2017). Although the corroded state limited the accuracy and precision of the XRF results, a basic alloy identification as well as some general observations could be made. By reviewing these different aspects in more detail, we will investigate the possibility of a local production and/or of (re)working of these brooches at the fort of Oudenburg.

4.2 Results: style, size and composition

Each group or subtype has to be considered separately, given that they roughly represent different stages in the biography of the crossbow brooch, with a different socio-cultural framework that relates to its production modes and distribution patterns (Van Thienen 2017a). Furthermore, the light crossbow brooches (type 0 and 1) are the most likely to have been made, processed or finished inside the *castellum* given the similar chronology with the fort's brooch workshop (Vanhoutte 2009a and Section 3.6.1 in this chapter). The more developed crossbow brooches (type 2) are more likely to have been produced elsewhere or, in the case of one brooch (CA.B026), to have been commissioned in a more specialized workshop.

4.2.1 Type 0 – Armbrustscharnierfibeln

The nine brooches identified as *type 0 – Armbrustscharnierfibeln* (Riha type 6.4) are very similar, sharing a simple functional design (Plate CCV). In general: the foot is a slim rectangular catch-plate with or without an elevated base and rear with sloping sides (resembling a saddle); the bow is also slim and usually rectangular in cross-section, albeit rounded and sometimes slightly tapered, often with an intermissive base and/or rear; the arms (crossbars) are pentagonal, hexagonal or completely rounded cylinders without knobs (with one exception); the bow knob is elongated in shape, ranging between cylindrical and flat.

Only five brooches still contain a foot, three of which have the characteristic style labelled here as an elevated base and rear with sloping sides (CA.B012; CA.B020; CA.B019) and two without (CA.B013; CA.B017). It has to be noted that brooch CA.B013 is heavily damaged and corroded.

All brooches contain a complete or partial bow, which allows for a more complete comparison. Three brooches (CA.B020; CA.B015; CA.B017) have the signature slim bow with intermissive base and rear. Two are broken and only demonstrate the intermissive base at the head of the brooch (CA.B016; CA.B018), and one (CA.B019) only clearly contains the intermissive rear. The remaining three (CA.B012; CA.B013; CA.B017) do not have this feature, although

181 **The XRF-analysis was carried out in collaboration with the Archaeometry group of Ghent University.**

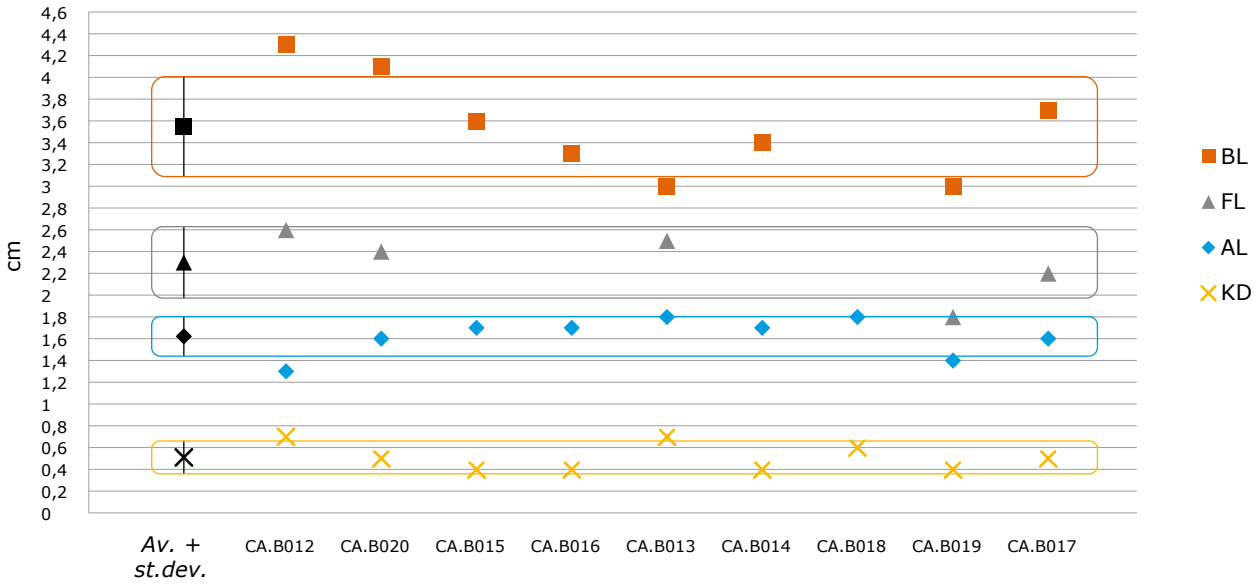

Figure 3.6. Measurements of individual features of the type 0 crossbow brooches from the south-west corner fort site: bow length (BL), foot length (FL), arm length (AL) and knob diameter (KD), expressed in cm. The averages and standard deviation per feature are presented on the left.

CA.B012 and CA.B013 are heavily damaged and corroded, possibly obscuring the presence of one or both intermissive elements. Only CA.B020 shows further signs of decoration with a striped pattern along the top of the bow, although the corrosion could obscure potential decorative motifs on some of the other brooches.

All brooches contain one or both arms, complete or partial, and all of them have a simple rounded cross-section. Most are completely rounded (CA.B012; CA.B020; CA.B014; CA.B018; CA.B017), where others demonstrate a number of sides, either pentagonal in cross-section (CA.B015; CA.B016; CA.B013) or hexagonal (CA.B019). Only CA.B020 is an exception in this group, for containing small bulbous knobs at the end of the arms, where the others have straight edges. These arms are hollow, as can be observed from the fragmented brooches.

In contrast, each brooch contains a bow knob. Given the corroded state of many of the brooches, it is difficult to tell if the basic elongated shape was always cut into a small knob, such as on CA.B020 and CA.B014 (and perhaps also on CA.B012; CA.B015; CA.B016), or if they remained rather crude cylindrical or semi-square stubs (CA.B013; CA.B018; CA.B019; CA.B017).

Overall, this group of brooches is stylistically related to each other, with only CA.B020 as an evident outlier because it is the best preserved and most elaborately worked. Yet, the state of preservation limits us by possibly obscuring subtle features through corrosion or damage. For instance, CA.B012, CA.B013, CA.B019, might have intermissive features on their bows, or the bow knobs of CA.B013, CA.B018 and CA.B019 could have a finer finish hidden underneath the corrosion. Furthermore, it appears that CA.B017 is comprised of only the most basic form without any decorative features on the foot, bow additives or a distinctive shape of bow knob. Perhaps this represents an unfinished product, cast in a standard mould or by use of a basic model (cf. Socchieve: Giumlia-Mair *et al.* 2007), lacking further processing. If a similar mould or model would have been used as a base-form, and most additional features were added after casting, it could explain the observed variation such as the degree of roundness in the arms, the variation in bow knobs and bow additives.

Further investigation into the idea of a shared mould (design) and batch production was explored through the brooch measurements and compositional results. The fragmented state of the brooches does not allow a precise comparison of the total dimensions, but from the measurements of the individual features it can be observed that there are minimal differences between several brooches (Figure 3.6). More specifically, CA.B014, CA.B015, CA.B016 and CA.B017 have near exact measurements for the bow length, arm length and knob diameter. Brooches CA.B013, CA.B018 and CA.B019 are also closely related, and their minor differences might be related to the fragmentation, or deviations from the estimated reconstruction in the cases of CA.B013 and CA.B019. Brooch CA.B020 also matches these measurements very nicely, although containing a larger bow length of 4.1 cm. The latter is only surpassed in bow length by CA.B012, measuring 4.3 cm. This brooch is also an outlier by containing the largest foot length, smallest arm length and largest knob diameter of the group. Nevertheless, the variation is still quite small and CA.B012 is clearly stylistically related to the other brooches. Although these results are based on a limited number of brooches, it can be considered likely that some of these brooches might have been made by the same mould, or that several moulds were made based on the same brooch-model, which would account for the small differences. Additionally, it is possible that some of these brooches were still unfinished products, or even failed products (*e.g.* CA.B012; CA.B013; CA.B017).

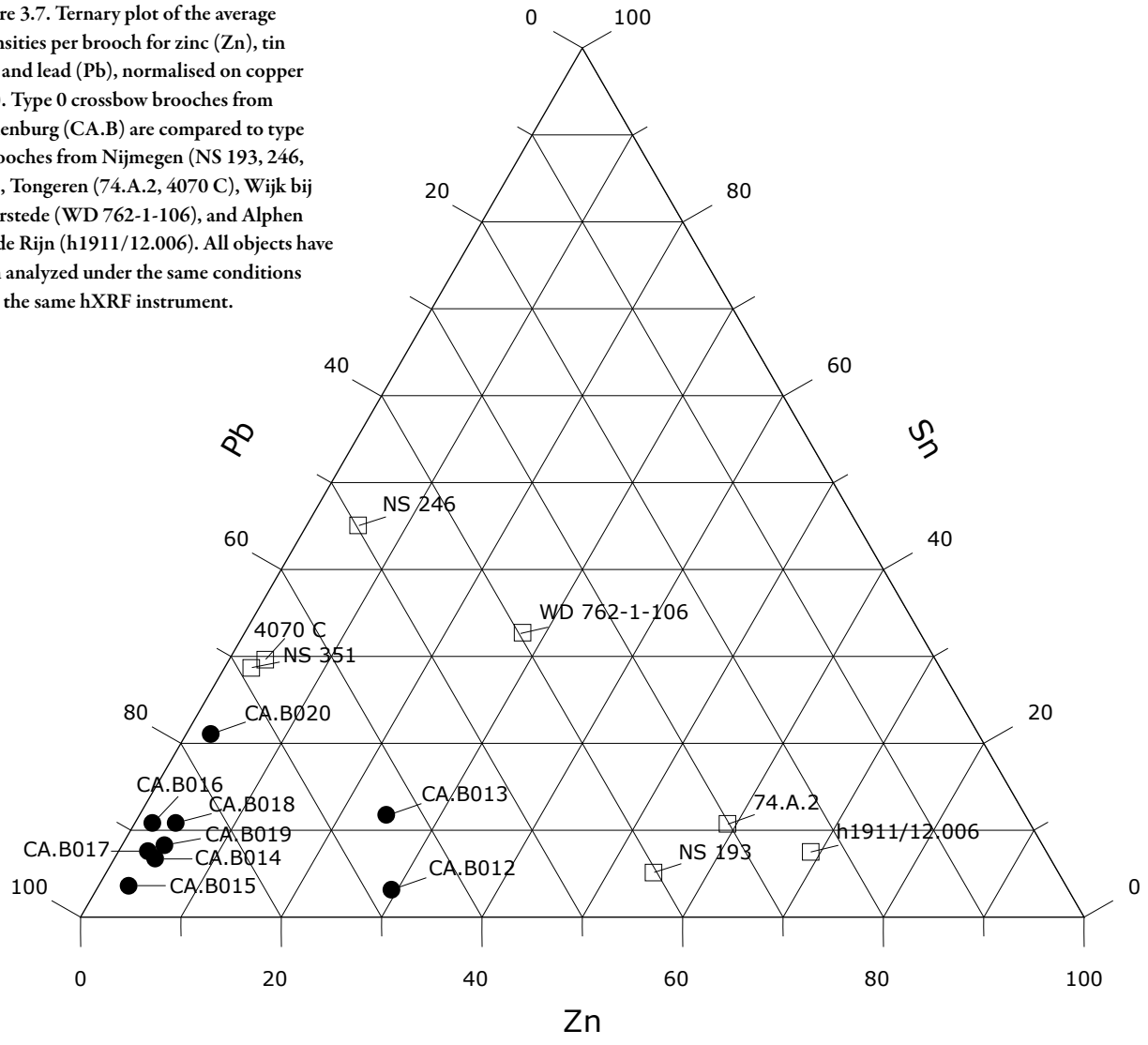

Figure 3.7. Ternary plot of the average intensities per brooch for zinc (Zn), tin (Sn) and lead (Pb), normalised on copper (Cu). Type 0 crossbow brooches from Oudenburg (CA.B) are compared to type 0 brooches from Nijmegen (NS 193, 246, 351), Tongeren (74.A.2, 4070 C), Wijk bij Duurstede (WD 762-1-106), and Alphen aan de Rijn (h1911/12.006). All objects have been analyzed under the same conditions with the same hXRF instrument.

In addition to the measurements, the composition of the brooches was examined by means of handheld X-ray fluorescence spectroscopy[182] (hXRF). Given the known challenges with corroded surface analyses, we will limit this section to the general results (for more details, see Van Thienen and Lycke 2017). All the Oudenburg crossbow brooches discussed here can be identified as ternary or quaternary copper alloys, meaning that copper (Cu) is the main metal used to manufacture these brooches, mixed with varying levels of zinc (Zn), tin (Sn) and lead (Pb). No traces of decorative metals, such as silver or gold, were registered. Ternary and quaternary copper alloys are likely the result of the mixing of alloys[183] or of recycling existing objects made from various copper alloys, a common practice for Roman brooches or other small finds (Bayley and Butcher 2004; Dungworth 1997; Pollard *et al.* 2015).

Only minor variations between the alloying elements were observed for the type 0 brooches, such as a slightly higher Zn-peak for CA.B013 or the lower Sn-peaks for CA.B012 and CA.B018 (Figure 3.8). When we focus on the relative ratio between the three major alloys, zinc, tin and lead (Figure 3.7), it is clear that most type 0 brooches from Oudenburg form a group with a low zinc, high tin and high lead content[184]. CA.B020 deviates slightly from this group with a lower lead content, which can possibly be explained by its less corroded state. In contrast, CA.B012 and CA.B013 appear to have a lower tin and higher zinc content, suggesting a different alloy composition. Furthermore, the Oudenburg brooches can clearly

182 **All measurements were carried out by using an Olympus InnovX Delta handheld X-Ray Fluorescence instrument equipped with a rhodium anode and silicon-drift detector, at 40 kV and 79 μA, for 300 seconds live time spectrum accumulation, in air, with a spot size of approximately 5x5 mm² on the surface of the brooches. The net peak X-ray intensities were used for further processing. For a full experimental description, see Van Thienen and Lycke 2017.**

183 **Such as the mixing of bronze (copper and tin) or brass (copper and zinc) with lead or with each other.**

184 **The degree of corrosion can lead to enrichment or depletion effects on the surface of the brooches.**

be separated from type 0 brooches that have been analyzed from Nijmegen, Tongeren, Wijk bij Duurstede and Alphen aan de Rijn (Van Thienen and Lycke 2017).

Overall, the combination of stylistic features, brooch-measurements and compositional results confirm the close relationship between the type 0 brooches from Oudenburg. Despite the rather limited number of samples, there are multiple indications that argue in favour of a local production and/or processing of these brooches in or around the Roman fort at Oudenburg. It can even be proposed that this assemblage contains evidence for batch-production based on a central mould-design. Some brooches might even have been made in the same batch (CA.B015; CA.B016; CA.B014; CA.B018; CA.B019; CA.B017), as the close measurements and similar composition suggest. The small variations in style are easily explained if the mould-design only contained the basic form and the finishing features were added after the brooch was taken out of the mould. This could also be the case for CA.B020 if it was created in a similar batch or according to a same base-model for its mould, but worked more elaborately with more care or technique. Brooches CA.B012 and CA.B013 appear as outliers by their measurements and compositional results, yet are clearly stylistically related. These two brooches could have been part of one or two different batches that contained a different metal composition and had a different mould that was fashioned after a central brooch-design. Another explanation is that they could have been made elsewhere and travelled to Oudenburg as goods or with people. Or, lacking closer parallels from other sites in composition and style, it can also be suggested that these were two failed or unfinished products.

4.2.2 Type 1 – light crossbow brooches

Three crossbow brooches can be identified as type 1. The first (CA.B023) consists of only the front part of the brooch consisting of a narrow bow, rounded hexagonal arms, with a single (hollow) eye motif on each arm, ending in (pine)cone shaped arm and bow knobs with a disc-shaped base. Additionally, a metal band is wrapped around the bow knob, overlapping the hinge location where the needle attaches to the brooch, indicating that the brooch was repaired or altered, possibly beyond the initial function of the brooch.

The second (CA.B021) brooch has a narrowing rectangular foot with wide base and sloping sides motif, a regular bow with incised line and small cuff at the bow-to-foot transition, and hexagonal arms with mounted tops. An unattached cone shaped knob was found along with the brooch and is assumed to be its bow knob.

The third (CA.B022) brooch is highly corroded, possibly obscuring some decorative details. Observable features are a narrow rectangular and slightly tapered foot with an inclined orientation, a tapered regular bow, hexagonal arms and cone shaped arm knobs.

Overall, the narrow foot, regular arc-shape of the bow and the hexagonal arms are all common features in early type crossbow brooches for Northern Gaul. To the contrary, the wide base on CA.B021 is rather unique, and the mounted top on the arms is more frequently associated with type 2 brooches, indicating that this brooch might be a late type 1 or early type 2, or a special brooch with a more elaborate decoration. Additionally, the eye-motif on the arms of CA.B023 is also rather uncommon. While eye- and circle-and-dot motifs are a very common decorative feature on crossbow brooches (and other Roman small finds), it is most commonly encountered as part of the foot decoration in types 2 or 3/4. Moreover, its presence on the arms in types 1 and 2 is quite a rare occurrence in Northern Gaul[185] and was not noted in the Swift's supra-regional study (Swift 2000a). Furthermore, the location of two 'eyes' at the underside is rather peculiar, as this would not have been visible while wearing the brooch. The notion of an alternative function can be entertained, possibly related to repair or alteration as evident from the added metal strap that would hinder any regular use of the brooch as a brooch. The creation of these hollow eyes at the bottom (or both) could perhaps be attributed to the same second life-phase of the brooch. Alternatively, something could have been set in these hollows, such as gems or enamel, although no residue is evident, and the positioning on the (invisible) bottom-side would not make much sense.

The full and partial dimensions of all three brooches fall well within the norm for type 1 brooches in Northern Gaul. Only the bow knob diameter of CA.B021 is slightly larger than most, but not exceptional. Like the type 0 brooches, their features are again quite close in size, but not exact.

The type 1 brooches are composed of a low-zinc quaternary copper alloy, *i.e.* most closely resembling a leaded bronze with only a small amount of zinc, indicating that they were made by mixing alloys or by recycling existing metal objects, similar to the type 0 brooches from Oudenburg. From the XRF-spectra (Figure 3.8), it can be observed that the levels of copper, zinc, tin and lead differ between the three brooches. While corrosion could have a significant effect on the results, it seems unlikely that they had the same metal composition. Furthermore, compared to twenty-one type 1 brooches analyzed from Nijmegen, Wijk bij Duurstede and Maasdriel (all sites in the Netherlands), these three do not have a specific compositional signal and they do not cluster together, but fall within the wide range of type 1 brooch compositions (see Van Thienen and Lycke 2017). This might indicate that type 1 crossbow brooches in Northern Gaul are not made in batch, but rather as a series of separately manufactured objects. Whether this is related to the access of raw materials, reflecting the compositional variation in semimanufactures that arrive at the fort, changed production practices in the fort, or a higher mobility of goods and/or people, is unclear. It is however interesting to note the possibility that these brooches were finished or re-worked at Oudenburg. First, brooch CA.B022 does not appear to have specific features and might be an unfinished product. Second, CA.B021 has a very uncommon foot-base without known parallels, making it possibly a unique

185 **Other known type 2 brooches from Northern Gaul demonstrate eye-motifs on the arms, for instance from Oudenburg (stray find stored at the De Pakhuizen – Raakvlak depot at Bruges (see further)), Tongeren (Gallo-Roman museum Tongeren collection, 1379) and Nijmegen (municipal service Nijmegen collection, Hg4-13-50). These motifs are however located in the mounted or undulating top, attached to the topside of the arms, and not integrated in the actual crossbars, as is the case with CA.B023.**

feature. And third, CA.B023 possibly had a second life after it was damaged and repaired, or rather reworked, given that the hinge mechanism became useless by the repair.

4.2.3 Type 2 – early developed crossbow brooches

The type 2 brooches are quite distinct from each other. Only the front part of CA.B024 is preserved, but its regular bow, quadrangular arms with slightly mounted top and cone-to-onion shaped arm and bow knobs identify it as most likely being a Swift-Keller-Pröttel type 2i (after Swift 2000a, 22, table B). Its few preserved features fall well within the average measurements of type 2 brooches. Similarly, brooch CA.B025[186] can be identified as type 2i with a regular rectangular bow, rounded quadrangular arms with slightly mounted top and onion-to-mushroom shaped arm and bow knobs. The bow is twisted and the foot broken off, hindering any indication of decorative or stylistic elements.

Brooch CA.B026 represents the largest, most elaborately worked and decorated brooch from this assemblage. The brooch consists of a narrowing rectangular foot with trapeze cut-outs, a regular bow with a large pronounced leaf shaped cuff, hexagonal arms, and hexagonally faceted arm knobs with matching hexagonal disc-shaped bases. Specifically, the large triangular pronounced cuff and faceted knobs identify the brooch as a particular variation of the Swift-Keller-Pröttel type 2iii[187] (Pröttel type 2D) of which only a very limited number is known, mostly found in *Germania Secunda* and *Belgica* (Swift 2000a, 38-42). At Oudenburg, another was found in cemetery A, grave 37 (Mertens and Van Impe 1971), even more elaborately decorated, including a gilded coating. Additionally, in Northern Gaul, three similar brooches are known from Tongeren (Gallo-Roman museum Tongeren, 74.A.35), Nijmegen (Kam museum, NYM 233.40) and Wijk bij Duurstede (Rijksmuseum van Oudheden Leiden, WD-839-2-154).[188] The CA.B026 brooch is the largest of the Oudenburg fort assemblage and its measurements exceed the average range of type 2 brooches. Although, it is clear that this subtype 2iii consists mainly of unique brooches, characterized by their larger size and the elaborate decorative features that sometimes extents to gilded brooches. Compared to measurements of eight other type 2iii brooches – from Oudenburg (cemetery A), Nijmegen, Tongeren and Wijk bij Duurstede – CA.B026 can be considered of average size for this particular subtype. Furthermore, compared to the brooch of grave 37 at Oudenburg (length 10.9 cm, width 7.4 cm), CA.B026 is rather modest (length *ca*. 8.5 cm, width 5.5 cm). Furthermore, CA.B026 did not carry any traces of gilding, whereas the brooch from grave 37 was decorated with mercury gilding[189].

The last brooch, CA.B027, is the most difficult to identify, given its corroded state and unfinished catch-plate. Initially, it was thought that the wide squat bow, hexagonal arms with mounted top and onion shaped arm knobs pointed towards type 5ii. These later type crossbow brooches are usually placed towards the end of the 4th and early 5th century, are far less found in the archaeological record, and are associated with high state and military officials (such as consuls, judges and senators) as part of their official *chlamys* costume, based on iconographic evidence (Van Thienen 2017a). While this remains possible, it is now considered more likely that this brooch is an unfinished or failed product of a type 2 brooch. A type 5 brooch commonly has specific and unique decorations on the foot and bow which seems to be lacking here, however, due to the state of the brooch, this cannot be verified. Furthermore, its dimensions are quite average for a type 2 brooch, with exception of its knob diameter, although it is still smaller than the largest diameter recorded for a type 2 brooch in Northern Gaul. In contrast, compared to type 5 brooches from Oudenburg (cemetery A), Nijmegen, Tongeren and Ravenstein (NL), its size is quite small. Additionally, its composition also appears to fit better with the documented type 2 copper alloys than with those of type 5 in Northern Gaul, although this can also be the result of the small sample size (only five other type 5 brooches from Northern Gaul were available for analysis).

The composition of the type 2 brooches is quite similar to the other Oudenburg brooches and can again be described as a low-zinc quaternary copper alloy (Figure 3.8). Only CA.B024 appears to contain much less tin, and might be closer to a leaded brass. Compared to twenty-nine other type 2 brooches from Northern Gaul, these three do not have a specific compositional signal and they do not cluster together. This makes it difficult to state whether they have been made or processed at Oudenburg, or if they have another provenance. The best evidence for an early 4th-century production of crossbow brooches at Oudenburg would be if CA.B027 could be confirmed as an unfinished or failed product. Unfortunately, this cannot be stated for certain.

While it could be possible for CA.B027 and CA.B024 (and perhaps CA.B025) to have been made at Oudenburg, it is much less likely for CA.B026. Although, given the limited number of brooches with faceted knobs and large pronounced triangular cuff, with a finer design, worked to appear as a leaf or feathers, it might be argued that this is the work of one workshop or artisan. It is possible that the artisan responsible for this particular design was stationed in various forts or military production centres over time, in the case of a strictly military production. Or, it may have been a travelling craftsman that either visited military workshops to create specific products or was commissioned to create these brooches by military or administrative officers. Either way, the elaborate decoration points towards more than a strictly functional use of the brooch,

186 This brooch was very heavily corroded and not recognized until after X-radiation and thorough conservation, which took place after the initial study of the crossbow brooches from the south-west corner site of the Oudenburg fort. Consequently, this brooch has not been measured or analyzed by hXRF and can only be briefly discussed.

187 Facet 7 shaped knobs, pronounced cuffs and bow base 9 in Swift's typology, drawn examples and distribution maps available in Swift 2000a, 19, Fig. 4; 38-42, Figs 34, 35, 36.

188 More examples of type 2iii with pronounced/triangular cuff and faceted knobs were identified by Swift in Dalheim (L), Laon-Aisne (F), Trier (G), Krefeld-Gellep (G), Nijmegen (NL) and Mijnsherenland-Hoeksche Waard (NL). With thanks to E. Swift for making the data available.

189 Mercury gilding was also attested at type 2iii brooches from Tongeren (Gallo-Roman museum Tongeren collection, 74.A.35) and Nijmegen (KAM collection, NYM 233.40 from grave 161.6).

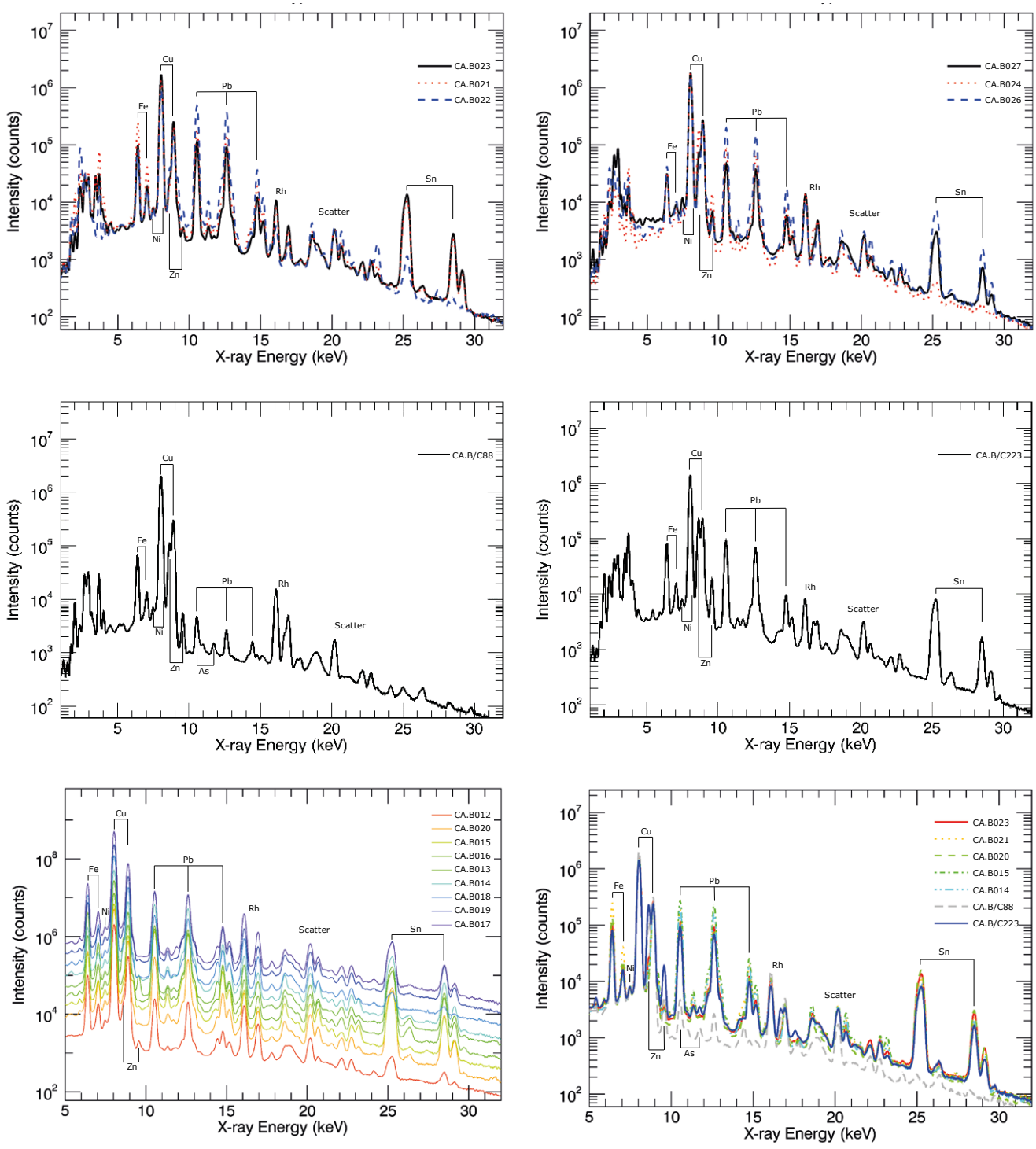

Figure 3.8. Left top: average XRF-spectra for type 1 brooches (CA.B023, CA.B021,CA.B022); Right top: average XRF-spectra for type 2 brooches (CA.B027, CA.B024, CA.B026); Left center: average XRF-spectrum of semimanufacture CA.B/C88, representing a leaded brass with traces of As; Right center: average XRF-spectrum of semimanufacture CA.B/C223, representing a quaternary copper alloy with Zn, Sn and Pb; Left bottom: comparison of average XRF-spectra (stacked) for type 0 brooches (CA.B012, CA.B020, CA.B015, CA.B016, CA.B014, CA.B018, CA.B019, CA.B017); Right bottom: comparison of average XRF-spectra selected from type 0 (CA.B020, CA.B015, CA.B014), type 1 (CA.B023, CA.B021) and the semimanufactures (CA.B/C88, CA.B/C223).

possibly as part of the gift-giving practice among state officials, to communicate status and wealth by the donor or recipient (Van Thienen 2021).

4.3 The composition of the semi-manufactured sprung brooches

In addition to these fifteen crossbow brooches, the composition of two of the semi-manufactured sprung-brooches from the 3rd-century fort's metal workshop was also analyzed by hXRF (in the same conditions) to test if these brooches could have been used as raw materials or scrap for the crossbow brooches.

The first semi-manufactured sprung brooch that was analyzed, CA.B/C223, consists of mainly copper, alloyed with zinc, tin and lead, forming a similar quaternary alloy composition to most of the light crossbow brooches (Figure 3.8). This indicates that these two type of brooches could have been made from the same raw materials or by a similar processes of mixing alloys. Moreover, this confirms a direct or indirect link between the composition of the brooches made at Oudenburg and the light crossbow brooches found there.

A second semi-manufactured sprung brooch (CA.B/C88) has a different compositional signal. It consists of a lead-containing brass with traces of arsenic (As). No tin was detected and the lead-levels are quite low in comparison to the other brooches. Arsenic was not found as a trace element in any of the crossbow brooches, meaning that the raw material for this semimanufacture came from a different source.

The fort's metal workshop where these semi-manufactured brooches were found (Vanhoutte 2009; cf. *infra*), contained evidence of casting, melting and cold working (beating, polishing, cutting) alongside wasters, scraps and whetstones. Large quantities of iron was found besides the copper alloy, but also lead melts and offcuts. It was suspected that this lead could have been part of the copper alloy production, which would be possible, given the lead present in both semimanufactures and in the crossbow brooches. Lead was often used to lower the melting temperature of the copper alloy and to replace the evaporating zinc in the cementation process of creating brass (Bayley and Butcher 2004; Dungworth 1997). There is no direct evidence that the lead waste that was found in the workshop area was directly involved in the analyzed brooches that contain lead, but it is possible.

4.4 In a larger framework

More crossbow brooches have been found at Oudenburg; so far 36 crossbow brooches are known from the other Oudenburg sites. A total of 33 crossbow brooches can be attributed to the late Roman cemetery A (see for the 32 grave finds: Mertens and Van Impe 1971; one stray find reported in the 1980s (SO14)). Two crossbow brooches come from the in 2014 excavated cemetery C[190]. One stray find, said to be found at Oudenburg, is stored in the archaeological heritage depot De Pakhuizen – Raakvlak at Bruges[191]. In general, only the fort yielded light crossbow brooches. No type 0 or 1 brooches were found in the cemetery. In the second half of the 3rd century, these and other bow brooches were a very common soldiers brooch all over the Roman Empire. At this point, they were little more than functional dress-items, easy to produce in large numbers and relatively low-cost. Once they were damaged or no longer necessary, they were probably collected as scrap and melted to manufacture new objects. It was only in the 4th century with the spread of the inhumation practice that dress-items were interned together with their owners. From the Tetrarchy onwards, the military style became more fashionable and previously everyday military items became more popular and precious, such as brooches and belts. It can be argued that this depositional shift from settlement to burial also further supports the notion that the type 2 brooches found at the fort could be linked to the workshop. They are most likely to be seen as failed or unfinished products or in need of repair, rather than as lost brooches.

Oudenburg's collection of 52 crossbow brooches is among the largest concentrations in the Roman Empire (cf. Swift 2000a), only matched in Northern Gaul by the quantity found at Nijmegen. The large number of finds alone would support a claim that these brooches were produced in or near Oudenburg, intended for this very important military base at the Continental North Sea shore. In first instance, the crossbow brooches (the earlier types) reflect the general soldiers population, while in later phases they represent the military officers. Although, a possible production in Roman Britain cannot be excluded either, as ties with Britain in the late Roman period are evident from other material found in Oudenburg. A larger study comparing brooches from Britain and Gaul could provide some further insights in the matter.

In general, the crossbow brooches found at the *castellum* display stylistic traits and average measurements that are considered common for Northern Gaul. It has to be noted, however, that the large quantity of brooches found at Oudenburg heavily influences the image of what is considered typical for Northern Gaul. A detailed comparison with Nijmegen is necessary to test whether the Oudenburg brooches represent a typical style for Northern Gaul or merely for *Belgica Secunda*, or perhaps reveals a closer relationship with British finds. The possibility that the light crossbow brooches could have been batch-produced and formed after a base-model would provide the ideal method to study distribution mechanisms with which same-batch brooches potentially could be traced back to their production site. More compositional studies are necessary to compare interregional production modes and possibly characteristic signals to aid in this study.

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190 One crossbow brooch was found in inhumation grave 10 of this eastern cemetery (Dyselinck *et al.* 2020). This brooch can be identified as a crossbow brooch type 3/4 (B) after the Swift-Keller-Pröttel model, dating to the second half of the 4th century. In 2018 a metal detectorist found another crossbow brooch in this area and reported it to the Flanders Heritage Agency. It can be catalogued as a type 3/4.

191 Little information is known about its provenance. The brooch could be identified as a type 2ii brooch after Swift's typology.

4.5 Conclusion

We put forth the idea that the crossbow brooches found in the fort of Oudenburg could have been made locally. The 3rd-century light crossbow brooches chronologically overlap with the brooch production attested at the fort's metal workshop during fort period 4. Furthermore, a batch-production for the type 0 crossbow brooches can be suggested based on shared stylistic traits, near exact measurements and closely related compositional signals. The semi-manufactured sprung brooch CA.B/C223 demonstrated a close compositional match consisting of a copper alloy mixed with zinc, tin and lead. This does not necessarily indicate that one served as raw material for the other. It rather points out that they were produced from similar scraps with a similar manufacture process (melting, casting, finishing) to achieve the material properties desired for a brooch.

The strongest indication that most of the type 0 brooches have been made in Oudenburg, is the difference in composition with the brooches analyzed from other sites in the Low Countries. Further indications of local workshop activities concerning the type 1 light crossbow brooches are the evidence of repair or even alteration beyond the initial function of the brooch provided by CA.B023, and the unique stylistic traits of CA.B021. Furthermore, it could be proposed that the lack of specific features on CA.B022 indicates that this brooch was not yet finished.

Finally, while the type 2 brooches are less likely to have been made locally, CA.B027 possibly represents a failed or unfinished product. The more elaborate CA.B026 is a specific subtype characteristic for Northern Gaul and has all the markings of being made as a unique item. Perhaps, a metal artisan that was capable and allowed to demonstrate some freedoms in finishing certain brooches could have worked at the metal workshop in Oudenburg. Although these brooches with pronounced triangular cuffs and faceted knobs were not always gilded, the lack of any gold trace here, could perhaps be seen as evidence that this brooch was not yet finished.

Overall, the XRF results reveal the use of metallurgical recycling practices. All brooches are ternary or quaternary alloys as a result from melting copper alloy objects instead of creating new alloys with fresh sources. The lack of trace elements also supports this notion, although it cannot be put beyond the effects of the corrosion on the results of the surface measurements. In one way or another, all brooches demonstrate some indications of local (batch) production, reparation, alteration or finishing. And finally, these brooches were found inside the fort, not as careful depositions or lost while wearing them, but rather as discarded waste. This evidence is in contrast to the idea of a central production of early crossbow brooches, but rather places for the late 3rd and early 4th century the production and finishing of early crossbow brooches in the regular military workshop practices.

5. The iron assemblage

5.1 The iron assemblage in general

To manage the considerable amount of the iron assemblage (IR), the 46,083 iron items collected at the south-west corner site were first classified according to the following categories[192]: nails (and fragments) and clamps (and fragments) (N), undetermined fragments ((fragments of) rods, bars, shafts, stems, sheets, amorphous pieces) (B), shoe sole parts (shoe spike clusters) (S), slag material (M) and 'representative' items ('objects') (BS)[193]. The group of nails and clamps, not surprisingly, represents the largest part of the assemblage, accounting for a total of 69.6%[194] (Figure 3.9, top).

The group of the 'representative items' accounts for 792 items or only 1.7% of the assemblage. In total, 812 items were studied in detail: not only 'representative items', but also a selection of (large) nails, nail clusters and representative shoe soles or fragments as these deserved further consideration. From these 812 originally catalogued items, 211 belong to post-Roman levels or levels mixed with post-Roman material. From the latter, 76 items can be assigned to the transition level between the Roman and post-Roman level and were either still situated at the top of fort level 5 or almost certainly dug-up from this level. Table 3.7 shows the overview of their classification in domains and categories and according to the (fort) level in which they were found. The in Section 8 of this chapter presented catalogue, only lists the illustrated representative items – 365 in total[195] – which cover all the represented types of objects[196] (Plates CCLVI-CCCXV).

It is not surprising to notice that the overall iron counts increase through time (Figure 3.9, below). While the first three fort installations knew a more short-termed occupation, expanding over several years though, the fort occupations of fort period 4 and 5 covered a much larger time-span and hence more activities, evidently resulting in a larger iron assemblage. In addition, also a significant residual factor must be taken into account. Although this can hardly be verified within the iron assemblage of which most of the finds only know large dating ranges, the high degree of residuality as evidenced in the ceramic assemblages, evidently has also determined the other find assemblages, such as that of the iron items. Also the degree of preservation most likely plays its part.

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192 A first ranging of the iron finds was made with the naked eye. Due to the often severe corrosion, it was necessary to Xray *c.* 3/4 of the material to come to a correct determination.

193 *I.e.* others than in the preceding categories: nails, shoe sole clusters and metal slags (iron) can evidently also offer a lot of information and can be 'representative': see *e.g.* the considerable diversity in nails (cf. Guillaume 2005 for the potential of the study of nails from the Roman settlement of Tienen (Flemish Brabant, B)) and iron slag material representing different stages in the metalworking process.

194 In all counts, fitting pieces and fragments of one individual are counted as one.

195 The representative shoe sole spike clusters are not listed in the here in Section 8 presented catalogue, but are integrated in the study of the shoes in Chapter 8 of this volume.

196 The non-illustrated items of the original catalogue all represent items which have a very close parallel in the illustrated assemblage.

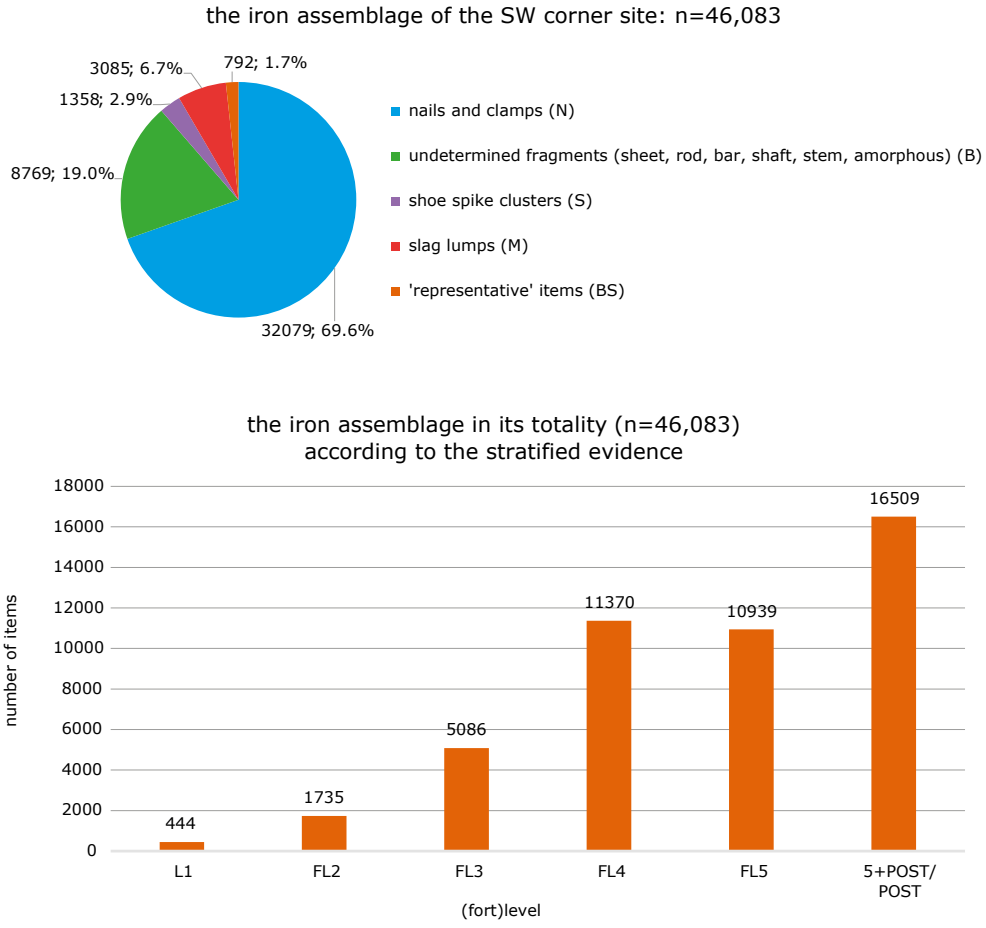

Figure 3.9. Top: overview of the find classification groups of the entire iron assemblage, dated to the Roman period, of the south-west corner site. Below: iron items at the south-west corner site and their distribution according to the stratified evidence.

The very low number of representative iron items in the first three fort levels (Figure 3.10) probably explains itself largely by the re-depositing of items during later construction activities and by a bad preservation of the iron resulting in more fragmented, and hence undetermined, finds.

The slight decrease of iron items at fort level 5, clearly visible in the nail counts (Figure 3.9, below; Figure 3.10), can be related to the functional implementation of this south-west corner during that period. The bath house of fort level 5A which was bordered by a road to the south, was surrounded to the west and the north by open space. During the last fort occupation (fort period 5B) the area served to coral horses or pack animals. Both uses of the area evidently represent less constructional elements, resulting in a lower number of structural fittings. The nail count is still very high though, so it can be assumed that certainly at this level 5 a lot of residual, dug-up material is included in the assemblage (definitely nails would be easily dug up), an observation that could also be made when looking at the ceramic assemblages.

In the following section, no further comments will be given with regards to the large amount of fittings and links, together accounting for 477 items or 58.7% of the 812 originally catalogued items. This number should be added to the rest of the nails and clamps recovered from the site, resulting in a total number of 32,524 (fragments of) (structural) fittings. These fittings may have belonged to a multitude of domains (furnishing, immovable property, transport) and do not yield specific information on the functional implementation of the fort area and related activities. The in the presented catalogue included and illustrated items of this group can offer reference for both regional military and later Roman site studies in the north-west provinces though.

Nevertheless, it is important to draw attention to several large nails recovered at the site, of which a selection has been catalogued (IR.J023-026, 030-031, 035-036, 039) (Plates CCCIV-CCCV). According to Lyne such large nails, which were also recovered at the Richborough fort (cf. Lyne 1996, 148: Fig. 1, 9-10), belonged to boats of so-called Celtic construction. Such a 'Romano-Celtic' single masted sailing vessel has been recovered from the Harbour entrance in St Peter Port at Guernsey, Channel Islands in the 1980s (Rule 1990). Two vessels found in London, the New Guys House and Blackfriars ship I, are also of the Romano-Celtic type (Marsden 1990). The Guernsey wreck sank shortly after AD 285; the London ships date from the latter half of the 2nd century AD. These ships were constructed with large, J-shaped (clenched by turning through 180°) iron nails (cf. Rule 1990, 50: Fig. 5.2; 51: Fig. 5.3; cf. Marsden 1990, 70: Fig. 7.4). Also the Zwammerdam type barges were made with such large iron nails (cf. de Weerd 1990, with references). The Richborough 'ship nails' were found either unstratified or came from 4th-century contexts. Lyne suggests the possibility that warships and supply vessels constructed in Celtic

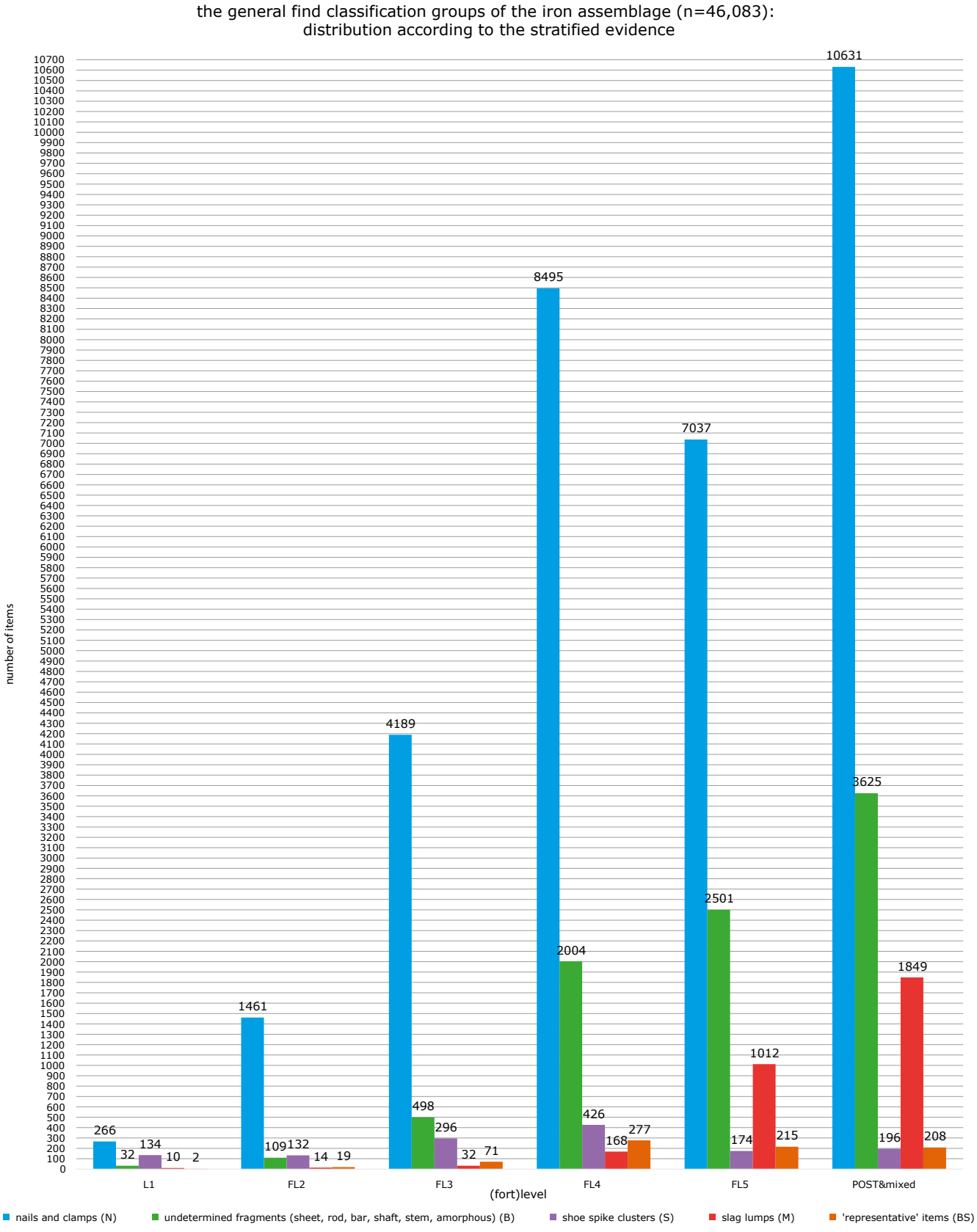

Figure 3.10. The find classification groups as represented in the iron assemblage of the south-west corner site according to the stratified evidence.

Table 3.7. Classification of the catalogued iron assemblage of the south-west corner site. Illustrated finds on Plates CCLVI-CCCX.

find domaine / category	item (found complete or as fragment)	cat. nos IR.	TOTAL n	L1	FL2	FL3	FL4	FL5	FL5+POST/ POST
military life									
military equipment									
	scabbard chape	A14	**1**			1			
	spear(?) ferrule	A15-16	**2**					1	1
	spearhead	A17-35	**19**		3	3	6	6	1
military dress									
	armour								
	-lorica segmentata	A01-02	**2**					2	
	-lorica squamata	A03	**1**				1		
	-lorica hamata	A04-13	**10**				2	3	5
transport									
equipment related to vehicule									
	linch pin	H03-07	**5**				1	3	1
	axle cap	H08-H09	**2**				1	1	
	cart bolt	H10	**1**			1			
	wheel hub	H11	**1**					1	
	yoke ring	H12	**1**				1		
	decorative cart fitting?	H13	**1**				1		
	cart fitting (?),of yoke?	H14-15	**2**						2
	? beam binding	J096, 098, 100	**3**				2		1
	? beam fitting	J097	**1**				1		
equipment related to animal									
	harness bell	H16-19	**4**				3		1
	bridle bit	H20-21	**2**				1		1
	hipposandal	H01	**1**					1	
	horse trappings	H02	**1**				1		
navigation?									
	? boat or ship stake (or fish spear?)	H/C22-23	**2**				1	1	
crafts - production (tools and products)									
leatherworking									
	cobbler's last	C68-70	**3**		2				1
	awl	C71	**1**				1		
	awl (may also be used for woodworking)	C72	**1**						1
textileworking									
	wool comb	C73-82	**10**			1	4	3	2
metalworking									
	anvil	C01	**1**				1		
	hammer	C02-09	**8**			1	4	1	2
	chisel	C10-13	**4**					4	
	chisel (may also be used for woodworking)	C14	**1**						1
	nail production clusters	C/D85-89	**5**			3	2		
woodworking/carpentry									
	axe	C15-23	**9**			2	3	2	2
	adze	C27	**1**				1		
	adze (or hoe?) (may also be used for agriculture/horticulture)	C24-26	**4**				4		
	draw-knife	C28, C38	**2**				1	1	
	chisel	C29-34	**6**				1	2	3
	saw	C40-45	**6**				3	1	2
	gouge	C35	**1**					1	
	drill-bit	C36	**1**						1
	scraper	C37	**1**						1
	awl	C46-47	**2**		1	1			
	saw file?	C39	**1**				1		

find domaine / category	item (found complete or as fragment)	cat. nos IR.	TOTAL n	L1	FL2	FL3	FL4	FL5	FL5+POST/ POST
	? scraping-knife	C48-49	**2**			1	1		
stoneworking or agriculture									
	pick or pickaxe	C51	**1**						1
agriculture									
	hoe	C50	**1**						1
	pickaxe	C52	**1**						1
	ploughshare	C53-55	**3**				1	2	
agriculture or construction									
	spade/shovel	C59-67	**9**			1	3	3	2
agro-pastoral life									
	pitchfork	C56-58	**3**					3	
grain processing									
	dosing cone (for mill installation)	C83	**1**				1		
personal life									
ornament and dress									
	buckle	B01-03	**3**				2		1
	shoe sole (element)	*B04-B12*	**9**		*1*	*2*		*6*	
social life / exchange									
writing implements									
	stylus	E01-02	**2**				1		1
trade, exchange									
weighing instruments									
	steelyard component	G01-07, 11?	**8**				5	2	1
	weight	G08-10	**3**				1		2
domestic life									
culinary activity (food preparation)									
	cleaver (for butchering meat)	D001-007	**7**			1	5	1	
	ladle	D053	**1**						1
	bar for grill or firedog	D054-055	**2**				1		1
	cauldron	D061	**1**					1	
	cauldron escutcheon	D062	**1**				1		
	chain for cauldron	D056-058, 063	**4**				3	1	
	hook for cauldron	D059-060	**2**				2		
furnishing/vessels									
	handle	D020-040, 044-048	**25**			1	8	11	5
vessels									
	bucket handle	D041-043, 047	**4**				3	1	
lighting									
	lamp	D049	**1**				1		
	candlestand	D050	**1**				1		
	candlestick or lamp	D051	**1**						1
	lamp hook	D052	**1**				1		
domestic life - immovable property									
locks									
	padlock	D014-17	**4**			1		2	1
	padlock chain	D018	**1**					1	
	lock (element)	D/I064-104	**42**			6	17	14	5
keys									
		D/I105-137	**33**	1		1	12	8	11
immovable property									
door framing									
	pivot lining (or mill bearing)	I01-03	**3**				2		1
	door hinge	I04	**1**				1		
gate framing									
	striker plate	I05	**1**						1

find domaine / category	item (found complete or as fragment)	cat. nos IR.	TOTAL n	L1	FL2	FL3	FL4	FL5	FL5+POST/ POST
domestic life - multipurpose									
	knife	D008-013	**6**			2		1	3
(structural) fittings									
	chest/box/door binding	D019, J087	**2**		1		1		
	fitting miscellaneous	J051, 053, 093, 454	**4**	1				2	1
	binding	J050, 085, 086, 090, 095, 099	**6**			1	3	2	
	loop-hinge	J079-084, 086, 088-089, 101-155, 305-310	**79**	1	1	5	22	16	34
	collar	J091-092	**2**					2	
	door-hinge?	J094, 156	**2**			1			1
	double-spiked loop (with or without attached link)	J054-057, 059-066, 072-076, 157-304, 431-440	**177**	1	1	20	63	48	44
	holdfast	J043-045	**3**				2		1
	hooked rod	J052	**1**						1
	joiner's dog (staple clamp)	J046-049, 311-314	**8**				3	3	2
	large nail	*J022-040*	**24**			*2*	*11*	*5*	*6*
	loop-headed pin	J068, 441	**2**						2
	rivet	J453-454	**5**				4		1
	spiral	J457-458	**2**						2
	T-clamp	J041, 455	**3**				1	2	
	perforated bar	J442	**1**				1		
	ring-headed pin	J058, 067, 445-452	**10**			1	3	4	2
	ring-headed pin with ring attached (or bridle bit?)	J077-078	**2**		1		1		
	ring-headed bar	J069-071, 444	**5**				1	3	1
	undetermined	J456	**1**					1	
unclassifiable									
	tool or knife grip	C/D84	**1**					1	
	chain (element)	J001-020, J443	**22**		1	2	8	9	2
	link	J315-430	**116**		4	11	40	24	37
undetermined									
		K08-21	**16**		1		7	3	5
TOTAL			**812**	**4**	**17**	**72**	**292**	**216**	**211**

manner may have been used by the garrison of the stone shore fort during the 4th century as a replacement for the old shell-first built Mediterranean style galleys (Lyne 1996a, 149). To the latter he attributes the bronze spikes (see Section 3.3 in this chapter). The large iron nails occur at the Oudenburg site already from fort level 3 onwards and are well-represented at fort level 4. Although it cannot be excluded that some were indeed extracted from ship beams or were intended for such a construction – both used and unused nails can be discerned –, other applications cannot be excluded. Large beams through which such large nails were driven could be used in wells, large gates and other constructions of immovable property.

5.2 Military life

Iron items referring to military life at the Oudenburg site consist either of armour or of weapons (Plates CCLVI-CCLIX). One military equipment accessory was recovered: an iron box-shaped scabbard chape (IR.A14) of the type '*Eiserne tauschierte Dosenortband*' (Oldenstein 1976; Miks 2007: Form-variante of type 1). The find context at fort level 3 is in line with the mainly 3rd-century date of this type of scabbard chape.

Thirteen fragments of armour were recovered from the site. Two *lorica segmentata* elements (IR.A01-02) were found, one in the construction pit of fort level 5 basin OS 4923, most likely a dug-up item (A01), another in a fort level 4 or 5

layer (A02). In contrast to what has long been thought, *lorica segmentata* (laminated strip-armour) continued to be in use until the 3rd century (Bishop and Coulston 2006, 171-172), and its late 3rd-century use can probably be confirmed by item IR.A02. *Lorica squamata* or scale armour continued to be popular throughout the Roman period (Bishop and Coulston 2006, 64, 208). Only one fragment was found at the Oudenburg site though, at fort level 4 (IR.A03). The preference for chain mail over scale armour may be related to the presumed mixed character of the units. Cavalry men required good mobility and will have preferred the more flexible *lorica hamata* or chain mail. It is the best represented at the site with ten fragments, all attributed to fort levels 4 or 5 (IR.A04-13). An interesting aspect is the insertion of copper alloy rivets in the mail iron rings of fragments IR.A09-11 and A13, while the other fragments only consist of iron rings. Apart from Oudenburg, the insertion of copper alloy rivets has been attested by Wijnhoven also at Thorsberg (G), Dura-Europos (S) and Maastricht (NL). It seems to be a relatively late decorative technique from the 3rd century onwards (Wijnhoven 2015, 27). Although the Oudenburg fragments in question all derive from the post-Roman level and as such cannot contribute chronologically, it can be supposed that they were dug up from the latest levels.

The recovered weaponry items at the Oudenburg site only consist of shafted weapons: *pila,* spears and/or javelins. These finds occur from fort level 2 onwards. Both *pilum* and spear were made up of a head, shaft (in wood) and butt-spike (such as the ferrules IR.A15-A16), the javelin of a head and shaft (Stephenson 1999, 52-54). *Pila*, spears (for infantry) and lances (for cavalry) were in use throughout the whole Roman period (Bishop and Coulston 2006, 76). Bishop and Coulston (2006, 76 and 202), and in their footsteps Stephenson (1999, 52, following Bishop and Coulston 1993), point to the difficulty to classify the head-types and to the diversity of spear- and javelin-head forms in the later Roman period. Small heads can usually be attributed to javelins, large heads to thrusting spears, and medium-sized heads to shafted weapons for either purpose (Stephenson 1999, 52). The majority of depicted 3rd-century spears and lances show narrow-shouldered leaf-shaped heads, but broad-shouldered, triangular heads were still in use (Bishop and Coulston 2006, 151). Until the 5th century, the head forms of earlier periods continued to be in use with a range of broad- and narrow-shouldered blades (Bishop and Coulston 2006, 202). The spear-/lance-/javelin heads recovered from the Oudenburg site display a range of dimensions and 'leaf-shaped' head-types: narrow- as well as broad-shouldered blades, with flat or triangular cross-section, but mostly socketed, less tanged.

5.3 Transport

The iron transport-related items (IR.H01-21, possibly to supplement with H/C22-23 and J096-098, 100) (Plates CCXCV-CCC, CCCXI) complement well those in copper alloy. While the copper alloy transport-related elements consist mainly of decorative horse gear trappings and yoke rings, most of the iron items refer to the structure of the cart: five linch pins (IR.H03-07), two axle caps (IR.H08-09), a cart bolt (IR.H10) and a wheel hub (IR.H11). Just like the copper alloy transport-related items, the iron elements of equipment related to vehicle and animal are clearly present from fort level 4 onwards. One has to take into account though that the repair function at the workshops can have influenced their presence.

The four iron harness bells should be considered together with the two in copper alloy. The bells IR.H17-19 were probably also used as horse gear; the fact that both bells IR.H18 and 19 were originally covered by a copper alloy layer links them with their copper alloy counterparts. The iron core may have produced a more robust sound, while the copper alloy cover enhanced its appearance. The large bell IR.H16 may have been intended for draft cattle or beasts of burden such as oxen or mules (see Allison *et al.* 2005, Section 8.2.2). Several such large iron bells were *e.g.* found at the site Steinacker in the hinterland of Cologne (G), dated to the first half of the 4th century and are identified there as cattle bells (cf. Päffgen 2011, 218: Abb. 24.1).

The recovered hippo sandal IR.H01 is a late Roman item and may possibly be dated to the 4th century based on a similar find at Verulamium (UK) (Manning 1972a, 173: Fig. 63, 25). Recovered from a level containing material from the end of fort level 4 and from fort level 5, it may have been at the workshops for repair, but it can neither be excluded that this hippo sandal belonged to one of the horses on compound at fort period 5B. Hippo sandals were used on traction animals (Crummy 2011, 61) and cannot be taken as an indication of cavalry.

Two bridle bit fragments IR.H20-21 can be recognized as part of a curb-bit of Manning (1985) type 1 and were recovered respectively from fort level 4 and the post-Roman level. The curb-bit was especially designed for the rapid reaction needed for cavalry mounts (Manning 1985, 67-68) and its presence is an extra argument for the identification of cavalry at the Oudenburg fort, at least at fort level 4.

The socketed double-pronged forks IR.H/C22-23 which were retrieved from fort levels 4 and 5 can be identified as boat stakes, with similar finds at Neupotz (G) (Künzl 1993, 45-48: Abb. 13-16) and Pommeroeul (B) (De Boe and Hubert 1977, 37, 39-40: Fig. 48-49). Since the fort could be reached by ship through the nearby tidal channel, even close to the fort walls in the late Roman period, the presence of such boat stakes is certainly possible. However, an identification as fishing spears cannot be totally excluded.

5.4 Personal life

Only a few iron items belong to the domain of personal life. The three simple buckles IR.B01-03 (Plate CCLIX), two from fort level 4 and one recovered from the post-Roman level, complement the small assemblage of the copper alloy buckles but are ordinary items. Also belonging to this domain are the shoe soles preserved as corroded shoe spike clusters. In total 1358 shoe spike clusters were recovered from the site. The complete or large parts of shoe soles, preserved only as iron spike clusters, form an important addition to the preserved leather shoes of which several still had their spike soles attached, not least since these leather shoes are only preserved from waterlogged contexts of fort level 4 and 5 (see Chapter 8 in

this volume). The shoe soles only preserved as corroded shoe spike clusters do yield significant information, not only on size, but also on the decorative design formed by the spikes (see Chapter 8 in this volume where these finds are integrated in the discussion).

5.5 Trade and exchange

The iron steelyard components and weights (IR.G01-11) (Plate CCXCIV) are to be considered together with the copper alloy scales and steelyards (see Section 3.8 in this chapter). The iron examples were probably used to weigh heavier goods. As mentioned above, their presence from fort level 4 onwards may suggest a function related to the cereal supplies – the division of rations for the soldiers? – as several concentrations of charred cereal were found amongst the workshops of fort level 4. Or they may be related to the presumed market place function of the workshop area.

5.6 Domestic life

Some iron items belong to the culinary atmosphere and refer to the preparation of food. Seven cleavers found at the site (IR.D001-007) (Plates CCLXXIX-CCLXXX) can be attributed to fort level 4, except for one example from fort level 3 and one from fort level 5. Butchering of meat in the workshop area seems very unlikely, and the five cleavers may have been present here for repair or for recycling. However, the large waste-pit OS 4980 in the corner of the workshop area yielded several *scapulae* of domestic cattle bearing a perforation as the result of mounting, drying and smoking of shoulder hams whereby a metal was driven through the bone (study by A. Ervynck and A. Lentacker, both Flanders Heritage Agency). They point to the practice of making a preservable meat product (Ervynck and Lentacker in Vanhoutte *et al.* 2009b, 70). These bone finds in the large waste-pit OS 4980 of fort level 4 suggest that a butchery was located in the vicinity of the workshop area and that not only waste from the workshop area was dumped in the waste-pit.

Whether the two grill bars (IR.D054-55) (Plate CCLXXXIV), of which one certainly belonged to fort level 4, can be connected with the uncovered hearths is unclear. The use of cauldrons at the workshop area seems evident from the presence of several fragments at this level (Plates CCLXXXV-CCLXXXVI), certainly in case of the cauldron chain IR.D056 found in the infill of well OS 22926, located centrally in the workshop area.

The many iron handles recovered at the site belonged to vessels, such as buckets, or furnishing (Plates CCLXXXII-CCLXXXIII). At the north-east fort site (site Kapellestraat, ET24) an iron handle was still attached to a copper alloy sheet fragment, probably part of a large bronze vessel (see Vanhoutte *et al.* 2014, 223: Fig. 66, 2). The iron handles to which the split pins were still preserved certainly served trunks or larger chests. These were mostly not lockable and used for storing less valuable goods such as clothes, tools and household utensils (cf. Riha 2001). Of the many recovered locks and lock elements (IR.D/I064-104) (Plates CCLXXXVII-CCXCI) the sliding locks probably belonged to doors or gates while the lock plates with key holes, and certainly the lock plate with cylinder for a rotary key (IR.D/C081), rather belonged to trunks or chests. Door and gate framing is furthermore represented by pivot linings (IR.I01-03) (although these can also have functioned as mill bearing), a door hinge (IR.I04) and a striker plate (IR.I05) (Plate CCCI). The variety in lock functions translates itself also in the diversity of keys (IR.D/I105-137) (Plates CCXCII-CCXCIII). Within this group of items related to furnishing again the predominant presence at fort level 4 is striking and may be partly/largely explained by the use of these, mainly large, iron elements, as scrap metal. The box type padlocks, of which at least four examples were found (IR.D014-017) (Plate CCLXXXI), represent a wide-spread type with an ingenious lock mechanism. As with the modern cylindrical locks, their use may have been very diverse.

5.7 Crafts and production

An important find domain within the iron assemblage is that of crafts and production. The majority of these finds represent tools (Plates CCLX-CCLXXVIII). Not all tools can be unambiguously related to a specific craft (see *e.g.* chisel IR.C14; adzes/hoes IR.C24-26; saw file(?) IR.C39; scraping-knives(?) IR.C48-49; spades/shovels IR.C59-67). Nevertheless, it is clear that these tools mainly refer to metalworking, woodworking/carpentry, textile working, leather working and agriculture/agro-pastoral life.

At least thirteen tools (an anvil, hammers, chisels) can be related to metalworking (IR.C01-13). The anvil (IR.C01) (Plate CCLX) is exceptional as it is one of the largest known examples when compared to similar finds in literature. This anvil of the block type (Manning (1985) type 2, Duvauchelle (2005) type 1b) had a round hole at the corner of the face running down to emerge in the sloping. Manning (1985) interprets it as a hardy-hole, to attach supplementary anvil tools; Crummy however sees it as a punching-hole, allowing the smith to drive a punch through the metal being worked without damaging the punch itself or the face of the anvil (Crummy 2011, 72). Except for one hammer (IR.C07) all metalworking tools were recovered from fort level 4 or later levels. Most of them most probably served in the metalworking activities at the workshops of fort level 4.

Interestingly, also the tools referring to other crafts prevail from fort level 4 onwards and their majority can equally be related to the fort level 4 workshops. An exception is formed by the two shoemaker's anvils IR.C68-69 (Plate CCLXXIV) which were recovered from a pit near the back of the military hospital of fort level 2. Such a shoemaker's anvil was used to beat the spikes into the shoe sole so the sharp points would bend back into the leather[197]. They are an indication for a nearby shoemaker's workshop. The presence of most of the tools from fort level 4 onwards does not necessarily imply that all these crafts were performed in this workshop area. These tools could have been manufactured at the workshops, repaired here and/or served as scrap metal to recycle them into new objects.

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197 With thanks to dr. C. van Driel-Murray for this identification.

All three options are possible. Nevertheless their presence implies their use at the fort precinct and by the military and points to the self-sustainability of the army.

An important portion of tools refers to woodworking and/or carpentry (IR.C15-38, C40-47); possibly tools IR.C39, C48-49 can be added here. The ten wool combs IR.C73-82 form an exceptionally large assemblage (Plates CCLXXVI-CCLXXVII). They all represent the continental double-sided type. This comb was used in the textile process to comb or card the wool before it could be spun, by removing short wool, entangling the fibres and aligning the strands in order to make spinning easier (White 1970, 25; Crummy 2011, 85). The find of wool combs, and moreover so many, suggests that carding was done on a large scale.

A hoe (IR.C50), a pickaxe (IR.C52) and three ploughshares (IR. C53-55) refer to agriculture. The pick or pickaxe IR.C51 and the nine spades or shovels IR.C59-67 (Plates CCLXXII-CCLXXIII) may also have served this purpose, although it cannot be excluded that they were used respectively in stone working and construction. The three pitchforks IR.C56-58 (Plate CCLXXI) recovered from the Oudenburg site belong to fort level 5. Pitchforks can be related to harvesting and were used to spread, stack and lift the cut hay or corn. However, certainly two of the recovered pitchforks (IR.C56-57) can be attributed to fort level 5B and can be functionally related to the compounds of which can be presumed that they held horses. As such they may have been used for collecting and lifting hay. The presence of a dosing cone or feed cone (IR.C83) (Plate CCLXXVIII) at fort level 4 confirms the use of mechanical mill installations for the processing of cereals in fort period 4. Especially some large mill fragments are evidence of this (cf. Chapter 10 in this volume).

5.8 Ironworking

The many iron slags are indicative of ironworking at the fort precinct. A selection of iron slag lumps has been archaeometrically analyzed (Plas 2016)[198]. All iron slags can be identified as forge slags, most of them being plano-convex bottom slags or 'smithing hearth bottoms' (PCB)[199], the most common type of waste material resulting from forging activities. Further analysis of their geochemical composition and morphology revealed that several slags are so-called SGD (*Scorie Grise Dense*); they result from a forging activity in which an iron object was produced out of cast iron or in which an iron object was forged into another. The latter explains the large amount of scrap metal at the site, specifically related to the workshop activities in fort period 4. Other slags are so-called SAS (*Scorie Argilo-Sableuse*), a type of slag formed during welding or while shaping steel, a high-quality iron alloy composed of iron and carbon. At the Oudenburg fort, it most likely concerns the process of welding. Most of the slags are the iron-rich so-called SFR (*Scories Ferreuse Rouillés*), slags typically formed while welding together iron items or whilst repairing iron objects.

The analyzed slags of level 1 to 3 are too low in number to draw general conclusions but they bear witness of (nearby?) welding and forging activities at the fort precinct. Our focus is on the large number of slag material at fort level 4 and the way in which they can be related to the workshop activities. The three types of forge slags are represented at this level. They point to the varied metallurgical activities at the workshops. The analyzed slags recovered from fort level 5 all represent SFR. They indicate that, although many slags were probably dug-up items from the fort level 4 workshops, the metallurgical activities at fort level 5 focused apparently only on the repair and welding of iron objects; no new products seem to be produced, at least not in this part of the fort.

Many iron items found at fort level 4 were probably scrap metal intended for recycling, other objects were probably repaired at the workshops. To what extent new iron items from cast iron were made is so far unclear. Only the production of nails seems evident. Already at fort level 3 such production took place in the south-west corner area. To the west of Unit IVb two of the hearth pits (see Plate CDLXXIV: feature sections 8/310 and 8/312 (earliest feature)) and the hearth succeeding one of these pits (feature section 8/312 (later feature)) yielded clusters of unused, identical nails in the bottom charcoal layers. Nail production can also be assumed to have taken place at workshop Unit IV of fort level 4. The fire layer covering this workshop contained many clusters of complete, unused nails of equal size (all *c.* 5.0 cm).

198 **I would like to thank prof. dr. P. Degryse (KULeuven) for organizing a bachelor study focussing on the analysis of a small selection of slag material from the Oudenburg site (Plas 2016). As such, a general idea of the metallurgical activities at the site could be retrieved. Obviously, an in-depth study of a much larger sample of slags is needed to be able to draw conclusions on the chronological distribution of the slag material and to obtain a full picture on the metallurgical activities. Furthermore, this study should be combined with the analysis of other hearth- or furnace-related finds such as the many vitrified hearth/furnace linings found on the site, mainly at fort level 4, obviously originating from the hearths and ovens uncovered at this level.**

199 **The terminology of the forge slags is based on Serneels and Perret (2003).**

6. The metal assemblages reconsidered

Residuality, as shown to be an important aspect in the ceramic assemblage, evidently also colours the metal assemblage of the south-west corner site. This is most obvious from the significant dug-up portion into the post-Roman level.

A very similar 3rd-century copper alloy assemblage was recovered at the Aardenburg fort (cf. Besuijen 2008). For several items, such as the yoke rings, horse gear fittings, simple one-piece sprung brooches with flat wire bow, netting needles, keys, furniture elements, identical parallels are known from this site. Although this is not an exclusive argument, it strengthens the idea of a parallel development at both forts in the 3rd century. Typically 4th-century items are clearly absent in the Aardenburg assemblage (see Besuijen 2008).

The Oudenburg metal assemblage contains a rather low quantity of copper alloy *militaria*. The same can be seen at the Aardenburg fort. Based on this low quantity, Besuijen (2008, 77-78) concluded, in combination with the large amount of furniture items at the Aardenburg fort, that its community rather had a civil character. However, the everyday life of a soldier, his household utensils, his furniture will not have differed much from that of a (higher-status) 'civil' household. The military character of a site is visible in the military items and often in the brooches, but it is important to keep in mind that they only represent waste, lost items and, within the context of the workshops of fort level 4, items for repair or recycling. Other items of everyday life or utilitarian objects should not be looked at as having a 'military component'.

The overview of the Oudenburg metal assemblages reveals the workshop function of fort level 4 as the determining factor in the composition of the assemblage, not only through the products made and repaired there, but also through the use of scrap metal for the metalworking activities. Nonetheless, the many functions and crafts the products for repair or recycling refer to, show the variety of crafts present on the fort precinct. They bear witness of the high degree of self-sustainability of the army unit. This becomes clear at fort level 4, due to the metalworking workshops where these items came together. Whether the self-sustainability of the fort characterizes the fort occupation only at fort level 4 (or from fort level 4 onwards) or whether this is characteristic for the fort in general, which only becomes visible at fort level 4 because of the functional implementation of the area, cannot be concluded from the metal study.

7. Catalogue of the illustrated copper alloy items

The catalogued copper alloy items are illustrated on Plates CXCVI-CCLV, following the same order as the following catalogue, according to find domains (cf. Table 3.1). In the catalogue references to parallels and the dating of the find type 'as accepted in literature' are only included when this is valuable and when there are specific data for the find type in question. When the item is not preserved completely, the listed dimensions are those of the preserved part.

CA.A01 scabbard chape
Find type: scabbard chape Miks 2007 'Volutenortband vom Typ Zugmantel, Form 1B' (Vortafel F: 41)
Description: pelta-shaped scabbard chape, with central vertical rib and rib along the edge; left arm bent
References to parallels: well-known at the Upper Germanic and Rhaetian Limes and Danube Limes: cf. Miks 2007, Taf. 247: *e.g.* B109,1 (Gostavatu-Slaveni (RO), first half 3rd century AD), B165,2-3 (Obergerm.-Raet. Limes), and elsewhere *e.g.* B311,45 (Volubilis (M)); cf. Oldenstein 1976: Taf. 20: no. 123 (Zugmantel (G)), 124 (Osterburken (G)), 125 (Limes))
Dating (as accepted in literature): late 2nd – 3rd quarter 3rd century AD (Miks 2007, 341-342)
(Fort) level of find context: **2**
Count: 1 (complete)
Dimensions in cm: length: 5.0; width: 5.7; thickness: 0.6

CA.A02 scabbard chape
Find type: scabbard chape Miks 2007 'Schmalleistige u-förmige Rahmenortband' (Miks 2007, Vortafel G: 39)
Description: cross-shaped fitting, arm terminals broken off, with central rivet hole
References to parallels: cf. Nydam (DK): Miks 2007, 416: Abb. 112, B (context of second half 4th century AD); comparable find: Miks 2007, Taf. 269: A536,83 (first half 5th century AD). To Miks, this find was only known from North European contexts
Dating (as accepted in literature): end 4th – end 5th/start 6th century AD (Miks 2007, 415-418)
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 3.8; width: 3.4

CA.A03 scabbard runner
Find type: scabbard runner Miks 2007 type "Zapfenkopf'-Bügel / Carnap Typ IIIC1' (Vortafel F: 9-10)
Description: scabbard runner, to attach the scabbard to the baldric, with ribbed top and broken off bottom part
References to parallels: well-known at the Upper Germanic and Rhaetian Limes in the 2nd and 3rd centuries AD: cf. Oldenstein 1976, Taf. 12: no. 44, 45, 48, Taf. 13: 49; Miks 2007, Taf. 220-223: several parallels, also from *Britannia*; see also at Xanten (G): Lenz 2006, Taf.62
Dating (as accepted in literature): 3rd quarter 2nd century – end 3rd quarter 3rd century AD (Miks 2007, 300; Oldenstein 1976, 109)
(Fort) level of find context: **3**
Count: 1 (bottom part broken off)
Dimensions in cm: length: 7.1; width: 1.5 (maximum width)

CA.A04 helmet cheek fragment
Find type: possibly comparable to the helmet from Worms (G)
Description: sheet, widening to the top, with three rivetted edges, broken off at the top
References to parallels: cf. helmet from Worms (G), late Roman: Klumbach 1973
Dating (as accepted in literature): late Roman
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 7.7; width: 7.5

CA.A05 helmet (cheek) fragment
Find type: too little to determine the type
Description: copper alloy sheet, partly broken off, with rivetted top edge and rivets along the margin, probably cheek fragment of a segment helmet
(Fort) level of find context: **3+4**
Count: 1 (fragment)
Dimensions in cm: length: 8.6; width: 6.5

CA.A06 helmet fragment?
Find type: cavalry helmet, section of stylized hair?
Description: thick copper alloy sheet fragment, showing a relief pattern on the X-ray image, representing a curl, possibly stylized hair that often adorned cavalry helmets (Appels and Laycock 2007, 32)
References to parallels: cf. Appels and Laycock 2007, 32 for comparable helmet piece
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 5.9; width: 6.4

CA.A07 spur?
Find type: arm of rivet-spur?
Description: curved strip which is broken at one end; the other end has a flattened circular end with remains of an iron rivet
References to parallels: similarities with spur finds at Richborough (UK), fort: Bushe-Fox 1932, 79, Pl. X: 20; Clausentum (Bitterne) (UK), fort: Aylwin Cotton and Gathercole 1958, 45, Fig. 12: 6 and 7; no. 6 from context dated *c.* AD 370-390, no. 7 from context dated *c.* AD 390 to 5th century; South Shields (UK), fort: Allason-Jones and Miket 1984, 205-206: no. 3.685: 3rd-4th century; Xanten (G): Lenz 2006, Taf. 89: 921; sites in Bayern (G): Hoffmann 2004, 256: Typentafel J, 11. However, also similarities with presumed helmet strenghtener at Birdoswald fort, unstratified find: Wilmott *et al.* 1997, 308-309: no. 240
Dating (as accepted in literature): late Roman
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: length: 6.5; width: 1.4 (head)

CA.A08 spur?
Find type: arm of rivet-spur?
Description: D-shaped sectioned, slightly curved strip which is broken at one end; the other end has a flattened circular end
References to parallels: cf. CA.A07
Dating (as accepted in literature): late Roman
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 4.2; width: 1.4

CA.A09 *phalera* (as military decoration)
Find type: with head in relief
Description: *phalera* with depiction of head, probably of a god, in relief, with small oblong perforation at the top for attachment; *phalera* as military decoration, attached on the breast (*phalerae* were awarded in sets, commonly of nine, although examples are known of seven or five: see Maxfield 1981, 92)
(Fort) level of find context: **1 > 4**
Count: 1 (nearly complete)
Dimensions in cm: length: 7.5; width: 6.7; thickness: 2.0 (elevation)

CA.A10 cuirass hinge
Description: element of a cuirass hinge, some rivets still in place during excavation
References to parallels: cf. Richborough (UK), fort: Wilson 1968, Pl. XXXVI: 115, still part of the rest of the cuirass hinge, unstratified find
(Fort) level of find context: **1+2**
Count: 1 (complete)
Dimensions in cm: length: 5.4 (height); width: 5.3

CA.A11 baldric fitting
Find type: back-side of a baldric *phalera*
Description: D-shaped fitting, with a knob
References to parallels: cf. Corbridge and Newstead (UK): Bishop and Coulston 1993, 159: fig. 100 (both from 3rd-century contexts); Aldborough (UK): Bishop 1996, 69: 423
Dating (as accepted in literature): 3rd century AD (Bishop and Coulston 1993, 159)
(Fort) level of find context: **3+4**
Count: 1 (fragment)
Dimensions in cm: length: 1.9; width: 2.5

CA.A12 baldric *phalera*
Find type: miniature shield
Description: shield-shaped sheet fitting with central circular boss
References to parallels: no exact parallels found, but comparable finds listed by Kiernan (2009b, 86 ff.), Kiernan demonstrates that baldric fasteners in the form of shields were common parts of the Roman soldier's uniform in late antiquity
Dating (as accepted in literature): late Roman
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 3.6; width: 3.8; thickness: 0.8 (elevation)

CA.A13 baldric *phalera*
Find type: openwork *phalera*
Description: openwork disc-shaped *phalera* with seven raised nodules around its perimeter; the attachment lug is not preserved; the disc is broken and bent over slightly
References to parallels: variant on examples shown by Bishop and Coulston 2006, 191: Fig. 124: 1, 3, 4, 6 and on the *phalera* shown by Appels and Laycock 2007, 85
Dating (as accepted in literature): the examples of openwork *phalerae* listed by Bishop and Coulston 2006 all date to the 3rd century
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 6.2 (height)

CA.A14 baldric *phalera*
Find type: flat round mount, one stud
Description: flat round mount with one stud; the flatness of the mount, the single stud and the shortness of the stud were criteria to identify this piece as a baldric *phalera* and not a horse gear fitting)
References to parallels: cf. Niederbieber (G), fort: Oldenstein 1977, Taf. 47: 512
Dating (as accepted in literature): mid-Roman
(Fort) level of find context: **3**
Count: 1 (complete)
Dimensions in cm: diameter: 3.1

CA.A15 baldric *phalera*
Find type: rounded square mount with central boss, one stud
Description: rounded-rectangular disc with bulb-shaped centre, no loop or studs present on the back, but possibly broken off central peg
References to parallels: cf. Nicolay 2007, Pl. 48: 242.12; Aardenburg (NL), fort: Besuijen 2008, 142: 7.7; Caerleon (UK): Nash-Williams 1941, Pl. XXXII: no. 4
Dating (as accepted in literature): 3rd century AD
(Fort) level of find context: **3+4**
Count: 1 (nearly complete, stud broken off)
Dimensions in cm: length: 3.1 (height); width: 3.2

CA.A16 baldric *phalera*
Find type: round mount with central boss, one stud
Description: round *phalera* with bulb-shaped centre, no stud preserved
References to parallels: cf. Xanten (G): Lenz 2006, Taf. 82: 843-845; Niederbieber (G): Oldenstein 1976, Taf. 51: 584; Zugmantel (G): Jacobi 1909, Taf. XII, 53-56, 64-65, 70, 71 and Oldenstein 1976, Taf. 86, 1122; comparable to the mounts with similar disc but with two studs, found on several sites along the Upper Germanic and Rhaetian Limes: see Oldenstein 1976, Taf. 49
Dating (as accepted in literature): 3rd century AD
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: diameter: 3.3

CA.A17 baldric *phalera*
Find type: round mount with central boss, one stud
Description: disc-shaped *phalera* with central boss, stud broken off
References to parallels: cf. CA.A16
Dating (as accepted in literature): 3rd century AD
(Fort) level of find context: **5**
Count: 1 (nearly complete, stud broken off)
Dimensions in cm: diameter: 3.7

CA.A18 baldric *phalera*
Find type: round mount with central boss, one peg
Description: round disc with bulb-shaped centre with central groove, with central peg on the underside
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: diameter: 4.3

CA.A19 baldric *phalera*
Find type: enamelled fitting, Nicolay 2007 type B2
Description: large enamelled disc with ring decoration, now very decayed, with one central pin on the back
References to parallels: cf. CA.A20
Dating (as accepted in literature): 2nd – 3rd century AD
(Fort) level of find context: **5(+4)**
Count: 1 (complete)
Dimensions in cm: diameter: 4.7

CA.A20 baldric *phalera*
Find type: enamelled fitting, Nicolay 2007 type B2
Description: enamelled disc with ring decoration, with one central pin on the back
References to parallels: cf. Xanten (G): Lenz 2006, Taf. 82, 848; Ellingen (G), fort: Zanier 1992, Taf. 18, B85; several similar finds in *Gallia*, *Germania Inferior* and *Superior*, and *Britannia* listed by Feugère *et al. s.d.*b (Artefacts-APH4015); similar to the finds listed by Nicolay 2007 as decorative horse gear fitting type B2: see Nicolay 2007, 382, Pl. 71: 82.181, but there with mushroom-shaped stud (dated to period 3: *c.* 120 – 250/300 AD). This type is absent at the 4th-early 5th-century graveyard A
Dating (as accepted in literature): 2nd – 3rd century AD
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: diameter: 2.6

CA.A/H21 horse gear trapping
Find type: small round mount, one stud (pin) (type Nicolay 2007 B1)
Description: small knobbed round mount
References to parallels: found *in situ* at the *tumulus* of Celles-les-Waremme, late 2nd – 1st half 3rd century AD, commune de Faimes (Liège, B) on the endings of the long bridle straps (Massart 2000, 519: h); Wange (B): Lodewijckx *et al.* 1993, 77: Fig. 6: 4.5 (3rd-century context)
Dating (as accepted in literature): according to Oldenstein 1976: mid 2nd – mid 3rd century AD, but proven by Gschwind to be dated until the late 3rd century (Gschwind 1998)
(Fort) level of find context: **3**
Count: 1 (stud partly broken off)
Dimensions in cm: diameter: 1.4

CA.A/H22 horse gear trapping
Find type: small round mount, one stud
Description: small knobbed round mount
References to parallels: cf. CA.A/H21
Dating (as accepted in literature): cf. CA.A/H21
(Fort) level of find context: **4**
Count: 1 (only base of stud missing)
Dimensions in cm: diameter: 1.2

CA.A/H23 horse gear trapping
Find type: small round mount, one stud
Description: small knobbed round mount
References to parallels: cf. CA.A/H21
Dating (as accepted in literature): cf. CA.A/H21
(Fort) level of find context: **3+4**
Count: 1 (only base of stud broken off)
Dimensions in cm: diameter: 1.5

CA.A/H24 horse gear trapping
Find type: small round mount, one stud (pin)
Description: small knobbed round mount
References to parallels: cf. CA.A/H21
Dating (as accepted in literature): cf. CA.A/H21
(Fort) level of find context: **4**
Count: 1 (base of stud broken off)
Dimensions in cm: diameter: 1.6

CA.A/H25 horse gear trapping
Find type: small round mount, one stud (pin)
Description: small knobbed round mount
References to parallels: cf. CA.A/H21
Dating (as accepted in literature): cf. CA.A/H21
(Fort) level of find context: **3**
Count: 1 (base of stud and fragment of disc broken off)
Dimensions in cm: diameter: 1.6

CA.A/H26 horse gear trapping
Find type: small round mount, one stud (pin)
Description: small knobbed round mount
References to parallels: cf. CA.A/H21
Dating (as accepted in literature): cf. CA.A/H21
(Fort) level of find context: **4**
Count: 1 (stud partly broken off)
Dimensions in cm: diameter: 1.6

CA.A/H27 horse gear trapping
Find type: small round mount, one stud
Description: small knobbed round mount
References to parallels: cf. CA.A/H21
Dating (as accepted in literature): cf. CA.A/H21
(Fort) level of find context: **5**
Count: 1 (fragment of disc and of stud broken off)
Dimensions in cm: diameter: 1.6

CA.A/H28 horse gear trapping
Find type: small round mount, one stud
Description: small knobbed round mount
References to parallels: cf. CA.A/H21
Dating (as accepted in literature): cf. CA.A/H21
(Fort) level of find context: **3+4**
Count: 1 only stud broken off
Dimensions in cm: diameter: 1.6

CA.A/H29 horse gear trapping
Find type: small round mount, one stud (pin)
Description: small knobbed round mount
References to parallels: cf. CA.A/H21
Dating (as accepted in literature): cf. CA.A/H21
(Fort) level of find context: **4**
Count: 1 (part of disc broken off)
Dimensions in cm: diameter: 1.8

CA.A/H30 horse gear trapping
Find type: medium round mount, one stud (pin)
Description: medium round knobbed mount, only one stud, disc bent
References to parallels: cf. CA.A/H21
Dating (as accepted in literature): cf. CA.A/H21
(Fort) level of find context: **4/5/post**
Count: 1 (part of disc broken off)
Dimensions in cm: diameter: 3.0

CA.A/H31 horse gear trapping
Find type: medium round mount, two studs (type Nicolay 2007 B1)
Description: round mount with two studs, with curved disc
References to parallels: cf. Nicolay 2007, 381: Pl. 70: type B1; Wange (B): Lodewijckx *et al.* 1993, 77: Fig. 6: 4.5 (3rd-century context)
Dating (as accepted in literature): according to Oldenstein 1976: mid 2nd – mid 3rd century AD, but proven by Gschwind to be dated until the late 3rd century (Gschwind 1998)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: diameter: 3.3

CA.A/H32 horse gear trapping
Find type: medium round mount, two studs
Description: round mount with two studs, with curved disc
References to parallels: cf. CA.A/H31
Dating (as accepted in literature): cf. CA.A/H31
(Fort) level of find context: **4?**
Count: 1 (complete, but edge damaged)
Dimensions in cm: diameter: 3.5

CA.A/H33 horse gear trapping
Find type: medium round mount, two studs
Description: round mount with two studs, with curved disc
References to parallels: cf. CA.A/H31
Dating (as accepted in literature): cf. CA.A/H31
(Fort) level of find context: **4+5**
Count: 1 (complete)
Dimensions in cm: length: 0.3; diameter: 3.1

CA.A/H34 horse gear trapping
Find type: medium round mount, two studs
Description: round mount with two studs, with curved disc
References to parallels: cf. CA.A/H31
Dating (as accepted in literature): cf. CA.A/H31
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: diameter: 3.7

CA.A/H35 horse gear trapping
Find type: medium round mount, two studs
Description: round mount with two studs, with curved disc
References to parallels: cf. CA.A/H31
Dating (as accepted in literature): cf. CA.A/H31
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: diameter: 3.4

CA.A/H36 horse gear trapping
Find type: medium round mount, two studs
Description: round mount with two studs, with curved disc
References to parallels: cf. CA.A/H31
Dating (as accepted in literature): cf. CA.A/H31
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: diameter: 3.9

CA.A/H37 horse gear trapping
Find type: medium round mount, two studs
Description: round mount with two studs, with curved disc
References to parallels: cf. CA.A/H31
Dating (as accepted in literature): cf. CA.A/H31
(Fort) level of find context: **4**
Count: 1 (nearly complete)
Dimensions in cm: diameter: 4.6

CA.A/H38 horse gear trapping
Find type: medium round mount, two studs
Description: round mount with two studs, with curved disc
References to parallels: cf. CA.A/H31
Dating (as accepted in literature): cf. CA.A/H31
(Fort) level of find context: **4**
Count: 1 (nearly complete, edge damaged)
Dimensions in cm: diameter: 4.1

CA.A/H39 horse gear trapping
Find type: medium round mount, two studs
Description: round mount with two studs, with curved disc
References to parallels: cf. CA.A/H31
Dating (as accepted in literature): cf. CA.A/H31
(Fort) level of find context: **5**
Count: 1 (nearly complete)
Dimensions in cm: diameter: 4.1

CA.A/H40 horse gear trapping
Find type: medium round mount, two studs
Description: round mount with two studs, with straight flat disc
References to parallels: cf. CA.A/H31
Dating (as accepted in literature): cf. CA.A/H31
(Fort) level of find context: **4+5**
Count: 1 (nearly complete, edge damaged)
Dimensions in cm: diameter: 3.8

CA.A/H41 horse gear trapping
Find type: medium round mount, two studs
Description: round mount with two studs, with curved disc
References to parallels: cf. CA.A/H31
Dating (as accepted in literature): cf. CA.A/H31
(Fort) level of find context: **post**
Count: 1 (nearly complete, edge damaged)
Dimensions in cm: diameter: 4.4

CA.A/H42 horse gear trapping
Find type: medium round mount, two studs
Description: round mount with two studs, with straight flat disc
References to parallels: cf. CA.A/H31

Dating (as accepted in literature): cf. CA.A/H31
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: diameter: 4.0

CA.A/H43 horse gear trapping
Find type: medium round mount, two studs
Description: round mount with two studs, with curved disc
References to parallels: cf. CA.A/H31
Dating (as accepted in literature): cf. CA.A/H31
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: diameter: 5.0

CA.A/H44 horse gear trapping
Find type: large round mount, two studs (type Nicolay 2007 B1)
Description: round mount with two studs, with curved disc
References to parallels: common find on military sites: cf. *e.g.* Oldenstein 1977: Taf. 56: similar finds at Niederbieber, Holzhausen, Saalburg and other sites along the German limes; common find in *Gallia*, *Britannia*, *Germania Inferior* and *Superior*: see Artefacts (APH-4049); Neupotz (G): Künzl 1993, G 26, 27, 28 (context of late 3rd century AD); Wange (B): Lodewijckx *et al.* 1993, 77: Fig. 6: 4.5 (3rd-century context)
Dating (as accepted in literature): late 2nd – 3rd century AD (Oldenstein 1976, 186; Gschwind 1998)
(Fort) level of find context: **1**
Count: 1 (less than half broken off and edge partly damaged)
Dimensions in cm: diameter: 7.1

CA.A/H45 horse gear trapping
Find type: large round mount, two studs
Description: round mount with two studs, with curved disc
References to parallels: cf. CA.A/H44
Dating (as accepted in literature): cf. CA.A/H44
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: diameter: 5.9

CA.A/H46 horse gear trapping
Find type: large round mount, two studs
Description: round mount with two studs, with curved disc
References to parallels: cf. CA.A/H44
Dating (as accepted in literature): cf. CA.A/H44
(Fort) level of find context: **4**
Count: 1 (complete, edge damaged)
Dimensions in cm: length: 0.4; diameter: 6.1

CA.A/H47 horse gear trapping
Find type: large round mount, two studs
Description: round mount with two studs, with curved disc
References to parallels: cf. CA.A/H44
Dating (as accepted in literature): cf. CA.A/H44
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: diameter: 5.9

CA.A/H48 horse gear trapping
Find type: large round mount, two studs
Description: round mount with two studs
References to parallels: cf. CA.A/H44
Dating (as accepted in literature): cf. CA.A/H44
(Fort) level of find context: **4**
Count: 1 (complete, but very corroded)
Dimensions in cm: diameter: 6.0

CA.A/H49 horse gear trapping
Find type: large round mount, two studs
Description: round mount with two studs, with slightly curved disc
References to parallels: cf. CA.A/H44
Dating (as accepted in literature): cf. CA.A/H44
(Fort) level of find context: **5**
Count: 1 (nearly complete, fragment of edge broken off)
Dimensions in cm: diameter: 6.8

CA.A/H50 horse gear trapping
Find type: large round mount, two studs
Description: round mount with two studs, with curved disc
References to parallels: cf. CA.A/H44
Dating (as accepted in literature): cf. CA.A/H44
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: diameter: 7.1

CA.A/H51 horse gear trapping
Find type: large round mount, two studs
Description: round mount with two studs, with straight flat disc
References to parallels: cf. CA.A/H44
Dating (as accepted in literature): cf. CA.A/H44
(Fort) level of find context: **post**
Count: 1 (fragment broken off)
Dimensions in cm: diameter: 5.6

CA.A/H52 horse gear trapping
Find type: shell mount, small (type Nicolay 2007 B5)
Description: small shell-shaped mount with two studs
References to parallels: cf. CA.A/54; Celles-les-Waremme, *tumulus*, end 2nd – 1st half 3rd century AD, commune de Faimes (Liège, B): the small shell mounts were found *in situ* on leather bridle straps, on endings but also other positions (Massart 2000, 518)
Dating (as accepted in literature): cf. CA.A/54
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 1.9 (height); width: 2.0

CA.A/H53 horse gear trapping
Find type: shell mount, large
Description: large shell-shaped mount with two studs
References to parallels: cf. CA.A/54
Dating (as accepted in literature): cf. CA.A/54
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 3.4 (height); width: 3.6

CA.A/H54 horse gear trapping
Find type: shell mount, large (type Nicolay 2007 B5)
Description: large shell-shaped mount with two studs
References to parallels: very popular type and wide-spread in the whole empire, mainly in the second half 3rd century and first half 4th century, not only on military sites (see *e.g.* Eining (G), second half 3rd century: Gschwind 1996, 1998) but also on settlement sites, see all the finds listed by Gschwind 1998 (with references) at *Mauretania Tingitana*, *Hispania*, *Britannia*, *Gallia Belgica*, *Gallia Lugdunensis*, *Aquitania*, *Narbonensis*, *Germania Inferior* and *Superior*, *Raetia*, *Italia*, *Noricum*, *Pannonia Superior* and *Germania Magna* (see also Feugère and Gilles *s.d.*b (Artefacts (APH-4025)), with references); cf. Celles-les-Waremme, *tumulus* end 2nd – 1st half 3rd century AD, commune de Faimes (Liège, B), found *in situ* on leather bridle straps: the large shell mounts were situated on the ending of long bridle straps: Massart 2000, 518; cf. Nicolay 2007, 384: Pl. 73: type B5; Neupotz (G): Künzl 1993, G 25 (context of late 3rd century AD); Aardenburg (NL), fort: Besuijen 2008, 149: 8.33-35
Dating (as accepted in literature): according to Oldenstein 1976: mid 2nd – mid 3rd century AD, but proven by Gschwind to be dated until the late 3rd century (Gschwind 1998)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 3.6 (height); width: 4.2

CA.A/H55 horse gear trapping
Find type: shell mount, large
Description: large shell-shaped mount with two studs
References to parallels: cf. cf. CA.A/54
Dating (as accepted in literature): cf. CA.A/54
(Fort) level of find context: **5+post**
Count: 1 (complete)
Dimensions in cm: length: 3.2 (height); width: 3.7

CA.A/H56 horse gear trapping
Find type: shell mount, medium (type Nicolay 2007 B5)
Description: medium shell-shaped mount with two studs
References to parallels: cf. CA.A/54; Celles-les-Waremme, *tumulus*, end 2nd – 1st half 3rd century AD, commune de Faimes (Liège, B): the medium-sized shell mounts were found *in situ* on leather bridle straps, along the straps (Massart 2000, 518)
Dating (as accepted in literature): cf. CA.A/54
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 2.8 (height); width: 2.9

CA.A/H57 horse gear trapping
Find type: shell mount, very large
Description: very large shell-shaped mount with two studs
References to parallels: cf. CA.A/54
Dating (as accepted in literature): cf. CA.A/54
(Fort) level of find context: **4+5**
Count: 1 (complete)
Dimensions in cm: length: 5.0 (height); width: 5.3

CA.A/H58 horse gear trapping
Find type: shield mount (type Nicolay 2007 B8)
Description: shield-shaped (shape of a double hyperbole) mount with two studs
References to parallels: several finds in *Gallia* and *Germania Inferior* listed by Feugère *s.d.* (Artefacts – APH-4007), with references; for the Rhineland, see also Oldenstein 1977, Taf. 59: 733, 734: Zugmantel and Saalburg (both G); Aardenburg (NL), fort: Besuijen 2008, 150: 8.39; see for Dutch sites: Nicolay 2007, 385: Pl. 74: type B8 (period 3: *c.* 120 – 250/300 AD); Les Avins (B): Vanden Berghe 1996, 75: Fig. 8: 5, 6
Dating (as accepted in literature): according to Oldenstein 1976, 191-192 mid 2nd – 3rd century AD
(Fort) level of find context: **3+4**
Count: 1 (nearly complete, one terminal broken off)
Dimensions in cm: length: 5.1; width: 3.3

CA.A/H59 horse gear trapping
Find type: rectangular mount
Description: rectangular mount with two studs
References to parallels: cf. Buch (G), fort (Oldenstein 1976, Taf. 59: 746)
(Fort) level of find context: **post**
Count: 1 (nearly complete, only one corner broken off)
Dimensions in cm: length: 6.6; width: 2.6

CA.A/H60 horse gear trapping
Find type: pelta mount (type Nicolay 2007 B9)
Description: small, pelta-shaped mount with two studs
References to parallels: cf. Rhineland (G): Oldenstein 1977, Taf. 53: 626-629: Zugmantel, Saalburg, Holzhausen; well-spread all over the Roman Empire according to the finds listed by Gschwind 1998 (with references): *Mauretania Tingitana*, *Britannia*, *Gallia Belgica*, *Lugdunensis*, *Germania Inferior* and *Superior*, *Italia*, *Noricum*, *Pannonia Superior* and *Germania Magna*: see also Feugère *et al. s.d.*a (Artefacts-APH4030); Aurrecoechea Fernández 1996 lists some finds at *Hispania*; Wange (B): Lodewijckx *et al.* 1993, 80: Fig. 8: 4.15/4.16 (3rd-century context); Dutch sites: Nicolay 2007, 385: Pl. 74: type B9 (period 3: *c.* 120 – 250/300 AD)
Dating (as accepted in literature): Oldenstein 1976, 181-183 dates this type in the period mid 2nd – mid 3rd century AD, but Gschwind 1998 demonstrates that this type lives until the late 3rd century
(Fort) level of find context: **3**
Count: 1 (complete, but badly preserved and heavily corroded)
Dimensions in cm: length: 1.8 (height)

CA.A/H61 horse gear trapping
Find type: pelta mount
Description: small pelta-shaped mount with two studs
References to parallels: cf. CA.A/H60
Dating (as accepted in literature): cf. CA.A/H60
(Fort) level of find context: **unstratified**
Count: 1(complete, but heavily corroded making it difficult to distinguish the pelta shape)
Dimensions in cm: length: 1.8 (height)

CA.A/H62 horse gear trapping
Find type: pelta mount
Description: large pelta-shaped mount with two studs, one arm broken off
References to parallels: cf. CA.A/H60
Dating (as accepted in literature): cf. CA.A/H60
(Fort) level of find context: **5+post**
Count: 1 (not complete, one arm broken off)
Dimensions in cm: length: 4.2

CA.A/H63 horse gear trapping
Find type: type undetermined: pelta/round (?) mount, two studs
Description: heavily corroded mount, with two studs, with part of the edge possibly broken off: round type or pelta-shaped mount with pelta shape hard to distinguish?
(Fort) level of find context: **4**
Count: 1 (complete?)
Dimensions in cm: length: 28.0 (height)

CA.A/H64 horse gear trapping
Find type: *vulva-* or hexagonal-shaped mount (often described as shield-shaped mount) (the *vulva* as a symbol protecting against evil (see Lodewijckx *et al.* 1996, 19; Oldenstein 1976, 137)
Description: fitting with a hexagonal base with central coffee-bean-shaped dome (raised oval boss with median groove) (generally seen as a stylized form of a *vulva*, bearing an apotropaic symbolism: see *e.g.* Oldenstein 1976, 137)
References to parallels: wide-spread distribution all over the Roman Empire on military sites, according to all the finds listed by Gschwind 1998 in *Britannia*, *Gallia Belgica*, *Gallia Lugdunensis*, *Germania Inferior*, *Germania Superior*, *Raetia*, *Italia*, *Noricum*, *Pannonia*, *Dacia* and *Germania Magna*: see also Feugère *et al. s.d.*c (Artefacts-APH4023); Aurrecoechea Fernández 1996, 101-102 mentions also some finds in *Hispania* (with references to similar finds elsewhere in the Roman Empire); cf. Oldenstein 1976, 139, 248, no. 267-272, Taf. 34: common form along the Limes and in the Rhineland (see *e.g.* Eining (G), second half 3rd century: Gschwind 1996; 1998), most often found on military sites but also known from sites without obvious military connections; also common form in Britain, cf. *e.g.* South Shields, fort (Allason-Jones and Miket 1984, 238-239: 3.870-871); Wange (B): Lodewijckx *et al.* 1996, 18: Fig. 20: type 19, and Lodewijckx *et al.* 1993, 83: Fig. 9: 4.19; on Dutch sites: Nicolay 2007, 384: Pl. 79, type B17; Aardenburg (NL), fort: Besuijen 2008, 150: 8.37-38; Scheveningseweg (NL): Waasdorp 1999, 65: 3.20
Dating (as accepted in literature): according to Oldenstein 1976, 139: mid 2nd – mid 3rd century AD, but proven by Gschwind to be dated until the late 3rd century (Gschwind 1998)
(Fort) level of find context: **3?**
Count: 1 (complete)
Dimensions in cm: length: 3.5 (height); width: 2.1

CA.A/H65 horse gear trapping
Find type: *vulva-* or hexagonal-shaped mount
Description: hexagonal stud with a raised oval boss with median groove and two studs
References to parallels: cf. CA.A/H64
Dating (as accepted in literature): cf. CA.A/H64
(Fort) level of find context: **4+5**
Count: 1 (complete)
Dimensions in cm: length: 3.3; width: 2.1

CA.A/H66 horse gear trapping
Find type: *vulva-* or hexagonal-shaped mount
Description: small hexagonal stud with a raised oval boss with median groove and two studs
References to parallels: cf. CA.A/H64
Dating (as accepted in literature): cf. CA.A/H64
(Fort) level of find context: **unstratified**
Count: 1 (complete)
Dimensions in cm: length: 2.4; width: 1.4

CA.A/H67 horse gear trapping
Find type: *vulva-* or hexagonal-shaped mount
Description: small, hexagonal stud with a raised oval boss with median groove
References to parallels: cf. CA.A/H64
Dating (as accepted in literature): cf. CA.A/H64
(Fort) level of find context: **post**
Count: 1 (complete, but badly preserved and edge damaged)
Dimensions in cm: length: 2.1 (height)

CA.A/H68 horse gear trapping
Find type: disc-and-foliated mount (often described as *phallus*-shaped or heart-shaped (see Lodewijckx *et al.* 1996, 15-16) (in that sense symbol of fertility and manliness, used as a talisman offering protection against evil powers and bad luck)
Description: oblong disc-and-foliated shaped mount with two studs
References to parallels: cf. Xanten (G): Lenz 2006, Taf. 77, 774; cf. metal detecting find in Britain (no location given): Appels and Laycock 2007, 118; Wange (B): Lodewijckx *et al.* 1996, 17: Fig. 19: type 14 (3rd-century context), see also Lodewijckx *et al.* 1993, 79: Fig. 7: 4.14; Les Avins (B): Vanden Berghe 1996, 75: Fig. 8, 4
Dating (as accepted in literature): 3rd century (Lodewijckx *et al.* 1996)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 4.2

CA.A/H69 horse gear trapping
Find type: disc-and-foliated mount
Description: small disc-and-foliated shaped mount with two studs, point broken off
References to parallels: cf. CA.A/H68
Dating (as accepted in literature): cf. CA.A/H68
(Fort) level of find context: **4**
Count: 1 (nearly complete, one terminal broken off, badly preserved)
Dimensions in cm: length: 2.3

CA.A/H70 horse gear trapping
Find type: disc-and-foliated mount
Description: small disc-and-foliated shaped mount with two studs, badly preserved, point broken off
References to parallels: cf. CA.A/H68
Dating (as accepted in literature): cf. CA.A/H68
(Fort) level of find context: **4**
Count: 1 (nearly complete)
Dimensions in cm: length: 3.0

CA.A/H71 horse gear trapping
Find type: disc-and-foliated mount
Description: large disc-and-foliated shaped mount with two studs, point broken off
References to parallels: cf. CA.A/H68
Dating (as accepted in literature): cf. CA.A/H68
(Fort) level of find context: **4+5**
Count: 1 (nearly complete, one terminal broken off)
Dimensions in cm: length: 3.7

CA.A/H72 horse gear trapping
Find type: disc-and-foliated mount, variation with base collar
Description: small and fine disc-and-foliated shaped mount with collar just above the base point, with two studs on the back
References to parallels: cf. Pfaffenhofen (G): Weber 2007, 216-217: Abb. 15: P28; sites in Bayern (G): Hoffmann 2004, 257: Typentafel K, 18; Zugmantel (G): Jacobi 1909, Taf. XII, 51; Dutch sites: Nicolay 2007, 391: Pl. 80: 61.6: type B-varia (period 3: *c.* 120 – 250/300 AD); Pommeroeul (B): Bausier *et al.* 2008, 59
Dating (as accepted in literature): according to Nicolay 2007 *c.* AD 120 – 250/300
(Fort) level of find context: **5+post**
Count: 1 (complete)
Dimensions in cm: length: 3.0

CA.A/H73 horse gear trapping
Find type: lunula-shaped mount
Description: small lunula-shaped mount with originally three studs, one side (together with one stud) is broken off
References to parallels: cf. Oldenstein 1976, Taf. 45, but at the Upper Germanic and Rhaetian Limes apparently only known as pendant (without studs)
(Fort) level of find context: **5**
Count: 1 (side with one stud broken off)
Dimensions in cm: length: 3.3 (height)

CA.A/H74 horse gear trapping
Find type: lunula-shaped mount or pendant
Description: part of lunula-shaped fitting with D-shaped section
References to parallels: cf. lunula-shaped mounts at *e.g.* Cologne (G): Schleiermacher 1996, 278: Abb. 96, u-v; Aalen and Osterburken (forts, both G): Oldenstein 1976, Taf. 44: 435, 436; lunula-shaped pendants found as part of a late Roman silver horse harness (4th century) deposit at the Esquiline Hill in Rome: Junkelmann 1992, 86: Abb. 99
Dating (as accepted in literature): 2nd and 3rd century AD according to Oldenstein (1976, 164)
(Fort) level of find context: **4/5**
Count: 1 (fragment)
Dimensions in cm: length: 7.0

CA.A/H75 horse gear trapping
Find type: dolphin-shaped mount (Oldenstein comprises them within the group of the 'Beschläge mit Trompetenornament' (Oldenstein 1976, Taf. 69 and 203 ff.), but Deschler-Erb 1996, 98 states that this type has to be seen as a specific, separate type)
Description: half of a mount, based on mount found *in situ* as part of a horse harnass in the *tumulus* of Celles-les-Waremme (end 2nd – 1st half 3rd century AD, commune de Faimes (Liège, B)) identifiable as mount depicting two dolphins facing each other with a serrated dorsal fin, ventral and caudral fins connected to volutes and a volute-tail turned down to the back, with originally four studs on the back (Massart 2000)
References to parallels: cf. Celles-les-Waremme (B), *tumulus*, late 2nd – 1st half 3rd century AD: Massart 2000, 513, 515: fig. 7: 1a (illustrated below the Oudenburg find as reference), found *in situ* on leather bridle straps, always on the same transversal position on the crossing of two bridle straps, on the exterior strap (Massart 2000, 513, 515: fig. 7: 1a); horse trappings with facing dolphins are not so common, similar trappings are found at Couvin (B) and Blicquy (B) (see Amand 1975, 36: Fig. 16, 34), Nijmegen (NL), Dalheim (L), Saalburg (G) (see also Oldenstein 1976, Taf. 69, 920) and Hedderheim (G). Their details and style suggest a common production centre: see Massart 2000, 515 for references; finds on Dutch sites: Nicolay 2007, 386: 51.47, 127.3 (period 3: *c.* 120 – 250/300 AD); Chilgrove, Chichester (UK): Down 1979, 152: Fig. 45: 21
Dating (as accepted in literature): This precize decoration of facing dolphins is very popular in the 3rd and 4th centuries; the finds at Saalburg and Heddernheim are respectively dated at the end of the 2nd and the first half of the 3rd century (Massart 2000, 515). Oldenstein 1976, 207 concludes to a use in the period mid 2nd – 1st half 3rd century AD; Deschler-Erb 1996, 98 narrows the date to the first half of the 3rd century AD based on all datable comparable finds
(Fort) level of find context: **3**
Count: 1 (half)
Dimensions in cm: length: 3.6 (height)

CA.A/H76 horse gear trapping
Find type: large oval mount
Description: fragment of oval-shaped mount with one rectangular loop on the underside (according to the find at Niederbieber, this type of fitting only had one attachment point), large part of the mount broken off
References to parallels: cf. Niederbieber (G), fort: Oldenstein 1976, Taf. 90, 1162
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 7.3

CA.A/H77 horse gear trapping
Find type: type undetermined: shape misformed
Description: mount with unidentified shape, misshapen (by fire?) or failed product?, with two studs
(Fort) level of find context: **post**
Count: 1 (nearly complete?)
Dimensions in cm: length: 5.0

CA.A/H78a horse gear trapping
Find type: horse gear pendant?
Description: ring with undetermined attachment; with horse mount CA.A/H78b corroded onto
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 6.2; width: 4.6

CA.A/H78b horse gear trapping
Find type: medium round mount, two studs
Description: round mount with two studs, with curved disc, corroded onto CA.A/H78a
References to parallels: cf. CA.A/H31
Dating (as accepted in literature): cf. CA.A/H31
(Fort) level of find context: **4**
Count: 1 (edge broken off)
Dimensions in cm: diameter: 2.8

CA.B001 buckle
Find type: annular buckle
Description: simple annular buckle with groove onto which the pin rested
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: width: 0.6; diameter: 3.4 (exterior diameter)

CA.B002 buckle
Find type: D-shaped buckle Nicolay 2007 buckle B-variant
Description: D-shaped buckle with conical knobs on either side of the hinge bar
References to parallels: cf. Krefeld-Gellep, grave 2832, dated to the middle third of the 4th century: Pirling *et al.* 1979, Taf. 79: 7; one parallel at Richborough (UK) (English Heritage number 7350262, context 1266, found at Area XI, surface): unpublished catalogue metal finds Richborough by dr. M. Lyne; close parallel at Gadebridge Park, to the north of London (UK): Neal 1974, 129: 36; known on Dutch sites: cf. Nicolay 2007, buckle B-variant: Pl. 40: 211.28 (dated to period 3: *c.* AD 120 – 250/300); Neupotz (G): Künzl 1993, J 102 (context of late 3rd century AD); Pfünz (G), fort and Saalburg (G), fort: Oldenstein 1976, Taf. 75: 993-994; Zugmantel (G), fort: Jacobi 1930, Taf. 11, 18, Taf. 12, 21; Jacobi 1909, Taf. XII, 94
Dating (as accepted in literature): late 2nd – 4th century AD
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 4.1; width: 3.4

CA.B003 buckle
Find type: D-shaped buckle, buckle with semi-circular loop Simpson 1976 Group II
Description: small, simple, D-shaped buckle
Dating (as accepted in literature): late Roman
(Fort) level of find context: **5+post**
Count: 1 (complete)
Dimensions in cm: length: 2.7; width: 1.7

CA.B004 buckle
Find type: ring-buckle, decorated
Description: annular buckle decorated with series of transversal lines, with hole for the pin and at the other sides semi-circular cut-outs in-between the grooves, decorative but of which one served as attachment point? (the flat underside prefers an identification as a buckle, rather than a brooch)
References to parallels: no parallels found in literature; possibly part of ring-buckle with trapezoid joining plate, a rare buckle type of which examples are known in former Czechoslovakia, Low Austria, Yugoslavia, Upper Italy, Germany, with the most western find at Ghlin-Lèz-Mons (B) (see Nowothnig 1970, 139-142)
Dating (as accepted in literature): late 3rd – early 4th century AD
(Fort) level of find context: **5+post**
Count: 1 (complete, only pin is missing)
Dimensions in cm: width: 0.6; diameter: 4.7 (exterior diameter)

CA.B005 buckle and buckle plate
Find type: belt-buckle type Simpson 1976 Group I (with concave B-shaped buckle-loop and rectangular buckle-plate); very stylized version of buckle Sommer 1984 Sorte 1, Form C, Typ e (buckle with four animal-heads and with rectangular plate); with local imitation of buckle plate?: the decoration on the buckle plate seems to imitate the chip-carved decoration
Description: concave buckle-loop, slightly squeezed in the centre, with stylized animal heads on either side of tongue rest and flat back with rectangular buckle-plate folded double around loop, fixed with two rivets (missing); front decorated with leaf decoration in the centre between the ribs and series of three grooves on the margins; small buckle and plate, intended for a narrow belt
References to parallels: comparable type of buckle found at Oudenburg, graveyard A, grave 101 (but with only two confronted, very stylized animal heads): Mertens and Van Impe 1971, Pl. XXXIII, 1 (see also Pl. LXXXIV, 7); comparable to Simpson 1976, 194: Fig. 1: 1-4 (Group I) but the Oudenburg buckle is more sofisticated, and recalls the small belt-buckle type with four central, very stylized, animal heads described by Sommer (1984, 25) as Sorte 1, Form C, Typ e (with four animal heads, confronting per two; with a distribution in *Gallia* and *Britannia*) and by Böhme 1974, 66 (dated to the second half of the 4th century AD) (see Texttafel A on p. 80) (date confirmed by Simpson 1976); the buckle may be a more stylized version of the buckle with confronted dolphins, cf. the find at Richborough (UK), fort: Lyne 1999a, 107: 4 (cast buckle of Chadwick Hawkes and Dunning (1964) type IA, but intended for a wide cingulum); the incised leaf-decoration of the buckle-plate recalls, and may be an imitation of, the notched leaf-decoration (chip carving) common on late Roman belt plates (see *e.g.* the belt plate from grave 3 of the late Roman military graveyard A at Oudenburg (Mertens and Van Impe 1971, Pl. II, 1a, 4a) and a belt plate at Monceau-le-Neuf (F) (Böhme 1974, Taf. 129: 3)) and is a very close parallel with a belt plate from Tamuda (Marocco): see Sommer 1984, Taf. 4: 5
Dating (as accepted in literature): second half 4th century AD
(Fort) level of find context: **unstratified**
Count: 1 (complete)
Dimensions in cm: length: 4.9 (total length); 1.5 (buckle); width: 2.4 (buckle plate); 3.4 (buckle)

CA.B006 buckle plate
Find type: rectangular buckle plate Simpson 1976 Group I
Description: buckle plate terminal, doubled over, with two terminals, of a rectangular plate with repoussé dot decoration
References to parallels: cf. Richborough (UK), fort: Lyne 1999, 109: 38 (from context post *c.* AD 400), see also Cunliffe 1968, Pl. XXXV: 107, with references to narrower plates from Stockstadt (G) and Colchester (UK); same type as the buckle plates found at Oudenburg, graveyard A, graves 57, 68 and 104: Mertens and Van Impe 1971, Pl. XVII, 4, Pl. XXV, 1, Pl. XXXIV, 1, with

close similarities with the buckle plate from grave 57 (which was accompanied by a cross-bow brooch type Keller 2b-3b, dated to 300-410) (grave 104 also contained a cross-bow brooch, type Keller 3b-4a, dated to 325-410); Krefeld-Gellep (G), grave 1106 probably dated to Stufe I: Pirling 1966, Taf. 90: 7
Dating (as accepted in literature): the buckle plate from grave 57 at Oudenburg was found together with a crossbow brooch Keller 2b-3b, dated to AD 300-410; the buckle plate from grave 104 can be dated to AD 325-410 based on the accompanying crossbow brooch Keller 3b-4a
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 2.3; width: 2.7

CA.B007 buckle
Find type: oval frame buckle
Description: rounded D-shaped buckle with thickened frame
References to parallels: generally interpreted as a Merovingian type of buckle: cf. Deckers 2017, similar buckle found through metal detection at Varsenare (west of Bruges)(B)(Deckers 2017, 99: no. 135); cf. Wasperton (UK): similar buckle found in inhumation grave 2 of the cemetery, period 5 (later 6th century) (Carver *et al.* 2009, 145); Krefeld-Gellep (G.): identical buckle found in horse burial 2724 which intersected grave 2722 and which is dated to Stufe III or IV (6th century) (Pirling *et al.* 1979, Taf. 64: 7); cf. Halmyris (*Moesia Inferior/Scythia*): similar buckle found as stray find at civil settlement (Nuțu 2011, 192: Pl. 3, 24), with references to parallels for this type at Novae, Salona, Ravenna, Aquis and Sadovec. Except for the latter, they were all dated in the 6th century. The buckle at Sadovec (BG) could be dated to the early 5th century (Nuțu 2011, 183); several such buckles found in today's Bulgaria and listed by Traykova (2017: Taf. 97, 98, 99) and all dated mid 5th – 6th century AD
Dating (as accepted in literature): 5th-6th century
(Fort) level of find context: **unstratified**
Count: 1 (complete)
Dimensions in cm: length: 2.9; width: 1.9

CA.B008 buckle plate?
Description: possibly half of hexagonal plate with central hole, chip-carved and richly decorated with volute design with blue glass inlay (only locally preserved), but badly preserved
References to parallels: no parallels found, but the form and the rich decoration suggest this might have been a buckle plate. The volute decoration recalls the richly decorated chip-carved belt plate of grave 3 at graveyard A, showing a leaf and volute design; the late date of the belt plate of grave 3 (late 4th-?early 5th century) however tends to consider another identification for the item here in question (found at fort level 4)
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 9.9; thickness: 0.3

CA.B009 strap-end
Find type: hinged amphora strap-end Simpson 1976 type b (with ring-and-dot ornament: in some cases this motif takes the form of concentric lines around a hole pierced through the centre of the strap-end's body, as it is the case with the Oudenburg find), Sommer 1984 Form B Typ a
Description: amphora-shaped strap-end, top part broken off, only start of handle-shaped part still visible, with slightly knobbed terminal and central hole through the strap-end's body
References to parallels: cf. Richborough (UK): Bushe-Fox 1928, Pl. XXI, 47, Bushe-Fox 1949, Pl. XXXVI: 113 (see also Lyne 1999, 109: 49, from context *c.* AD 350)
Dating (as accepted in literature): according to Keller (1971) *c.* AD 350-390 on continental sites
(Fort) level of find context: **5+post**
Count: 1 (not complete)
Dimensions in cm: length: 4.1; width: 2.3; thickness: 0.1

CA.B010 strap-end
Find type: amphora-shaped strap-end?
Description: part of a possible strap-end: pear-shaped, possibly amphora-shaped body with start of arms and two round perforations through the body
(Fort) level of find context: **5+post**
Count: 1 (not complete)
Dimensions in cm: length: 4.7; width: 2.4; thickness: 0.1

CA.B011 strap-end
Find type: amphora-shaped strap-end rivetted to strap, Simpson 1976 type b, Sommer 1984 Form B Typ a (with arms cut through pelta-shaped)
Description: very fine version of an amphora-shaped strap-end, with two copper-alloy rivets in the top strip which is split to receive the leather of the belt; the series of pinched-in dots may have contained enamel (no parallells for the latter known)
References to parallels: Simpson (1976) listed all amphora-shaped strap-ends type b found until then: finds in Austria, Belgium (Tongeren), Britain, France, Germany, Hungary, Jugoslavia, Morocco, Switzerland; Sommer (1984, 50) confirms a distribution from England to Bulgaria, but also in North Africa and North Italy; cf. Richborough (UK): Bushe-Fox 1928, Pl. XXI: 46, 47, 49, Lyne 1999, 109: 46 (for the pinched-in-dots: cf. strap-end Lyne 1999, 109: 53); Lankhills (UK): Clarke 1979, 280-281: 26, 489: found in grave 23 and grave 366 of the Roman cemetery of Lankhills, respectively dated to 350-380 AD and 370-410 AD
Dating (as accepted in literature): *c.* AD 350-390 according to Keller (1971, 65-66)
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 7.4; width: 3.0; thickness: 0.6

CA.B012 brooch
Find type: crossbow brooch Van Thienen 2016 type 0; Riha 1979 type 6.4.3; van Buchem 1941 type I-II; Ettlinger 1973 type 56; Hull (Bayley and Butcher 2004) type T190-191A; Jobst 1975 type 25; Böhme 1972 type 28; Heeren & van der Feijst (2017) type 67b 'brooch with tubular hinge and arched bow, so-called brooch with long hinge-arms'
Description: early type of crossbow brooch with slim rectangular foot with elevated base and rear with slopes, slim bow, round arms with finished edges, cylindrical elongated bow knob, no arm knobs

Dating (as accepted in literature): prior to AD 280 (Van Thienen 2016); according to Heeren & van der Feijst 2017: *c.* AD 240 – 280/300
(Fort) level of find context: **4**
Count: 1 (almost complete, needle missing, left arm and arm knobs missing)
Dimensions in cm: length: 7.1; width: 2.6; thickness: 3.1 (height)

CA.B013 brooch
Find type: crossbow brooch Van Thienen 2016 type 0; Riha 1979 type 6.4.2; van Buchem 1941 type I-II; Ettlinger 1973 type 56; Hull (Bayley and Butcher 2004) type T190-191A; Jobst 1975 type 25; Böhme 1972 type 28; Heeren & van der Feijst (2017) type 67b 'brooch with tubular hinge and arched bow, so-called brooch with long hinge-arms'
Description: early type of crossbow brooch with slim rectangular foot, slim bow, rounded pentagonal arms, cylindrical elongated bow knob, no arm knobs
Dating (as accepted in literature): prior to AD 280 (Van Thienen 2016); according to Heeren & van der Feijst 2017: *c.* AD 240 – 280/300
(Fort) level of find context: **4**
Count: 1 (almost complete, needle missing, badly preserved, arm knobs broken off)
Dimensions in cm: length: 5.9; width: 3.7; thickness: 2.6 (height)

CA.B014 brooch
Find type: crossbow brooch Van Thienen 2016 type 0; Riha 1979 type 6.4.3; van Buchem 1941 type I-II; Ettlinger 1973 type 56; Hull (Bayley and Butcher 2004) T190-191A; Jobst 1975 type 25; Böhme 1972 type 28; Heeren & van der Feijst (2017) type 67a1 'brooch with tubular hinge and arched bow, so-called brooch with long hinge-arms' (variant with bow ridge)
Description: early type of crossbow brooch, with minimal knob on the bow top, broken off at presumed bow ridge; with small strip of copper alloy underneath the top as reparation or consolidation
Dating (as accepted in literature): prior to AD 280 (Van Thienen 2016); according to Heeren & van der Feijst 2017: *c.* AD 240 – 280/300
(Fort) level of find context: **4**
Count: 1 (not complete, right arm, foot, arm knobs and needle broken off)
Dimensions in cm: length: 4.1; width: 3.3; thickness: 2.5 (height)

CA.B015 brooch
Find type: crossbow brooch Van Thienen 2016 type 0; Riha 1979 type 6.4.2; van Buchem 1941 type I-II; Ettlinger 1973 type 56; Hull (Bayley and Butcher 2004) type T190-191A; Jobst 1975 type 25; Böhme 1972 type 28; Heeren & van der Feijst (2017) type 67b 'brooch with tubular hinge and arched bow, so-called brooch with long hinge-arms'
Description: early type of crossbow brooch, with slim bow with intermissive base and rear, rounded pentagonal arms, flat elongated bow knob, no arm knobs
Dating (as accepted in literature): prior to AD 280 (Van Thienen 2016); according to Heeren & van der Feijst 2017: *c.* AD 240 – 280/300
(Fort) level of find context: **4+5**
Count: 1 (not complete, needle, arms and foot broken off)
Dimensions in cm: length: 4.8; width: 2.8; thickness: 2.5 (height)

CA.B016 brooch
Find type: crossbow brooch Van Thienen 2016 type 0; Riha 1979 type 6.4.4; van Buchem 1941 type I-II; Ettlinger 1973 type 56; Hull (Bayley and Butcher 2004) type T190-191A; Jobst 1975 type 25; Böhme 1972 type 28; Heeren & van der Feijst (2017) type 67b 'brooch with tubular hinge and arched bow, so-called brooch with long hinge-arms'
Description: early type of crossbow brooch, with slim bow with protruding base, rounded pentagonal arms, flat elongated bow knob, no arm knobs
Dating (as accepted in literature): prior to AD 280 (Van Thienen 2016); according to Heeren & van der Feijst 2017: *c.* AD 240 – 280/300
(Fort) level of find context: **5+post**
Count: 1 (fragment, foot, right arm, knobs and needle broken off)
Dimensions in cm: length: 4.1; width: 2.3; thickness: 3.2 (height)

CA.B017 brooch
Find type: crossbow brooch Van Thienen 2016 type 0; Riha 1979 type 6.4.2; van Buchem 1941 type I-II; Ettlinger 1973 type 56; Hull (Bayley and Butcher 2004) type T190-191A; Jobst 1975 type 25; Böhme 1972 type 28; Heeren & van der Feijst (2017) type 67b 'brooch with tubular hinge and arched bow, so-called brooch with long hinge-arms'
Description: early type of crossbow brooch, with slim rectangular foot, slim bow, round arms, flat elongated bow knob, no arm knobs
Dating (as accepted in literature): prior to AD 280 (Van Thienen 2016); according to Heeren & van der Feijst 2017: *c.* AD 240 – 280/300
(Fort) level of find context: **post**
Count: 1 (almost complete, needle and right arm broken off)
Dimensions in cm: length: 6.4; width: 2.1; thickness: 2.8 (height)

CA.B018 brooch
Find type: crossbow brooch Van Thienen 2016 type 0; Riha 1979 type 6.4.3; van Buchem 1941 type I-II; Ettlinger 1973 type 56; Hull (Bayley and Butcher 2004) T190-191A; Jobst 1975 type 25; Böhme 1972 type 28; Heeren & van der Feijst (2017) type 67b 'brooch with tubular hinge and arched bow, so-called brooch with long hinge-arms'
Description: early type of crossbow brooch, with slim bow with intermissive base, round arms, flat elongated bow knob, no arm knobs
Dating (as accepted in literature): prior to AD 280 (Van Thienen 2016); according to Heeren & van der Feijst 2017: *c.* AD 240 – 280/300
(Fort) level of find context: **4**
Count: 1 (fragment, only head and part of bow, but arm knobs broken off)
Dimensions in cm: length: 2.5; width: 3.6; thickness: 2.6

CA.B019 brooch
Find type: crossbow brooch Van Thienen 2016 type 0; Riha 1979 type 6.4.3; van Buchem 1941 type I-II; Ettlinger 1973 type 56; Hull (Bayley and Butcher 2004) T190-191A; Jobst 1975 type 25; Böhme 1972 type 28; Heeren & van der Feijst (2017) type 67b 'brooch with tubular hinge and arched bow, so-called brooch with long hinge-arms'
Description: two parts of the same early type crossbow brooch, with slim rectangular foot with elevated base and rear with slopes, slim bow with intermissive rear, round hexagonal arms, cylindrical elongated bow knob, no arm knobs
Dating (as accepted in literature): prior to AD 280 (Van Thienen 2016); according to Heeren & van der Feijst 2017: *c.* AD 240 – 280/300
(Fort) level of find context: **5**
Count: 1 (not complete, part of bow, right arm and needle missing)
Dimensions in cm: length: 5.8; width: 2.4; thickness: 2.6

CA.B020 brooch
Find type: crossbow brooch Van Thienen 2016 type 0; Riha 1979 type 6.4.4; van Buchem 1941 type I-II; Ettlinger 1973 type 56; Hull (Bayley and Butcher 2004) T190-191A; Jobst 1975 type 25; Böhme 1972 type 28; Heeren & van der Feijst (2017) type 67b 'brooch with tubular hinge and arched bow, so-called brooch with long hinge-arms'
Description: early type of crossbow brooch, with slim rectangular foot with elevated base and rear with slopes, slim bow with intermissive base and rear and geometrical motif, round arms, flat elongated bow knob and very small bulbous arm knobs
Dating (as accepted in literature): prior to AD 280 (Van Thienen 2016); according to Heeren & van der Feijst 2017: *c.* AD 240 – 280/300
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 7.2; width: 4.0; thickness: 2.9 (height)

CA.B021 brooch
Find type: crossbow brooch Van Thienen 2016 type 1; Swift 2000a type 1; Keller 1971 type 1B; Riha 1979 type 6.5.1; van Buchem 1941 type II-IIIa; Ettlinger 1973 type 57; Hull (Bayley and Butcher 2004) type T191B-192; Jobst 1975 type 26
Description: early type of crossbow brooch, with axe-shaped foot, with geometric decoration of transverse grooves: foot decoration von Patek 1942 no. 21, bow with longitudinal groove splitting in two towards the head, arm and bow knobs broken off; one conical arm knob preserved separately
Dating (as accepted in literature): AD 280-320
(Fort) level of find context: **5+post**
Count: 1 (almost complete, needle missing, only one (loose) arm knob preserved, also bow knob is broken off)
Dimensions in cm: length: 6.1; width: 3.1; thickness: 3.0 (height)

CA.B022 brooch
Find type: crossbow brooch Van Thienen 2016 type 1; Swift 2000a type 1; Keller 1971 type 1A; Riha 1979 type 6.5.1; van Buchem 1941 type II-IIIa; Ettlinger 1973 type 57; Hull (Bayley and Butcher 2004) type T191B-192; Jobst 1975 type 26
Description: complete, early type of crossbow brooch (except for the damaged bow knob), with narrowing rectangular foot with wide base and slope motif, regular bow with geometrical motif and small cuff, hexagonal arms with mounted top, cone-shaped (bow) knob, arm knobs not preserved
Dating (as accepted in literature): AD 280-320
(Fort) level of find context: **post**
Count: 1 (complete but needle bent and bow knob broken off)
Dimensions in cm: length: 5.8; width: 5.0; thickness: 2.7 (height)

CA.B023 brooch
Find type: crossbow brooch Van Thienen 2016 type 1; Keller 1971 type 1A; Riha 1979 type 6.5.1; van Buchem 1941 type II-IIIa; Ettlinger 1973 type 57; Hull (Bayley and Butcher 2004) type T191B-192; Jobst 1975 type 26; Swift 2000a type 1
Description: early crossbow brooch with very thin bow, with hexagonal arms and eye decoration on upper and underside of arms (four eyes in total), with hexagonal knobs on arm terminals and bow top; strip of copper alloy underneath the head, probably a reparation or consolidation
Dating (as accepted in literature): AD 280-320
(Fort) level of find context: **5**
Count: 1 (fragment, part of bow, foot and needle broken off)
Dimensions in cm: length: 2.5; width: 4.7; thickness: 2.6 (height)

CA.B024 brooch
Find type: crossbow brooch Van Thienen 2016 type 2; Swift 2000a type 2i; Keller 1971 type 1B-2B; Riha 1979 type 6.5.1-6.5.2; van Buchem 1941 type II-IIIa-IV; Ettlinger 1973 type 57; Hull (Bayley and Butcher 2004) T191B-192; Jobst 1975 type 26
Description: crossbow brooch with regular bow (only partially preserved), quadrangular arms with slightly mounted top, cone- to onion-shaped arm and bow knobs
Dating (as accepted in literature): AD 300-340
(Fort) level of find context: **post**
Count: 1 (fragment, foot, part of bow and needle are missing)
Dimensions in cm: length: 3.8; width: 2.8; thickness: 2.7 (height)

CA.B025 brooch
Find type: crossbow brooch Van Thienen 2016 1B; Swift 2000a, type 2i; Keller 1971 type 1B-2B; Riha 1979 type 6.5.1-6.5.2; van Buchem 1941 type II-IIIa-IV; Ettlinger 1973 type 57; Hull (Bayley and Butcher 2004) T191B-192; Jobst 1975 type 26
Description: small crossbow brooch with onion-shaped knobs
Dating (as accepted in literature): AD 280-340
(Fort) level of find context: **post**
Count: 1 (only head with knob, one arm with knob and part of the bow preserved; the bow is bent)
Dimensions in cm: length: 2.7; width: 2.3

CA.B026 brooch
Find type: crossbow brooch Van Thienen 2016 type 2; Swift 2000a type 2iii; Keller 1971-Pröttel 1988 type 2D; Riha 1979 type 6.5.2; van Buchem 1941 type IIIb-IV; Ettlinger 1973 type 57; Hull (Bayley and Butcher 2004) type T192; Jobst 1975 type 26
Description: crossbow brooch with narrowing rectangular foot with cut trapeze motif, regular bow with pronounced leaf shaped cuff, hexagonal arms, faceted arm knobs and base with geometrical motif, bow knob not preserved

Dating (as accepted in literature): AD 335-365
(Fort) level of find context: **unstratified**
Count: 1 (almost complete, needle and bow knob missing)
Dimensions in cm: length: 7.5; width: 5.5; thickness: 3.2 (height)

CA.B027 brooch
Find type: crossbow brooch Van Thienen 2016 type 2 or 5; Swift 2000a type 5ii?; Keller 1971 type 5?; Riha 1979 type 6.5.5; van Buchem 1941 type IVb-V; Ettlinger 1973 type 57; Hull (Bayley and Butcher 2004) type T192; Jobst 1975 type 26
Description: crossbow brooch with rectangular foot (unfinished/damaged?), wide squat bow, hexagonal arms with mounted top, onion-shaped arm knobs, bow knob not preserved
Dating (as accepted in literature): AD 350-415
(Fort) level of find context: **post**
Count: 1 (nearly complete, but needle missing and part of foot broken off)
Dimensions in cm: length: 6.3; width: 4.2; thickness: 2.7 (height):

CA.B028 brooch
Find type: simple one-piece sprung brooch, too fragmentary to specify the type, but likely to be a Nauheim brooch comparable to Riha 1979 type 2.7; Böhme 1972 type 4; Ettlinger 1973 type 1; Hull (Bayley and Butcher 2004) type T10-11; Feugère 1985 type 5
Description: stretched bow part, spiral and needle of small wire brooch with strip-shaped bow with two parallel grooves
References to parallels: the Nauheim brooch has a main distribution in the south of Britain, Gaul and the Rhine provinces: see Snape 1993, 12
Dating (as accepted in literature): BC 50 – AD 100 (based on comparable typology)
(Fort) level of find context: **post**
Count: 1 (only part of bow, spiral and needle preserved)
Dimensions in cm: length: 5.3; width: 1.6; thickness: 1.0 (height)

CA.B029 brooch
Find type: eye-brooch Heeren and van der Feijst 2017 type 20, variant e (without eye decoration); belongs to the group of the Eye brooch/'Knickfibel' Riha 1979 type 2.3.2; Böhme 1972 type 5; Ettlinger 1973 type 17; Hull (Bayley and Butcher 2004) type T42; Feugère 1985 type 14b
Description: medium-sized brooch with wide bow with collar and a longitudinal ridge, the head has a wavy character
References to parallels: cf. Heeren and van der Feijst 2017, 73-75 for distribution of the Eye brooch in the Low Countries; a brooch at Tongeren (B) shows several similarities with the Oudenburg brooch: Hensen 2000, 50, no. 4; at Richborough, some of the comparable finds are also missing the characterizing eyes: Bayley and Butcher 2004, 58-59; also some brooches at Augst (Riha 1979, 68-69) and at Duisburg (G) (Bechert 1973, 16-17) are very similar
Dating (as accepted in literature): second half 1st century AD (Heeren and van der Feijst 2017, 75)
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 6.1; width: 1.8; thickness: 2.4 (height)

CA.B030 brooch
Find type: Hod Hill brooch, hinged brooch with longitudinal decoration, with similarities with Riha 1979 type 5.12.1; Böhme 1972 type 17; Ettlinger 1973 type 31; Hull (Bayley and Butcher 2004) type T60 (Hod Hill brooches); Feugère 1985 type 23a; Heeren and van der Feijst 2017 type 56d
Description: medium-sized brooch with broad bow with three parallel ribs in the middle and with upstanding edges, with perforation in the transition to the top; remarkable are the two broken off circular lugs, one centrally at the front of the head and one at the left backside of the bow (while excavating these two lugs were still preserved, but they have broken off later); an identical brooch (no. 1818) was found at Oudenburg, settlement site Belleroche (ET28), still equipped with four lugs, two at each side of the bow (Bakx, in Dysselinck *et al.* 2020, 170-171), which must also have been the case for CA.B030; according to Heeren and van der Feijst (2017, 192) these lugs were intended to attach a chain (and therefore this type of brooch was most likely worn by women)
References to parallels: exact same brooch found at Oudenburg, site Belleroche (with four lugs, two on each side of the flat bow) (Bakx, in Dysselinck *et al.* 2020, 170-171); comparable brooches were found at Han-sur-Lesse (B) (Callewaert and Gofette 2011, 23, j), Xanten (Boelicke 2002, 109-112) and Augst (CH) (Riha 1979, 137-140), but also at other sites in Switzerland (Ettlinger 1973, 97-98)
Dating (as accepted in literature): 1st – first half 2nd century AD (widest date based on the comparable typology), according to Heeren and van der Feijst (2017, 351) AD 120-180
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 4.9; width: 2.0; thickness: 1.9 (height)

CA.B031 brooch
Find type: hinged plate brooch with enamel decoration close to Heeren and van der Feijst 2017 type 57g9; Riha 1979 type 7.16; Böhme 1972 type 41e; Ettlinger 1973 type 43.2; Hull (Bayley and Butcher 2004) type T227-228; Feugère 1985 type 26c; Callewaert 2016 III.B.2
Description: small, symmetrical enamelled hinged plate brooch with three enamelled eyes: lozenge-shaped centre on the bow and two lower circular terminals, with white enamel in the lozenge with four black glass pearls and a single black glass pearl in each circle (only one preserved)
References to parallels: for comparable finds in the region: cf. Heeren and van der Feijst 2017, 154, 156 and catalogue; only one similar brooch found in literature, from a graveyard at Dillingen-Saar (G): Glansdorp 2005, 127, Taf. 65, grave 220/3a). Van Thienen (2011) suggests that this was possibly a child's brooch
Dating (as accepted in literature): according to Heeren and van der Feijst 2017, 149 mainly Flavian in date with some continuity in the 2nd century; widest dating based on the other typologies: AD 50-150; 2nd century according to Callewaert 2016 (Catalogue no. REB1413)
(Fort) level of find context: **post**
Count: 1 (almost complete)
Dimensions in cm: length: 3.5; width: 0.9; thickness: 1.3 (height)

CA.B032 brooch
Find type: hinged plate brooch with enamel decoration Heeren and van der Feijst 2017 type 57d4; Riha 1979 type 7.11.4; Böhme 1972 type 41g; Ettlinger 1973 type 43.4/5-44.2; Hull (Bayley and Butcher 2004) type T240; Feugère 1985 type 26d; Callewaert 2016 V.E.2.e
Description: symmetrical, lozenge- or leaf-shaped disc with enamel decoration, with two symmetrical axes and round projecting lugs; profiled long lug at the top and the base and two smaller projecting round lugs at the sides of which only one preserved; the enamel decoration on the lugs is not visible anymore, the enamel decoration on the disc shows two ovals with a pale enamel in between
References to parallels: cf. Heeren and van der Feijst 2017, 153, 156 and catalogue for distribution of brooches of this type in the region; a brooch with multiple similarities was found at Tongeren (B): lozenge-shaped bow, lugs at all sides, also a hollow form (see Hensen 1999, Pl. 25, 265)
Dating (as accepted in literature): according to Heeren and van der Feijst 2017 dated to AD 70-150; AD 75-175 is widest dating based on the other typologies, second half 2nd century according to Callewaert 2016 (Catalogue no. REB1415)
(Fort) level of find context: **2**
Count: 1 (nearly complete, only one satelite and the needle missing)
Dimensions in cm: length: 4.6; width: 2.3; thickness: 1.1 (height)

CA.B033 brooch
Find type: enamelled plate brooch with a two-piece spring Heeren and van der Feijst 2017 type 58f; similarities with Riha 1979 type 7.17; Böhme 1972 type 41h; Ettlinger 1973 type 44.2; Hull (Bayley and Butcher 2004) type T240; Feugère 1985 type 26d; Callewaert 2016 IV.D.1.a
Description: symmetrical enamel disc brooch with two axes; lozenge-shaped brooch with hinge system, with open centre, with six round projecting lugs on the exterior and two round projecting lugs on the interior; on the top and base corner: blue enamel triangles, with a yellow circle; orange on the four exterior corner lugs; the colour of the two middle and two interior lugs is invisible; the lozenge itself is red with yellow and green dots. The open centre is remarkable; similar forms with lugs were found, but they all have a closed centre. Van Thienen (2011) beliefs that a second level originally covered the open centre. The remaining enamel shows an uncovered edge at the inside and the two circular interior lugs possibly served as support. With a second level, this brooch fits in with the tutulus brooches with geometric form and enamel decoration
References to parallels: No exact parallels are known in the Low Countries; Heeren and van der Feijst 2017, 159 only list the Oudenburg example as type 58f; close paralllels, with filled-in centre, were found in the region between the Seine and the Marne (F) (Philippe 1999, 165, no.525) and at Augst (CH) (Riha 1979, Taf. 60). A brooch from Tongeren (B) shows similarities, but has a flat centre: Hensen 1999, 69, Pl. 25, 262
Dating (as accepted in literature): AD 100-225 (widest dating based on the dates of the close parallels), 2nd century according to Callewaert 2016 (Catalogue no. REB1414)
(Fort) level of find context: **5+post**
Count: 1 (almost complete (needle missing))
Dimensions in cm: length: 5.7; width: 3.8; thickness: 1.2 (height)

CA.B034 brooch
Find type: arched bow brooch with covered two-piece spring (with knobbed plate on upper bow) Heeren and van der Feijst 2017 type 64b; Böhme 1972 type 25h
Description: part of brooch, fragment of the central four-knobbed panel; identified based on similar, but complete brooch found at the north-east corner site of the Oudenburg fort, site Jacali (ET17) (added to illustration)
References to parallels: Cool 2004, 143 lists similar brooches in *Britannia* at Brougham, Caerleon, Corbridge, South Shields, Kirby Thore and Richborough (see Cool 2004, 143 for the references); see for Richborough also Bushe-Fox 1932, Pl. IX: 13 and Bayley and Butcher 2004, 102: no. 247 (T185); for Britain, also Cirencester and Suffolk can be added (Bayley and Butcher 2004, 102-103, 247; Hattatt 2000, 367: no. 494 and 1252); Aardenburg (NL), fort: Besuijen 2008, 117: 4.8; some comparable finds at Germany listed by Böhme 1972, but with only one or two knobs on the bow, *e.g.* Zugmantel (G): Böhme 1972, 24: no. 611
Dating (as accepted in literature): according to Heeren and van der Feijst 2017, 172 dated to AD 180-300; also Böhme 1972, 24 dates this type to the late 2nd – early 3rd century on the German limes; the Caerleon brooch was part of a deposit dated *c*. AD 220, but the Brougham brooch was found as a grave good in cremation burial 138 of the Brougham Roman cemetery, a burial of phase 2 dated *c*. AD 240-270 (Cool 2004, 142-143). Van Thienen (2011) believes this brooch type is a British product with a military connection; Heeren and van der Feijst 2017, 172 support this idea
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 2.8; thickness: 1.2

CA.B035 brooch
Find type: circular gilt brooch with central glass setting Hull (Bayley and Butcher 2004) type T270 / plate brooch with a two-piece spring and applied decoration Heeren and van der Feijst 2017 type 60a
Description: intaglio brooch filled in with blue glass paste, intaglio depicting eagle looking backwards to a circular form or possibly a laurel wreath (pers. comm. dr. K. Sas), gilt, hinge was worn below; only small part of edge broken off
References to parallels: large resemblance with brooch T270 found at Richborough (Bayley and Butcher 2004), but there the bird is depicted in the opposite direction, with the head to the left and with stretched wing, and with to the right of the head a circular form. A comparable image as of the Oudenburg brooch can be seen on a ring-intaglio at Richborough: Bushe-Fox 1949, Pl. XXXV, 89 (eagle, looking ahead, with laurel wreath). The bird motif is not unusual and the eagle has a strong (military) connotation in the Roman Empire. The bird 'looking back' is also a motif in the Merovingian culture, on dress accessories and coins (see Klein-Pfeuffer 1993, 146-151)
Dating (as accepted in literature): The British parallels are dated in the 3rd and 4th centuries AD (Bayley and Butcher 2004); Heeren and van der Feijst 2017, 165 conclude to a date AD 150-300 for the subtype 60a
(Fort) level of find context: **post**
Count: 1 (nearly complete)
Dimensions in cm: length: 2.8; width: 2.6; thickness: 1.5 (height)

CA.B036 brooch
Find type: bow brooch, type undetermined
Description: fragment of the bow with upper part of the hinge of the head, no identification possible
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 3.6; width: 1.7; thickness: 0.9 (height)

CA.B037 brooch
Find type: brooch with slightly flat and rounded cross-section of the bow, presumably the type with spring with four coils and internal chord and foot with knob, Heeren and van der Feijst 2017 type 47b; Almgren 1897 type 16; Böhme 1972 type 15; Hull (Bayley and Butcher 2004) type T10-11
Description: flat bow, rectangular-sectioned, with central longitudinal line
References to parallels: Heeren and van der Feijst (2017, 130, 385: Fig. 8,17) demonstrate that subtype 47b is particularly well-represented at Belgian sites
Dating (as accepted in literature): 2nd century AD (Heeren and van der Feijst 2017, 129-130)
(Fort) level of find context: **4**
Count: 1 (fragment, only bow preserved)
Dimensions in cm: length: 4.4; thickness: 1.7

CA.B038 brooch
Find type: crossbow brooch?, type undetermined
Description: fragment of the transition bow – head, arms broken off, possibly from an early crossbow brooch but not certain
(Fort) level of find context: **3+4**
Count: 1 (fragment)
Dimensions in cm: length: 1.8; width: 1.6; thickness: 2.1 (height)

CA.B039 brooch
Find type: annular brooch
Description: simple annular brooch with corroded pin; based on size and section, an identification as brooch has been favoured here over a buckle, although the latter cannot be excluded as possibility
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: width: 0.5; diameter: 3.1 (exterior diameter)

CA.B040 brooch
Find type: annular brooch
Description: fine, simple, annular brooch with corroded pin; based on size and fine section, an identification as brooch has been favoured here over a buckle, although the latter cannot be excluded as possibility
(Fort) level of find context: **unstratified**
Count: 1 (complete)
Dimensions in cm: width: 0.3; diameter: 2.8 (exterior diameter)

CA.B041 brooch
Find type: penannular brooch Fowler 1960 type A3 with rounded bulbous terminals, Hull (Bayley and Butcher 2004) type P6
Description: penannular brooch with small knob terminals, pin not preserved, in bad condition
Dating (as accepted in literature): 1st-4th century AD (Fowler 1960, 174)
(Fort) level of find context: **4 (end)**
Count: 1 (complete, only pin is missing)
Dimensions in cm: width: 0.4; diameter: 3.3 (exterior diameter)

CA.B042 brooch
Find type: penannular brooch Heeren and van der Feijst 2017 type 70a; Fowler 1960 type D; Riha 1979 type 8.2; Böhme 1972 type 51; Ettlinger 1973 type 51; Hull (Bayley and Butcher 2004) type P4; Feugère 1985 type 30g
Description: small circular brooch with terminals turned back over the ring and flattened, pin fixed onto the ring
References to parallels: distribution from *Britannia* to the Danube (Heeren and van der Feijst 2017, 185-186: with distribution map in the region Fig. 4.140); Heeren and van der Feijst 2017, 186 assume a connection with the late Roman army
Dating (as accepted in literature): AD 250-350 according to Heeren and van der Feijst 2017, 186
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 2.4; width: 2.6; thickness: 0.5 (height)

CA.B043 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular bow decorated with two series of crosswise lines
References to parallels: cf. Aardenburg (NL), fort: Besuijen 2008, 120-128: 4.25-4.72 (the site yielded undecorated and decorated brooches, with the same groove-decoration as at Oudenburg)
(Fort) level of find context: **2**
Count: 1 (complete)
Dimensions in cm: length: 5.7

CA.B045 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: fine wire brooch with angular bow decorated with crosswise lines (only one series visible)
References to parallels: cf. CA.B043
(Fort) level of find context: **3**
Count: 1 (nearly complete, part of pin holder broken off)
Dimensions in cm: length: 4.1

CA.B046 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular bow, no decoration visible
References to parallels: cf. CA.B043
(Fort) level of find context: **3**
Count: 1 (almost complete, only most of pin holder broken off)
Dimensions in cm: length: 4.4

CA.B047 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular bow, no decoration visible
References to parallels: cf. CA.B043
(Fort) level of find context: **3/4**
Count: 1 (complete)
Dimensions in cm: length: 4.8

CA.B048 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular bow, no decoration visible
References to parallels: cf. CA.B043
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 4.8

CA.B049 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular bow, no decoration visible
References to parallels: cf. CA.B043
(Fort) level of find context: **4**
Count: 1 (complete, only pin holder not completely preserved)
Dimensions in cm: length: 4.1

CA.B050 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular bow, no decoration visible
References to parallels: cf. CA.B043
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 4.1

CA.B051 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular bow decorated with two series of crosswise lines
References to parallels: cf. CA.B043
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 5.4

CA.B052 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular bow decorated with two series of crosswise lines
References to parallels: cf. CA.B043
(Fort) level of find context: **4**
Count: 1 (only bow and spiral preserved)
Dimensions in cm: length: 6.2

CA.B053 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: small wire brooch with angular bow decorated with crosswise lines (only one series visible)
References to parallels: cf. CA.B043
(Fort) level of find context: **4**
Count: 1 (nearly complete, only large part of pin holder broken off)
Dimensions in cm: length: 3.5

CA.B054 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular bow and bent over needle, with two series of crosswise lines on the bow
References to parallels: cf. CA.B043
(Fort) level of find context: **4**
Count: 1 (complete but point of needle broken off)
Dimensions in cm: length: 4.5

CA.B055 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular bow decorated with two series of crosswise lines
References to parallels: cf. CA.B043
(Fort) level of find context: **4**
Count: 1 (needle broken off)
Dimensions in cm: length: 4.0

CA.B056 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8

Description: wire brooch with angular bow decorated with two series of crosswise lines
References to parallels: cf. CA.B043
(Fort) level of find context: **4**
Count: 1 (needle broken off)
Dimensions in cm: length: 4.2

CA.B057 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular bow decorated with crosswise lines (two series?)
References to parallels: cf. CA.B043
(Fort) level of find context: **4**
Count: 1 (only needle broken off)
Dimensions in cm: length: 4.5

CA.B058 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular bow, no decoration visible
References to parallels: cf. CA.B043
(Fort) level of find context: **4**
Count: 1 (needle not preserved)
Dimensions in cm: length: 4.3

CA.B059 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch, only needle and spiral preserved
References to parallels: cf. CA.B043
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 4.2

CA.B060 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: small wire brooch with angular bow and large pin holder, no decoration visible, needle bent
References to parallels: cf. CA.B043
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 3.7

CA.B061 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular bow decorated with two series of crosswise lines
References to parallels: cf. CA.B043
(Fort) level of find context: **4+5**
Count: 1 (almost complete, only pin holder not completely preserved)
Dimensions in cm: length: 4.6

CA.B062 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular bow decorated with two series of crosswise lines
References to parallels: cf. CA.B043
(Fort) level of find context: **4+5**
Count: 1 (only needle and part of pin holder broken off)
Dimensions in cm: length: 5.4

CA.B063 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular bow decorated with two series of crosswise lines
References to parallels: cf. CA.B043
(Fort) level of find context: **4+5**
Count: 1 (needle broken off)
Dimensions in cm: length: 6.3

CA.B064 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular bow, no decoration visible
References to parallels: cf. CA.B043
(Fort) level of find context: **(4+)5**
Count: 1 (needle and part of spiral broken off)
Dimensions in cm: length: 7.1

CA.B065 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8

Description: wire brooch with angular bow decorated with two series of crosswise lines
References to parallels: cf. CA.B043
(Fort) level of find context: **5+post**
Count: 1 (complete, only edge of pin holder broken off)
Dimensions in cm: length: 5.2

CA.B066 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular shaped bow decorated with two series of crosswise lines
References to parallels: cf. CA.B043
(Fort) level of find context: **4+5+post**
Count: 1 (only needle missing)
Dimensions in cm: length: 5.5

CA.B067 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular bow, no decoration visible
References to parallels: cf. CA.B043
(Fort) level of find context: **4+5+post**
Count: 1 (needle and part of pin holder broken off)
Dimensions in cm: length: 4.7

CA.B044 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: small wire brooch with angular bow, slightly bent, some crosswise lines visible on the bow
References to parallels: cf. CA.B043
(Fort) level of find context: **2/3**
Count: 1 (complete)
Dimensions in cm: length: 3.3

CA.B068 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular shaped bow, no decoration visible
References to parallels: cf. CA.B043
(Fort) level of find context: **4+5+post**
Count: 1 (part of pin holder and point of needle broken off)
Dimensions in cm: length: 4.0

CA.B069 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular bow, no decoration visible
References to parallels: cf. CA.B043
(Fort) level of find context: **unstratified**
Count: 1 (complete)
Dimensions in cm: length: 5.6

CA.B070 brooch
Find type: simple one-piece sprung brooch with wire bow Böhme 1972 type 14, Almgren 1897 type 15, Hull (Bayley and Butcher 2004) type T10-11; wire brooch with a more or less angular bow and spring with three or four coils and internal chord Heeren and van der Feijst 2017 type 45a8
Description: wire brooch with angular bow, bent, no decoration visible
References to parallels: cf. CA.B043
(Fort) level of find context: **post**
Count: 1 (needle and part of spiral broken off)
Dimensions in cm: length: 6.0

CA.B/C71 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow
Description: small, start form of the semimanufacture of a wire brooch, pin holder and bow can be recognized
(Fort) level of find context: **4**
Count: 1 (fragment, future needle part broken off)
Dimensions in cm: length: 5.3

CA.B/C72 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow
Description: fragment of start form of the semimanufacture of a wire brooch, beginning of pin holder and bow can be recognized
(Fort) level of find context: **4**
Count: 1 (fragment, future needle part broken off)
Dimensions in cm: length: 5.0

CA.B/C73 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow
Description: small, start form of the semimanufacture of a wire brooch, pin holder and bow can be recognized
(Fort) level of find context: **4**
Count: 1 (fragment, future needle part broken off)
Dimensions in cm: length: 4.5

CA.B/C74 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow
Description: complete start form of the semimanufacture of a wire brooch
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 7.7

CA.B/C75 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow
Description: start form, straight, untwisted brooch, only end point is broken off
(Fort) level of find context: **post**
Count: 1 (almost complete)
Dimensions in cm: length: 7.3

CA.B/C76 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow
Description: complete small start form of an untwisted wire brooch, only point broken off
(Fort) level of find context: **unstratified**
Count: 1 (nearly complete)
Dimensions in cm: length: 5.4; width: 0.4 (pin); thickness: 0.3 (pin)

CA.B/C77 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow – untwisted product
Description: complete, straight untwisted brooch
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 8.7

CA.B/C78 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow – untwisted product
Description: complete, straight untwisted brooch
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 9.1

CA.B/C79 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow – untwisted product
Description: complete untwisted wire brooch
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 8.9

CA.B/C80 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow
Description: complete, straight, untwisted brooch
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 13.8

CA.B/C81 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow – untwisted product
Description: complete, straight, untwisted brooch, pin holder damaged
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 8.2

CA.B/C82 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow – untwisted product
Description: complete, untwisted brooch, with crack in the needle part
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 9.8

CA.B/C83 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow
Description: complete, straight, untwisted wire brooch
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 8.6; width: 0.3 (pin); thickness: 0.1 (pin)

CA.B/C84 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow – untwisted product
Description: complete, straight, untwisted wire brooch
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 10.3; width: 0.3 (pin); thickness: 0.2 (pin)

CA.B/C85 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow – untwisted product
Description: small, straight, untwisted brooch
(Fort) level of find context: **4**
Count: 1 (almost complete, end of needle broken off and pin holder damaged)
Dimensions in cm: length: 5.5

CA.B/C86 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow – untwisted product
Description: small, straight, untwisted brooch
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 7.1

CA.B/C87 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow
Description: complete, straight, untwisted wire brooch
(Fort) level of find context: **4+5+post**
Count: 1 (complete)
Dimensions in cm: length: 8.8; width: 0.3 (pin); thickness: 0.1 (pin)

CA.B/C88 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow
Description: very long, straight, untwisted brooch with thickened bow and two series of grooves on the bow, no pin holder
(Fort) level of find context: **5+post**
Count: 1 (nearly complete)
Dimensions in cm: length: 15.6

CA.B/C89 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow – untwisted product
Description: complete, straight, untwisted wire brooch
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 8.6; width: 0.3 (pin); thickness: 0.1 (pin)

CA.B/C90 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow – untwisted product
Description: small, straight, untwisted brooch
(Fort) level of find context: **4**
Count: 1 (needle part broken off)
Dimensions in cm: length: 4.2

CA.B/C91 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow – untwisted product
Description: complete untwisted wire brooch, needle part is bent
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 12.4

CA.B/C92 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow
Description: complete, untwisted brooch, needle part is bent over
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 11.8

CA.B/C93 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow – untwisted product
Description: complete, very long, untwisted wire brooch with thickened bow and two series of grooves on the bow, cf. CA.B/C88, no pin holder
(Fort) level of find context: **4+5+post**
Count: 1 (complete)
Dimensions in cm: length: 10.7; width: 0.3 (pin); thickness: 0.1 (pin)

CA.B/C94 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow – untwisted product
Description: complete, straight, untwisted brooch with thickened bow, cf. CA.B/C88, and with crack in the needle part, no pin holder
(Fort) level of find context: **post**
Count: 1 (nearly complete)
Dimensions in cm: length: 12.0 (total length)

CA.B/C95 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow
Description: long, untwisted brooch, only bow part can be distinguished, no pin holder, needle part is bent in a hook, also the point is bent over
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 10.2

CA.B/C96 brooch – brooch production waste
Find type: waste product of a simple one-piece sprung brooch with wire bow
Description: nearly complete, untwisted brooch, the needle part is curled
(Fort) level of find context: **4**
Count: 1 (nearly complete, only point of needle part is missing)
Dimensions in cm: length: 3.8

CA.B/C97 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow – failed product
Description: bow of wire brooch with stretched spiral
(Fort) level of find context: **4+5**
Count: 1 (no needle)
Dimensions in cm: length: 4.7

CA.B/C98 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow – failed product
Description: bow of brooch with misshapen and stretched spiral part, and needle of brooch with misshapen spiral
(Fort) level of find context: **4 (end)**
Count: 2 (two fragments)
Dimensions in cm: length: 4.1

CA.B/C99 brooch – brooch production waste
Find type: waste product of a simple one-piece sprung brooch with wire bow
Description: needle and part of presumed spiral, stretched and curled
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 6.5

CA.B/C100 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow – failed product
Description: part of bow and misshapen spiral of wire brooch
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 4.4

CA.B/C101 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow – failed product
Description: stretched spiral and part of needle of wire brooch
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 3.8

CA.B/C102 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow – failed product

Description: fragment of bow and misshapen spiral of wire brooch
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 2.9

CA.B/C103 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow – failed product
Description: misshapen, squeezed spiral and part of stretched bow of wire brooch
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 3.9

CA.B/C225 brooch – brooch production waste
Find type: semimanufacture for simple one-piece sprung brooch with wire bow – untwisted product
Description: complete, small, untwisted brooch; corroded onto spade IR.C61
(Fort) level of find context: **4+5**
Count: 1 (complete)
Dimensions in cm: length: 9.6

CA.B233 bracelet
Find type: general type of the open snake-like bracelet Sas 1999 type AIA3a (Sas 1999, 40-43, 54), subtype stylized animal head ends (import)
Description: rutted (pseudo twisted) bracelet with small stylized snakeshead ends; CA.B233, B234, B235 and B236 were found together, intertwisted
References to parallels: cf. Tongeren: Sas 1999, catalogue no. 341
Dating (as accepted in literature): 3rd-4th century AD (Sas 1999, 40-43)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: thickness: 0.3; diameter: 5.1-6.1

CA.B234 bracelet
Find type: general type of the open snake-like bracelet Sas 1999 type AIA3a (Sas 1999, 40-43, 54), subtype stylized animal head ends (import)
Description: rutted (pseudo twisted) bracelet with small stylized snakeshead ends; CA.B233, B234, B235 and B236 were found together, intertwisted
References to parallels: cf. CA.B233
Dating (as accepted in literature): cf. CA.B233
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: thickness: 0.4; diameter: 4.9-6.1

CA.B235 bracelet
Find type: general type of the open snake-like bracelet Sas 1999 type AIA3a (Sas 1999, 40-43, 54), subtype stylized animal head ends (import)
Description: rutted (pseudo twisted) bracelet with small stylized snakeshead ends; CA.B233, B234, B235 and B236 were found together, intertwisted
References to parallels: cf. CA.B233
Dating (as accepted in literature): cf. CA.B233
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: thickness: 0.4; diameter: 5.1 -6.6

CA.B236 bracelet
Find type: general type of the open snake-like bracelet Sas 1999 type AIA3a (Sas 1999, 40-43, 54), subtype stylized animal head ends (import)
Description: rutted (pseudo twisted) bracelet with small stylized snakeshead ends; CA.B233, B234, B235 and B236 were found together, intertwisted
References to parallels: cf. CA.B233
Dating (as accepted in literature): cf. CA.B233
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: thickness: 0.4; diameter: 5.0-6.1

CA.B237 bracelet
Find type: general type of the open snake-like bracelet Sas 1999 type AIA3a (Sas 1999, 40-43, 54)/ Allason-Jones and Miket (1984) type 6 snake head bracelet; subtype Oudenburg 1
Description: complete, open bracelet, penannular ring with flat D-shaped section with extended leaf-shaped terminals representing simple snakesheads, devolved type, marked only by lateral grooves
References to parallels: general resemblance with Snettishoam hoard type B subtype ii (Johns 1996, 45); comparable finds: cf. De Panne (B) (rural site second half 1st century – first half 3rd century AD): Sas 1999, catalogue no. 759; especially cf. Koninksem, south-west graveyard of Tongeren (B): Sas 1999, catalogue no. 713 (both the De Panne and Koninksem bracelets are also characterized by a head with longitudinal grooves); very close similarities with bracelet 2 (here in silver) of inhumation burial B291 of the eastern Roman cemetery of London, 4th century AD (Barber and Bowsher 2000, 165-166) (here the snakeshead is marked by some small carvings at the sides); also some similarities with bracelet found in inhumation grave 156 (period 1: 4th century) of the cemetery of Wasperton (UK) (Carver *et al.* 2009, 297) (here the penannular ring has pointed terminals formed into snake-like heads by the addition of eyes encircled by punched dots with similar motifs next to it, middle of ring connecting five more single patterns of single dots encircled by punched dots (Carver 2009, 297); similar to South Shields (UK) 3.243 (Allason-Jones and Miket 1984, 126): fragment of oval-sectioned bracelet with snakeshead terminals decorated with incised grooves, parallelled with bracelet at Verulamium Theatre (UK) (Wheeler and Wheeler 1936, fig. 45: 44) (late 3rd century); only one found at Vindolanda (UK), from period VII or VIII (3rd-4th century) (Birley and Green 2006)
Dating (as accepted in literature): 3rd-4th century AD for the northern provinces (Sas 1999, 40-43)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 12.4 + 7.3; width: 1.4 (head); thickness: 0.2; diameter: 7.4 – 5.5

CA.B238 bracelet
Find type: open snake-like bracelet Sas 1999 type AIA3a, subtype Oudenburg 1
Description: complete, flat bracelet (slightly curved section) with stylized snakeshead ends (ends are stuck together due to corrosion); cf. CA.B237
References to parallels: cf. CA.B237
Dating (as accepted in literature): cf. CA.B237
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 18.1; width: 0.9-1.0 (heads); thickness: 0.4; diameter: 4.9-5.8

CA.B239 bracelet
Find type: general type of the open snake-like bracelet Sas 1999 type AIA3a, subtype Oudenburg 1
Description: 1/3 of flat bracelet (slightly curved section) with stylized snakeshead end; only one end preserved
References to parallels: cf. CA.B237
Dating (as accepted in literature): cf. CA.B237
(Fort) level of find context: **3**
Count: 1 (fragment)
Dimensions in cm: length: 7.3; width: 1.2 (head); thickness: 0.3

CA.B240 bracelet
Find type: general type of the open snake-like bracelet Sas 1999 type AIA3a, subtype Oudenburg 1
Description: fragment of flat bracelet (slightly curved section) with stylized snakeshead end; only one end preserved
References to parallels: cf. CA.B237
Dating (as accepted in literature): cf. CA.B237
(Fort) level of find context: **3/4**
Count: 1 (fragment)
Dimensions in cm: length: 5.8; width: 1.2 (head); thickness: 0.2

CA.B241 bracelet
Find type: general type of the open snake-like bracelet Sas 1999 type AIA3a, subtype Oudenburg 1
Description: fragment of flat bracelet (slightly curved section) with stylized snakeshead end; only one end preserved
References to parallels: cf. CA.B237
Dating (as accepted in literature): cf. CA.B237
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 6.4; width: 1.2 (head); thickness: 0.2

CA.B242 bracelet
Find type: general type of the open snake-like bracelet Sas 1999 type AIA3a, subtype Oudenburg 1
Description: fragment of flat bracelet with stylized snakeshead end
References to parallels: cf. CA.B237
Dating (as accepted in literature): cf. CA.B237
(Fort) level of find context: **4**
Count: 1 (fragment, badly preserved)
Dimensions in cm: length: 6.2; width: 0.9 (head); thickness: 0.3

CA.B243 bracelet
Find type: general type of the open snake-like bracelet Sas 1999 type AIA3a, subtype Oudenburg 1
Description: fragment of flat bracelet (slightly curved section) with stylized snakeshead end; only one end preserved
References to parallels: cf. CA.B237
Dating (as accepted in literature): cf. CA.B237
(Fort) level of find context: **4+5**
Count: 1 (fragment, badly preserved)
Dimensions in cm: length: 3.9; width: 1.4 (head); thickness: 0.4

CA.B244 bracelet
Find type: general type of the open snake-like bracelet Sas 1999 type AIA3a, subtype Oudenburg 1
Description: fragment of flat bracelet (slightly curved section) with stylized snakeshead end; only one end preserved
References to parallels: cf. CA.B237
Dating (as accepted in literature): cf. CA.B237
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: length: 4.9; width: 1.2 (head); thickness: 0.3

CA.B245 bracelet
Find type: general type of the open snake-like bracelet Sas 1999 type AIA3a, subtype Oudenburg 1
Description: fragment of flat bracelet (slightly curved section) with stylized snakeshead end; only one end preserved
References to parallels: cf. CA.B237
Dating (as accepted in literature): cf. CA.B237
(Fort) level of find context: **unstratified**
Count: 1 (fragment)
Dimensions in cm: length: 5.7; width: 1.3 (head); thickness: 0.3

CA.B246 bracelet
Find type: general type of the open snake-like bracelet Sas 1999 type AIA3a, subtype Oudenburg 1
Description: fragment of flat bracelet (slightly curved section) with stylized snakeshead ends; only one terminal preserved
References to parallels: cf. CA.B237
Dating (as accepted in literature): cf. CA.B237
(Fort) level of find context: **unstratified**
Count: 1 (fragment)
Dimensions in cm: length: 7.1; width: 1.0 (head); thickness: 0.1; diameter: min. 5.1 (when terminals touching each other)

CA.B247 bracelet
Find type: general type of the open snake-like bracelet Sas 1999 type AIA3a, subtype Oudenburg 1
Description: fragment of flat bracelet (slightly curved section) with stylized snakeshead end; only one end preserved; badly preserved
References to parallels: cf. CA.B237
Dating (as accepted in literature): cf. CA.B237
(Fort) level of find context: **unstratified**
Count: 1 (fragment)
Dimensions in cm: length: 4.7; width: 1.2 (head); thickness: 0.2

CA.B/C249 bracelet / bracelet production waste
Find type: open snake-like bracelet Sas 1999 type AIA3a, subtype Oudenburg 1 – semifinished product/failed product
Description: unbent flat bracelet (slightly curved section) with stylised snakeshead end marked by slight longitudinal grooves; strip cut half-way where the strip already narrows slightly (product not finished because of fault in beating process?); possible that the decoration was not finished yet and that details still needed to be executed
References to parallels: cf. CA.B237
Dating (as accepted in literature): cf. CA.B237
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 10.1; width: 1.3 (head); thickness: 0.2

CA.B/C250 bracelet / bracelet production waste
Find type: open snake-like bracelet Sas 1999 type AIA3a, subtype Oudenburg 1 – semifinished product/failed product
Description: complete untwisted flat bracelet (slightly curved section) with stylized snakeshead ends cf. CA.B237
References to parallels: cf. CA.B237
Dating (as accepted in literature): cf. CA.B237
(Fort) level of find context: **5(+4)**
Count: 1 (complete but fragmented)
Dimensions in cm: length: 20.0; width: 1.2-1.3 (head); thickness: 0.2; diameter: min. 6.4 (with terminals touching each other)

CA.B/C251 bracelet / bracelet production waste
Find type: open snake-like bracelet Sas 1999 type AIA3a, subtype Oudenburg 2 – semifinished product/failed product
Description: fragment of unbent flat bracelet (slightly curved section) with stylized snakeshead end, refined version (same type and form as Oudenburg 1 but with more complex groove decoration); with crack at the side of the cut end
References to parallels: cf. CA.B237
Dating (as accepted in literature): cf. CA.B237
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 9.9; width: 1.4 (head); thickness: 0.3

CA.B/C252 bracelet / bracelet production waste?
Find type: open snake-like bracelet Sas 1999 type AIA3a, subtype Oudenburg 1 – semifinished product/failed product
Description: flat bracelet (slightly curved section) with stylized snakeshead ends; only one end preserved, completely bent over, failed product
References to parallels: cf. CA.B237
Dating (as accepted in literature): cf. CA.B237
(Fort) level of find context: **unstratified**
Count: 1 (fragment)
Dimensions in cm: length: 7.3; width: 1.2 (head); thickness: 0.2

CA.B/C253 bracelet / bracelet production waste?
Find type: open snake-like bracelet Sas 1999 type AIA3a, subtype Oudenburg 1 – semifinished product/failed product
Description: fragment of flat bracelet (slightly curved section) with stylized snakeshead ends, slightly bent at broken off end (failed product); CA.B/C253 and B/C254 were found together
References to parallels: cf. CA.B237
Dating (as accepted in literature): cf. CA.B237
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 8.3; width: 1.2; thickness: 0.3

CA.B/C254 bracelet / bracelet production waste?
Find type: open snake-like bracelet Sas 1999 type AIA3a, subtype Oudenburg 1 – semifinished product/failed product
Description: fragment of flat bracelet (slightly curved section) with stylized snakeshead ends, bent at broken off end (failed product); ; CA.B/C253 and B/C254 were found together
References to parallels: cf. CA.B237
Dating (as accepted in literature): cf. CA.B237
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 9.1; width: 1.3; thickness: 0.2

CA.B255 bracelet
Find type: simple bracelet type Sas AIA1a (Sas 1999, 31-33)
Description: complete, fine, open bracelet with round section and smooth surface, with rounded ends; slightly bent
Dating (as accepted in literature): AD 1st-4th century (Sas 1999, 32)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 17.0; thickness: 0.1/0.3; diameter: min. 5.4 (when terminals are touching each other)

CA.B256 bracelet
Find type: simple bracelet type Sas AIA1a (Sas 1999, 31-33)
Description: fine, open bracelet with round section and smooth surface, with rounded ends; stretched
Dating (as accepted in literature): AD 1st-4th century (Sas 1999, 32)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 16.9; thickness: 0.2/0.3; diameter: min 5.4

CA.B257 bracelet
Find type: simple bracelet type Sas AIA1a (Sas 1999, 31-33)
Description: part of fine, open bracelet with flat rounded section and smooth surface, with rounded ends (one end preserved, other end broken off)
Dating (as accepted in literature): AD 1st-4th century (Sas 1999, 32)
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 6.5; width: 0.4; thickness: 0.3

CA.B258 bracelet
Find type: type undetermined
Description: possibly fragment of bracelet: fine, smooth, probably open, bracelet with grooved piece at narrower part; half of bracelet preserved, broken off next to the grooved part, possibly where the hook-eye fastener can be expected
(Fort) level of find context: **4**
Count: 1 (not complete, *c.* half preserved)
Dimensions in cm: length: 7.0; thickness: 0.2

CA.B259 bracelet
Find type: simple bracelet type Sas AIA1a (Sas 1999, 31-33)
Description: fine, open bracelet with flat rounded section and smooth surface, with rounded ends (one end preserved, other end broken off)
Dating (as accepted in literature): AD 1st-4th century (Sas 1999, 32)
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 10.1; width: 0.4; thickness: 0.2

CA.B260 bracelet?
Find type: bracelet type undetermined
Description: fragment of bracelet with small round section and smooth surface, widening to thick end
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 7.5 (total length)

CA.B261 bracelet
Find type: flat bracelet type AIIIA2a (Sas 1999, 79-81, 88)
Description: part of very fine flat bracelet with fine zigzag notched edge
References to parallels: very popular in *Britannia*, Rhineland and *Pannonia* (Sas 1999, 175 with references)
Dating (as accepted in literature): the zigzag notched decoration is common in second half 3rd – 4th C (Sas 1999, 174-175 and references listed)
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 10.3; width: 0.2; thickness: 0.1

CA.B262 bracelet
Find type: open, grooved strip-bracelet type Sas AIIA1b (Sas 1999, 61-65, 69); type Clarke 1979 D1a,b,c-E1a,b,c with hook-and-eye fastening
Description: very badly preserved, deteriorated, flat bracelet with vague traces of grooved decoration (longitudinal median groove and transverse grooves), with possibly start of hook of fastener; partly stretched
References to parallels: cf. CA.B263
Dating (as accepted in literature): cf. CA.B263
(Fort) level of find context: **5**
Count: 1 (fragment, badly preserved)
Dimensions in cm: length: 5.9; width: 0.3; thickness: 0.1

CA.B263 bracelet
Find type: open, grooved strip-bracelet type Sas AIIA1b (Sas 1999, 61-65, 69); type Clarke 1979 D1a,b,c-E1a,b,c with hook-and-eye fastening
Description: open, grooved strip-bracelet with flat rounded section, with transverse grooves and a thickening just above the fastening, type with vertical, feathered and zigzag grooved decoration, with curved hook end, part of fastener (only this end preserved)
References to parallels: common find on the Continent along the Rhine limes and in *Britannia* (Sas 1999, 62 with references); found in graves 139 (AD 350-370 AD) and 326 (AD 350-380) at the Lankhills cemetery (Clarke 1979)
Dating (as accepted in literature): AD 275-400 (Sas 1999, 63)
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 5.8; width: 0.6; thickness: 0.3

CA.B264 bracelet
Find type: two-strand cable-bracelet type Clarke 1979 A1a
Description: part of two-wire twisted bracelet, with stretched end parts; normally with two-hook fastening, each hook formed by one strand bent over and the other wound around, not preserved
References to parallels: cf. CA.B266
Dating (as accepted in literature): cf. CA.B266
(Fort) level of find context: **3**
Count: 1 (fragment)
Dimensions in cm: length: 5.8; thickness: 0.2

CA.B265 bracelet
Find type: twisted cable bracelet with multiple wires: three-strand cable bracelet (with hook-eye fastener) type Sas AIIB3a (Sas 1999, 71-75), type Clarke 1979 A2a
Description: part of a very fine, three-wire twisted bracelet, probably with hook-eye fastener (not preserved)
References to parallels: type found at the Lankhills cemetery, Winchester (UK), in graves 100 (AD 330-370), 122, 139, 183, 256, 323 (all dated AD 350-370), 155 (AD 310-330/70) and 310 (AD 310-370) (Clarke 1979); common type in 4th-century Belgium: several parallels listed by Sas 1999, 73-74, with the best dated finds found at the late Roman graveyards of Tournai, Tongeren-Koninksem and Oudenburg, all second half 4th century; widespread type appearing along the Danube and Rhine Limes all the way to Britain (Swift 2000a, 124, Fig. 145) with a slight clustering in *Raetia* and *Germania* (Sas 2004, 359)
Dating (as accepted in literature): second half 4th century AD (Sas 1999, 71-75)
(Fort) level of find context: **5**
Count: 1 (not complete)
Dimensions in cm: length: 13.3; thickness: 0.2

CA.B266 bracelet
Find type: two-strand cable-bracelet type Clarke 1979 A1a
Description: fragment of two-wire twisted bracelet, with start of eye of fastener
References to parallels: type found at graves 117, 139 and 168 of the Roman cemetery of Lankhills, all dated AD 350-370 (Clarke 1979); twisted copper alloy bracelets appear in Vindolanda in 2nd-, 3rd- and 4th-century levels (Birley and Green 2006, 142)
Dating (as accepted in literature): 2nd-4th centuries
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 3.4; thickness: 0.3/0.4

CA.B267 bracelet
Find type: simple bracelet type Sas AIA1a (Sas 1999, 31-33), thick version
Description: nearly half of bracelet with round section and smooth surface
Dating (as accepted in literature): AD 1st-4th centuries (Sas 1999, 32)
(Fort) level of find context: **5+post**
Count: 1 (not complete, nearly half)
Dimensions in cm: length: 7.8; width: 0.7; thickness: 0.5; diameter: 4.7

CA.B270 finger ring
Find type: finger ring type Sas RIIB2d (Sas 1999, 200-201, 203-207); Guiraud 1989 type 2d (Guiraud 1989, 181); Vindolanda type I (Birley and Green 2006, 117-131)
Description: wide finger ring with a decorative setting, with space for inlay or intaglio, probably a gem of glass paste, not completely preserved
References to parallels: cf. Lullingstone (UK), Roman villa, late 2nd-century level: Meates 1997, 71: 118, fig. 28; Winchester (UK): Rees *et al.* 2008, 59: 248 (of iron, from late 1st- to 2nd- century cremation grave), 249 (of bronze, from posthole of likely early to mid-3rd-century building); South Shields (UK): Allason-Jones and Miket 1984, 123-124: 3.184, 3.186, 3.187; Vindolanda (UK): Birley and Green 2006, 117-131
Dating (as accepted in literature): universal type of 2nd – beginning 3rd century AD (see Sas 1999, 200-201 for our region)
(Fort) level of find context: **1-3**
Count: 1 (fragment broken off)
Dimensions in cm: diameter: 1.4

CA.B271 finger ring
Find type: finger ring likely recycled from bracelet type AIIIA2a (Sas 1999, 79-81, 88)
Description: fine finger ring with rectangular cross-section with zigzag notched technique, likely made of fragment of bracelet, terminals are overlapping forming the upper side of the ring
References to parallels: the zigzag notched ring was a very popular type in *Britannia*, Rhineland and *Pannonia* (Sas 1999, 175); see also finger ring found at the Oudenburg graveyard A, grave 67 (Mertens and Van Impe 1971, Pl. XXI)
Dating (as accepted in literature): the zigzag notched decoration is common in second half 3rd – 4th century (Sas 1999, 174-175, with references listed)
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: diameter: 1.5

CA.B272 finger ring
Find type: finger ring Sas type RIIB4b (Sas 1999, 217-218); Guiraud 1989 type 4c (Guiraud 1989, 188); Riha 1990 type 2.1.8 (Riha 1990, 32)
Description: fragment of finger ring with deteriorated (burnt?) seperated glas bezel with two globules at each side of the base of the bezel
References to parallels: cf. Oudenburg graveyard A, grave 191, AD 388+ (Mertens and Van Impe 1971, Pl. LIX: 9); Tongeren (B), graveyard 2nd-4th century; Virton, military structure (4th-early 5th century), Spontin (B), graveyard (last quarter 4th – first quarter 5th century), Suarlée (B), graveyard (early 5th century): all these Belgian sites are listed by Sas 1999 (with references)
Dating (as accepted in literature): mainly 4th century (Sas 1999, 217-218)
(Fort) level of find context: **unstratified**
Count: 1 (fragment)
Dimensions in cm: diameter: 3.0

CA.B273 finger ring
Find type: finger ring type Clarke (1979) B1b (Clarke 1979, 319)
Description: complete finger ring with three well-defined projections
References to parallels: parallels found in grave 336 (AD 350-370), grave 326 (AD 350-380), grave 438 (AD 360-370/380), all in silver, and in grave 438 also one in bronze, at Lankhills cemetery, Winchester (UK): Clarke 1979, Fig. 98: 571, 567; cf. Richborough (UK): Wilson 1968, Pl. XLII: 165; no parallels known in Belgium (pers. comm. dr. K. Sas)
Dating (as accepted in literature): AD 360-370/380 according to Clarke 1979
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: diameter: 1.5

CA.B274 finger ring
Find type: finger ring type Sas RIIBA1 (Sas 1999, 183-185, 194)
Description: open finger ring with semi-rounded cross-section, with pointed terminals originally overlapping, one end broken off, simple upper side, no decoration visible
Dating (as accepted in literature): 2nd- and (mainly) 3rd- century type (Sas 1999, 183-185)
(Fort) level of find context: **post**
Count: 1 (complete but badly preserved)
Dimensions in cm: diameter: *c.* 1.5

CA.B275 finger ring – key ring / key
Find type: finger ring Guiraud 1989 type 5a; Riha 1990 type 17, Variante 1; key ring, lever lock key Guillaumet and Laude 2009, Type 1 (rotary key *e.g.* for padlock)
Description: nearly complete key ring with circle-and-dot motif on the front plate
References to parallels: cf. Augst (CH): Riha 1990, Taf. 10, 180 with references to similar key rings in the Rhineland, Avenches (F), *Gallia* and Slovenia (Riha 1990, 40-41)
Dating (as accepted in literature): 1st – 4th century AD according to Guiraud 1989, 193; according to Riha 1990, 40-41 mainly 1st half 3rd century AD
(Fort) level of find context: **3**
Count: 1 (almost complete)
Dimensions in cm: length of key: 2.3; thickness of ring: 0.3; diameter: 1.7 x 1.9

CA.B277 finger ring?
Find type: finger ring Sas type RIA1 (Sas 1999, 168-176)?
Description: simple, possible finger ring, of the closed wire type, with rectangular cross-section
(Fort) level of find context: **2**
Count: 1 (complete)
Dimensions in cm: diameter: 1.5

CA.B278 hair pin
Find type: flat circular head
Description: complete hair pin (only end point missing), with circular, wide head with central circular boss
References to parallels: no parallels found in copper alloy but known type in bone
(Fort) level of find context: **4**
Count: 1 (nearly complete)
Dimensions in cm: length: 9.5; diameter: 1.6 (head)

CA.B279 hair pin
Find type: decorated rectangular (?) head
Description: nearly complete hair pin, with semi-rectangular head (possibly not completely preserved) with the preserved side face showing a X in relief
References to parallels: the head with X in relief is comparable to the lower block of Cool 2004 Group 11 'pins with multiple block heads', but it is not certain that the head of the Oudenburg pin is complete or partly broken off
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 9.7; width: 0.6 (head); thickness: 0.4 (head)

CA.B280 hair pin
Find type: faceted cuboid head, hair pin type Cool 1990 Group 15, Crummy 1983 type 4
Description: almost complete hair pin, point broken off, with head in the form of a cube covered by diamond shaped facets, pin bent mid-way
References to parallels: cf. typologies by Cool (1990) and Crummy (1983)
Dating (as accepted in literature): found in late 3rd- and 4th- century contexts in southern Britain (Cool 1990, 164-165; Cool, in Darling and Gurney 1993, 80); at Colchester dated post AD 250 (Crummy 1983, 29)
(Fort) level of find context: **5(+4)**
Count: 1 (not complete)
Dimensions in cm: length: 7.4; width: 0.4 (head); thickness: 0.4 (head)

CA.B281 hair pin
Find type: biconical head, hair pin type Cool 1990 Group 1 ('knob heads'), sub-group E
Description: complete hair pin with biconical head, lower half of pin is bent
References to parallels: cf. southern *Britannia*: Cool 2004, 152: Fig. 1: 2, 4
Dating (as accepted in literature): in use throughout the Roman period, but very popular in the late Roman period (Cool 1990, 151-154)
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 10.5; diameter: 0.8 (head)

CA.B282 hair pin
Find type: flat circular head
Description: upper half of hair pin with flat, circular head
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 2.2

CA.B283 hair pin
Find type: oblong, oval, pointed head
Description: hair pin, end broken off, with long, slightly thickened, pointed head, with very fine, longitudinal lines
(Fort) level of find context: **5+post?**
Count: 1 (not complete)
Dimensions in cm: length: 5.3; diameter: 0.4 (head)

CA.B284 hair pin
Find type: undetermined head (Cool 2004 Group 3 ('curved units between cordon heads') or Group 6 ('button and cordon heads') or Group 7 ('human hand heads'), all with cordons at the base of the head
Description: hair pin, square-sectioned, top of head broken off, bordered by two cordons, pin bent mid-way, end broken off
References to parallels: see for references in Britain: Cool 2004
Dating (as accepted in literature): 1st to 3rd centuries (Cool in Darling and Gurney 1993, 80)
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 5.5; width: 0.4 (head); thickness: 0.4 (head)

CA.B285 hair pin?
Find type: undetermined, no head preserved
Description: long shank presumably of a hair pin
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 11.4

CA.B287 head of hair pin
Find type: rounded head, hair pin type Cool 1990 Group 1 ('knob heads')
Description: rounded head of hair pin
References to parallels: cf. *e.g.* Cool 2004, 152: Fig. 1: 3
Dating (as accepted in literature): in use throughout the Roman period, but very popular in the late Roman period (Cool 1990, 151-154)
(Fort) level of find context: **5**
Count: 1 (only part of head)
Dimensions in cm: diameter: 1.0

CA.B288 mirror
Find type: hand mirror, originally with wooden framework
Description: small round plate, slightly curved
References to parallels: cf. Krefeld-Gellep (G): Pirling and Siepen 2006, 420, Taf. 74, 6 (smaller mirror, from context of the first half of the 2nd century AD); Oberwinterthur (CH): Deschler-Erb 1996, Taf. 17, 219-221
Dating (as accepted in literature): according to Deschler-Erb 1996, 65 these framed mirrors were only in use in the 1st and 2nd century AD; however, the good preservation of the Oudenburg find suggests a longer use
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: diameter: 11.0

CA.B289 probe
Find type: scoop probe Jackson 1986 form 30, Riha 1986 Variante H?
Description: fragment of probe, rounded rectangular-sectioned with end with pointed terminal broken off and start of spoon-terminal, limited by a bulb and single moulding
References to parallels: cf. CA.B291/292
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 7.8; width: 0.2 (central); thickness: 0.2 (central)

CA.B290 probe
Find type: scoop probe Jackson 1986 form 30, Riha 1986 Variante E or H
Description: fragment of a probe, circular-sectioned, with one olivary terminal, the other terminal broken off; a small double-ring moulding is the start of the zone of the grip, behind which situates the scoop-terminal
References to parallels: cf. Augst and Kaiseraugst (CH): Riha 1986, Taf. 44, 477 or Taf. 48
(Fort) level of find context: **4?**
Count: 1 (not complete)
Dimensions in cm: length: 9.8; width: 0.3 (central)

CA.B291 probe
Find type: scoop probe Jackson 1986 form 30; Riha 1986 Variante H
Description: pin, (semi-)rectangular sectioned, both ends broken off; the head is marked by a knob bordered by a base collar, on the knob the start of the base of a spoon-shape can be distinguished
References to parallels: cf. Augst (CH): Riha 1986, Taf. 48, 526: comparable find, but the Oudenburg find shows only one thick collar underneath the knob; cf. Richborough (UK): Wilson 1968, Pl. XLIII, 173
(Fort) level of find context: **unstratified**
Count: 1 (not complete)
Dimensions in cm: length: 5.7; diameter: 0.8 (head)

CA.B292 probe
Find type: scoop probe Jackson 1986 form 30; Riha 1986 Variante H?
Description: central fragment of probe, round-sectioned, with start of spoon-terminal, limited by a bulb and single moulding
References to parallels: cf. Augst (CH): Riha 1986, Taf. 48, 522, 526; Richborough (UK), fort: Cunliffe 1968, Pl. XLIII, 173
(Fort) level of find context: **3**
Count: 1 (fragment)
Dimensions in cm: length: 4.7

CA.B293 probe
Find type: ear probe Jackson 1986 form 29
Description: tiny circular spoon of an ear probe
References to parallels: cf. Jackson 1990, 17: Fig. 4, 10
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: length: 1.05

CA.B294 tweezer
Find type: tweezer type Eckardt and Crummy 2008 'plain, flared tweezer', Riha 1986 type Variante G
Description: rectangular-sectioned tweezer with looped ending and curved blade terminals
References to parallels: *e.g.* cf. Augst and Kaiseraugst: Riha 1986
Dating (as accepted in literature): 1st – 4th century (Eckardt and Crummy 2008, 148; Riha 1986, 37)
(Fort) level of find context: **3**
Count: 1 (complete)
Dimensions in cm: length: 6.6

CA.B295 tweezer
Find type: tweezer type Eckardt and Crummy 2008 'plain, flared tweezer', Riha 1986 type Variante G (Pinzette mit ösenförmig umgebogenen Griffarmen)
Description: rectangular-sectioned tweezer with looped ending and curved blade terminals
References to parallels: cf. CA.B294
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 5.9

CA.B296 tweezer
Find type: tweezer type Eckardt and Crummy 2008 'plain, flared tweezer', Riha 1986 type Variante G
Description: rectangular-sectioned tweezer with looped ending and curved blade terminals
References to parallels: cf. CA.B294
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 6.6

CA.C01 unfinished product?
Find type: undetermined
Description: semi-conical, solid piece
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 4.5

CA.C02 unfinished product?
Find type: undetermined
Description: oblong rounded flat strip with small pedicle
(Fort) level of find context: **4**
Count: 1 (complete?)
Dimensions in cm: length: 14.3; width: 3.5; thickness: 0.5

CA.C03 bronze production waste?
Find type: undetermined
Description: solid, cylindrical piece, one end flat, other end amorphous: fragment of small copper alloy bar, piece of ingot?
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: diameter: 2.2

CA.C05 slag material
Description: long amorphous piece of slag material (melting bronze)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 10.3; width: 3.7

CA.C04 ceramic melting pot with slag material
Description: fragment of ceramic melting pot with bronze slag
(Fort) level of find context: **1**
Count: 1 (fragment)
Dimensions in cm: length: 7.3; width: 5.6

CA.C06 slag material
Description: large, long, amorphous piece of slag material
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: *c.* 10; width: 8.2

CA.C07 netting needle
Find type: standard double-pronged netting needle type
Description: two fragments of the same netting needle: central rod fragment and one fragment with terminal with fork with two teeth, forming a lozenge and touching each other at the top; identifiable as netting needle, used for the reparation of nets and/or specific weave and hand-knotted work (see Deschler-Erb 1996, 46), cf. Wild 1970, 73: he states that this kind of needle not only could be used as netting needle, but also for tablet-weaving and band-weaving
References to parallels: standard Roman netting needle type, generally in bronze, sometimes in iron, found all over the Roman Empire (see Wild 1970, 138-139, Table N for a list of bronze netting needles in *Britannia* and the German provinces); Feugère 1992, 144-145 gives an overview of the bronze and iron netting needles in *Gallia*; Oldenstein 1982 listed the netting needles found at the forts of the Upper Germanic and Rhaetian Limes (mainly 2nd and 3rd century AD); Deschler-Erb 1996, 47: Tab. 12 completed these lists for Switzerland and mentions in footnote 268 some comparable finds from elsewhere; for Aardenburg (NL), fort, Besuijen 2008 listed four netting needles (see p. 133-134: 5.21-5.24); cf. Richborough (UK), fort: Bushe-Fox 1926, Pl. XIV, 22, Cunliffe 1968, Pl. XLVII, 212
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 6.3 and 10.9

CA.C08 netting needle
Find type: standard double-pronged netting needle type
Description: part of netting needle with terminal with large lozenge-shaped fork with two teeth touching each other at the top
References to parallels: cf. CA.C07
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 8.9

CA.C09 netting needle
Find type: standard double-pronged netting needle type
Description: complete netting needle with a fork with two teeth on both sides
References to parallels: cf. CA.C07
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 17.0

CA.C10 netting needle
Find type: standard double-pronged netting needle type
Description: netting needle with a long fork with two teeth on both sides
References to parallels: cf. CA.C07
(Fort) level of find context: **4**
Count: 1 (nearly complete, teeth largely broken off)
Dimensions in cm: length: 15.7

CA.C11 netting needle
Find type: standard double-pronged netting needle type
Description: part of netting needle ending in fork with two teeth, other terminal broken off
References to parallels: cf. CA.C07
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 8.1

CA.C12 netting needle
Find type: standard double-pronged netting needle type
Description: netting needle with two small forks and shank bent in a hook, one fork not completely preserved
References to parallels: cf. CA.C07
(Fort) level of find context: **4**
Count: 1 (terminals broken off)
Dimensions in cm: length: 15.3

CA.C13 netting needle
Find type: standard double-pronged netting needle type
Description: terminal of netting needle, with small fork with two teeth
References to parallels: cf. CA.C07
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 3.6

CA.C14 netting needle
Find type: standard double-pronged netting needle type
Description: terminal of netting needle, with a long fork with two teeth touching each other
References to parallels: cf. CA.C07
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 5.8

CA.C15 netting needle
Find type: standard double-pronged netting needle type
Description: terminal of netting needle, with fork with two teeth, which are squeezed and corroded together at the top
References to parallels: cf. CA.C07
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 2.9

CA.C16 netting needle
Find type: standard double-pronged netting needle type
Description: central part of netting needle, terminals broken off, but the flattening of the circular-sectioned rod at both broken off ends indicates that two fork-terminals can be expected here
References to parallels: cf. CA.C07
(Fort) level of find context: **4**
Count: 1 (terminals broken off)
Dimensions in cm: length: 15.5

CA.C17 netting needle
Find type: standard double-pronged netting needle type
Description: netting needle with a long fork with two teeth on both sides
References to parallels: cf. CA.C07
(Fort) level of find context: **5+post**
Count: 1 (nearly complete, the teeth on one side are partly broken off)
Dimensions in cm: length: 16.3

CA.C18 netting needle
Find type: standard double-pronged netting needle type
Description: fragment of netting needle with terminal with fork with two teeth, touching each other at the top
References to parallels: cf. CA.C07
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: length: 8.7

CA.C19 netting needle
Find type: standard double-pronged netting needle type
Description: complete, fine netting needle with a small fork with two teeth on both sides, with central part bent over
References to parallels: cf. CA.C07
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 16.1

CA.C20 netting needle
Find type: standard double-pronged netting needle type
Description: part of netting needle with terminal with fork with two teeth
References to parallels: cf. CA.C07
(Fort) level of find context: **5+post**
Count: 1 (fragment)
Dimensions in cm: length: 9.3

CA.C23 textile implement – weaving comb
Description: rectangular fragment of plate with wide teeth on one side, cf. Wild 1970, 66-67: implement for beating up the weft from the front (cf. bone pin-beater), but may only have been used on fairly coarse woollen cloth
References to parallels: Wild (1970, 66-67, 156, Fig. 16, b) only mentions these implements in bone; cf. Richborough (UK), fort: Cunliffe 1971, 124: Fig. 53: 195: comparable fragment, with perforation, but left undetermined
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 5.2; width: 3.7

CA.C24 textile implement – weaving comb
Description: rectangular sheet at one side cut with large teeth
References to parallels: cf. CA.C23
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 5.3; width: 3.6; thickness: 0.2

CA.D001 candlestick
Find type: symmetrical candlestick or 'hour-glass' candlestick
Description: candlestick with originally two hemisperical cups: a circular bowl and domed (semi-identical, symmetrical) base (latter is missing), with circular-sectioned stem in between with projecting discs
References to parallels: rather rare find in Britain but common type on the Continent: several parallels listed by Feugère and Bourrieau *s.d.*a&b (Artefacts (CYM-4002&4001)) (with references), also known on Maroccon sites: see Boube-Piccot 1975, 209-210: no. 326-327 and Pl. 144
Dating (as accepted in literature): 2nd-3rd century (Eckhardt 2002, 42) / AD 200-300 (Feugère and Bourrieau 2016)
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 4.8; diameter: 4.0 (exterior diameter cup)

CA.D002 candlestick
Find type: symmetrical candlestick or 'hour-glass' candlestick
Description: cf. CA.D001, the domed base is also missing here; the intermediate disc is less pronounced here
References to parallels: cf. CA.D001
(Fort) level of find context: **post**
Count: 1 (nearly complete)
Dimensions in cm: length: 4.1; diameter: 3.7 (exterior diameter cup)

CA.D003 candlestick socket?
Description: interior of candlestick in which the candle was held?, edge partly broken off; cf. CA.D004
References to parallels: CA.D004
Dating (as accepted in literature): CA.D004
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 3.1; diameter: 2.9

CA.D004 candlestick
Description: symmetrical candlestick formed by two truncated conical parts, constricted in the middle, in the one half the cylindrical candle socket is still preserved, in the other the suspected pin is missing; nearly complete, with misformed, squeezed base and neck
References to parallels: cf. parallels in Gaul and along the Rhine: see Feugère and Bourrieau *s.d.*a&b (Artefacts (CYM-4002&4001)) for list of references; London (UK): Eckardt 2002, 259: Fig. 122, 1674; Dury (F), two examples from a context of AD 220-250: Quérel and Feugère 2000, 168: Fig. 141: 146, 147
Dating (as accepted in literature): AD 250-400 suggested by Feugère and Bourrieau *s.d.*b, but the Dury find predates this slightly
(Fort) level of find context: **4**
Count: 1 (nearly complete, but squeezed)
Dimensions in cm: length: 8.1; diameter: 7.7 (original diameter upper side)

CA.D005 decorative nail / lock pin
Find type: plug-in attachment, type Allason-Jones 1985 'bell-shaped stud' type 2; Riha 2001 type 'Steckaufsatz'
Description: central part of bell-shaped stud, with low head
References to parallels: cf. CA.D006

(Fort) level of find context: **3**
Count: 1 (fragment)
Dimensions in cm: length: 1.6; diameter: 2.6

CA.D006 decorative nail / lock pin
Find type: plug-in attachment, type Allason-Jones 1985 'bell-shaped stud' type 2; Riha 2001 type 'Steckaufsatz'; type not recorded at Dury (Quérel and Feugère 2000, 160): variant on type I, with low head and without pronounced necklet; used for attaching decorative panels or lock-plates to boxes or chests (Allason-Jones 1985, 102, 'bell-shaped studs' type 2) or to door panels or larger furniture (Quérel and Feugère 2000, 160)
Description: small bell-shaped stud with rectangular-sectioned shaft and low head
References to parallels: two similar studs found at the north-east side of the fort (site Kapellestraat): Vanhoutte *et al.* 2014, 221: Fig. 65, 19-20); wide-spread item, cf. Augst (CH): Riha 2001, 73-75, Taf. 46, 588-590, 592
(Fort) level of find context: **4**
Count: 1 (nearly complete, only top broken off (where a perforation is to be expected))
Dimensions in cm: length: 5.4; diameter: 3.0

CA.D007 decorative nail / lock pin
Find type: plug-in attachment, type Allason-Jones 1985 'bell-shaped stud' type 2; Riha 2001 type 'Steckaufsatz'
Description: small bell-shaped stud with rectangular-sectioned shaft and low head
References to parallels: cf. CA.D006
(Fort) level of find context: **4**
Count: 1 (nearly complete, only top broken off (where a perforation is to be expected))
Dimensions in cm: length: 5.0; diameter: 2.6

CA.D008 decorative nail / lock pin
Find type: plug-in attachment, type Allason-Jones 1985 'bell-shaped stud' type 2; Riha 2001 type 'Steckaufsatz'
Description: central part of bell-shaped stud cf. CA.D006/007
References to parallels: cf. CA.D006
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: diameter: 2.6

CA.D009 decorative nail / lock pin
Find type: plug-in attachment, type Allason-Jones 1985 'bell-shaped stud' type 2; Riha 2001 type 'Steckaufsatz'
Description: small bell-shaped stud with rectangular-sectioned shaft and low head, top of shaft broken off
References to parallels: cf. CA.D006
(Fort) level of find context: **4+5**
Count: 1 (not complete)
Dimensions in cm: length: 4.1; diameter: 2.8

CA.D010 decorative nail / lock pin
Find type: plug-in attachment, type Allason-Jones 1985 'bell-shaped stud' type 2; Riha 2001 type 'Steckaufsatz'; type not recorded at Dury (Quérel and Feugère 2000, 160): variant on type I, with low head and without pronounced necklet
Description: central disc and part of the shank of a bell-shaped stud cf. CA.D006/007
References to parallels: cf. CA.D006
(Fort) level of find context: **5**
Count: 1 (fragments)
Dimensions in cm: diameter: 2.4

CA.D011 decorative nail / lock pin
Find type: plug-in attachment, type Allason-Jones 1985 'bell-shaped stud' type 2; Riha 2001 type 'Steckaufsatz'
Description: central part of bell-shaped stud, with slightly higher head than cf. CA.D006
References to parallels: cf. CA.D006
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 2.1; diameter: 3.9

CA.D012 decorative nail / lock pin
Find type: plug-in attachment, type Allason-Jones 1985 'bell-shaped stud' type 2; Riha 2001 type 'Steckaufsatz'; 'clavette de fixation' Quérel and Feugère 2000, Type I but variant with low head and pronounced necklet (rather: brim)
Description: central part of bell-shaped stud with rectangular-sectioned shaft and with central brim
References to parallels: comparable to Augst (CH): Riha 2001, Taf. 46, 588-590; see also Dury (F): Quérel and Feugère 2000 (from a context dated to AD 220-250)
(Fort) level of find context: **4**
Count: 1 (only central part preserved)
Dimensions in cm: length: 3.4; diameter: 2.9

CA.D013 decorative nail / lock pin
Find type: plug-in attachment, type Allason-Jones 1985 'bell-shaped stud' type 2; Riha 2001 type 'Steckaufsatz'; 'clavette de fixation' Quérel and Feugère 2000, Type I (with pronounced necklet)
Description: bell-shaped stud with rectangular-sectioned shaft with perforation at the top for attachment
References to parallels: cf. Dury (F): Quérel and Feugère 2000, 159: Fig. 136 (from a context of AD 220-250)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 6.8; diameter: 4.9

CA.D014 decorative nail / lock pin
Find type: plug-in attachment, type Allason-Jones 1985 'bell-shaped stud' type 2; Riha 2001 type 'Steckaufsatz'; 'clavette de fixation' Quérel and Feugère 2000, Type I (with pronounced necklet)
Description: bell-shaped stud with rectangular-sectioned shaft with perforation at the top for attachment (end of top broken off)
References to parallels: cf. CA.D013
(Fort) level of find context: **post**
Count: 1 (almost complete)
Dimensions in cm: length: 5.6; diameter: 5.0

CA.D015 decorative nail / lock pin
Find type: plug-in attachment, type Allason-Jones 1985 'bell-shaped stud' type 2; Riha 2001 type 'Steckaufsatz'; 'clavette de fixation' Quérel and Feugère 2000 type 1 (with pronounced necklet, rather: additional brim)
Description: central part of bell-shaped stud, in size comparable to CA.D013 and cf. CA.D014, but with central brim pronouncing the necklet cf. CA.D012
References to parallels: cf. CA.D013
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 2.5; diameter: (3.2)

CA.D016 decorative nail / lock pin
Find type: plug-in attachment, type Allason-Jones 1985 'bell-shaped stud' type 2; 'clavette de fixation' Quérel and Feugère 2000, type II, but head seems squeezed
Description: central part of bell-shaped stud with very low head, peg and front bulge are broken off
References to parallels: cf. Augst (CH): Riha 2001: 73-75, Taf. 46; 593, 594
(Fort) level of find context: **5?**
Count: 1 (only disc preserved)
Dimensions in cm: diameter: 3.5

CA.D017 decorative nail / lock pin
Find type: attachment type Riha 2001 'Knopfförmige Aufsatz'
Description: knob-shaped stud on pointed pin, for attachment by percussion
References to parallels: cf. Augst (CH): Riha 2001, 77-78, Taf. 47, 627; Dury (F): Quérel and Feugère 2000, 159: Fig. 136, 87 (from a context of AD 220-250); Aardenburg (NL), fort: Besuijen 2008, 105: 2.30
Dating (as accepted in literature): 2nd-3rd century AD (Riha 2001, 77)
(Fort) level of find context: **5+post**
Count: 1 (complete)
Dimensions in cm: length: 2.8; diameter: 2.5

CA.D018 decorative nail
Find type: small nail
Description: small stud with flat, round head
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: diameter: 1.0

CA.D019 decorative nail
Description: stud with solid head, flat and round, trapezoidal in cross-section
References to parallels: cf. Aardenburg (NL), fort: Besuijen 2008, 106: 2.35; Krefeld-Gellep (G): Pirling and Siepen 2006, Taf. 81, 6, Taf. 102, 2-4 (from grave 6351 dated to the beginning of the 4th century AD)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 5.1; diameter: 3.0

CA.D020 decorative nail?
Description: spike met thick, round, semi-spherical head
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 5.4; diameter: 2.7 (head)

CA.D021 decorative nail
Description: complete stud with round, rather flat head, with thick, short, round-sectioned stem
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 4.3 (stem: 2.3); diameter: 4.4 (head); 2.1 (stem below the head)

CA.D022 decorative fitting?
Find type: furnishing fitting or charriot fitting?
Description: solid ball on top of folded sheet; the dimensions of the ball point to a charriot fitting, rather than to the end of a scabbard chape or a ball of a dodecahedron
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: diameter: 1.8 (ball)

CA.D023 decorative fitting
Find type: lion mount
Description: *phalera* with depiction of lion-head in relief, no fastening or attachment point visible
References to parallels: cf. Bocholtz (NL), *tumulus* grave last quarter 2nd – early 3rd century AD, decorated knobs with lion head found as attachments on axis terminals and pivot points of a *sella castrensis*, an iron tip-up seat of high standard (De Groot 2006, 113 and 135 (with reconstruction and with references to comparable finds; the found decorative knobs have a diameter of 3.2 cm); also comparable to Augst (CH): Riha 2001, Taf. 48, 634, 636 (decorative top attachments of furnishing), but these are much smaller; identical appliques found in Maroccon sites: Boube-Piccot 1975, 222-224: no. 355-362 and Pl. 157-158
(Fort) level of find context: **4+5**
Count: 1 (complete)
Dimensions in cm: length: 5.2; width: 4.8; thickness: 2.0 (elevation)

CA.D024 decorative fitting
Find type: baluster-shaped furniture or door attachment, cf. CA.D025
Description: hollow, conical element with narrowed base with ridges
References to parallels: cf. CA.D025; comparable to decorative knobs found at Avenches (F) (Amrein *et al.* 1999, 399: Pl. 167, 1721-1728, and identified as decorative fittings with a multitude of functions, elements of chests, keys, lock plates, gaming pieces, ... (Amrein *et al.* 1999, 362), according to Deschler-Erb 1996, 40 these are attachments for furniture and doors
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 4.9

CA.D025 decorative fitting
Find type: baluster-shaped furniture of door attachment (Deschler-Erb 1996, 40 mentions that they are generally used on furniture and

doors; Duvauchelle however believes that this kind of fitting could decorate different types of objects like chests, keys, lock plates, chess pieces, ... (Duvauchelle, in Amrein *et al.* 1999, 362)
Description: fitting with campanulate terminal, knob with spherical top with the remains of an interior iron shaft and with two grooves running around the knob near the base
References to parallels: cf. Augst (CH): Riha 2001, Taf. 47: no. 610; Oberwinterthur (CH): Deschler-Erb 1996, 40-41, Taf. 7, 76 (with references to comparable finds at Mâlain (F), Heddernheim, Neuss, Straubing (all G); South Shields (UK): Allason-Jones and Miket 1984: 3.733-34-36; Colchester (UK): Crummy 1992, 200: Fig. 5.65, 1978, 1979 and Crummy 1983, 168: 4656 and 167: Fig. 204; comparable to find at Richborough (UK): Wilson 1968, Pl. XLVIII, 222, with shank and identified as decorative stud; Avenches (F): Amrein *et al.* 1999, 399: Pl. 67, 1721-1730; very similar to find at Dury (F) (from context of AD 220-250): Quérel and Feugère 2000, 174: Fig. 147, no. 172, however here interpreted as decorative protection fitting on yoke or charriot
(Fort) level of find context: **5**
Count: 1 (not complete)
Dimensions in cm: length: 3.9; width: 2.3

CA.D026 decorative fitting?
Description: curved sheet with profiled base, bent and broken off partly, fitting possibly similar to CA.D025
(Fort) level of find context: **4+5+POST**
Count: 1 (fragment)
Dimensions in cm: length: 4.3

CA.D027 chest handle
Find type: dolphin-shaped handle
Description: handle representing two opposing dolphins, their mouth biting in a central bulge, their tails both ending in a threefold leaf, with part of a split pin still attached at one terminal; stuck together with handle CA.G01 and found together with several fragments of copper alloy sheet, whether or not riveted (fragments of chest fitting?)
References to parallels: cf. Augst (CH): Riha 2001, Taf. 6: 53, 54, 57, 59 (Riha states that this type is in use in the whole Roman Empire, but not so widely distributed in the western provinces; with references to parallels from the Rhine provinces, Gaul and *Britannia* on p. 25); Aardenburg (NL), fort: Besuijen 2008, 100: 2.8; Naaldwijk (NL): van der Feijst *et al.* 2008, 287: Pl. 13, I1.02; Straubing (G), fort: Walke 1965, Taf. 115: 13 and 14; Burgheim (G), graveyard, grave 1/1953: Keller 1971, Taf. 14, 13 (late Roman); close parallels from Belgian sites, from Blicquy (Amand 1975, 34: Fig. 15, 1; Faider-Feytmans 1979, 203: context second half 3rd century), Waudrez (Faider-Feytmans 1979: 204: context second half 3rd century), Elewijt (Faider-Feytmans 1979, 122: 202), Kruishoutem (Vermeulen 1992, 133: Fig. 77, 4) and from the region of Flobecq-Ellezelles or Renaix (Faider-Feytmans 1979, 121: 197-200)
Dating (as accepted in literature): two of the Waudrez parallels are dated to the second half of the 3rd century (Faider-Feytmans 1979, 122), the finds from Augst date to the 1st and 2nd centuries AD (Riha 2001, 25)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 12.1; width: 6.0

CA.D028 chest handle
Find type: dolphin-shaped handle
Description: threefold leaf-shaped terminal of dolphin-shaped handle
References to parallels: cf. CA.D027
Dating (as accepted in literature): cf. CA.D027
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 6.1 (leaf); width: 4.1 (leaf)

CA.D029 handle of coffin
Find type: dolphin-shaped handle
Description: handle representing two opposing dolphins, in their mouth holding a figure, their tails both ending in a threefold leaf, only one preserved; the central figure is badly preserved but may have been the head of Oceanus (see Riha 2001, 24)
References to parallels: no exact parallel found; for references for dolphin-shaped handles cf. CA.D027
(Fort) level of find context: **5**
Count: 1 (almost complete, one terminal broken off)
Dimensions in cm: length: 13.4; width: 5.6

CA.D030 terminal of chest handle
Find type: U-shaped version of the handle with central bulge and simple curved terminals
Description: hooked terminal with mouldings, typical for U-shaped handle with simple curved terminals
References to parallels: cf. CA.D031; see *e.g.* the examples from Aardenburg (NL), fort: Besuijen 2008, 98: 2.1, 2.2
(Fort) level of find context: **5+post**
Count: 1 (fragment)
Dimensions in cm: length: 4.8

CA.D031 chest handle
Find type: U-shaped version of the handle with central bulge and acorn or simple curved terminals
Description: badly preserved, solid cast U-shaped handle with *c.* rectangular cross-section with bulge in the middle with circular cross-section, the straight bow had longitudinal ridges; terminals are broken off
References to parallels: cf. Augst (CH): Riha 2001, Taf. 7, 79 (from context of 3rd century AD); Scheveningseweg (NL): Waasdorp & Zee 1988, 39: 6.5; Aardenburg (NL), fort: Besuijen 2008, 98: 2.1 – 2.5 (2.3 is a finer version in comparising with the Oudenburg find, but is identical in that the ends of the straight bow extend to the outside in pointed ends); Merbes-le-Château (B): found in a context of *c.* 260 AD (Paridaens *et al.* 2010, 218)
Dating (as accepted in literature): found in 3rd-century contexts
(Fort) level of find context: **4**
Count: 1 (almost complete)
Dimensions in cm: length: 12.9; width: 3.6 (largest side); thickness: 2.6 x 2.4 (central knob)

CA.D032 handle chest / helmet carrying handle / vessel grip handle ?
Description: complete handle (broken in two), with straight central handle part
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 9.7; width: 4.2; thickness: 0.6

CA.D033 chest handle or vessel handle
Find type: handle with central bulge (see Riha 2001, 29: no. 76) / vessel handle of Eggers 1951 Typ 75 ('frühe steilwandige Becken mit aufgehöhtem Boden')
Description: solid U-shaped handle with rounded rectangular-sectioned bow and central bulge with mouldings at either side; the ends of the bow are linked with a straight side piece, extending further than the bow and ending in a stylized acorn(?) shape; corroded onto flat, curved iron bar with looped end
References to parallels: cf. Aardenburg (NL), fort: Besuijen 2008, 99: 2.6; Augst (CH): Riha 2001, Taf. 7: 76; type comparable to finds at Trier: Menzel 1966, 129: Abb. 66 and 67
(Fort) level of find context: **4?**
Count: 1 (not complete)
Dimensions in cm: length: 15.9; width: 8.8; thickness: 1.4 x 1.1 (central)

CA.D034 chest handle or vessel handle
Find type: handle with central bulge (see Riha 2001, 29: no. 76) / vessel handle of Eggers 1951 Typ 75 (frühe steilwandige Becken mit aufgehöhtem Boden)
Description: U-shaped solid cast handle with *phallus* shaped decorative endings (stylized acorns?) that in length exceed the length of the functional handle itself, in the middle of the grip enlargement with ribs on both sides
References to parallels: cf. CA.D033
(Fort) level of find context: **4+5**
Count: 1 (nearly complete, one terminal broken off)
Dimensions in cm: length: 12.9; width: 8.3 (side); thickness: 1.5 (central)

CA.D035 chest handle
Find type: handle with central bulge and acorn terminals
Description: bow-shaped handle, with round to oval-sectioned, smooth bow, with central bulge bordered by mouldings, and acorn-shaped terminals
References to parallels: common chest handle type, widely distributed throughout the Roman Empire (Riha 2001, 29, with references), see *e.g.* Augst: Riha 2001, Taf. 7, 81 and Taf. 8, 94, 99
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 12.5; width: 4.8; diameter: 2.1 (central knob)

CA.D036 handle chest / helmet carrying handle / vessel grip handle ?
Description: handle with rectangular cross-section and transversal grooves on the outside
(Fort) level of find context: **unstratified**
Count: 1 (not complete)
Dimensions in cm: length: 7.4; width: 4.5; thickness: 1.1 x 0.6 (central bow)

CA.D037 handle
Description: fragment of fine handle, slightly stretched, with both terminals broken off, with central grooved piece
(Fort) level of find context: **3**
Count: 1 (not complete)
Dimensions in cm: length: 8.8; thickness: 0.3/0.4

CA.D038 handle?
Description: fragment with one profiled end, both ends broken off, possibly of small handle
(Fort) level of find context: **1>4**
Count: 1 (fragment)
Dimensions in cm: length: 3.4 (total length)

CA.D039 chest or box handle?
Description: fragment of curved, solid, round-sectioned, rod, slightly tapering to one side, possibly part of handle
(Fort) level of find context: **1>4**
Count: 1 (fragment)
Dimensions in cm: length: 5.0

CA.D040 handle
Description: small handle with circular cross-section with circular hook, one terminal broken off
(Fort) level of find context: **4**
Count: 1 (almost complete, one end broken off)
Dimensions in cm: length: 10.5; thickness: 0.4 / 0.4

CA.D041 small handle?
Description: oval-sectioned curved stem with curled end; other end broken off
(Fort) level of find context: **4**
Count: 1 (one end broken off)
Dimensions in cm: width: 4.2 (max.width)

CA.D042 handle attachment disc
Find type: round fitting
Description: round fitting perforated to hold the attachment of a handle
References to parallels: cf. still attached onto the handle: Faider-Feytmans 1979, 121-122: 197, 202, 204; Augst (CH): Riha 2001, Taf. 11: 162-166; Liberchies (B), *vicus*: Dewert *et al.* 2008
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: diameter: 4.2

CA.D043 handle attachment ring for box or chest
Find type: round perforated fitting
Description: round fitting perforated to hold the attachment of a handle
References to parallels: cf. CA.D042
(Fort) level of find context: **5+post**
Count: 1 (complete)
Dimensions in cm: diameter: 4.4

CA.D044 handle attachment disc
Description: round fitting perforated to hold the attachment of a handle
References to parallels: cf. CA.D042
(Fort) level of find context: **post**
Count: 1 (fragment broken off)
Dimensions in cm: diameter: 5.0

CA.D045 chest or box sheet fitting
Find type: rectangular box or chest sheet
Description: almost complete, rectangular sheet with central perforation surrounded by circular mouldings; the sheet is partly bent over
References to parallels: cf. Richborough (UK): Bushe-Fox 1949, 142, Pl. XLVII: 176a and b, Pl. XLVIII (from a casket containing a hoard of coins from AD 268-270); Aardenburg (NL), fort: Besuijen 2008, 101: 2.12; Caerleon (UK): Nash-Williams 1941, Fig. 8: 35 (late Roman dating); Augst (CH): Riha 2001, Taf. 30, 370; Burgheim (G), graveyard, grave 1/1953: Keller 1971, Taf. 14, 10-18 (late Roman)
(Fort) level of find context: **4**
Count: 1 (almost complete)
Dimensions in cm: length: 14.9 (total length); width: 8.1

CA.D048 chest or box sheet fitting
Find type: rectangular box or chest sheet
Description: fragment of rectangular sheet with central perforation surrounded by circular mouldings
References to parallels: cf. CA.D045
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: diameter: 7.5 (from perforation to edge)

CA.D049 chest or box sheet fitting
Find type: furniture binding or part of lock plate?
Description: folded copper alloy strip, with rivetted edge and remains of iron rivet: possibly binding of box, door, ...
(Fort) level of find context: **4+5**
Count: 1 (not complete)
Dimensions in cm: length: 8.6; width: 5.0

CA.D050 chest or box sheet fitting
Find type: rectangular box or chest sheet
Description: double folded sheet with two original, rivetted edges, with mushroom-shaped rivet perforations; corroded onto copper alloy flagon
References to parallels: cf. Augst (CH): Riha 2001, 112 (assemblage of lock plate and other chest fitting plates (Abb. 130), showing the same perforations along the margins; with reconstruction of the chest (Abb. 131); see also Taf. 30, 370); Krefeld-Gellep (G): Pirling and Siepen 2006, Taf. 79, 16 and Pirling and Siepen 2000, Taf. 122, 7, 10 (from grave 5418 dated to the last third of the 3rd century AD); Naaldwijk: van der Feijst *et al.* 2008, 279: Pl. 5, D2.04 (but here interpreted as military belt fitting)
(Fort) level of find context: **post**
Count: 1 (fragments)
Dimensions in cm: length: 11.9; width: 11.3

CA.D051 chest or box sheet fitting
Find type: rectangular box or chest sheet
Description: rectangular copper alloy sheet, found together with CA.D045, and probably also box fitting, with corner perforations in two corners (one of them only visible through X-radiation image)
(Fort) level of find context: **4**
Count: 1 (probably nearly complete)
Dimensions in cm: length: 7.8; width: 8.3

CA.D052 key
Find type: palmette-shaped, lever lock key; Guillaumet and Laude 2009, Type 1
Description: open-work palmette-shaped key handle, with broken-off iron stem and foot
References to parallels: two similar keys found at the north-east side of the fort (site Kapellestraat – ET24): Vanhoutte *et al.* 2014, 220, 221: Fig. 65, 17 and 18); this key type knows a wide distribution: cf. Lullingstone (UK), villa, 2nd century level: Meates 1987, 76-77, fig. 32: 186; Richborough (UK), fort: Bushe-Fox 1949, Pl. XXXIV: 86, with mention of parallel at Zugmantel (G), dating to *c.* AD 150: see also Jacobi 1909, Taf. XIII, 51, 63; Neuss (G): Simpson 2000, Pl. 20: 10, 11; Krefeld-Gellep (G): Pirling and Siepen 2006, Liberchies (B), *vicus*: Vilvorder 2015, 215: Fig. 165: 74, 75
Dating (as accepted in literature): 2nd to 4th century (Pirling and Siepen 2006, 431 (with references) mention the long use of this type of palmette-shaped key, with finds from (the end of) the 2nd century onwards to finds post-dating AD 341)
(Fort) level of find context: **3**
Count: 1 (handle complete; key broken off)
Dimensions in cm: length: 5.5; width: 3.3

CA.D053 key
Find type: palmette-shaped, lever lock key, Guillaumet and Laude 2009, Type 1
Description: open-work palmette-shaped key handle, with broken-off iron stem and foot
References to parallels: cf. CA.D052
Dating (as accepted in literature): cf. CA.D052
(Fort) level of find context: **3+4**
Count: 1 (handle complete; iron key broken off)
Dimensions in cm: length: 6.0; width: 3.9

CA.D054 key
Find type: palmette-shaped, lever lock key; Guillaumet and Laude 2009, Type 1
Description: elaborate palmette-shaped handle of key
References to parallels: cf. CA.D052
Dating (as accepted in literature): cf. CA.D052
(Fort) level of find context: **5(+4)**
Count: 1 (handle nearly complete; key (probably iron) missing)
Dimensions in cm: length: 8.5; width: 3.1

CA.D055 key
Find type: palmette-shaped, lever lock key, Guillaumet and Laude 2009, Type 1
Description: complete key with palmette-shaped handle
References to parallels: cf. CA.D052
Dating (as accepted in literature): cf. CA.D052
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 6.6; width: 2.6

CA.D056 key
Find type: simple lever lock key; Guillaumet and Laude 2009, Type 1
Description: small key with ring-shaped grip with knob on top
References to parallels: same type of key found at the north-east corner site of the Oudenburg fort (site Jacali – ET17), unpublished

material; cf. Cologne (G): Liesen and Boelicke 1999, 369: Abb. 13, B/108, B/107; Richborough (UK), fort: Bushe-Fox 1932, Pl. XIII, 41: five keys of the same type, Wilson 1968, Pl. XLV: 196
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 5.9; width: 2.6

CA.D057 key?
Find type: undetermined
Description: possible handle of undetermined shape (human figure, head broken off?) with start of peg, probably stem of key
(Fort) level of find context: **4+5**
Count: 1 (not complete)
Dimensions in cm: length: 8.3

CA.D059 hinge
Find type: cotter hinge, Manning 1985 hinge type 4 (in iron)
Description: threefold hinge, with three splints circulating around iron rod
References to parallels: cf. Augst (CH): Riha 2001, Taf. 28, 340-351
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 5.8; width: 4.0

CA.D060 hinge
Find type: cotter hinge, Manning 1985 hinge type 4
Description: threefold hinge, one splint broken off
References to parallels: cf. CA.D059
(Fort) level of find context: **5**
Count: 1 (two arms partly broken off)
Dimensions in cm: length: 4.2; width: 1.6

CA.D061 hinge
Find type: cotter hinge, Manning 1985 hinge type 4
Description: threefold hinge cf. CA.D052, one splint broken off, one splint bent and only partly preserved
References to parallels: cf. CA.D059
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 5.5; width: 4.2

CA.D062 hinge
Find type: cotter hinge, Manning 1985 hinge type 4
Description: curved rod with hinge, cf. CA.D059 but with curved rod
References to parallels: cf. CA.D059
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 5.2 (total length)

CA.D063 sculpted corner fitting of vessel or small furniture
Find type: footstand in shape of animal leg (probably lion leg)
Description: small footstand, possibly a lion leg, but badly preserved, to support (the corner of a) piece of furniture (box or chest?) or a vessel
References to parallels: cf. comparable finds at Augst (CH): Riha 2001, several examples on Taf. 4 and 5; Dury (F): Quérel and Feugère 2000, 157: Fig. 135, 48, 49 (context of AD 220-250); Trier region (G): Bienert 2007, 258-259, Kat.-Nr. 303, 304, 305
(Fort) level of find context: **2**
Count: 1 (nearly complete leg)
Dimensions in cm: length: 5.1

CA.D064 vessel, undetermined
Description: small footring of a small vessel
(Fort) level of find context: **3+4**
Count: 1 (fragment)
Dimensions in cm: thickness: 1.5 (height); diameter: 2.4 (footring)

CA.D065 knife scabbard
Description: intentionally double folded sheet with one straight, open, short side and one end narrowing to a point
(Fort) level of find context: **4**
Count: 1 (complete, but badly preserved)
Dimensions in cm: length: 15.6; width: 3.0

CA.D066 knife handle
Find type: copper alloy handle for iron knife
Description: handle with bead-and-reel mouldings and a terminal suspension loop
References to parallels: cf. Colchester: Crummy 1983, 110-111: no. 2950
(Fort) level of find context: **5+post**
Count: 1 (not complete)
Dimensions in cm: length: 5.6; width: 1.7

CA.D067 knife handle?
Description: half of a tubular case (at one side completely bent open) enclosing a wooden peg, attached to it by means of one small rivet; with start of a broken off blade
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 4.8

CA.D068 sewing needle
Find type: needle Crummy 1983 type 3 'needle with groove above and below the eye'
Description: incomplete needle, end broken off, rounded section, rectangular at the head where it is pierced by a countersunk oval eye
References to parallels: cf. South Shields (UK): Allason-Jones and Miket 1984, 176-177: 3.496; Colchester (UK): Crummy 1983, 67
Dating (as accepted in literature): 3rd-4th centuries AD (Crummy 1983, 67)
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 8.7; width: 0.4 (head)

CA.D069 sewing needle
Find type: needle Crummy 1983 type 3 'needle with groove above and below the eye'
Description: upper half of needle cf. CA.D068
References to parallels: cf. CA.D068
Dating (as accepted in literature): CA.D068
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 6.0; width: 0.4

CA.D070 sewing needle
Description: two fragments of needle, part with head is oval/subrectangular in section and pierced by an oval eye, the other fragment is more rectangular in section but may belong to the same needle
References to parallels: cf. South Shields (UK): Allason-Jones and Miket 1984, 177-178: 3.504
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 6.0; width: 0.4

CA.D071 sewing needle? (unfinished product?)
Description: short needle, with flat rectangular section, with rectangular ending with oblong eye; the shank seems to be cut off; the rudimentary form and the non-symmetrical rectangular head may indicate that this is a failed, unfinished product
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 7.8; width: 0.7 (head)

CA.D072 jug (tableware)
Find type: swan-neck of jug Bienert 2007 Form 16 ('Blechkannen mit Standring, konisch zulaufendem Gefässkörper, Ausgussschnabel und birnenförmigen Klappdeckel'), Eggers 1951 Typ 128 ("Gallo-römische' Bronzekannen vom Typus Överbo'), den Boesterd 1956 type 257-258, Koster 1997 type 10-13
Description: neck fragment of a jug with start of the handle, with the remains of two (originally perforated) bows on top to hold a hinged lid, lid is missing
References to parallels: cf. *e.g.* Tongeren (B): Van Buggenhout 2016, 54, 55; Dover (UK): Philp 1981, 164-165: 212; Richborough (UK), fort: Bushe-Fox 1932, Pl. XIV, 49, with references to several finds at the German Limes (see p. 83)
Dating (as accepted in literature): last third 1st to first half 4th century AD (Bienert 2007, 48)
(Fort) level of find context: **4**
Count: 1 (only neck and rim preserved)
Dimensions in cm: length: 11.2; width: 10.5; thickness: 5.2

CA.D073 jug, handle
Description: fragment of handle with 'fin'
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 5.0; thickness: 1.0

CA.D074 jug (tableware), decorated ending of handle
Find type: type of jug undetermined, possibly *oenochoe*
Description: decorated terminal of handle, with mask (?)
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 11.3; width: 6.4

CA.D075.1 sieve/strainer/colander handle
Find type: cf. CA.D075.2: sieve Eggers 1951 Typ 161 ('Bronzekellen mit Sieb, mit ruderförmigen Griff und flachbodigem Becken'), Bienert 2007 Form 37 ('Sieb mit steiler Wandung, eckigem Bodenübergang und ellipsförmigen Griffende'), den Boesterd 1956 type 59a, Künzl 1993 type ND 31
Description: handle with fin-shaped lobs, ending broken off; not fitting, but most likely forming individual together with CA.D075.2
References to parallels: type popular in Gaul and Rhine area, see *e.g.* Neupotz: Künzl 1993, D 97, 195-197 (context of late 3rd century AD), Rouen: Tassinari 1995, 80, with references
Dating (as accepted in literature): 3rd to 4th/5th century AD (Bienert 2007, 98 and 106)
(Fort) level of find context: **4+5**
Count: 1 (handle, nearly complete)
Dimensions in cm: length: 8.6

CA.D075.2 sieve/strainer/colander
Find type: sieve Eggers 1951 Typ 161 ('Bronzekellen mit Sieb, mit ruderförmigen Griff und flachbodigem Becken'), Bienert 2007 Form 37 ('Sieb mit steiler Wandung, eckigem Bodenübergang und ellipsförmigen Griffende'), den Boesterd 1956 type 59a, Künzl 1993 type ND 31
Description: complete profile of sieve, but fragmented and parts missing; most likely handle D075.1 belongs to this individual
References to parallels: type popular in Gaul and Rhine area, see *e.g.* Neupotz: Künzl 1993, D 97, 195-197 (context of late 3rd century AD), Rouen: Tassinari 1995, 80, with references
Dating (as accepted in literature): sieves with cylindrical body and a sharp transition between body and slightly rounded base and biconcave, rather short handle are dated later: 3rd to 4th/5th century AD (Bienert 2007, 98 and 106)
(Fort) level of find context: **4**
Count: 1 (only vessel body, not complete)
Dimensions in cm: length: 5.3 (height); diameter: 14.3 (reconstructed)

CA.D076 sieve or dipper handle
Find type: sieve/dipper Eggers 1951 Typ 161, Bienert 2007 Form 36/37, den Boesterd 1956 type 58a/59a; Tassinari 1995 type 74
Description: almost complete large handle with wide oval-shaped ending, with central fin-shaped lobs (one broken off) and transition to rim of vessel
References to parallels: Eggers 1951 Typ 161, Bienert 2007 Form 36/37, den Boesterd 1956 type 58a/59a; Tassinari 1995 type 74
Dating (as accepted in literature): Bienert 2007 Form 36: mid 2nd to 4th century AD – Form 37: 3rd to 4th/5th century AD
(Fort) level of find context: **4**
Count: 1 (only handle)
Dimensions in cm: length: 18.4

CA.D077 sieve or dipper handle
Find type: sieve/dipper Eggers 1951 Typ 161, Bienert 2007 Form 36/37, den Boesterd 1956 type 58a/59a; Tassinari 1995 type 74
Description: handle with wide oval-shaped ending and rounded lobs; part of the vessel folded onto the back of the handle
References to parallels: Eggers 1951 Typ 161, Bienert 2007 Form 36/37, den Boesterd 1956 type 58a/59a; Tassinari 1995 type 74
Dating (as accepted in literature): Bienert 2007 Form 36: mid 2nd to 4th century AD – Form 37: 3rd to 4th/5th century AD
(Fort) level of find context: **4**
Count: 1 (only handle and fragment of wall)
Dimensions in cm: length: 12.7

CA.D078 sieve or dipper handle
Find type: sieve/dipper Eggers 1951 Typ 161, Bienert 2007 Form 36/37, den Boesterd 1956 type 58a/59a; Tassinari 1995 type 74
Description: straight handle with oval-shaped ending and transitition to rim of vessel
References to parallels: Eggers 1951 Typ 161, Bienert 2007 Form 36/37, den Boesterd 1956 type 58a/59a; Tassinari 1995 type 74
Dating (as accepted in literature): Bienert 2007 Form 36: mid 2nd to 4th century AD – Form 37: 3rd to 4th/5th century AD
(Fort) level of find context: **4**
Count: 1 (only handle, not complete)
Dimensions in cm: length: 8.7

CA.D079 sieve or dipper handle
Find type: sieve/dipper Eggers 1951 Typ 161, Bienert 2007 Form 36/37, den Boesterd 1956 type 58a/59a; Tassinari 1995 type 74
Description: handle with wide oval ending, no lobs, with transition to rim of vessel
References to parallels: Eggers 1951 Typ 161, Bienert 2007 Form 36/37, den Boesterd 1956 type 58a/59a; Tassinari 1995 type 74
Dating (as accepted in literature): Bienert 2007 Form 36: mid 2nd to 4th century AD – Form 37: 3rd to 4th/5th century AD
(Fort) level of find context: **4**
Count: 1 (only handle)
Dimensions in cm: length: 10.0

CA.D080 sieve or dipper handle
Find type: sieve/dipper Eggers 1951 Typ 161, Bienert 2007 Form 36/37, den Boesterd 1956 type 58a/59a; Tassinari 1995 type 74
Description: oval-shaped ending of handle which is slightly narrowing towards the vessel
References to parallels: Eggers 1951 Typ 161, Bienert 2007 Form 36/37, den Boesterd 1956 type 58a/59a; Tassinari 1995 type 74
Dating (as accepted in literature): Bienert 2007 Form 36: mid 2nd to 4th century AD – Form 37: 3rd to 4th/5th century AD
(Fort) level of find context: **4 (end)**
Count: 1 (fragment of handle)
Dimensions in cm: length: 6.7

CA.D081 sieve or dipper handle
Find type: sieve/dipper Eggers 1951 Typ 161, Bienert 2007 Form 36/37, den Boesterd 1956 type 58a/59a; Tassinari 1995 type 74
Description: handle with fin-shaped lobs; transition to rim of vessel and ending broken off
References to parallels: Eggers 1951 Typ 161, Bienert 2007 Form 36/37, den Boesterd 1956 type 58a/59a; Tassinari 1995 type 74
Dating (as accepted in literature): Bienert 2007 Form 36: mid 2nd to 4th century AD – Form 37: 3rd to 4th/5th century AD
(Fort) level of find context: **5**
Count: 1 (part of handle)
Dimensions in cm: length: 7.3

CA.D082 sieve or dipper handle
Find type: sieve/dipper Eggers 1951 Typ 161, Bienert 2007 Form 36/37, den Boesterd 1956 type 58a/59a; Tassinari 1995 type 74
Description: handle with central fin-shaped lobs, ending broken off, with part of transition to rim of vessel
References to parallels: Eggers 1951 Typ 161, Bienert 2007 Form 36/37, den Boesterd 1956 type 58a/59a; Tassinari 1995 type 74
Dating (as accepted in literature): Bienert 2007 Form 36: mid 2nd to 4th century AD – Form 37: 3rd to 4th/5th century AD
(Fort) level of find context: **5+post**
Count: 1 (only handle, not complete)
Dimensions in cm: length: 10.8

CA.D083 sieve or dipper handle
Find type: sieve/dipper Eggers 1951 Typ 161, Bienert 2007 Form 36/37, den Boesterd 1956 type 58a/59a; Tassinari 1995 type 74
Description: large handle with transition to rim of vessel, with wider central part, partly broken off (likely to have been large lobs), ending broken off
References to parallels: Eggers 1951 Typ 161, Bienert 2007 Form 36/37, den Boesterd 1956 type 58a/59a; Tassinari 1995 type 74
Dating (as accepted in literature): Bienert 2007 Form 36: mid 2nd to 4th century AD – Form 37: 3rd to 4th/5th century AD
(Fort) level of find context: **post**
Count: 1 (only handle, not complete)
Dimensions in cm: length: 10.3 (central)

CA.D084 sieve/strainer/colander
Find type: sieve Eggers 1951 Typ 161, Bienert 2007 Form 36/37, den Boesterd 1956 type 58a/59a; Tassinari 1995 type 74
Description: four fragments of the central part of a sieve base
References to parallels: Eggers 1951 Typ 161, Bienert 2007 Form 36/37, den Boesterd 1956 type 58a/59a; Tassinari 1995 type 74
Dating (as accepted in literature): Bienert 2007 Form 36: mid 2nd to 4th century AD – Form 37: 3rd to 4th/5th century AD
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: length: 10.8; width: 9.2

CA.D085 sieve/strainer/colander
Find type: sieve Eggers 1951 Typ 161, Bienert 2007 Form 36/37, den Boesterd 1956 type 58a/59a; Tassinari 1995 type 74
Description: central part of base of sieve with radial lines of perforations and central perforation in the base
References to parallels: Eggers 1951 Typ 161, Bienert 2007 Form 36/37, den Boesterd 1956 type 58a/59a; Tassinari 1995 type 74
Dating (as accepted in literature): Bienert 2007 Form 36: mid 2nd to 4th century AD – Form 37: 3rd to 4th/5th century AD
(Fort) level of find context: **5**
Count: 1 (fragment of base)
Dimensions in cm: length: 6.7; width: 6.6

CA.D086 sieve/strainer/colander
Find type: sieve Eggers 1951 Typ 161 ('Bronzekellen mit Sieb, mit ruderförmigen Griff und flachbodigem Becken'), Bienert 2007 Form 37 ('Sieb mit steiler Wandung, eckigem Bodenübergang und ellipsförmigen Griffende'), den Boesterd 1956 type 59a, Künzl 1993 type ND 31
Description: base and part of wall of sieve, with perforations in decorative pattern (radial lines linked together at the base of the wall by arcades; series of dots in the central part of the base)
References to parallels: cf. CA.D075.2
(Fort) level of find context: **unstratified**
Count: 1 (only base and fragment of wall, not complete)
Dimensions in cm: diameter: >17.6

CA.D087 dipper
Find type: dipper Bienert 2007 Form 37 ('Kelle'), Eggers 1951 Typ 160
Description: undercut rim, the widening to below indicates this rim belongs to a dipper
References to parallels: cf. Trier: Bienert 2007 Form 37 ('Kelle'); cf. Eggers 1951 Typ 160
Dating (as accepted in literature): 3rd – 4th/5th century (Bienert 2007, 106)
(Fort) level of find context: **5**
Count: 1 (rim fragment)
Dimensions in cm: length: 1.6 (height); diameter: *c.* 14.8

CA.D088 cauldron
Find type: Westland cauldron Eggers 1951 Typ 14, den Boesterd 1956 type 163; Bienert 2007 Form 47; Künzl 1993 Type NE 7
Description: cauldron with convex base forming a rounded angle with the wall which then becomes almost vertical, with two small vertical triangular lugs; cauldron CA.D088 and plate/dish CA.D112 were found together: the plate was fit in the cauldron
References to parallels: cf. Neupotz: Künzl 1993, E 25 (context of late 3rd century AD); cf. Koster 1997, 71; cf. Bienert 2007, 137
Dating (as accepted in literature): numerous in 3rd-century hoards and still present in 4th century (Koster 1997, 71); 2nd – 4th/5th century according to Bienert 2007, 137
(Fort) level of find context: **4**
Count: 1 (nearly complete)
Dimensions in cm: thickness: 20.5 (2.9: height of escutcheon); diameter: 38.4

CA.D089 baking tin?
Find type: baking tin Bienert 2007 Form 62 ('Runde Backbleche mit steiler Wandung und Horizontalrand')?
Description: large round base with start of upstanding wall, very corroded and slightly bent
References to parallels: cf. Trier: Bienert 2007 Form 62
Dating (as accepted in literature): 1st to 5th century AD (Bienert 2007, 181)
(Fort) level of find context: **4**
Count: 1 (complete base)
Dimensions in cm: length: 1.7; width: 1.5

CA.D090 bucket
Find type: Henmoor bucket Bienert 2007, Form 53; den Boesterd 1956 type 147
Description: the bucket could not be conserved: it lies upside down, with the base on top, oblique, totallly squeezed and pressed in; the identification as a Henmoor bucket is based on the rim type and triangular lug; the Henmoor bucket base CA.D090 was found next to this vessel and possibly belongs to this individual; the complete handle is decorated with series of two ridges
References to parallels: the Henmoor bucket had a wide distribution (Upper Italy, *Gallia*, *Germania Inferior* and *Superior*, *Britannia*, *Germania Libera*, *Raetia*, *Pannonia* and *Thracia*) (found in a number of 3rd-century graves throughout continental Europe including the Roman Danube provinces, Scandinavia and Russia): see den Boesterd 1956, 44-45 and Bienert 2007, 146
Dating (as accepted in literature): AD 150 – 300/350 (den Boesterd 1956, 44-45); according to Bienert (2007, 152-153) 3rd to 4th century
(Fort) level of find context: **4**
Count: 1 (nearly complete, but totally fragmented and badly preserved)
Dimensions in cm: length: 15.0 (squeezed height); width: 33.0 (estimated original width); thickness: *c.* 1.0 (handle)

CA.D091 bucket base
Find type: Henmoor bucket Bienert 2007, Form 53; den Boesterd 1956 type 147
Description: nearly complete, typical foot of a Henmoor bucket, probably belonging to individual CA.D090 (found next to it)
References to parallels: cf. CA.D090
Dating (as accepted in literature): cf. CA.D090
(Fort) level of find context: **4**
Count: 1 (complete base)
Dimensions in cm: thickness: 3.3; diameter: 12.4 (exterior diameter footring)

CA.D092 bucket escutcheon
Find type: Henmoor bucket Bienert 2007, Form 53; den Boesterd 1956 type 147 ?
Description: profiled triangular escutcheon of a bucket, possibly from a Henmoor bucket
References to parallels: cf. CA.D090
Dating (as accepted in literature): cf. CA.D090
(Fort) level of find context: **3+4**
Count: 1 (complete lug)
Dimensions in cm: length: 3.9; width: 5.3

CA.D093 bucket escutcheon
Find type: Henmoor bucket Bienert 2007, Form 53; den Boesterd 1956 type 147 ?
Description: curved triangular escutcheon of a bucket, possibly from a Henmoor bucket
References to parallels: cf. CA.D090
Dating (as accepted in literature): cf. CA.D090
(Fort) level of find context: **4**
Count: 1 (complete lug)
Dimensions in cm: length: 5.2; width: 7.7

CA.D094 bucket escutcheon
Find type: Henmoor bucket Bienert 2007, Form 53; den Boesterd 1956 type 147 ?
Description: part of a triangular escutcheon of a bucket, possibly from a Henmoor bucket
References to parallels: cf. CA.D090
Dating (as accepted in literature): cf. CA.D090
(Fort) level of find context: **unstratified**
Count: 1 (fragment of the lug)
Dimensions in cm: length: 5.2; width: 3.7

CA.D095 bucket handle
Description: central part of round-sectioned handle, divided in sections by beading (series of two ridges), cf. handle of CA.D090
References to parallels: cf. Koster 1997, 49: no. 46, 47; cf. Bienert 2007, 156: Kat.-Nr. 173
Dating (as accepted in literature): second half of the 2nd – 3rd century (den Boesterd 1956, 44)
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 16.4; width: 4.9; thickness: 1.0

CA.D096 bucket escutcheon
Find type: attachment Tassinari 1975 Form 130-137, for bucket Eggers type 36 ('Bronze-Eimer vom Typus Vaengegaard'), den Boesterd form 153
Description: hollow cast escutcheon with triangular shape with convex exterior face, ending in a point, with a circular loop on top for attachment of a bucket handle
References to parallels: common type in the Rhineland and in *Britannia*: cf. Aldborough (UK): Bishop 1996, 13 (fig. 13: 22), 14); Richborough (UK): Bushe-Fox 1932, Pl. XIV, 52; South Shields (UK): Allason-Jones and Miket 1984, 222: no. 3.765, with references to several examples in Britain and at the Rhine Limes; Housestead (UK): Rushworth 2009, 438: no. 54; Nijmegen (NL): see Koster 1997, 49: no. 45, with distribution of this type of buckets in Gaul and the Rhine provinces, and den Boesterd 1956, 47-48, Pl. VI:153-155; Aardenburg (NL), fort: Besuijen 2008, 138: 6.8; Zugmantel (G): Jacobi 1909, 93, Pl. XIII, 9, 14, 28; but also several finds in France: see Tassinari 1975, 56-57: 130-137, Pl. XXVIII, and at Autun: Pinette 1987, 142: no. 231
Dating (as accepted in literature): mainly second half 2nd century – middle 3rd century AD (Kunow 1983, 19)
(Fort) level of find context: **3**
Count: 1 (complete escutcheon)
Dimensions in cm: length: 6.8; width: 4.1

CA.D097 bucket or bowl escutcheon
Description: attachement for a bucket or bowl to attach a handle, lug linking two small rectangular plates
(Fort) level of find context: **3+4**
Count: 1 (complete escutcheon)
Dimensions in cm: length: 5.8; width: 1.5

CA.D098 bucket escutcheon
Description: lower part of an escutcheon cf. CA.D099, lug broken off
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 9.9; width: 5.1

CA.D099 bucket escutcheon
Description: T-shaped attachement for a bucket handle, edge of the lug is damaged but seems to be broken off on circular perforations along the edge
(Fort) level of find context: **unstratified**
Count: 1 (nearly complete escutcheon)
Dimensions in cm: length: 9.5; width: 9.2

CA.D100 bucket handle
Description: large handle of bucket, narrowing towards the terminals, curved endings broken off
(Fort) level of find context: **post**
Count: 1 (nearly complete, terminals broken off)
Dimensions in cm: length: 22.8; width: 11.2

CA.D101 bowl (small)
Find type: bowl Bienert 2007 Form 69 ('Halbkugelige Schälchen mit Standring und gerundeter Lippe')
Description: complete base with footring and part of the wall of a small bowl
References to parallels: cf. Trier: Bienert 2007 Form 69
Dating (as accepted in literature): 1st to 4th century AD (Bienert 2007, 193)
(Fort) level of find context: **3**
Count: 1 (complete base and part of wall)
Dimensions in cm: length: 3.6 (height); diameter: >11.8

CA.D102 bowl
Find type: type undetermined
Description: rim fragment of a bowl
(Fort) level of find context: **4**
Count: 1 (rim fragment)
Dimensions in cm: length: 2.5; diameter: >13.1

CA.D103 bowl
Find type: bowl Bienert 2007 Form 67, 69 or 73
Description: footstand of a small bowl, with corroded iron nail attached
References to parallels: cf. Trier: Bienert 2007, 197: Kat.-Nr. 221
(Fort) level of find context: **4**
Count: 1 (complete base)
Dimensions in cm: diameter: 5.8 (exterior diameter of footring)

CA.D104 bowl
Find type: bowl Bienert 2007 Form 67, 69 or 73
Description: small footring of a dish or bowl
References to parallels: cf. Trier: Bienert 2007, 197: Kat.-Nr. 221
(Fort) level of find context: **4 (end)**
Count: 1 (complete base)
Dimensions in cm: diameter: 3.7 (exterior diameter)

CA.D105 dish or bowl
Description: small footring of a dish or bowl with start of horizontal wall
(Fort) level of find context: **4**
Count: 1 (complete base)
Dimensions in cm: diameter: 3.4 (exterior diameter footring)

CA.D106 bowl
Find type: footring of small bowl, Bienert 2007 Form 69?
Description: footring of a bowl
Dating (as accepted in literature): 1st to 4th century (Bienert 2007, 192)
(Fort) level of find context: **post**
Count: 1 (complete base)
Dimensions in cm: thickness: 1.9; diameter: 9.6 (exterior diameter footring)

CA.D107 casserole
Find type: type undetermined
Description: rim of casserole
(Fort) level of find context: **4**
Count: 1 (rim fragment)
Dimensions in cm: length: 18.3; width: 4.4

CA.D108 plate
Find type: similarities with small deep plate Bienert 2007 Form 65 ('Schälchen mit Standring, s-förmigen Wandungsverlauf und Steilrand') but this is a very early type (Augustean to last third of 1st century AD)
Description: small vessel with steep walls and thick, triangular-sectioned rim, base is missing
(Fort) level of find context: **4**
Count: 1 (fragment, large part of rim preserved)
Dimensions in cm: thickness: 1.5; diameter: 7.4

CA.D109 plate
Find type: plate Bienert 2007 Form 61? ('Zierliche rund Platten mit Standring und gerundeter Lippe'), Eggers 1951 Typ 116?; Tassinari 1975 Form 91?
Description: rim fragment of a large dish
Dating (as accepted in literature): Bienert 2007 Form 61 dates to the 2nd-3rd centuries AD (Bienert 2007, 181)
(Fort) level of find context: **4**
Count: 1 (rim fragment)
Dimensions in cm: length: 25.8; thickness: 1.6

CA.D110 plate
Find type: plate Eggers 1951 Typ 120? ('Runde Bronze-Tabletts vom Typus Gehrden')
Description: rim fragment of round plate
References to parallels: cf. Eggers 1951
(Fort) level of find context: **4+5+post**
Count: 1 (rim fragment)
Dimensions in cm: thickness: 0.6; diameter: 17.6

CA.D111 plate
Find type: type undetermined
Description: base of a flat plate, with slightly pronounced footring
(Fort) level of find context: **post**
Count: 1 (base fragment)
Dimensions in cm: diameter: 4.9 (exterior diameter footring)

CA.D112 plate
Find type: plate Bienert 2007 Form 79 ('Schälchen met Standring, muschelförmig gerippter Wandung und schlichter Lippe'), Eggers 1951 Typ 107 ('Geriffelte bronzene fussbecken')
Description: deep dish with mussel-shaped relief decoration, with complete profile, although very fragmented; cauldron CA.D088 and plate/dish CA.D112 were found together: the plate was fit in the cauldron
References to parallels: cf. Trier, with references to parallel finds in Italy, Cyprus and *Germania Libera* (Bienert 2007, 190)
Dating (as accepted in literature): from 1st century AD onwards (Bienert 2007, 202)
(Fort) level of find context: **4**
Count: 1 (nearly complete)
Dimensions in cm: length: 6.1 (height); diameter: 29.3

CA.D113 dish/plate
Find type: plate Bienert 2007 Form 71 ('Niedrige Schälchen mit Flachboden, gewölbter Wandung und Horizontalrand'), Tassinari 1975 Form 70
Description: complete profile of small dish with curved horizontal rim
Dating (as accepted in literature): 1st century according to Bienert 2007, 195, which is however not in line with the find context here
(Fort) level of find context: **4**
Count: 1 (complete profile, only *c.* one third preserved)
Dimensions in cm: thickness: 1.6; diameter: 9.8 (exterior diameter)

CA.D114 dish/plate
Find type: similar to Bienert 2007 Form 71 ('Niedrige Schälchen mit Flachboden, gewölbter Wandung und Horizontalrand') but seen as an early type (1st century AD: Bienert 2007, 195)
Description: complete profile of a small simple dish with horizontal flat rim, only part of the edge broken off; corroded onto a limestone fragment
References to parallels: cf. Trier: Bienert 2007 Form 71
Dating (as accepted in literature): 1st century according to Bienert 2007, 195, which is however not in line with the find context here
(Fort) level of find context: **4**
Count: 1 (large part of rim not preserved)
Dimensions in cm: diameter: >16.8

CA.D115 dish
Find type: dish Bienert 2007 Form 75-76 ('Schälchen mit herabgezogenem Rand')
Description: base and wall fragment of a deep plate
References to parallels: cf. Trier: Bienert 2007 Form 75-76
Dating (as accepted in literature): Flavian to ? (Bienert 2007, 199)
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: thickness: 3.5 (height); diameter: *c.*19.0?

CA.D116 vessel, undetermined
Description: thin sheet, fragmented, with concentric lines, possibly base of plate
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: diameter: 6.1

CA.D117 spoon
Find type: spoon Crummy 1983 type 3 'spoon with mandolin-shaped bowl'; Riha and Stern 1982 type '*cochlearia* mit beutelförmiger Laffe'
Description: spoon bowl with mandolin or bag shape
References to parallels: cf. Colchester (UK): Crummy 1983; Augst and Kaiseraugst (CH): Riha and Stern 1982
Dating (as accepted in literature): second half 2nd century throughout the rest of the Roman period (Riha and Stern 1982, 24)
(Fort) level of find context: **3**
Count: 1 (spoon bowl complete)
Dimensions in cm: length: 4.1; width: 2.4

CA.D118 spoon
Find type: spoon Crummy 1983 type 3 'spoon with mandolin-shaped bowl'; Riha and Stern 1982 type '*cochlearia* mit beutelförmiger Laffe'
Description: spoon bowl with mandolin or bag shape
References to parallels: cf. CA.D117
Dating (as accepted in literature): cf. CA.D117
(Fort) level of find context: **4? (end)**
Count: 1 (spoon bowl complete)
Dimensions in cm: length: 4.9; width: 3.0

CA.D119 spoon
Find type: spoon Crummy 1983 type 2 'spoon with pear-shaped bowl'; Riha and Stern 1982 type '*cochlearia* mit abgesenkter, birnenförmiger Laffe und glattern, nadelförmigem Stiel von rundem Quernschnitt'
Description: spoon bowl with pear shape
References to parallels: cf. Colchester (UK): Crummy 1983; Augst and Kaiseraugst (CH): Riha and Stern 1982, 17
Dating (as accepted in literature): end 1st century throughout the rest of the Roman period (Riha and Stern 1982, 24); according to the British data collected by Crummy the type was in use from the first half of the 2nd century AD onwards (Crummy 1983, 39)
(Fort) level of find context: **4+5**
Count: 1 (spoon bowl complete)
Dimensions in cm: length: 3.7; width: 2.3

CA.D120 spoon
Find type: spoon Crummy 1983 type 2 'spoon with pear-shaped bowl'; Riha and Stern 1982 type '*cochlearia* mit abgesenkter, birnenförmiger Laffe und glattern, nadelförmigem Stiel von rundem Quernschnitt'
Description: spoon bowl with pear shape, identical to CA.D119
References to parallels: cf. CA.D119
Dating (as accepted in literature): cf. CA.D119
(Fort) level of find context: **4+5**
Count: 1 (spoon bowl complete)
Dimensions in cm: length: 3.8; width: 2.3

CA.D/C121 repair plate
Find type: rectangular
Description: almost complete, but fragmented and badly preserved plate with rivetted edges
References to parallels: repair plates are known for the reparation of vessels; cf. *e.g.* Bienert 2007, 157: Kat.-Nr. 174 (finds from a well at Wederath, Trier region (G)); Nieuwenhagen (NL): Hiddink 2004, 19-20: 5a (4255) (small repair plate on the inside of a jug Eggers 1951 Typ 128)
(Fort) level of find context: **4**
Count: 1 (nearly complete)
Dimensions in cm: length: 11.0; width: 3.5

CA.D/C122 repair plate
Find type: rectangular
Description: complete, small, rectangular repair plate edged with rivets
References to parallels: cf. CA.D/C121
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 5.4; width: 3.9

CA.D/C123 repair plate
Find type: undetermined
Description: fragment of folded plate edged with rivets
References to parallels: cf. CA.D/C121
(Fort) level of find context: **4**
Count: 1 (fragments)
Dimensions in cm: length: 7.2; width: 3.8

CA.D/C124 repair plate
Find type: rectangular
Description: fragment (short side) of rectangular plate edged with rivets
References to parallels: cf. CA.D/C121
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 5.1; width: 2.0

CA.D/C126 repair plate
Find type: undetermined
Description: part of sheet with rivetted edges, folded
References to parallels: cf. CA.D/C121
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 5.3; width: 3.2

CA.D/C127 repair plate
Find type: rectangular
Description: small rectangular plate with rivetted edges
References to parallels: cf. CA.D/C121
(Fort) level of find context: **5**
Count: 1 (complete but badly preserved)
Dimensions in cm: length: 5.3; width: 3.4

CA.D/C125 repair plate
Find type: rectangular
Description: complete, rectangular plate with rivetted edges
References to parallels: cf. CA.D/C121
(Fort) level of find context: **4+5**
Count: 1 (complete)
Dimensions in cm: length: 15.6; width: 6.4

CA.D/C128bis repair plate
Find type: rectangular, folded
Description: folded plate edged with rivets
References to parallels: cf. CA.D/C121
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 7.4; width: 8.5 (max. width)

CA.E01 *stylus*
Find type: simple type
Description: simple *stylus* with flat-sectioned scraping end, other end broken off; the stem is bent locally
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 7.1; width: 1.2 (head)

CA.E02 *stylus*
Find type: *stylus* Schaltenbrand Obrecht 2012 Formgruppe P53
Description: stem with thickened round-sectioned part, with *stylus* point broken off, rest of the stem is octogonal, other side of the stem damaged but minimal collar indicates the start of the erasing blade
References to parallels: cf. Augst (CH): Schaltenbrand Obrecht 2012, 160; Colchester (UK): Crummy 1983, 104: Fig. 107, 2534. On Plate CCXLII the latter is presented in comparison to CA.E02, same scale
Dating (as accepted in literature): mid 2nd – first half 3rd century AD (Schaltenbrand Obrecht 2012, 161)
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 8.5

CA.E03 handle of wax *spatula*
Description: solid, semi-conical item with flattened top, broken off at the other end where a long, probably iron, blade was fastened but due to conservation attachment no longer visible
References to parallels: cf. Saalburg (G), fort: observation author, in permanent museum exhibition (no reference found)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 6.2; width: 2.1

CA.F01 statuette
Find type: ram
Description: animal statue on pedestal, most likely a ram; the ram is a beast of Mercury, the patron of merchants and of flocks and herds (Crummy 1983, 145)
References to parallels: At Colchester, a ram statue of similar dimensions was found as a terracotta figurine (Crummy 1983, 145)
(Fort) level of find context: **3+4**
Count: 1 (complete, but badly preserved)
Dimensions in cm: length: 4.9; diameter: 3.4 (diameter of base)

CA.F02 statuette
Find type: undetermined figure
Description: fragment of foot with toes of small statue
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 1.2; thickness: 1.5 (thickness of wall)

CA.F03 statuette
Find type: Mars
Description: representation of Mars, with helmet and shield; left leg and lance are missing
References to parallels: cf. Kruishoutem (B) (several similar statues of Mars found): Vermeulen 1992, 134, 135: Fig. 80, Rogge and Vermeulen 1993, 146-149, Parent 1986; Blicquy (B): Amand 1975, 30: Fig. 13: 1, 2; Neuvy-en-Sullias (F): Gorget and Guillaumet 2007, 191-193; Boulogne (F), in a context dated to the last quarter of the 3rd century: Belot 1990, 90-95
(Fort) level of find context: **5**
Count: 1 (nearly complete, one leg and lance missing)
Dimensions in cm: height: 7.5

CA.F04 fragment of plastic arts?
Find type: type undetermined
Description: hollow-cast, curved fragment
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 5.7; width: 5.3

CA.E/F05 cymbal
Description: cymbal, almost completely preserved, disc with upstanding edged and central boss with central hole (for the attachment of the leather lug to put the finger through); cymbal, used in pair, one in each hand, associated to religious ceremonies and mainly to rituals related to mother cults (*e.g.* Cybele) (Fort and Tisserand 2011; Tisserand 2013)
References to parallels: similar finds at Autun (F), Dittelsheim (G), Famars (F): see Fort and Tisserand 2011, Tisserand 2013; Grozon (F), Augst (CH), Newel (G), Pompei (I), Tavaux (F): see Artefacts (CYM-4001) with references
Dating (as accepted in literature): AD 100-400 suggested by Artefacts (CYM-4001)
(Fort) level of find context: **4**
Count: 1 (almost complete)
Dimensions in cm: thickness: 2.7 (elevation); diameter: 15.3/14.7

CA.G01 scales arm
Find type: type Rottenburg (cf. Büttner and Schlehofer 2019, 131-135, iron versions)
Description: arm of steelyard with rectangular cross-section, with looped terminal and one looped projection; near the broken off part some markings are visible (short linear marks, indication of weight); corroded onto handle CA.D027
References to parallels: cf. Saalburg (G), fort (AD 105/115-260/270): for markings: cf. steelyard S3245 of the Saalburg collection, type Walbrook, with two scales marked on (one on each side), one with a range from 0 to 6 *librae* 9 *unciae*, one with a range from 5 to 16 *librae*. The linear markings of the Oudenburg item are comparable; type Rottenburg scales are known from finds in *Gallia, Germania, Raetia* and *Britannia* (Büttner and Schlehofer 2019, 131)
Dating (as accepted in literature): mid-1st – end 4th century (Büttner and Schlehofer 2019, 131)
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 20.5; width: 0.9/0.7; thickness: 0.8/0.7

CA.G02 scales terminal and chain with hooks
Find type: fine steelyard, most likely type Eining (cf. Büttner and Schlehofer 2019, 126-131)
Description: terminal of fine steelyard of solid copper alloy, with two complete eyes, arm broken off at third eye; in upper eye, attachment probably for preserved, but loose, hook, with winded eye (only base of winding preserved, eye broken off), through end eye part of chain (one complete and one half link); found loose in same find context, from same individual: suspension chain with division into two chains consisting of eight-shaped links with central winding, each chain holds a hook, one hook with winded wire-eye, the other hook with looped terminal
References to parallels: cf. Richborough (UK): Bushe-Fox 1949, Pl. XXXVIII: 133 (with references); Winchester (UK): Rees *et al.*

2008, 118; Saalburg (G), fort (AD 105/115-260/270): Büttner and Schlehofer 2019, 126 (iron versions), referring to known finds in *Hispania, Gallia, Germania, Raetia, Pannonia, Britannia*; for the suspension chain: cf. Dury (F): Quérel and Feugère 2000, 168: Fig. 141, 156
Dating (as accepted in literature): from early 1st century AD onwards (Büttner and Schlehofer 2019, 126)
(Fort) level of find context: **4**
Count: 1 (several fragments)
Dimensions in cm: length: 3.9 (preserved steelyard terminal); 4.0 (one link); 9.6 (total length winded hook), 8.7 (total length hook with looped terminal); 6.7 (total length upper hook)

CA.G03 scales terminal
Find type: fine steelyard, most likely type Eining (cf. Büttner and Schlehofer 2019, 126-131)
Description: fragment of fine steelyard, circular-sectioned arm with terminal with three looped projections
References to parallels: cf. CA.G02
Dating (as accepted in literature): mid-1st – end 3rd century AD (Büttner and Schlehofer 2019, 119)
(Fort) level of find context: **4**
Count: 1 (not complete, badly preserved)
Dimensions in cm: length: 10.6; thickness: 0.5

CA.G04 scales terminal
Description: solid terminal of arm of fine steelyard, square-sectioned, with facetted head
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: length: 4.4; width: 0.5

CA.G05 steelyard terminal
Find type: large steelyard with wooden measuring bar and bronze terminals
Description: part of steelyard, circular-sectioned, with one preserved terminal, one eye on shaft, for attachment on wooden scales bar: (see Garbsch 1994; Franken 1993, 100-102; Büttner and Schlehofer 2019, 138-139)
References to parallels: cf. Trier (G): Garbsch 1994, 276: Fig. 1; Augst (G): Mutz 1983, 28-34: 'Waage 2', 'Waage 3'; Quérel and Feugère 2000, 167-170: Dury (from context of AD 220-250) and Amiens (from context of 3rd century) (both F); Büttner and Schlehofer (2019, 138) discuss the steelyards from the Saalburg and Zugmantel forts and mention finds in *Italia, Gallia, Germania, Britannia, Noricum* and *Pannonia*
Dating (as accepted in literature): end 1st – 3rd century AD according to Franken (1993, 101) but adjusted to mid-1st century to end 4th century AD by Büttner and Schlehofer (2019, 138)
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 8.4; width: 1.2

CA.G06 steelyard terminal
Find type: large steelyard with wooden measuring bar and bronze terminals
Description: terminal of steelyard, circular-sectioned, with eye-end bordered by a transversal disc, and eye on shaft; cf. CA.G05
References to parallels: cf. CA.G05
Dating (as accepted in literature): cf. CA.G05
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 6.1; width: 1.6

CA.G07 steelyard arm
Find type: large steelyard with wooden measuring bar and bronze terminals
Description: fragment of steelyard arm, circular-sectioned, with part of eye on shaft
References to parallels: cf. CA.G05
Dating (as accepted in literature): cf. CA.G05
(Fort) level of find context: **(4+)5**
Count: 1 (fragment)
Dimensions in cm: length: 4.6; width: 1.6

CA.G08 steelyard arm
Find type: large steelyard with wooden measuring bar and bronze terminals
Description: part of arm of heavy steelyard, circular-sectioned, with two eyes
References to parallels: cf. CA.G05
Dating (as accepted in literature): cf. CA.G05
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 9.6; width: 1.2; thickness: 1.9 (elevation)

CA.G09 steelyard arm
Find type: large steelyard with wooden measuring bar and bronze terminals
Description: part of arm of heavy steelyard with originally circular cross-section, with one eye; shaft is bent inwards at one side, the other broken off end is squeezed (misformed by fire?)
References to parallels: cf. CA.G05
Dating (as accepted in literature): cf. CA.G05
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 13.0; width: 2.2

CA.G10 steelyard chain and hook
Find type: steelyard Franken 1993 type Osterburken (Franken 1993, 85-89)
Description: part of chain, consisting of two eight-shaped links (one not completely preserved) with central winding, and hook of large steelyard, solid copper alloy, for heavy weights
References to parallels: parallels known all over the Roman Empire: cf. Franken 1993, 88 (with references)
Dating (as accepted in literature): second half 2nd century – 3rd century AD (Franken 1993, 89)
(Fort) level of find context: **5**
Count: 1 (hook and part of chain complete)
Dimensions in cm: length: 7.3 (link); 17.3 (hook); width: 73.7 (hook)

CA.G11 steelyard hook?
Description: fine hook with round section and smooth surface, comparable to CA.G12; with one curved hook end preserved

(Fort) level of find context: **4**
Count: 1 (not complete; *c.* half preserved)
Dimensions in cm: length: 6.5

CA.G12 steelyard hook
Description: hook with curved arm ending in leaf-shaped point
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 10.9 (total length)

CA.G13 scales weight
Find type: nut-shaped weight
Description: solid copper alloy, nut-shaped weight, with small suspension loop, partly broken off; the weight of now 80 gram (but suspension loop is partly broken off) was most likely originally 81.86 gram, thus representing one *quadrans* or three *unciae* (see Mutz 1983, 7: Tab. 1); possibly belonging to steelyard CA.G02 from the same find context
References to parallels: cf. Augst (CH): Mutz 1983
(Fort) level of find context: **4**
Count: 1 (almost complete; part of eye broken off)
Dimensions in cm: length: 2.9 (with reconstructed loop); diameter: 2.8

CA.G14 scales cursor
Find type: *kantharos*-shaped weight
Description: small weight in the form of a *kantharos*
References to parallels: cf. Richborough (UK): Wilson 1968, Pl. XLVIII: 218; Zülpich-Enzen (G), from sarcophagus *c.* AD 360: Follmann-Schulz 1989, Fig. 5: 31; Liberchies (B), *vicus*: Dewert 2001, 77-78: 34
Dating (as accepted in literature): AD 300-400 suggested by Artefacts (BLC-4002)
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 2.9; diameter: 1.7

CA.G15 scales hook?
Description: small strip with spiral-like shape at one end, broken off, possibly a fragment of a small steelyard hook cf. CA.G02
References to parallels: cf. Oberwinterthur (CH): Hedinger *et al.* 2001, Taf. 70, 13
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 3.5; width: 0.7 (maximum width)

CA.H01 bridle ring
Find type: eye on peg, without brim
Description: ring attached on peg, with smooth transition
(Fort) level of find context: **3+4**
Count: 1 (complete)
Dimensions in cm: length: 9.9; diameter: 4.1 (ring)

CA.H02 bridle ring
Find type: eye on peg with brim
Description: pointed peg with ring on top, seperated by a brim
References to parallels: cf. Aardenburg (NL), fort: Besuijen 2008, 154: 8.58; Kruishoutem (B): Vermeulen 1992, 133: Fig. 77, 10
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 11.1; diameter: 4.4 (ring)

CA.H03 bridle ring
Find type: eye on peg with brim
Description: cf. CA.H02, very well preserved ring
References to parallels: cf. CA.H02
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 4.2; diameter: 3.7 (ring)

CA.H04 bridle ring
Find type: eye on peg with brim
Description: cf. CA.H02, peg broken off
References to parallels: cf. CA.H02
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 5.4; diameter: 4.4 (ring)

CA.H05 bridle ring
Find type: eye on peg with brim
Description: cf. CA.H02, peg broken off
References to parallels: cf. CA.H02
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 4.4; diameter: 4.1 (ring)

CA.H06 bridle ring
Find type: eye on peg with brim
Description: central fragment with mouldings in between the broken off ring and peg
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 2.4

CA.H07 bridle ring
Find type: eye on peg with brim
Description: cf. CA.H02, but ring broken off
References to parallels: cf. CA.H02
(Fort) level of find context: **1>5**
Count: 1 (fragment)
Dimensions in cm: length: 6.3

CA.H08 bridle ring
Find type: eye on peg with brim
Description: cf. CA.H02, small version
References to parallels: cf CA.H02
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 7.8; width: 3.1 (ring)

CA.H09 bridle ring
Find type: eye on peg, without brim
Description: cf. CA.H01, large version, point broken off, with iron peg-with-eye corroded onto
(Fort) level of find context: **5**
Count: 1 (nearly complete, point broken off)
Dimensions in cm: length: 10.3; width: 5.1

CA.H10 bridle ring
Find type: type undetermined
Description: thick ring, slightly oval-shaped, with round cross-section, with start of broken off bar , part of bridle ring
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 5.8; diameter: 5.0 (ring)

CA.H11 bridle ring
Find type: eye on peg, without brim
Description: ring attached on peg, with smooth transition
(Fort) level of find context: **5+post**
Count: 1 (nearly complete, only point broken off)
Dimensions in cm: length: 9.7; diameter: 4.3

CA.H12 bridle ring
Find type: eye on peg with brim
Description: cf. CA.H02; ring broken and partly stretched
References to parallels: cf. CA.H02
(Fort) level of find context: **post**
Count: 1 (complete, but damaged)
Dimensions in cm: length: 8.7

CA.H13 bridle ring
Find type: bell-shaped, on ring; Künzl 1993, Type NG 9
Description: lower ring placed cross-wise towards the top ring and covered by a bell-shaped sheet of bronze attached in the middle between both rings; bronze plate fragment corroded onto bell-shaped sheet
References to parallels: cf. Aardenburg (NL), fort: Besuijen 2008, 152-153: 8.49-55; Autun (F) (Pinette 1987, 230: no. 453a); Blicquy (B) (Amand 1975, 36, Fig. 16, 28); Neupotz (G): Künzl 1993, G 22 (context of late 3rd century AD); sites in Bayern (G): Hoffmann 2004, 257: Typentafel K; several finds in *Gallia* listed by Artefacts (AJG-4006)
Dating (as accepted in literature): AD 200-300 suggested by Artefacts (APH-4006)
(Fort) level of find context: **3(+2)**
Count: 1 (edge broken off)
Dimensions in cm: length: 7.3; diameter: 3.5 (ring)

CA.H14 bridle ring
Find type: bell-shaped, on ring; Künzl 1993, Type NG 9
Description: cf. CA.H13, very well and completely preserved
References to parallels: cf. CA.H13
Dating (as accepted in literature): AD 200-300 suggested by Artefacts (APH-4006)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 6.8; diameter: 5.5 (bell); 3.2 (ring)

CA.H15 bridle ring
Find type: bell-shaped, on ring; Künzl 1993, Type NG 9
Description: cf. CA.H13, completely preserved
References to parallels: cf. CA.H13
Dating (as accepted in literature): AD 200-300 suggested by Artefacts (APH-4006)
(Fort) level of find context: **4+5+post**
Count: 1 (complete)
Dimensions in cm: length: 6.4; diameter: 4.9 (bell); 3.7 (ring)

CA.H16 bridle ring
Find type: bell-shaped, on ring; Künzl 1993, Type NG 9
Description: cf. CA.H13, completely preserved
References to parallels: cf. CA.H13
Dating (as accepted in literature): AD 200-300 suggested by Artefacts (APH-4006)
(Fort) level of find context: **4+5+post**
Count: 1 (complete)
Dimensions in cm: length: 7.6; diameter: 5.0 (bell); 3.8 (ring)

CA.H17 bridle ring
Find type: bell-shaped, on ring; Künzl 1993, Type NG 9
Description: cf. CA.H13, very well and completely preserved
References to parallels: cf. CA.H13
Dating (as accepted in literature): AD 200-300 suggested by Artefacts (APH-4006)
(Fort) level of find context: **5+post**
Count: 1 (complete)
Dimensions in cm: length: 6.6; diameter: 4.6 (bell); 3.6 (ring)

CA.H18 bridle ring
Find type: bell-shaped, on peg
Description: cf. CA.H13 but instead of lower ring a rectangular peg (in this case broken off)
(Fort) level of find context: **4+5+post**
Count: 1 (peg broken off)
Dimensions in cm: length: 5.8; diameter: 5.2 (bell); 3.2 (ring)

CA.H19 bridle ring
Find type: bell-shaped, on peg
Description: cf. CA.H18
(Fort) level of find context: **4+5+post**
Count: 1 (peg broken off)
Dimensions in cm: length: 7.2; diameter: 5.4 (bell); 4.0 (ring)

CA.H20 bridle ring
Find type: eye on peg?
Description: cf. CA.H02?, but very large version of ring, and peg and large part of ring broken off
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 4.1

CA.H21 bridle ring
Find type: bell-saddle-shaped, on ring
Description: ring with loop beneath protective masking, top ring and lower ring placed in the same direction and separated by harness-shaped sheet
References to parallels: cf. Autun (F): Pinette 1987, 230: no. 453b; similar bridle rings found in Morocco, closest parallel: Boube-Piccot 1980, 79: no. 47
(Fort) level of find context: **post**
Count: 1 (complete, but squeezed)
Dimensions in cm: length: 6.7; diameter: 3.9 (ring)

CA.H22 bridle ring
Find type: undetermined, only ring preserved
Description: ring but transition to lower part of bridle ring unclear due to corroded piece
(Fort) level of find context: **4+5+post**
Count: 1 (fragment)
Dimensions in cm: length: 5.5; diameter: 4.3 (ring)

CA.H23 bridle ring
Find type: 'special type'
Description: ring on top of a two-partite, flared cylinder, with originally two rings attached to the bottom for attachment to the wood support tube
References to parallels: cf. Cologne (G): Liesen and Boelicke 1999, 383: Abb. 25, B/211; Unterpleichfeld (G): Hoffmann 2004, Taf. 41, 8; Long Pont (Thorembais-Saint-Trond) (B): Mariën 1979, Taf. 4, 2 (found in *tumulus* grave of first half of the 3rd century AD)
Dating (as accepted in literature): the two bridle rings of this type from Long Pont were found in a *tumulus* grave of the first half of the 3rd century AD (Mariën 1979, 95)
(Fort) level of find context: **4+5**
Count: 1 (nearly complete)
Dimensions in cm: length: 8.4; diameter: 2.9 (ring)

CA.H24 bridle ring
Find type: 'special type', undetermined
Description: upper half of bridle ring with baluster element on top of ring; the lower half with supposed peg and two large arms is broken off
References to parallels: possibly comparable to find at Volubilis (M): Boube-Piccot 1980, Pl. 21
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: length: 7.1; diameter: 3.4

CA.H25 bridle ring
Find type: saddle-shaped
Description: yoke fitting with a saddle-shaped upper side, shaped and decorated as a rozette, with ring attached to the underside
References to parallels: cf. Cologne (G): Schleiermacher 1996, 288: Abb. 100: d, but here with elaborate underside underneath saddle-shaped disc
(Fort) level of find context: **3/4**
Count: 1 (complete)
Dimensions in cm: length: 2.7 (height); width: 4.7

CA.H26 bridle ring
Find type: saddle-shaped
Description: yoke fitting with a saddle-shaped upper side with a ring attached to it
References to parallels: cf. Aardenburg (NL), fort: Besuijen 2008, 155: 8.62; Nicolay 2007, 251, fig. 6.6, no. 8
Dating (as accepted in literature): Flavian – end 3rd century AD (Nicolay 2007)
(Fort) level of find context: **5+post**
Count: 1 (nearly complete, part of edge broken off)
Dimensions in cm: length: 2.6 (height); width: 4.5

CA.H27 bridle ring
Find type: saddle-shaped
Description: bridle ring consisting of circurlar-sectioned rod flanked by two discs and covered by saddle-shaped sheet decorated as rozette, cf. CA.H25
References to parallels: cf. CA.H25
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 3.4 (height); width: 3.8

CA.H28 bridle ring
Find type: disc with eyelet
Description: disc with ring on top and rectangular link and hooked peg below for attachment
References to parallels: no parallels found in literature
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: diameter of disc: 8.0

CA.H29 bridle ring
Find type: disc with eyelet
Description: cf. CA.H28
(Fort) level of find context: **(4+)5**
Count: 1 (complete)
Dimensions in cm: diameter of disc: 8.0

CA.H34 charriot fitting
Find type: tubular fitting, possibly fitting on the terminal of the vertical beams of a charriot
Description: circular-sectioned hollow tube, with rounded top with central dent and concentric grooves, with ridges below the top and at the base, with two opposite perforations above the base ridge; cf. CA.H35
References to parallels: cf. CA.H35
Dating (as accepted in literature): cf. CA.H35
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 6.5; width: 2.6; thickness: ; diameter:

CA.H35 charriot fittings
Find type: tubular fitting, possibly fitting on the terminal of the vertical beams of a charriot
Description: circular-sectioned hollow tube, with rounded top with central dent and concentric grooves, with ridges below the top and at the base, with two opposite perforations above the base ridge; found close to CA.H34 but in post-Roman level (dug-up item)
References to parallels: cf. Autun (F): Pinette 1987, 230: no. 460; Dury (F): Quérel and Feugère 2000, 56, 174: Fig. 147: no. 171 (with list of similar finds at Paris, Bavay (both F) and Sarmizegetusa (RO) (with references)); several similar fittings found on Roman sites in Morocco: Boube-Piccot 1980, 62-65: no. 23-28
Dating (as accepted in literature): at Dury context dated to the second quarter of the 3rd century
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 5.5; width: 2.6

CA.H36 harness bell
Find type: bell Künzl 1993 Type NJ 3
Description: simple conical bell with a faceted shoulder and a large round suspension loop, with part of the iron clapper; identifiable as harness bell for draft animal, but according to Nicolay 2007, 57-58 also part of the trappings for a horse
References to parallels: cf. Aardenburg (NL): Besuijen 2008, 144: 8.5; cf. Oldenstein 1976, Taf. 56: found at several military sites along the Upper Germanic and Rhaetian Limes; Wange (B): Lodewijckx *et al.* 1993, 84: Fig. 10: 4.21 (3rd-century context); cf. Nicolay 2007, 406: Pl. 95: type E (found at several Dutch sites); Neupotz: Künzl 1993, J 24 (context of late 3rd century AD)
Dating (as accepted in literature): 2nd – 3rd century AD (Nicolay 2007, 57-58)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 4.4; diameter: 4.5 (base of bell)

CA.H37 harness bell
Find type: bell Richborough type 3 (Lyne, unpublished catalogue metal finds Richborough fort)
Description: piramidal bell with rectangular base and simple suspension loop on top, with iron clapper, no decoration visible
References to parallels: cf. Richborough (UK), fort: Bushe-Fox 1926, Pl. XIII, 15, Bushe-Fox 1932, Pl. X: 18; Liberchies (B), *vicus*: Vilvorder 2015, 169: no. 137-140
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 3.9; width: 3.5; thickness: 2.1

CA.H?38 ship nail?
Find type: spike from shell-first constructed galleys of mediterranean type?
Description: used spike, only upper part preserved, shank bent
References to parallels: cf. Richborough: Lyne 1996, 148: Fig. 1, 1-4. Lyne interpretes the used and extracted bronze nails from contexts from Richborough spanning the entire Roman occupation of the site from AD 43 to 400+ as originating from the breaking up of old *Classis Britannica* ships during the 1st to 4th centuries (Lyne 1996, 147)
Dating (as accepted in literature): 1st to 4th centuries AD (Lyne 1996)
(Fort) level of find context: **3+4**
Count: 1 (not complete)
Dimensions in cm: length: 5.0; diameter: 1.5 (head)

CA.H?39 ship nail?
Find type: spike from shell-first constructed galleys of mediterranean type?
Description: used spike, complete
References to parallels: cf. CA.H?38
Dating (as accepted in literature): cf. CA.H?38
(Fort) level of find context: **4?**
Count: 1 (complete)
Dimensions in cm: length: 10.5; diameter: 1.8 (head)

CA.H?40 ship nail?
Find type: spike from shell-first constructed galleys of mediterranean type?
Description: spike with lozenge-shaped head, part of shank broken off
References to parallels: cf. CA.H?38
Dating (as accepted in literature): cf. CA.H?38
(Fort) level of find context: **5+post**
Count: 1 (not complete)
Dimensions in cm: length: 4.8; width: 2.1 (head)

CA.H?41 ship nail?
Find type: spike from shell-first constructed galleys of mediterranean type?
Description: used spike, almost complete, point broken off
References to parallels: cf. CA.H?38
Dating (as accepted in literature): cf. CA.H?38
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 8.2; diameter: 1.4 (head)

CA.H?42 ship nail?
Find type: spike from shell-first constructed galleys of mediterranean type?
Description: used spike, point broken off
References to parallels: cf. CA.H?38
Dating (as accepted in literature): cf. CA.H?38
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 6.5; diameter: 2.2 (head)

CA.I01 water tap
Description: tap with rectangular loop on top and perforation through the tube for connection to the pipe line; iron and wood remains in the loop
References to parallels: cf. Köln: Hellenkemper 1986, 197: Abb. 3
(Fort) level of find context: **unstratified**
Count: 1 (complete)
Dimensions in cm: length: 5.3; diameter: 2.5 (maximum diameter)

CA.J01 link
Find type: oval
Description: oval link with oval-shaped cross-section
(Fort) level of find context: **3**
Count: 1 (complete)
Dimensions in cm: diameter: 3.6 x 3.1

CA.J02 link
Find type: round
Description: round link with round cross-section, with iron nail through, corroded together
(Fort) level of find context: **3+4**
Count: 1 (complete)
Dimensions in cm: diameter: 3.6

CA.J03 link
Find type: round
Description: round link with oval cross-section
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: diameter: 2.3

CA.J04 link
Find type: round
Description: round link with round cross-section
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: diameter: 2.6

CA.J05 link
Find type: round
Description: round link with oval? cross-section (not well preserved)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: diameter: 2.9

CA.J06 link
Find type: round
Description: round link with oval cross-section
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: diameter: 4.0

CA.J07 link
Find type: round
Description: round link with round cross-section
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: diameter: 4.1

CA.J08 link
Find type: round
Description: round link with round cross-section
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: diameter: 4.5

CA.J09 link
Find type: round
Description: round link with lozenge-shaped cross-section
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: diameter: 4.3

CA.J10 link
Find type: round
Description: two round links, round-sectioned of different size, corroded onto each other
(Fort) level of find context: **4+5**
Count: 2 (complete)
Dimensions in cm: diameter: 2.8 and 1.9

CA.J11 link?
Description: flat strip folded as a penannular link, but squeezed
(Fort) level of find context: **5**
Count: 1 (almost complete)
Dimensions in cm: width: 2.5

CA.J12 link
Find type: round
Description: round link with round cross-section
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: diameter: 3.4

CA.J13 link
Find type: round
Description: round link with round cross-section
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: diameter: 4.2

CA.J14 link
Find type: round
Description: small round link with round cross-section
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: diameter: 1.8 x 2.0

CA.J15 link
Find type: round
Description: round link with semi-rounded cross-section
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: diameter: 2.4

CA.J16 link
Find type: round
Description: thick round link with semi-rounded cross-section
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: diameter: 3.2

CA.J17 link
Find type: round
Description: link with round cross-section, with small link attached to it, consisting of a folded strip with overlapping terminals
(Fort) level of find context: **post**
Count: 1 (complete link)
Dimensions in cm: diameter: 3.6

CA.J18 link
Find type: round
Description: round link with oval cross-section
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: diameter: 4.6

CA.J19 link
Find type: round/folded
Description: strip folded as a round link, oval cross-section
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: diameter: 1.9

CA.J20 link with two windings
Find type: round/with windings
Description: link with two windings wit overlaying threads, multiple functions possible
References to parallels: *in situ* find at Amiens (F) (attached to steelyard) from context of AD 220-250 (see Quérel and Feugère 2000, 170: Fig. 143) and at Fishbourne (UK) (attached to possible lamp holder) (Cunliffe 1971, 114: Fig. 45, 99)
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: diameter: 1.2

CA.J21 link
Find type: rectangular
Description: rectangular link with flat rectangular cross-section
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 1.3; width: 1.5; thickness: 0.8

CA.J22 link
Find type: cylindrical
Description: cylindrical-shaped fitting, slightly tapering
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 2.2; diameter: 2.3 (max. diam.)

CA.J23 fitting
Find type: divider?
Description: complete, rectangular piece with central rectangular perforation at both sides
(Fort) level of find context: **4+5**
Count: 1 (complete)
Dimensions in cm: length: 5.2; width: 1.6

CA.J24 binding
Find type: strip fitting
Description: two fragments of long, flat strip, partly folded double (of furniture or military equipment?)
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: *c.* 2.2; width: 0.1 – 0.2

CA.J25 fitting
Find type: small strip fitting
Description: small strip with round eye terminal
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 6.3; width: 0.4

CA.J26 binding
Find type: strip fitting
Description: part of curved thick strip binding, rectangular-sectioned
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 7.0; width: 1.4

CA.J27 binding
Find type: strip fitting
Description: two strips of copper alloy attached together by means of two copper alloy nails, fragment of larger fitting
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 3.0

CA.J28 fitting
Find type: rod with eyelet
Description: bent wire attached through eye-terminal of split pin
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 2.3 (split pin)

CA.J29 fitting
Find type: hook fitting
Description: fine hook with eye-ending, with small nail through eye
(Fort) level of find context: **unstratified**
Count: 1 (complete)
Dimensions in cm: length: 5.7 (total length of hooked rod); 2.2 (nail)

CA.J30 connected links
Description: fragment of very fine chain with three small, fine, oblong, rounded links
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: length: 1.0 (one link)

CA.K01 undetermined, part of machinery?
Description: copper alloy sheet, showing rivets near the broken off part, with the edge enclosed in a thick iron strip; at the backside, an iron bar is corroded onto the sheet
(Fort) level of find context: **5**
Count: 1 (large fragment)
Dimensions in cm: max. length: 20.9; max. width: 9.6

CA.K02 undetermined
Find type: acorn-shaped
Description: solid, acorn-shaped item, topped with a stem; broken off attachment on the centre of the base; terminal of handle? however, the stem is remarkably wide; or is this an unfinished product with a stem which needs to be narrowed or removed?)
References to parallels: cf. Liberchies (B): Dewert 2008, 141, 143, Fig. 62: 73, described as acorn-shaped end of handle
(Fort) level of find context: **3**
Count: 1 (not complete)
Dimensions in cm: length: 4.1; diameter: 1.2

CA.K03 undetermined
Find type: acorn-shaped
Description: cf. CA.K02 but here partly hollow, for attachment on something (on handle end?)
References to parallels: cf. CA.K02
(Fort) level of find context: **4?**
Count: 1 (fragment)
Dimensions in cm: length: 4.7; width: 1.4

CA.K04 undetermined
Description: part of a concave-sided item, with transition to a link?
References to parallels: no parallels found in literature
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 3.2

CA.K05 undetermined
Description: disc-shaped, fairly thick sheet, slightly curved
References to parallels: no parallels found in literature
(Fort) level of find context: **4+5**
Count: 1 (complete?)
Dimensions in cm: thickness: 0.3; diameter: 4.2

CA.K06 undetermined
Description: trident-shaped ending on bar, broken off, with rectangular cross-section; terminal of key?
References to parallels: no parallels found in literature
(Fort) level of find context: **4+5**
Count: 1 (not complete)
Dimensions in cm: length: 5.3; width: 5.6; thickness: 1.1 (stem)

CA.K07 undetermined
Description: rod with rectangular cross-section with thickened part; both ends broken off
References to parallels: no parallels found in literature
(Fort) level of find context: **1>4**
Count: 1 (fragment)
Dimensions in cm: length: 5.3; width: 0.9

CA.K08 fitting?
Description: unclear sheet fragment with unidentifiable shape, possibly decorative fitting misformed by fire?
(Fort) level of find context: **4**
Count: 1 (fragment?)
Dimensions in cm: length: 4.3

CA.K09 undetermined
Description: part of link attached to part with two intertwisting wires; both ends broken off
References to parallels: no parallels found in literature
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 3.3; width: 2.9

CA.K10 undetermined
Description: sligtly curved rod with three-partite curved end, broken off at both ends
References to parallels: no parallels found in literature
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 4.1

CA.K11 fitting?
Description: flat sheet, rounded triangular-shaped, with three lug-shaped corners each with small perforation, one lug broken
References to parallels: no parallels found in literature
(Fort) level of find context: **unstratified**
Count: 1 (nearly complete)
Dimensions in cm: length: 2.2; width: 2.3

CA.K12 fitting?
Description: complete, open, cylindrical and slightly conical-shaped item (and with conical cross-section), corroded onto copper alloy sheet (related?)
References to parallels: no parallels found in literature
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: thickness: 1.8; diameter: 3.5 (exterior diameter)

CA.K13 fitting?
Description: partly folded, circular sheet, probably fitting for furnishing or military gear
References to parallels: no parallels found in literature
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: >7.0

8. Catalogue of the illustrated iron items

The catalogued iron items are illustrated on Plates CCLVI-CCCXV, following the same order as the following catalogue, according to find domains (cf. Table 3.1). In the catalogue references to parallels and the dating of the find type 'as accepted in literature' are only included when this is valuable and when there are specific data for the find type in question. When the item is not preserved completely, the listed dimensions are those of the preserved part (max. dimensions).

IR.A01 armour breast plate with buckle
Find type: lorica segmentata
Description: fragment of *lorica segmentata* plate with fastening buckle with D-shaped ring, the buckle and ring are corroded onto the buckle plate; no original edge of the *lorica segmentata* is preserved to specify the location of the piece in the cuirass
References to parallels: cf. Corbridge (UK): Allason-Jones and Bishop 1988, 24, 25, 33, 37, 41, all with figures representing reconstruction drawings of the six cuirasses found in the Corbridge hoard which all show the presence of such fastening buckles (context dated to the first quarter of the 2nd century AD (see Allason-Jones and Bishop 1988, 109); Vindonissa (CH): Unz and Deschler-Erb 1997, Taf. 31, 629
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 9.5; width: 6.8

IR.A02 tie-hook
Find type: lorica segmentata tie-hook
Description: fragment of tie-hook consisting of flat rectangular plate, rivetted, with looped stem fastened underneath onto the plate by the rivet
References to parallels: cf. Corbridge (UK): Allason-Jones and Bishop 1988, 24, 25, 49, 50, 51 all with figures representing reconstruction drawings of the six cuirasses found in the Corbridge hoard which all show the presence of such tie-hooks (context dated to the first quarter of the 2nd century AD (see Allason-Jones and Bishop 1988, 109)
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: length: 5.4; width: 2.2

IR.A03 armour
Find type: scale armour (*lorica squamata*)
Description: four fragments of scale armour, each showing part of one row of very corroded small scales; some rivets are still visible
(Fort) level of find context: **4**
Count: 1 (fragments)
Dimensions in cm: largest fragments: length: 6.6 and 4.3; width: 2.6 and 2.7

IR.A04 armour
Find type: chain mail (*lorica hamata*)
Description: fragment of mail, iron rings
(Fort) level of find context: **3/4**
Count: 1 (fragment)
Dimensions in cm: length: 8.0; width: 4.5

IR.A05 armour
Find type: chain mail (*lorica hamata*)
Description: small piece of mail, iron rings
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 2.8; width: 1.9

IR.A06 armour
Find type: chain mail (*lorica hamata*)
Description: small fragment of mail, iron rings
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 3.6; width: 2.6

IR.A07 armour
Find type: chain mail (*lorica hamata*)
Description: small fragment of mail, iron rings
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 4.5; width: 3.0

IR.A08 armour
Find type: chain mail (*lorica hamata*)
Description: fragment of mail, iron rings
(Fort) level of find context: **unstratified**
Count: 1 (fragment)
Dimensions in cm: length: 7.0; width: 5.0

IR.A09 armour
Find type: chain mail (*lorica hamata*)
Description: fragment of mail, iron rings with copper alloy rivets (insertion of copper rivets in the mail iron rings)
References to parallels: the insertion of copper-alloy rivets in mail iron rings has been attested at finds from Thorsberg (G), Dura-Europos (S) and Maastricht (NL) by Wijnhoven (2015, 27)
Dating (as accepted in literature): according to Wijnhoven (2015, 27) this decorative technique appears to be a relatively late phenomenon; the earliest finds date to the 3rd century AD
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 10.7; width: 7.3

IR.A10 armour
Find type: chain mail (*lorica hamata*)
Description: fragment of mail, iron rings with copper alloy rivets (insertion of copper rivets in the mail iron rings)
References to parallels: cf. IR.A09
Dating (as accepted in literature): cf. IR.A09
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 8.3; width: 5.3

IR.A11 armour
Find type: chain mail (*lorica hamata*)
Description: fragment of chain mail, iron rings with copper alloy rivets (insertion of copper rivets in the mail iron rings)
References to parallels: cf. IR.A09
Dating (as accepted in literature): cf. IR.A09

(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 6.0; width: 5.6

IR.A14 scabbard chape
Find type: scabbard chape Miks 2007 type 'Eiserne Dosenortband' Form-Variante 1 'mit flachen Deckeln', Oldenstein 1976 'Eiserne tauschierte Dosenortband'
Description: iron disc chape with niello decoration but badly preserved, piece of iron corroded onto; CT scanning revealed linear decoration on both sides of the scabbard chape consisting of concentric bands and crossing lines
References to parallels: cf. Upper Germanic and Rhaetian Limes: Oldenstein 1976, Taf. 22-24: 138-137 (with finds from Eining, Hofstett/Geislingen, Niederbieber, Heddernheim, Zugmantel (all G)); Miks 2007, Taf. 254: B13,51 (Augst (CH), *c.* AD 275-276); one side of the scabbard chape of Oudenburg comparable to Miks 2007, Taf. 256: B200,30-31 (both from Niederbieber (G), fort) and to scabbard chapes found at Insula 519, Raum A at Augst (Ammann and Schwarz 2011, 198: Abb. 177, 670-671 (find context of the 3rd century AD)
Dating (as accepted in literature): end 2nd – end 3rd century AD (Miks 2007, 354-355), mainly 3rd century AD (Oldenstein 1976, 123)
(Fort) level of find context: **3**
Count: 1 (nearly complete)
Dimensions in cm: length: 6.9; thickness: 1.6

IR.A15 ferrule
Find type: conical ferrule
Description: closed, conical socket, with remains of wood inside, likely the protection of the butt of a spear, however, Manning (1985, 141) points out that such ferrules could also protect the butt of other staffs
References to parallels: cf. Manning 1985, 140-141, Pl. 66; cf. *e.g.* Wales (UK): Chapman 2005, 41-42
(Fort) level of find context: **4+5**
Count: 1 (nearly complete)
Dimensions in cm: length: 7.7; diameter: 2.0

IR.A16 ferrule
Find type: conical ferrule
Description: closed, conical socket cf. IR.A15
References to parallels: cf. IR.A15
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 7.3; diameter: 2.8

IR.A17 lance- or spearhead
Find type: leaf-shaped, small
Description: oval, leaf-shaped, rather wide, flat blade with transition to shaft
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 4.6; width: 2.0

IR.A18 lance- or spearhead
Find type: leaf-shaped
Description: long, leaf-shaped blade, no midrib, with rounded, high shoulders and closed socket; point of spearhead broken off
References to parallels: cf. Manning 1985, Pl. 78: V86
(Fort) level of find context: **2**
Count: 1 (not complete)
Dimensions in cm: length: 14.0; width: 3.0 (blade)

IR.A19 lance- or spearhead
Find type: narrow-bladed
Description: spearhead with narrow blade, badly preserved
(Fort) level of find context: **2**
Count: 1 (not complete)
Dimensions in cm: length: 12.2; width: 1.1 (blade)

IR.A20 lance- or spearhead
Find type: narrow-bladed
Description: long, narrow blade cf. IR.A21, point broken off, with long, closed socket
(Fort) level of find context: **3**
Count: 1 (not complete)
Dimensions in cm: length: 14.8; width: *c.* 2.1 (blade)

IR.A21 lance- or spearhead
Find type: narrow-bladed
Description: complete, long spearhead, with narrow flat blade with minimal shoulders and slight midrib, closed socket
References to parallels: cf. Manning 1985, Pl. 79: V106-108
(Fort) level of find context: **3**
Count: 1 (complete)
Dimensions in cm: length: 24.0; width: 2.5 (max. width blade)

IR.A22 lance- or spearhead
Find type: broad-bladed
Description: very badly preserved fragment of a spearhead with broad blade and tang
(Fort) level of find context: **3**
Count: 1 (fragment)
Dimensions in cm: length: 10.2; width: 4.7 (blade)

IR.A23 lance- or spearhead
Find type: broad-bladed
Description: very badly preserved, broad blade with damaged edges, with strong midrib and closed socket
References to parallels: cf. Manning 1985, Pl. 81: V135
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 10.3; width: 4.5 (blade)

IR.A24 lance- or spearhead
Find type: broad-bladed
Description: wide, flat blade with rounded shoulders, no midrib, top and base broken off
References to parallels: cf. Manning 1985, Pl. 81: V138
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 10.0; width: 5.6

IR.A25 lance- or spearhead
Find type: broad-bladed
Description: large spearhead with long socket and rather short blade, rather broad blade with marked shoulders, no midrib, with closed socket
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 19.0; width: 4.3 (blade)

IR.A26 lance- or spearhead
Find type: leaf-shaped
Description: very damaged, long, leaf-shaped blade with low, rounded shoulders and strong midrib and very short closed socket
(Fort) level of find context: **4+5**
Count: 1 (nearly complete)
Dimensions in cm: length: 14.7; width: 3.5 (blade)

IR.A27 lance- or spearhead
Find type: lozenge-shaped
Description: lozenge-shaped blade with slight midrib, with rounded high shoulders and closed socket
References to parallels: cf. Manning 1985, Pl. 76: V32, 34
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 14.3; width: 3.2 (blade)

IR.A28 lance- or spearhead
Find type: leaf-shaped
Description: large spearhead with long, closed socket (with remains of wood) and rather short, leaf-shaped blade with high, rounded shoulders and midrib; point broken off
(Fort) level of find context: **5**
Count: 1 (not complete)
Dimensions in cm: length: 20.0; width: 3.5 (blade, at section)

IR.A29 lance- or spearhead
Find type: leaf-shaped
Description: large spearhead with rather short blade with midrib and high, rounded shoulders and long, closed socket
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 27.0; width: 3.8 (blade)

IR.A30 lance- or spearhead
Find type: leafshaped, narrow
Description: complete, narrow, leaf-shaped blad with open socket
References to parallels: cf. Manning 1985, Pl. 78: 89, 92
(Fort) level of find context: **unstratified** (from 'mixed level' (contaminated with post-Roman level))
Count: 1 (complete)
Dimensions in cm: length: 9.3; width: 2.3 (blade)

IR.B01 buckle
Find type: D-shaped buckle
Description: complete, small, simple, D-shaped buckle, smaller version than IR.B03
References to parallels: cf. IR.B03, small version
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 2.8; width: 2.3

IR.B02 buckle
Find type: ring-buckle
Description: possibly ring-buckle, with possibly copper alloy transversal plate where the pin was attached; too corroded to distinguish more
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: diameter (exterior): 3.8

IR.B03 buckle
Find type: D-shaped buckle
Description: simple, D-shaped buckle
References to parallels: cf. *e.g.* Manning 1985, 146-147, Pl. 71, T6 with references to finds in Britain and Germany. These buckles can be part of military armour or could be attached on a leather belt
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 7.0; width: 4.4

IR.C01 anvil
Find type: block anvil Manning 1985 type 2, Duvauchelle 2005 type 1b
Description: complete, large block anvil with eyelet (hardy-hole according to Manning 1985, punching-hole according to Crummy 2011, 72), weight: 63.0 kg; the anvil was corroded onto an iron bell (IR.H16) forming an enormous corroded block
References to parallels: cf. Avenches (F): Duvauchelle 2005, 18-19; Wijnegem (B): Cuyt and Clerbaut 2015; Rebière *et al.* 1995 investigated comparable finds in France, with references; the anvil of Oudenburg is larger than the known examples in France, but has similar dimensions to the one found at Wijnegem (Cuyt and Clerbaut 2015, 43); Gaitzsch lists four comparable block anvils from Pompei (I): see Gaitzsch 1980, 341-342: 8, 9, 10, 11 and Taf. 2, 8 (with heights of 19.0, 17.5, 21.0 and 18.0 and respective sides of 14.0 x 14.0, 17.0 x 17.0, 16.0 x 16.0 and 16.0 x 16.0); a block anvil of similar height but with a more slender shape was found at the fort of Ellingen (G): Zanier 1992, 190-191, Taf. 30: C99 (height: 25.8 cm; top: 15.2 x 15.4 cm; base: 12.4 x 11.6 cm; weight: *c.* 38.5 kg, with references to the rare anvil finds in the Roman Empire
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 24.5 to 25.0 (height); width: top: 21.0 x 21.0; base: 15.0 x 16.0

IR.C02 hammer
Find type: smith's hammer
Description: complete hammer with block terminal and thin flat terminal, with elevated shaft block, for fine forging activities
References to parallels: cf. Bibracte (F): Mölders 2010, 119: Fig. 50: 2
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 14.5; width: 3.2

IR.C03 hammer
Find type: straight-peen hammer (?)
Description: almost complete hammer with vertical, pointed, truncated end; other end is broken off but was possibly identical
References to parallels: no exact parallels found in literature, but comparisons with Manning 1976, 47: Fig. 14, 52
(Fort) level of find context: **4** (final phase)
Count: 1 (nearly complete)
Dimensions in cm: length: 16.4; width: 3.6 (central)

IR.C04 hammer
Find type: cross-peen hammer
Description: hammer with block shape on one side and a chisel-edge on the other
References to parallels: cf. Avenches (F): Duvauchelle 2005, Pl. 2: 8; Saalburg, Feldberg, Zugmantel (G): Pietsch 1983, Taf. 6: 88, 90, 91
(Fort) level of find context: **4+5**
Count: 1 (complete)
Dimensions in cm: length: 20.2; width: 4.4 (central); thickness: 4.4

IR.C05 hammer
Find type: smith's hammer Pietsch 1983 type 'Finnenhammer'
Description: small hammer with a block terminal and a sharp flat end, used to do repoussé work, punching and other light forging work (Pietsch 1983, 23)
References to parallels: cf. Avenches (F): Duvauchelle 2005, Pl. 3: 14; Saalburg, Feldberg, Zugmantel (G): Pietsch 1983, Taf. 6: 97
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 7.1; width: 2.0

IR.C06 hammer
Description: hammer with curved claw
References to parallels: no parallels found in literature
(Fort) level of find context: **unstratified**
Count: 1 (complete)
Dimensions in cm: length: 9.6; width: 3.4 (central)

IR.C07 hammer
Description: block-shaped backside of a hammer, cf. IR.C06
(Fort) level of find context: **3**
Count: 1 (fragment)
Dimensions in cm: length: 20.2; width: 3.7; thickness: 3.5; diameter of the eye: 2.3

IR.C08 hammer?
Description: possibly central fragment of hammer
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 7.1; width: 3.9; thickness: 3.6

IR.C10 chisel
Find type: cold chisel
Description: complete chisel with hammered top and pointed flat end; strong, stout chisel used for cutting cold metal, is usually struck with a sledge-hammer
References to parallels: cf. Manning 1985, Pl. 5, A22; Saalburg, Feldberg, Zugmantel (G): Pietsch 1983, Taf. 11: 222-235; Bibracte (F): Mölders 2010, 123: Fig. 54 , 134: Fig. 65; Verulamium (UK): Manning 1972a, 164: Fig. 60, 2, 3
(Fort) level of find context: **4+5**
Count: 1 (complete)
Dimensions in cm: length: 11.8; width: 1.9 (base), 1.5 (point)

IR.C11 chisel
Find type: cold chisel
Description: complete chisel with hammered top and pointed flat end
References to parallels: cf. IR.C10; Manching: Jacobi 1974, Taf. 6: 80
(Fort) level of find context: **5(+4)**
Count: 1 (complete)
Dimensions in cm: length: 11.0; width: 2.8 (base); thickness: 1.1 (point)

IR.C12 chisel
Find type: cold chisel
Description: simple chisel with pointed flat end, point broken off
References to parallels: cf. IR.C10
(Fort) level of find context: **5**
Count: 1 (nearly complete)
Dimensions in cm: length: 9.7; width: 1.8

IR.C13 chisel
Find type: cold chisel
Description: simple chisel, point broken off
References to parallels: cf. IR.C10; Manching: Jacobi 1974, Taf. 6: 63
(Fort) level of find context: **4+5**
Count: 1 (nearly complete)
Dimensions in cm: length: 10.6; width: 2.5 (base)

IR.C15 axe
Find type: axe Manning 1985 type 1/2; Duvauchelle 2005 type 1A
Description: nearly complete axe, edge of blade partly broken off, fragment of wooden stem corroded in and onto the socket
References to parallels: cf. Manning 1985, Pl. 7, B1-B2; Avenches (F): Duvauchelle 2005, Pl. 8: 53, 54; Saalburg, Feldberg, Zugmantel (G): Pietsch 1983, Taf. 1: 1-4 (but here perforation very close to the end and rather narrow blade)
(Fort) level of find context: **3**
Count: 1 (complete)
Dimensions in cm: length: 12.0; width: 3.7 (base); thickness: 3.9 (at the eye)

IR.C16 axe
Find type: axe Manning 1985 type 2; Duvauchelle 2005 type 1A
Description: part of axe blade
References to parallels: cf. IR.C17
(Fort) level of find context: **3**
Count: 1 (fragment)
Dimensions in cm: length: 6.9; width: 2.5 – 5.1; thickness: 1.6 (max.)

IR.C17 axe
Find type: axe Manning 1985 type 2; Duvauchelle 2005 type 1A
Description: complete axe with straight front face and rear face slightly sweeping back
References to parallels: cf. Manning 1985, Pl. 7, B2; Avenches (F): Duvauchelle 2005, Pl. 10: 60-61; cf. Saalburg, Feldberg, Zugmantel (G): Pietsch 1983, Taf. 1: 7, 12, 13
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 19.2; width: 3.6 (base); thickness: 3.8 (at the eye)

IR.C18 axe
Find type: axe Manning 1985 type 2; Duvauchelle 2005 type 1A
Description: axe blade, broken off at the transition to the socket
References to parallels: cf. IR.C17
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 9.2; width: 3.1 – 5.3; thickness: 1.5 (max.)

IR.C19 axe
Find type: axe Duvauchelle (2005) type 2A
Description: nearly complete, short, axe, slightly thickened at the socket, point of blade damaged
References to parallels: cf. Avenches (F): Duvauchelle 2005, Pl. 9: 56; Saalburg, Feldberg, Zugmantel (G): Pietsch 1983, Taf. 1-2: 17, 19, 20
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 13.0; width: 3.7 (base); thickness: 4.4 (at the eye)

IR.C20 axe
Find type: axe Manning 1985 type 2; Duvauchelle 2005 type 1A
Description: complete axe with straight front face and rear face slightly sweeping back
References to parallels: cf. IR.C17
(Fort) level of find context: **5(+4)**
Count: 1 (complete)
Dimensions in cm: length: 14.9; width: 2.7; thickness: 3.1

IR.C21 axe
Find type: axe Manning 1985 type 2; Duvauchelle 2005 type 1A
Description: axe blade, broken off at the transition to the socket
References to parallels: cf. IR.C17
(Fort) level of find context: **5**
Count: 1 (not complete)
Dimensions in cm: length: 11.5; width: 3.8 – 7.2; thickness: 3.4 (max.)

IR.C22 axe
Find type: axe Manning 1985 type 2; Duvauchelle 2005 type 1A
Description: almost complete axe, edge of blade damaged, remains of wood in the socket
References to parallels: cf. IR.C17
(Fort) level of find context: **post**
Count: 1 (complete but edge of blade damaged)
Dimensions in cm: length: 15.8; width: 4.0 (base); thickness: 4.0 (at the eye)

IR.C24 adze / hoe
Find type: adze Duvauchelle 2005 type 4A
Description: adze (or hoe) with remains of wood (with iron corrosion) in the socket, edge of blade damaged; Manning 1985, 16 points out that an identification as an adze is likely, but not absolutely certain, since plain adzes could also be used as hoes
References to parallels: cf. Manning 1985, 16-17 and Pl. 8: B10; Avenches (F): Duvauchelle 2005, Pl. 16-17: 87-90; Neuss (G): Gaitzsch 1978, 59: Abb. 33
(Fort) level of find context: **4**
Count: 1 (nearly complete)
Dimensions in cm: length: 18.7; width: 11.3 (blade, at it widest), 4.5 (at the eye); thickness: 4.7 (height base)

IR.C25 adze / hoe
Find type: adze Duvauchelle 2005 type 4A
Description: blade of adze (or hoe) broken off at transition to socket; Manning 1985, 16 points out that an identification as an adze is likely, but not absolutely certain, since plain adzes could also be used as hoes
References to parallels: cf. IR.C24
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 14.2; width: 9.8 (blade, at its widest), 3.2 (at the eye)

IR.C26 adze / hoe
Find type: adze Duvauchelle 2005 type 4A
Description: blade of adze broken off at transition to eye; Manning 1985, 16 points out that an identification as an adze is likely, but not absolutely certain, since plain adzes could also be used as hoes
References to parallels: cf. IR.C24
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 13.0; width: 7.7 (blade, at its widest), 4.4 (at the eye)

IR.C27 adze
Find type: hollowing adze or gouge adze, socketed scraping axe Künzl 1993 Type NH 8
Description: adze with curved blade and with semi-rectangular socket
References to parallels: cf. Bibracte (F): Mölders 2010, 119: Fig. 60: 86-87; Dünsberg (G): Jacobi 1977, Taf. 14: 2, Taf. 16: 1, 2, 5 (all refer to the find as an axe); Neupotz (G): Künzl 1993, H 52 (context of late 3rd century AD); Manching (G): Jacobi 1974, Taf. 16, 291-292
(Fort) level of find context: **4**
Count: 1 (complete, only edge of blade sligtly damaged and corroded)
Dimensions in cm: length: 12.7; width: 10.7 (blade, at its widest); thickness: 3.0 (height of curve of blade); diameter: 4.6 x 3.6 (shaft)

IR.C28 draw-knife
Description: knife with two handles, one handle broken off
References to parallels: cf. Saalburg, Feldberg, Zugmantel (G): Pietsch 1983, Taf. 21, 500
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 15.5 (blade), 9.3 (stem); width: 3.0 (blade)

IR.C29 chisel
Find type: paring chisel Manning 1985 type 1/2 (finishing tool used to pare the surface of the wood, used with hand or shoulder pressure)
Description: almost complete chisel, with wide, flat end; only edge of blade terminal damaged
References to parallels: cf. Manning 1985, 20: Fig. 4, 1-2; Saalburg, Feldberg, Zugmantel (G): Pietsch 1983, Taf. 9: 152
(Fort) level of find context: **5**
Count: 1 (nearly complete)
Dimensions in cm: length: 26.4; width: 1.4 (central), 3.3 (point blade)

IR.C30 chisel
Find type: mortise chisel, chisel Manning 1985 type 5 (chisel primarily intended for chopping mortises and similar heavy work, but was probably also used as firmer chisel; this tool was struck with a mallet or sometimes with a hammer: see Manning 1985, 23)
Description: complete mortise chisel with remains of wood
References to parallels: cf. Manning 1985, 20: Fig. 4, 5, Pl. 10: B36/37; Saalburg, Feldberg, Zugmantel (G): Pietsch 1983, Taf. 8: 130; Gaitzsch 1980, Taf. 54: 272 (Königsforst (G)), Taf. 57: 285 (Koblenz (G))
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 24.6; 14.6 (blade); width: 1.9 (at widest part blade); diameter: *c.* 1.5 (stem)

IR.C31 chisel
Find type: mortise chisel, chisel Manning 1985 type 5
Description: complete socketed mortise chisel with remains of wood
References to parallels: cf. IR.C30
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 23.7; width: 1.9

IR.C32 chisel
Find type: firmer chisel, chisel Manning 1985 type 4 (common, general purpose chisel; could be used for woodworking or stone working (Gaitzsch 1980, 159)
Description: complete, massive, flat-pointed chisel
References to parallels: cf. Manning 1985, 20: Fig. 4, 4; Saalburg, Feldberg, Zugmantel (G): Pietsch 1983, Taf. 11: 208, 217; Vertault (F): Tisserand 2001, no. 239
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 16.5; width: 1.2

IR.C33 chisel?
Find type: paring chisel?
Description: possibly chisel, with small semi-rectangular-sectioned tang, thickened centrally and narrowing to a pointed end
References to parallels: cf. Manning 1985, Pl. 10: B29, variant on the paring chisel; the marked shoulder of the Oudenburg find is rather odd
(Fort) level of find context: **5+post**
Count: 1 (complete?)
Dimensions in cm: length: 19.6; width: 1.9 (blade, at widest part); thickness: 1.3 (blade, at widest part)

IR.C34 chisel
Find type: socketed chisel, type undetermined
Description: socketed chisel, hexagonal in section, lower part of stem broken off which makes further identification not possible
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 16.3; width: 4.0 (base), 1.7 (point)

IR.C35 gouge
Description: complete socketed gouge, edge of blade abraded; used for general carpentry work
References to parallels: cf. Manning 1985, Pl. 11: B48; Saalburg, Feldberg, Zugmantel (G): Pietsch 1983, Taf. 8: 122; Pompei (I): Gaitzsch 1980, Taf. 18: 98; Manching (G): Jacobi 1974, Taf. 10, 168-169
(Fort) level of find context: **4+5**
Count: 1 (complete, but damaged)
Dimensions in cm: length: 23.2; width: 2.9 (point blade)

IR.C36 drill-bit
Find type: spoon bit, drill-bit Manning 1985 type 3; Künzl 1993 Type NH 27
Description: complete, large drill-bit with elongated, blunted, pyramidal head, round-sectioned stem and long, narrow, spoon blade
References to parallels: cf. Manning 1985, 26-27: common find, references to spoon-bits in Britain and Germany, Pl. 12: B55-57; Avenches (F): Duvauchelle 2005, Pl. 25-26: 136-137; Saalburg, Feldberg, Zugmantel (G): Pietsch 1983, Taf. 14: 327, 328, 330, 331; Niederbieber (G): Gaitzsch 1980, Taf. 47: 229; Neupotz (G): Künzl 1993, H 94 (context of late 3rd century AD)
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 33.6; width: 2.4 (at its widest)

IR.C37 scraper
Description: tool with fine, flat, trapezoidal blad with thin stem, bent and point broken off
References to parallels: comparable finds on French sites listed on Artefacts: Feugère and Gilles *s.d.*a (Artefacts – TRA-4002)
(Fort) level of find context: **5+post**
Count: 1 (almost complete)
Dimensions in cm: length: 9.7 (total length)

IR.C38 draw-knife/shaving knife
Find type: draw-knife Künzl 1993 Type NH 49
Description: almost complete, very large knife with originally two handles, one end of blade broken off where the second shank was situated, edge of blade damaged and blade bent
References to parallels: cf. Neupotz (G): Künzl 1993, H 148 (context of late 3rd century AD)
(Fort) level of find context: **5**
Count: 1 (not complete)
Dimensions in cm: length: 35.4; width: 3.3 (blade)

IR.C39 saw file?
Description: knife-shaped bar, triangular-rectangular-sectioned, with u-shaped perforation along the side near the top and with the other terminal (grip) curved
References to parallels: no exact parallels found, but comparison with find from Saalburg, identified as a saw file (because of the file traces): see Gaitzsch 1980, Taf. 60, 295 (length: 26.0 cm, also long flat triangular-sectioned blade with notch in the blade, but there located near the grip)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 41.8; width: 3.7 (blade)

IR.C40 saw
Find type: single-sided saw Duvauchelle 2005 type with teeth of equilateral triangles
Description: large fragment of single-sided saw
References to parallels: cf. Avenches (F): Duvauchelle 2005, Pl. 14: 75-77
(Fort) level of find context: **4**
Count: 1 (large part preserved)
Dimensions in cm: length: 27.8; width: 4.9

IR.C41 saw
Find type: single-sided saw Duvauchelle 2005 type with teeth of equilateral triangles
Description: fragment of single-sided saw, with at least four visible perforations (the fragment is broken along the perforations) to attach the wooden brace
References to parallels: cf. Avenches (F): Duvauchelle 2005, Pl. 14: 81; cf. Saalburg, Feldberg, Zugmantel (G): Pietsch 1983, Taf. 16: 375-376
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 10.9; width: 5.9

IR.C42 saw
Find type: double-sided saw Duvauchelle 2005 type with teeth of equilateral triangles
Description: large fragment of double-sided saw
References to parallels: cf. Avenches (F): Duvauchelle 2005, Pl. 14: 81
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 17.5; width: 5.9 (max)

IR.C43 saw
Find type: saw Duvauchelle 2005 type with large teeth of scalene triangles
Description: fragment of saw, only part of the side with teeth is preserved
References to parallels: cf. Saalburg, Feldberg, Zugmantel (G): Pietsch 1983, 382
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: length: 7.2; width: 4.5

IR.C44 saw
Find type: saw Duvauchelle 2005 type with teeth of scalene triangles
Description: fragment of saw, only part of the side with teeth is preserved
References to parallels: cf. Avenches (F): Duvauchelle 2005, Pl. 14: 77
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 6.2

IR.C46 awl
Find type: awl as cutting tool (firmer chisel)
Description: complete awl, square-sectioned, with thickened central part, truncated top and pointed end
References to parallels: cf. Niederbieber (G): Gaitzsch 1980, Taf. 47: 236, 239, 241; Manching (G): Jacobi 1974, Taf. 12, 247
(Fort) level of find context: **3**
Count: 1 (complete)
Dimensions in cm: length: 10.8; width: 1.8

IR.C47 awl
Find type: awl as cutting tool (firmer chisel)
Description: complete awl, square-sectioned, with thickened central part, truncated top and pointed end
References to parallels: cf. IR.C46
(Fort) level of find context: **2**
Count: 1 (complete)
Dimensions in cm: length: 11.7; width: 2.0 (widest part)

IR.C48 scraping-knife
Description: complete tool, with half-spherical flat blade with horizontal, flat, rectangular-sectioned stem with looped end
References to parallels: no exact parallels found, but comparisons with Gaitzsch 1980, Taf. 50, 253 but this find from the Niederbieber fort (G) has a longer, rectangular blade of 24.0 cm long by 6.2/6.6 cm high; Gaitzsch (1980, 373) suggests this was a scraping-knife for mortar or loam
(Fort) level of find context: **3(+2)**
Count: 1 (complete)
Dimensions in cm: length: 6.0 (blade), 10.5 (stem); width: 18.0 (blade); thickness: 1.9 x 0.9 (stem)

IR.C49 scraping-knife
Description: tool with half-spherical, flat blade (one hook broken off) with horizontal, flat, rectangular-sectioned stem, broken off
References to parallels: cf. IR.C48
(Fort) level of find context: **3+4**

Count: 1 (fragment)
Dimensions in cm: length: 3.7 (height blade); width: 14.4 (calculated complete width of blade)

IR.C50 hoe
Find type: hoe Duvauchelle 2005 type 'blade hoe'
Description: blade of hoe with remains of wood in the eye, edge of the blade is damaged
References to parallels: cf. Avenches (F): Duvauchelle 2005, Pl. 44: 244-245
(Fort) level of find context: **5+post**
Count: 1 (nearly complete)
Dimensions in cm: length: 16.4; width: 9.9 (blade, at it widest), 4.3 (at the eye); thickness: 2.8 (height base)

IR.C51 pick or pickaxe
Description: possibly one arm of pickaxe with curved flat blade; broken off at the transition to the socket
(Fort) level of find context: **unstratified** (from 'mixed level' (contaminated with post-Roman level))
Count: 1 (not complete)
Dimensions in cm: length: 13.2; width: 2.7; thickness: 2.2 (max.)

IR.C52 pickaxe
Description: pickaxe, with hoe-blade and pick-end
References to parallels: cf. Saalburg, Feldberg, Zugmantel (G): Pietsch 1983, Taf. 4: 65
(Fort) level of find context: **unstratified**
Count: 1 (nearly complete, only edge of blade damaged)
Dimensions in cm: length: 17.0; width: 5.8 (blade, at it widest), 3.4 (at the eye); thickness: 1.4 (at the eye)

IR.C53 ploughshare
Description: triangular-shaped plate with edges of the upper part bent over; point broken off
References to parallels: cf. Dünsberg (G): Jacobi 1977, Taf. 18, 2-3
(Fort) level of find context: **4**
Count: 1 (nearly complete)
Dimensions in cm: length: 15.7; width: 9.6 (at it widest); thickness: 4.0

IR.C54 ploughshare
Description: triangular-shaped plate with edges of the upper part bent over
References to parallels: cf. Dünsberg (G): Jacobi 1977, Taf. 18, 2-3
(Fort) level of find context: **5**
Count: 1 (nearly complete)
Dimensions in cm: length: 20.1; width: 8.5 (at it widest); thickness: 2.6

IR.C55 ploughshare
Description: large, semi-rectangular shaped plate with edges of the upper part bent over (for attachment on wood); possibly triangular-shaped to the top, but uncertain (broken off)
References to parallels: cf. similar find at Odijk (NL), with comparable form and size: Schurmans and Verhelst 2007, 114 and 116: fig. 9.18, 3 (V6.332) (with references to comparable finds at Breda, Tiel-Medel and Asperen (all NL))
(Fort) level of find context: **4+5**
Count: 1 (not complete)
Dimensions in cm: length: 18.1; width: 15.4 (at it widest); thickness: 2.6

IR.C56 pitchfork
Description: well-preserved double-pronged fork with part of the wooden handle
References to parallels: cf. Manning 1976, 31: no. 87 with references to other British finds; Saalburg, Feldberg, Zugmantel (G): Pietsch 1983, Taf. 25: 560; Rees 1979, 610: Fig. 252 b; see also White 1967, 109-110
(Fort) level of find context: **5**
Count: 1 (fork complete, shank broken off)
Dimensions in cm: length: 22.0 (maximum preserved), 13.5 (fork); width: 8.1 (width fork); diameter: 3.7 (stem)

IR.C57 pitchfork
Description: part of double-pronged fork cf. IR.C56
References to parallels: cf. IR.C56
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 13.2 (maximum preserved), 6.3 (preserved fork)

IR.C58 pitchfork
Description: shank and transition to the pins of a double-pronged fork, with remains of the wooden grip
References to parallels: cf. IR.C56 and cf. Saalburg, Feldberg, Zugmantel (G): Pietsch 1983, Taf. 25: 559; Rees 1979, 612: Fig. 254 a
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: length: 13.7 (maximum preserved)

IR.C59 spade/shovel
Find type: rectangular blade with rounded (?) top
Description: shovel blade with straight vertical sides and with opening for the wooden grip; very damaged
References to parallels: cf. IR.C60
(Fort) level of find context: **4**
Count: 1 (large part preserved)
Dimensions in cm: length: 15.9; width: 13.8

IR.C60 spade/shovel
Find type: rectangular blade with rounded top
Description: fragment of shovel blade with straight vertical sides and rounded top and with opening for the wooden grip
References to parallels: same type of spade found at the north-east side of the fort (site Kapellestraat ET24): Vanhoutte *et al.* 2014, 223: Fig. 66, 5; no exact parallels found in literature, but for this type of spade/shovel: see White 1967, 17-18, 28-29 and Saalburg, Feldberg, Zugmantel (G): Pietsch 1983, Taf. 22, 518
(Fort) level of find context: **4+5**
Count: 1 (large part preserved)
Dimensions in cm: length: 22.1; width: 16.9

IR.C61 spade/shovel
Find type: rectangular blade with rounded, oblique top; small untwisted brooch (CA.B/225) (semimanufacture) corroded onto the spade blade
Description: shovel blade with rounded top, with opening for the wooden grip and perforation for fixation of this wooden grip
References to parallels: cf. IR.C60
(Fort) level of find context: **4+5**
Count: 1 (complete)
Dimensions in cm: length: 14.8; width: 11.9

IR.C62 spade/shovel
Find type: rectangular blade with rounded top
Description: shovel blade with straight vertical sides and rounded end, with opening for the wooden grip
References to parallels: cf. IR.C60
(Fort) level of find context: **5+post**
Count: 1 (complete)
Dimensions in cm: length: 16.9; width: 14.2

IR.C63 spade/shovel
Find type: U-shaped blade
Description: flat, rectangular blade with extending arms
References to parallels: similarities with turf-cutter, but the blade of the Oudenburg find is much longer
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 15.1; width: 15.0

IR.C64 spade/shovel
Find type: trapezoidal blade, widening to the top, with straight top
Description: spade blade with straight buth widening sides towards the top, with opening for the wooden grip
References to parallels: no parallels found in literature
(Fort) level of find context: **4+5**
Count: 1 (corner of blade broken off)
Dimensions in cm: length: 13.7; width: 8.1 / 15.2 (calculated complete widest side)

IR.C68 shoemaker's anvil
Description: long stem (badly preserved) with a small roughly foot-shaped head, identifiable as a shoemaker's anvil that was used to beat the spikes into the sole so the sharp points would bend back into the leather; found together with IR.C69, corroded onto each other
References to parallels: cf. Manning 1985, Pl. 17: E35 and p. 42, with references to a few finds in Britain and some similar implements at Saalburg, Zugmantel and Monreal (all G); see also Neuss (G): Simpson 2000, Pl. 42, 1, also referring to the finds at Zugmantel and Silchester (Simpson 2000, 110)
(Fort) level of find context: **2**
Count: 1 (not complete)
Dimensions in cm: length: 12.0, 13.7 (preserved length of head)

IR.C69 shoemaker's anvil
Description: long stem (badly preserved) with a small roughly foot-shaped head, identifiable as a shoemaker's anvil that was used to beat the spikes into the sole so the sharp points would bend back into the leather; found together with IR.C68, corroded onto each other
References to parallels: cf. IR.C68
(Fort) level of find context: **2**
Count: 1 (not complete)
Dimensions in cm: length: 41.1, 7.7 (preserved length of head); diameter: 2.0 (stem)

IR.C70 shoemaker's anvil?
Description: possible head of shoemaker's anvil, tang broken off
References to parallels: cf. IR.C68 and C69
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 7.5 (head), 5.3 (height with preserved part of tang)

IR.C71 awl
Description: complete awl consisting of a straight pin and a block-shaped iron grip, slightly tapering towards the pin, with the remains of one rivet, possibly for the attachment of a cover in another material
References to parallels: no exact parallels found in literature
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 14.8; width: 2.4 x 1.2 (base)

IR.C72 awl
Find type: awl Manning 1985 type 3b or awl as firmer chisel
Description: square-sectioned, with slightly thickened central part, with short pointed top and pointed bottom end; cutting tool for leatherworking (cf? (Manning 1985) or woodworking (Jacobi 1974)
References to parallels: cf. Manning 1985, 38: Fig. 9 (3b), 39-41 for identification as leatherworking tool; cf. Manching (G): Jacobi 1974, Taf. 12, 243, 244, 247, 248 for identification as woodworking cutting tool
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 8.5

IR.C73 wool comb
Find type: double-sided wool comb ('continental type', Manning 1985 type D1/2/3)
Description: double-sided, rectangular comb consisting of a rectangular central plate furnished by fine long teeth at both sides; terminals are damaged, teeth are slightly spread
References to parallels: cf. Avenches (F): Duvauchelle 2005, Pl. 37: 200, 201; Autun (F): Pinette 1987, 220: no. 427; Vertault (F): Tisserand 2001, 55: no. 126-130; Xanten (G): Rieche and Schalles 1987, 58; Pompei and Aquileia (I): Gaitzsch 1980, Taf. 11, 47, Taf. 42, 195-196. Several comparable finds listed on Artefacts in Gaul, Britain, Italy and along the Rhine limes: see Feugère and Valentin *s.d.* (Artefacts (PCD-4001). The double-ended comb form appears to be the norm on the Continent; the Romano-British single-sided comb seems to be an East Anglian form (see Manning 1972b; Manning 1985, 33-34; Duvauchelle 2005, 73). The wool comb was used to remove any short wool, to entangle the fibres and to draw the long fibres parallel to make spinning easier (White 1970, 25, with references to iron wool-combs with a double row of teeth at Baydon (UK), Augst (CH), Waldfischbach (G), Kösching (G),

fort, Straubing (G), Virunum and Uranje in *Noricum* (see Table C on p. 123). Manning 1985, 33-34 adds double-sided comb finds at Pompeii and Aquileia (I), Martizay, Compiègne (both F), Newel (G), Liedana (SP), Ewel and London (both UK) (with references). The finds listed by Wild come from contexts of the 3rd or 4th century AD
(Fort) level of find context: **4**
Count: 1 (nearly complete)
Dimensions in cm: length: 19.2; width: 8.9 (central)

IR.C74 wool comb
Find type: double-sided wool comb ('continental type')
Description: double-sided, rectangular comb consisting of a rectangular central plate furnished by fine long teeth at both sides; terminals are damaged, teeth are slightly spread
References to parallels: cf. IR.C73
(Fort) level of find context: **4**
Count: 1 (nearly complete)
Dimensions in cm: length: 20.7; width: 11.6 (central)

IR.C75 wool comb
Find type: double-sided wool comb ('continental type')
Description: double-sided, rectangular, comb consisting of a rectangular central plate furnished by fine long teeth at both sides; large part of the teeth not preserved, piece clearly used
References to parallels: cf. IR.C73
(Fort) level of find context: **4**
Count: 1 (large part preserved)
Dimensions in cm: length: 22.1; width: 11.2 (central)

IR.C76 wool comb
Find type: double-sided wool comb ('continental type')
Description: double-sided, rectangular, comb consisting of a rectangular central plate furnished by fine long teeth at both sides, large part of one original edge preserved; large part of the teeth not preserved, part of teeth bent
References to parallels: cf. IR.C73
(Fort) level of find context: **4**
Count: 1 (large part preserved)
Dimensions in cm: length: 18.7; width: 10.2 (central)

IR.C77 wool comb
Find type: double-sided wool comb ('continental type')
Description: double-sided, rectangular, comb consisting of a rectangular central plate furnished by fine long teeth at both sides; terminals are damaged, teeth are slightly spread
References to parallels: cf. IR.C73
(Fort) level of find context: **4+5**
Count: 1 (nearly complete)
Dimensions in cm: length: 23.8; width: 11.0 (central)

IR.C78 wool comb
Find type: double-sided wool comb ('continental type')
Description: double-sided, rectangular, comb consisting of a rectangular central plate furnished by fine long teeth at both sides; large part of teeth broken off
References to parallels: cf. IR.C73
(Fort) level of find context: **4+5**
Count: 1 (large part preserved)
Dimensions in cm: length: 18.4; width: 10.8 (central)

IR.C79 wool comb
Find type: double-sided wool comb ('continental type')
Description: double-sided, rectangular, comb consisting of a rectangular central plate furnished by fine long teeth at both sides; almost complete, two angles broken off
References to parallels: cf. IR.C73
(Fort) level of find context: **4/5**
Count: 1 (nearly complete)
Dimensions in cm: length: 29.0; width: 11.2 (central)

IR.C83 dosing cone (of mill installation)
Description: bar with conical shape ending in a point, round-sectioned, based on a round-sectioned shank, broken off
References to parallels: cf. Baatz 1994; Reniere *et al.* 2014 with comparable finds in Flanders
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 20.2; diameter: 3.6 (widest), 1.9 (stem)

IR.C/D84 tool or knife grip?
Description: rivetted grip to hold shank of some kind of implement
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 8.2; width: 1.7 (central section); thickness: 0.6 (central section)

IR.D001 cleaver
Find type: meat cleaver Manning 1985 type 2
Description: large fragment of meat cleaver, socketed, part of blade and shank preserved, point of blade and terminal of shank broken off; for butchering meat
References to parallels: cf. IR.D002
(Fort) level of find context: **3**
Count: 1 (fragment)
Dimensions in cm: length: 13.0 (maximum preserved); width: 7.5 (blade)

IR.D002 cleaver
Find type: meat cleaver Manning 1985 type 2a
Description: complete, large meat cleaver, socketed, with straight shank, blade edge slightly damaged; for butchering meat
References to parallels: see Manning 1985, Pl. 57: Q97. Manning mentions several comparable cleaver finds in *Britannia*, and on the Continent at Saalburg (G) and Compiègne (F) (Manning 1985, 122)
(Fort) level of find context: **3+4**
Count: 1 (complete)
Dimensions in cm: length: 36.4; width: 12.4 (blade, widest part (complete)); diameter: 3.0 x 3.5 (stem)

IR.D003 cleaver
Find type: meat cleaver Manning 1985 type 2, but grip is curved
Description: large meat cleaver, tanged, point of blade broken off, shank is curved
References to parallels: cf. IR.D002

(Fort) level of find context: **3+4**
Count: 1 (nearly complete)
Dimensions in cm: length: 26.4 (maximum preserved); width: 9.8 (blade, widest part (complete)); diameter: 3.1 x 2.4 (stem)

IR.D004 cleaver
Find type: meat cleaver Manning 1985 type 2
Description: fragment of meat cleaver: socket and start of blade, cf. IR.D002
References to parallels: cf. IR.D002
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 16.8 (maximum preserved); width: 6.7 (blade, at widest part (complete?)); diameter: 3.7 (stem)

IR.D005 cleaver
Find type: meat cleaver Manning 1985 type 2
Description: part of meat cleaver, tanged, with part of the blade and stem, point of blade and end of stem broken off, edge of remaining blade damaged
References to parallels: cf. IR.D002
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 9.5 (maximum preserved); width: 6.4 (preserved width of blade)

IR.D006 cleaver
Find type: meat cleaver Manning 1985 type 3
Description: meat cleaver, socketed, with narrow blade, point of blade broken off
References to parallels: cf. Manning 1985, 122 for references to comparable finds in Britain; Manning also mentions that type 3 is less common than type 2
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 20.5; width: 4.2 (blade, widest part (complete)); diameter: 2.1 x 2.4 (stem)

IR.D007 cleaver
Find type: meat cleaver, uncertain type
Description: part of blade and shank of meat cleaver, tanged
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 10.7 (maximum preserved); width: 4.6 (blade, widest part (complete))

IR.D008 knife
Find type: knife Manning 1985 type 11b
Description: complete knife, tanged
References to parallels: see Manning 1985, 109 ff. for reference finds
(Fort) level of find context: **3**
Count: 1 (complete)
Dimensions in cm: length: 21.9 (total); 9.4 (stem), 12.5 (blade); width: 4.5 (at it widest)

IR.D009 knife
Description: part of knife blade
(Fort) level of find context: **3**
Count: 1 (fragment)
Dimensions in cm: length: 11.0; width: 3.5 (at it widest)

IR.D010 knife
Find type: knife Manning 1985 type 19
Description: small knife, tanged, point of blade broken off, end of shank broken off
References to parallels: see Manning 1985, 109 ff. for reference finds
(Fort) level of find context: **unstratified**
Count: 1 (nearly complete)
Dimensions in cm: length: 8.7; 6.5 (blade, point broken off); width: 2.7

IR.D011 knife
Find type: knife Manning 1985 type 16?
Description: almost complete knife, tanged, end of shank broken off
References to parallels: see Manning 1985, 109 ff. for reference finds
(Fort) level of find context: **post**
Count: 1 (nearly complete)
Dimensions in cm: length: 11.8, 8.6 (blade); width: 1.6 (blade)

IR.D012 knife
Find type: knife Manning 1985 type 16?
Description: almost complete knife, tanged, end of shank broken off
References to parallels: see Manning 1985, 109 ff. for reference finds
(Fort) level of find context: **post**
Count: 1 (nearly complete)
Dimensions in cm: length: 12.3, 9.4 (blade); width: 1.8 (blade)

IR.D013 knife grip
Description: ring-headed pin with open head, rectangular-sectioned tang, likely the grip of a knife
References to parallels: cf. *e.g.* Manching: Jacobi 1974, Taf. 19, 318
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 9.0

IR.D014 padlock
Find type: box type padlock, Künzl 1993 Type NJ 5
Description: iron cylindrical box-shaped padlock with central horizontal strip of copper alloy; CT scanning shows the lock mechanism, and yields the presence of a copper alloy rod fragment and a copper alloy curled sheet fragment inside the padlock
References to parallels: cf. Vertault (F): Guillaumet and Laude 2009, 24: Fig. 16-17; Mamer (L): Elsen and Paulke 2014: see Schloss 1; Neupotz (G): Künzl 1993, J 27 (context of late 3rd century AD); Krefeld-Gellep, grave 4518, identical parallel with central bronze strip (no date assigned): Pirling 1997, Taf. 124: 12; Lullingstone (UK): Meates 1987, 94: Fig. 41, 232 (context dated AD 330-350) (with reconstruction of the lock mechanism: Meates 1987, 96: Fig. 42, see also Künzl 1993, 366; 3D computer animation: Herber 2014); box type padlocks have been found in Britain, Northern Gaul and along the Rhine Limes (see Elsen and Paulke 2014, 621-622; Paulke *et al.* 2018, 178: Abb. 10 (distribution map of finds))
(Fort) level of find context: **2+3**
Count: 1 (complete)
Dimensions in cm: thickness/height: 4.6; diameter: 5.8

IR.D015 padlock
Find type: box type padlock, Künzl 1993 Type NJ 5
Description: iron cylindrical box-shaped padlock with copper alloy elements (central horizontal binding, top plate with knobs and base plate); CT scanning shows the lock mechanism
References to parallels: cf. IR.D014
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: thickness/height: 3.6; diameter: 5.4

IR.D016 padlock
Find type: box type padlock, Künzl 1993 Type NJ 5
Description: iron cylindrical box-shaped padlock with suspension loop on top; CT scanning shows the lock mechanism
References to parallels: cf. IR.D014
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: thickness/height: 3.2; diameter: 5.1

IR.D017 padlock fragment with part of chain
Find type: probably of box type padlock, Künzl 1993 Type NJ 5
Description: round disc plate of presumably cylindrical box-shaped padlock with fragment of chain attached, corroded forming a cluster; chain consisting of rectangular links
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 4.4 (one link); width: 1.5 (one link); diameter: 5.3 (round plate)

IR.D018 padlock chain
Description: cluster of very corroded links and part of an attached split pin
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: length: 7.2 (max)

IR.D019 chest or box corner binding (Plate CCLXXXIV)
Find type: hook-shaped binding
Description: hook-shaped D-sectioned binding expanding into a lozenge-shaped decorative terminal pierced by a square nail hole; to protect, fasten and decorate the corner of a chest or box
References to parallels: cf. Augst: Riha 2001, Taf. 37-39; cf. bronze counterpart at Dury: Quérel and Feugère 2000, 165: Fig. 140, 141
(Fort) level of find context: **2**
Count: 1 (complete)
Dimensions in cm: length: 6.6 (height)

IR.D020 handle
Description: fine handle with curved terminals with leaf-shaped end, one arm broken off
(Fort) level of find context: **3**
Count: 1 (not complete)
Dimensions in cm: length: 9.7

IR.D021 handle
Description: fragmented handle, flat rectangular-sectioned, with curved terminals with leaf-shaped end, with part of the split pin attached to each terminal end; badly preserved
(Fort) level of find context: **4**
Count: 1 (almost complete but very fragmented)
Dimensions in cm: length: 4.9 (fragment to the left)

IR.D022 handle
Description: handle fragment with curved terminals with leaf-shaped end, one arm broken off, head of split pin attached to the preserved arm
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 14.5; height: 6.7

IR.D023 handle
Description: nearly complete handle, flat rectangular-sectioned, with curved terminals, originally with leaf-shaped ends but broken off at the start, with ring-headed pin (not complete) attached to both terminals
(Fort) level of find context: **4+5**
Count: 1 (nearly complete)
Dimensions in cm: length: 14.9; width: 6.3

IR.D024 handle
Description: fine handle with curved terminals with leaf-shaped end, one arm broken off, head of split pin attached to the preserved arm
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: length: 9.2; width: 5.9

IR.D025 handle
Description: handle, flat rectangular-sectioned, with curved terminals with possibly leaf-shaped end, but broken off at transition, with head of split pin attached to preserved arm, other arm broken off
(Fort) level of find context: **4+5**
Count: 1 (not complete)
Dimensions in cm: length: 9.3; width: 6.6

IR.D026 handle
Description: half of fine handle, rectangular-sectioned, with curved terminals with leaf-shaped end
(Fort) level of find context: **5**
Count: 1 (half)
Dimensions in cm: length: 6.5; width: 4.9

IR.D027 handle
Description: terminal of handle with leaf-shaped end, with split pin attached to it
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 4.8 (handle terminal), 5.4 (split pin); width: 2.6 (handle terminal, max.); thickness: 0.4 (handle terminal)

IR.D028 handle
Description: two fragments of almost complete handle, flat rectangular-sectioned, with curved terminals with leaf-shaped end, with split pin still attached to one arm
(Fort) level of find context: **post**
Count: 1 (nearly complete, but very corroded)
Dimensions in cm: length: 15.0; height: 6.2

IR.D029 handle
Description: half of handle, flat rectangular-sectioned, with curved terminal, possibly with leaf-shaped end, but broken off at transition
(Fort) level of find context: **post**
Count: 1 (half)
Dimensions in cm: length: 7.5; width: 6.5

IR.D030 handle
Description: curved terminal of handle with curled end
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: height of terminal: 2.7

IR.D031 handle
Description: almost half of handle with curved terminal with curled end, with head of split pin attached to it
(Fort) level of find context: **4+5**
Count: 1 (almost half)
Dimensions in cm: max. height: 7.5

IR.D032 handle
Description: terminal of handle with curved terminal with curled end, with ring-headed pin attached to it
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: length of pin: 5.9; width of pin ring: 2.9

IR.D033 handle
Description: large part of handle with slightly curved terminal with fine curled end (clearly visible on the X-ray image), one arm broken off (remark: for this type of handle a function as helmet carrying handle can not be excluded)
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 10.8; height: 6.6

IR.D034 handle
Description: flat-sectioned handle with slightly curved terminals, one end broken off (remark: for this type of handle a function as helmet carrying handle can not be excluded)
(Fort) level of find context: **4**
Count: 1 (nearly complete)
Dimensions in cm: length: 13.2

IR.D035 handle
Description: flat-sectioned handle with simple curved, pointed terminals, one end broken off
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 11.0

IR.D036 handle
Description: small handle with simple curved terminals, rectangular-sectioned (remark: for this type of handle a function as helmet carrying handle can not be excluded); a similar handle (not illustrated) was found at the same level, and may have belonged to the same box or chest
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 8.7

IR.D037 handle
Description: more than half of fine handle with curved, pointed terminals, one arm broken off
(Fort) level of find context: **5**
Count: 1 (not complete)
Dimensions in cm: length: 7.3

IR.D038 handle
Description: nearly complete, but broken, handle with curved terminals (one end not complete) and with central block-shaped copper alloy thickening
(Fort) level of find context: **post**
Count: 1 (nearly complete)
Dimensions in cm: length: 15.7; width: 5.4

IR.D039 handle
Description: small fine handle, round-sectioned, with curved terminals (remark: for this type of handle a function as helmet carrying handle can not be excluded)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 6.8; width: 3.7

IR.D040 handle
Description: one curved terminal end with cylindrical fitting attached
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: width: 1.8 (ring); diameter: 2.6 (ring)

IR.D041 handle
Find type: bucket handle
Description: large handle with large curved terminals, not complete: broken in two and one terminal missing; likely to be a bucket handle
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 22.6 (preserved length longest part), 13.2 (preserved length of shortest piece)

IR.D042 handle
Find type: bucket handle
Description: large handle, with curved terminals, only one preserved showing fine curled end
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 18.2

IR.D043 handle
Find type: bucket handle
Description: large handle with slightly curved terminals, one terminal and other end are broken off; likely to be a bucket handle
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 24.7

IR.D049 lamp
Find type: open lamp
Description: very small, and only partly preserved, open lamp (the original 'figure-of-eight' shape is hard to distinguish since the front part is damaged), with attachment at the back bent downwards
References to parallels: cf. Eckardt 2002, 241: Fig. 109: examples from Gadebridge Park, Wilderspool, Braintree, Luton (all UK) (with references)
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 8.7; width: 4.8

IR.D050 candle stand
Description: part of originally probably hexagonal candlestand with flat stem with eye-terminal
References to parallels: no parallels found in literature
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 17.8; width: 12.2 (calculated complete width)

IR.D051 candle stick / lamp?
Description: hook-shaped, curled terminal of flat, scoop-shaped object: possibly candlestick of lamp
(Fort) level of find context: **5+post**
Count: 1 (fragment)
Dimensions in cm: length: 3.6 (stem)

IR.D052 lamp hook
Description: rod with pointed side-branch (hook), with one curved end, broken off, other end also broken off; comparable to known lamp hangers with hook; according to the curving of the rod, the Oudenburg find represents a very short lamp hanger
References to parallels: cf. *e.g.* Manning 1985, Pl. 45: P6
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 8.9

IR.D053 ladle
Description: vertical handle with central pin (to attach wooden grip?) with scoop, only partly preserved
References to parallels: cf. Manning 1985, Pl. 50: P34
(Fort) level of find context: **5+post**
Count: 1 (fragment)
Dimensions in cm: length: 6.1; width: 6.3 (max.); thickness: 0.5 (handle)

IR.D054 bar for grill or firedog
Description: flat bar, rectangular-sectioned, with narrowed, rounded, fixation terminals
References to parallels: cf. Manching (G): Jacobi 1974, Taf. 33: 581, 585
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 35.0; width: 1.7; thickness: 0.6

IR.D055 bar for grill or firedog
Description: flat bar, rectangular-sectioned, with narrowed fixation terminal, other end broken off
References to parallels: cf. IR.D054
(Fort) level of find context: **unstratified** (from 'mixed level' (contaminated with post-Roman level))
Count: 1 (*c.* half)
Dimensions in cm: length: 19.8; width: 1.6; thickness: 0.6

IR.D056 chain for cauldron
Find type: cauldron chain Künzl 1993 type NE 9
Description: part of cauldron chain (central part: see Künzl 1993, Typentafel 13: part B of type NE 9), two fitting parts, consisting of five circular rings, four ribbed bars with looped terminal and two hooked bars
References to parallels: cf. Neupotz (G): Künzl 1993, E64 (context late 3rd century AD)
(Fort) level of find context: **4 (end) – 5**
Count: 1 (fragment)
Dimensions in cm: length: 21.4 (complete bar); thickness: 1.5 (bar); diameter: 7.3 (complete link)

IR.D057 chain for cauldron
Find type: cauldron chain Künzl 1993 type NE 9
Description: part of cauldron chain (upper part: see Künzl 1993, Typentafel 13: part B of type N3 9), consisting of three ribbed fine bars with looped terminals, five circular rings (two complete, three fragments) and one hooked rod
References to parallels: cf. Neupotz (G): Künzl 1993, E64 (context late 3rd century AD)
(Fort) level of find context: **4** (final phase)
Count: 1 (fragment)
Dimensions in cm: length: 30.8 (complete bar); width: 3.6 (ring terminal of bar); thickness: 0.8 (bar); diameter: 6.5 (round link)

IR.D058 chain for cauldron?
Description: two large hooks with looped terminal attached by eight-shaped link, possibly part of a cauldron chain
(Fort) level of find context: **4**
Count: 1 (complete hooks, link nearly complete)
Dimensions in cm: length: 12.6 and 12.8 (hooks)

IR.D059 hook for cauldron
Description: long bar with hook, possibly part of cauldron chain
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 31.8; thickness: 1.0 (bar)

IR.D060 hook for cauldron
Description: bar with hook, possibly part of cauldron chain
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 15.5; thickness: 0.9 (bar)

IR.D061 cauldron
Description: iron cauldron fragment: part of cauldron body with attached ring; fragment of flat bar corroded onto the cauldron body
(Fort) level of find context: **4+5**

Count: 1 (fragment)
Dimensions in cm: length: 15.0; width: 10.0

IR.D062 cauldron escutcheon?
Description: rounded lug, perforated, attached to rounded sheet, broken off, with rivet hole for fixation
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 9.2

IR.D/I064 lock plate for door or gate
Find type: sliding lock
Description: fragment of lock plate with sliding lock; very corroded, but bar and bolt holder still visible
References to parallels: cf. Mans (F): Guillaumet and Laude 2009, 31: Fig. 24; Avenches (F): Amrein *et al.* 1999, 352: Fig. 355: reconstruction of mecanism
(Fort) level of find context: **3**
Count: 1 (not complete)
Dimensions in cm: length: 20.0; width: 8.3

IR.D/I065 lock plate for door or gate
Find type: sliding lock
Description: part of lock plate, fragment of sliding lock, very corroded but bar and bolt holder still preserved
References to parallels: cf. IR.D/I064
(Fort) level of find context: **3**
Count: 1 (fragment)
Dimensions in cm: length: 14.5; width: 7.9

IR.D/I066 lock plate for door or gate
Find type: sliding lock
Description: fragment of lock plate with part of the sliding bar; with ten related but undetermined sheet fragments (not illustrated)
References to parallels: cf. IR.D/I064
(Fort) level of find context: **3**
Count: 1 (fragment)
Dimensions in cm: length: 8.9; width: 7.8

IR.D/I067 lock plate for door or gate
Find type: sliding lock
Description: large part of lock plate of sliding lock; very corroded but bar and bolt holder still preserved
References to parallels: cf. IR.D/I064
(Fort) level of find context: **5**
Count: 1 (not complete)
Dimensions in cm: length: 24.3; width: 11.6

IR.D/I068 lock plate for door or gate
Find type: sliding lock
Description: fragment of lock plate with bar holder of sliding lock
References to parallels: cf. IR.D/I064
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 6.5; width: 3.3

IR.D/I069 lock plate for door or gate
Find type: sliding lock
Description: large fragment of a rectangular lock plate for a sliding lock, with rivets along the margins for attachment and with three holes near the preserved end for a 3-teeth key (only visible on the X-ray image)
References to parallels: cf. IR.D/I064
(Fort) level of find context: **4**
Count: 1 (large part preserved)
Dimensions in cm: length: 16.8; width: 5.9

IR.D/I070 lock plate for door or gate
Find type: sliding lock
Description: lock plate, for lock of door or large chest or case, with part of the curved bar holder; to the other side the holes for the key teeth are visible on the X-ray image
References to parallels: cf. IR.D/I064
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 14.7; width: 5.6

IR.D/I071 lock plate for door or gate
Find type: sliding lock
Description: fragment of a lock plate for a sliding lock, with part of the bar and three holes for a 3-teeth key (only visible on the X-ray image)
References to parallels: cf. IR.D/I064
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: length: 9.3; width: 4.6

IR.D/I072 lock plate for door or gate
Find type: sliding lock
Description: part of a lock plate for a sliding lock, with slide holder; broken off at the key holes (suitable for a 4-teeth key)
References to parallels: cf. IR.D/I064
(Fort) level of find context: **4+5**
Count: 1 (not complete)
Dimensions in cm: length: 13.0; width: 4.3

IR.D/I073 lock plate for door or gate
Find type: sliding lock
Description: fragment of a lock plate, cf. IR.D/I072, broken off at the holes intended for the key teeth
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: length: 8.6; width: 5.0

IR.D/I074 spring of lock plate – with split pin or double-spiked loop
Find type: laminated spring
Description: part of lock plate with fragment of the spring-bolt, with split pin or double-spiked loop attached through hole at the end
References to parallels: cf. Pommeroeul (B): Bausier *et al.* 2008, 106; Saintes (F): Feugère *et al.* 1992, 36-37: 47
(Fort) level of find context: **3**
Count: 1 (fragment)
Dimensions in cm: length: 15.3; width: 4.2

IR.D/I075 spring of lock plate – with split pin or double-spiked loop
Find type: laminated spring
Description: spring of a lock with four slats (for mechanism: see reconstruction medieval (but similar) lock by Linlaud 2012, 37)
References to parallels: cf. IR.D/I074
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 11.5; width: 3.3

IR.D/I076 spring of lock plate – with split pin or double-spiked loop
Find type: laminated spring
Description: spring of a lock with four slats
References to parallels: cf. IR.D/I074
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 11.6; width: 3.7

IR.D/I077 spring of lock plate – with split pin or double-spiked loop
Find type: laminated spring
Description: fragment of a spring of a lock with four slats
References to parallels: cf. IR.D/I074
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 6.1; width: 3.2

IR.D/I078 spring of lock plate – with split pin or double-spiked loop
Find type: laminated spring
Description: part of spring of lock plate: fragment of spring-bolt
References to parallels: cf. IR.D/I074
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 13.8; width: 3.7

IR.D/I079 spring of lock
Find type: laminated spring
Description: part of spring of lock, but the slats of the spring are broken off
(Fort) level of find context: **2+3**
Count: 1 (fragment)
Dimensions in cm: length: 11.2

IR.D/I080 spring bolt of lock plate
Find type: laminated spring
Description: fragment of a spring holder, the three or four slats are broken off but a slight imprint can be distinguished
References to parallels: cf. IR.D/I074
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 12.0; width: 2.5 (at its widest)

IR.D/C081 lock plate
Find type: lock plate with cylinder for rotary key
Description: part of iron sheet with the remains of a small cylindrical form with a thorn in the middle
References to parallels: cf. Krefeld-Gellep (G): Pirling and Siepen 2006, 435-436: several of these plates found in different graves (*e.g.* Taf. 78, 7: in grave 5393 dating post AD 276 (see also Pirling and Siepen 2000, Taf. 118: 1); Taf. 102, 8: in grave 6351 dated to the early 4th century AD)
(Fort) level of find context: **3**
Count: 1 (fragment)
Dimensions in cm: length: 8.6; width: 5.5

IR.D/I082 lock bolt
Description: fragment of a lock bolt
References to parallels: cf. Colchester (UK): Crummy 1983, 124: 4134; Ladenburg (G): Schmidts 2004, Taf. 39, H28
(Fort) level of find context: **unstratified**
Count: 1 (fragment)
Dimensions in cm: length: 4.8; width: 1.8; thickness: 1.0

IR.D/I083 lock plate?
Description: not complete, rectangular sheet with central perforation but broken off here: not certain whether part of the perforation was intended
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 17.3; width: 13.3

IR.D/I084 lock plate?
Description: possibly fragment of small rectangular lock plate, most likely broken off at key hole
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 7.8; width: 6.5

IR.D/I085 lock plate
Description: rectangular plate, only two edges preserved, other sides are broken off, with one iron rivet preserved in the preserved angle, with rounded rectangular perforation to the centre of the plate
References to parallels: cf. Manching (G): Jacobi 1974, Taf. 48
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: length: 12.3; width: 12.5

IR.D/I086 lock plate
Description: large rectangular sheet with some rivet holes along the margins for attachment; found together with lock plate fragment IR.D/I071 and most likely part of the same lock system, but broken off near the centre, so not clear where the lock hole was situated
(Fort) level of find context: **4+5**
Count: 1 (not complete)
Dimensions in cm: length: 18.8; width: 11.6

IR.D/I105 key
Find type: lever lock key / simple blade-key with hooked blade
Description: complete small key with thickend stem with large round loop, with simple, hooked blade
(Fort) level of find context: **1**
Count: 1 (complete)
Dimensions in cm: length: 7.3; width: 2.5 (blade)

IR.D/I106 key
Find type: lever lock key / simple blade-key
Description: complete small key with simple, small, rectangular blade and with flat round terminal
(Fort) level of find context: **3+4**
Count: 1 (complete)
Dimensions in cm: length: 5.8; width: 1.9 (blade)

IR.D/I107 key
Find type: lever lock key / simple blade-key
Description: complete small key with simple, rectangular blade with thickened edge below, with simple, rounded terminal
(Fort) level of find context: **5(+4)**
Count: 1 (complete)
Dimensions in cm: length: 7.2; width: 2.8 (blade)

IR.D/I108 key
Find type: lever lock key / simple blade-key
Description: simple key with eye-terminal and simple, rectangular, small blade, very corroded
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 11.7; width: 4.8 (top); diameter: 4.7 (eye)

IR.D/I109 key
Find type: lever lock key / simple blade-key
Description: simple key with rectangular blade, triangular-sectioned, with terminal broken off at start of eye-terminal where split pin is attached
(Fort) level of find context: **unstratified** (from 'mixed level' (contaminated with post-Roman level))
Count: 1 (not complete)
Dimensions in cm: length: 10.0; width: 3.2 (blade)

IR.D/I110 key
Find type: lever lock key / simple blade-key
Description: small key with ring-terminal
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 6.3; width: 2.2 (blade)

IR.D/I111 key
Find type: tumbler lock lift key / T-key (4 teeth), Manning 1985 type 1
Description: complete key with thickened, flat, rectangular-shaped stem, large eye-terminal and with four teeth, two on each side of the stem
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 18.3; width: 5.1 (blade)

IR.D/I112 key
Find type: tumbler lock lift key / T-key (2 teeth), Manning 1985 type 1
Description: fragment of key, complete head with one tooth at each side of the stem, one tooth curved slightly
References to parallels: cf. Manning 1985, Pl. 40: O23
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: width: 4.0 (head)

IR.D/I113 key
Find type: tumbler lock lift key / T-key (2 teeth), Manning 1985 type 1
Description: fragment of key, complete head with one tooth at each side of the stem
References to parallels: cf IR.D/I112
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: width: 3.1 (head)

IR.D/I114 key
Find type: tumbler lock lift key / hook-key (3 teeth), Manning 1985 type 3
Description: fragment of key, slightly bent over, with three teeth at one side of the stem
References to parallels: cf. Manning 1985, Pl. 40: O28-O36
(Fort) level of find context: **1/2**
Count: 1 (fragment)
Dimensions in cm: width: 4.0 (head)

IR.D/I115 key
Find type: tumbler lock lift key / hook-key (3 teeth), Manning 1985 type 3
Description: complete key, slightly bent (rotated), with flattened wider terminal with eyelet and with head with three teeth at one side of the stem
References to parallels: cf. IR.D/I114
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 13.8; width: 3.8 (head)

IR.D/I116 key
Find type: tumbler lock lift key / hook-key (2 teeth), Manning 1985 type 3
Description: complete key with widening stem towars the top with eyelet and with head with two teeth (hardly preserved)
References to parallels: cf. IR.D/I114
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 14.0

IR.D/I117 key
Find type: tumbler lock lift key / hook-key (3 teeth), Manning 1985 type 3
Description: key with straight semi-rectangular-sectioned stem with three teeth at one side of the stem; terminal broken off
References to parallels: cf. IR.D/I114
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 14.3; width: 4.3 (head)

IR.D/I118 key
Find type: tumbler lock lift key / hook-key (3 teeth?), Manning 1985 type 3

Description: head of key with part of the stem, with head with originally at least four teeth
References to parallels: cf. IR.D/I114
(Fort) level of find context: **unstratified**
Count: 1 (fragment)
Dimensions in cm: width: 4.0 (head)

IR.D/I119 key
Find type: probably key handle with eye-terminal
Description: terminal with widened end with eyelet, probably a key terminal
(Fort) level of find context: **5+post**
Count: 1 (fragment)
Dimensions in cm: length: 9.6; width: 2.0 (wide part); thickness: 0.6 (wide part)

IR.D/I120 key
Find type: probably key handle with perforation for suspension
Description: terminal with widened end with eyelet, probably a key terminal
(Fort) level of find context: **unstratified** (from 'mixed level' (contaminated with post-Roman level))
Count: 1 (fragment)
Dimensions in cm: length: 7.3; width: 2.7 (wide part)

IR.D/I121 key
Find type: probably key handle with eye-terminal
Description: end of flat stem, ring-headed with curled loop
References to parallels: cf. *e.g.* Manning 1985, Pl. 40, O32
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 8.2; width: 2.3

IR.D/I122 key
Find type: probably key handle with eye-terminal
Description: flat terminal with eyelet, probably a key terminal
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 8.5; width: 3.6; thickness: 1.0

IR.D/I123 key
Find type: probably key handle with eye-terminal
Description: flat terminal with eyelet, possibly a key terminal
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 6.0; width: 2.3

IR.D/I124 key
Find type: probably key handle with eye-terminal
Description: flat terminal with eyelet, probably a key terminal
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 7.6; width: 1.4; thickness: 0.4 (central section)

IR.D/I125 key
Find type: probably key handle with eye-terminal
Description: terminal with widened end with eyelet, probably a key terminal
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 9.6; width: 2.0 (at the eye-end)

IR.D/I126 key
Find type: probably key handle with eye-terminal
Description: flat terminal, tapering to the end, with extending eyelet at the end, probably a key terminal
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: length: 8.3; width: 2.6 (at the eye-end)

IR.D/I127 key
Find type: probably key handle with eye-terminal
Description: end of flat stem with eye-terminal
(Fort) level of find context: **4?**
Count: 1 (fragment)
Dimensions in cm: width: 2.5 (at the eye-end)

IR.D/I128 key
Find type: probably key handle with eye-terminal
Description: end of flat stem with eye-terminal
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: width: 2.0 (at the eye-end)

IR.D/I129 key
Find type: probably key handle with eye-terminal
Description: end of flat stem with eye-terminal
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: width: 2.1 (at the eye-end)

IR.D/I130 key
Find type: latch-lifter
Description: heavy, solid, rectangular-sectioned hooked stem with hooked-and-curved pointed end, temrinal broken off
(Fort) level of find context: **4**
Count: 1 (nearly complete)
Dimensions in cm: length: 19.2

IR.D/I131 key
Find type: latch-lifter
Description: solid, rectangular-sectioned shank with hooked-and-curved terminal ending in a pointed tip, handle-terminal broken off
References to parallels: cf. IR.D/I130
(Fort) level of find context: **3**
Count: 1 (fragment)
Dimensions in cm: length: 14.8 (horizontal shank part)

IR.E01 *stylus*
Find type: stylus type Manning (1976) III
Description: large part of *stylus*, with pointed end and erasing blade broken off

References to parallels: cf. IR.E02
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 9.9; width: 0.8; thickness: ; diameter:

IR.E02 *stylus*
Find type: stylus type Manning (1976) III; Schaltenbrand Obrecht 2012 Formgruppe P52
Description: nearly complete *stylus*, with one pointed end (point broken off) and one flat blade (erasing blade) bordered by small collar
References to parallels: see Manning 1976, 34-35: Fig. 10 (III); cf. Augst (CH): Schaltenbrand Obrecht 2012, 157
Dating (as accepted in literature): mid 2nd to mid 3rd century AD (Schaltenbrand Obrecht 2012, 158)
(Fort) level of find context: **unstratified** (from 'mixed level' (contaminated with post-Roman level))
Count: 1 (nearly complete)
Dimensions in cm: length: 10.4; width: 0.9 (calculated width of eraser)

IR.G01 steelyard arm
Find type: steelyard of solid iron, Franken 1989 type Eining (Franken 1989, 96-98)
Description: arm of steelyard: terminal with eye-ending and one looped projection
References to parallels: cf. Manning 1985, Pl. 52: P40 ; see Franken 1989 for further references
Dating (as accepted in literature): 2nd – 3rd century AD (Franken 1989, 97-98)
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 24.2; width: 1.3 (bar); thickness: 0.9 (bar); diameter: 4.3 (ring)

IR.G02 steelyard fragment
Description: fragment of steelyard arm with suspension loop with part of link attached
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 6.8

IR.G03 steelyard arm
Description: steelyard arm of solid iron, with conical terminal
References to parallels: cf. Manning 1985, Pl. 52: P42; cf. Büttner and Schlehofer 2019
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 22.2; diameter: 1.4 (bar)

IR.G04 steelyard hook
Description: S-shaped, rectangular-sectioned rod with pointed end, other end broken off
(Fort) level of find context: **3+4**
Count: 1 (not complete)
Dimensions in cm: length: 8.4

IR.G05 steelyard hook
Description: hook with pointed end and ring-shaped, open terminal
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 10.8

IR.G06 steelyard hook
Description: hook with curved end and ring-shaped terminal, very corroded
References to parallels: cf. *e.g.* Franken 1989, 71: Abb. 1; 101: Abb. 17; Augst (CH): Mutz 1983, 27: Abb. 16
(Fort) level of find context: **5(+4)**
Count: 1 (complete)
Dimensions in cm: length: 7.8

IR.G07 steelyard hook
Description: flat hook with eye-terminal
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 5.5 (height); width: 1.4 (eye)

IR.G08 weight
Find type: steelyard weight
Description: biconical weight, suspension loop broken off; weight current state: 544 g, probably originally representing 2 dextrans (2 x 272.88 g = 545.76 g) (cf. Mutz 1983, 7, Tabelle 1)
References to parallels: cf. IR.G10
(Fort) level of find context: **4**
Count: 1 (nearly complete)
Dimensions in cm: length: 5.9; diameter: 7.0

IR.G09 weight
Find type: steelyard weight
Description: solid, cylindrical weight, suspension loop broken off; weight current state: 320 g, probably originally representing 2 semis (2 x 163.73 g = 327.46 g) (cf. Mutz 1983, 7, Tabelle 1)
(Fort) level of find context: **5+post**
Count: 1 (complete)
Dimensions in cm: length: 5.5 (height); diameter: 4.3

IR.G10 weight
Find type: steelyard weight
Description: biconical weight, suspension loop broken off; weight current state: 138 g, probably representing 1 quincunx (136.44 g) (see for units of weight: Mutz 1983, 7, Tabelle 1)
References to parallels: cf. Augst: Mutz 1983, Abb. 31, 5
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 4.9 (height); diameter: 3.7

IR.H01 hipposandal
Find type: hipposandal Junkelmann 1992 type 3; possibly hipposandal Manning 1985 type 2
Description: fragment of hipposandal, wings and heel broken off
References to parallels: cf. Manning 1985, 65: examples known from London, Verulamium and Silchester, from contexts dated to late 1st/early 2nd and 3th/4th century; according to Junkelmann (1992, 88) type 3 is the youngest Roman type; very similar to

fragment found at Verulamium: Manning 1972a, 173: Fig. 63, 25 (by Manning identified as a possible Aubert Type I hipposandal, from a context dated to *c.* 300-315 AD)
(Fort) level of find context: **4** (final phase) **or 5**
Count: 1 (large part preserved)
Dimensions in cm: length: 12.6; width: 10.8

IR.H02 horse trapping
Find type: large round mount
Description: large, flat, round mount with one peg or stud, broken off
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: diameter: 9.3

IR.H03 linch pin
Find type: linch pin Manning 1976/1985 type 2 b, Künzl 1993, Type NF 12
Description: pin with widened, spatulate-head and with a turned-over loop formed from the metal of the head; damaged pin
References to parallels: cf. Neupotz (G): Künzl 1993, F 111 (context late 3rd century AD); common find at the Rhine limes: see Gerrard *s.d.* (Artefacts (CVC-4002)) with references; Pommeroeul (B): Bausier *et al.* 2008, 56; Saintes (F): Feugère *et al.* 1992, 90-91: 185; Manning 1985, Pl. 31: H41; most common type of linch pin: Manning 1985, 74 lists several finds in Britain and Germany (with references)
(Fort) level of find context: **5(+4)**
Count: 1 (complete)
Dimensions in cm: length: 17.9; width: 4.1 (head)

IR.H04 linch pin
Find type: linch pin Manning 1976/1985 type 2 b, Künzl 1993, Type NF 12
Description: pin with widened, spatulate-head and with a turned-over loop formed from the metal of the head
References to parallels: cf. IR.H03
(Fort) level of find context: **4**
Count: 1 (nearly complete)
Dimensions in cm: length: 16.5; width: 3.2 (head)

IR.H05 linch pin
Find type: linch pin Manning 1976/1985 type 2 b, Künzl 1993, Type NF 12
Description: pin with widened, semi-rectangular end with a turned-over loop formed from the metal of the head
References to parallels: cf. IR.H03
(Fort) level of find context: **unstratified** (from 'mixed level' (contaminated with post-Roman level))
Count: 1 (complete)
Dimensions in cm: length: 16.0; width: 2.8

IR.H06 linch pin
Description: thick, flat strip with two looped ends, curved to the centre of the strip, probably variant on known linch pin types
References to parallels: cf. Aldborough: Manning 1976; see Manning 1985, 73
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 13.6; width: 2.7 (central)

IR.H07 linch pin
Description: pin with widened, rectangular ending with two eyes on one side
References to parallels: cf. Widdersdorf: Liesen and Düerkop 2003, 447: Abb. 5, 4
(Fort) level of find context: **unstratified within the Roman level**
Count: 1 (complete)
Dimensions in cm: length: 16.0; width: 3.0 (head)

IR.H08 axle cap
Find type: axle cap Künzl 1993 type NF 14, Manning 1985 type 1
Description: cylindrical binding with one large semi-circular side, with two perforations (a small one on top and a larger one more towards the base); identifiable as axle guard band, used to bind the end of the axle which would have projected beyond the wheels, to strenghten the pole where it was weakened by the hole for the peg which held the yoke; with small perforation for the attachment of the mount onto the axle and large perforation for linch pin to pass through the axle in order to keep the wheels of the cart in place (Manning 1985, 75)
References to parallels: cf. Manning 1985, Pl. 32: H47; Fishbourne (UK): Cunliffe 1971, 136: Fig. 61, 59-60; Neupotz (G): Künzl 1993, F 119 (context of late 3rd century AD) (with references to comparable finds: see p. 278)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 11.2; diameter: 7.5

IR.H09 axle cap
Find type: cf. IR.H08
Description: curved sheet, possibly part of cylindrical binding cf. IR.H08
References to parallels: cf. IR.H08
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: width: 7.6

IR.H10 cart bolt
Description: stem in the shape of a large nail with round section, with round, flat, thick head, point of stem broken off, possibly a bolt used for attaching the yoke to the beam of a cart (see Manning 1985, 126)
References to parallels: cf. Châteaumeillant (Cher) (F): Torrado Alonso 2015, 323: Fig. 1: 1 (from well filling dated to end 2nd – early 3rd century AD); Manning 1985, 126, with references to similar finds in Germany, Pl. 58, R6
(Fort) level of find context: **3**
Count: 1 (almost complete)
Dimensions in cm: length: 22.0; diameter: 3.7 (head)

IR.H11 wheel hub
Find type: wheel hub Künzl 1993 Type NF 3
Description: cylindrical, flat, wide fitting
References to parallels: cf. Neupotz: Künzl 1993, F 23 (context of late 3rd century AD)

(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: width: 6.2; diameter: 10.0

IR.H12 yoke ring
Find type: iron version of eye on peg, without brim (cf. CA.H01)
Description: ring attached on pointed pin with smooth transition, likely to be the iron version of the copper alloy bridle ring type 'eye on peg, without brim'
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 10.2; width: 3.7 (eye)

IR.H13 cart fitting?
Find type: decorative fitting?
Description: flat, round mount on thick circular-sectioned peg
(Fort) level of find context: **4**
Count: 1 (nearly complete)
Dimensions in cm: length: 5.9; diameter: 7.6/7.0

IR.H14 cart fitting, of yoke?
Find type: sheet fitting
Description: curved sheet fitting with two nails preserved, running through the decayed wood
References to parallels: cf. *e.g.* Hanemann 2012, 143: Taf. 6, Kat. Nr. 20-22
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 16.9; width: 4.4 (height)

IR.H15 cart fitting, of yoke?
Find type: sheet fitting
Description: curved double sheet fitting, on the X-ray image two nails can be distinguished, running through the decayed wood
References to parallels: cf. IR.H14
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 10.2; width: 2.9 (height); thickness: 3.1

IR.H16 harness bell for draft animal, cattle
Find type: bell Künzl 1993 type NJ 2
Description: large bell, with suspension ring on top and very corroded iron clapper; bell attached to the halters or collars of cows, sheep, goats (Crummy 1983, 127); the bell formed an enormous corroded block together with anvil IR.C01
References to parallels: fragment of similar bell found at the north-east side of the fort (site Kapellestraat ET24): Vanhoutte *et al.* 2014, 223: Fig. 66, 1); cf. Neupotz (G): Künzl 1993 J 17 (context of late 3rd century AD); Saintes (F): Feugère *et al.* 1992, 76-77: 148; common find in the Roman provinces, according to Feugère *et al.* (1992, 76) and even more common in late Roman times; several large harness bells found at the *villa rustica* 'Steinacker' in Jülich-Kirchberg near Cologne, dated in the first half of the 4th century and identified as cattle bells (Päffgen 2011, 218: Abb. 24.1)
Dating (as accepted in literature): mainly 3rd-4th centuries AD
(Fort) level of find context: **4** (in the waste fillings of well OS 22926)
Count: 1 (complete)
Dimensions in cm: length: 12.0 (height), with ring: 15.0

IR.H17 harness bell for draft animal, cattle
Find type: bell Künzl 1993 type NJ 2
Description: bell, suspension loop broken off, iron clapper corroded onto the interior of the bell
References to parallels: cf. IR.H16
(Fort) level of find context: **4** (in the waste fillings of well OS 22926)
Count: 1 (nearly complete)
Dimensions in cm: length: 7.9; width: 8.6; thickness: 5.6

IR.H18 harness bell for draft animal, cattle
Find type: bell Künzl 1993 type NJ 2
Description: fragment of bell, with rounded rectangular base, iron with copper alloy cover layer
References to parallels: cf. IR.H16
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: width: 4.2; thickness: 2.8

IR.H19 harness bell for draft animal, cattle
Find type: bell Künzl 1993 type NJ 2
Description: bell, base broken off, broken off large suspension loop starting from the edges of the top, iron with copper alloy cover layer
References to parallels: cf. IR.H16
(Fort) level of find context: **post**
Count: 1 (large part preserved)
Dimensions in cm: length: 6.6

IR.H20 bridle bit
Find type: curb-bit Manning 1985 type 1
Description: two interlocking double-ring-headed pins with two rings attached to the preserved end
References to parallels: cf. Manning 1985, 67-68: the curb-bit was designed for a rapid reaction from the horse and was used especially for riding horses, particularly for cavalry mounts where complete control by the rider was necessary
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 9.8 (max. length)

IR.H21 bridle bit
Find type: curb-bit Manning 1985 type 1
Description: two interlocking double-ring-headed pins with at their other ring-head two round links attached
References to parallels: cf. IR.H20
(Fort) level of find context: **unstratified** (from 'mixed level' (contaminated with post-Roman level))
Count: 1 (not complete)
Dimensions in cm: length: 16.8

IR.H/C22 boat or ship stake
Description: part of double-pronged fork, socketed
References to parallels: cf. ship/boat stakes found at Neupotz (G) (context of late 3rd century AD): Künzl 1993, 45-48: Abb. 13-16: with references to comparable finds in the region between Nord-West Switzerland and the North Sea dated throughout the Roman period; cf. Pommeroeul (B) where several boat hooks were found at a Roman harbour installation: De Boe and Hubert 1977, 37, 39-40: Fig. 48-49

(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 11.0; diameter: 2.8 (largest section)

IR.H/C23 boat or ship stake
Description: part of double-pronged fork, socketed
References to parallels: cf. IR.H/C22
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: length: 10.6; diameter: 1.6 (largest section)

IR.I/C01 pivot-lining for door/gate or mill bearing
Description: thick, solid, rectangular block with central circular deepening, known in two functions: as pivot-lining, set in a pivot-hole, for door or gate, and as bearing in a mill installation (the bearing was mounted at the bottom of the installation and functioned as pivoting base for the spindle)
References to parallels: as pivot-lining: cf. Manning 1976, 40 and 57: Fig. 24, 153; Feugère *et al.* 1992, 38: no. 53; Liberchies (B): Dewert 2008, 175 and Vilvorder 2015, 243-244: 45; Dünsberg (G): Jacobi 1977, Taf. 45: 29; Simon and Kölher 1992, 120 mit Taf. 60: B119; Widdersdorf (G): Liesen and Düerkop 2003, 447: Abb. 5: 6; as mill bearing: cf. Liberchies (B), *vicus*: Demanet and Vilvorder 2013
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 6.4; width: 6.1; thickness: 2.3 (max); diameter: 2.5 (eye)

IR.I/C02 pivot-lining for door/gate or mill bearing
Description: thick, solid, rectangular block with central circular deepening, known in two functions: as pivot-lining, set in a pivot-hole, for door or gate, and as bearing in a mill installation (the bearing was mounted at the bottom of the installation and functioned as pivoting base for the spindle)
References to parallels: cf. IR.I/C01
(Fort) level of find context: **unstratified**
Count: 1 (complete)
Dimensions in cm: length: 7.0; width: 6.4; thickness: 2.3 (max); diameter: 2.8 (eye)

IR.I/C03 pivot-lining for door/gate or mill bearing
Description: thick, solid, rectangular block with central circular deepening, cf. IR.I/C01 and IR.I/C02, but here no deepening but complete perforation; item known in two functions: as pivot-lining, set in a pivot-hole, for door or gate, and as bearing in a mill installation (the bearing was mounted at the bottom of the installation and functioned as pivoting base for the spindle)
References to parallels: cf. IR.I/C01
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 6.2; width: 5.4; thickness: 1.9; diameter: 2.0 (eye)

IR.I04 door hinge
Description: part of a rectangular-sectioned bar with right-angled terminal and side-branche to below, broken off; identifiable as element on which a door or gate turns
References to parallels: cf. Saintes (F): Feugère *et al.* 1992, 36-37, 51
(Fort) level of find context: **3/4**
Count: 1 (fragment)
Dimensions in cm: length: 15.3 (horizontal part); height: 11.0 (max. total height)

IR.I05 striker plate
Description: U-shaped fitting, rectangular-sectioned, with wider horizontal part, to slide over the board of a gate
(Fort) level of find context: **unstratified**
Count: 1 (complete)
Dimensions in cm: length: 7.0 (height); width: 7.6; thickness: 1.9

IR.J001 part of chain
Description: part of a chain consisting of rounded rectangular links interlocked with head of a split pin
(Fort) level of find context: **4+5**
Count: 1 (complete links, only head of split pin preserved)
Dimensions in cm: length: 9.3 / 5.9 (largest and smallest link); width: 2.6 / 2.1 (largest and smallest link)

IR.J002 part of chain
Description: part of a chain consisting of two rounded rectangular links and one hook-and-eye
(Fort) level of find context: **5**
Count: 1 (complete links and eye-on-hook)
Dimensions in cm: length: 9.1 (one link); width: 3.3 (one link)

IR.J003 part of chain
Description: one eye-on-hook, part of a chain cf. IR.J002
(Fort) level of find context: **2**
Count: 1 (complete eye-on-hook)
Dimensions in cm: length: 7.6

IR.J004 part of chain
Description: two interlocking rounded rectangular links with split pin attached
(Fort) level of find context: **3**
Count: 1 (complete links and split pin)
Dimensions in cm: length: 5.8 (one link), 7.2 (split pin), 21.7 (total length); width: 2.7 (one link)

IR.J005 part of chain
Description: part of a chain consisting of two eight-shaped links, attached to one rounded rectangular link and one hook which is corroded onto L-shaped piece of bar: not clear whether these are related
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 6.4 (max); width: 7.0 (max)

IR.J006 part of chain
Description: very corroded fragment of chain, consisting of long links, but no more can be deduced from the corroded piece and its X-ray image
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 10.2 (max)

IR.J007 chain element
Description: double-ring-headed bar, the one ring is larger than the other
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 10.4

IR.J008 chain element
Description: complete narrow round-sectioned bar with two large eye-terminals, part of large chain? or part of large bridle-bit?
(Fort) level of find context: **4 or 5**
Count: 1 (complete)
Dimensions in cm: length: 22.7

IR.J022 nail
Description: complete nail with round head, straight stem
(Fort) level of find context: **3**
Count: 1 (complete)
Dimensions in cm: length: 15.5

IR.J023 nail
Description: nail with hammered mushroom-shaped head, only point damaged; ship nail (nail from boat of celtic construction)?
References to parallels: cf. Richborough: Lyne 1996, 148: Fig. 1, 9-10, and pers. comm. M. Lyne
(Fort) level of find context: **3 or 4**
Count: 1 (nearly complete)
Dimensions in cm: length: 20.9; diameter: 4.2 (head)

IR.J024 large nail
Description: nail with conical head with top slightly hammered flat; ship nail (nail from boat of celtic construction)?
References to parallels: cf. IR.J023
(Fort) level of find context: **3 or 4**
Count: 1 (complete)
Dimensions in cm: length: 21.0; diameter: 4.5 (head)

IR.J025 large nail
Description: mushroom-headed large nail, with conical head with flattened top (because of hammering); ship nail (nail from boat of celtic construction)?; with slightly curved shank because of extraction from wood: reused wood from ship?
References to parallels: cf. IR.J023
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 37.9; diameter: 4.8 (head)

IR.J026 large nail
Description: large nail in two pieces, not fitting, with conical head, squeezed; ship nail (nail from boat of celtic construction)?
References to parallels: cf. IR.J023
(Fort) level of find context: **4**
Count: 1 (almost complete)
Dimensions in cm: length: 23.6; diameter: 3.9 (head)

IR.J027 nails
Description: two complete nails with conical head corroded onto each other
(Fort) level of find context: **4** (final phase)
Count: 2 (complete)
Dimensions in cm: length: 21.0 /11.0

IR.J028 nail
Description: nail with hammered mushroom-shaped head, only point broken off
(Fort) level of find context: **4**
Count: 1 (nearly complete)
Dimensions in cm: length: 14.6; diameter: 3.5 (head)

IR.J029 large nail
Description: nail with conical head, part of shank broken off; ship nail (nail from boat of celtic construction)?
References to parallels: cf. IR.J023
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 10.3; diameter: 5.1 (head)

IR.J030 large nail
Description: nail with rounded square, flat head, with curved shank (because of extraction from wood); ship nail (nail from boat of celtic construction)?
References to parallels: cf. IR.J023
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 18.8; diameter: 3.4 (head)

IR.J031 large nail
Description: nail with conical head with curved shank because of extraction from wood; ship nail (nail from boat of celtic construction)?
References to parallels: cf. IR.J023
(Fort) level of find context: **4+5**
Count: 1 (complete)
Dimensions in cm: length: 16.4; diameter: 3.7 (head)

IR.J032 nail
Description: large nail, almost complete, with mushroom-shaped head, hammered
(Fort) level of find context: **unstratified** (from 'mixed level' (contaminated with post-Roman level))
Count: 1 (nearly complete)
Dimensions in cm: length: 11.9; diameter: 2.9 (head)

IR.J033 large nail
Description: nail with conical head with flattened top due to hammering, point broken off
(Fort) level of find context: **unstratified** (from 'mixed level' (contaminated with post-Roman level))
Count: 1 (nearly complete)
Dimensions in cm: length: 13.9; diameter: 3.3 (head)

IR.J034 nail
Description: large nail with mushroom-shaped head, stem broken off
(Fort) level of find context: **5+post**
Count: 1 (not complete)
Dimensions in cm: length: 9.5; width: 4.0 (head)

IR.J035 large nail
Description: nail with conical head with flattened top due to hammering, point broken off; ship nail (nail from boat of celtic construction)?
References to parallels: cf. IR.J023
(Fort) level of find context: **3**
Count: 1 (not complete)
Dimensions in cm: length: 17.7; diameter: 4.1 (head)

IR.J036 large nail
Description: large nail in two pieces, part of shank not preserved, circular, flat head, possibly flat because of hammering, shank partly curved, due to extraction from wood; ship nail (nail from boat of celtic construction)?
References to parallels: cf. IR.J023
(Fort) level of find context: **4+5+post**
Count: 1 (not complete)
Dimensions in cm: length: *c.* 17.0; diameter: 4.3 (head)

IR.J037 nails
Description: nail with conical head, with hammered flat top, large part of shank broken off; nail with low conical head and hooked shank, showing thickness of wood of which the nail is retrieved, part of shank broken off; nail with circular and round head, shank largely broken off
(Fort) level of find context: **5?**
Count: 3 (fragments)
Dimensions in cm: length: 6.7 / 6.3 / 6/3; diameter: 4.4 / 3.5 / 4.3

IR.J038 nail
Description: large nail with flat round head, almost complete, bent over
(Fort) level of find context: **4**
Count: 1 (nearly complete)
Dimensions in cm: length: 10.9; diameter: 2.8 (head)

IR.J039 large nail
Description: nail with circular, flat head, with shank bent over (because of extraction from wood); ship nail (nail from boat of celtic construction)?
References to parallels: cf. IR.J023
(Fort) level of find context: **5+post**
Count: 1 (complete)
Dimensions in cm: length: 18.0; diameter: 3.2 (head)

IR.J040 nail
Description: large nail with flat head, bent; was probably still located driven into the wood, but wood decayed
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 20.5

IR.J041 T-clamp
Description: nail with T-shaped head, point broken off
(Fort) level of find context: **4**
Count: 1 (almost complete)
Dimensions in cm: length: 15.7; width: 5.6 (head)

IR.J042 holdfasts
Description: holdfasts, nails with two opposite heads, one larger than the other
(Fort) level of find context: **4**
Count: 4 (complete)
Dimensions in cm: length: 6.1 (largest holdfast); width: 2.7 (largest head of the largest holdfast)

IR.J043 holdfast
Description: holdfast, nail with two opposite, flat round heads of more or less equal size
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 5.3

IR.J044 holdfast
Description: holdfast, nail with two opposite, flat round heads, one larger than the other
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 5.3

IR.J045 holdfast
Description: holdfast, nail with domed head and flat round head
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 5.3

IR.J046 joiner's dog/staple clamp
Description: staple-shaped clamp, rectangular-sectioned, one point broken off
References to parallels: cf. Manning 1985, Pl. 61, R53
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 10.6

IR.J047 joiner's dog/staple clamp
Description: staple-shaped clamp, rectangular-sectioned, one leg stretched
References to parallels: cf. IR.J046
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 8.6

IR.J048 joiner's dog/staple clamp
Description: staple-shaped clamp, rectangular-sectioned
References to parallels: cf. IR.J046
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 7.9

IR.J049 joiner's dog/staple clamp
Description: staple-shaped clamp, flat-sectioned, with widened head
(Fort) level of find context: **5**
Count: 1 (not complete)
Dimensions in cm: length: 10.3

IR.J050 binding (specific type of joiner's dog?)
Description: U-shaped flat binding, with semi-round upper side, legs bent to the center, possibly a narrow variant of the joiner's dog; nail with round flat head corroded onto
(Fort) level of find context: **4+5**
Count: 1 (complete)
Dimensions in cm: length: 8.0; width: 4.4

IR.J051 fitting
Description: U-shaped fitting, flat-sectioned
(Fort) level of find context: **post**
Count: 1 (complete?)
Dimensions in cm: length: 8.0; width: 3.8 (arm)

IR.J052 hooked rod
Description: simple straight-hooked rod, both ends broken off
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 12.7

IR.J053 fitting
Description: U-shaped fitting, one arm broken off, with triangular-shaped flat head
(Fort) level of find context: **1**
Count: 1 (not complete)
Dimensions in cm: length: 9.4

IR.J054 double-spiked loop (split pin) with hooked ring-headed pin
Description: interlocking hooked ring-headed pin and double-spiked loop (split pin)
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 12.6 (pin) and 6.4 (split pin)

IR.J055 double-spiked loop (split pin) with hooked ring-headed pin
Description: interlocking hooked ring-headed pin and double-spiked loop (split pin)
(Fort) level of find context: **unstratified** (from 'mixed level' (contaminated with post-Roman level))
Count: 1 (not complete)
Dimensions in cm: length: 10.7 (pin) and 7.7 (split pin)

IR.J056 double-spiked loop (split pin) and ring-headed pin
Description: interlocking double-spiked loop (split pin) and ring-headed pin
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 7.3 (pin) and 5.4 (split pin)

IR.J057 double-spiked loops (split pins)
Description: two double-spiked loops, interlocking
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 4.8 and 3.8

IR.J058 ring-headed pins
Description: interlocking ring-headed pins (hook-eye-ended shanks), one hooked
(Fort) level of find context: **unstratified** (from 'mixed level' (contaminated with post-Roman level))
Count: 1 (not complete)
Dimensions in cm: length: 9.5 (one pin)

IR.J059 double-spiked loops (split pins)
Description: two interlocking split pins
(Fort) level of find context: **4**
Count: 1 (nearly complete)
Dimensions in cm: length: 11.1 and 9.4

IR.J060 double-spiked loops (split pins)
Description: two split pins corroded onto each other, badly preserved and heavily corroded
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 9.1 (max)

IR.J061 double-spiked loops (split pins)
Description: two interlocking split pins
(Fort) level of find context: **5**
Count: 1 (not complete)
Dimensions in cm: length: 6.7 and 7.5

IR.J062 double-spiked loop (split pin)
Description: split pin with straight legs, points broken off
(Fort) level of find context: **4**
Count: 1 (nearly complete)
Dimensions in cm: length: 10.0

IR.J063 double-spiked loop (split pin)
Description: double-spiked loop with wide, flat head, legs broken off
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 11.9; thickness: 2.0 (eye)

IR.J064 double-spiked loop (split pin)
Description: split pin, points broken off
(Fort) level of find context: **4+5**
Count: 1 (not complete)
Dimensions in cm: length: 7.3

IR.J065 double-spiked loop (split pin)
Description: split pin, legs broken off
(Fort) level of find context: **4+5**
Count: 1 (not complete)
Dimensions in cm: length: 6.0

IR.J066 double-spiked loop (split pin)
Description: split pin, one point broken off
(Fort) level of find context: **post**
Count: 1 (nearly complete)
Dimensions in cm: length: 9.3

IR.J067 ring-headed pin
Description: ring-headed pin, open ring, stem broken off; corroded onto copper alloy bridle ring CA.H09
(Fort) level of find context: **5**
Count: 1 (not complete)
Dimensions in cm: length: 8.3

IR.J068 loop-headed pin
Description: ring-headed pin with open head
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 11.0

IR.J069 ring-headed bar
Description: ring-headed bar, ring partly broken off, other end broken off; this can also be part of a double-ringed rod, part of a chain
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 12.6

IR.J070-071 ring-headed bar
Description: two fragments of flat bar, heavily corroded, with part of ring-terminal, not fitting but likely to be from the same item
(Fort) level of find context: **5**
Count: 2 (fragments)
Dimensions in cm: length: 15.4 (IR.J070); width: 2.1 (IR.J070, central section)

IR.J072 oval link with double-spiked loop
Description: oval ring with double-spiked loop attached, points of legs broken off
(Fort) level of find context: **4+5**
Count: 1 (link complete, split pin not complete)
Dimensions in cm: length: 6.4 (link); width: 4.0 (link)

IR.J073 round link with double-spiked loop
Description: round link with split pin attached
(Fort) level of find context: **3**
Count: 1 (link complete, points of split pin broken off)
Dimensions in cm: length: 6.7 (split pin); diameter: 4.9 (link)

IR.J074 round link with double-spiked loop
Description: large round link with head of split pin attached
(Fort) level of find context: **unstratified** (from 'mixed level' (contaminated with post-Roman level))
Count: 1 (link complete, only head of split pin preserved)
Dimensions in cm: diameter: 10.3 (link)

IR.J075 round link with double-spiked loop
Description: round link with double-spiked loop attached
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 8.7 (split pin); diameter: 6.2 (link)

IR.J076 round link with double-spiked loop
Description: large round link with head of split pin attached
(Fort) level of find context: **post**
Count: 1 (round link complete, only head of split pin preserved)
Dimensions in cm: diameter: 11.7

IR.J077 round link with ring-headed pin / bridle bit fragment?
Description: round link, not complete, with head of ring-headed pin attached; part of curb-bit Manning 1985 type 1? (see Manning 1985, 67-68)
(Fort) level of find context: **2**
Count: 1 (link not complete, part of pin broken off)
Dimensions in cm: length: 6.6 (eye-pin); diameter: *c.* 5.3 (ring), 2.8 (eye)

IR.J078 round link with ring-headed pin / bridle bit fragment?
Description: round link with head of ring-headed pin attached; part of curb-bit Manning 1985 type 1? (see Manning 1985, 67-68)
(Fort) level of find context: **4**
Count: 1 (link complete, only head of pin preserved)
Dimensions in cm: diameter: 7.0 (link)

IR.J079 hinge
Find type: loop-hinge, Manning 1985 type 2
Description: part of long rectangular plate, flat-sectioned, with eye-terminal, with split pin attached
References to parallels: cf. Manning 1995, 4-5: 4-6
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 12.2 (plate), 5.7 (split pin); width: 2.6 (plate)

IR.J080 hinge
Find type: loop-hinge, Manning 1985 type 2
Description: cf. IR.J079
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 11.0 (plate), 6.1 (split pin); width: 2.5 (plate)

IR.J081 hinge
Find type: loop-hinge, Manning 1985 type 2
Description: fragment of rectangular plate, flat-sectioned, with eye-terminal, and central rivet perforation
References to parallels: cf. Manning 1995, 4-5: 4-5
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 5.9; width: 2.6

IR.J082 hinge
Find type: loop-hinge, Manning 1985 type 2
Description: fragment of rectangular plate, flat-sectioned, with eye-terminal, and central rivet perforation
References to parallels: cf. Manning 1995, 4-5: 4-5
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 5.4; width: 2.0

IR.J083 hinge
Find type: loop-hinge, Manning 1985 type 2
Description: fragment of one of the straps of a loop-hinge, rectangular plate, flat-sectioned, with eye-terminal with split pin attached, and central rivet perforation
References to parallels: cf. Manning 1995, 4-5: 4-5
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 5.0 (plate), 5.5 (split pin); width: 2.7 (plate)

IR.J084 hinge
Find type: loop-hinge, Manning 1985 type 2
Description: large part of flat rectangular plate with eye at the end, other end broken off at perforation
References to parallels: cf. IR.J079
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 26.5 (total); width: 2.6

IR.J085 binding of door, gate, chest, box, cupboard, …?
Description: large part of flat rectangular plate with central rivetted perforations
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 40.9; width: 3.8

IR.J086 binding of door, gate, chest, box, cupboard, … or hinge?
Find type: cf. loop-hinge, Manning 1985 type 2?
Description: large part of flat rectangular plate with central rivetted perforations on regular distance, rivets not preserved; copper alloy fragment attached to it
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 23.2; width: 2.9

IR.J087 door or chest fitting, binding
Description: double sheet fitting linked by two preserved rivets; the wood in-between is decayed
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 11.8; width: 4.7 (height); thickness: 2.1

IR.J088 binding or hinge
Find type: loop-hinge?, Manning 1985 type 2
Description: fragment of strap, flat-sectioned rectangular plate with central perforation
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 9.3; width: 5.2

IR.J089 binding or hinge
Find type: loop-hinge?, Manning 1985 type 2
Description: fragment of strap, flat-sectioned rectangular plate, broken off at perforation, slightly curved
(Fort) level of find context: **unstratified**
Count: 1 (fragment)
Dimensions in cm: length: 10.2; width: 2.8

IR.J090 binding
Description: small rectangular plate with eye-terminal, other end broken off
(Fort) level of find context: **4** (final phase)
Count: 1 (fragment)
Dimensions in cm: length: 24.4; width: 2.0 (at the eye-end)

IR.J091 collar
Description: flat-sectioned cylindrical collar, edge damaged
(Fort) level of find context: **5(+4)**
Count: 1 (nearly complete)
Dimensions in cm: width: 4.0; diameter: 4.7

IR.J092 collar
Description: flat-sectioned collar with wider and narrower side
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 5.9; width: 4.6; thickness: 2.2 / 4.0

IR.J093 attachment fitting
Description: fragment of flat-sectioned rectangular plate with eye-terminal, partly broken off, and two central perforations, other end broken off
(Fort) level of find context: **4+5**
Count: 1 (fragment)
Dimensions in cm: length: 11.2

IR.J094 door-hinge?
Description: L-shaped bar, long end broken off
(Fort) level of find context: **3**
Count: 1 (not complete)
Dimensions in cm: length: 8.3; width: 3.7

IR.J095 binding
Description: fragment of U-shaped, flat binding with nail through perforation for attachment
(Fort) level of find context: **3**
Count: 1 (fragment)
Dimensions in cm: length: 2.4 (height), 2.1 (nail)

IR.J096 binding (for a beam)
Description: large U-shaped, flat rectangular-sectioned binding, with a perforation for attachment at both sides, both ends broken off
References to parallels: cf. Manning 1985, Pl. 68, S105
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 10.4 (height); thickness: 2.4 x 0.7

IR.J097 beam fitting
Find type: fitting Künzl 1993 Type NF 25
Description: U-shaped, wide fitting, with wider base edge, with three perforations for iron nail to attach the fitting onto the wood
References to parallels: cf. Neupotz (G): Künzl 1993, F 163 (context of late 3rd century AD)
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 15.6 (height); width: 10.0; thickness: 4.9

IR.J098 binding (for a beam)
Description: rounded rectangular wide fitting, edge largely broken off
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 12.6; width: 10.6

IR.K01 undetermined
Description: fragment of blade, original rounded edge preserved, with start of perpendicular element; iron core with copper alloy cover
(Fort) level of find context: **2**
Count: 1 (fragment)
Dimensions in cm: length: 4.9; width: 2.6

IR.K02 conical pin
Description: large conical pin with round base, point broken off
(Fort) level of find context: **3**
Count: 1 (not complete)
Dimensions in cm: length: 12.2; width: 1.7 (base)

IR.K03 part of chain?
Description: lozenge-shaped item linked by small round link to two drop-shaped links
(Fort) level of find context: **3**
Count: 1 (not complete)
Dimensions in cm: length: 5.2 (max.)

IR.K04 undetermined
Description: two long, fine bars, round-sectioned: a complete bar with spiral-like end with head of ring-headed pin(?) attached, other end curved with possibly attachment of other bar; a similar bar, also with spiral-like end with undetermined piece attached to it, other end broken off
(Fort) level of find context: **3 or 4**
Count: 2 (not complete)
Dimensions in cm: length: 29.0 / 22.1

IR.K05 tool?, undetermined
Description: double-pronged stem, rectangular-sectioned, fragment of undetermined item
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 5.8; width: 2.1 (max. width at the open end)

IR.K06 fitting?
Description: almost complete, large, fitting-like sheet, fin-shaped; large box or door fitting?
(Fort) level of find context: **4** (final phase)
Count: 1 (nearly complete, one side broken off)
Dimensions in cm: length: 23.5; width: 7.4

IR.K07 fitting?
Description: perforated end of sheet with curved arm, part of a decorative fitting?
(Fort) level of find context: **3**
Count: 1 (fragment)
Dimensions in cm: length: 5.7

IR.K08 sheet fittings
Description: five sheet fragments, all with iron core and copper alloy cover: one is slightly curved and has one single rivet hole, three other sheet fragments show a rivet hole along the rim; all five are likely to be from the same object
(Fort) level of find context: **4**
Count: 5 (fragments)
Dimensions in cm: length: 9.4 (largest fragment); width: 1.2 (largest fragment)

IR.K09 undetermined
Description: solid piramidal-shaped piece, small anvil?, with undetermined rounded top (other item corroded onto piramidal-shaped piece?)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 6.2; width: 3.1; thickness: 2.6

IR.K10 lifting tackle element?
Description: ring-headed item with start of rectangular-sectioned stem positioned perpendicular to the ring, part of a lifting tackle system?
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 7.7; width: 2.8 (eye)

IR.K11 undetermined
Description: stem with part of blade-like sheet with slight midrib
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 11.2; width: 4.9

IR.K12 hook-on-peg
Description: pin with sharp hook-end, other end broken off
(Fort) level of find context: **5+post**
Count: 1 (not complete)
Dimensions in cm: length: 11.9

IR.K13 tool?, undetermined
Description: fragment of curved rod with two knobs or broken off arms to the outside
(Fort) level of find context: **5+post**
Count: 1 (fragment)
Dimensions in cm: length: 5.4

IR.K14 undetermined
Description: rectangular-sectioned bar with thicker end and two straight-angled side branches, one at each side, partly broken off, end of bar is also broken off: part of a large hinge system?
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 15.3

IR.K15 undetermined
Description: long flat bar with slightly collared, tapering end (complete?), with other end broken off, and with straight-angled side branch; broken in two: part of a tool?
(Fort) level of find context: **post**

Count: 1 (not complete)
Dimensions in cm: length: 24.3

IR.K16 fitting?
Description: large U-shaped fitting with upstanding margins, a fitting of some form?
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 16.4; width: 9.6

IR.K17 bar
Description: large bar, round-sectioned, both ends broken off, function undetermined
(Fort) level of find context: **2**
Count: 1 (not complete)
Dimensions in cm: length: 44.7; thickness: 2.4

IR.K18 tool, undetermined
Description: central part of possible tool or weapon, with fragment of the socket and transition to narrow rectangular-sectioned tang
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 8.2; diameter: 1.3 (socket)

IR.K19 undetermined
Description: complete item consisting of a continuous rod, symmetrically shaped, with upstanding arms, and with studs underneath, possibly some kind of stand
References to parallels: no parallels found in literature
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 11.7; width: 5.2

IR.K20 tool, undetermined
Description: rounded flat blade with part of a stem, broken off
References to parallels: comparable to Manning 1985, Pl. 70, S134a although this find from Rodmarton (UK) is a bit larger. Manning 1985, 144 suggests an identification as a fire tool, but remains in doubt about its specific function; the find context at Oudenburg near the workshops may suggest a relation to the metalworking activities
(Fort) level of find context: **4**
Count: 1 (blade complete, stem broken off)
Dimensions in cm: length: 9.1; width: 6.2 (blade)

IR.K21 tool, undetermined
Description: rounded flat blade with part of a stem, broken off
References to parallels: cf. IR.K20
(Fort) level of find context: **4**
Count: 1 (blade complete, stem broken off)
Dimensions in cm: length: 8.3; width: 6.3

4. The items in worked animal products (antler, horn, bone and ivory)

Sofie Vanhoutte

1. Introduction to the assemblage of items in worked animal products

Items in worked bone, antler, horn and ivory deserve close attention, mainly because this category largely consists of personal items of which the study offers an important contribution to the gender research of the fort site. The assemblage is also significant in light of the presence of military items as in the 3rd century AD many sword and baldric accessories were made of bone or similar materials (Bishop and Coulston 1993, 161).

At the south-west corner site of the Oudenburg fort, 327 items in worked bone, antler, horn or ivory were recovered. Apart from finished artefacts this number also includes bone, antler and horn fragments with clear traces of processing, representing half-finished or waste products. This collection was brought together during the fieldwork and initial cleaning of the finds, but detailed archaeozoological studies of selected contexts have demonstrated that much more of such half-finished or waste material can be found within the collection of (presumed unworked) animal bones (see *e.g.* the study by Ervynck and Lentacker in Vanhoutte *et al.* 2009b; Fret 2005 and 2006; Massagé 2015). Of the 327 finds, 190 items in worked bone, antler, horn and ivory were subject to analysis as they could be identified to specific Roman artefact types, coming from the Roman and post-Roman levels. Not included in this assemblage are the animal remains that cannot be identified as (fragments of) specific objects but that are waste products of the production process (merely horn, bone and antler fragments). Neither are included the clear and probable medieval finds, all of course recovered from the post-Roman levels. The here presented catalogue lists the 146 illustrated items which cover all the represented types of objects[200]. They stand for a wide range of domains (Table 4.1).

For each item in the catalogue comparable finds are listed where possible and to the extent necessary to understand the chronological significance and the area of distribution of the considered find type. In this respect the literature study in the catalogue has not the intention to be exhaustive. The following text aims at highlighting broad conclusions and wants to offer the basis for further analysis of gender, social and cultural aspects of the fort inhabitants. For the find comparisons the author refers to the catalogue in order not to repeat all data listed there.

The catalogue of the Roman finds made of animal products (antler, horn, bone and ivory) (AHBI) is inserted as Section 10 in this chapter. The finds are recorded and illustrated (Plates CCCXVI-CCCXXVII) according to the functional classification also applied to the metal finds (see Chapter 3 in this volume, Table 3.1). The raw materials were identified by dr. An Lentacker and dr. Anton Ervynck, both Heritage Researchers at the Flanders Heritage Agency.

2. Items related to military life

Ten items of the worked bone/antler/horn/ivory assemblage can be classified as military accessories (Plate CCCXVI). Five of them are (fragments of) scabbard chapes. The two-piece box chape type represented by AHBI.A03, A04 and A05 can be dated in the late 2nd-3rd centuries (Oldenstein 1976, 244-245; Miks 2007, 363-364) which is in line with the find contexts at the Oudenburg site, respectively from fort level 3, 4 and 1>4. This type has a wide distribution in *Britannia*, *Gallia* and *Germania Inferior* and *Superior*. The box chape A01 with pelta-shaped piercings – a popular type with a Europe-wide distribution as well (Bishop and Coulston 2006, 161) – is dated late 2nd/early 3rd century until at least the end of the 3rd century, possibly into the second half of the 4th century (Miks 2007, 373: '*Kastenortband*' variant A1). If the Oudenburg fragment, which is burnt, is not a residual find at fort level 5, its find context may confirm this later end date. The rounded scabbard chape A02, most likely the lower fragment of a chape with peltate piercings but broken off at their bases, is obviously a residual find in level 5+post.

This assemblage also contains a bone scabbard runner (A06) of the type which can be dated in the first half of the 3rd to the second half of the 4th century (Miks 2007, 315-316). Recovered from the level 5+post, it may have been an item from fort level 5 or a dug-up item from fort levels 2, 3 or 4. The ivory baldric fitting A07, a fungiform stud, was a common belt fitting type in the 3rd century (see Bishop

200 **The non-illustrated items of the original catalogue comprise one small comb plate fragment and 43 pins, mostly fragmented items and (hair) pins with a very close parallel in the illustrated assemblage.**

Table 4.1. Classification of the catalogued assemblage of the items in worked bone, antler, horn and ivory of the south-west corner site, into domains and categories, and according to their find level. 'POST' stands for the post-Roman level Illustrated finds on Plates CCCXVI-CCCXXVII.

find domaine / category	item (found complete or as fragment)	cat. nos AHBI.	TOTAL n	L1	FL2	FL3	FL4	FL5	5+POST / POST
military life									
military equipment									
	scabbard chape	A01-05	**5**			1	2	1	1
	scabbard runner	A06	**1**						1
	sword hilt grip	A08-10	**3**				2		1
military dress									
	baldric fitting	A07	**1**						1
personal life									
ornament and dress									
	armlet	B150	**1**						1
	hair pin	B011-143	**133**		6	17	32	32	46
	hair pin / cosmetic instrument / writing tool	B009, 010, 147	**3**			1	1		1
body care (medicine or toilet implement)									
	ligula	B148	**1**		1				
	fan handle	B149	**1**				1		
	comb	B001-008	**8**					5	3
domestic life									
furnishing									
	decorative veneer	D01-D02	**2**			1			1
	decorative plate	D03	**1**					1	
household utensil									
	clasp-knife	D04	**1**				1		
crafts - production									
boneworking									
	(hair?) pin semimanufactures	B144-146	**3**				1		2
	pin semimanufacture	C08-C09	**2**					2	
textile working									
	pin-beater	C01-02	**2**					2	
	needle case	C03-06	**4**					1	3
	pin(?)	C10	**1**					1	
woodworking?									
	saw(?) handle	C07	**1**				1		
social life									
entertainment									
	counter	E01-07	**7**			3	2	1	1
	chess-piece?	E08	**1**					1	
spiritual life									
	perforated antler spike	F01-05	**5**				3	2	
undetermined									
		K01-03	**3**			1	2		
TOTAL			**190**	**0**	**7**	**24**	**48**	**49**	**62**

and Coulston 2006, 182-183: Fig. 118, 9-12). Oldenstein (1976, 169) dates this type in the second half of the 2nd – first half of the 3rd century indicating that, although recovered from the post-Roman level, this item must have belonged to one of the first three fort levels. The 'military' assemblage is completed by three fragments of ribbed sword hilt grips, two made in antler (A08 and A10) and one in bone (A09). They represent the general type of grip of 3rd-century long swords or *spathae* (see Bishop and Coulston 2006, 157: Fig. 98). The A10 sword hilt grip can be identified as the Nydam type (Miks 2007, 200-202). Example A08, recovered from the infill of well OS 22926 of fort level 4, confirms the use of such grip in the late 3rd century.

These military items can only be generally dated, mainly to the 3rd and/or 4th centuries, and can therefore contribute only very little to the chronological discussion of the successive occupations of the Oudenburg fort. Nevertheless, they are in line with what can be expected at a military site and they represent standardised Roman military accessories.

3. Items related to personal life

3.1 Combs

In total 40 combs or comb fragments were recovered from the Roman and post-Roman levels at the south-west corner site. At least eight of them can be identified with certainty as Roman, through their type and/or based on the stratified evidence (Plate CCCXVII). Four of them are triangular-backed single-sided combs made in antler, a typical late Roman comb type. Only comb B003 was found in context at fort level 5, namely in the primary infill of the large basin OS 4923 of fort level 5B. This decorated type can be generally dated in the 4th to first half of the 5th century (Thomas 1960; Riha 1986, 1). The same dating can be assumed for the decorated comb B002, recovered from the dark earth level. A similar comb was found in grave 14 of the Oudenburg Graveyard A (Mertens and Van Impe 1971, Pl. V, 2) and dated after AD 350 based on the accompanying grave goods. Comb B001 and comb fragment B004 – in its complete form the latter comb was probably not much smaller than B001 – represent the undecorated triangular-backed single-sided comb type which seems to be of a later date, according to Böhme (1972, 123) dated to the 5th century. Both finds are recovered from the dark earth level.

Four comb fragments, produced in antler or bone, represent the double-sided type, a type that emerged in the 4th century but continued to be used in exactly the same form at least well into the early medieval period (see *e.g.* Dijkman and Ervynck 1998). For that reason the double-sided combs of the post-Roman level are not integrated in the presented catalogue, although at least some/many of these combs (or comb fragments) were probably residual items from the Roman level. That the double-sided comb did occur at the late Roman fort, is demonstrated by the find of four different double-sided comb fragments, all found within the context of the double well OS 2562 of fort level 5. While B007, B005a, B008 and B006 belong to the filling-in of the inner well after abandonment and represent therefore the very end of the final fort occupation at Oudenburg, the location of the cross joining B005b at the bottom of the shaft in between both frameworks, testifies to the certain occurrence of this comb type during fort period 5B when the inner well was constructed. The context here dates this comb with a *terminus ante quem* of AD 379/380, which is the felling date provided by dendrochronological analysis for the inner well. The deposition of the double-sided comb as a grave good in a few graves of Graveyard A (graves 58, 71, 84 and 88[201]) is obviously another piece of evidence from Oudenburg that confirms the late Roman date of at least several of the double-sided combs at the fort site[202].

The find of a semi-manufactured double-sided comb fragment (Figure 4.1: a) at the transition of the top of the Roman level with the post-Roman level (however without clear context) most likely indicates that double-sided combs were made at the fort site during the last fort occupation.

3.2 Hair pins

In total 135 pins identifiable as (most likely) hair pins were recovered at the south-west corner site, both from the Roman and post-Roman levels[203] (Plates CCCXVII-CCCXXI). Two of them (B009 and B010, attributed to respectively fort level 3 and 4) are of the type with plain conical head Crummy 1979/1983 Type 1, for which another function as writing tool or cosmetic instrument can also be suggested (cf. Schenk 2008, 26; Riha 1990, 112). The same interpretation is valid for pin B147 recovered from the post-Roman level[204]. Three other hair pins, B101, B045 and B078, were re-worked into shorter pins, possibly after the original point was broken off.

The hair pins recovered from the post-Roman level all belong to the Roman type repertoire and are most likely all (or mostly[205]) residual Roman finds (Table 4.2). Of these 46 hair pins from the post-Roman level (and from levels 5+post and mixed levels: sixteen hair pins were collected at the transition Roman – post-Roman level), one can assume that the largest share was dug up from contexts that originally belonged to the last fort level (fort level 5B).

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201 While graves 71 and 84 can only be generally dated to the second quarter of the 4th century – early 5th century since they did not yield any datable grave goods, grave 58 is dated by a roller-stamped Chenet 320 bowl in the period AD 375-425 and grave 88 likely dates *c.* AD 430 based on the accompanying brooches (cf. Volume I, Chapter IV.3.2.2).

202 To name a parallel from a closed context of another late Roman site: see Nempont-Saint-Firmin (F) where double-sided combs occur next to triangular combs at the graveyard dating from *c.* AD 330 until *c.* AD 410/420 (Pouriel 2015).

203 A first overview of the hair pins found at the south-west corner site was made by T. De Ridder (2009) within the context of his Master thesis, guided by the present author.

204 These pins are included in the hair pin overview table as pins of Crummy Type 1 (although pin B147 has grooves on the head).

205 However, it cannot be totally excluded that there are some early medieval hair pins involved. The early medieval site of Domburg (NL) for example yielded a vast amount of bronze hair pins of which several types are related to the Roman hair pin typology (cf. Capelle 1976, Taf. 12-14).

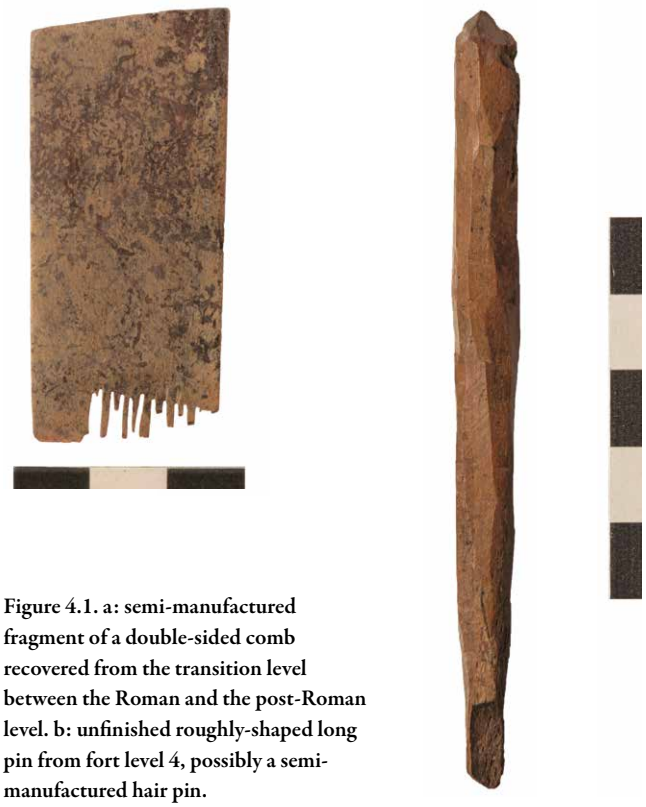

Figure 4.1. a: semi-manufactured fragment of a double-sided comb recovered from the transition level between the Roman and the post-Roman level. b: unfinished roughly-shaped long pin from fort level 4, possibly a semi-manufactured hair pin.

When the hair pins are classified according to the (general) level to which their find context belongs, an increasing presence of hair pins becomes visible (Table 4.2). While level 1 did not yield any and fort level 2 only yielded six hair pins or fragments, their presence is significant from fort level 3 onwards with a clear increase at fort level 4. Fort level 5 shows a status quo with fort level 4 but with most likely a lot of hair pins from fort level 5 dug up into the later levels, this number was probably a lot higher.

Besides these 'finished' hair pins, two pins represent semi-finished items of hair pin production (B144 and B145). Although they were found respectively at the transition Roman – post-Roman level (without clear context) and in the dark earth, a hair pin production activity may be assumed at the fort site[206], likely in the last fort level; however fort level 4 should not be excluded as a possibility. An unfinished roughly-shaped long pin (B146) recovered at fort level 4 (Figure 4.1: b) may be an indication for that, although it cannot be concluded with certainty whether the intended end product was a hair pin. In any case this find confirms that there was working of bone and/or antler during fort period 4.

206 It is of course difficult to evaluate the degree and extent of the production of bone and other animal products at the site without taking into account the waste products. One can assume that at every larger Roman site there must have been such production (pers. comm. A. Ervynck).

3.3 Armlet

Another piece of personal ornament is the armlet fragment B150 found in the post-Roman level (Plate CCCXXI). With a diameter of 4.5 cm, this armlet was clearly intended for a girl (or a young boy?) (cf. the discussion of the diameters of the jet(-like) armlets: Chapter 5 in this volume). It can however not be excluded that this find was brought in from outside the fort together with the earth (cf. Volume I, Chapter II.2.3).

3.4 Toilet instruments, writing tools and/or toothpicks?

Attention was already drawn to a few items in the (hair) pin assemblage which might have had another function. The pins B009 (fort level 3) and B010 (fort level 4), both of Crummy 1979/1983 Type 2 without a separately developed head, might have had a function as writing tool or cosmetic instrument according to Schenk (2008, 26) and Riha (1990, 112). The pins B045 (fort level 5), B103 and B078 (both of the post-Roman level) were originally made to serve as hair pins but were later reworked into a shorter pin (probably after the point was broken off); in their second life they could well have been a toothpick, a writing tool or a cosmetic implement. Another short pin, item B147 (post-Roman level) that cannot be identified as a hair pin type, also may have been used for one of these functions.

Undoubtedly used as an instrument for body care or medicine is the bone *ligula* from fort level 2 (B148) (Plate CCCXXI). It was found in a waste-pit just outside the southern wall of the hospital building which was covered by the fallen down plaster wall of the southern corridor. Its relation to body care may assign the use of this *ligula* to the hospital. Related to body care is also the presumed fan handle found at fort level 4 (B149). As with the hair pins, this item may point to a female presence at the fort site.

4. Items related to social life

Seven counters can be classified in this assemblage, presumably all made of bone (Plate CCCXXV). They represent the circular type with planoconvex section Crummy 1983 Type 3, either plain (E01, E02, E03, E05, E07) or with central dot (E04, E06). Three of them can be attributed to fort level 3, two to fort level 4, one to fort level 5 and one counter was found unstratified. These counters are to be considered together with the glass and jet(-like) counters (and the gaming pieces made of pottery sherds) (cf. in this volume Chapter 6, Section 3).

A hollowed, sculpted object with incised decoration of a bird's head, possibly an eagle's head (E08) – the latter identification would fit in well in the military context – and for which no parallels could yet be found in literature, is thought to possibly have been a chess-piece. It originates from a mixed level 4+5.

Gaming clearly occurred inside the fort walls and formed part of the fort life. For a long time it has been believed that soldiers went

Table 4.2. Distribution of the hair pin types according to the stratified evidence. Dating range of types based on Crummy 1979/1983, Riha 1990, Mikler 1997, Schenk 2008.

HAIR PIN TYPE	L1	FL2	FL3	FL4	FL5	5+POST/ POST	TOTAL	DATING RANGE OF TYPE
pins with a plain conical head (Crummy Type 1)			1	1			**2**	*c.* AD 70-250
pins with 1-3 transverse grooves beneath a conical head (Crummy Type 2)			1			1	**2**	*c.* AD 50-250
pins with a spherical or ovoid head (Crummy Type 3)		4	9	16	15	8	**52**	*c.* AD 100/200-400 (depending on sub-type)
-onion- or pine cone-shaped			1	2	1	10	**14**	
-stamp-shaped		1		3	1	2	7	
pins with a cuboid, faceted head (polyhedron-shaped) (Crummy Type 4)		1		3	1	1	**6**	*c.* AD 250-400
pins with 1-5 reels beneath a conical or ovoid head (Crummy Type 5)						4	**4**	*c.* AD 250-400
pins with a reel- or bead-and-real-shaped head (baluster-shaped) (Crummy Type 6)					1	3	**4**	*c.* AD 200-400
pins with a stylised anthropomorphic head						4	**4**	*c.* AD 250-450
undetermined (only partially/no head preserved)			6	8	13	13	**40**	
TOTAL	**0**	**6**	**18**	**33**	**32**	**46**	**135**	

outside the fort to the civil settlement for leisure; this all fitted in the conception of the military base as a strictly military world. The contrary has already been demonstrated by the material evidence at German forts studied by Allison (2013, 350).

5. Items related to domestic life

Two fragments of decorative veneer (bone) (D01 and D02) and possibly also a decorative plate made of antler (D03) point to the presence of decorated boxes or other pieces of furniture (Plate CCCXXIV). With one item from fort level 3, one from fort level 5 and a third unstratified find, no further conclusions can be drawn based on their find context. The handle of a clasp-knife can be attributed to fort level 4.

6. Items related to production

Two polished double-pointed pins C01 and C02, both recovered at fort level 5, can be identified as weaving pins or pin-beaters (Plate CCCXXIII). Wild (1970, 66) recognizes them as implements for beating up the loose weft or to order the warp and weft, an identification also accepted by Deschler-Erb (1998, 140) for the items found at Augst. The Augst finds verify a time-span for this type of tool from the 2nd to the 4th century AD.

Another indication for textile working at the fort site may be the four hollowed bones (Plate CCCXXII). Three of them are decorated with dot-and-ring decoration, on item C05 applied rather careless. The bone C04 has no decoration but its modifications put this item in the same category. While C04, C05 and C06 were found in the post-Roman level, the item C03, found at level 5(+4), indicates that the three items from the post-Roman level are most likely residual Roman finds, possibly from the latest level. This type of object was recognized by Wild (1970, 34) as a bobbin, used to carry thread between spinning and warping. The identification as bobbin has also been put forward for similar finds at Richborough and Portchester, respectively by Bushe-Fox (1928, 46) and Cunliffe (1975, 222). However, the X-radiation of such an object found in the North of France at the site of Moyencourt has revealed sewing needles in its interior and evidences a function as needle case (Thuet and Morel 2013). Greep, studying the Moyencourt type decorated needle cases from Britain, defines this type of object as '*sharing a common feature of utilising sheep metapodia, having their proximal ends removed, and the distal remaining intact, but with sometimes two drilled holes, probably for suspension; the central cavity often appears to have been hollowed smooth and sometimes the outer surface is worked and 'squared', probably to make it easier for the surface to be decorated*' (pers. comm. S. Greep, with permission). While most examples are partly or largely covered by a ring-and-dot decoration, some were undecorated, like *e.g.* the example of Lankhills of a burial dated to *c.* AD 390-410 based on coin evidence (Clarke 1979) and which has also evidenced by X-radiation to contain the remains of copper alloy needles (pers. comm. S. Greep). The Oudenburg example C04 is equally undecorated. Examples from Roman Britain are known by Greep from Chignal (*c.* AD 285-370+), Nettleton (4th century), Piddington (associated coins of AD 350-353), London (*c.* AD 350-400), Winchester (mid to late 4th century or later), Bourton-on the Water (*c.* AD 370), Frocester Court (late 4th century), Winchester, Lankhills (*c.* AD 390-410), Dorchester (early 5th century), Canterbury (post-Roman 'dark earth') (pers. comm. S. Greep, taken over with permission). The find contexts of the presumed pin-beaters and these needle cases complement each other well. Both the pin-beaters and the hollowed bone from fort level 5 point to textile working at the fort site during the final fort occupation.

The large, polished handle C07 made of a fragment of the antler of a red deer and with remains of iron nails to secure the iron blade (of which remains of the fixation part are still preserved), most likely represents a saw (Plate CCCXXIII). Found at Unit I of fort level 4, the saw fits in well in the toolbox of the workshop where, based on the metal finds recovered at the spot, clearly more activities took place than just metalworking.

7. Items related to spiritual life?

Five antler spikes with perforation at the base, F01-F05, are most likely to be considered as a kind of talisman (Plates CCCXXVI-CCCXXVII). Although no common find, this type of object is well-spread over Europe according to the distribution research by Anderes (2015, 44-45). Most of the scholars attribute an apotropaic function to these spikes of which the smaller ones could be worn by individuals and the larger ones hung in the quarters or workshops to protect against evil (Czysz 2003; Obmann 1997; Deschler-Erb 1998). They might recall the bronze mounted boars' tusks which were for example found at Richborough (Bushe-Fox 1949, Pl. XLVI, 173-174). Three of the Oudenburg spikes were found at fort level 4 (F01-F03) and two at fort level 5 (F04-F05).

8. Undetermined finds

Three finds from the Roman level remain undetermined (Plate CCCXXVII). An antler of a young deer (K01), polished at the point and with the pedicle surrounded by a ring of copper alloy, must have functioned as a grip but it is unclear for what instrument, maybe a writing tool? This item was found at fort level 3. Two polished rings, one made of a hollowed long bone (K02) and one in ivory (K03), both from fort level 4, remain unidentified.

9. The significance of the assemblage of items in worked animal products

The assemblage of items made of worked bone/antler/horn/ivory contains a set of military items mainly typical for the 3rd century. It needs to be considered as complementary to the military equipment made of copper alloy and iron.

Most important is the large quantity of hair pins recovered at the site, shedding light on the female presence and its evolution at the fort. Evidence is given for hair pin production at the fort, certainly during fort period 5 but possibly already during fort period 4. The fact that hair pins were manufactured at the fort implies that women were part of the fort community and not simply visitors or 'passers-by'. More production is implied by the finds pointing to textile working. The pin-beaters and needle cases indicate that textile working took place during fort period 5, 4th – early 5th century.

Very significant are the antler spikes to which an apotropaic function as talisman is attributed: they are some of the few finds offering a window to the spiritual life of the fort inhabitants.

10. Catalogue of the illustrated items in worked bone, antler, horn and ivory

The catalogued items in worked animal products are illustrated on Plates CCCXVI-CCCXXVII, following the same order, according to find domains (cf. Chapter 3 in this volume, Table 3.1 ; Table 4.1). In the catalogue references to parallels and the dating of the find type 'as accepted in literature' are only included when this is valuable and when there are specific data for the find type in question. When the item is not preserved completely, the listed dimensions are those of the preserved part.

AHBI.A01 scabbard chape
Find type: box chape Miks 2007 type 'Kastenortband' Variant A1 (Vortafel F: 55)
Description: fragment of the front plate of a scabbard chape decorated with a central rib, a raised border down each side, and a pair of opposed pelta-shaped piercings near the top
Material: bone
References to parallels: cf. Reculver (UK): Philp 2005, 170: Fig. 58: 352; 356; Caerleon (UK), fortress: Chapman 2005, 15-16; South Shields (UK): Allason-Jones & Miket 1984, 49, no. 80 with references (see p. 47); Richborough (UK): Bushe-Fox 1932, Pl. XI: 22 (Bushe-Fox lists similar chapes at South Shields (UK), Chester (UK), Pfünz (G), Osterburken (G), Stockstadt (G) and Zugmantel (G)); Mainz (G): Mikler 1997, Taf. 4, 1-4; for the Upper Germanic and Rhaetian Limes, see also Oldenstein 1976: Taf. 25 and 26: 148-162 and Miks 2007, Taf. 261-264; Schevingseweg, Valkenburg, Domburg (all NL): see Waasdorp 1999, 57 (with references); Aardenburg (NL): Besuijen 2008, 54: Fig. 17
Dating (as accepted in literature): according to Miks 2007, 373: end 2nd/beginning 3rd – end 3rd century, maybe even until the second half of the 4th century AD
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 5.3; width: 3.3

AHBI.A02 scabbard chape
Find type: oval chape
Description: rounded base of presumably oval chape, with two circular perforations, with converging lines; most likely broken off at the base of peltate piercings
Material: bone
References to parallels: cf. Zugmantel (G): Oldenstein 1976, Taf. 19: 119 in bronze
Dating (as accepted in literature): late 2nd – first half 3rd century AD (Oldenstein 1976, 122)
(Fort) level of find context: **5+post**
Count: 1 (not complete)
Dimensions in cm: length: 4.7; width: 3.0; thickness: 0.7

AHBI.A03 scabbard chape
Find type: box chape (back side)
Description: plate with 11 grooves at one side and a curving decoration at the other side
Material: bone
References to parallels: cf. Miks 2007, Taf. 266-267: several parallels, *e.g.* from Niederbieber (G), Caerleon (UK), Dover (UK); see for

Dover (UK) also: Philp 1981, 169 (context B24, pit Room 1A: level PII or III: mid-2nd century – *c.* 210 AD); Reculver (UK): Philp 2005, 170: Fig. 58, 358; Caerleon (UK): Chapman 2005, 15-16; Upper-Germanic and Rhaetian Limes: Oldenstein 1976, Taf. 26: 163-168; Aardenburg (NL): Besuijen 2008, 54: Fig. 17
Dating (as accepted in literature): wide distribution in Britain, *Gallia*, *Germania Inferior* and *Superior*, and dated to the late 2nd to 3rd century AD; very common find at Niederbieber (Oldenstein 1976, 244-245), a fort occupied in the late 2nd to 3rd centuries AD
(Fort) level of find context: **3**
Count: 1 (complete)
Dimensions in cm: length: 7.0; width: 3.5

AHBI.A04 scabbard chape
Find type: box chape (back side)
Description: rectangular plate of chape with side ridges and notched ends: six small grooves at one end and two grooves at the other end (not completely preserved)
Material: bone
References to parallels: cf. AHBI.A03
Dating (as accepted in literature): cf. AHBI.A03
(Fort) level of find context: **4**
Count: 1 (broken)
Dimensions in cm: length: 5.6; width: 2.7

AHBI.A05 scabbard chape
Find type: box chape (back side)
Description: scabbard chape with six small grooves at one end; the other end is more sculpted, with two grooves
Material: antler?
References to parallels: cf. AHBI.A03
Dating (as accepted in literature): cf. AHBI.A03
(Fort) level of find context: **1>4**
Count: 1 (complete)
Dimensions in cm: length: 6.5; width: 3.2

AHBI.A06 scabbard runner
Find type: scabbard runner Miks 2007 type 'Beierne Laschenkopf – Bügel vom Type 'Nydam'' (Vortafel F, 19)
Description: fragment of scabbard runner with pointed top (broken off) and a line along the margins
Material: bone
References to parallels: cf. Worms (G): Oldenstein 1976, Taf. 14, 65; Krefeld-Gellep (G): Miks 2007, Taf. 236, B151,5-6-8 (all three dated to the second half of the 3rd century AD); Nida-Heddernheim (G): Obmann 1997, 214: Taf. 2, 11, 12, 14; Mainz (G): Mikler 1997, Taf. 3, 7; Augst (CH): Deschler-Erb 1998, Taf. 42, 4014 & Miks 2007, Taf. 235, B13,27
Dating (as accepted in literature): first half 3rd – second half 4th century AD (Miks 2007, 315-316)
(Fort) level of find context: **5+post**
Count: 1 (not complete)
Dimensions in cm: length: 4.8; width: 1.9 (max. width)

AHBI.A07 baldric fitting
Find type: baldric fitting Deschler-Erb 1998 type 'Pilsförmiger Beschlag mit grossem Gegenknopf'
Description: fastener with a circular-sectioned shank; the upper section is hemispherical with a marginal groove and an incised dot-and-ring motif at its centre; the lower section is flat with a faceted inner edge
Material: ivory
References to parallels: cf. Augst (CH): Deschler-Erb 1998, 178: no. 4043; Upper-Germanic and Rhaetian Limes: Oldenstein 1976: 168, Taf. 46, 474, 478, 480 (Niederbieber (G)) and Taf. 46: 475, 481, 482 (Holzhausen (G)); Zugmantel (G): Jacobi 1909, Taf. XX, 64; Nida-Heddernheim (G): Obmann 1997, 218: Taf. 6, 39; Mainz (G): Mikler 1997, Taf. 6, 5-12; South Shields (UK): Allason-Jones & Miket 1984, 37: no. 2.20
Dating (as accepted in literature): second half 2nd – first half 3rd century AD (Oldenstein 1976, 169)
(Fort) level of find context: **post**
Count: 1 (part broken off)
Dimensions in cm: length: 2.5; width: 1.8

AHBI.A08 sword hilt grip
Find type: grip for long sword or *spatha*
Description: fragment of curving plate with series of parallel grooves
Material: antler
References to parallels: cf. Miks 2007, Taf. 151: B6,1 (from Allonnes (F))
(Fort) level of find context: **4**
Count: 1 (fragment)
Dimensions in cm: length: 8.3; width: 2.9

AHBI.A09 sword hilt bone grip?
Find type: grip for long sword or *spatha*?
Description: fragment of curving plate with parallel grooves
Material: bone
References to parallels: cf. AHBI.A08
(Fort) level of find context: **1>4**
Count: 1 (fragment)
Dimensions in cm: length: 3.2

AHBI.A10 sword hilt bone grip
Find type: grip for long sword or *spatha* Miks 2007 type 'Beierne Plattengriff vom Typ 'Nydam'' (Vortafel D: 24)
Description: part of curved plate with longitudinal grooves
Material: antler
References to parallels: cf. Miks 2007, Taf. 152-155: same form but without grooves; parallel finds on Taf. 274-275: A536,55, A47, B208,14, B247,1
Dating (as accepted in literature): type in use throughout the mid-Roman period (Miks 2007, 200-202)
(Fort) level of find context: **5+post**
Count: 1 (fragment)
Dimensions in cm: length: 8.8; width: 3.2

AHBI.B001 comb
Find type: triangular-backed single-sided comb, undecorated: triangular comb Böhme 1974 Form C / Riha 1986 Variante B, undecorated / Ashby 2011 type 1a
Description: nearly complete triangular comb, teeth not preserved, undecorated; tooth plate extending widely
Material: antler

References to parallels: cf. Augst (CH): Riha 1986, 119: Taf. 5, 54; cf. Richborough (UK): Bushe-Fox 1949, Pl. LVI: 270; Lauriacum (AT): Deringer 1967, 62-63: Kat.-Nr. 6 (type is dated here in the 5th-6th centuries AD)
Dating (as accepted in literature): 5th century AD according to Böhme (1972, 123), 5th – 6th centuries according to Deringer (1967)
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 6.7 (max.); width: 3.3 (max.)

AHBI.B002 comb
Find type: triangular-backed single-sided comb, decorated: triangular comb Thomas 1960 Typ II Variante 1/ Böhme 1974 Form C1 / Riha 1986 Variante B, Motiv A / Ashby 2011 type 1a
Description: triangular comb, teeth not preserved, decorated with circle-and-dot motifs and framing lines
Material: antler
References to parallels: cf. Bad Lippspringe (G), graveyard: Böhme 1974, Taf. 4, 29; comparable to Augst (CH): Riha 1986, 119: Taf. 4, 51; cf. Richborough (UK): Bushe-Fox 1949, Pl. LVI: 265; cf. Oudenburg, graveyard A, grave 14: Mertens & Van Impe 1971, Pl. V, 2
Dating (as accepted in literature): 4th century AD according to Thomas 1960, 99 (found in grave contexts of early, first half and second half 4th century; cf. comb found in grave 14 of Oudenburg graveyard A dated *tpq* by a Magnentius coin (350-353) and a crossbow brooch Keller-Pröttel 2b (300-365)
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 8.2; width: 3.2

AHBI.B003 comb
Find type: triangular-backed single-sided comb, decorated: triangular comb Thomas 1960 Typ II / Böhme 1974 Form A / Riha 1986 Variante B, Motiv B
Description: complete triangular comb decorated with circle-and-dot motifs; tooth plate slightly crossing the edges of the comb plate
Material: antler
References to parallels: cf. Langen (G): Böhme 1974, Taf. 24, 14
Dating (as accepted in literature): 4th – first half 5th century AD (Thomas 1960; Riha 1986, 21)
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 12.4 (max. height); width: 6.6 (max. height)

AHBI.B004 comb
Find type: triangular-backed single-sided comb, undecorated (apart from framing lines): triangular comb Böhme 1974 Form C / Riha 1986 Variante B, undecorated / Ashby 2011 type 1a
Description: fragment of small, triangular, one-sided comb, with lines along the margins
Material: antler
References to parallels: cf. AHBI.B001; the complete comb was most likely not so much smaller than AHBI.B001
Dating (as accepted in literature): 5th century AD (Böhme 1972, 123)
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 4.7; width: 2.4

AHBI.B005 comb
Find type: double-sided comb (coarse – fine)
Description: two fragments of covering plate and one tooth plate of double-sided comb; the covering plate is decorated with lines along the margin and with dotted circles (dot-and-ring decoration)
Material: antler
References to parallels: cf. AHBI.B006 and especially Oudenburg, graveyard A, grave 84 (comb plate also with dot-and-ring decoration): Mertens & Van Impe 1971, Pl. XXX, 5a & b
Dating (as accepted in literature): cf. AHBI.B006
(Fort) level of find context: **5**
Count: 1 (fragmented)
Dimensions in cm: length: 6.9; width: 1.8

AHBI.B006 comb
Find type: double-sided comb (coarse – fine)
Description: edge of large double-sided comb
Material: bone
References to parallels: *e.g.* cf. Oudenburg, graveyard A, grave 58, 71, 84 (comb plate with dot-and-ring decoration), 88: Mertens & Van Impe 1971, Pl. XVIII, 1, Pl. XXIII, 8, Pl. XXX, 5a & b, Pl. XXVIII, 8; Reculver (UK): Philp 2005, 169: no. 343, 342; Richborough (UK): Bushe-Fox 1932, 82 and Pl. XIII, 42, with references to other late Roman finds; South Shields (UK): Allason-Jones & Miket 1984, 41-43: no. 39-46; Augst (CH): Deschler-Erb 1998, Taf. 29, 1990
Dating (as accepted in literature): double-sided combs came into use in the 4th century AD and are common in the succeeding periods; at the Winchester cemeteries they came into use as grave good in the last third of the 4th century AD (Rees *et al.* 2008, 64); the double-sided comb of grave 58 of graveyard A at Oudenburg can be dated in the last quarter of the 4th – first quarter of the 5th century AD based on the accompanied Argonne bowl Chenet 320 with roller stamp UC-108, the one from grave 88 is dated by the accompanied tutulusfibeln in the second half of the 4th century AD
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 2.1; width: 7.4

AHBI.B007 comb
Find type: double-sided comb (coarse – fine)
Description: end of double-sided comb, with small indentations along the side at the central part; one iron nail preserved
Material: bone
References to parallels: cf. AHBI.B006
Dating (as accepted in literature): cf. AHBI.B006
(Fort) level of find context: **5**
Count: 1 (fragment)
Dimensions in cm: length: 6.6; width: 1.8

AHBI.B009 hair pin
Find type: pin-shaped head: Schenk 2008 'épingle à corps tronconique'; Crummy 1979 Type 1 'pin with a plain conical head'; Riha 1990 'Pfriemenförmige Haarnadel'; Mikler 1997 'Einfache konische Nadel'
Description: pin without (decorated) head, but with simple, flat top
Material: bone?

References to parallels: large distribution in the western and eastern provinces of the Roman Empire: see Riha 1990, 112-113; Schenk 2008, 26; Béal 1983, 185
Dating (as accepted in literature): 2nd – mid-5th century according to Schenk 2008, 26; at Augst and Kaiseraugst already found in the 1st century (until 4th century) (Riha 1990, 112-113); in Britain datable finds point to a life-span of *c.* 70-200/250 (Crummy 1979, 159-160)
(Fort) level of find context: **2+3**
Count: 1 (complete)
Dimensions in cm: length: 6.2

AHBI.B010 hair pin
Find type: pin-shaped head: Schenk 2008 'épingle à corps tronconique'; Crummy 1979 Type 1 'pin with a plain conical head'; Riha 1990 'Pfriemenförmige Haarnadel'; Mikler 1997 'Einfache konische Nadel'
Description: pin without (decorated) head, but with simple, flat top
Material: bone?
References to parallels: cf. AHBI.B009
Dating (as accepted in literature): cf. AHBI.B009
(Fort) level of find context: **3+4**
Count: 1 (complete)
Dimensions in cm: length: 7.4

AHBI.B011 hair pin
Find type: hair pin with thin profiled head: Schenk 2008 'épingle à sommet profilé'; Crummy 1979 Type 2 'pin with 1-3 grooves beneath a conical head'; Riha 1990 'Haarnadel mit schmalem profiliertem Kopf' sub type 'Haarnadel mit diagonal gekerbtem Kopf'
Description: pin with cone-shaped head with incised net motif, based on three thin collars, made by thin horizontal grooves
Material: bone?
References to parallels: cf. Augst (CH) Deschler-Erb 1998, Taf. 35, no. 3400; Mainz: Mikler 1997, Taf. 30, 1, 3; this type is mainly found in Britain and Gaul (Schenk 2008, 30)
Dating (as accepted in literature): second half 1st century – first half 3rd century AD (Riha 1990, 111-112; Crummy 1979, 160-161); Béal (1983, 221-223) however mentions that this type is mainly known from 3rd and 4th century sites in Britain
(Fort) level of find context: **3**
Count: 1 (complete)
Dimensions in cm: length: 9.4

AHBI.B012 hair pin
Find type: hair pin with thin profiled head: Riha 1990 'Haarnadel mit schmalem profiliertem Kopf' sub type 'Haarnadel mit einfach gewulstetem Kopf'; comparable to Crummy 1979 Type 2 'pin with 1-3 grooves beneath a conical head'
Description: pin without distinct head which is only marked by grooves, giving the idea of a collar below the rounded top
Material: bone?
References to parallels: cf. Augst and Kaiseraugst (CH): Riha 1990, no. 2608
Dating (as accepted in literature): c. AD 50-200/250 according to Crummy 1979, 160
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 8.3

AHBI.B013 hair pin
Find type: round/oval-shaped head – sub type almond: hair pin Riha 1990 'Haarnadel mit rundem bzw. ovalem Kopf'; hair pin Greep 1986 Type B1; Crummy 1983 Type 3 'pin with spherical head'; Crummy 1979 Type 3 'pin with a spherical or ovoid head'; Mikler 1997 'Nadel mit kugeligen bis spitzovalen Köpfen'*Description*: pin with ovoid-shaped head, point broken off
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: most common type on many sites, very common type in 2nd- and 3rd-century forts like Pfünz, Zugmantel, Stockstadt, Heddernheim and Saalburg (all D), common in the western provinces of the Roman Empire, like Britain, Gaul and along the Rhine Limes, but also occurring in the eastern provinces, like in Greece, Israel and Egypt (Schenk 2008, 27; Mikler 1997, 39; Béal 1983, 193)
Dating (as accepted in literature): according to Riha 1990, 104-107, based on the finds at Augst and Kaiseraugst, 1st to end 4th century AD, confirmed by Schenk 2008, 26-27; *c.* AD 200 to late 4th/early 5th century (Crummy 1979, 161; Crummy 1983, 21-22)
(Fort) level of find context: **2**
Count: 1 (complete)
Dimensions in cm: length: 9.6

AHBI.B014 hair pin
Find type: round/oval-shaped head – sub type mushroom: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: At Augst and Kaiseraugst (CH) only attested as bronze pins (Riha 1990)
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **2**
Count: 1 (not complete)
Dimensions in cm: length: 8.5

AHBI.B015 hair pin
Find type: round/oval-shaped head – sub type egg; hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **2**
Count: 1 (not complete)
Dimensions in cm: length: 6.7

AHBI.B016 hair pin
Find type: round/oval-shaped head – sub type egg: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)

(Fort) level of find context: **2**
Count: 1 (not complete)
Dimensions in cm: length: 6.2

AHBI.B017 hair pin
Find type: round/oval-shaped head – sub type round: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to 2nd half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **2/3**
Count: 1 (not complete)
Dimensions in cm: length: 8.0

AHBI.B018 hair pin
Find type: round/oval-shaped head – sub type round: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: complete pin with simple round head
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **3**
Count: 1 (complete)
Dimensions in cm: length: 7.7

AHBI.B019 hair pin
Find type: round/oval-shaped head – sub type round: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **3**
Count: 1 (not complete)
Dimensions in cm: length: 4.9

AHBI.B020 hair pin
Find type: round/oval-shaped head – sub type round: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **3**
Count: 1 (not complete)
Dimensions in cm: length: 8.0

AHBI.B021 hair pin
Find type: round/oval-shaped head – sub type egg: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **3**
Count: 1 (complete)
Dimensions in cm: length: 6.6

AHBI.B022 hair pin
Find type: round/oval-shaped head – sub type mushroom: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **3**
Count: 1 (complete)
Dimensions in cm: length: 8.6

AHBI.B023 hair pin
Find type: round/oval-shaped head – sub type egg: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with simple roundish head shaped like an egg, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **3**
Count: 1 (not complete)
Dimensions in cm: length: 5.4

AHBI.B024 hair pin
Find type: round/oval-shaped head – sub type oval: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **3**
Count: 1 (not complete)
Dimensions in cm: length: 5.2

AHBI.B025 hair pin
Find type: round/oval-shaped head – sub type round: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **3**
Count: 1 (complete)
Dimensions in cm: length: 9.2

AHBI.B026 hair pin
Find type: round/oval-shaped head – sub type almond: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **3+4**
Count: 1 (not complete)
Dimensions in cm: length: 6.8

AHBI.B027 hair pin
Find type: round/oval-shaped head – sub type egg: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **3+4**
Count: 1 (not complete)
Dimensions in cm: length: 6.5

AHBI.B028 hair pin
Find type: round/oval-shaped head – sub type round: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 8.0

AHBI.B029 hair pin
Find type: round/oval-shaped head – sub type round: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with round head with indentation at each side
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 8.4

AHBI.B030 hair pin
Find type: round/oval-shaped head – sub type round: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 7.3

AHBI.B031 hair pin
Find type: round/oval-shaped head – sub type oval: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 8.4

AHBI.B032 hair pin
Find type: round/oval-shaped head – sub type round: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 7.4

AHBI.B033 hair pin
Find type: round/oval-shaped head – sub type oval: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 6.3

AHBI.B034 hair pin
Find type: round/oval-shaped head – sub type round: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 6.5

AHBI.B035 hair pin
Find type: round/oval-shaped head – sub type round: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 5.9

AHBI.B036 hair pin
Find type: round/oval-shaped head – sub type egg: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **4** (first phase)
Count: 1 (not complete)
Dimensions in cm: length: 4.8

AHBI.B037 hair pin
Find type: round/oval-shaped head – sub type mushroom: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 5.3

AHBI.B038 hair pin
Find type: round/oval-shaped head – sub type round: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 3.8

AHBI.B039 hair pin
Find type: round/oval-shaped head – sub type egg: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 2.7

AHBI.B040 hair pin
Find type: round/oval-shaped head – sub type egg: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **4+5**
Count: 1 (complete)
Dimensions in cm: length: 7.8

AHBI.B041 hair pin
Find type: round/oval-shaped head – sub type almond: hair pin Riha 1990 'Haarnadel mit Pilzköpfen
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **4+5**
Count: 1 (not complete)
Dimensions in cm: length: 6.1

AHBI.B042 hair pin
Find type: round/oval-shaped head – sub type oval: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **4+5**
Count: 1 (not complete)
Dimensions in cm: length: 7.2

AHBI.B043 hair pin
Find type: round/oval-shaped head – sub type round: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **5+post**
Count: 1 (complete)
Dimensions in cm: length: 11.8

AHBI.B044 hair pin
Find type: round/oval-shaped head – sub type round: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **5?**
Count: 1 (not complete)
Dimensions in cm: length: 7.9

AHBI.B045 hair pin
Find type: round/oval-shaped head – sub type almond: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, originally probably much longer but reworked for another function?
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **5**

Count: 1 (complete)
Dimensions in cm: length: 6.2

AHBI.B046 hair pin
Find type: round/oval-shaped head – sub type round: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **5**
Count: 1 (not complete)
Dimensions in cm: length: 5.5

AHBI.B047 hair pin
Find type: round/oval-shaped head – sub type almond: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **5**
Count: 1 (not complete)
Dimensions in cm: length: 5.9

AHBI.B048 hair pin
Find type: round/oval-shaped head – sub type egg: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **5**
Count: 1 (not complete)
Dimensions in cm: length: 4.9

AHBI.B049 hair pin
Find type: round/oval-shaped head – sub type almond: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **5**
Count: 1 (not complete)
Dimensions in cm: length: 4.2

AHBI.B050 hair pin
Find type: round/oval-shaped head – sub type round: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **5+post**
Count: 1 (not complete)
Dimensions in cm: length: 5.7

AHBI.B051 hair pin
Find type: round/oval-shaped head – sub type round: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: upper half of pin with round head
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 5.0

AHBI.B052 hair pin
Find type: round/oval-shaped head – sub type egg: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **unstratified**
Count: 1 (not complete)
Dimensions in cm: length: 6.3

AHBI.B053 hair pin
Find type: round/oval-shaped head – sub type round: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **unstratified**
Count: 1 (not complete)
Dimensions in cm: length: 6.4

AHBI.B055 hair pin
Find type: round/oval-shaped head – sub type oval: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: hair pin with fine, long, oval head, point broken off
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 9.1

AHBI.B056 hair pin
Find type: round/oval-shaped head – sub type oval: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: hair pin with fine, long, oval head, point broken off

Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **5**
Count: 1 (not complete)
Dimensions in cm: length: 7.7

AHBI.B057 hair pin
Find type: round/oval-shaped head – sub type oval: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: complete hair pin with long, slightly thickened head
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 9.7

AHBI.B058 hair pin
Find type: round/oval-shaped head – sub type oval: hair pin Riha 1990 'Haarnadel mit Pilzköpfen'
Description: upper half of hair pin with long oval head
Material: bone?
References to parallels: cf. AHBI.B014
Dating (as accepted in literature): mid-1st to second half 3rd century AD according to Riha (1990, 104-107)
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 5.2

AHBI.B059 hair pin
Find type: nail/cone-shaped head: hair pin Riha 1990 'Haarnadel mit Kegel- oder Nagelkopf'; hair pin Crummy 1983 Type 3 'pin with a spherical or ovoid head'; Schenk 2008 'épingle à tête conique'
Description: hair pin with cone-shaped head, point broken off
Material: bone?
References to parallels: common find in the whole Roman Empire, from Britain, to Gaul, the Rhine Limes, Italy, Hongary, Greece and Israël: see Béal 1983, 188, Schenk 2008, 28, Riha 1990, 108, Dijkman & Ervynck 1998, 73, Mikler 1997, 40-41; see *e.g.* Colchester (UK): Crummy 1983, 24-25
Dating (as accepted in literature): 2nd to 4th century AD according to Béal 1983, 187-188; according to Riha 1990, 108 and confirmed by Mikler 1997, 40-41 mainly in use in the 3rd and 4th centuries AD, although a few earlier finds occur; cf. at Colchester dated to *c.* AD 250 – 4th century (Crummy 1983, 24-25)
(Fort) level of find context: **4+5**
Count: 1 (not complete)
Dimensions in cm: length: 6.3

AHBI.B060 hair pin
Find type: nail/cone-shaped head: hair pin Riha 1990 'Haarnadel mit Kegel- oder Nagelkopf'; hair pin Crummy 1983 Type 3 'pin with a spherical or ovoid head'; Schenk 2008 'épingle à tête conique'
Description: pin with a small disc-shaped end
Material: bone?
References to parallels: cf. AHBI.B059
Dating (as accepted in literature): cf. AHBI.B059
(Fort) level of find context: **5(+4)**
Count: 1 (complete)
Dimensions in cm: length: 7.2

AHBI.B061 hair pin
Find type: nail/cone-shaped head: hair pin Riha 1990 'Haarnadel mit Kegel- oder Nagelkopf'; hair pin Crummy 1983 Type 3 'pin with a spherical or ovoid head'; Schenk 2008 'épingle à tête conique'
Description: hair pin with flat head, point broken off
Material: bone?
References to parallels: cf. AHBI.B059
Dating (as accepted in literature): cf. AHBI.B059
(Fort) level of find context: **5(+4)**
Count: 1 (not complete)
Dimensions in cm: length: 3.8; width

AHBI.B062 hair pin
Find type: nail/cone-shaped head: hair pin Riha 1990 'Haarnadel mit Kegel- oder Nagelkopf'; hair pin Crummy 1983 Type 3 'pin with a spherical or ovoid head'; Schenk 2008 'épingle à tête conique'
Description: almost complete hair pin with rather flat, slightly conical head
Material: bone?
References to parallels: cf. AHBI.B059
Dating (as accepted in literature): cf. AHBI.B059
(Fort) level of find context: **5**
Count: 1 (not complete)
Dimensions in cm: length: 7.7

AHBI.B063 hair pin
Find type: nail/cone-shaped head: hair pin Riha 1990 'Haarnadel mit Kegel- oder Nagelkopf'; hair pin Crummy 1983 Type 3 'pin with a spherical or ovoid head'; Schenk 2008 'épingle à tête conique'
Description: hair pin with pointed, long, oval head, point broken off
Material: bone?
References to parallels: cf. AHBI.B059
Dating (as accepted in literature): cf. AHBI.B059
(Fort) level of find context: **5**
Count: 1 (not complete)
Dimensions in cm: length: 6.1

AHBI.B064 hair pin
Find type: nail/cone-shaped head: hair pin Riha 1990 'Haarnadel mit Kegel- oder Nagelkopf'; hair pin Crummy 1983 Type 3 'pin with a spherical or ovoid head'; Schenk 2008 'épingle à tête conique'
Description: hair pin with flat head, point broken off
Material: bone?
References to parallels: cf. AHBI.B059
Dating (as accepted in literature): cf. AHBI.B059
(Fort) level of find context: **5+post**
Count: 1 (not complete)
Dimensions in cm: length: 5.8

AHBI.B065 hair pin
Find type: nail/cone-shaped head: hair pin Riha 1990 'Haarnadel mit Kegel- oder Nagelkopf'; hair pin Crummy 1983 Type 3 'pin with a spherical or ovoid head'; Schenk 2008 'épingle à tête conique'

Description: hair pin with flat head, point broken off
Material: bone?
References to parallels: cf. AHBI.B059
Dating (as accepted in literature): cf. AHBI.B059
(Fort) level of find context: **5+post**
Count: 1 (not complete)
Dimensions in cm: length: 5.5

AHBI.B066 hair pin
Find type: nail/cone-shaped head: hair pin Riha 1990 'Haarnadel mit Kegel- oder Nagelkopf'; hair pin Crummy 1983 Type 3 'pin with a spherical or ovoid head'; Schenk 2008 'épingle à tête conique'
Description: hair pin with flattened head
Material: bone?
References to parallels: cf. AHBI.B059
Dating (as accepted in literature): cf. AHBI.B059
(Fort) level of find context: **5+post**
Count: 1 (not complete)
Dimensions in cm: length: 5.2

AHBI.B067 hair pin
Find type: nail/cone-shaped head: hair pin Riha 1990 'Haarnadel mit Kegel- oder Nagelkopf'; hair pin Crummy 1983 Type 3 'pin with a spherical or ovoid head'; Schenk 2008 'épingle à tête conique'
Description: pin with a disc-shaped end, point broken off
Material: bone?
References to parallels: cf. AHBI.B059
Dating (as accepted in literature): cf. AHBI.B059
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 7.0

AHBI.B068 hair pin
Find type: pine cone/onion-shaped head – sub type onion: hair pin Riha 1990 'Haarnadel mit Zwiebelkopf'; Schenk 2008 'épingle à tête bulbiforme'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: type found at 2nd- and 3rd-century forts like Pfünz, Stockstadt, Saalburg, Heddernheim and Zugmantel (all D) and at Portchester (UK) dated to the late 3rd-4th century (see Mikler 1997, 37-40); cf. South Shields (UK) and Niederbieber (G), both beginning 3rd century (Schenk 2008, 29); cf. Maastricht (NL), mid-4th to beginning 5th century AD (Dijkman & Ervynck 1998, 38 and 73); generally this type is found in Britain, Gaul, Rhineland, Italy, Hongary, Greece, Cyprus, Egypte and Libia (Schenk 2008, 29; Mikler 1997, 37-40)
Dating (as accepted in literature): late 2nd – early 5th century AD according to Riha 1990, 102 (confirmed by Crummy 1983, 21-22: *c.* AD 200-400); at Colchester the finds date to the period *c.* AD 250- late 4th/early 5th century (Crummy 1979, 161-162); at Caerleon found in 4th century contexts (Greep 1986, 198)
(Fort) level of find context: **3**
Count: 1 (not complete)
Dimensions in cm: length: 7.5

AHBI.B069 hair pin
Find type: pine cone/onion-shaped head – sub type onion: hair pin Riha 1990 'Haarnadel mit Zwiebelkopf'; Schenk 2008 'épingle à tête bulbiforme'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B068
Dating (as accepted in literature): cf. AHBI.B068
(Fort) level of find context: **5**
Count: 1 (not complete)
Dimensions in cm: length: 8.1

AHBI.B070 hair pin
Find type: pine cone/onion-shaped head – sub type onion: hair pin Riha 1990 'Haarnadel mit Zwiebelkopf'; Schenk 2008 'épingle à tête bulbiforme'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B068
Dating (as accepted in literature): cf. AHBI.B068
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 5.3

AHBI.B071 hair pin
Find type: pine cone/onion-shaped head – sub type onion: hair pin Riha 1990 'Haarnadel mit Zwiebelkopf'; Schenk 2008 'épingle à tête bulbiforme'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B068
Dating (as accepted in literature): cf. AHBI.B068
(Fort) level of find context: **mixed**
Count: 1 (not complete)
Dimensions in cm: length: 4.8

AHBI.B072 hair pin
Find type: pine cone/onion-shaped head – sub type pine cone: hair pin Riha 1990 'Haarnadel mit Zwiebelkopf'; Schenk 2008 'épingle à tête bulbiforme'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B068
Dating (as accepted in literature): cf. AHBI.B068
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 5.6

AHBI.B073 hair pin
Find type: pine cone/onion-shaped head – sub type pine cone: hair pin Riha 1990 'Haarnadel mit Zwiebelkopf'; Schenk 2008 'épingle à tête bulbiforme'
Description: hair pin with pointed, long, oval head, point broken off
Material: bone?
References to parallels: cf. AHBI.B068
Dating (as accepted in literature): cf. AHBI.B068
(Fort) level of find context: **5+post**
Count: 1 (not complete)
Dimensions in cm: length: 4.4

AHBI.B074 hair pin
Find type: pine cone/onion-shaped head – sub type pine cone: hair pin Riha 1990 'Haarnadel mit Zwiebelkopf'; Schenk 2008 'épingle à tête bulbiforme'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B068
Dating (as accepted in literature): cf. AHBI.B068
(Fort) level of find context: **5+post**
Count: 1 (not complete)
Dimensions in cm: length: 7.8

AHBI.B075 hair pin
Find type: pine cone/onion-shaped head – sub type pine cone: hair pin Riha 1990 'Haarnadel mit Zwiebelkopf'; Schenk 2008 'épingle à tête bulbiforme'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B068
Dating (as accepted in literature): cf. AHBI.B068
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 5.7

AHBI.B076 hair pin
Find type: pine cone/onion-shaped head – sub type pine cone: hair pin Riha 1990 'Haarnadel mit Zwiebelkopf'; Schenk 2008 'épingle à tête bulbiforme'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B068
Dating (as accepted in literature): cf. AHBI.B068
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 7.0

AHBI.B077 hair pin
Find type: pine cone/onion-shaped head – sub type pine cone: hair pin Riha 1990 'Haarnadel mit Zwiebelkopf'; Schenk 2008 'épingle à tête bulbiforme'
Description: upper half of hair pin with large pointed angular head with incised lines with X on the four sides
Material: bone?
References to parallels: cf. AHBI.B068
Dating (as accepted in literature): cf. AHBI.B068
(Fort) level of find context: **3+4**
Count: 1 (not complete)
Dimensions in cm: length: 6.1

AHBI.B078 hair pin, reworked as writing tool or toilet instrument?
Find type: pine cone-shaped head?: Riha 1990 'Haarnadel mit Pinienzapfenkopf'; Mikler 1997 'Nadel mit sog. Pinienzapfenköpfen'; Béal 1983 'épingle à tête en forme de pomme de pin'; Schenk 2008 'épingle à tête en forme de pomme de pin'
Description: hair pin with decorated head with crossing lines on top of collar, top of head broken off; short pin, possibly originally longer but reworked for another function
Material: bone?
References to parallels: cf. Mainz (G): Mikler 1997, Taf. 33, 17 (with diagonal lines, with conical shape on top), Taf. 33, 3 (very similar to the Oudenburg pin, but without extra form on top)
Dating (as accepted in literature): late 1st to 5th century (Riha 1990,101-102; Schenk 2008, 34-35; Béal 1983, 221-223; Mikler 1997, 45-46)
(Fort) level of find context: **post**
Count: 1 (nearly complete)
Dimensions in cm: length: 7.3

AHBI.B079 hair pin
Find type: hair pin with stamp-shaped head: Greep 1986 Type B1; Crummy 1979/1983 Type 3 'pin with spherical head'; Schenk 2008 'épingle à tête en forme de calotte renversée'; Mikler 1997 'Nadel mit halbkugeligen Köpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: type in use in the western provinces of the Roman Empire: Britain, Gaul and along the Rhine Limes (Schenk 2008, 27); common find in forts of the 2nd and 3rd centuries, like Zugmantel, Heddernheim, Seligenstadt, Saalburg, Stocktstadt (all D): see Mikler 1997, 41
Dating (as accepted in literature): c. AD 200-400 according to Crummy 1979, 161; 1983, 21-22; second half 2nd century to end 4th century according to Riha 1990, 106; mainly dated in the 3rd and 4th centuries, but already in use in the 2nd century according to Mikler 1997, 41; cf. Palatine, Rome (I): late 3rd – end 4th century AD (Schenk 2008, 27-28)
(Fort) level of find context: **1/2**
Count: 1 (not complete)
Dimensions in cm: length: 6.4

AHBI.B080 hair pin
Find type: hair pin with stamp-shaped head: Greep 1986 Type B1; Crummy 1979/1983 Type 3 'pin with spherical head'; Schenk 2008 'épingle à tête en forme de calotte renversée'; Mikler 1997 'Nadel mit halbkugeligen Köpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B079
Dating (as accepted in literature): cf. AHBI.B079
(Fort) level of find context: **3+4**
Count: 1 (not complete)
Dimensions in cm: length: 5.3

AHBI.B081 hair pin
Find type: hair pin with stamp-shaped head: Greep 1986 Type B1; Crummy 1979/1983 Type 3 'pin with spherical head'; Schenk 2008 'épingle à tête en forme de calotte renversée'; Mikler 1997 'Nadel mit halbkugeligen Köpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B079
Dating (as accepted in literature): cf. AHBI.B079
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 7.3

AHBI.B082 hair pin
Find type: hair pin with stamp-shaped head: Greep 1986 Type B1; Crummy 1979/1983 Type 3 'pin with spherical head'; Schenk 2008 'épingle à tête en forme de calotte renversée'; Mikler 1997 'Nadel mit halbkugeligen Köpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B079
Dating (as accepted in literature): cf. AHBI.B079
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 8.1

AHBI.B083 hair pin
Find type: hair pin with stamp-shaped head: Greep 1986 Type B1; Crummy 1979/1983 Type 3 'pin with spherical head'; Schenk 2008 'épingle à tête en forme de calotte renversée'; Mikler 1997 'Nadel mit halbkugeligen Köpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B079
Dating (as accepted in literature): AHBI.B079
(Fort) level of find context: **5**
Count: 1 (not complete)
Dimensions in cm: length: 5.7; width: ; thickness: ; diameter:

AHBI.B084hair pin
Find type: hair pin with stamp-shaped head: Greep 1986 Type B1; Crummy 1979/1983 Type 3 'pin with spherical head'; Schenk 2008 'épingle à tête en forme de calotte renversée'; Mikler 1997 'Nadel mit halbkugeligen Köpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B079
Dating (as accepted in literature): cf. AHBI.B079
(Fort) level of find context: **5+post**
Count: 1 (not complete)
Dimensions in cm: length: 6.3

AHBI.B085 hair pin
Find type: hair pin with stamp-shaped head: Greep 1986 Type B1; Crummy 1979/1983 Type 3 'pin with spherical head'; Schenk 2008 'épingle à tête en forme de calotte renversée'; Mikler 1997 'Nadel mit halbkugeligen Köpfen'
Description: pin with ovoid-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B079
Dating (as accepted in literature): cf. AHBI.B079
(Fort) level of find context: **post?**
Count: 1 (not complete)
Dimensions in cm: length: 7.4

AHBI.B086 hair pin
Find type: hair pin with polyhedron-shaped head: Crummy 1979/1983 Type 4 'pin with a faceted cuboid head'; Riha 1990 'Haarnadel mit Polyederkopf' & 'Haarnadel mit Würfelkopf'
Description: pin with flat rectangular head with at both sides two grooves with in between an incised X
Material: bone?
References to parallels: large distribution area: type found in Britain, Gaul, along the Rhine and Danube, Hongary, Slovenia and Greece (Riha 1990, 109; Schenk 2008, 29-30); cf. Colchester (UK): Crummy 1983, 22-23; South Shields (UK): Allason-Jones & Miket 1984, 85, no. 2.534
Dating (as accepted in literature): according to Riha 1990, 109-110 late 3rd – end 4th century AD; according to Mikler 1997 mainly 3rd and 4th century, but two graves at Cologne from the mid-3rd century also yielded this type of hair pin (Mikler 1997, 42); at Colchester dated to *c.* AD 250 – 4th century/early 5th century (Crummy 1979, 161-162)
(Fort) level of find context: **2**
Count: 1 (not complete)
Dimensions in cm: length: 8.0

AHBI.B087 hair pin
Find type: hair pin with polyhedron-shaped head: Crummy 1979/1983 Type 4 'pin with a faceted cuboid head'; Riha 1990 'Haarnadel mit Polyederkopf' & 'Haarnadel mit Würfelkopf'
Description: pin with rectangular head with incised X on each of the four sides; burnt and point broken off
Material: bone?
References to parallels: cf. AHBI.B086
Dating (as accepted in literature): cf. AHBI.B086
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 8.2

AHBI.B088 hair pin
Find type: hair pin with polyhedron-shaped head: Crummy 1979/1983 Type 4 'pin with a faceted cuboid head'; Riha 1990 'Haarnadel mit Polyederkopf' & 'Haarnadel mit Würfelkopf'
Description: pin with flat rectangular head with horizontal grooves and incised X on both sides, point broken off
Material: bone?
References to parallels: cf. AHBI.B086
Dating (as accepted in literature): cf. AHBI.B086
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 9.3

AHBI.B089 hair pin
Find type: hair pin with polyhedron-shaped head: Crummy 1979/1983 Type 4 'pin with a faceted cuboid head'; Riha 1990 'Haarnadel mit Polyederkopf' & 'Haarnadel mit Würfelkopf'
Description: pin with rectangular head
Material: bone?
References to parallels: cf. AHBI.B086
Dating (as accepted in literature): cf. AHBI.B086
(Fort) level of find context: **4**
Count: 1 (not complete)
Dimensions in cm: length: 4.4

AHBI.B090 hair pin
Find type: hair pin with polyhedron-shaped head: Crummy 1979/1983 Type 4 'pin with a faceted cuboid head'; Riha 1990 'Haarnadel mit Polyederkopf' & 'Haarnadel mit Würfelkopf'
Description: pin with faceted cuboid head
Material: bone?
References to parallels: cf. AHBI.B086
Dating (as accepted in literature): cf. AHBI.B086
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 8.1

AHBI.B091 hair pin
Find type: hair pin with polyhedron-shaped head: Crummy 1979/1983 Type 4 'pin with a faceted cuboid head'; Riha 1990 'Haarnadel mit Polyederkopf' & 'Haarnadel mit Würfelkopf'
Description: complete pin with rectangular-sectioned head, heavily grooved horizontally
References to parallels: cf. AHBI.B086
Material: bone?
Dating (as accepted in literature): cf. AHBI.B086
(Fort) level of find context: **5+post**
Count: 1 (complete)
Dimensions in cm: length: 13.3

AHBI.B092 hair pin
Find type: hair pin with conical head with three reels underneath: Crummy Type 5 'pin with 1-5 reels beneath a conical or ovoid head'
Description: pin with globular head and single collar beneath, point broken off
Material: bone?
Dating (as accepted in literature): c. AD 250 – late 4th/early 5th century AD (Crummy 1979, 162)
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 3.5

AHBI.B093 hair pin
Find type: pin with conical head with three reels underneath: Crummy Type 5 'pin with 1-5 reels beneath a conical or ovoid head'
Description: pin with onion-shaped head and single collar beneath
Material: bone?
Dating (as accepted in literature): c. AD 250 – late 4th/early 5th century AD (Crummy 1979, 162)
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 9.4

AHBI.B094 hair pin
Find type: pine cone/onion-shaped head – sub type onion: hair pin Riha 1990 'Haarnadel mit Zwiebelkopf'; Schenk 2008 'épingle à tête bulbiforme'
Description: pin with globular head and single collar beneath, point broken off
Material: bone?
References to parallels: cf. AHBI.B068
Dating (as accepted in literature): cf. AHBI.B068
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 4.7

AHBI.B095 hair pin
Find type: hair pin with conical head with three reels underneath: Crummy Type 5 'pin with 1-5 reels beneath a conical or ovoid head'
Description: pin with pointed head decorated with three pronounced rings, point broken off
Material: bone?
References to parallels: *e.g.* cf. Reculver (UK): Philp 2005, 163: no. 241
Dating (as accepted in literature): c. AD 250 – late 4th/early 5th century AD (Crummy 1979, 162)
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 3.9

AHBI.B096 hair pin
Find type: baluster-shaped head: Schenk 2008 'épingle à tête balustre', Riha 1990 'Haarnadel mit Balusterkopf', Crummy 1979 Type 6 'pin with a reel- or bead-and-reel-shaped head'
Description: upper half of pin with baluster-shaped head with rosette top
Material: bone?
References to parallels: in use only in the western provinces of the Roman Empire: Britain, Gaul and along the Rhine Limes (Schenk 2008, 30)
Dating (as accepted in literature): 2nd to end of 4th century AD according to Riha 1990, 110; according to Crummy 1979, 162 *c.* 200 to late 4th/early 5th century AD; according to Schenk 2008 with a peak in the second half of the 2nd and the 3rd centuries AD
(Fort) level of find context: **4+5**
Count: 1 (not complete)
Dimensions in cm: length: 7.3

AHBI.B097 hair pin
Find type: baluster-shaped head: Schenk 2008 'épingle à tête balustre', Riha 1990 'Haarnadel mit Balusterkopf', Crummy 1979 Type 6 'pin with a reel- or bead-and-reel-shaped head'
Description: upper half of pin with baluster-shaped head with rosette top
Material: bone?
References to parallels: cf. AHBI.B096
Dating (as accepted in literature): cf. AHBI.B096
(Fort) level of find context: **unstratified**
Count: 1 (not complete)
Dimensions in cm: length: 6.0

AHBI.B098 hair pin
Find type: baluster-shaped head: Schenk 2008 'épingle à tête balustre', Riha 1990 'Haarnadel mit Balusterkopf', Crummy 1979 Type 6 'pin with a reel- or bead-and-reel-shaped head'
Description: complete pin with baluster-shaped head with thin horizontal grooves
Material: bone?
References to parallels: cf. AHBI.B096
Dating (as accepted in literature): cf. AHBI.B096
(Fort) level of find context: **5+post**

Count: 1 (complete)
Dimensions in cm: length: 8.3

AHBI.B099 hair pin
Find type: baluster-shaped head: Schenk 2008 'épingle à tête balustre', Riha 1990 'Haarnadel mit Balusterkopf', Crummy 1979 Type 6 'pin with a reel- or bead-and-reel-shaped head'
Description: upper half of pin with baluster-shaped head with thickened part between two collars, with the top collar showing a rosette form
Material: bone?
References to parallels: cf. AHBI.B096
Dating (as accepted in literature): cf. AHBI.B096
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 4.2

AHBI.B100 hair pin
Find type: head-shaped head: Deschler-Erb 1998 'Kopfhaarnadel'; sub type Riha 1990 'Haarnadel mit Männerkopf' (Type 1, Variante 3); Mikler 1997 'Nadel mit stilisierten anthropomorfen Köpfen'
Description: long pin with stylised head-shaped head, point broken off; according to Riha (1990, 99) the stylised head represents a male head, Deschler-Erb (1998, 163) interprets these heads as female heads
Material: bone?
References to parallels: cf. Richborough (UK): Bushe-Fox 1928, Pl. XIX, 22; Maastricht (NL), dated to *c.* AD 400: Dijkman & Ervynck 1998, 73; Riha 1990, Taf. 40, 1366 with references to similar finds in Britain and Gallia (see p. 99); Mainz (G): Mikler 1997, Taf. 35, 6-11; Xanten (G): Jung 2013, Taf. 36, 651; hair pins with stylised human head are found in the western Roman provinces, along the Rhine Limes, in Gaul and in Britain, with a principal distribution area between the Trier region and the Paris Basin (Rodet-Belarbi and Van Ossel 2003, 340-341, with references)
Dating (as accepted in literature): second half 3rd century – first half 5th century AD (Rodet-Belarbi and Van Ossel 2003, 340)
(Fort) level of find context: **5+post**
Count: 1 (not complete)
Dimensions in cm: length: 9.5

AHBI.B101 hair pin
Find type: head-shaped head: Deschler-Erb 1998 'Kopfhaarnadel'; sub type Riha 1990 'Haarnadel mit Männerkopf' (Type 1, Variante 3); Mikler 1997 'Nadel mit stilisierten anthropomorfen Köpfen'
Description: almost complete pin with stylised head-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B100
Dating (as accepted in literature): second half 3rd century – first half 5th century AD (Rodet-Belarbi and Van Ossel 2003, 340)
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 7.8

AHBI.B102 hair pin
Find type: head-shaped head: Deschler-Erb 1998 'Kopfhaarnadel'; sub type Riha 1990 'Haarnadel mit Männerkopf' (Type 1, Variante 3); Mikler 1997 'Nadel mit stilisierten anthropomorfen Köpfen'
Description: pin with stylised head-shaped head, point broken off
Material: bone?
References to parallels: cf. AHBI.B100
Dating (as accepted in literature): second half 3rd century – first half 5th century AD (Rodet-Belarbi and Van Ossel 2003, 340)
(Fort) level of find context: **post**
Count: 1 (not complete)
Dimensions in cm: length: 4.0

AHBI.B103 hair pin, re-used as toothpick or toilet instrument?
Find type: head-shaped head: Deschler-Erb 1998 'Kopfhaarnadel'; sub type Riha 1990 'Haarnadel mit Männerkopf' (Type 1, Variante 3); Mikler 1997 'Nadel mit stilisierten anthropomorfen Köpfen'
Description: upper half of a pin with stylised head-shaped head, the broken off end is sharpened to use in another function
Material: bone?
References to parallels: cf. AHBI.B100
Dating (as accepted in literature): second half 3rd century – first half 5th century AD (Rodet-Belarbi and Van Ossel 2003, 340)
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 4.7

AHBI.B104 hair pin
Find type: unclassifiable
Description: lower half of pin
Material: bone?
(Fort) level of find context: **4/5**
Count: 1 (fragment)

AHBI.B144 hair pin – semimanufactured
Description: upper half of pin with roughly shaped, rectangular, flat head
Material: bone?
(Fort) level of find context: **5+post**
Count: 1 (not complete)
Dimensions in cm: length: 4.0

AHBI.B145 hair pin – semimanufactured
Description: very rough pin with rectangular head
Material: bone?
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 12.5

AHBI.B146 pin – semimanufactured
Description: roughly-shaped long pin
Material: bone or antler
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 10.2

AHBI.B147 hair pin, writing tool or toilet instrument?
Description: complete small pin with thin, grooved, rounded head
Material: bone?
References to parallels: comparable to small pin at South Shields (UK): Allason-Jones & Miket 1984, 53, no. 106 and identified as a cosmetic spoon
(Fort) level of find context: **post**
Count: 1 (complete)
Dimensions in cm: length: 6.5

AHBI.B148 toilet instrument
Find type: ligula Jackson 1986 form 28 (used in several ways in body care and medizin: see *e.g.* Riha 1986, 56)
Description: toilet spoon with small round flat angled scoop, which has a convex underside and a flat top; other terminal is broken off
Material: bone
References to parallels: *e.g.* cf. Augst and Kaiseraugst (CH): Riha 1986, Taf. 28-37: several parallels; Colchester (UK): Crummy 1983, 60: no. 1907
Dating (as accepted in literature): this type was made throughout the Roman period (Crummy 1983, 69-60)
(Fort) level of find context: **2**
Count: 1 (not complete)
Dimensions in cm: length: 8.1

AHBI.B149 fan (?) handle
Description: polished and decorated bone handle with a slot at one end, pierced laterally by a hole for a rivet or pivot of some kind
Material: bone
References to parallels: cf. Aldborough (UK): Bishop 1996, 38-39, Fig. 22: 221; Augst (CH): Deschler-Erb 1998, Taf. 6, 74
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 6.8; width: 0.9

AHBI.B150 armlet
Find type: fine, plain armlet
Description: *c.* one third of very fine, plain armlet with rectangular cross-section (small flat section with straight corners)
Material: bone (burnt)
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: ; width: 0.4; thickness: 0.15; diameter: 4.5

AHBI.C01 textile implement – weaving pin
Find type: pin-beater
Description: polished double-pointed pin
Material: bone
References to parallels: cf. Wild 1970, 66: implement for beating-up the loose weft, but it may also have had other functions; cf. *e.g.* Augst (CH): Deschler-Erb 1998, Taf. 16-17: 385-390
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 2.0

AHBI.C02 textile implement – weaving pin
Find type: pin-beater
Description: polished double-pointed pin
Material: bone
References to parallels: cf. AHBI.C01
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 1.8

AHBI.C03 needle case
Find type: hollowed bone, decorated
Description: bone, hollowed and ornamented with incised dot-and-circle design, broken off at one end
Material: bone
References to parallels: cf. Richborough (UK): Bushe-Fox 1928, Pl. XIX: 31, pierced at the larger end; Bushe-Fox (1928, 46) compares this find with similar bones found at Stockstad (G) where they are interpreted as possible bobbins (spools to put in a shuttle) in comparison to undecorated parallels at Glastonbury Lake Village (UK) (Bulleid and Gray 1917, 426-427); comparable, undecorated find at Portchester (UK): Cunliffe 1975, 222: no. 110, which Cunliffe compares with bone bobbins of Iron Age type; see also Manching: Jacobi 1974, 62-63; comparable finds at Nida-Heddernheim (G): Obmann 1997, 254: Taf. 42, 1801-1807; comparable find at Gudendorf (G), graveyard, grave 1324: Böhme 1974, Taf. 19, 14 (here interpreted as needle case, but no comparisons are given); cf. Tiel-Passewaaij (NL): Groot 2006, 119 (undecorated) (with reference to similar finds at Valkenburg (NL)). The X-radiation of such a decorated hollowed bone found at Moyencourt (department of the Somme, France) has evidenced sewing needles in the interior and suggests a function as needle case (Thuet and Morel 2013). Several finds in Roman Britain point to a late Roman date (pers. comm. S. Greep)
Dating (as accepted in literature): late Roman
(Fort) level of find context: **post**
Count: 1 (almost complete)
Dimensions in cm: length: 10.1; width: 1.9

AHBI.C04 needle case
Find type: hollowed bone, undecorated
Description: hollowed bone, polished, undecorated, broken off at one end
Material: bone
References to parallels: cf. AHBI.C03; comparison for such an undecorated hollowed bone at the Lankhills cemetery in a burial dated *c.* AD 390-410 (Clarke 1979)
Dating (as accepted in literature): late Roman
(Fort) level of find context: **post**
Count: 1 (almost complete)
Dimensions in cm: length: 9.3

AHBI.C05 needle case
Find type: hollowed bone, decorated
Description: bone, hollowed and ornamented with incised dot-and-circle design, broken off at one end
Material: bone
References to parallels: cf. AHBI.C03
Dating (as accepted in literature): late Roman
(Fort) level of find context: **5(+4)**
Count: 1 (almost complete)
Dimensions in cm: length: 9.8; width: 2.3

AHBI.C06 needle case
Find type: hollowed bone, decorated
Description: bone ornamented with incised dot-and-circle design, broken off at both ends
Material: bone
References to parallels: cf. AHBI.C03
Dating (as accepted in literature): late Roman
(Fort) level of find context: **post**
Count: 1 (fragment)
Dimensions in cm: length: 6.3; width: 1.7

AHBI.C07 saw(?) handle
Description: large, polished handle with remains of iron nails to secure the iron blade, probably of a saw
Material: antler red deer
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 14.4 (base); width: 4.0; thickness: 3.0; diameter handle: 2.4

AHBI.D01 decorative veneer
Description: angle fragment of inlay plate, decorated with dotted ring-and-dot motifs on the upperside, two of the dotted circles preserved; underside not polished
Material: bone
(Fort) level of find context: **3**
Count: 1 (fragmented)
Dimensions in cm: length: 3.7; width: 2.3

AHBI.D02 decorative veneer
Find type: Brougham type C1.1 diamond-shaped
Description: lozenge-shaped plate, decorated with six dotted circles; usually referred to as 'inlay' and assumed to have decorated the sides of wooden boxes or caskets or other domestich or funerary furniture
Material: bone
References to parallels: cf. Brougham (UK): Greep 2004; the most significant find assemblages of bone and antler veneer are listed by Greep and come from non-funerary contexts, like Richborough (UK): with two assemblages: Bushe-Fox 1949, Pl. 57 and Cunliffe 1968, Pls. 61-62, both dated to the later 3rd-4th century AD and presumed to be decoration of boxes or other items of furniture; Augst (CH): Deschler-Erb 1998, 189: no. 4454
Dating (as accepted in literature): late Roman
(Fort) level of find context: **mixed** (unstratified)
Count: 1 (one side broken off)
Dimensions in cm: length: 9.3; width: 2.3

AHBI.D03 decorative plate
Description: longitudinal plate with perforation at the preserved side, which can be assumed for the other end, decorated with a series of vertical grooves and diagonal grooves near the perforation
Material: antler
(Fort) level of find context: **5?**
Count: 1 (not complete)
Dimensions in cm: length: 7.8; width: 0.9

AHBI.D04 clasp-knife
Description: tubular object with longitudinal groove for the fixation of another material
Material: ivory?
References to parallels: cf. South Shields (UK): Allason-Jones & Miket 1984, 43, no. 53; Augst (CH): Deschler-Erb 1998, Taf. 6, 75: both bone handles identified as from a clasp-knife
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 6.2; width: 1.5

AHBI.E01 counter
Find type: circular counter: convex counter Crummy 1983 type 3
Description: plain circular counter with a plano-convex section and with central dot on the upper side
Material: undetermined
References to parallels: cf. Colchester (UK): Crummy 1983, 91-92
(Fort) level of find context: **3**
Count: 1 (complete)
Dimensions in cm: length: ; width: ; thickness: 0.6; diameter: 2.1

AHBI.E02 counter
Find type: circular counter: convex counter Crummy 1983 type 3
Description: plain circular counter with a plano-convex section and with central dot on the upper side
Material: undetermined
References to parallels: cf. Colchester (UK): Crummy 1983, 91-92
(Fort) level of find context: **3**
Count: 1 (complete)
Dimensions in cm: thickness: 0.6; diameter: 2.6

AHBI.E03 counter
Find type: circular counter: convex counter Crummy 1983 type 3
Description: plain circular counter with a plano-convex section and with central dot on the upper side
Material: undetermined
References to parallels: cf. Colchester (UK): Crummy 1983, 91-92
(Fort) level of find context: **4?**
Count: 1 (complete)
Dimensions in cm: thickness: 0.5; diameter: 2.7

AHBI.E04 counter
Find type: circular counter with central incised dot: convex counter Crummy 1983 type 3
Description: small plain circular counter with a plano-convex section
Material: bone
References to parallels: cf. Colchester (UK): Crummy 1983, 91-92
(Fort) level of find context: **3**
Count: 1 (complete)
Dimensions in cm: thickness: 0.6; diameter: 1.4

AHBI.E05 counter
Find type: circular counter: convex counter Crummy 1983 type 3
Description: plain circular counter with a plano-convex section
Material: undetermined
References to parallels: cf. Colchester (UK): Crummy 1983, 91-92
(Fort) level of find context: **4 (end)**
Count: 1 (complete)
Dimensions in cm: thickness: 0.4; diameter: 2.4

AHBI.E06 counter
Find type: circular counter with central incised dot: convex counter Crummy 1983 type 3
Description: plain circular counter with a plano-convex section; burnt
Material: bone
References to parallels: cf. Colchester (UK): Crummy 1983, 91-92
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: thickness: 0.6; diameter: 2.0

AHBI.E07 counter
Find type: circular counter: convex counter Crummy 1983 type 3
Description: plain circular counter with a plano-convex section
Material: undetermined
References to parallels: cf. Colchester (UK): Crummy 1983, 91-92
(Fort) level of find context: **unstratified**
Count: 1 (complete)
Dimensions in cm: thickness: 0.4; diameter: 2.3

AHBI.E08 chess-piece?
Description: sculpted object, with incised decoration of a bird's head, possibly an eagle's head
Material: bone
References to parallels: no parallels found in literature
(Fort) level of find context: **4+5**
Count: 1 (complete)
Dimensions in cm: length: 6.7; width: 3.8

AHBI.F01 talisman? or tool?
Find type: perforated antler spike
Description: pointed antler spike with perforation at the base
Material: antler red deer
References to parallels: cf. Heldenbergen (G): Czysz 2003, Taf. 48, C12-13 (with references to comparable finds); Nida-Heddernheim (G): Obmann 1997, 254: Taf. 42, 1809; Augst (CH): Deschler-Erb 1998, Taf. 38, 3972-3974: identified as amulets, objects with apotropaic function; possibly comparable to the bronze mounted boars' tusks, cf. Richborough (UK): Bushe-Fox 1949, Pl. XLVI, 173-174, which are also perforated at one end, see also Pl. LVI, 273: shaped animal bone decorated with incised circles and diagonal cuts, but perforated at both ends to be connected to a chain probably. Anderes 2015, 44-45 lists parallels for the decorated, perforated antler spike from Lausanne (CH) (Anderes 2015, 131: Pl. 5, 99) in Britain, France, Germany, Austria, Hongary and Spain (mainly undecorated), and discusses all the possible functions attributed in literature to this find. For this author the most plausible hypothesis is that it is a tool by means of which materials could be bound to a bundle with a cord. However, the decoration of some finds does not fit well with this idea. Anderes 2015 also mentions the apotropaic function suggested by several scholars: the perforated antler spikes could be worn by individuals (the smaller ones) or hung in the quarters or workshops (the larger ones) to protect against evil
Dating (as accepted in literature): (late?) Roman
(Fort) level of find context: **3+4**
Count: 1 (complete)
Dimensions in cm: length: 19.0

AHBI.F02 talisman? or tool?
Find type: perforated antler spike
Description: antler spike with perforation at the base
Material: antler red deer
References to parallels: cf. AHBI.F01
Dating (as accepted in literature): (late?) Roman
(Fort) level of find context: **3+4**
Count: 1 (complete)
Dimensions in cm: length: 28.0

AHBI.F03 talisman? or tool?
Find type: perforated antler spike
Description: antler spike with perforation at the base
Material: antler red deer
References to parallels: cf. AHBI.F01
Dating (as accepted in literature): (late?) Roman
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 19.5

AHBI.F04 talisman? or tool?
Find type: perforated antler spike
Description: antler spike with perforation at the base
Material: antler red deer
References to parallels: cf. AHBI.F01
Dating (as accepted in literature): (late?) Roman
(Fort) level of find context: **5**
Count: 1 (complete)
Dimensions in cm: length: 26.0

AHBI.F05 talisman? or tool?
Find type: perforated antler spike
Description: antler spike with perforation at the base
Material: antler red deer
References to parallels: cf. AHBI.F01
Dating (as accepted in literature): (late?) Roman
(Fort) level of find context: **4+5**
Count: 1 (complete)
Dimensions in cm: length: 35.0

AHBI.K01 antler grip for copper alloy instrument?
Description: antler of a young deer, polished at the end, with the pedicle surrounded by a ring of copper alloy
Material: antler red deer
(Fort) level of find context: **3**
Count: 1 (complete)
Dimensions in cm: length: 10.9; width: 2.2

AHBI.K02 ring
Description: circular bone ring cut from a hollowed long bone
Material: bone
(Fort) level of find context: **4**
Count: 1 (complete)
Dimensions in cm: length: 3.0; width: 0.9

AHBI.K03 ring
Description: *c.* 3/4 of a polished ring
Material: ivory
(Fort) level of find context: **1>4**
Count: 1 (fragmentary)
Dimensions in cm: length: 3.9; width: 1.2; thickness: 0.6

5. The jet and jet-like finds

Sofie Vanhoutte and Peter Cosyns

1. Introduction to the jet(-like) assemblage

The 25 finds made of jet or a jet-like black material from the south-west corner site of the Oudenburg fort encompass fifteen armlets, four hair pins, one necklace bead, one spindle whorl, three counters and a die (Plate CCCXXVIII) (Table 5.1; Section 8 in this chapter (Table 5.2)). This small amount of jet or jet-like objects at the Oudenburg fort site is nevertheless unusual, especially because these materials only occur occasionally on continental sites in the northwestern provinces with the exception of the Rhine region (Hagen 1937) including the *civitas Tungrorum* (Lefrancq 1988; Mariën 1983). At *Britannia* – the region of origin closest by (see further) – items in jet or a jet-like material were, on the contrary, commonly distributed and are found in contexts of different social levels. An explanation for the poor presence of jet and jet-like materials in the north-west of the Continent is probably due to a distribution distance exceeding the benefit of trade. Jet and jet-like black appearing materials never became commonly available across the Channel except as a luxurious material and solely affordable by the wealthy people elite. These materials seem to have been usually replaced by black glass in this region (Cosyns 2011; Cosyns and Ceglia 2016, 4).

The jet and jet-like assemblage of the Oudenburg site consists essentially of jewellery, but also some gaming pieces and one utensil have been recorded. Remarkable is the total absence of finger rings, pendants, and in particular the characteristic double perforated '*Trilobitenperlen*' and semi-circular pieces forming part of a segmented flexible bracelet. Both latter types are idiosyncratic for the 3rd to mid-4th century (Cosyns and Ceglia 2016, 5) and rather commonly attested in the Meuse-Sambre region in the south of Belgium (Cosyns *in press*).

Table 5.1. Overview of the jet and jet-like finds from the south-west corner site of the Oudenburg fort.

FUNCTION	QUANTITY	%
jewellery	20	80
armlet	15	
hairpin	4	
bead	1	
gaming pieces	4	16
counter	3	
die	1	
utensil	1	4
TOTAL	**25**	**100**

2. Materials and their chronology

The differences in appearance, texture and radiance of the Oudenburg artefacts make already clear at first sight that different kinds of 'black' material are in play. Their differentiation can only be made through scientific analysis (cf. Eckardt 2014, 120). Analysis by Allason-Jones of 'jet' artefacts from the Yorkshire Museum by reflected light microscopy has revealed that apart from jet, also shale, cannel coal, durain and household coal were used to carve objects from, as they all could be polished into black and shiny material (Allason-Jones and Jones 1994; Allason-Jones 1996, 54). Of these various organic and geological materials, shale was probably the most used alternative to jet (Allason-Jones 1996, 6). Nine objects of the Oudenburg 'jet' assemblage were examined by means of a micro-XRF to discover the chemical composition of the used material.[207] [208] Based on this chemical composition three separate groups have been differentiated (Cosyns and Ceglia 2016, 9 with references). The two main groups comprise the high carbon organic materials such as jet and the low carbon, high silica geological materials such as shale. A third intermittent group is that of carbonized bone characterized with a high lime content.

Hair pin cat. no. 2 appears to be of 'real' jet, bracelets cat. nos 7 and 17 are made of shale. For the necklace bead cat. no. 5 and for the

207 Ten items were analyzed. One item appeared to be made of bone which was secondary burnt, and was therefore added to the assemblage of the worked bone finds.

208 The results concern superficial measurements with non-destructive handling of the objects, yielding only relative plots. Therefore, the results should be considered as preliminary. More intensive analyses with more appropriate techniques would define more accurately the material applied to produce these items.

bracelets 9, 14, 15, 18 and 20 the analysis was not conclusive; their material is jet or shale (Cosyns and Ceglia 2016, 9-12). It can be expected that the 'real' jet items were imported from the north of England or from Württemberg (G) within the *Agri Decumates*, a region between the Rhine and the Danube beyond the formal Limes[209] (Moser 1843, 195; Bauer 1909, 685). However, other jet sources in the UK such as Dorset as well as in Hungary, France, Spain and Turkey were also in use during the Roman imperial period (Allason-Jones and Jones 2001). As the jet finds appear from fort period 4 onwards, the period in which cross-Channel connections were intensified, the Yorkshire coast near Whitby seems to be the most plausible source. The most frequently worked shale in Britain was the 'Kimmeridge shale', with its most famous source in Dorset but with outcrops all over the country. Most of the cannel coals and durains used for jewellery production in York appear to have come from the Yorkshire Coal Measures (Allason-Jones 1996, 6- 7).

Research revealed that jet was the preferred material for the production of hair pins; shale was mainly used for armlets and tablets, and coals were preferred for the production of finger rings and beads (Allason-Jones 2002, 40). The analysis results for the items from Oudenburg, although very limited, seem to confirm this general division.

The jet industry in York probably already started in the (late) 2nd century AD, but it is only in the 3rd century AD that this material rapidly became very popular and stayed that way throughout the 4th century AD (Allason-Jones 1996, 8-9, 15). At Oudenburg, the material only appears from fort period 4, the later 3rd century AD, onwards which coincides with the, in detail studied, late 3rd-4th century AD material from South Shields at the eastern end of Hadrian's Wall (Allason-Jones and Jones 1994, 271-272). All three Oudenburg hair pins originate from this period, as is the case for the gaming pieces and the die. Except for one armlet belonging to fort period 4, all armlets were collected from fort level 5 of the 4th – early 5th century AD or from a later level.

3. Female connection

Necklaces, hair pins and spindle whorls are traditionally associated with women (Allason-Jones 1996, 17). Apart from this functional attribution, jet finds in general seem to have been especially attributed to women likewise black glass jewellery (Cosyns 2011, 281-282, tab. 137). Their presence in female graves seem to indicate that they were intended solely for female use (Allason-Jones 1996, 26; 2002). Allason-Jones believes this is related to the religious or magical significance of this material for women. Pliny the Elder mentions in his *Historia Naturalis* (Book XXXVI, Chapter 34, 141: Eichholz 1962) that '*the kindling of jet drives off snakes and relieves suffocation of the uterus. Its fumes detect attempts to simulate a disabling illness or a state of virginity*', a clear indication for the connection of this material with fertility (Allason-Jones 2005, 123-124). For shale there is less direct evidence for an attribution to women (and children) but this connection seems to be likely (cf. Eckardt 2014, 118-119).

Closed contexts from excavations in Belgium and abroad have demonstrated that jet and jet-like jewellery occurs in very specific contexts: in burial contexts and in (ritual) depots, including hoards (Cosyns and Ceglia 2016). The fragmentation and the chronological and spatial distribution of the jet or jet-like jewellery finds from the Oudenburg site indicate that they have to be considered as discarded material which had been worn by fort inhabitants, *in casu* women and girls.

4. Jewellery

4.1. Armlets

The fifteen jet and jet-like armlets consist of two cabled armlets (cat. nos 6 and 7), three dot-and-ring decorated armlets (cat. nos 8-10), one armlet with ridge and notches (cat. no. 11), and nine undecorated and plain armlets (cat. nos 12-20). The study of over 1200 black glass bangles from the Roman period, in which those from Oudenburg were included, has demonstrated that a basic subdivision into a group of undecorated/plain armlets and a group of decorated ones is barely useful when it comes to chronology (Cosyns 2011; see also Chapter 6 in this volume). The distinction based on technology between the larger/wider rod-formed glass bangles versus the narrower/lighter swirled and cone-rolled group of glass armlets appeared to be much more important in light of chronology.

Bangles cat. nos 12, 13 and 14 can be categorized as massive plain armlets. Larger/wider, almost massive glass bangles were characteristic for the period from the beginning of the 3rd to the mid-4th century AD (Cosyns 2011). This dating is in accordance with the context of the jet/jet-like bangles cat. nos 12, 13 and 14 which all originate from fort level 5 or from the post-Roman level (in the latter of course as residual items). Massive plain armlets were according to Allason-Jones more common in Germany than in Britain (Allason-Jones 1996, 33). Allason-Jones discovered they were mostly in shale and this appears to be confirmed by the Oudenburg assemblage. At Portchester, such large, shale bracelets were particularly common. At least 37 bracelets were recovered from the 1961-1972 excavations. Except for some illustrated examples, most of them were plain and of circular or D-shaped cross-section (Webster 1975, 228).

The narrower bangles (cat. nos 6-11 and 15-20) from Oudenburg are plain (six examples: cat. nos 15-20) or decorated. Three examples have a so-called dot-and-ring pattern (cat. nos 8-10), one has a so-called ridged-and-notched decoration (cat. no. 11). The narrow glass armlets are typical for the second half of the 4th to the beginning of the 5th century AD. This also seems in accordance to the context of most of the Oudenburg jet/jet-like armlets: armlets cat. nos 8-11, 15-17[210], 19 and 20 belonged to a context of fort level 5 or to the post-Roman level (as residual item). Armlet cat. no. 18 derives from a context from fort period 4, dated to the later

209 An in-depth scientific analysis is essential to obtain information on the specific origin of the jet and jet-like materials attested at Oudenburg.

210 Chemical analysis concluded this item was made of shale (Cosyns and Ceglia 2016, 10).

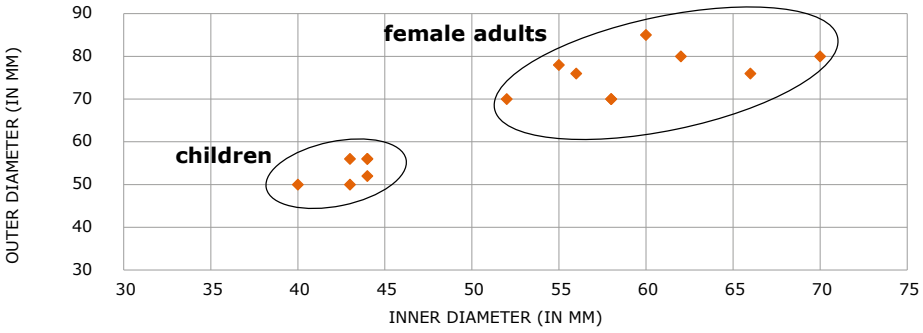

Figure 5.1. Comparison of the diameters of the jet and jet-like bracelets at the south-west corner site.

3rd century AD, and is probably intrusive. The dot-and-ring armlets were one of the most popular forms in Britain, worn from the late 2nd century AD throughout the Roman period (Allason-Jones 1996, 32). The armlets cat. nos 8 and 10 look like real jet (but could not be analyzed); the analysis for armlet cat. no. 9 was not conclusive. The finds of cabled armlets, like cat. nos 6 and 7, in Britain suggest a wide distribution in *Britannia* in the 4th century AD. The British finds all appeared to be of jet and Allason-Jones believes that this type would have been difficult to carve in the other materials, which are prone to splitting when carved against the grain (Allason-Jones and Jones 1994, 272; Allason-Jones 1996, 31). Armlet cat. no. 7, however, is evidenced through chemical analysis to be made of shale (Cosyns and Ceglia 2016).

Two groups of armlets can be distinguished when considering the size (Figure 5.1). No less than six armlets have a very small internal diameter ranging between 40 and 45 mm (with external diameter averaging from 50 to 60 mm). A second group of bangles shows an internal diameter ranging between 50 and 70 mm (with external diameter averaging from about 70 to 85 mm). Recent research on Hallstatt-armrings from Baden-Württemberg (G) demonstrates that the small diameter refers to young girls up to about eight years old (Lehnert *et al.* 2014). These measurements refine the conclusions by Allason-Jones who takes 45 mm as the minimum for the average adult wrist, while a smaller diameter was most likely intended for a child (Allason-Jones 1996, 35). Armlets cat. nos 8, 10, 11, 18-20 can therefore be considered as armlets for girls. Of these supposed child armlets from Oudenburg, one originates from fort level 4 (cat. no. 18) – however not from a closed context -, three belong to fort level 5 (cat. nos 8, 11, 20) which can be dated to the 4th – early 5th century AD; the remaining two come from a later level. At the in 2014 discovered late Roman graveyard about 500 m (south)east of the Roman *castellum* (site Oudenburg-Bellerochelaan (ET28)) a massive plain armlet made of jet or a jet-like material[211] was found in inhumation tomb 5. On anthropological grounds this grave is defined as being of a child (Dyselinck *et al.* 2020, 261). The link to a child corroborates the dimensions of child's armlets as the inner diameter measures 41,4 mm (with outer diameter of 46,2 mm) (Dyselinck *et al.* 2020, 158).

4.2. Hair pins

The 'jet' assemblage of the Oudenburg south-west corner site contains three hair pins (cat. nos 1-3) and one plain, semi-rounded hair pin head which could be attached onto a bone pin (cat. no. 4). The three hair pins can be divided into two types. The two pins with facetted cube head cat. no. 1 and cat. no. 2, both most likely of 'real' jet[212], represent the most popular type of hair pin. This type was introduced from the late 2nd-early 3rd century onwards, and a common type until the 4th century, not only in *Britannia* but also on the Continent (Allason-Jones 1996, 40). Hair pin cat. no. 1 shows a cubic pinhead, while the other faceted pinhead cat. no. 2 is more elongated, a subtype also known in other materials. These are short hair pins (length: *c.* 60 to 65 mm) with a thickening of the shaft (diameter: *c.* 6.5 to 7.5 mm). This type of hair pin is also known in bone (Crummy (1983) bone Type 4) and in metal (Crummy (1983) metal Type 4). Based on burial contexts in *Britannia* these hair pins are mainly dated to the second half of the 3rd and 4th century AD (Crummy 1983, 29; Barber and Bowsher 2000). The short jet hair pins fit in with the hair fashion popular in the 3rd and 4th century AD. The fashion was to wear the hair close to the back of the head rather than piled on top of the crown as before, so longer pins were no longer required (Allason-Jones 1996, 38). Based on their context, both of the Oudenburg hair pins can be attributed to fort period 4, dated to the later 3rd century, which is in accordance to the dating of the type.

The third hair pin (cat. no. 3) has a narrow cylindrical shaft (diameter: 3.7 mm) without thickening and a cylindrical pinhead (diameter: 7 mm) decorated with two parallel horizontal grooves. This form is unknown in jet in *Britannia*, but well-known in bone (Crummy (1983) bone Type 5). This type of hair pin in bone has a pinhead with one or four grooves (to represent one or more rings) and is always finished with a conical head. The Oudenburg pin has a rosette-shaped top and seems to be finished; it cannot be ruled out that it concerns a secondary processing of the pin. This type of hair pin in bone and in metal is dated to the (second half of the) 4th century AD (Crummy 1983, 24). The Oudenburg hair pin was found in a level belonging to fort period 4, dated to the later

211 The report mentions 'jet', however, based on the lateral break over half of the bracelet (see Dyselinck *et al.* 2020, 158 and Fig. 124), it seems more plausible that it concerns another, jet-like material.

212 The very shiny appearance and high quality of cat. no. 1 indicates that it concerns most likely jet; the hair pin is exhibited in the Oudenburg museum RAM and could not be examined. The chemical analysis of hair pin cat. no. 2 points to jet.

3rd century AD. If this is not an intrusive find, the Oudenburg find is possibly indicative for an earlier start date of this type in jet.

The semi-rounded piece with perforation on one side (cat. no. 4) was the head of a hair pin with a bone shaft, as comparable finds still attached onto the bone pin from South Shields demonstrate (cf. Allason-Jones and Miket 1984, 79: nos 2.443-446). The Oudenburg item was found in a pit attributed to fort period 3 of the mid-3rd century AD. Similar hair pin heads have been attested in black glass merged with a metallic pin in iron or in bronze, known from Belgian, French, Swiss and British sites (Cosyns 2011, 125). One such glass hair pin head has also been found at the Oudenburg site (see Chapter 6 in this volume).

4.3. Beads

Only one single jet bead has been found at the south-west corner site (cat. no. 5). With a diameter of 2.1 mm and a width of 1.1 mm this bead can be catalogued as a micro-annular bead for the diameter is less than 8 mm (Cosyns 2011, 107). Such beads formed part of a segmented bead (Allason-Jones 1996, 26-27: 9-12), and are to be dated in the late 3rd and 4th century AD. The Oudenburg bead originates from fort level 4 and can be dated to the later 3rd century AD.

5. Gaming pieces

The jet/jet-like assemblage also includes four gaming pieces, cat. nos 21-23 and 25 (not ill.) . All three counters show a central drilled-in perforation. The two counters cat. nos 21 and 25 with a plano-convex shape with an outer diameter of *c.* 23.5-24.0 mm and a height of *c.* 6 mm correspond with Crummy Type 3 (Crummy 1983, 91-92, Fig. 94). The flat counter cat. no. 22 with a diameter of *c.* 18 mm and a height of 3.5-4.0 mm is a flat type with slight concave topside decorated in the middle with a minimal perforation. Such counters correspond to Kenyon Type A or Crummy Type 1 (Crummy 1983, 91-92, Fig. 94, nos 2238-2256). While the plano-convex counters know parallels in the glass counters, the flat ones are comparable to bone counters (Cosyns and Ceglia 2016, 8) (cf. in this volume Chapter 6 and Chapter 4 resp.).

The small die cat. no. 23, a not so accurately cut cube with sides ranging between 6 and 8 mm, shows the numbers in the conventional system in which the accumulated eyes of the opposite sides together form seven (6-1; 5-2; 4-3). Only one parallel was found at York (Allason-Jones 1996, 49), but similar small dies are well-known in bone, although these are mainly slightly larger with sides ranging between 8 and 11 mm.

6. Spindle whorl

The only utensil in the jet/jet-like assemblage is a spindle whorl (cat. no. 24). Spindle whorls in jet or jet-like material are generally globular roundels with a diameter of less than 50 mm (Allason-Jones 1996, 47, nos 296-298). The Oudenburg example is a disc with rounded edge decorated with a groove of *c.* 31 mm diameter, an opening of *c.* 5 mm and a thickness of almost 8 mm. Such discoid spindle whorls are common in ceramic, but do exist in shale (Crummy 1983, 67). The material of the Oudenburg find could not be tested.

7. The significance of the Oudenburg jet and jet-like assemblage

The jet and jet-like finds at the south-west corner site demonstrate the material diversity occurring in an at first glance 'jet' assemblage. The occurrence of these items has strong implications. First, it represents significant material evidence for the presence of women and children at the fort precinct from fort period 4 onwards, through a combination of the material itself with believed symbolic value and the represented functions: jewellery (necklace bead, hair pins, armlets, spindle whorl). Secondly, the occurrence of these jet and jet-like materials at the Oudenburg *castellum* emphasizes the close connection with *Britannia* previously demonstrated by several pottery categories. Thirdly, several of the items belonging to fort period 5 (or found as residual item in the post-Roman level) may be linked to troop movements from the Rhine and Danube Limes, a connection which was already revealed from the study of the bronze bracelets of graveyard A (Sas 2004; cf. Volume I, Chapter IV.3.2.4).

Why the so-called '*Trilobetenperlen*' and the semi-circular sections of segmented, flexible armlets are completely lacking in Oudenburg is a prominent anomaly. Both types of double perforated beads are dated in the 3rd – mid-4th century AD and thus contemporaneous with the jet and jet-like material attested at the Oudenburg fort. The total absence of these idiosyncratic jewellery types is remarkable seeing that these types are ubiquitous in the Rhine region, the south of Belgium as well as on the British Isles (Mariën 1983).

Typologically, the jet and jet-like material can be unambiguously put in two general chronological periods: (1) a set of items which can be dated to the late 2nd to the mid-4th century AD, corresponding with the first four fort periods and possibly the first phase of the final fort period, and (2) a clearly younger set, dated from the second half of the 4th to the early 5th century AD, matching with the final fort period. As a consequence, the early assemblage gives no well-defined chronology as it covers over 150 years, while the late set provides a sharper chronology within a margin of *c.* 50 years.

8. Catalogue of the jet and jet-like finds

Table 5.2. Catalogue of the jet and jet-like finds from the south-west corner site of the Oudenburg fort. *: material identification confirmed by chemical analysis. Cat. nos refer to Plate CCCXXVIII.

cat. no.	material	find name	typology	description	parallels and distribution	date of type	(fort) level	complete?	length in mm	width x thickness in mm	inner diameter in mm	outer diameter in mm
1.	jet	hair pin	Allason-Jones (1996) type 206; Crummy (1983) jet type 2	pin with cuboid facetted head, clear thickening of the shaft	widespread distribution in Britannia and Germany according to Allason-Jones 1996, 40; most popular type of hair pin, introduced from late 2nd to early 3rd century onwards, common until the 4th century (Allason-Jones 1996, 40)	IId-IV	4	almost complete, only point broken off	94.0 (head: 11.5)	10.9 x 11.1 (head); 5.6 (below head); 7.3 (thickening)		
2.	jet*	hair pin	Allason-Jones (1996) type 202/206; Crummy (1983) jet type 2	upper half of pin with facetted elongated cube head, slight thickening of the shaft	cf. cat. no. 1	IId-IV	4	not complete	56.5 (head: 13.0)	9.7 x 8.7 (head); 5.8 (pin below head); 6.5 (pin at thickening)		
3.	jet	hair pin		upper half of pin with slender, straight shaft and wide cylindrical, groove-decorated head (two parallel grooves creating three rings) with rosette-shaped terminal	unknown in jet in Britannia, but well-known in bone: Crummy (1983) bone type 5 (Crummy 1983, 23-24)		4	not complete	36.5 (head: 11.0)	7.0 (head); 3.7 (pin)		
4.	jet	head of hair pin	undecorated disc, flat rounded	semi-rounded head with perforation on one side to form the head of a bone hair pin	cf. South Shields for comparable finds, still attached onto bone pin: Allason-Jones & Miket 1984, 79: no. 2.443-446		3	complete	8.0			10.5
5.	jet or shale*	necklace bead	Allason-Jones (1996) type 9	half of plain, tiny barrel-shaped micro-bead	cf. York: Allason-Jones 1996, 26: no. 9; popular type in the late 3rd to 4th centuries (Allason-Jones 1996, 26)	III-IV	4	fragment		2.1 x 1.1	1.5	3.6
6.	jet	armlet, cabled	Allason-Jones (1996) type 72-74; cf. glass armlet Cosyns (2011) type A2	*c.* one third of annular cabled armlet, very large bangle, with worn areas; O-sectioned bracelet with a pronounced, spiralled, ridge-and-groove decoration (S-twisted cable motif with wide cables)	Allason-Jones (1996, 31, with references) lists parallels from York, South Shields (see also Allason-Jones & Miket 1984: 7.116-120), Silchester, Colchester and Wroxester, suggesting a wide distribution in Britain in the 4th century	III-IVA	5	fragment		8.8 x 8.5	*c.* 62	*c.* 80
7.	shale*	armlet, cabled	Allason-Jones (1996) type 72-74; cf. glass armlet Cosyns (2011) type A2	fragment of annular cabled armlet, large bangle; O-sectioned bracelet with a pronounced, spiralled, ridge-and-groove decoration (S-twisted cable motif with wide cables)	cf. cat. no. 6	III-IVA	post	fragment		7.0 x 9.0	52	70
8.	jet	armlet, dot-and-ring	Allason-Jones (1996) type 78-79; cf. glass armlet Cosyns (2011) type D2	fragment of fine dot-and-ring decorated armlet with oval cross section (small flat section with rounded corners) (incised dot-and-ring decoration with a regular inner spacing along the outer face, the topside)	Allason-Jones (1996, 32, with references) lists parallels from York, Corbridge, Corstopitum Museum, Leicester, Shakenoak, Vindolanda, South Shields (Allason-Jones & Miket 1984: 7.114-115), Colchester, Kingscote and Wroxester, indicating that this type of armlet was worn in towns, villas and forts throughout Britannia from the late 2nd into the post-Roman period	IId-V	5	fragment		6.5 x 3.5	43	50
9.	jet or shale*	armlet, dot-and-ring	Allason-Jones (1996) type 78-79; cf. glass armlet Cosyns (2011) type D2	fragment of fine dot-and-ring decorated armlet with oval cross section (small flat section with rounded corners); incised dot-and-ring decoration on the topside with a regular inner spacing	cf. cat. no. 8	IId-V	post	fragment		8.2 x 4.8	70	80
10.	jet	armlet, dot-and-ring	Allason-Jones (1996) type 78-79; cf. glass armlet Cosyns (2011) type D2	*c.* one third of a fine dot-and-ring decorated armlet with a sub-triangular (small flat with rounded corners) cross-section (incised dot-and-ring decoration with a regular inner spacing along the outer face)	cf. cat. no. 8	IId-V	post	fragment		7.3 x 4.6	40	50
11.	coal?	armlet, ridged and notched		fragment of fine armlet with hexagonal cross-section with fine sharp angular central ridge along the outer face (small squad cubic section with convex topside and V-shaped inner side) with small notches on the ridge and the edges of the outer face, and with less sharp central ridge incised along the inner face: so-called 'ridged-and-notched' pattern	Silchester (Lawson 1976, no. 55, with parallels at Verulamium (dating before AD 300) and Lydney)	IId-IV	5	fragment		5.6 x 4.2	44	56

cat. no.	material	find name	typology	description	parallels and distribution	date of type	(fort) level	complete?	length in mm	width x thickness in mm	inner diameter in mm	outer diameter in mm
12.	coal?	armlet, plain	Allason-Jones (1996) type 95-102; cf. glass armlet Cosyns (2011) type A1	half of thick plain annular armlet, very large bangle with wide rounded D-shaped almost O-shaped section (semi-circular)	according to Allason-Jones (1996, 33) the massive armlets are rare in Britain, but more common in Cologne; the German examples are mostly of shale with a wide variation in reflectance, suggesting more than one source of raw material	IId-IVA	post	fragment		13.5 x 11.6	55	78
13.	coal?	armlet, plain	Allason-Jones (1996) type 95-102; cf. GLASS armlet Cosyns (2011) type A1	almost half of thick plain annular armlet, very large bangle, with semi-circular cross-section (wide rounded D-shaped almost O-shaped section)	cf. cat. no. 12	IId-IVA	5	fragment		14.2 x 12.0	60	85
14.	jet or shale*	armlet, plain	cf. glass armlet Cosyns (2011) type B1 var.	*c.* one quarter of plain armlet with half-circular cross-section, flat along the inner face (small, high cubic section with convex topside and flattened inner side); abraded surface		III-IVA	post	fragment		9.4 x 6.7	56	76
15.	jet or shale*	armlet, plain	cf. glass armlet Cosyns (2011) type D1	*c.* one quarter of fine, plain armlet with hemispherical cross-section (squad cubic section with rounded corners)		IVB-V	5+post	fragment		6.6 x 5.5	58	70
16.	coal?	armlet, plain	cf. glass armlet Cosyns (2011) type D1	half of fine plain armlet with oval cross-section (squad cubic section with rounded corners)		IVB-V	post	fragment		6.8 x 5.2	58	70
17.	shale*	armlet, plain	cf. glass armlet Cosyns (2011) type D1	*c.* one quarter of fine, plain armlet with oval cross-section (squad cubic section with rounded corners)		IVB-V	post	fragment		6.5 x 4.6	66	76
18.	jet or shale*	armlet, plain	cf. glass armlet Cosyns (2011) type D1	*c.* one third of fine, plain armlet with semi-oval cross-section (small squad cubic section with convex topside and V-shaped inner side) with ridge running around the inner face		IVB-V	4	fragment		5.5 x 4.7	44	56
19.	coal?	armlet, plain	cf. glass armlet Cosyns (2011) type D1	fragment of fine, plain armlet with semi-circular cross-section (small squad cubic section with convex topside and V-shaped inner side) with ridge along the inner face		IVB-V	5+post	fragment		8.7 x 6.8	43	56
20.	jet or shale*	armlet, plain	cf. glass armlet Cosyns (2011) type D1	half of fine, small, plain armlet (with small flat section with rounded corners), finished extra at interior by abrasion; cutting marks		IVB-V	5	fragment		7.4 x 3.3	44	52
21.	jet	gaming disc/ counter	Crummy (1983) type 3	complete, plano-convexe disc with central perforation, with flat underside and rounded, slightly raised upper side, straight edge with uneven thickness, basal side polished but remains partly coarse			4	complete	23.9	5.8		28
22.	jet	gaming disc/ counter	Crummy (1983) type 1	complete, irregular round disc with flat basal side and slight concave topside with central perforation, rectangular cross-section, slightly raised, straight edge with rounded corners			4	complete		3.5/4.0		16/18.5
25. (not ill.)	coal?	gaming disc/ counter	Crummy (1983) type 3	small fragment of plano-convex disc with central conical perforation in the topside, with flat underside and raised upper side with rounded edge			2	fragment	23.4	5.8		
23.	jet	die	Allason-Jones (1996) type 314	complete, hexagonal cube with irregular sides rendered with a numeral annotation in the middle and/or in the corners of the side, small die with the values indicated by deeply incised/drilled dot-and-ring motifs; the opposing faces add up to seven, like the majority of Roman (and modern) dice; some traces of a yellow-white material in the grooves suggest a contrasting inlay	cf. York: Allason-Jones (1996, 49) but no exact parallels known by Allason-Jones		4	complete	7.8	7.1 x 6.2		
24.	jet	spindle whorl		complete annular spindle whorl with convex sides and with rounded corners, with flat underside and slightly rounded upper side, the exterior is decorated with a wide concentric groove			post	complete	31.0	7.5	6.0	31.0

6. The glass finds

Peter Cosyns and Sofie Vanhoutte

1. Introduction to the glass assemblage of the south-west corner site

The site at the south-west corner of the fort yielded 1039 glass fragments which can be dated to the Roman period[213] (Table 6.1; see also Plates CCCXXIX-CCCXXXVIII). Scientific analysis on the isotopic compositions of some vessels, secondary molten glass and windowpane samples from this site revealed a clear eastern Mediterranean origin of the raw glass (Ganio *et al.* 2012). Ensuing optical and chemical analyses on 94 selected samples including windowpanes and vessel glass in decolourised and pale naturally coloured glass resulted in defining the ratios of imported Egyptian and Levantine glass as well as the impact of recycled glass throughout the various levels within the Roman fort (Bidegaray *et al.* 2018).

Glass jewellery is most significant in this study as these finds tell a great deal about the identity of the Oudenburg fort community, *in casu* gender identity. Some of the other glass finds yield information not covered by other find categories. The here provided overview of the different glass categories aims to focus on the glass items that can attribute to a better understanding of the everyday life of the fort inhabitants and of their identity. Besides jewellery, the glass assemblage mainly involves vessel and windowpane fragments, a few utensils and counters, next to secondary molten glass items.

The spatial distribution of the glass finds, recovered from all kinds of features and always as loose fragments, points to the dispersed character of the glass items. It makes clear that the glass finds are not suitable for drawing conclusions regarding the functional interpretation of the respective specific find contexts. The glass assemblage only yields a few joining fragments, of which the ones stretching over a distance of at least 2 m are visualized in Figure 6.1. They illustrate the spread of the material and also the residuality aspect that has to be counted in, as seen in other find categories. Nevertheless, the attribution of the glass finds to the successive fort levels enables to see certain evolutions through time, regarding the presence of jewellery items for example, and the occurrence of vessel and windowpane types.

2. Utensils

A small, thin-walled, curved mirror glass with a diameter of *c.* 3.5 cm was found at fort level 4 (Figure 6.2). It displays an average size as most mirror glasses have a diameter between 3.0 and 5.0 cm (van Buchem 1976, 11; Lloyd-Morgan 1981, 152). The first known reference to glass mirrors already occurs in the later 1st-century AD *Natural History* by Pliny the Elder and more or less correlates with the earliest archaeological reference known so far. At the mid-1st century AD glass workshop of Avenches – Derrière la Tour in Switzerland (Amrein 2001, 41-48) lead layered bulbous glass bottles were produced to be reworked into small mirroring discs. Notwithstanding this early date, most examples seem to belong to the 2nd or 3rd century AD (Lloyd-Morgan 1981, 152) and they continue to be used up to the 4th – early 5th century AD (Tudor 1959). These circular and convex glasses were known to be set in metal frames (mainly lead) or in stone frames (mainly limestone). However, in most cases frames in perishable materials such as wood should be considered, seeing the considerable number of loose glass mirrors found at several 3rd and 4th century AD cemeteries (Lloyd-Morgan 1981, 152) (Table 6.2).

When gender and age of the deceased can be identified, mirrors always seem to be related to female or children burials (Vanvinckenroye 1984, 196; Amrein 2001, 48). Both graves 96 and 141 at the south-west cemetery at Tongeren belonged to women; the data from graves 106-107 and 208 were inconclusive but the finds strongly point to women as well (Vanvinckenroye 1984). Both graves from Arcis-sur-Aube were female graves (Cabart 2004) and grave B183 from the London cemetery also belonged to a woman. One exception is burial B197 of London: although buried with all female attributes, the skeleton appeared to be of a man (Barber and Bowsher 2000). Maybe the deceased was a transgender; transgenderism was not exceptional in Roman times as written sources indicate, and it was socially and legally accepted, both for men as women. In view of the London burial, the Krefeld-Gellep

213 **In total 1094 glass fragments were collected of which 56 pieces from the post-Roman dark earth level could be identified as post-Roman. Four items were classified as early medieval (amongst which one red opaque cylindrical bead dated to the 6th-7th centuries), besides two ironing glasses (5th-10th centuries), two painted window glasses from the 12th to 14th centuries, six fragments of medieval to post-medieval times and 44 modern to recent items. Of the latter two groups most are fragments of windowpanes.**

Table 6.1. Distribution of the different glass categories according to the stratified evidence, based on fragment count; cross joining fragments are counted as one.

level / category	utensil	jewellery	counter	vessel	window pane	secondary molten glass	not identifiable	TOTAL
L1				1				**1**
FL2				10	7		2	**19**
FL3		3	3	46	51	7	1	**111**
FL4	3	8	1	136	42	29	5	**224**
FL5		7		104	39	17	60	**227**
5+POST / POST		17	2	281	134	18	5	**457**
TOTAL	**3**	**35**	**6**	**578**	**273**	**71**	**73**	**1039**
%	**0,3**	**3,4**	**0,6**	**55,6**	**26,3**	**6,8**	**7,0**	**100**

Table 6.2. A selective overview of burial sites in Northwestern Europe with graves comprising a loose glass mirror.

location	context	date	reference
Tongeren (B)	south-west cemetery, tomb 96	second half 4th century AD	Vanvinckenroye 1984, 62-63, pl. 62, no. 12
Tongeren (B)	south-west cemetery, tombs 106-107	second half 3rd century AD	Vanvinckenroye 1984, 68-69, pl. 67, no. 2
Tongeren (B)	south-west cemetery, tomb 141	first half 4th century AD	Vanvinckenroye 1984, 86-87, pl. 83, no. 5
Tongeren (B)	south-west cemetery, tomb 208	first half 3rd century AD	Vanvinckenroye 1984, 116, pl. 106, no. 3
Arcis-sur-Aube (F)	tomb 113	second half 3rd century AD	Cabart 2004, 13, fig. 1, no. 99
Arcis-sur-Aube (F)	tomb 125	second half 3rd century AD	Cabart 2004, 13, fig. 1, no. 56
London (UK)	eastern cemetery, tomb B183	second quarter 2nd – first half 3rd century AD	Barber and Bowsher 2000, 151, B183, no. 1
London (UK)	eastern cemetery, tomb B197	last quarter 2nd – 3rd century AD	Barber and Bowsher 2000, 155, B197, no. 6
Krefeld-Gellep (G)	tomb 3533	first half 3rd century AD	Pirling and Siepen 2006, 420, no. 11
Krefeld-Gellep (G)	tomb 3601	2nd century AD	Pirling and Siepen 2006, 420, no. 2
Krefeld-Gellep (G)	tomb 3918	last quarter 2nd – 3rd century AD	Pirling and Siepen 2006, 420, no. 15
Krefeld-Gellep (G)	tomb 3941	first half 3rd century AD	Pirling and Siepen 2006, 420, no. 3
Krefeld-Gellep (G)	tomb 4227	3rd century AD	Pirling and Siepen 2006, 420, no. 4
Krefeld-Gellep (G)	tomb 4319	first half 3rd century AD	Pirling and Siepen 2006, 420, no. 2
Krefeld-Gellep (G)	tomb Kr9	late 3rd – early 4th century AD	Pirling and Siepen 2006, 420, no. 3

burials cannot be included in the discussion as the female gender was only determined based on the burial gifts. The Oudenburg find originates from the large waste-pit OS 4980 and clearly represents waste material; further specific conclusions on its use cannot be drawn. The occurrence of a single discarded glass mirror is of course no strong evidence for permanent or long-term female presence at the fort as for instance prostitutes commonly made temporary stopovers at Roman forts. Nevertheless, its gender attribution adds another marker for female and child presence within the fort walls in the late 3rd century AD aside from the (glass) jewellery and other finds like female and children shoes.

Two fragments of conical lamps with short vertical handles (Isings 1957 Form 134) should also be discussed in this section as these vessels were used as lighting device (one ill.: cat. no. 109). The shape is conical with vertical outward-folded rim. Such lamps had three short vertical handles to be hung with metal hooks and wires. The base is slightly pushed-in and at the inner side a squad tubular vessel is stuck in the middle to work as a wick holder (Plate CCCXXXV: 109). Cat. no. 109 was recovered from a mixed level 4+5, the other fragment comes from the post-Roman level. As these conical lamps are characteristic only from the (mid-)4th century AD onwards, they should be related to fort period 5.

It is worth mentioning that in the ceramic assemblage only one possible oil lamp could be discerned, in Lower Nene Valley colour-coated ware, and recovered from the post-Roman level (Chapter 1.A.2 in this volume, cat. no. 96). The metal assemblage yielded some lighting devices, although not numerous. A small, open lamp (Plate CCLXXXIV: IR.D049), a presumed candle stand (IR.D050) and a lamp hook (IR.D052), all three in iron, were found at fort level 4. An iron, hook-shaped, curled terminal may possibly be the handle of a candlestick or lamp and was collected at the top of the Roman level (IR.D051). In copper alloy, three, possibly four, candlesticks were preserved, two of the symmetrical 'hour-glass' type (Plate CCXIX: CA.D001 and D002) and two of the type with two truncated conical parts constricted in the middle (CA.D003 and CA.D004; the first fragment is believed to be the interior of a candlestick). The latter two and one of the 'hour-

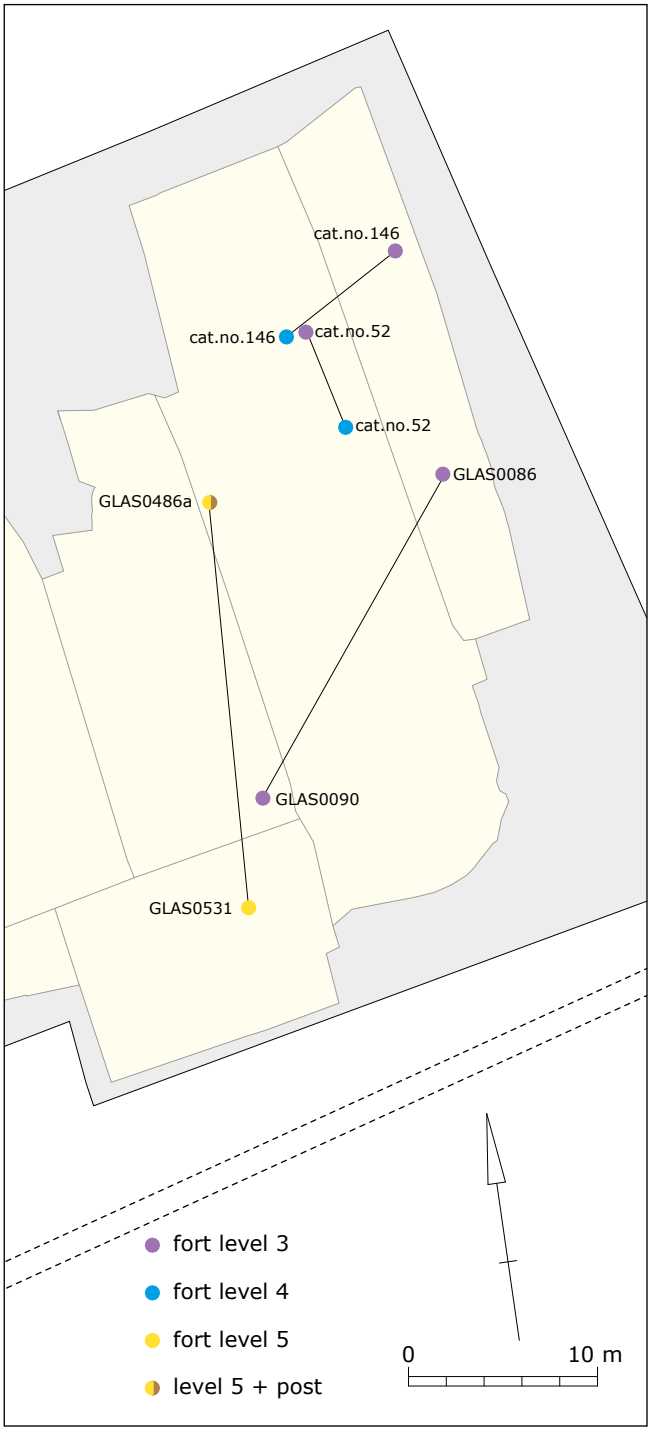

Figure 6.1. Visualization of the lateral cross joining glass fragments stretching over a distance of at least 2 m, all situated at the east side of the south-west corner site.

glass' candlesticks were found in contexts of fort level 4; the other cannot be assigned to a specific level. Eckardt has demonstrated that candlesticks increasingly replaced lamps in the later Roman period in Roman Britain (Eckardt 2011, 187). It is striking that most of the lighting devices were retrieved from fort level 4, the level with the workshops in this part of the fort during the later 3rd century.

Figure 6.2. Small glass mirror from the primary infill of the large waste-pit OS 4980, fort level 4.

3. Counters/gaming pieces

Glass counters are usually interpreted as gaming pieces. However, these Roman small discoid glass pieces are known to have had multifunctional applications as counters (the so-called *calculi*), tokens and ornamental elements in architecture and jewellery aside from gaming purposes (Schärlig 2003; Cosyns 2011, 299-300). At a military site, a function as gaming piece is very likely though. Next to the counters, a small die made of jet, found at fort level 4 at the south-west corner site, can be added to this gaming context.

The south-west corner site yielded six glass counters (of which five are illustrated: Plate CCCXXIX, 1-5; Table 6.3). The characteristic shape of these glass objects is circular plano-convex with a flat basal surface, a curved top side and a rounded edge.

Gaming was a known leisure activity for soldiers. In the late 1st century BC – early 1st century AD Ovid mentions in his *Ars Amatoria* (II, 208) and his *Tristia* (II, 478-488) the game *ludus latrunculorum*, the 'soldiers' game' for which coloured glass counters were used and which was played on a squared board. In the early 7th century AD Isidore of Seville writes in his *Origines* (XVIII, 60ff.; based on Cato) about the game *tabula* or *alea*, a modern version of backgammon with fifteen pieces for each player (Allason-Jones and Bishop 1988, 82). The important role of gaming amongst the Oudenburg soldiers of the 4th – early 5th century arises from the grave finds at Graveyard A. In three graves one or more counters were deposited next to the deceased. Grave 31 contained seven ivory counters and one made of bone and one of glass, next to a bone dice. Grave 44 and grave 143 both yielded one counter, respectively in bone and glass (see Mertens and Van Impe 1971). The Corbridge Hoard – although from an earlier period, *c.* AD 122-138 – illustrates this importance as well. In a wooden chest, found in the 1960s in the central part of one of the Corbridge forts (UK), a complete or nearly complete set of gaming pieces was found together with mainly weapons, armour and military equipment (Allason-Jones and Bishop 1988, 82).

The glass counters should obviously be considered together with the jet (or jet-like material) and bone counters from the site which display the same characteristic shape (Table 6.4). A polished fragment of a pebble or cobble stone, seemingly of the same, convex discoid shape, and of similar size (cf. Chapter 10: cat. no. 021-194), may also have been used as gaming piece. Besides these refined discoid counters, more gaming pieces can be identified at the site,

Table 6.3. Catalogue of the glass counters found at the south-west corner site.

cat. no.	find name - function	find type	dating of type	description	(fort) level	preservation	outer diameter in mm
1.	counter	round plano-convex	I-IV	pitted straight basal surface, matt rounded top surface	5+post	complete	20
2.	counter	round plano-convex	I-IV	deep blue, pitted straight basal surface, matt rounded top surface	4	complete	20
3.	counter	round plano-convex	I-IV	pitted straight basal surface, matt rounded top surface	post	complete	19
4.	counter	round plano-convex	I-IV	black/green, pitted straight basal surface, matt rounded top surface	3	complete	16.5
5.	counter	round plano-convex	IIB-IIIA	white opaque, pitted straight basal surface, matt rounded top surface	2+3	almost complete	26

Table 6.4. Overview of the glass, jet(-like) and bone counters from the south-west corner site according to their find context arranged by (fort) level.

(fort) level	GLASS COUNTERS	JET COUNTERS	BONE COUNTERS	TOTAL
FL2		1		1
FL3	3		3	6
FL4	1	2	2	5
FL5			1	1
5+POST/POST	2		1	3
TOTAL	**6**	**3**	**7**	**16**

such as the ten small discs reworked from pottery sherds[214]. Also ceramic building material was sometimes reworked into discs, as 29 items testify (cf. Chapter 9 in this volume, Section 4). They comprise mostly larger examples, perhaps indicating that different games were 'in play'[215], although it cannot ruled out that (some of) these discs were used as lids on vessels.

The three jet(-like) and the seven bone gaming pieces can be seen as suitable (and 'cheaper') alternatives for respectively black and white glass counters. The Oudenburg glass, jet(-like) and bone counters together with the possible counter in stone seemingly from the same type, distinguish themselves from the rest of the gaming pieces in being small and refined, and intentionally made to serve as counters. The discs reworked from pottery sherds and ceramic building material were clearly *ad hoc* manufactures.

4. Windowpanes

In total 273 windowpane fragments have been recorded from 206 different archaeological features at the south-west corner site of the fort, representing *c.* 26.3% of the total glass assemblage (Tables 6.1 and 6.5; see Plates CCCXXIX-CCCXXX). The matt-glossy cast and pulled panes of the 1st-3rd centuries AD form the largest group with 179 fragments or 65.6%. The late Roman glossy-glossy cylindrical blown panes comprise 92 fragments or 33.7%. A substantial number of the early to mid-Roman matt-glossy cast and pulled panes were recorded in the 3rd-century AD fort levels 2 and 3. The few pieces of this type present in the later fort levels 4 and 5 as well as in the post-Roman dark earth level are to be seen as residual material. The redeposition as a backfill from later fort construction works may explain the occasional intrusive late Roman glossy-glossy pieces registered within the earlier fort levels. Nearly all glossy-glossy panes though, come from the later fort levels 4 and 5 or from the post-Roman dark earth level (as residual material).

Based on the most standard dimensions of both Roman windowpane types, ranging between 30 and 50 cm (Fontaine and Foy 2005, 22-23; Vanpeene 2005; Cosyns 2005b), the preserved window glass fragments point to the use of large rectangular and square single slab windowpanes remodelled by cutting or nibbling for a set-up in complex window frames. When looking more carefully to the windowpane rim fragments, a variety of profiles can be observed for the early to mid-Roman matt-glossy type (cat. nos 6-7, 10-13, 15-16, 18, 21, 27). Characteristic to these cast and pulled panes is a uniformly straight but pitted basal surface looking dull, and an irregular wavy but smooth upper surface looking shiny. Four subcategories of early to mid-Roman matt-glossy windowpanes can be defined. The first subcategory covers the classic matt-glossy panes, representative for the 1st – 2nd centuries AD, which have an irregular thickness ranging between 2 to 5 mm and a distinct rim edge with thick thumb-rest of about 7 to 9 mm. Only one piece of subcategory 1 (cat. no. 7) has been noticed, found at fort level 5 as a residual item. The second subcategory is more consistent in thickness, varying between 3 and 5 mm, and has a less prominent thumb-rest rim edge of about 6 to

214 Three were made from samian fragments, two from amphorae sherds, two from coarse reduced fragments, one from a colour-coated sherd and one from a handmade pottery fragment.

215 The ceramic building material disc belonging to fort level 2 was engraved by two perpendicularly crossing lines on its top side, possibly representing some kind of significance in the game.

Table 6.5. Catalogue of the illustrated (and representative) windowpane fragments from the south-west corner site. The cat. nos refer to the illustrated fragments on Plates CCCXXIX-CCCXXX.

cat. no.	find name - function	find type	dating of type	description	(fort) level	preservation
6.	windowpane	matt-glossy 2	IB-III	pale yellow-green, thick walled, tool marks, matt/straight basal surface, glossy/wavy top surface	5	rim fragment
7.	windowpane	matt-glossy 1	IB-III	pale blue-green, thick walled, tool marks, matt/straight basal surface, glossy/wavy top surface	5	rim fragment
8.	windowpane	matt-glossy 3	II-III	pale green, thin walled, matt/straight basal surface, glossy/wavy top surface	2	rim fragment
9.	windowpane	matt-glossy 3	II-III	pale green, thin walled, matt/straight basal surface, glossy/wavy top surface	3	rim fragment
10.	windowpane	matt-glossy 2	IB-III	decolourised/blue tinged, thick walled, matt/straight basal surface, glossy/wavy top surface	post	rim fragment
11.	windowpane	matt-glossy 1	IB-III	pale yellow-green, thick walled, tool marks, matt/straight basal surface, glossy/wavy top surface	4	rim fragment
12.	windowpane	matt-glossy 2	IB-III	pale blue-green, thick walled, tool marks, matt/straight basal surface, glossy/wavy top surface	4	rim fragment
13.	windowpane	matt-glossy 1	IB-III	blue-green, thick walled, matt/straight basal surface, glossy/wavy top surface	4	rim fragment
14.	windowpane	matt-glossy 3	III	blue-green, thin walled, matt/straight basal surface, glossy/wavy top surface	4+5	rim fragment
15.	windowpane	matt-glossy 2	IB-III	pale blue-green, thick walled, tool marks, matt/straight basal surface, glossy/wavy top surface	5+post	rim fragment
16.	windowpane	matt-glossy 2	IB-III	blue-green, thick walled, matt/straight basal surface, glossy/wavy top surface	post	rim fragment
17.	windowpane	matt-glossy 4	III	blue-green, thin walled, matt/straight basal surface, glossy/wavy top surface	3	rim fragment
18.	windowpane	matt-glossy 2	IB-III	pale green, thick walled, tool marks, matt/straight basal surface, glossy/wavy top surface	3+4	rim fragment
19.	windowpane	matt-glossy 3	II-III	decolourised/yellow-green tinged, thin walled, matt/straight basal surface, glossy/wavy top surface	1-4	rim fragment
20.	windowpane	matt-glossy 3	II-III	pale blue-green, thin walled, matt/straight basal surface, glossy/wavy top surface	4	rim fragment
21.	windowpane	matt-glossy 2	IB-III	pale yellow-green, thick walled, tool marks, matt/straight basal surface, glossy/wavy top surface	4+5	rim fragment
22.	windowpane	matt-glossy 3	III	blue-green, thin walled, matt/straight basal surface, glossy/wavy top surface	post	rim fragment
23.	windowpane	matt-glossy 3	III	blue-green, thin walled, matt/straight basal surface, glossy/wavy top surface	post	rim fragment
24.	windowpane	matt-glossy 3	III	blue-green, thin walled, matt/straight basal surface, glossy/wavy top surface	post	rim fragment
25.	windowpane	matt-glossy 3	II-III	blue-green, thin walled, matt/straight basal surface, glossy/wavy top surface	3	rim fragment
26.	windowpane	matt-glossy 4	III	blue-green, thin walled, matt/straight basal surface, glossy/wavy top surface	4	rim fragment
27.	windowpane	matt-glossy 2	IB-III	decolourised/blue-green tinged, thick walled, matt/straight basal surface, glossy/wavy top surface	post	rim fragment
28.	windowpane	matt-glossy 3	III	pale blue-green, thin walled, matt/straight basal surface, glossy/wavy top surface	post	rim fragment
29.	windowpane	matt-glossy 4	III	blue-green, thin walled, matt/straight basal surface, glossy/wavy top surface	post	rim fragment
30.	windowpane	matt-glossy 3	III	blue-green, thin walled, matt/straight basal surface, glossy/wavy top surface	post	rim fragment
31.	windowpane	matt-glossy 4	III	blue-green, thin walled, matt/straight basal surface, glossy/wavy top surface	post	rim fragment

cat. no.	find name - function	find type	dating of type	description	(fort) level	preservation
32.	windowpane	matt-glossy 3	III	blue-green, thin walled, matt/straight basal surface, glossy/wavy top surface	post	rim fragment
33.	windowpane	glossy-glossy	IV-V	blue-green, thin walled, both surfaces straight glossy	post	rim fragment
34.	windowpane	matt-glossy 3	III	blue-green, thin walled, matt/straight basal surface, glossy/wavy top surface	5	rim fragment
35.	windowpane	matt-glossy 4	III	blue-green, thin walled, matt/straight basal surface, glossy/wavy top surface	post	rim fragment
36.	windowpane	matt-glossy 3	II-III	blue-green, thin walled, matt/straight basal surface, glossy/wavy top surface	1-4	rim fragment
37.	windowpane	matt-glossy 4	III	blue-green, thin walled, matt/straight basal surface, glossy/wavy top surface	5+post	rim fragment
38.	windowpane	matt-glossy 3	III	pale blue-green, thin walled, matt/straight basal surface, glossy/wavy top surface	5+post	rim fragment
39.	windowpane	glossy-glossy	IV-V	decolourised/yellow-green tinged, thin walled, both surfaces straight glossy	5+post	rim fragment
40.	windowpane	glossy-glossy	IV-V	pale blue-green, thin walled, both surfaces straight glossy	post	rim fragment
41. a, b, c	windowpane	glossy-glossy	IV-V	decolourised/blue-green tinged, thin walled, both surfaces straight glossy	post	3 rim fragments
42.	windowpane	matt-glossy 3	III	pale blue-green, thin walled, matt/straight basal surface, glossy/wavy top surface	post	rim fragment
43.	windowpane	glossy-glossy	IV-V	pale blue-green, thin walled, both surfaces straight glossy	post	rim fragment
44.	windowpane	glossy-glossy	IV-V	pale blue-green, thin walled, both surfaces straight glossy	post	rim fragment
45.	windowpane	glossy-glossy	IV-V	decolourised/blue-green tinged, thin walled, both surfaces straight glossy	post	rim fragment

7 mm (cat. nos 8-16). Most of these come from fort level 2 and can be dated as such to the first half of the 3rd century AD, though some were retrieved from later levels. Subcategory 3 and 4 lack a thumb-rest rim edge and are quite regularly thick. The third subcategory varies between 3 to 4 mm in terms of thickness with a slightly thicker rounded rim edge (cat. nos 17-24, 29, 34, 35), whereas the fourth category shows to be not more than 2 to 3 mm thick with a narrowing, almost pointed, rim edge, which is sometimes curly (cat. nos 25-28, 30-33, 37, 38). The majority of subcategory 3 originates from fort level 3 or is residual in later levels, while subcategory 4 is typical from fort level 4, though also present at fort level 5. It is clear that the 3rd-century AD matt-glossy panes from the south-west corner fort site appear to be much more regular and thinner, more in line with the late Roman glossy-glossy cylindrical blown windowpanes that become characteristic at the 4th century AD. Typical for the latter type is the shiny, slightly wavy, surface on both sides and the narrow and quite regular wall thickness, mainly ranging around 2 to 3 mm but with extremes going from about 1 mm for the wall to 4 mm at the rim (cat. nos 36, 39-45). The glossy-glossy panes are representative for the final fort phase – fort period 5 – but, evidently, also occur as residual items in the post-Roman level, though certain pieces have been found at fort level 4 too.

The spatial distribution of the window glass fragments at the site does not yield any information on the function of the structures. The absence of window glass at fort level 1 most likely indicates that the windows of the soldiers' barracks attested in this area for fort period 1 were closed with alternative material than glass sheets. The presence of glass windowpanes at the soldiers' barracks cannot be completely ruled out though, as these glass sheets could have been taken away easily when the fort was abandoned or recovered and re-used in the following period. For fort period 2 however, glass windowpanes can definitely be assumed at the military hospital. This is also the case for the bath house of fort level 5, in use during fort period 5A in the second and third quarter of the 4th century. Seven window glass fragments from fort level 5 and later levels revealed mortar remains, one fragment from the post-Roman level even with pink, hydraulic mortar. These finds most likely belonged to the 4th-century bath house.

Further contextual analysis seems not possible, as the material is found as discarded fragments and scattered over the site due to the long history of construction works resulting in a high residual factor. Whether or not the window glass fragments from fort levels 3 and 4 represent discarded material from that level or have to be seen as residual fragments from the preceding military hospital, cannot be deduced from the material.

5. Vessels

The 519 vessel items, encompassing 578 fragments or 55.6% of the glass assemblage, are represented at all levels, but about half of the vessel material has been retrieved from the post-Roman dark earth level. More than half of the material is undiagnostic; the vessel form could only be defined for 220 items (Table 6.6; cf.

Plates CCCXXXI-CCCXXXVI). The vessel fragments from the 4th-century double well of fort level 5 have already been published in detail (Vanhoutte *et al.* 2009b, 42-43; 73; 77-78; 88; 99-100).

Despite the fact that a vast number of the glass vessel fragments remains undiagnostic, in total eight different general forms and 32 different types can be discerned (Tables 6.6-6.8). Eight types – or no less than 25% of the registered types – are only represented in the post-Roman level, as residual items. Most of the vessels belong to the groups of storage ware and tableware, although there is also some toilet ware. It is of course not surprising for a military site that the glass vessel spectrum is dominated by common tableware and storage ware with respectively bowls (*c.* 30%) and bottles (40%) (Table 6.6). The recovered toilet wares at the south-west corner of the fort can be related either to the military hospital of fort period 2 or the bath house of fort period 5A.

A closer look at the relation between the typological date of the vessels and the levels in which each vessel type was found, emphasizes the high degree of residuality (Table 6.7). The large numbers of earlier vessel types at fort level 5 must be related to the important levelling and subsequent significant construction works at fort period 5 resulting in a lot of dug-up material.

Level 1, including features of the pre-fort civil settlement and of fort period 1, yielded only one item, a wall fragment of a mould-blown prismatic bottle (Isings 1957 Form 50) in decolourised glass. Several glass fragments of the 1st-/2nd-century civil settlement phase were however attested as residual material in later levels. Various pieces of small hemispherical cups with wheel-cut concentric lines (Isings 1957 Form 12), a few cast ribbed bowls (Isings 1957 Form 3), handle fragments of bottles with conical or globular body and tall neck (Isings 1957 Form 52/55) (Table 6.8: cat. nos 49, 50, 70), a narrow but high conical beaker with pad-base (Isings 1957 Form 21), a beaker with applied decoration (Isings 1957 Form 33), a dish with sloping sides (Isings 1957 Form 49) (cat. no. 82), and a fragment of an ultramarine so-called circus beaker (Goethert-Polashek 1977, form Trier 34) depicting circus games with *quadrigae* (cat. no. 46; Figure 6.3), are all of earlier date than the first fort. Considering that circus beakers were only produced during a very short period in the second half of the 1st century AD (Hanut and Cosyns 2010, 143), this piece must originate from the earliest phase of the civil settlement. The other early fragments are only common from the Flavian period onwards and a few are characteristic of the 2nd century AD. The observation that most glass finds that are clearly datable to the pre-fort settlement were found in the post-Roman level, strengthens the idea that the earth from the dark earth level was brought in from outside the fort where it had cut settlement rubbish (see Volume I, Chapter II, Section II.2.3)

The hemispherical bowls with everted rim with cut-of edge (Isings 1957 Form 96) (cat. nos 66, 73, 92-98, 100-106, 110, 113-115, 120, 127) and the prismatic bottles, square and rectangular (Isings 1957 Form 50) (cat. nos 52-55, 60-61, 63), are the most common types within the Roman fort. The prismatic bottle is a distinctive storage vessel and with 72.6% the predominant type within the bottle group. Since this bottle type was produced not later than the end of the 2nd – early 3rd century AD, it can only be related to the first two (fort) levels. Prismatic bottles are present throughout most Roman levels (one at level 1, twelve in level 3, 25 in level 4, ten in level 5 and 21 in the post-Roman level) which makes this vessel type indicative for the residual aspect of the material recovered at the site.

Figure 6.3. The fragment of a 1st-century so-called circus beaker recovered from the post-Roman dark earth level.

Important to notice is the presence of *aryballoi* (Isings 1957 Form 61) (*e.g.* cat. no. 108) and *unguentaria* (Isings 1957 Forms 82, 84 and 101) (*e.g.* cat. no. 128), here classified as one category since some small fragments cannot be conclusively categorized. Both forms, containers for perfumed oils and medicine in liquids or powder, are mainly typical for the 2nd – 3rd centuries AD. The *unguentarium* Isings type 61 is still in use in the first half of the 4th century though, while type Isings 84 dates to the 3rd and 4th centuries and Isings type 101 even continues to be used into the 5th century. The occurrence of the *unguentarium* Isings 82 and the *aryballos* Isings 61 at fort level 2 (and at later fort levels as residual items) may well be related to the military hospital of fort period 2. Even the *unguentarium* type Isings 84 from fort level 4 may be dug up from that context. The presence of the *unguentarium* type Isings 101 and type Isings 84 at fort level 5 may well be connected to the function of the bath house of fort period 5A of the 4th century.

Seven glass fragments Isings 116 (cat. nos 85-91) from fort level 5 and the post-Roman level represent distinctive shallow bowls with slightly everted rim and broken-off edge, decorated with figurative scenes in the centre incised with hatched contours and inscriptions just below the rim. These are late Roman bowls on which two specific themes are popular, hunting scenes and Christian scenes, but pagan scenes also occur (Harden *et al.* 1987, nos 126-128). None of the pieces from the south-west corner site are large enough to be able to interpret the inscription or the represented scene. It appears, however, that the most plausible scenes are hunting scenes comparable to the so-called Wint Hill group (Harden 1960). Cologne is considered to be the production centre of these vessels with hatched engraved decoration, and their production is assumed to be limited to (the second half of) the 4th century AD. One of the fragments (cat. no. 85) shows part of an undefined animal. Most frequently represented are dogs and wild boars, but hares and deer do occur as well. These animals occur in the classical hunting scenes

Table 6.6. Distribution of glass vessel forms according to the stratified evidence.

(fort) level	aryballos / unguentarium	flask	cup	beaker	bowl	plate	bottle	jug / jar	TOTAL
L1							1		**1**
FL2	2			2	1				**5**
FL3	1				4		14		**19**
FL4	2	2		7	8	1	32		**52**
FL5	3	2	1	8	10	2	11	1	**38**
5+POST / POST	2		3	12	42	11	30	5	**105**
TOTAL	**10**	**4**	**4**	**29**	**65**	**14**	**88**	**6**	**220**
%	**4.5**	**1.8**	**1.8**	**13.2**	**29.5**	**6.4**	**40.0**	**2.7**	**100**

Table 6.7. Overview of the various glass vessel types attested at the south-west corner site. Typology according to Isings 1957 (Is.), Rütti 1991 (AR) and Goether-Polaschek 1977 (T). Bold: period-related material; light grey: residual material; dark grey: intrusive material.

type	function	form	L1	FL2	FL3	FL4	FL5	5+POST / POST	typological date
Is. 50 / AR 156 / T 114/119	storage ware	bottle	X		X	X	X	X	IB-IIIA AD
Is. 82	toilet ware	unguentarium		X	X				IIB-IIIA AD
Is. 61	toilet ware	aryballos		X	X	X	X	X	II-IVA AD
Is. 96 / AR 60 / T 49	tableware	bowl		X	X	X	X	X	III-V AD
Is. 103	storage ware	bottle			X	X			III-IVA AD
Is. 85b / AR 98.1 / T 47a	tableware	cup			X	X	X	X	IIB-IIIB AD
Is. 89 / 128 / AR 161 / T 121/142	storage ware	bottle			X	X		X	II-IV AD
Is. 3 / AR 2 / T 3	tableware	bowl				X			I-IIa AD
Is. 21 / AR 45 / T 35	tableware	beaker				X			Id-IIA AD
Is. 134	lighting	bowl				X			IV-V AD
Is. 84 / AR 144 / T 105	toilet ware	unguentarium				X	X		III-IV AD
Is. 101 / AR 148 / T 79	toilet ware	unguentarium				X	X		IIIB-V AD
Is. 52/55 / AR 163 / T 113	storage ware	bottle				X	X	X	IB-IIA AD
Is. 100 / AR 155 / T 140	storage ware	bottle				X	X	X	III-IV AD
Is. 115	tableware	bowl				X		X	IV-V AD
Is. 33 / AR 52	tableware	beaker					X		IA-IIA AD
Is. 80 / AR 20.2	tableware	cup					X		II-IIIA AD
Is. 85b / AR 98.2	tableware	cup					X		IIB-IIIc AD
Is. 104/120/123 / T 101	tableware	bottle					X		III-IV AD
Is. 116b/117 / AR 59 / T 28	tableware	bowl					X	X	IV-V AD
Is. 122/123 / AR 173 / T 128/129	tableware	bottle					X	X	IV AD
Is. 120/121 / AR 172/174 / T 124/126	tableware	bottle					X	X	IIIB-V AD
Is. 109 / AR 70 / T 59	tableware	beaker					X	X	IIIB-V AD
Is. 36b	tableware	cup					X	X	IIB-IIIA AD
T 34	tableware	cup						X	I AD
Is. 12 / AR 34 / T 30	tableware	cup						X	I-IIa AD
Is. 49	tableware	dish						X	IB-II AD
Is. 51 / T 118	storage ware	bottle						X	IB-IIIa AD
Is. 106 / AR 65 / T 52	tableware	beaker						X	IIIB-V AD
Is. 108 / T 64	tableware	bowl						X	III-V AD
Is. 118	tableware	dish						X	IV-V AD
Is. 124 / AR 170	tableware	bottle						X	IV-V AD

Table 6.8. Catalogue of the illustrated (and representative) vessel fragments from the south-west corner site. The cat. nos refer to the illustrated fragments on Plates CCCXXXI-CCCXXXVI.

cat. no.	find name - function	find type	dating of type	description	(fort) level	preservation
46.	vessel - cup	Trier 34 ('sports cup' or 'circus cup')	I	deep blue, mould-blown, one horizontal ribbing (register) and various vertical ribbings (legs of horses)	post	wall
47.	vessel - cup	Isings Form 80	IB-II	decolourised/yellow tinged, cast, conical body with rounded rim edge	5	rim
48.	vessel - bottle/ jar	Isings Form 52/55/63/67	IB-IIA	yellow-green, free-blown, hemispherical body, open folded foot stand, slightly concave base	post	base
49.	vessel - bottle	Isings Form 52/55	IB-IIA	yellow-green, mould-blown, large vertical handle with three ribbings	post	handle
50.	vessel - bottle	Isings Form 52/55	IB-IIA	decolourised, free-blown, everted rim with broken-off edge, engraved decoration + inscription below the rim	4	handle
51.	vessel - bottle/ jug	Isings Form 104a/120/123	IV-Va	decolourised/yellow tinged, free-blown, oblique foot stand with tool marks on either side and pushed-in base	5	base
52.	vessel - bottle	Isings Form 50	IB-IIIA	blue-green, mould-blown, base mark with a circle within a losange	4	base
53.	vessel - bottle	Isings Form 50	IB-IIIA	blue-green, mould-blown, rectangular body, base mark with two mirroring stylized peltas (acanthus-leaf) in the center of a rectangular frame and flanked by a double lozange	4+5	base
54.	vessel - bottle	Isings Form 50	IB-IIIA	blue-green, mould-blown, flattened horizontal folded rim, reeded handle	4	rim
55.	vessel - bottle	Isings Form 50	IB-IIIA	blue-green, mould-blown, large horizontal folded rim, vertical handle with thick ribbings	post	rim/handle
56.	vessel - cup	Isings Form 85	IIB-IIIA	decolourised/yellow-green tinged, free-blown, double annular foot ring, pontil mark	3	base
57.	vessel - bottle	Isings Form 89/128	IIIB-Va	pale yellow-green, mould-blown, wide reeded vertical handle	post	handle
58.	vessel - bottle	Isings Form 50/62/89/128	IB-Va	pale blue-green, mould-blown, base mark with two concentric lines, pontil mark	post	base
59.	vessel - bottle	Isings Form 50/62/89/128	IB-Va	blue-green, mould-blown, base mark with two concentric lines, pontil mark	post	base
60.	vessel - bottle	Isings Form 50	IB-IIIA	pale blue-green, mould-blown, 29 mm wide reeded handle	3	handle
61.	vessel - bottle	Isings Form 50	IB-IIIA	blue-green, mould-blown, base mark with relief dots in the corners	4	base
62.	vessel - cup	Isings Form 85?	IIB-IIIA	decolourised, free-blown, vertical inward folded rim	3	rim
63.	vessel - bottle	Isings Form 50	IB-IIIA	blue-green, mould-blown, 55 mm wide reeded handle	3	handle
64.	vessel - cup	Isings Form 85	IIB-IIIA	decolourised/yellow tinged, free-blown, double annular foot ring, pontil mark	4	base
65.	vessel	not defined	IB-Va	decolourised/blue-green tinged, free-blown, annular foot stand with pushed-in base	5	base
66.	vessel - bowl	Isings Form 96	III-Va	decolourised/milky white tinged, free-blown, slightly everted rim with rounded edge	4	rim
67.	vessel - cup	Isings Form 85	IIB-IIIA	decolourised/milky white tinged, free-blown, vertical rim with thick rounded edge	4	rim
68.	vessel	not defined	ND	blue-green, free-blown, thick vertically inward folded rim	5	rim
69.	vessel	not defined	IB-Va	decolourised/yellow-green tinged, free-blown	5+post	base
70.	vessel - bottle	Isings Form 52/55	IB-IIA	pale green, mould-blown, flat vertical handle with thick rounded edge	4+5	handle
71.	vessel - jar	Isings Form 130	IIIB-Va	decolourised/yellow tinged, free-blown, slightly pushed-in base without foot	5+post	base
72.	vessel - beaker	Isings Form 36	IIB-IIIA	black/green, free-blown, slightly everted rim with rounded edge	5	rim
73.	vessel - bowl	Isings Form 96	III-Va	yellow-green, free-blown, slightly everted rim with rounded edge	5+post	rim
74.	vessel	not defined	ND	blue-green, free-blown, tubular folded foot stand with flat base, pontil mark	1-5	base
75.	vessel	not defined	IB-Va	pale blue-green, free-blown, tubular folded foot stand	4	base
76.	vessel	not defined	ND	pale yellow-green, free-blown, tubular folded foot stand	post	base
77.	vessel	not defined	ND	pale blue-green, mould-blown, tubular folded footring and pushed-in base	4	base
78.	vessel - beaker	Isings Form 109	IIIB-Va	pale yellow-green, free-blown, tubular folded foot stand	post	base
79.	vessel - cup	Isings Form 115	IIIB-Va	decolourised/blue tinged, free-blown, tubular folded foot stand with flat base	post	base

cat. no.	find name - function	find type	dating of type	description	(fort) level	preservation
80.	vessel	not defined	ND	pale blue-green, free-blown, tubular folded foot stand with pushed in base, pontil mark	post	base
81.	vessel - cup	Isings Form 44/115	IB-Va	pale blue-green, free-blown, tubular folded foot stand with pushed in base, pontil mark	4	base
82.	vessel - dish	Isings Form 49	IB-II	pale blue, free-blown, oblique folded foot stand with flat base, pontil mark	post	base
83.	vessel	not defined	ND	decolourised/yellow-green tinged, free-blown, thick-walled large oblique foldedfoot stand	4	base
84.	vessel	not defined	ND	blue-green, free-blown, large oblique folded foot stand	post	base
85.	vessel - bowl	Isings Form 116	IV	decolourised, free-blown, everted rim with broken-off edge, engraved decoration + inscription below the rim	5	rim
86.	vessel - bowl	Isings Form 116	IV	decolourised/yellow-green tinged, free-blown, decoration with undefined engraved figurative scene	5	wall
87.	vessel - bowl	Isings Form 116	IV	decolourised, free-blown, slightly everted rim with broken-off edge and incised decoration	5+post	rim
88.	vessel - bowl	Isings Form 116	IV	decolourised/yellow-green tinged, free-blown, slightly everted rim with broken-off edge, two pairs of concentric lines below the rim with incised letters 'SI' in between	post	rim
89.	vessel - bowl	Isings Form 116	IV	decolourised/yellow-green tinged, free-blown, slightly everted rim with broken-off edge, two pairs of concentric lines below the rim with unreadable inscription in between	post	rim
90.	vessel - bowl	Isings Form 116	IV	decolourised/yellow-green tinged, free-blown, slightly everted rim with broken-off edge, two pairs of concentric lines below the rim with incised letter 'I' in between, engraved figurative scene	post	rim
91.	vessel - bowl	Isings Form 116	IV	decolourised/yellow-green tinged, free-blown, engraved decoration with undefined figurative scene (running animal?)	post	wall
92.	vessel - bowl	Isings Form 96	III-Va	decolourised/milky white tinged, free-blown, slightly everted rim with rounded edge	3	rim
93.	vessel - bowl	Isings Form 96	III-Va	decolourised, free-blown, slightly everted rim with thick rounded rim, incised concentric line just below the rim	4	rim
94.	vessel - bowl	Isings Form 96	III-Va	pale yellow-green, free-blown, slightly everted rim with rounded edge, with applied glass trail decoration	post	rim
95.	vessel - bowl	Isings Form 96	III-Va	yellow-green, free-blown, slightly everted rim with broken-off edge	5	rim
96.	vessel - bowl	Isings Form 96	III-Va	decolourised/yellow tinged, free-blown,	5	rim
97.	vessel - bowl	Isings Form 96	III-Va	decolourised/yellow-green tinged, free-blown, slightly everted rim with broken-off edge	5	rim
98.	vessel - bowl	Isings Form 96	III-Va	decolourised/yellow-green tinged, free-blown, slightly everted rim with broken-off edge	5	rim
99.	vessel	not defined	ND	decolourised, free-blown, slightly everted rim with thick rounded rim	5	rim
100.	vessel - bowl	Isings Form 96	III-Va	pale yellow-green, free-blown, slightly everted rim with broken-off edge	2	rim
101.	vessel - bowl	Isings Form 96	III-Va	yellow-green, free-blown, slightly everted rim with broken-off edge	5	rim
102.	vessel - bowl	Isings Form 96	III-Va	pale green, mould-blown, honeycomb pattern	post	rim
103.	vessel - bowl	Isings Form 96	III-Va	yellow-green, free-blown, slightly everted rim with broken-off edge	post	rim
104.	vessel - bowl	Isings Form 96	III-Va	yellow-green, free-blown, slightly everted rim with broken-off edge	post	rim
105.	vessel - bowl	Isings Form 96	III-Va	decolourised, free-blown, decoration with hatched vertical ribbings	3	wall
106.	vessel - bowl	Isings Form 96	III-Va	decolourised, free-blown, incised losange, deformed by strong heat	3	wall
107.	vessel	not defined	ND	decolourised, mould-blown, decoration with rows of protruding knobs	post	wall
108.	vessel - aryballos	Isings Form 61	IB-III	blue-green, free-blown, thick walled spherical base without foot	4+5	base
109.	vessel - bowl	Isings Form 134 (tubular wick-holder / lamp)	IIIB-Va	pale blue-green, free-blown, pushed in flat base with base mark at inside	4 + 5	base
110.	vessel - bowl	Isings Form 96	III-Va	pale yellow-green, free-blown, slightly pushed-in flat base	post	base
111.	vessel	not defined	ND	decolourised, free-blown, slightly pushed-in flat base, pontil mark	2	base

cat. no.	find name - function	find type	dating of type	description	(fort) level	preservation
112.	vessel - bowl	Isings Form 96?	III-Va	decolourised/milky white tinge, free-blown, slightly pushed-in flat base, no pontil mark	3	base
113.	vessel - bowl	Isings Form 96	III-Va	blue-green, free-blown, base mark with a circle within a losange	4	base
114.	vessel - bowl	Isings Form 96	III-Va	blue-green, free-blown, flat base without foot, pontil mark	5	base
115.	vessel	not defined	ND	yellow-green, mould-blown, decoration with centrifugal lines	post	base
116.	vessel - aryballos/ unguentarium	Isings Form 61/101	IB-Va	decolourised/yellow-green tinged, free-blown, slightly pushed-in flat base, pontil mark	4	base
117.	vessel - bowl	Isings Form 96?	III-Va	pale yellow-green, free-blown, rounded base without foot	post	base
118.	vessel - bowl	Isings Form 117?	IIIB-Va	pale yellow-green, free-blown, slightly pushed-in flat base, pontil mark	post	base
119.	vessel	not defined	ND	pale blue-green, free-blown, pontil mark	post	base
120.	vessel - bowl	Isings Form 96	III-Va	pale yellow-green, free-blown, slightly pushed-in flat base, pontil mark	post	base
121.	vessel - beaker	Isings Form 109	IIIB-Va	pale yellow-green, free-blown, folded foot stand	5	base
122.	vessel - jug	Isings Form 122/123?	IIIB-Va	blue-green, free-blown, oblique fot stand wih tool marks on either side and flat base	5	base
123.	vessel - beaker	Isings Form 109b	IIIB-Va	pale yellow-green, free-blown, narrow conical foot with tubular folded foot stand and deeply pushed-in central part, pontil mark	post	base
124.	vessel - beaker	Isings Form 109b	IIIB-Va	decolourised, free-blown, small oblique folded foot stand	post	base
125.	vessel	Isings Form 109b	IIIB-Va	yellow-green, free-blown, slightly everted rim with broken-off edge	post	rim
126.	vessel - bowl	Isings Form 96?	III-Va	decolourised, free-blown, thin-walled, decorated with applied deep blue elliptical dot	5+post	wall
127.	vessel - bowl	Isings Form 96	III-Va	decolourised, free-blown, decoration with applied deep blue-green blob	5	wall
128.	vessel - unguentarium	Isings Form 101	IIIB-Va	pale yellow-green, free-blown, horizontalfolded rim (out-up-in), short cylindrical neck widening towards the shoulder	5	neck
129.	vessel - bottle	Isings Form 100	IIIB-Va	decolourised/blue-green tinged, large applied dolphin-shaped handles	4	handle
130.	vessel - bottle	Isings Form 100	IIIB-Va	decolourised/yellow-green tinged, large applied dolphin-shaped handles	4	handle
131.	vessel - bottle	Isings Form 100	IIIB-Va	decolourised/blue-green tinged, large applied dolphin-shaped handles	4	handle
132.	vessel - bottle	Isings Form 100	IIIB-Va	decolourised/yellow-green tinged, mould-blown, large applied dolphin-shaped handles	post	handle
133.	vessel - bottle	Isings Form 89/128	IIIB-Va	yellow-green, mould-blown, decoration with horizontal ribbings	post	wall
134.	vessel - bottle	Isings Form 89/128	IIIB-Va	pale blue-green, mould-blown, plain	4	base
135.	vessel - bottle	Isings Form 89/128	IIIB-Va	decolourised/yellow-green tinged, mould-blown, base mark with three concentric circles, pontil mark	post	base
136.	vessel - bottle	Isings Form 89	IIIB-Va	blue-green, mould-blown, base mark with a circle and inscription "O T" => Frontinus-bottle	4	base
137.	vessel - amphoriskos	Isings Form 91?	IIB-IIIA	decolourised/yellow tinged, free-blown, 23 mm wide tall vertical handle with central ribbing	3+4	handle
138.	vessel	not defined	ND	decolourised, applied, thin vertical handle with thick rounded edge	post	handle

on local wildlife in northwestern Europe, different from the oriental hunting scenes including bears, tigers and other large animals. Part of a similarly engraved bowl was found in the fill of grave 122 at the late Roman military graveyard A showing a man standing in the field with a cloak and part of the inscription 'ITA' (Mertens and Van Impe 1971, 151-152: Figs 63-64). The inscriptions on the fragments from the fort site also remain partial and accordingly impossible to interpret: 'INO' (cat. no. 85), 'SI' (cat. no. 88), 'I' (cat. no. 89) and unreadable letters (cat. no. 90).

6. Secondary molten glass

With a total of 71 pieces, a considerable quantity of secondary molten glass pieces was collected. They should, however, not be related to glass processing. These pieces were deformed by heavy fire. This is confirmed by the thirteen additional molten fragments in which part of a vessel can still be recognized: one originated from fort level 2, two from fort level 3, eight from fort level 4 and one each from fort level 5 and from the post-Roman level. Glass only deforms at a very high temperature from about 700 °C onwards, when the classical Roman silica-soda-lime glass reaches its softening point (Stern 1995, 34-37, Figs. 16-17B). This can only be achieved in a very heavy, long-lasting fire of at least twelve, preferably 24 hours. The 37 secondary molten glass items from fort level 4 of which several items specifically originate from the fire layer ending this level, are significant in this perspective. Together with other indications they are signifying evidence for a fierce enduring fire representing the end of this fort occupation (see Volume I, Chapter II, Section 4.6.2.e).

7. Jewellery

The presence of glass jewellery at the Roman fort of Oudenburg is in light of the gender debate particularly important (Tables 6.9-6.10; Plates CCCXXXVII-CCCXXXVIII). The jewellery finds at the south-west corner site count for in total 35 items: 17 armlets, 17 beads and one hair pin head. The bead and armlet – the latter not in a closed context – from fort level 3 appear to be rather isolated finds. From fort level 4 onwards however, the jewellery – although not in large quantities – is clearly present and scattered over the entire area.

Table 6.9. Glass jewellery items at the south-west corner site: distribution according to the stratified evidence. No glass jewellery was found in (fort) levels 1 and 2.

(fort) level	glass bead	glass armlet	glass hair pin	TOTAL
FL3	1	1		**2**
FL4	6	2		**8**
FL5	2	5		**7**
5+POST / POST	8	9	1	**18**
TOTAL	**17**	**17**	**1**	**35**

7.1. Armlets

All glass armlets are made of black glass (cat. nos 140-154), apart from one single fragment in bichrome opaque blue and white glass from fort level 4 (cat. no. 139). This idiosyncratic piece is an example of Romano-British bangles (cf. Price 1988), sporadically attested along the Continental shore in the Channel area (van Lith 1977). Rather than evidence of Romano-British imported goods, it more likely points to the presence of a Romano-British woman at the Oudenburg fort.

A study on this type of jewellery from funerary contexts has demonstrated that glass bangles were exclusively intended to be worn by girls and (young) women, and only on the left wrist (Cosyns 2011, 282). The armlets type A, B and C (Table 6.10) are characteristic for the beginning of the 3rd century AD onwards until the middle of the 4th century AD. As the type A and B armlets (cat. nos 140-145, 148) are all found as residual items, they cannot attribute to chronological conclusions. The two type C3 armlets (cat. nos 146-147), found at fort levels 3 and 4, represent the early phase of this type from around the middle of the 3rd century AD. Armlet type D (cat. nos 149-154) is the characteristic type from the second half of the 4th century AD onwards, which coincides with the respective find contexts: all type D armlets were found at fort level 5 or in later levels as dug-up items.

Worth mentioning are the two black armlets found by Mertens (unpublished material) (Figure 6.4). The find context in 1977 at the northern sector of the fort provides an uncertain date for the open armlet of type C3a (Cosyns 2011) (Figure 6.4: left). The closed armlet (60/OU/10) of type D1 (Cosyns 2011) that was retrieved in 1960 during the research on the western defence system in Trench XXV at excavation level 2 from a top layer of the earthen rampart is most likely to be linked with fort level 4 or 5 (Figure 6.4: right). This latter piece is a very fine and narrow bracelet with an inner diameter of 45 mm and can be considered as a dress-accessory of a girl[216].

Figure 6.4. Two black glass armlets excavated by Mertens: Left: armlet found in the northern sector of the Oudenburg fort in 1977. Right: armlet found in the western sector of the Oudenburg fort in 1960.

7.2. Beads

A large eye-bead (cat. no. 155) in deep blue glass with three large eyes made of yellow dots on white opaque patches is known as '*Perle mit Punktaugenzier*' (Zepezauer 1993, 84-85). Characteristic to the late La Tène C2 and La Tène D1 period this eye-bead is to be dated in the 2nd – 1st centuries BC, though it is found within a context of fort level 4. Clearly an anomaly since no Iron Age site pre-dates the fort and the civil settlement, this find should probably be considered as an intentionally collected item in later Roman times. Curating found old items is a known phenomenon; several late Roman and Merovingian cemeteries have yielded beads and armlets from the Iron Age. These items may possibly have been considered as protective amulets (Haevernick 1968).

The emerald green and cobalt blue glass beads of the south-west corner site represent the classical repertoire of the 3rd – 4th centuries on the Continent. While the south-west corner fort site only yielded loose beads (Plate CCCXXXVIII), a presumably complete necklace of glass beads was found *in situ* at the northeastern fort site Oudenburg-*Jacali* (site ET17) in a destruction layer[217] most likely related to the end of fort level 4 (Figure 6.5). The necklace comprises 65 beads in monochrome glass hues such as translucent deep blue, transparent pale blue and decolourised, and opaque yellow. Various

216 However, there have been suggestions in the past that smaller annular rings were not used as bracelets but as hair rings, dress fasteners, belt dividers or teething rings (cf. Lawson 1976, 24; Allason-Jones 1996, 35).

217 The necklace was found directly to the south of the northern construction slot of the structure of the third occupation level at site Jacali which can be attributed to fort period 4 (Vanhoutte *et al.* 2014, 239: Fig. 83).

Figure 6.5. The glass beads of a presumably complete necklace (here reconstructed as such) from fort level 4 at the north-east corner site of the Oudenburg fort.

shapes in different sizes can be recognized, including annular and globular beads, faceted beads, barrel-shaped beads and elongated biconical beads. All are very characteristic to the later Roman bead production in the 3rd – 4th centuries AD (Guido 1978, 91-102). The loose beads from the south-west corner do not contain yellow opaque beads but include translucent deep emerald green beads. All material is related to fort levels 4 and 5, though a number have been retrieved from the post-Roman level as residual items (Table 6.10).

The annular, globular and barrel-shaped beads (cat. nos 156-159, 167, 169) are ubiquitous types occurring throughout practically the entire Roman imperial period, and are thus not suitable to date or to determine the provenance.

The elongated baulk-shaped bead (cat. no. 166), Guido type 6 / Riha type 22, is made in blue glass, but the type also occurs in green, blue-green and red glass. While only sporadically present in the North Sea and Channel zone, it is a characteristic find for the Danube region and more particularly *Pannonia* (Riha 1990, 89). Based on burial contexts in South Bavaria, Germany, these elongated baulk-shaped beads can be dated in the second half of the 4th century AD (Keller 1971, 92).

The cylindrical beads are of the long variant in deep green and deep blue glass (cat. nos 160-162). Cylindrical beads were made in various monochrome glass hues and were distributed all over the European area of the Roman Empire from the British Isles to the Black Sea. In contrast to the polygonal beads that were mainly implemented in armlets and necklaces, the cylindrical beads appear to have been essentially applied for the embellishment of earrings. Generally dated in the late Roman period, these beads are in connection with their find contexts at fort levels 4 and 5 of the Oudenburg site. An odd piece, found in a post-Roman context, is the cylindrical bead in pale green glass decorated with three applied trails in gilded glass on the outer sides and at the centre (cat. no. 163). Considering the technique, it is tempting to date this bead type to the 4th century.

One single heart-shaped bead in translucent deep blue glass was found at the south-west corner of the Oudenburg fort (cat. no. 168). This type of glass bead is repeatedly attested in both civil and military burial and ritual contexts. Another five heart-shaped beads are known from a female inhumation at Graveyard A, tomb 177 (Mertens and Van Impe 1971, 198-199; pl. LIV, 177:3). Further examples of such beads are identified in Han-sur-Lesse-*Trou de Han* (B) (6 ex. (unpublished)), in Nismes-*La Roche Sainte-Anne* (B) (4 ex.) (Doyen 1980a, 271, pl. 4: 1; 1980b, 11, pl. 9: nos 50-53), in South Shields (UK) (Allason-Jones and Miket 1984, 279, 4.42) and in Colchester (UK) (Crummy 1983, 34; nos 1448-1450, 1479). Guido dates this type of glass beads in the 3rd – 4th centuries AD (Guido 1978, 91-102). According to their find context, the beads of the fortification settlement of *La Roche Sainte-Anne* at Nismes can be dated to the third quarter of the 3rd century (Doyen 1980a; 1980b). The sets of heart-shaped blue glass beads from the tombs G1 and G69 at the late Roman cemetery of Colchester-*Butt Road* are dated 320-450 AD (Crummy 1983, 1-3).

The small irregular cubic bead in opaque pale blue glass with an opaque red undulating line on a white band (cat. no. 164) is found in the post-Roman level at the south-west corner site, but knows a parallel in cremation grave S7027 at the site Oudenburg-*Bellerochelaan* (site ET28) (Cosyns 2020). This specific type of glass beads (Guido type 15 / Riha type 11.21) is also known from British sites, such as Colchester, though similar beads have been attested on the Continent. At the site Jabbeke-*Klein Strand*, in a neighbouring municipality of Oudenburg, a burial of a rural settlement yielded a necklace with 300 such beads (Hollevoet 2009a, 69). At Augst at least 24 of these beads have been documented (Riha 1990, 88-89, 160, Taf. 38: 1254-1278). Guido (1978, 98, Fig. 35: 15) considers this type of bead an import product from the Mediterranean area and more specifically from North Africa, but the evidence for this statement is unclear. So far, the provenance of this bead type cannot be proposed with certainty as this type of bead is rather uncommon and an exhaustive study on the matter is lacking. What is clear, is that these polychrome blue-red-white irregular cubic beads are to be dated late 3rd – mid-4th century AD. The latest example so far known comes from Colchester-*Butt Road* where a burial with such beads is dated *c.* AD 320 (Crummy 1983, 34, Fig. 36: 1415).

7.3. Hair pin head

Finally, the globular piece in black glass showing the start of a pin on a more flattened area is the head of a hair pin (cat. no. 172). Besides spherical pin heads, also conical, discoid (= flattened sphere) or elliptical (= narrowed sphere) shapes occurred (Cosyns 2009, 90-91, Fig. 4a). The black glass hair pin of Oudenburg and the two examples found at Liberchies (Demanet and Vilvorder 2013) are most likely imports from the glass workshop of Les Houis nearby Sainte Menehould in the Argonne region. The production there took place in the 3rd – 4th centuries AD (Cosyns 2009; 2011, 162). These hair pins were solely used by women to keep their coiffure in shape. This hair pin can be added to the hair pin assemblage in bone (cf. Chapter 4 in this volume) and in jet (or jet-like material) (cf. Chapter 5 in this volume).

8. Conclusion

The main importance of the glass assemblage of the south-west corner site lies primarily in providing various indications for the presence of women and children at the military site. Not only the glass armlets, beads and a hair pin, but also a small mirror glass yield strong evidence. These gender-related finds can be linked with items found in other areas of the fort complex that are similarly related to female identity (for further discussion: see Volume I, Chapter V, Section 3.4.2). Although the glass finds demonstrate a high degree of residuality, the typological dating of the different types of armlets and beads clearly demonstrates that this (significant) presence of women and children can be situated from fort period 4 onwards – *i.e.* from the later 3rd century – until the final phase of the fort occupation. In this respect a striking observation about the glass beads is the similarity between assemblages in late Roman contexts in the northwestern provinces showing a uniform limited colour combination (black, ultramarine blue and emerald green) and analogous shapes. At this stage it is unclear whether this is due to the systematic swop of people to either sides of the Channel or nothing more than an interregional uniformity in dress code and trends.

The glass vessel assemblage demonstrates a change in the storage ware from squarish bottles in the early fort levels to cylindrical ones in the later fort levels. Predominant for the later fort levels 4 and 5 is the hemispherical bowl with slightly everted rim, though this vessel shape is possibly used as lighting device rather than drinking vessel. All in all, the vessel shapes used within the fort show a limited variety which may be related to the military context combined with the later date. Toilet ware and tableware in glass remained a relatively rare item within the Roman fort of Oudenburg.

From the windowpane assemblage can be concluded that most material is related to the later fort phases. The earlier barracks and other buildings either did not receive glass window sheets or these windowpanes were re-used when the fort was again in use. For the latter, the fragments of earlier matt-glossy cast and pulled sheets at fort levels 4 and 5 may be indicative, although it may also concern residual material. The late Roman cylindrical blown glossy-glossy window sheets have been registered in the 4th-century fort level 5 and the post-Roman level. Seeing that none of the windowpane pieces show remains of plaster, it is plausible that all windowpanes were fixed in wooden frames.

Table 6.10. Catalogue of the jewellery items from the south-west corner site. The cat. nos refer to Plates CCCXXXVII-CCCXXXVIII.

cat.no.	find name	find type	date of type	description	(fort) level	preserva-tion	length in mm	width in mm	thickness in mm	inner diameter in mm (ND: fragment too small to determine)	outer diameter in mm (ND: fragment too small to determine)
139.	armlet	Cosyns (2011) type A1 or British?	IB-III	deep blue with opaque lines, open-elliptical, plain armlet, O-shaped section	4	*c.* 1/4	49	6-9		72	90
140.	armlet	Cosyns (2011) type A1	II-IVA	black/green, open-elliptical, plain armlet, O-shaped section, with joint (two joining fragments)	5+post	*c.* 1/2	66.8	6.6-7.5		66.5	80
141.	armlet	Cosyns (2011) type A2	III-IVA	black/green, open-elliptical armlet, with wide twists	5	*c.* 1/4	52.3	9.3-11.1		ND	ND
143.	armlet	Cosyns (2011) type A4	III-IVA	black/green, open-elliptical armlet, with alternating plain - twisted decoration	post	*c.* 1/2	67	6.5-11		42-53	68
142.	armlet	Cosyns (2011) type A5	II-IVA	black/green, open-elliptical armlet, with alternating fine-wide twists	post	*c.* 1/4	42	9		52	70
144.	armlet	Cosyns (2011) type B1	III-IVA	black/green, broad plain armlet, wide D-shaped section	post	*c.* 1/4	58.9	14.4	5.8	70	82
145.	armlet	Cosyns (2011) type B2	II-IVA	black/green, broad armlet, with D-shaped section, notched with indented spatula	5	fragment	35	13-18		ND	ND
148.	armlet	Cosyns (2011) type B2	II-IVA	black/green, profiled armlet, notched with indented spatula	5	fragment	33.4	10.4-14.1	5.5-7	ND	ND
146.	armlet	Cosyns (2011) type C3	III-IVA	black/green, open-elliptical armlet, with three lengthwise ribbings (two joining fragments forming complete armlet)	3+4	complete		8.6-14.5	4-8.5	40-53.7	
147.	armlet	Cosyns (2011) type C3	III-IVA	black/green, open-elliptical armlet, with three lengthwise ribbings	3	*c.* 1/3	57.1	20-25	7-11.3	ND	ND
149.	armlet	Cosyns (2011) type D1	IVB-VA	black/green, narrow plain, closed armlet, with D-shaped section	5+post	fragment	21.5	4	5.3	ND	ND
150.	armlet	Cosyns (2011) type D1	IVB-V	black/green, narrow plain, closed armlet, with D-shaped section	post	fragment	27.8	6.3	4.1	ND	ND
151.	armlet	Cosyns (2011) type D1	IVB-VA	black/green, narrow plain, closed armlet, with D-shaped section	5	*c.* 1/4	40.9	6.0-6.1	3.8	40	48
152.	armlet	Cosyns (2011) type D1	IVB-V	black/green, narrow plain, closed armlet, with D-shaped section	post	*c.* 1/3	54.3	6.4-6.7	3.6-3.7	57	75
153.	armlet	Cosyns (2011) type D1	IVB-V	black/green, narrow plain, closed armlet, with D-shaped section	post	fragment	14.4	6.6	3	ND	ND
154.	armlet	Cosyns (2011) type D1	IVB-V	black/green, narrow plain, closed armlet, with D-shaped section	post	*c.* 1/3	50.9	6.1-6.9	4.0-4.2	57	65
155.	bead	large annular eye-bead	II-I BC	deep blue, large, ring-shaped, slightly triangular bead, with three green with white bordered corners	4	complete				6	22
156.	bead	medi-um-sized annular	I-V	green, medium-sized, ring-shaped bead	4	complete				7	16.6

cat.no.	find name	find type	date of type	description	(fort) level	preservation	length in mm	width in mm	thickness in mm	inner diameter in mm (ND: fragment too small to determine)	outer diameter in mm (ND: fragment too small to determine)
157.	bead	small spherical	III-Va	blue, small, spherical bead	post	almost complete (damaged side)	6.1			1.2	6.4
158.	bead	small spherical	III-Va	blue, small, spherical bead	4	complete				2	6.8
159.	bead	small spherical	III-Va	blue, small, spherical bead	3+4	half; damaged sides		5?		1.5	0.6 to 0.8?
160.	bead	long cylindrical	III-IV	blue, tube-shaped, cylindrical bead	unstratified	complete	24.4				4.2
161.	bead	long cylindrical	III-IV	pale blue, medium-sized, tube-shaped, cylindrical bead	5+post	almost complete, broken off at both sides	24.5				4.5
162.	bead	long cylindrical	III-IV	green, medium-sized, tube-shaped, cylindrical bead; iron wire of necklace still preserved in cavity	5+post	almost complete, broken off at both sides	17.8			1	4.6
163.	bead	cylindrical, ribbed	III-IV	pale green, tube-shaped bead, with three gold coloured ribs	post	complete	16.5				c. 4
164.	bead	small conical	III-IV	polychrome blue, small, conical, tube-shaped bead	post	complete	7				5.7
165.	bead	short cylindrical	III-IV	blue, short cylindrical bead with convex sides	post	complete		10		4.2	11
166.	bead	bar-shaped	III-IV	blue, bar-shaped bead	3	complete	26	4.5			
167.	bead	biconical annular	III-IV	blue green, biconical ring bead	5	complete		6.3		3	11
168.	bead	heart-shaped	III-IV	blue, heart-shaped bead	4	almost complete; damaged sides	13.5	11.7			
169. (not ill.)	bead	oval	III-IV	pale blue, oval bead, with grooves	4+5	only half preserved	14				
170. (not ill.)	bead	micro bead	IIIB-Va	blue, small, spherical bead	4	complete	4.7			1.25	6.8
171.	bead	micro bead	IIIB-Va	blue, small, annular bead	post	complete				0.5	5.2
172.	hair pin	Cosyns (2011) variant A	II-IVA	black/green, spherical head of hair pin, with broken off metal pin	5+post	complete head	11	12			

7. The figurines

Jan De Beenhouwer and Sofie Vanhoutte

1. Introduction to the figurine assemblage

The south-west corner site yielded a very small, but interesting assemblage of figurine fragments. In total nine individuals can be counted in terracotta, one in stone (Plates CCCXXXIX-CCCXL) and three in copper alloy (Plate CCXLII). References are made to the figurine finds from other sites at Oudenburg.

The figurines give an idea, although very limited, of the religious life of the army units. Moreover, they represent some additional information on (trade) network routes to the fort.

2. Mould-made terracotta figurines

2.1 Two nursing mothers from the Central Gaulish pottery centre of Priscus

Fragments were found of two figurines of a nurse/mother belonging to the same production series (Plate CCCXXXIX: 1 and 2). This signifies that they originate from the same initial model that was reproduced more or less unchanged. Often, a new mould was made from a finished figurine, maybe because the original model was broken or maybe because the copy was made in another workshop. As the mould was made of an existing figurine, the new model was always a bit smaller than the original one, simply because of the shrinking of the clay during the firing in the furnace. Therefore, several generations can be found of a series, recognizable from the varying sizes. Commonly, the largest figurines resembled the original model the most and were the best detailed ones.

The representation of the Oudenburg figurines is that of a sitting woman with two children at the uncovered chest (*nutrix*). The dress falls down in supple folds; the chair is made of vertical wickerwork with the twigs forming a herringbone motif.

Of this representation several series were made, but for this series it is typical that the angle of inclination of the children is 60° and 120° (De Beenhouwer 2005, 569: series 338). The children hence form a corner of 60°. The feet of the children are separated from each other. The dress of the woman falls on each leg in three V-shaped folds on top of each other. Her hair is fixed in a bun on top of the head and turns into a hair bread on the back of the head.

The first individual (Plate CCCXXXIX: 1) consists of three fitting fragments of the head and the shoulders and a loose fragment of the chest (De Beenhouwer 2005, no. 819) (fragment with head and shoulders: 7.1 cm high, 3.8 cm max. width; chest fragment: 2.5 x 2.2 cm). They were found in levelling layers assigned to the construction of fort 5 and were situated close to the western earthen rampart. These layers were covered by a layer of fine mortar/loam gravel that has been identified as the running surface of fort level 5A. From the second individual (burnt) (no. 2), only the front of the lower legs and the right side of the chair is preserved (1.9 cm high; 4.0 cm wide; 4.3 cm max. length). It was found in a mixed level (5+post) in the transition layers at the top of the Roman level with the post-Roman level, but in the same area as the first individual.

Figurines from the same series as the one of the Oudenburg fragments are known from several sites. A first example is a fragment of a mould from France of which the find context is not known (preserved in the museum of Moulins MAB) (Lange 1990, 77, no. 34; De Beenhouwer 2005, 569, no. 3853). On the mould fragment the front of the head of the woman, the children at the chest and a part of the right leg are visible. On the back the inscription PR[ISCVS] can be read, possibly the owner of the mould who was at the same time the producer. Besides the 'sitting woman with child' the repertoire of this producer also comprises several Venus series. He also made figurines of pigeons, chickens and cocks. In total 53 mould parts are known with the signature PRISCVS X or PRISCVS, and one statuette with the signature PRISCVS (Jeanlin, in Bémont *et al.* 1993, 119). The most important site with twenty mould parts is Toulon-sur-Allier, both the workshop at Champ Lary as the one at La Forêt. Mould parts were also found at the production centres of Saint-Pourçain-sur-Besbre, Vichy, Yzeure Saint Bonnet and Moulins. Some signed fragments were recovered at Aulnay, Chanteau, St-Just/Dive et Sens, sites that are not known as production centres. The study of the evolution of the production by Priscus has concluded to a very long activity of the 'brand' Priscus, at least during the whole 2nd century (De Beenhouwer 2005, 886-888). A second example of the same series as the Oudenburg

statuettes is a complete figurine with traces of burning found at the Hees cemetery near Nijmegen (Schauerte 1985, 334-335, no. 941, Taf. 112: 1-3; van Boekel 1987, 485-486, no. 87; De Beenhouwer 2005, 569, no. 3844). It was made in the same way as the one of Oudenburg (no. 1). The foot was closed off with a separately made covering plate. To prevent that the statuette would explode in the furnace, an air hole was perforated in the left side arm of the chair. The foot plate and the air hole are not preserved at the Oudenburg figurines. Just like the fabric of the fragments of Oudenburg, the figurine of Nijmegen is slightly micaceous. The cemetery of Hees was in use until *c.* AD 280. At Velzeke the front of the head of a third example of the same series was found, in a pit in the central territory of the *vicus* that can be dated in the 3rd century (Rogge 1978, 122, no. 1, Pl. X: 1 a-b; Lamarcq and Rogge 1996, 170, Fig. 4; De Beenhouwer 2005, 304, 569, no. 1128).

One of the Oudenburg fragments was found in a level dated to the start of fort period 5, in the early 4th century; the level of the other fragment dates to the early 5th century or even later. It indicates that both fragments can be considered as residual items in these levels. The size of the Oudenburg fragments concludes to a later generation of the figurines than the one from Nijmegen. The reduction in size of the first individual of Oudenburg can be estimated at *c.* 6%, that of the second at *c.* 20%. It is therefore possible that the Oudenburg figurines belonged to the later 3rd century and that they were dug up from fort level 4. It is plausible that the series was still produced until late in the 3rd century, although Priscus himself, the owner of the original moulds, was working in the 2nd century. Another remarkable constatation is the distribution of the statuettes from Central Gaul to sites as Velzeke in the hinterland and two military sites, Oudenburg[218] along the North Sea and Nijmegen along the Rhine Limes.

2.2 A fragment of a statuette from Central Gaul

A small fragment with a max. length of 3.6 cm shows at one side dress folds with on top the horn-shaped end of an attribute (Plate CCCXXXIX: 3). The figurine was certainly imported from Central Gaul according to the barbotine remains on the break of the seam where the two halfs join. It is characteristic for the Central Gaulish workshops that both halfs were first taken out of the moulds to be subsequently glued together with clay slip. On the Oudenburg fragment a small part of the seam is preserved at the side of the dress folds where remains of the clay slip can be recognized. The fragment was found in a pit of fort level 3.

2.3 Fragments of three statuettes from the Rhineland

Three figurines originate from the Rhineland. The very specific production method in use at the Rhineland workshops led to traces at the surface of the statuettes. In contrast to the method at the Central Gaulish production centres, most of the figurines of the Rhineland were made in plaster moulds. As a result of the production of these moulds, small air bubbles were formed in the plaster, leading to small voids at the surface of the moulds and small blisters on the surface of the figurines. Also the composition technique differed at the Rhineland. There, both halves were fixated to each other while they were still in the moulds, resulting in a pressed seam of which the exterior had to be readjusted. The sides at the seam were flattened and vague details were retraced.

The first figurine represented a sitting figure in a chair with straight smooth sides without detail (Plate CCCXXXIX: 4). Two non-fitting pieces belong to the same figurine (largest fragment: 10.7 cm high, 3.5 cm wide; smallest fragment: 2.4 cm high, 3.4 cm wide). They were found in the same context and display an identical fine sandy fabric. The first fragment shows the side of a chair with the left arm and hand of a sitting figure. The second fragment is a piece of the front or back of the base of the figurine. Based on the sandy fabric, the statuette was produced in the Mosel region. Moreover, the chair and the position of the arm are characteristic for figurines of a sitting woman with fruits or a little dog on the lap, very popular scenes for the Mosel workshops. According to the find context at fort level 4, the Oudenburg fragment can be dated to the late 3rd century.

A second fragment also belongs to a chair with smooth sides (3.9 cm high) (no. 5). It shows the typical traces of the smoothening of the side. The lack of further details does not enable to identify the representation. The fragment was found in the infill of the large basin of fort level 5; its find context dates from the end of the last military occupation of the fort.

The third fragment most likely represents the legs of a standing figure with falling dress folds (2.8 cm high, 3.5 cm wide; max. length: 3.9 cm) (no. 6). The side of the dress is partly highlighted by a row of dots. This piece also shows traces of the smoothening of the side. It was found in a fire layer (context OS 7957/7971) marking the end of fort period 4, around AD 300.

2.4 Unattributed statuette fragments

Fragments of two figurines display too little detail or are too abraded to enable an identification of the origin or of the representation.

Two fragments, belonging together, show little cracks on the surface and are secondary burnt (largest fragment: 3.1 cm high; smallest fragment: 2.0 cm high) (not ill.). They display the same calcareous fabric. Both were found in the fire layer of Unit V of fort level 4 (context OS 8905B).

218 **At least three figurines of nursing mothers are known from the civil settlement at Oudenburg. One complete statuette was found to the south/south-east of the fort (site ET13/ET14; Hollevoet, unpublished material, on display in the Roman Archaeological Museum RAM at Oudenburg). Two figurines were recovered at the 2007-2009 excavations to the east of the fort (site Riethove, ET26): one lower part of a *nutrix* statuette in well 34 dated to the first half of the 3rd century, and one woman head of a statuette, probably also of the *nutrix* type, in a pit dated after AD 222-235 by a Iulia Mammaea coin (Dhaeze *et al.* 2018). The latter can most likely be identified as series 336 (De Beenhouwer 2005, 567).**

A second figurine fragment (Plate CCCXXXIX: 7), with a maximal length of 4.9 cm, has as only detail five straight parallel grooves of uneven length on a smooth surface. The fragment was recovered from a mixed level 4+5.

3. A handmade horse statuette

Part of a horse statuette, 3.8 cm high and showing the head (with pointed mule, short ears and manes punched in with the fingers), neck and chest of the horse, was recovered from the post-Roman dark earth level (Plate CCCXXXIX: 8). It most likely represents a residual Roman item, but whether it was dug up from the fort level or whether this piece was brought in with the earth from outside the fort, cannot be defined. It is therefore not clear whether this figurine has to be considered as a find from the fort occupation or from the civil settlement. The massive clay statuette was shaped freehand, possibly locally.

4. A marble Venus figurine

A marble figurine, *c.* 17 cm high and found in a pit of fort level 5, shows a torso with upper legs and left arm (Plate CCCXL: 9). It represents Venus covering her pubis with her left hand (*Venus Pudica*), a well-known representation. The right arm is not preserved but from the break on the chest can be deduced that the right hand covered the left chest. Locks of hair fall down on top of the shoulders. The counterpose suggests movement, with the right upper leg slightly brought forward. Apparently the figurine was part of a larger entity within a composition with attributes or figures now missing. To this conclusion point the broken off ends of attributes or connecting parts on the back, namely on the left thigh and the right buttock.

5. Three bronze statuettes

A small copper alloy statuette, 7.5 cm high, was found in the mortar and loam gravel floor level attributed to fort level 5A (Plate CCXLII: CA.F03). Although very abraded (through corrosion), the representation of Mars is clear, equipped with helmet and shield. The right arm held a lance that is missing, as is also the left leg. The figurine originally stood on a pedestal. Such small statuettes are well-known for North and Central Gaul and appear to be characteristic for the 2nd and 3rd centuries (Faider-Feytmans 1979). Being amongst other functions primarily the god of war, its presence at the fort comes obviously as no surprise. Several similar statuettes of Mars are known from Kruishoutem (Vermeulen 1992, 134, 135: Fig. 80, Rogge and Vermeulen 1993, 146-149; Parent 1986). Comparable examples can be mentioned from Blicquy (B) (Amand 1975, 30: Fig. 13: 1, 2), Neuvy-en-Sullias (F) (Gorget and Guillaumet 2007, 191-19) and Boulogne (F) (in a context dated to the last quarter of the 3rd century: Belot 1990, 90-95).

Of the same size, two small statuettes are known from outside the fort precinct, both representing the naked Mercurius with his characteristic small wings on top of the head. A first statuette was found by chance in the 1970s unstratified at the precinct of the late Roman military Graveyard A. Hollevoet (1986) believed it to belong to the civil settlement. A ring-shaped thickening around the neck of this Mercurius, not related to the figure itself, has been interpreted by Thoen (in Hollevoet 1986, 78: footnote 12) as the remains of a link of a chain. A very similar Mercurius statuette (*c.* 5 cm preserved length; under legs and arms broken off) was found in 2014 at the settlement area to the east of the fort, along the west-east road at the site Belleroche (ET28) (Dyselinck *et al.* 2020, 184-185; found as a dug-up item in a medieval ditch). The find of these two statuettes of Mercurius, amongst other functions the protector of trade, are perhaps a reflection of the trading function the civil settlement fulfilled. Similar small-sized Mercurius statuettes were found at Boulogne (F) for example (Belot 1990, 86-87). A Mercurius statuette was also recovered from the lowest levels on the Aardenburg fort precinct and can be dated there in the second half of the 2nd century (Besuijen 2008, 65).

Another small statuette from the south-west corner site, 4.9 cm high, recovered from a mixed level 3+4, preserved completely but in a very corroded state, represents an animal, most likely a ram, on a pedestal (diameter base: 3.4 cm) (Plate CCXLII: CA.F01). At Colchester a ram statue of similar dimensions was found as a terracotta figurine (Crummy 1983, 145). Crummy refers to the ram as the beast of Mercurius, the patron of merchants and of flocks and herds. The first function seems to be at its place here at the fort, as the army was also an important trading community.

To be complete, a very small piece of a figurine should be mentioned here (Plate CCXLII: CA.F02). This 1.2 cm long fragment of the foot of a small statue was found in a fire layer marking the end of fort level 4. Finally, in the covering layers on top of workshop Unit V of fort level 4, an unidentified large copper alloy hollow-cast and curved fragment was found of which can be assumed that it was part of plastic arts (Plate CCXLII: CA.F04)[219]. However no further identification is possible. The find context may indicate that the fragment was intended to be used as scrap metal for remelting.

6. Significance and wider context of the Oudenburg figurines: a glimpse on the religious life at the Roman fort

Figurines were very common in the Roman world and occur in various contexts. Looking at the finds from the Oudenburg fort, the late dating of the find contexts immediately attracts attention. According to the current knowledge, the continuing production of terracotta statuettes in the 4th century can only be justified for the pottery at Trier-Süd. The Oudenburg fragments originating at the Mösel region can therefore fit in well. For the Central Gaulish products, a late dating is difficult. A late potter Pistillus still produced into well in the 3rd century and maybe he had some successors in

219 From the earlier excavations by Mertens, only one bronze statuette is known, found in 1970 (1970 Trench I; unpublished material, mentioned in Mertens 1970). The uncomplete statuette, kept in storage at the depot of the Flanders Heritage Agency, shows an unidentified male (?) figure richly-dressed.

Autun and Gueugnon, but from the 4th century there is no export-oriented production known in Central Gaul (De Beenhouwer 2014a; 2014b). According to the analysis of the series and the style evolution, the *nutrices* of Oudenburg are clearly late products, but a dating in the 4th century is not evident. It is therefore very likely that they are residual items coming from a context of an earlier level.

From the study on terracotta figurines in Northwest Europe and more specifically in the *civitas Tungrorum,* the conclusion can be drawn that in the 2nd and 3rd century figurines were primarily cult objects belonging to the private atmosphere (De Beenhouwer 2005; 2014c)[220]. They were offered anonymously in temples or formed part of the burial rite. Figurines are exceptionally found in *lararia*, as *e.g.* finds at Rezé (France) demonstrate (Santrot 1993; De Beenhouwer 2005, 1425-1426). Some assemblages in *vici* suggest that they were displayed in a small home shrine, as became clear from the find context of two intact idols in a basement furnished with niches in a house at Liberchies (Werner 1982; Brulet and Demanet 1993, 162-167; De Beenhouwer 2005, 191-192, 836). The composition of some burial assemblages also gives that impression. Moreover, some Venus and Minerva statuettes picture these goddesses in an *aedicula* and could form as such a *lararium* on their own.

Since figurines are cult objects belonging to the private atmosphere, every individual made its own personal choice and therefore no presentation is a surprise, neither in a military base. Typical military oriented figurines, as the Mars statuette, can obviously be expected, since the soldierhood affected also the individual and hence the choice of religious oriented objects in the private atmosphere. The study of the terracotta figurines from the soldiers' barracks at the fleet base of Alteburg near Cologne revealed that the figurine spectrum hardly differed from the themes common on civil sites (De Beenhouwer *forthcoming*).

The stone statuette found at the south-west corner site cannot be simply unified with the terracotta figurines. On an iconographic level, the theme of the *Venus Pudica* occurs in the same way in terracotta[221]. It connects very well with the iconography of the many Venus figurines that were very popular in Northwest Europe. However, two elements make the stone Venus a totally different product. Being in marble, this statuette expresses prestige which makes it obvious that it was meant to show publicly, in contrast to terracotta figurines which were cheaper series products. The marble figurine also expresses prosperity and *romanitas* of the individual who gave the order to make it. It therefore rather belonged to the public atmosphere. Remarkably, Venus was not at all popular in the public-religious atmosphere in Northwest Europe; only seldomly she is mentioned in epigraphic sources. This statuette was found in fort level 5B, in a pit to the north of the bath house. The presentation of *Venus Pudica* as shown on the statuette in question, originates from the Greek-Roman imagery and is based on the theme of Venus after bathing. The choice of material and the choice of theme indicate that a link with the bath house of fort period 5A *i.e.* the 4th century, a building in the public atmosphere, is very likely. The *Venus Pudica* may have adorned a niche in the baths. A second element that makes this stone statuette so different than the terracotta figurines lies in its durability; it was obviously less breakable. Terracottas were often used, sometimes in a second life, as votive object, whereby the possibility to break could be important, for example in cremation burials, but also with other ritual practices. Their fragility and the fact that terracotta figurines belong to the private atmosphere make clear that they cannot be simply unified with statuettes or other images in other materials.

220 *Dea Nutrix* figurines are comparatively rare in Britain. For their distribution in *Britannia*: see Jenkins (1958).

221 Cf. for example the Venus figurine found at the civil settlement to the west of the fort, underneath the late Roman military Graveyard A. It originated from the Allier workshops in Central Gaul (Creus 1975, 30).

8. The leather finds

Carol van Driel-Murray[220]

1. Introduction to the late Roman footwear assemblage from the fort at Oudenburg

The shoes recovered from the excavations at the south-west corner of the fort at Oudenburg give an unprecedented insight into the stylistic and technological changes in footwear occurring during the somewhat obscure period between the mid-3rd and the end of the 4th century. In Oudenburg leather was preserved in four separate contexts, two from fort period 4 (well OS 22926, large waste pit OS 4980: *c.* AD 260-300) and two from fort period 5 (basin OS 4923, double well OS 2562: *c.* AD 379/380 – early 5th century), all of which are closely datable (see the Appendix in this volume, Sections 5.3, 5.2, 6.2.2 and 6.2.5 resp.; see Volume I: Appendix 6). Such close definition for late Roman organic remains is extremely rare and the lack of comparative complexes of any size means that, for the present, the finds from Oudenburg must stand alone, as fixed points to which other finds can be related. Furthermore, what limited evidence there is comes primarily from Britain, a province that at this time has a rather different profile from the rest of the Roman Empire. The wider implications and international relationships cannot therefore be explored satisfactorily.

Following an outline focussing on the salient aspects of this assemblage, the finds are presented by context with a more detailed discussion of significant items. Most of the catalogued objects are illustrated on Plates CCCXLI-CCCLXII. Undiagnostic material, as well as sieve residue, is listed in the catalogue (Section 8 of this chapter).

2. The leather assemblage: general aspects

The leather assemblage consists almost entirely of footwear, with over 60 more or less complete shoes or soles. Apart from the deliberate deposition in well 22926 (cat. no. 1), the finds are composed of re-deposited material and include a large proportion of unrelated decayed fragments. Since the material is so fragmentary, it is difficult to quantify accurately: it must also be assumed that the fills were taken from larger dumps elsewhere, so that the composition of the complexes is unlikely to be entirely representative. Some of the shoes can be reconstructed with reasonable certainty, while other fragments can only be generally classified as to style.

Roman footwear is classified primarily on technological features relating to the construction, since these basic elements have the greatest chance of survival (van Driel-Murray 2001, 347). The main categories present in Oudenburg are:

- simple single piece shoes (*carbatinae*),
- sewn single piece shoes,
- multi-layer constructions joined by hobnails,
- similar constructions joined by sewing (using twine) or thonging (using thin leather strips) (Table 8.1).

In addition, infrequent forms such as mules (cat. nos 95, 96) and fibre soles (cat. nos 60, 109) are also represented.

Where present, uppers can be identified on fastening method and appearance, and are sufficiently standardized to allow styles to be distinguished for ease of comparison. Conventionally, such styles are named after the location where first defined or another significant site (van Driel-Murray 2001, 362ff; Volken 2014)[221]. The footwear from Oudenburg fills a long-standing gap in the development of footwear in the later Roman period in the northwestern province and charts the shift from nailed, multi-layered constructions to new types of sewn and single piece footwear. Nevertheless, for a period covering some 150 years, the range of footwear styles is curiously restricted. The wide choice of footwear styles of earlier times seems to have withered to variations on just two or three forms specific to

220 **I would like to thank Franky Wyffels (†) (Flanders Heritage Agency) who was responsible for cleansing and conservation of the leather, Sylvia Mazereel (Flanders Heritage Agency) for the graphic designs based on my own poor sketches, Graham Sumner for kindly giving permission for the use of his illustration (Fig. 8.2) and Sofie Vanhoutte for the opportunity to study these finds, and her support during the production process.**

221 **Roman footwear is highly individual and named styles are defined on the basis of repeated occurrences at more than one site, preferably across a wide geographical area. Since complete shoes are infrequent, groups should also be defined on more general characteristics rather than on variable details.**

Table 8.1. Shoe constructions (totals) by context. Between brackets, re-deposited material.

	OS 22926	OS 4980	OS 4923	OS 2562
single piece		5	1	12
single piece sewn			5	
nailed soles	2	27	2 (+2)	4
sewn soles				5
slipper				2
varia		2		
Total footwear	**2**	**34**	**8**	**23**

Table 8.2. Cutting patterns of uppers in the different contexts.

	I-pattern	J-pattern
OS 22926	1	
OS 4980	1	6
OS 4923		
OS 2562		2

Figure 8.1. A roughly made archer's brace, found in the primary infill of the inner well of OS 2562 (cat. no. 110).

each context. It is unclear whether this is a result of limited demand, perhaps due to specific population groups on the site expressing their wishes, or simply due to chance and the unrepresentative nature of the complexes. Most unusually, sandals are not present in any of the find groups from Oudenburg.

Apart from a few shoemaking off cuts the only leather artefact is an archer's wrist-guard from OS 2562 (cat. no. 110, Figure 8.1), evidently an incidental item roughly cut from old leather, and therefore not evidence for an archery unit in the fort. This was clearly made for personal use, perhaps for hunting or fowling. There is none of the military equipment so characteristic of earlier Roman sites: no tents, shield covers or baggage wrappings. The disappearance of leather equipment after the mid-2nd century is a general phenomenon, and is difficult to explain. In part, the changing nature of refuse disposal, poorer preservation conditions in the upper deposits, and perhaps ease of re-cycling in permanent forts could be contributing factors, but it may also be that leather ceased to play such a prominent role, being replaced by textiles.

3. The footwear

3.1 Composite constructions, nailed or sewn

Conventional Roman footwear is composed of an upper and a separate sole unit built up of several layers: an insole, an outer sole and between these a heel stiffener, as well as small packing pieces. These may be thonged to the insole (for example, cat. nos 1, 19, 29) but it is noticeable that in the 3rd century often it is only the seat lamina that is fixed (cat. nos 25, 31, 32). The sole is attached by means of nailing, or less frequently, stitching. The upper is usually whole-cut, as a J- or I-shaped pattern, with the edges joined respectively at the side or at the toe (Volken 2014, 66-70). The upper is braced over the insole, using twine, but in the 4th century, twine is increasingly replaced by thin leather thong (cat. nos 97-101). Finally, the outer sole was nailed on, but from the early 4th century nailing begins to loose favour with a sharp decline especially apparent in the final quarter of the century. Instead, the outer sole was sewn on with twine or thong tunnel stitches, a construction that had previously been much less common. During the time of transition, the various sole constructions seem to have been used interchangeably, and the same shoe style may appear in a nailed, a sewn or even a single piece version: construction and style are, therefore, independent variables. Although uppers cut to an I-pattern are the norm for the first two centuries, during the 3rd century J-patterns become increasingly common, and dominate later assemblages, as is the case at Oudenburg (Table 8.2). The seam is usually at the medial side. Though this is often double stitched (cat. nos 12, 99), the side seam is evidently a weak point and frequently ripped, requiring additional reinforcements or patches (cat. nos 1, 11, 31). The decorative line of saddle stitches on the vamps of several shoes seems to refer to the earlier I-pattern where the seam produces a pronounced ridge as can be seen on cat. no. 14 (Figure 8.9). Such decorative stitching begins to appear around the mid-3rd century and, as is apparent from the Oudenburg finds, remains popular till the very end of the Roman presence in the region (cat. nos 1, 99, 102).

The most frequent style of footwear with a separate sole at Oudenburg is an ankle boot, laced through two or more pairs of eyelets. The vamp of the Ridley style is often low cut, exposing much of the foot and the shoes usually (cat. no. 10, Figure 8.9), but not always (cat. no. 9) possess integrally cut laces. Eyelets are usually lined inside, and a sewn heel stiffener as well as linings stiffening the lasting margins may also be present. A variant, style Walbrook, has a high vamp and between two and four pairs of latchets closing round the leg but lacks the integral lace (cat. no. 1, Figure 8.8). This is a widespread, if infrequent variant and

Figure 8.2. Third-century shoes from two different tombstones. Left: the soldier Ares from Alexandria (British Museum BM1973.0422.1) with Ridley-type shoes. Right: Aurelius Firmus of Legio II Traiana Fortis (Catalan Archaeological Museum, Barcelona) with boots of the style Walbrook or Oudenburg (reproduced by courtesy of G. Sumner ©).

is attested in Dura Europos (Syria) as well as Barland's Farm (UK) (Volken 2014, 376). Small scraps of linings and eyelets suggest other variants of the front laced ankle boot, only one of which can be completed satisfactorily (cat. no. 14, Figure 8.9: a). From this it would seem that boots, tied at the ankle or a little above, were the favoured style of footwear together with occasional low cut shoes. Both shoes and boots could be worn with brightly coloured hose and leg-wrappings, as is depicted on contemporary tombstones, but all occur in a range of sizes and are neither specifically male nor military (Sumner 2009, Fig. 122) (Figure 8.2).

The four contexts at Oudenburg clearly chart the decline of nailed shoe constructions between the 3rd and late 4th centuries (Table 8.1). In the mid/late 3rd century, nailing still predominates, though the patterns tend to be lighter than in the previous century (van Driel-Murray 2001, 351 Fig. 21). The denser arrangements that were common for all sizes in the 2nd and earlier 3rd century (patterns 2 and 3, Figure 8.4: a, and Figure 8.3: 1 resp.) gradually disappear and are replaced by a single line of hobnails around the sole edge and a variety of decorative elements at the tread and seat (pattern 1, cat. nos 10, 20) (Table 8.3). But by the end of the 4th century hobnails appear sporadically, with only a few specimens in contexts OS 2562 and OS 4923. This trend is also evident from the occurrence of hobnails in graves: on the Continent and in Britain, a sharp decline in hobnails can be discerned from the mid-4th century onwards.

Table 8.3. Hobnailed soles.

	light: pattern 1	dense: pattern 2
OS 22926	2	
OS 4980	18	4
OS 4923	1	
OS 2562	1	3

X-ray photographs of iron corrosion reveal some of the complex tendril patterns that are a feature of the 3rd century (Figure 8.3: 2, 3, 5), but in context OS 4980 decoration is much simplified: fourteen of the seventeen soles with hobnails in pattern 1 display an S-shape under the tread (Figure 8.4: b). The effect of the hobnails lies primarily in the imprint left on the ground, and when viewed as a pair it appears that the S is usually (but not always) directed outwards. A regular feature is the appearance of double nails at the waist, sometimes in several sets (*e.g.* cat. nos 10, 16, 25, 26). Such double nails in combination with heavy nailing first appear at the very end of the 2nd century but are more regularly attested throughout the 3rd century (cat. no. 19).

Some 70 years later, the footwear spectrum has completely changed, and nailed footwear has almost disappeared (Table 8.1). None of the sewn soles of fort level 5 (OS 2562) preserves sufficient of the upper to identify the style, though decorative tunnel stitching down the length of the vamp is common, occurring on shoes in both male and female sizes. Such stitching is a reoccurring element on footwear of the 4th century and continues to be applied into the 5th and even the 6th century (*e.g.* Portchester *c.* 330: Ambrose 1975, nos 268, 300-301, 385; Queen Arégonde: Volken 2014, 119, Figs 155-156).

3.2 Single piece shoes

Single piece shoes or *carbatinae* are basically formed out of a single oval of leather, shaped only by a T-shaped back seam and laced over the foot through loops spaced round the edge. There is no separate sole, though damaged areas might be patched. The back seam is sewn with an edge/flesh stitch so that it is invisible from the outside. As is the case with the other constructions, sewing with thin thong becomes increasingly common in the 4th century. Two main styles are represented: style Amcotts exclusively in OS 4980 (cf. Figure 8.5) and style Wijster exclusively in OS 2562 (cf. Figure 8.6.a). An unusual feature of this latter group of shoes is

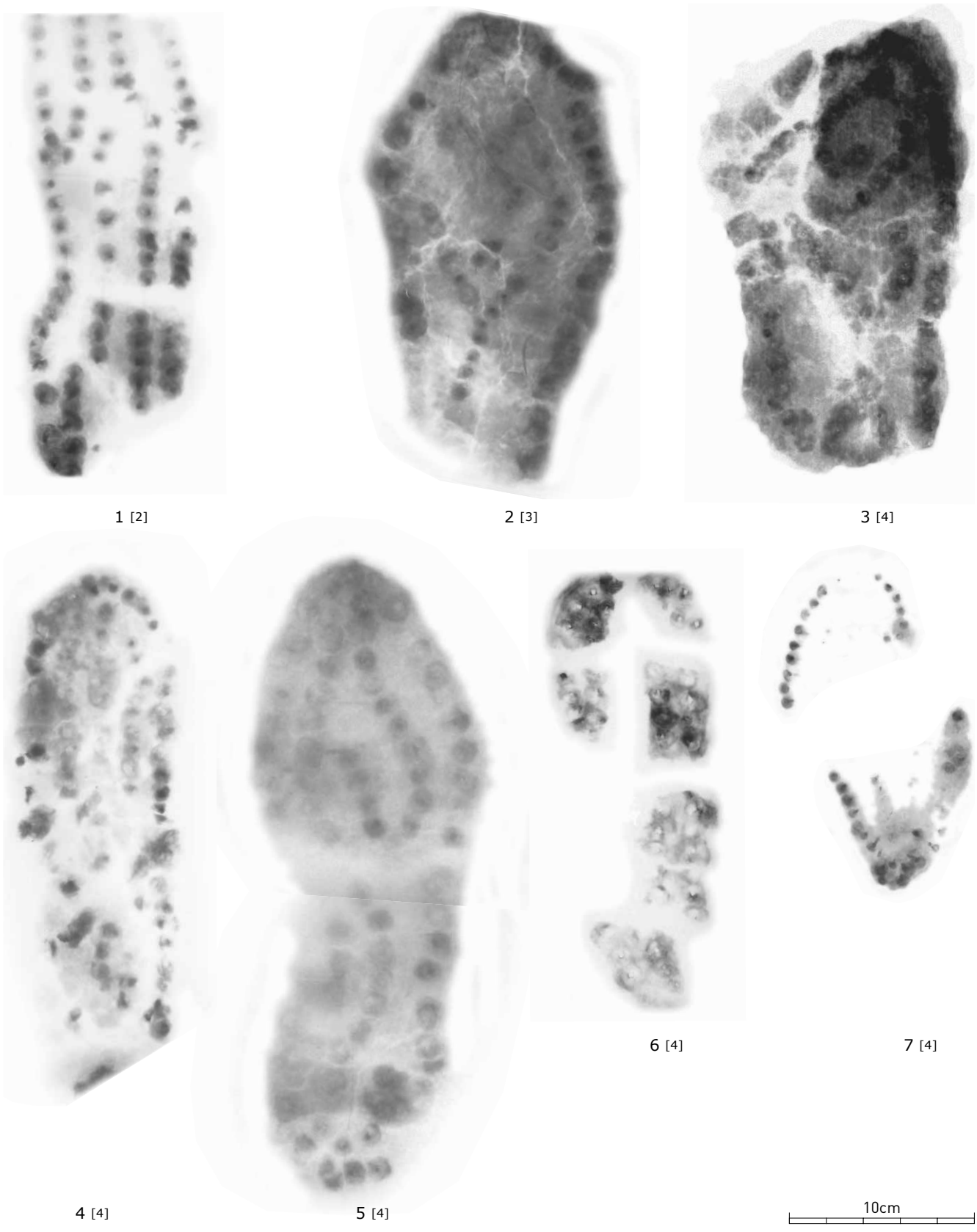

Figure 8.3. Hobnails revealed by the X-ray photography of iron corrosion, from different levels. The fort level for each is indicated.

Figure 8.4. Comparative hobnail patterns and sole shapes, cat. nos 28, 8 and 99.

a slit in the quarter, that may be associated with the use of spurs (Figure 8.6; cat. nos 76, 77, 83). Cat. no. 85 also has a small hole at the back that might serve a similar purpose. Some of the shoes from the fort at Cuijk and the settlement at Wijster (NL) also seem to be modified to take a prick spur, possibly of organic material (van Driel-Murray 2005, Figure 8.9) and a spur was still attached to one of the shoes from Deurne (van Driel-Murray 2000, 298). Although the lack of larger well-dated assemblages of leather on the Continent complicates the identification of regional groupings, the Amcotts style may betray connections with Britain (see below, paragraph 6.2.1), while the Wijster style has clear links with northern Germany (see below, paragraph 6.4.2).

Figure 8.5. Photograph of Amcotts style single piece shoe cat. no. 2, after cleansing.

3.3 Single piece sewn shoes

Shoes cut from a single piece of leather and ingeniously sewn together appear rather suddenly at the start of the 4th century. There are several variations to the basic form but all tend to be very low cut, with a small vamp and some form of lace passing under the foot through small holes in the shoe sides (Figure 8.7; van Driel-Murray 2001, 370-71; Volken 2014, 142). In style Deurne the fastening lace springs from a pronounced quarter, that may be decorated with openwork while in the Cuijk variant the quarter is hardly defined.

Figure 8.6. a: photograph of Wijster type shoe cat. no. 74 after cleansing; b: back part of Wijster style shoe cat. no. 76 with possible 'spur vent'.

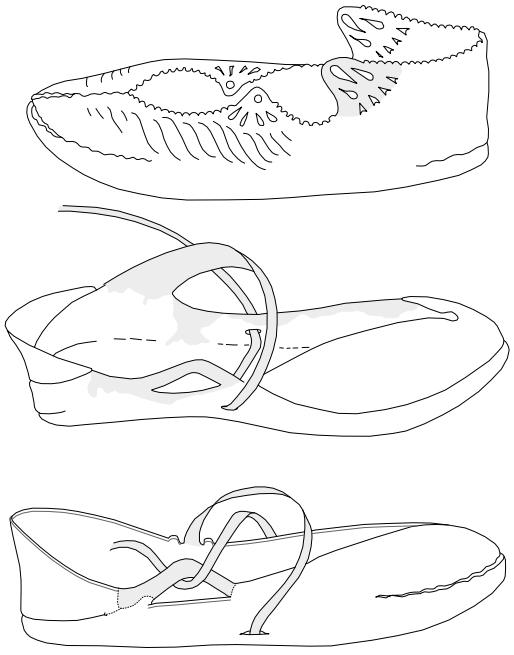

Figure 8.7. The three single piece sewn shoes associated with the deposition of a helmet and other equipment at Deurne with suggested reconstructions (shaded). From top to bottom, style Meyel, style Deurne and style Cuijk (graphic realisation S. Mazereel, Flanders Heritage Agency).

An important association is formed by the shoes, one with attached spur, found at Deurne (NL) together with a helmet in its carrying bag, a sword sheath, a cross bow brooch, textiles and a bivouac tent. A carefully chosen collections of coins gives a *terminus post quem* of *c.* 320 for this group (van Driel-Murray 2000). A much larger group of similar sewn footwear from the mid-4th century has been recovered from the river Maas at the location of the later Roman fort and bridge at Cuijk, and Oudenburg now extends the range of this shoe style till the end of the 4th century. It is a truly international style and other finds are known from military sites such as Vindolanda (UK) and (possibly) Portchester (UK), with sporadic occurrences at *villae* and other civilian settlements, such as Aquileia (I) showing that this is not an exclusively military style (Ambrose 1975, Fig. 135; van Driel-Murray 2007). It is also attested in children's sizes. Though the vestigial vamps are easily recognizable in late Roman art work, the footlace is only occasionally indicated: the clearest depiction is to be seen on the statue of the Tetrarchs in Venice (van Driel-Murray 2001, Figs 76-77; Volken 2014, Fig. 145). While at Cuijk the variants occur in various sizes and together with single piece shoes of style Wijster, in Oudenburg the shoes of this type occur only in context OS 4923, and all are in adult male sizes (Tables 8.4 and 8.5).

Table 8.4. Late Roman *carbatinae* and single piece sewn shoes from Cuijk and Oudenburg.

	Cuijk	Oudenburg
style Deurne	5	-
style Cuijk	13	5
style Wijster	8	7

3.4 Fibre sandals

Two rather shapeless soles, stitched around the edges are possibly reinforcements for sandals or mules made of fibre (cat. nos 60 and 109). The leather is thin and curled up at the edges in a way that does not accord with use as a repair sole for single piece shoes. Well-preserved thongs on a comparable sole from Cuijk showed that it had been attached to a solid sole layer some 1-2cm thick. This suggests some organic material and invites comparison with woven or coiled reed sandals from Roman Egypt, and more modern examples of reed mules used in Hungary (van Driel-Murray 2001, 359). There is also some evidence from London for fibre soles enclosed in leather strips like cat. no. 66 (Mould 2012, cat. no. 139). These leather soles are crudely made, sometimes of re-used material, and this may have been an expedient attempt to prolong the life of reed sandals in a damp climate.

Related to this type of thick-sole footwear are the two decorated mule tops that were attached to a thick cork/wooden sole (Figure 8.11, cat. nos 95 and 96). This type of closed fronts was previously only known from a single occurrence in Pommeroeul (B), though open fronted cork slippers are attested in civilian and military contexts from the end of the 2nd century onwards (van Driel-Murray 2001, 369-370 and Fig. 37).

4. Shoemaking

Relatively few shoemaking off cuts are present amongst the refuse (for example, cat. nos 67-70). These represent no more than the usual settlement background noise, attesting to some sort of shoemaking or cobbling on site, but not to the presence of workplaces in the immediate environs of the find locations. That shoemakers were active within military communities is evident from the distribution of off cuts in forts such as Valkenburg and Velsen (NL) (van Driel-Murray 1985, Fig. 5) and although not directly relevant for the late Roman situation at Oudenburg, the rather exceptional find of two shoemaker's anvils (IR. C68-70) in a pit at the back of the military hospital of fort level 2 confirms the presence of a workshop here at least in the second quarter of the 3rd century. The iron anvil is a specifically Roman shoemaker's tool, used when hammering in the hobnails. On striking the anvil, the sharp points of the hobnails are bent back into the leather clenching the layers and making the points safe. In contrast, the sewn footwear of the 4th century only requires a wooden shaping last. All the different styles of footwear could have been made by any shoemaker working within normal Roman manufacturing traditions, though the rather restricted choice of footwear and the uniformity of nailing patterns suggests that only a few craftsmen were working here at any one

time. In view of the worn condition of much of the footwear, cobbling was perhaps of more importance than shoemaking. Repairs carried out on cat. nos 1 and 11 especially will have required reconstruction of the sole layers and many other soles display signs of re-nailing. Refurbished shoes like cat. nos 7, 11, 76 and 91 show that considerable effort was put into prolonging the life of footwear. The large off cut cat. no. 44 is a large piece of smoothed hide folded double in order to cut out a pair of *carbatinae*, carefully avoiding several surface blemishes. This is not a particularly thrifty use of a hide, but ensures accurate pairing, and also suggests that shoes were more or less bespoke, not laid out beforehand in economically driven arrangements.

If certain styles such as Wijster indeed reflect the presence of incomers, it is evident that shoemakers were able to adapt to the new demands, for the techniques and the leather used are the same as in other Roman complexes and it is only the style of the shoes that is different. Experimentation is perhaps visible in the light scores on the Wijster shoe cat. no. 75, a first indication of the position of the lace holes that had to be modified after fitting the shoe to the client's foot. A few snippets in OS 4923 suggest that the Cuijk style sewn shoes were also being made here.

5. The inhabitants of the fort

Footwear forms an accurate picture of the living population present in the fort at any one time so it is rather unfortunate that there are relatively few complete, measurable soles to provide convincing graphs for each assemblage. Only a general impression can be given on the basis of size groups formed by comparing the dimensions of complete soles with those of more fragmentary specimens (Table 8.5). Any estimation must also take account of the fact that only the insole registers the true foot size, while single piece shoes are easily adjusted to minor differences in foot length or width. In Roman contexts the division between adult male and adult female lies around size 35 (23 cm), with size 36 forming an overlap between the two. Though the dense nailing pattern 2 is exclusive to the large, male sizes, there is no further correlation between decorative patterns or the style of the shoe uppers and the size of the footwear. The elaborate tendril nailing of cat. no. 61 and the one exposed by the X-ray photograph of iron corrosion (Figure 8.3: 5) occur on large soles, while the Ridley style uppers appear in both male and female sizes.

As is to be expected, male footwear dominates, but there are sufficient shoes in the smaller size ranges to show that women and children formed about one third of the population. This proportion is comparable to that from *vici* and urban settlements, and suggests that the fort sheltered not only soldiers, but also their families (Hoevenberg 1993, 257). The assemblage from OS 4923 stands in stark contrast, being composed exclusively of male footwear. Even the unmeasurable, decayed fragments are clearly derived from large shoes, reinforcing the impression that this group of people is somehow special.

With the necessary caution, the style of the footwear may hint at the origin of the inhabitants of the fort and the nature of the garrison in residence. Sewn shoes of the Cuijk/Deurne styles are widespread throughout the Empire, and also figures on statues, frescos and mosaics: they are very much an international, Roman style of dress and may point to the presence of a mobile unit, operating without dependents (van Driel-Murray 2000, 302, Fig. 7). In contrast, the Wijster style is not attested on Roman sites, other than at Oudenburg in context OS 2562 and in the fort at Cuijk, but it does occur widely outside the Empire, in the northern Netherlands and Jutland (Hald 1972, 54-55; van Driel-Murray 2005). It may therefore be justified to regard these shoes as representative of a Germanic element, although the footwear was made locally, using standard Roman materials and techniques. As at Cuijk, this shoe style may be connected to the presence of Germanic mercenaries serving together with regular Roman forces, as represented by the Cuijk style shoes of OS 4923 (van Driel-Murray 2009, 11-2, Figs 2-3). And if the slits in the Wijster shoes are indeed made for spurs, the unit of fort period 5B (late 4th – early 5th century) would appear to have been mounted. Ethnicity is, however, not clear-cut, a topic that also arose in the analysis of the late Roman Germanic-style pottery (see Chapter 1.C.2 in this volume) (for further discussion on identity: see Volume I, Chapter V.3.4.2).

Table 8.5. Size groups represented in the four assemblages, both measured and estimated.

	OS 22926	OS 4980	OS 4923	OS 2562	TOTAL
child *18-22 cm*		2		2	**4**
female *22-24 cm*	1	7		4	**12**
male *25+ cm*		16	8	12	**37**
TOTAL	**1**	**25**	**8**	**18**	**53**

A different problem is posed by the Amcotts style shoes. The pattern diverges from that current in earlier 3rd-century complexes such as the Saalburg or Valkenburg (Busch 1965; Hoevenburg 1993), but the absence of comparable late 3rd-century assemblages on the Continent makes it difficult to evaluate the significance of the – as yet – exclusively British parallels for the style. Nevertheless, the presence of people from Britain might be considered.

6. The dated assemblages and the development of late Roman footwear styles

6.1 A closure offering: well OS 22926 (felling date AD 260-275)

The virtually complete left shoe (cat. no. 1) from the well OS 22926 is a neatly made but old and patched ankle boot in a woman's size (Figure 8.8; Plate CCCXLI). Both sides of the vamp were ripped apart and no longer fit together, but traces of the side seam are visible at the medial waist, confirming that this is a J-pattern shoe upper with decorative saddle stitch on the vamp, style Wallbrook. Although both sides are damaged it is unlikely that there was

a b

Figure 8.8. Well OS 22926, fort level 4: a. shoe (cat. no. 1) *in situ* at the bottom of the well, in the clay level representing the abandonment of the structure; b: reconstruction (graphic realisation S. Mazereel, Flanders Heritage Agency).

sufficient space for integral laces, and the shoe closely resembles an early-mid 4th century shoe from Barland's Farm (van Driel-Murray 2004, Fig. 4.5.6-7). Nail punctures suggest the S-pattern that is also favoured in OS 4980 and with which this find is pretty well contemporary.

Lying at the base of the final fill, the shoe represents an offering of closure, dating towards the end of the 3rd century. Shoes associated with either the construction or the closure of wells occur with some frequency throughout the Roman period and a regular feature of such deposits is the use of a left shoe, as here (van Driel-Murray 1999). This would seem to be a form of sympathetic magic, but why some wells contain shoes while others do not is unclear. There is no such deposit in the double well OS 2562, and although the two decorated mules are certainly special they are both incomplete (see below, paragraph 6.4).

Another nailed sole was revealed in corroded iron from the later waste infill of the well (Figure 8.3: 5). This is a large (right?) sole with elaborate tendril nailing, very similar in design to cat. no. 61 from OS 4923 which is almost certainly re-deposited from disturbing the top of OS 4980. Elaborate tendrils are especially popular on men's shoes from the 180's till the end of the 3rd century (Figure 8.3: 2-3; van Driel-Murray 2001, 353, Fig. 23).

6.2. The rubbish pit OS 4980 (c. AD 268-275)

This is the largest of the Oudenburg leather complexes with a minimum of 33 shoes, for the most part nailed soles with a small number of single piece *carbatinae* (cat. nos 2-53; Plates CCCXLII-CCCLI). The absence of sandals and sewn soles is remarkable, as both would be expected in a mid-later 3rd century complex. Where preserved the uppers are predominantly Ridley style or variants thereof, while the *carbatinae* are almost all Amcotts style.

6.2.1 Single piece shoes

Five **single piece shoes** can be classed as Amcott style[222]. The characteristic forward facing loops are ingeniously cut out, using a minimum of slits and resulting in scarcely any waste (Figure 8.5). Each long narrow loop is formed by two oblique slits and is simply pulled up into shape. The quarters are often decorated with openwork, frilling and stamping, and are highly individual in form and arrangement: the front is sometimes cut into tabs that close over the toes, but that does not appear to be the case in Oudenburg. The style is well known in Britain, appearing in several late 3rd – early 4th century contexts (Mould 1990, Fig. 142; van Driel-Murray 2011, Fig. 11.6; unpublished examples from Vindolanda and the Museum of London archive). With the exception of cat. no. 6, the openwork quarters close just above the ankle and all possess rather similar decoration formed of expanded cuts (cat. no. 4), stamped roundels and frilled edges. On cat. no. 2 the open rectangles are individually cut between two stamped roundels. The quarter treatment of cat. no. 6 differs, but the cutting pattern of the oblique loops is the same as the others of this style, showing the variation possible within the same basic form.

A much cruder *carbatina* is represented by several fragments of similar, but not matching, shoes (cat. nos 7-8) with stubby loops and crudely cut rectangles in a low quarter. Cat. no. 7 is thonged to the heel stiffener of an old nailed bottom unit. This combination is an infrequent, if reoccurring phenomenon (see also cat. no. 91). As *carbatinae* are highly flexible, the loops would soon snap if attached to a rigid nailed sole, and these hybrids may in fact have served some special (short-term) purpose. Old nailed soles might, for instance be bound under single piece shoes to provide extra grip in snow or icy conditions.

222 Named after the shoes worn by a female bog body found in 1747 during peat cutting at Amcotts (UK) (Turner & Rhodes 1992).

Figure 8.9. Reconstruction of shoes cat. no. 14 (a) and cat. no. 9 (b) (graphic realisation S. Mazereel, Flanders Heritage Agency).

6.2.2 Nailed shoes

The rubbish pit is the only context in Oudenburg where the nailed construction dominates (Table 8.1) but the upper of only five of the shoes remains together with some loose fragments from decayed shoes. Cat. no. 10 is a neat Ridley style with a fat integral lace set so far forward that the is only room for a small toe-cap (Figure 8.9: b). Though worn, the shoe is well made with vulnerable points like the lasting margins and the lace holes being reinforced with stitched in linings and the sole is neatly nailed. Cat. no. 9 is an almost identical shoe, but without the integral laces. Traces of an instep loop at the appropriate position suggests cat. no. 15 also belongs in this group, as do some unattached linings (cat. nos 30, 35), making at least five examples of this style. In London, the New Fresh Wharf site offers close parallels and there are several from the later levels at Vindolanda (MacConnoran 1986, 220; van Driel-Murray 2001, Fig. 63) Other kinds of boots are represented by fragments only, such as the eyelets cat. nos 11, 22, or the larger cat. no. 13 that is recognizable as a front-laced ankle boot of an infrequent type also known from 3rd-century Vindolanda, but seemingly becoming more popular in later times, as similar footwear appears on sculpture of the 4th and 5th centuries.

One new style can now be defined and is named 'Oudenburg' (Figure 8.9: a), as it is clear that it is not simply an occasional variant. Cat. no. 14 is a sturdy, close-fitting boot with a laced front opening combined with two or more eyelets in the boot leg. The foot lacing is horizontal, producing a raised comb, that in the case of an incomplete example from Barland's Farm is continued in a line of decorative saddle stitch, resembling the shoes of *Aurelius Firmus* (Figure 8.2). In Oudenburg this is the only upper cut in an I-pattern; elsewhere the boots occur in both I and J-patterns. Early to mid-3rd-century parallels occur at the Saalburg (Busch 1965, Taf. 15.222) and Vindolanda (unpublished), while the early 4th-century boot from Barland's Farm suggests a much longer life for the style (van Driel-Murray 2004, Fig. 4.5.2).

In contrast to the fragmentary nature of so many of the finds, the pair of children's soles, cat. nos 28 and 29 is notable. The soles are quite strongly constructed with laminae firmly thonged to the insole and large nails holding the construction together. Interestingly, the thonging differs as more small pieces were used to fill cat. no. 29. Several nails had to be replaced along the outer edge of cat. no. 28, unusual for a child's shoe, but less so in the case of the sole cat. no. 19, where much of the front appears to have been re-nailed. Cat. no. 12 is an exceptionally massive shoe. Not only is it heavily nailed, but the upper is made of a double thickness of leather. This may be for a special purpose shoe, or more probably, to cover the poor quality of the inner layer: deep cuts in the poorly cleaned hide used for both cat. nos 11 and 12 were sewn up before the shoes were made, but in the case of cat. no. 11 the many blemishes continued to rip, requiring constant repairs and patches. These shoes and the worn condition of many of the other soles could indicate difficulties of supply, or the footwear belonging to poorer members of the community.

The favoured **nailing pattern** is a single line around the edge and an S under the tread. At the seat there is more variation – a circle, a simple line or a group of four nails while at the waist various combinations of double nails or lines occur: the most common is two nails at the waist area (pattern 1c). Occasionally complex S-patterns or tendrils occur (cat. nos 24, 33 and also 61) but there is little of the exuberant variety seen in earlier 3rd-century find groups (Figure 3: 2). Four soles are heavily nailed (cat. nos 12, 19, 27, 32), in either pattern 2c or 2b (with or without a central nail). These soles are wide, blunt and thick waisted, and represent heavy work

shoes. Though these occur mainly in large, male sizes, decorative nailing is by no means exclusive to smaller foot sizes.

The preponderance of S-nailing patterns aligns this assemblage more to early-mid 3rd-century contexts from the Saalburg, London and Valkenburg (Busch 1965; MacConnoran 1986, 218; Hoevenberg 1993), rather than the late 3rd/early 4th-century complexes from London and Britain in general. Notable is the absence in Oudenburg of hobnails in groups of three: a few soles in OS 4980 display such groups as a variant on the more common double waist nail (cat. nos 11, 20) but not as an independent element. A scattering of triple nails occurs regularly on soles in several late Roman assemblages, including London and Aardenburg, and in consequence of the evidence from Oudenburg, it would therefore seem that such assemblages follow OS 4980 and date to the very end of the 3rd/first half of the 4th century (van Driel-Murray 2001, Fig. 22; 2011, Fig. 11.1).

The two closely dated assemblages OS 22926 and OS 4980 bring certain trends into focus that characterize 3rd century footwear:

- the dominance of pattern 1,
- hobnails in an S-pattern under the tread,
- the occurrence of double nails at the waist,
- the occurrence of pattern 2 with a gap at the waist, sometimes with one or two nails.

The two later assemblages reveal the extent of technological and stylistic changes in the following century.

6.3 A special group, OS 4923: last quarter 4th century – early 5th century

The finds from the water basin OS 4923 display a completely different profile to the other complexes (cat. nos 54-73; Plates CCCLII-CCCLIV). The five Cuijk style sewn single piece shoes and the fragments of a Skeldergate nailed shoe are not represented in any of the other contexts. The waste pit OS 4980 is cut by the construction of the water basin and the **nailed sole** (cat. no. 61) with its elaborate tendril nailing and neatly finished off upper evidently clearly belongs to the earlier complex. Both nailing and the finish of the shoe back are typical of the mid-3rd century, indeed, the tendril nail pattern is almost identical to the X-ray photograph of a sole from the fill of well OS 22926 (Figure 8.3: 5).

Consistent with the late 4th-century date is the very fragmentary cat. no. 62, that is closely comparable to footwear from York and Portchester (MacGregor 1978, Fig. 28; Ambrose 1975, Fig. 133, 266). These **nailed shoes** possess a much-reduced vamp, fastened at the ankle with an integral lace set close to the quarter. Such shoes may also have an underfoot lace, though this is not apparent on these illustrations. But on a fragment of a comparable, poorly preserved nailed shoe from Barland's Farm the hole for a footlace is discernable (van Driel-Murray 2004, Fig. 4.5.10). The upper and vamp are often decorated with cut openwork and impressed or stamped designs, resembling chip-carving, and similar shoes with sewn soles occur at Cuijk: this is the type of footlace shoe worn by the Tetrarchs on the statue in Venice, and is a forerunner of the sewn Deurne/Cuijk style footlace shoes (van Driel-Murray 2001, 371; 2007, Fig. 4).

The Cuijk style **sewn shoe** cat. no. 54 (Figure 8.10) preserves the fastening loop at the offside and clearly displays the impressions of the lace passing under the foot and through holes at the side of the shoe. The similarity of the shoes with those from Cuijk is remarkable, even to quite specific details, such as the attachment of a raised back piece (cat. no. 58), and the decoration with frilling, punched holes, impressed swags and pricking. What is curious is the lack of any other accompanying styles: at Cuijk this footwear appears together with single piece shoes of style Wijster, as well as sandals and sewn shoes of various types (van Driel-Murray 2007, table 1, Fig. 1). Perhaps indicative of a specific population group is the fact that all the shoes appear to be adult male, in contrast to Cuijk where women and children's sizes are also represented. It seems likely that these shoes are the refuse left by a specific group of male occupants who were clothed in a distinctive fashion. Interestingly, a few offcuts seem to suggest that this shoe style was also being made on site. The similarities with both Deurne and Cuijk would seem to point to a date in the mid- 4th century, though a small peak of coins in the river at *c.* AD 380 might allow a slightly later date for the finds from Cuijk.

6.4. The double well OS 2562: felling date 379-380, fill late 4th – early 5th century

This complex (cat. nos 74-117: Plates CCCLV-CCCLXII) reveals a marked shift away from nailed shoes to single piece and sewn or thonged constructions, though the aspect of the footwear itself retains familiar features and is still recognizably 'Roman'. Highly unusual is the occurrence of two **leather mules** (backless slippers, cat. nos 95 and 96) both associated with the stitched envelope sheathing over a 10mm thick cork or wood sole, but otherwise incompletely preserved (Figure 8.11). The wood fragments were identified as linden bark (*Tilia* sp.).[223] The two mules are sophisticated products, made of fine, smoothed deer or thin goatskin, richly decorated and with textile or fur linings. On cat. no. 96 the decoration is still crisp: unusually this was impressed from behind, possibly by being pressed into a mould. The two differ in size, cat. no. 95 is in the female range, while cat. no. 96 is male. These are two very special finds, but there is nothing to suggest they were intentionally deposited: the mules were fragmentary, and were mixed with all the other rubbish in the main body of the fill. The mules may tentatively be associated with the bath house located to the south of the well, but are equally likely to have been used in a domestic setting. Curiously, the sewn sole cat. no. 99 was modified by partially removing the back and inserting a wedge, so that it too could be re-used as a backless slipper. Another unusual form is the reinforcement sole for a **fibre sandal** cat. no. 109.

223 **Wood analysis by dr. K. Deforce, Flanders Heritage Agency.**

Figure 8.10. Cuijk style single piece sewn shoe cat. no. 54 and reconstruction (graphic realisation S. Mazereel, Flanders Heritage Agency).

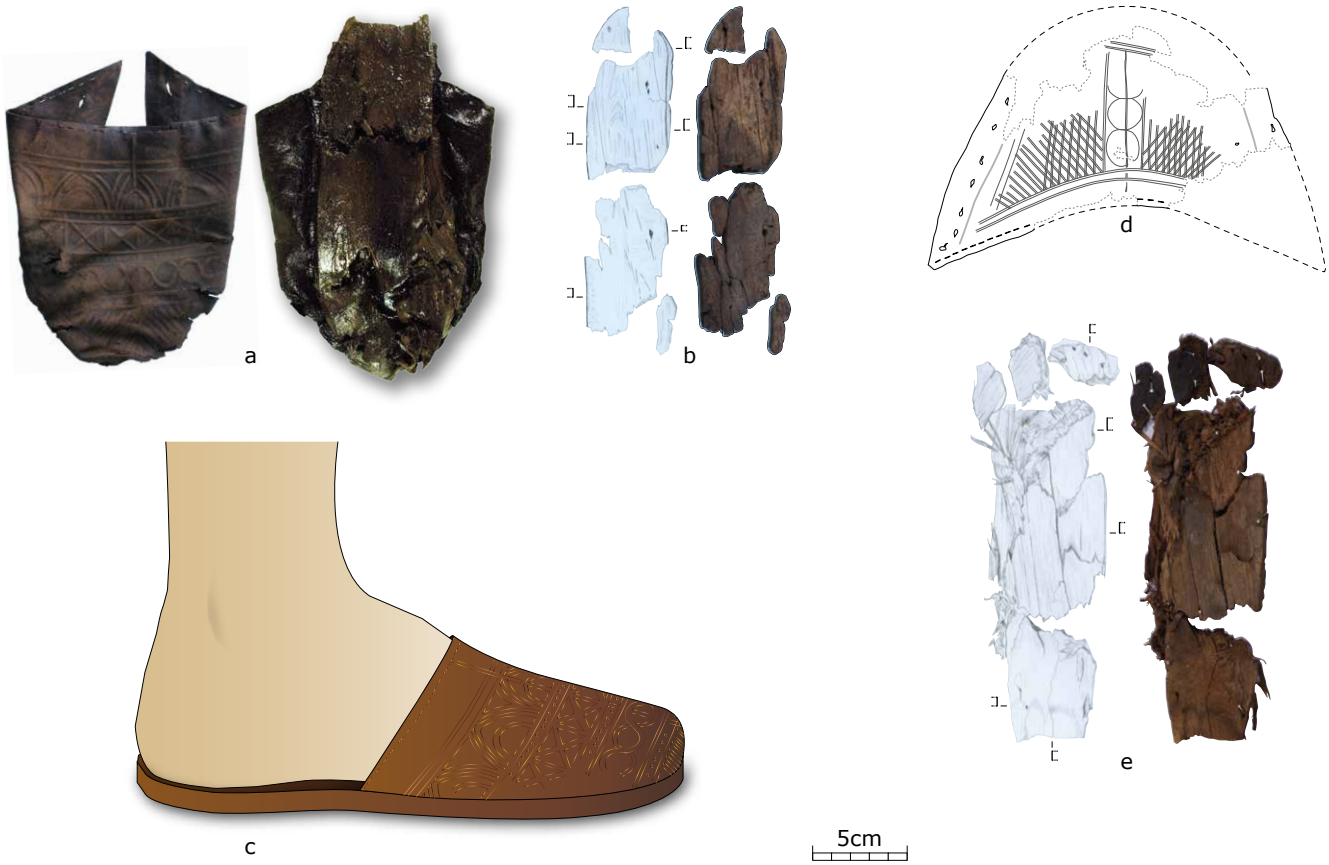

Figure 8.11. a: mule cat. no. 96, leather top as found with wood in place; b: wood following conservation. d: mule cat. no. 95; e: wood following conservation; c: reconstruction of the mule cat. no. 96 (photos H. Denis/F. Wyffels; graphic realisation S. Mazereel, all Flanders Heritage Agency).

6.4.1 Separately soled shoes

As is to be expected at this time, there are few **nailed** soles, most disintegrated and incomplete, still clearly similar in shape to the sewn soles in the complex. The type of upper represented by the fragment of a middle layer associated with cat. no. 91 is unclear as thongs seem to indicate the presence of a side seam, while the scars of a side loop between decorative roundels suggest a Cuijk style fasting. This may be another example of the sort of hybrid modification seen in cat. no. 7, and also represented at other sites such as London New Fresh Wharf (MacConnoran 1986, 220, no. 8.8).

Here composite footwear is most commonly **thonged** together using narrow leather strips, giving a softer, more flexible construction. The individual components – two sole layers, laminae, heel stiffener, separately cut upper with internal lasting margin reinforcements stitched in – remain the same as in the earlier nailed constructions but as the thongs survive, they reveal the construction clearly: the lasting margins whipped to the underside of the insole (cat. nos 97 and 98) with the outer sole attached by tunnel stitching (cat. no. 98). Details such as the starting and finishing knots are also clearly visible (cat. nos 100 and 105). All the soles are rather straight, thick waisted and pointed in shape, contrasting strongly with the sole shapes of the 3rd century in OS 4980, but there is still a clear demarcation between left and right (Figure 8.4). Where preserved **the uppers** are J-pattern, with a side seam that also tends to be thonged rather than stitched (cat. nos 99 and 100). Three vamps display decorative saddle stitching, but no indication of the fastening method survives and the small fragments of upper with cat. nos 98 and 102 are too unspecific for identification or reconstruction. The remnants of the decayed upper cat. no. 103 seems to represent a shoe with very large, open loops, as, perhaps, does the back cat. no. 104. As the leather quality of these fragments differs considerably, it is unlikely that they are associated, though they evidently belong to the same type of footwear. Neither can be paralleled in any Roman assemblage, but they do closely resemble a shoe with a separate, sewn sole found on the Frisian coastal *terp* Finkum (unpublished, but see van Driel-Murray and van der Plicht 2016). This site has produced Roman pottery and coins and several other Roman influenced shoes, as well as local footwear in the style of the *carbatina* cat. no. 85 (see below), and offers an intriguing insight into contacts between the northern coastal region and military sites within the Empire.

6.4.2 Single piece shoes (*carbatinae*)

Seven fragments can be identified as belonging to the style Wijster (Table 8.4; cf. Figure 8.12). The style seems to be influenced by Germanic traditions of strongly asymmetrical cutting patterns (Gräf 2015, Abb. 33), and first appears in Roman military settlements such as Cuijk, in the mid-4th century (van Driel-Murray 2007, Fig. 10) though several examples are known from outside the Empire, including the early 5th-century settlement of Wijster (Hald 1972, 54-55; van Driel-Murray 2005, Fig. 1-2; Gräf 2015, Taf. 20-24). The shoe type may be connected with the presence of Germanic mercenaries and their accompanying families, though the shoes in both Cuijk and Oudenburg were

Figure 8.12. Wijster style *carbatina* reconstruction (based on cat. no. 75) (graphic realisation S. Mazereel, Flanders Heritage Agency).

clearly made using normal Roman shoemaking techniques. The shoes are cut as an asymmetrical oval, with slits on the lateral side allowing the leather to be pulled over the foot as a sort of net that is laced to simple slits cut in the opposite edge. The principle is simple, though remarkably difficult to achieve experimentally. The shoe can be elaborated in various ways (cat. no. 74), and the care with which the expansion slits are arranged varies.

Two of the shoes had been subjected to extreme wear: the back seam of cat. no. 75 had been entirely re-stitched with coarse twined fibre thread using new holes cut roughly into the back and the instep loop appears to have been replaced as well. In much worse condition was cat. no. 76: it had been patched several times, the back seams had been re-stitched and the side may have been drastically modified. On cat. nos 78 and 87 snapped loops were apparently replaced or re-attached with string, knotted through holes punched into the stumps. It looks as though considerable effort was being taken to prolong the life of these shoes. The vertical slit on either side of the back seam of three of the shoes has been discussed above (paragraph 3.2).

The decayed *carbatina* cat. no. 85 (possibly with the fragments cat. no. 86) is even more closely related to the Germanic tradition of footwear with narrow composite loops, as exhibited by shoes from Uetersen and Fallwerd, as well as specimens from Friesland (Gräf 2015, Taf. 8; van Driel Murray & van der Plicht 2016, Fig. 2, 4). Similar shoes are already attested in the early 3rd century on the Roman fort of Saalburg, where they can be associated with Germanic pottery and brooches, revealing the presence of Germanic soldiers and their families (Busch 1965, nos 3, 82, 100-101; van Driel-Murray 2009, 815, Fig. 1). Here too, small holes on either side of the back seam may indicate the presence of spurs. In the context of these Germanic influences, the thong stitching cat. no. 89 is intriguing since it is still interlocked and some remnant of the associated *carbatina* back would be expected. Conceivably this stitching is all that is left of a shoe made in the Germanic tradition with cured skin: unlike vegetable tanned leather, cured

skin decays in damp conditions. Taken together there appears to be strong evidence in OS 2562 for the presence of people with roots beyond the frontier, in the northern Netherlands and northwestern Germany.

7. Conclusion

The footwear from the fort at Oudenburg provides direct evidence for the clothing of the inhabitants and also provides an insight into the nature of the communities concerned. The shoes of women and children in the two largest assemblages, OS 4980 and OS 2562, suggests that families were living within the fort in both periods 4 and 5. In contrast, in OS 4923, an exclusive assemblage of Cuijk style footwear occurring only in male sizes points to a separate group, perhaps the temporary presence of a special military unit, since the style does not appear in the more or less contemporary assemblage of OS 2562.

In times of transition and in multi-ethnic communities, clothing is intimately linked to expressions of personal identity, in a visual demonstration of the cultural links of the wearer. At Oudenburg there is little variety in nailing patterns, that in most military and urban communities formed the favoured medium for personal expression (Busch 1965; Hoevenberg 1993), but instead there are clear choices in the design and technology of footwear, that would be reflected in the gait of the wearer and the drape of other garments. The difference between a person walking in hobnailed boots or someone walking in the soft *carbatinae* of the Amcotts style would be recognizable at a glance. The minimal vamps of the Cuijk style sewn shoes demand a sliding, front-strike gait, in contrast to the heel-strike of thick soled shoes, whether nailed or sewn.

The four assemblages span a time of technological change. While the material in OS 4980 continues traditions of footwear design of the later 2nd and early 3rd century, a new design in *carbatinae*, the Amcotts style, might point to enhanced links with Britain at this time. The footwear of the period 5 fort shows the results of the rapid changes that had taken place during the 4th century. Hobnailed constructions are hardly used and sandals may also have disappeared, thin leather thong replaces twine as a sewing medium, and new forms are introduced – mules, fibre soles, ingeniously sewn soft-soled single piece shoes.

Most significant at Oudenburg is the evidence for the presence of people from outside the Empire, from Friesland or northern Germany, witnessed by their distinctive shoes.

8. Catalogue of the late Roman leather from the Oudenburg fort

I. Context OS 22926, well fort period 4, primary infill

Tpq AD 260-275 (felling date of boards framework), infill: *c.* AD 274-300(+)

Cat. no. 1. Complete shoe (Plate CCCXLI; Figure 8.8).
Complete, though fragmentary left shoe of calfskin (2mm), style Walbrook, with nailed bottom unit, damaged at the front but probably no more than size 33-34. There is a narrow heel stiffener (3.5 cm) and two large laminae are thonged to the insole: lasting margins are braced and partially whipped to the laminae. Only fragments of the outer sole remain, with holes of sparse nailing (1d), with a circle under the seat. The upper is almost complete, though worn and sweat rotted inside, and is now broken into two not quite joining fragments. Back is ankle height with two pairs of latchets, reinforced by a whipped-in cord along the edges (visible only where flesh side preserved), the top edge is folded in and whipped down. Medial instep area damaged, but stitching and a depressed line on the grain side of the back section are recognizable, indicating the presence of a double stitched lap seam. On the lateral side, a deep tear has almost separated the vamp from the back: possibly an opened out fleshing cut; it does not extend into the lasting margin and it was repaired with a patch tacked to the outside. High vamp, with a line of saddle stitch raising a ridge 3mm wide, but the flesh is too worn to see whether a tongue or other reinforcements were present. The shoe is heavily worn and creased, and the upper may have torn loose at the tread, where some stitches indicate a further repair. Despite the tearing, there is no suggestion of integral laces neither would there have been room for them. The tie holes are distended by a broad, flat lace, the upward direction of which seems to indicate that it was wound round the lower leg after crossing to the ankle latchets. Insole (19) x 8 cm; surviving upper dimension (38) x (10) cm.

* Delaminated grain surface of a narrow strip of leather. Off cut or lace end. 6.5 x 0.8 cm.

II. Context OS 4980, large rubbish pit fort period 4, primary infill

Tpq AD 267-268 (coin hoard), infill *c.* AD 268-275

Carbatinae

Cat. no. 2. Almost complete, if decayed and delaminated shoe lacking much of the grain surface (Plate CCCXLII; Figure 8.5).
Most of the loops are detached, and the ankle loops do not actually fit to the main part, though they clearly belong. The loops are formed by simple oblique cuts pulled into shape (style Amcotts), with a drop-shaped loop at the toe and two ankle loops. The back seam is a closely whipped edge/flesh, invisible from the outside and the quarter is decorated with openwork formed by linking circular stamps. Smoothed calfskin. 26 x (19) cm.

Cat. no. 3. Heavily worn, fragmentary shoe, style Amcotts, with obliquely cut raised loops, and openwork around the ankle piece (Plate CCCXLII).
Much of the grain missing and the loops are all snapped, though some are still present. Back seam neat edge/flesh, invisible on the outside. The ends of the grid-like back openwork are formed with a circular stamp, while the loops are simply slit open. Smoothed cow hide 3mm thick, but not of uniform quality, as the one side is denser and the other is thinner and split. (20) x (22) cm.

Cat. no. 4. Back of a small left shoe, style Amcotts, with grid-like openwork quarters, and snapped loops, some separated by roundels (Plate CCCXLII).
Back seam stitched through the entire thickness of 2mm. Seat worn through, cowhide surface scuffed. (17) x (15.5) cm.

Cat. no. 5. Matching quarters of a similar Amcotts style shoe with grid-like openwork and snapped loops (Plate CCCXLII).
Decorative frilling along the top edge and between the ankle loops is formed with a round stamp and a smaller curved implement. The ends of the openwork bars may also be stamped. Neat edge/flesh seam at back. (14) x (8.5) cm.

Cat. no. 6. Back part of a left shoe with elongated and decorated ankle loops style Amcotts, and snapped oblique side loops (Plate CCCXLIII).
Smoothed calf, leather split and separated. Back edge/flesh seam topped by two roundels on either side of a tab. Fine product made with simple cuts joining stamped roundels. The sole is scuffed but only the back of the heel is worn though. (16) x (11) cm.

Cat. no. 7. Curious composite shoe fragment combining the back of a single piece shoe with a re-used nailed sole (Plate CCCXLIII). The back shows crudely cut out rectangles and a seam similar to cat. no. 8, with which it may be associated. The *carbatina* is worn and split and the sole seam appears to have worn away at the base. The shoe was repaired by thonging the piece to an existing nailed sole. No other fragments of this shoe are present. Since the nails do not penetrate the leather of the *carbatina*, it is most likely that this is a crude attempt to lengthen the life of a shoe by using an old heel section to cobble the worn *carbatina* (12.5) x (6.5) cm.

Cat. no. 8. Collection of similar fragments of a low rather crudely cut back, similar to cat. no. 7, with which it may be associated (Plate CCCXLIII).
Three fragments have a widely stitched back seam, four pieces show roughly cut out rectangles and there are two stumpy ankle loops. Additional thong slits near the sole suggest repairs and modifications like cat. no. 7. None of the pieces fit to one another or to any other of the soles. Larger fragment of (9) x (5.5) cm.

Nailed shoes

Cat. no. 9. Complete left shoe (Plate CCCXLIV; Figure 8.9.b).
Sole in poor condition, with two laminae thonged to the insole. The goatskin upper is substantially complete (Ridley variant), with a double stitched side seam, two latchets at the ankle and two over the foot. There is no room for an integral lace. Whip stitches on the flesh side mark the presence of backings reinforcing the fastenings, and the goatskin lasting margin reinforcements (gr. to the foot) are still in place, running from the narrow heel stiffener to the tip of the toe. The top edge is folded inwards and secured with whip stitches. The vamp is heavily creased but appears to be undecorated. Possibly forms a pair with cat. no. 30. Upper 44 x 13 cm.

Cat. no. 10. Complete left shoe, style Ridley (Plate CCCXLIV).
Neatly nailed 1c with an S under the tread, and larger nails used for the edging (5mm and 7mm), also some repair nails around the outer seat. Thongs on the insole indicate the presence of laminae. Much of the upper together with a heel stiffener and lasting margin reinforcements (gr. to foot) remain in place, though lacking the vamp and much of the medial front. A small fragment of the medial side seam is also present. The eyelets are backed by a reinforcement (fl. to fl.). The top edge is folded in and stitched down, probably leaving a tab centre back. The shoe is very worn, and in places looks to have rotted. Outer sole: 25/9.5/7/6.5 cm, foot *c.* 24 cm.

Cat. no. 11. Decayed fragments of a shabby and repeatedly repaired shoe (Plate CCCXLV).
The leather is in poor condition, split, abraded and flaking, the sole layers are all separated into thin splits. Outer sole nailed, 1c with an S under the tread and double waist nails, impressions of bracing and whipped lasting margins. Two laminae are thonged to the insole, the heel stiffener is in place with remnants of the upper adhering. A few stitch holes of a side seam remain, but the only indication of the upper type is a fragment of the topmost lace hole (G) with a separate lining whipped to the flesh over which the top edge is folded down and stitched, suggesting a Ramshaw variant. Rips at the side of the shoe have been repaired with patches, some of them to the original poor quality leather to repair blemishes (B, C), others to repair damage or opened cuts (A, D). Placing these repairs must have involved re-nailing part of the sole. The vamp is difficult to interpret as the surface is so abraded that it is unclear whether the loose oval (F) is a repair or a part of a complete layer made of exceptionally thin sheep/goat skin. If the latter, the shoe might have had two layers, like cat. no. 12. Whatever the case, it

seems that a deep score in the leather was first roughly whipped up, then a narrow toe reinforcement (E) was stitched to the inside, and a separate outer layer or repair covered the outside (F). A short length of saddle stitching imitating a vamp seam penetrates all three layers, and all were attached to the sole together. Considerable effort has gone into making poor quality leather suitable for use, but the subsequent opening up of the rips and scores required further repairs so the result can hardly have been satisfactory. Foot length *c*. 26 cm.

Cat. no. 12. Huge right shoe, heavily nailed, with heel stiffener in place together with remnants of a curious upper composed of two layers of goatskin placed fl. to fl. and whipped round the edges (Plate CCCXLVI).
Most of the upper is lost, except for the vamp and the inside waist where a double line of stitching marks a reinforced side seam. The insole is thonged down the length, indicating the presence of laminae. Densely nailed 2a, corrosion has formed an almost solid mass of metal. Heavy, solid shoe. Other than having a front opening there is no indication of the fastening method, though boots in the style of cat. nos 13 and 14 might be considered. Foot *c*. 25.5/26 cm. Outer sole: 28/10/7.5/8 cm; insole partially obscured by the vamp.

Cat. no. 13. Fragment of a front laced boot with the stitching of a side seam indicating a left shoe (Plate CCCXLVI).
Four lace holes remain and the top and front edges are whipped, suggesting a construction similar to the lined shoe cat. no. 12. Creased goatskin, not smoothed and with two small raised warts or parasite bites visible on the grain surface. (13) x (11) cm.

Cat. no. 14. Disintegrated and worn fragments of a front laced boot with four lace holes in the leg and further lace holes punched through the folded edges of the instep opening. The top edge and the instep opening are folded in and stitched down (whip stitch), and whip stitches along the front of the boot indicate the position of a reinforcement cord rather than a backing (Plate CCCXLVI; Figure 8.9.a). A small fragment of the vamp with a toe seam remains, as does a scrap of the opposite side of the instep fastening (14b). (22) x (14.5) cm.

Cat. no. 15. Back of a disintegrated left shoe, probably a Ramshaw variant in view of the remaining eyelet and the height of the surviving thick goatskin upper (Plate CCCXLVII).
The lasting margins are braced over a lamina thonged to the seat of the insole, and there is a narrow heel stiffener. The outer sole is lightly nailed, 1d with a circle at the seat. Outer sole: (14.5)/-/6.2/6 cm.

Nailed soles

Cat. no. 16. Decayed bottom unit with thonging of laminae between the layers forming a dense and compact sole (Plate CCCXLVII).
The sole edges are abraded, but the nail pattern is sparse 1a with an S under the tread. A number of goatskin scraps probably belong to the upper and lasting margins. Insole: (21.5) x (7), foot length *c*. 22/23 cm.

Cat. no. 17. Fragmentary sole, lacking the seat and tread, the insole and the outer sole found in two separate layers (not ill.).
A large lamina extends from waist to seat, and there are impressions of a front lamina, as well as of braced lasting margins, though no thong slits are present on the insole. Close set nailing (1a) around the edge with a large, possibly complex S at the front and rather small nails arranged in a drop shape under the heel. There are double nails at the waist. A scrap of the lasting margin which remains, together with a reinforcement/repair strip, both of goatskin. Large adult in size. (17.5)/9.5/6/- cm.

Cat. no. 18. Small left insole of thick coarsely fleshed cowhide, with deep scores, wrinkled and with much of the fibrous under layer remaining (not ill.).
A long lamina extending from seat to waist is thonged in place with whip stiches from securing the lasting margins, a few scraps of which remain. There are two pairs of thong slits on the insole, but none under the tread. Rather sparsely nailed 1a with a diamond arrangement of four nails at the tread. The front edge of the sole is curled up around the foot, foot length *c*. 23.5. (22.5)/7.4/5.3/5 cm.

Cat. no. 19. Right bottom unit, heavily nailed 2c with paired nails at the waist (Plate CCCXLVII).
Decayed insole with two laminae still thonged in place (a) and some more scraps of waste leather loosely laid on top as extra packing (b) with remnants of the wide lasting margins, sewn to the laminae. A large heel stiffener (17 x 4.5 cm) probably belongs to this sole. Outer sole incomplete but probably a good 29 cm in length. Outer sole: (28)/11/8/- cm.

Cat. no. 20. Decayed left outer sole, mostly flesh flake with a few nails adhering (Plate CCCXLVIII). Neat small nails (6mm) 1d with circle under seat, S under tread and grouped nails between. Some stitch holes may indicate re-stitching of the upper. Edges decayed, original length *c.* 25/25.5 cm.

Cat. no. 21. Fragments of a totally disintegrated nailed shoe comprising flakes of the outer sole, parts of the insole with a thonged lamina and a scrap from the heel stiffener (not drawn). Largest fragment (10) x (5) cm.

Cat. no. 22. Fragments of a totally disintegrated sole, outer sole, insole scrap with thonged lamina (6.5 x 5 cm) and low heel stiffener, as well as a crumpled fragment of the topmost lace hole of a goatskin upper with folded top edge and stitching of an internal lining round the distended eyelet (Plate CCCXLVIII).

Cat. no. 23. Two flesh flakes probably from the same outer sole with decorative nailing and impressions of stitched and braced lasting margins (Plate CCCXLVIII). Pattern similar to other fragments found in the layer in question but do not fit. (10) x (6.5) cm.

Cat. no. 24. Disintegrated right outer sole, worn through at tread, fragments of the thick, poorly fleshed insole (5 mm) remain, with impressions of a wedge at the seat between the layers (Plate CCCXLVIII).
Neat decorative nailing with an elaborate tendril at the tread (nail diam. 5 mm) with larger nails (7 mm) around edge, some of which

may be re-struck (8 mm). Some similarly nailed, but not fitting fragments in the same bag may belong to a pair or to other layers of the same sole. 25/8.5/6.5/6.5 cm.

Cat. no. 25. Left bottom unit with heel stiffener, nailed 1c with double waist nails and S under the tread (Plate CCCXLIX).
A lamina is thonged to the seat, but only flakes of the outer sole remain, together with scraps of the upper. Insole 22.3/7.4/5/4.8 cm.

Cat. no. 26. Left bottom unit nailed 1c with double waist nails and S under tread, heavily corroded at seat (Plate CCCXLIX).
Three large laminae with thong slits remain, but the insole is missing. Sole is of thick, poorly fleshed hide with deep cuts. (22.5)/9.3/6/6.5 cm.

Cat. no. 27. Front of a large right outer sole, heavily nailed, 2c, but most of the nails have fallen out and are stored separately (Plate CCCXLIX). Nail heads 9 mm diam. Some flakes of the insole remain. Associated with cat. no. 40? (22)/11.2/-/- cm.

Cat. no. 28. Forming a pair with cat. No. 29. Small neat right bottom unit with laminae thonged to the insole and a scrap of the upper (Plate CCCXLIX).
The outer sole is decayed, with large corroded nails, some re-struck, 1a. Insole: 18/6.3/4/3.7 cm.

Cat. no. 29. Forming a pair with cat. no. 28 despite some small differences. Small neat left bottom unit (Plate CCCL). A thick lamina is secured with irregular, close thonging to form a compact, stiff layer. Insole of poor quality, flaky cowhide, much of the outer sole missing. Widely spaced, large nails diam. 8 mm, exploded by corrosion. Foot *c.* 16 cm. (11.5)/6/4.2/- cm.

Cat. no. 30. Possible pair with cat. no. 9? Decayed right (?) insole (in pieces, fit uncertain) with flakes of outer sole and fragments of the lasting margins and laminae in between (Plate CCCL). Laminae thonged to the seat/waist, but under tread simply inserted. Nailed 1a/c with S under tread. Possibly associated are three fragments of a lined goatskin upper. Insole: (25)/8.5/-/5 cm.

Cat. no. 31. Disintegrated left bottom unit, all layers split leaving only thin flakes, though the grain side of the insole is complete (Plate CCCL). Thong slits at the waist and seat only, nail punctures indicate 1c with an S under the tread, and a circle under the seat. The sole is creased from a swivelled gait. The heel stiffener may have been cut down on one side. An oval cut from worn goatskin and whipped round the top is either a repair or the reinforcement of a side seam. No trace of the upper (pair with cat. no. 11?). Insole: 25.2/8.8/5.7/5.2 cm.

Cat. nos 32-35. Mixed collection of three completely disintegrated soles with numerous fragments, including pieces of an upper (35), which may belong to any of them (Plate CCCL).
One insole nailed 2c (32), another has a complicated S under the tread (33), the third a circle at the seat (34).

Footwear fragments

Cat. no. 36. Toe fragment nailed insole (not ill.). 10 x (5.5) cm.

Cat. no. 37. Heel stiffener, nailed and sewn (Plate CCCL). 15 x 3.5 cm.

Cat. no. 38. Fragment of a thick repair sole with paired stitching round edge and surface cuts (a; 7 x 10 cm); a heel stiffener, nailed and stitched (b; 3 x 18 cm); and some small scraps (Plate CCCL).

Cat. no. 39. Decayed and flaked outer sole with scraps of the insole and the heel stiffener, together with a length of sheepskin lasting margin reinforcement stitched along the top and whipped to the sole (not ill.). (10.5) x 3 cm).

Cat. no. 40. Grain flake of a large right outer sole, nailed, with some other sole scraps and a rectangular calf off cut (not ill.). (12) x 10 cm.

Cat. no. 41. Seat of an insole of coarse wrinkled hide (not ill.). (8) x 6.5 cm.

Cat. no. 46. Scrap nailed insole (not drawn). (7) x (5) cm.

Cat. no. 47. Sewn repair wedge (not drawn). (8) x (1.5) cm.

Cat. no. 48. Abraded and delaminated fragments of footwear, including scraps of an insole, lasting margins, lamina, some nails (not drawn)

Off cuts, varia

Cat. no. 42. Delaminated and split semi-circular off cut, removal of a damaged and abraded area of cow/calf skin, possibly rotted (not ill.). 16 x (7.5) cm.

Cat. no. 43. Off cut with two stretch holes, sheep/goat (Plate CCCLI). 9 x 7 cm.

Cat. no. 44. Two pieces (C + D) fitting to form a folded off cut of smoothed calfskin with a roundel projecting from a curved edge (Plate CCCLI). The other edge is cut straight and along the fold the surface is decayed and cracked. Elsewhere blemishes – rotting? – may show the cause for discarding such a large piece. A similar smaller off cut is associated. Off cut or slipper rough out? 21 x 24.5 cm, 8 x 5 cm.

Cat. no. 45. Oval of roughly cut cow hide with edge chamfered to flesh side – broken remnants of a heel stiffener? (not ill.). 10 x 4 cm.

Cat. no. 49. Triangular off cut, delaminated (not drawn). 10 x 7 cm.

Cat. no. 50. Narrow cow hide trimming (not drawn). 9 x 0.7cm.

Cat. no. 51. Some dozens of tiny flakes of leather residues (not drawn).

Cat. no. 52. Four smallish off cuts, coarse goatskin, three of them folded double (not drawn). Largest 8 x 3 cm.

Cat. no. 53. Calfskin off cut (not drawn). 11.5 x 3 cm.

III. Context OS 4923, large waterbasin fort period 5(B), primary infill

Construction: last quarter 4th century, infill: end 4th – early 5th century

Carbatinae

Cat. no. 54. Virtually complete right shoe, style Cuijk, partially cut up (Plate CCCLII; Figure 8.10).
The butted seams at the front and back, (edge/grain overstitch) are raised *c*. 15 mm from the ground. There is a single side loop with the stump of the integrally cut fastening lace opposite, and holes at either side of the waist for the passage of the thong under the foot. Impressions of the thong are visible on the outside (grain), passing to the flesh side underfoot. A scrap of the repaired, knotted lace remains. Slightly smoothed cow/calf skin, with extensive, lightly impressed decorative hatching, swags and meanders. Where preserved the vamp edge is frilled. Much of the vamp has been removed and it is not clear whether there was a vamp seam or whether the front has the hooked construction of De Peel type shoes. One side of the vamp seems to be cut to a tab or stump and stitch holes suggest modifications of the construction here. Unrelated slashes on the shoe surface may indicate it was used as a cutting platform. 31 x (22) cm. Foot length 28 cm.

Cat. no. 55. Two fragments of unsmoothed, thick cow hide (4 mm) forming the side and back of a style Cuijk shoe with the stump of the fastening lace (Plate CCCLIII).
There is a hole at the instep with impressions of the lace on the outside (grain) passing to the flesh side underfoot. Back and sole seam stitched edge/grain, with continuous impressions on the grain side. The surface is covered with impressed lines and swags. (24) x (9.5) cm.

Cat. no. 56. Three fragments of a small style Cuijk shoe with single side loop, the instep slit just visible below it (Plate CCCLIII).
Thick tough leather only perfunctorily smoothed to take the extensive impressed and pricked decoration. The vamp top is frilled, with a defining line of small stamped holes. Back seam edge/grain. (21) x (6) cm.

Cat. no. 57. Grain split only of wrinkled calf skin back with large oval stitch holes of the seam and simple slit-and-pulled up loops (Plate CCCLIII). (12) x (6) cm.

Cat. no. 58. Fastening loop surrounded by cut outs and cusps, with a back extension with edge/gr stitching for the sole seam, and along the top, edge/flesh stitching to attach a raised back piece (style Cuijk) (Plate CCCLIII).
Thick cowhide, 3 mm, split but not separated. Other smaller scraps probably belong, including one with an instep lace hole and the stitching of the vamp sole seam (11) x (3.5) cm.

Cat. no. 59. Two delaminated grain flakes, probably from the back of the same shoe bearing lightly impressed geometric decoration and with angular, roughly cut, tie holes (Plate CCCLIII).
Only the scalloped edge of the back seam remains. The inside surface has a cracked and slightly glossy surface, suggestive of decay products at the junctions of grain/flesh – poor tanning or untanned? Calf? (11.5) x (5.6) cm.

Cat. no. 60. Grain flake of a shapeless sole with thong holes round edge: this is either the repair sole for a *carbatina*, or the reinforcement for a fibre sandal (Plate CCCLIII).
Heavily ribbed hide, worn over the entire surface. 25 x 10.7 cm.

Nailed shoes

Cat. no. 61. Disintegrated nailed shoe, both insole and outer sole reduced to delaminated flakes with a lamina under the seat and impressions of another at the front (Plate CCCLIV).
Fragments of a heel stiffener remain together with the grain split of the shaped back of the upper (drawn as though from the flesh). This is 7 cm high, with a stitched down top edge. Elaborate tendril nailing. Sole: (26) x (8) cm, upper: (21) x (7.5) cm.

Cat. no. 62. Disintegrated nailed shoe including fragments of the nailed outer sole, an insole with thonged lamina and a heel stiffener, with scraps of the upper, none fitting to form larger pieces (Plate CCCLIV).
The surviving part of the upper forms the quarter with openwork triangles and an integral lace or latchet and the lasting margin has both nail and stitch holes: no side or back seam is preserved. Somehow associated is a small fragment with stumps of triangular openwork and a multi-tailed thong carefully threaded through the tab end. These tails are stitched down at the back. The leather is severely decayed. (12.5) x (7.5) cm.

Cat. no. 63. Scraps of nailed insoles with thonged lamina, possibly all associated (Plate CCCLIV). (8) x (4) cm.

Cat. no. 64. Insole fragment with nail punctures, remnants of a thonged lamina (not ill.). (7.5) x 8 cm.

Cat. no. 65. Scrap of an upper with lace holes from a front-laced boot, presumably belonging to one of the soles in this context, though the leather differs in quality from cat. no. 61 (Plate CCCLIV). (5) x (5) cm.

Varia

Cat. no. 66. Fragment of the leather envelope from a cork or wooden sole *c*. 15mm thick (Plate CCCLIV).
Fine smooth deerskin. Quite unrelated in nature and quality to the other finds in this context. Rather compatible with finds from context OS 2562, like cat. no. 95. (12.5) x 3.5 cm.

Off cuts

Cat. no. 67. Several small flaked and delaminated off cuts, flabby skin edges, all with cracked inside surfaces as though decayed in the centre (Plate CCCLIV).

Cat. no. 68. Collection of small off cuts and scraps, together with a large piece of a well-fungus (Plate CCCLIV). One off cut is deerskin, and the two largest primary off cuts (14 x 9.5 cm and 13 x 13 cm) are sheep/goat.

Cat. no. 69. Triangle, calf (Plate CCCLIV). 4 x 4 cm.

Cat. no. 70. Thick cow hide off cut (4-5 mm), wrinkled and rough, left after cutting out at least two shoes, and perhaps being prepared for use as a repair sole (Plate CCCLIV). 25 x 13 cm.

Cat. no. 71. Brittle cracked primary off cut, sheep/goat (not drawn). 13 x 13 cm.

Cat. no. 72. Triangular off cut, cow/calf (not drawn). 6 x 10 cm.

Cat. no. 73. Large quantity of disintegrated fragments of coarse wrinkled hide, 180 gr, apparently neck and belly off cuts. Included amongst these was the incongruous fragment of a cork slipper, cat. no. 66.

IV. Context OS 2562, double well fort period 5 (final phase), bottom of shaft in-between and primary infill inner well

Tpq AD 379-380 (felling date of boards inner framework), infill: *c.* AD 390- early 5th century

Single piece footwear

Cat. no. 74. Back fragment of a left shoe, style Wijster, with decorated instep fastening and remnant of expanded openwork loops over the foot (Plate CCCLV; Figure 8.6.a).
Smoothed cowhide, *c.* 4 mm thick, with lightly impressed lines on the scuffed grain surface. The back seam is still stitched together by means of two thin thongs, sewn from the outside (edge/grain). This forms a marked welt on the outside, though the sole seam is well closed and almost invisible (edge/flesh). The shoe is severely worn and in places delaminated, much of the flesh surface abraded and, at the seat worn though entirely. Here, thick flat thongs, which contrast with the thin thong/gut of the original sewing, mark the attachment of a now missing repair sole. (21) x 20.5 cm.

Cat. no. 75. Back of a small left shoe, style Wijster, of coarse, creased cow-hide, heavily worn (Plate CCCLV; Figure 8.12).
Remains of an angular quarter tie and two simple cut-and-raised loops on either side, with below them scores on the flesh side from an initial marking out. One side appears to have been cut and modified, leaving only a stump with a large thong (repair?) hole. The back seam is coarsely and very visibly sewn with two strands of thick, twined fibre, tufts of which remain, passing horizontally on the outside and vertically inside. The shoe is crudely made, using poor quality materials. (19) x 15 cm.

Cat. no. 76. Three larger fragments and a number of flakes from a decayed shoe, style Wijster, probably right, delaminated and split cow hide, *c.* 2-3 mm thick and unsmoothed (Plate CCCLVI; Figure 8.6.b).
The back is firmer, and has two 'spur vents' cut in: the area between is slightly depressed. Remnants of two simple slit loops with an angular quarter tie. Much of the thong at the sole edge/flesh seam remains *in situ* and more was recovered during sieving. The back seam was stitched from the outside, possibly with twine, leaving large round holes right through the leather and raising a welt. Two repair patches, now delaminated and split, were attached with thong to the worn sole, but due to extreme wear and the decay of the stitching twine/gut, their positions are not entirely clear. (24) x 18 cm, small adult. 24904.1-4 + 24907 (grain split)

Cat. no. 77. Three decayed fragments belonging to a simple left(?) shoe, similar to cat. no. 76 and also with a 'spur vent' at the back (Plate CCCLVI).
The worn and flaked leather is entirely split into grain and flesh surfaces. Front fragment (8) x (11) cm.

Cat. no. 78. Two sides of a shoe back, joined with leather thong (edge/grain) sewn from the outside and raising a welt: the sole seam is edge/flesh (Plate CCCLVI).
Two thong holes mark the re-sewing of the snapped quarter tie. Cow hide, 4 mm thick, slightly smoothed with lightly impressed decorative lines remaining on the lateral side. The leather is delaminated and in places entirely split. Surface wear and abrasion suggest a right shoe. Cat. no. 87 of similar leather quality is possibly associated. (17.5) x (9.5) cm.

Cat. no. 79. Two sides of a delaminated quarter with roughly cut angular tie loops. Rough, creased cow hide and poor quality, hasty work with deep knife slips and irregular edges (Plate CCCLVI).

Cat. no. 80. Fragmentary back of 3mm thick cow/calf skin, scuffed and worn but originally smoothed, still joined by thick leather thong stitched from the outside (edge/gr: cf. cat. no. 74) (Plate CCCLVI). Faint impressed lines.

Cat. no. 81. Two sides of a back still joined by thin leather thong closely stitched from the outside, making a raised welt (top seam) (not ill. in the catalogue). Grain split only, smooth calfskin.(7) x (4.5) cm.

Cat. nos 82-84. Delaminated fragments from footwear similar to cat. no. 76, among them: one back with 'spur slit' (cat. no. 83) and remains of loops (cat. no. 84) (Plate CCCLVI). Worn and flaked cow-hide.

Cat. no. 85. Decayed scraps of the back of a shoe with the remains of four long, narrow loops (gr. flakes only) with cusps between the loop positions (Plate CCCLVII).

Leather delaminated and split, with lightly impressed lines visible on remaining gr. surfaces. A flake of the seat seam is tightly sewn, with large holes of the stitching of a repair sole. Two apparently intentional slits in the lower quarters may indicate the position of a spur. Quarter: (14) x 7 cm.

Cat. no. 86. A collection of small flakes and fragmentary loops, perhaps associated with cat. no. 85 or a similar style: includes loops with impressions of wide, flat lacing, perforated tabs and a group of narrow, slit tabs belonging to the front of a shoe (Plate CCCLVIII). Small fragments of similar long loops, together with pieces of narrow thong used to stitch a back seam, which are present in the sieve residue from the same layer are probably associated.

Single piece, varia and scrap

Cat. no. 87. Ripped and repaired fragment with remnants of expanded openwork, probably from the front of a shoe like cat. no. 74, and perhaps belonging to cat. no. 78 (Plate CCCLVII). (9) x (5) cm.

Cat. no. 88. Scrap of cut and expanded leather, flesh split only (Plate CCCLVII). The slits are too small to belong to a Wijster style construction, and this may represent a decorative panel (see cat. no. 62). (5) x (3) cm.

Cat. no. 89. Piece of intertwined leather thong, from a disintegrated shoe back (Plate CCCLVII). Other such scraps remain in the various sieve residues.

Cat. no. 90. Seven small bags of sieve residue, and four bags with disintegrated scraps containing small remnants probably deriving from other shoes in this group, as well as some decayed fragments belonging to *carbatinae*. Other bags of very small residues not examined.

Nailed shoes

Cat. no. 91. Disintegrated nailed right shoe, consisting of an insole and two fragments of a middle layer cut in one with the upper, a strip of which remains (Plate CCCLVII).
Insole substantially complete, cow hide ca. 2-3 mm thick, mildly pointed shape with dense nail punctures revealing some sort of pattern under the fore foot. Some long narrow thong slits along the outer sole edge indicate repairs to the construction. Surface worn, with deep foot impression, *c*. 26.5-27 cm long. The middle layer is flaked and decayed, with large nail holes and some traces of iron corrosion. This was attached to the insole by tunnel stitching. The strip belonging to the upper bears the scar of a ripped loop position flanked by upstanding roundels and ending in a tab. This is probably the side seam, secured with thick leather thong (for a similar overlap see cat. no. 100. Some other scraps in this number with similar roundels are probably associated, but there is no further indication as to the form of the shoe. There is no trace of the nailed outer sole. The construction is reminiscent of the composite nailed sole/ *carbatina* cat. no. 7. Insole: 28/9.5/5.5/6 cm.

Cat. no. 92. Collection of fragments of several totally disintegrated nailed soles found close together, in very poor condition (Plate CCCLVII).
The group includes fragments of an insole (a: (11) x 6.5 cm), small scraps of a neatly nailed outer sole and a piece of the heel stiffener which may be associated. This sole has a narrow, slightly pointed elegant shape. Other fragments, including a lamina and a small insole with thong slits at the waist (b: (10) x 6 cm) are larger and of rougher cow hide, suggesting that at least two broken up soles are represented.

Cat. no. 93. Decayed fore fragment of an outer sole with random nailing pattern (not ill. in the catalogue).
The thick leather sole has flaked into three thin layers: a few corroded iron nail heads adhere to the outer of these flakes. (11.5) x (9.5) cm.

Cat. no. 94. Fragments of a delaminated inner and outer sole with some corroded iron nails still present (Plate CCCLVII).
Two pear shaped lamina (making use of shoemaking off cuts), and a strip of the lasting margin (whipped to the insole) are in position. Various other fragments of nailed soles could belong to the rest of the sole or to another decayed sole in the context. (11.5) x (10) cm.

Sewn/thonged constructions

Slippers

Cat. no. 95. Fragments of a backless slipper made of thin smoothed deerskin (Plate CCCLVIII); Figure 8.11.d).
The D-shaped, closed front has small stitches without impressions along the top opening, indicating the presence of a binding or, more probably, a textile lining, and is covered with irregular hatching flanking a central panel with five circles. These designs are lightly pressed in from the back. Three pieces of the associated envelope covering a cork or wooden sole remain. These are made of left-over scraps of slightly rougher deerskin, braced over a solid sole *c*. 9-10 mm thick, to which the vamp is sewn with tunnel stitching. Remains of a wood/bark sole are probably associated (Figure 8.11.e). The front is severely damaged, but the original length would have been *c*. 10-11 cm (small adult in size). 20 x (10) cm.

Cat. no. 96. Fragments of a backless cork slipper, with remnants of the wooden sole (linden bark or *Tillia* sp.*)* as well as the leather envelope covering (Plate CCCLVIII; Figure 8.11.a, b, c).
The outer surface is worn, partially effacing the elaborate decoration of lines, swags, dots and hatching which was impressed from behind. The four pairs of cross lines were laid out first with a central line superimposed and filled with less deeply impressed designs. The top is attached to the leather-covered wooden sole with tunnel stiches, and small stitches without impressions along the top opening suggest the presence of a textile lining. Where protected, the thin, compact skin is smoothed and glossy, but the rather coarse grain suggests goat rather than deerskin. The front is damaged, but the original length would have been *c*.13 cm (adult). 26 x (15) cm.

Soles and upper fragments

Cat. no. 97. Left bottom unit broken in two pieces and composed of an insole with braced lasting margins and remnants of the outer sole (Plate CCCLIX).
The flat leather thong used for the bracing is still largely present, so that the original foot length can be estimated from the impressions. The outer sole has disintegrated and split, but a small fragment is still attached by tunnel stitch at the front. The insole is of poor quality cow hide with deep impressions of the foot and toes, as well as marks of the underlying bracing zigzagging across the sole. The lasting margins are also of cow hide, but there is no indication of the upper itself. At the front, a small wedge was inserted between the two sole layers. Insole: *c*. 23.5cm long, foot *c*. 23 cm.

Cat. no. 98. Childs left shoe, inner and outer sole joined by tunnel stitch (Plate CCCLIX).
Insole of coarse, wrinkled cow hide, with a large heel stiffener attached with thin thongs. Outer sole decayed and worn, exposing the tunnels on the outer side and sewn to the upper/insole with wide, flat thong. On the inner surface, some remnants of the lasting margins are still in place, the edges whipped to the insole with thin thong, and there are additional impressions of bracing across the sole. A scrap of the calfskin upper with faint impressed decorative lines has a folded edge interrupted by small holes – unclear whether decorative or functional – with above this projecting roundels and the scar of a ripped loop. This would appear to be the ankle/instep area. Other small scraps of the shoe are also present. Insole: (15.5)/5/4/4.5 cm.

Cat. no. 99. Worn right shoe, composed of two sole layers joined by tunnel stitch, with much of the lasting margins and the front part of the upper in place (Plate CCCLX).
The outer sole was originally of thick cow hide, but except for an area under the instep the grain split is entirely lost, exposing the thong of the tunnel stitching. The insole is of thick, creased, cow hide, with strongly chamfered edges, of a straight pointed shape. The lasting margins were carefully pleated around the toe and were lightly whipped to the insole, just sufficient to hold them in place. Impressions of the twine are clearly visible. It is possible that there was a separate heel stiffener, but the back has been modified to incorporate a repair wedge between lasting margins and the outer sole, and it is possible that the back was either cut away entirely or trodden down to from a backless slipper. The upper is of thinner cow hide, single piece with a side seam, for the most part ripped or, in places, cut away leaving only part of the vamp. There is no trace of the fastening method, but the vamp is decorated with a blind seam (saddle stitch). A thin thong is threaded through the insole at the waist, possibly to attach a pair of shoes for sale. Insole: 24.3/7.8/5.3/5 cm, foot *c*. 24 cm.

Cat. no. 100. Disintegrated fragments of a bottom unit similar to cat. no. 99 and perhaps its pair (Plate CCCLXI).
The outer sole is reduced to the flesh flake, with edge tunnel stitching attaching the sole to the lasting margins: some of the twisted leather thongs remain. A small segment of the poor quality cow hide insole remains together with some fragments of the lasting margins, with the starting knot of the flat thong used to whip the margins to the insole. Another fragment (poor quality, pitted calfskin) preserves the overlapping side seam, sewn with wide-spaced, flat very thin leather thong passed through thin slits. The vamp fragments of cat. no. 102 may belong here. Outer sole: (16.5)/8.5/ -/- cm.

Cat. no. 101. Seat of a small sewn sole, of two layers with a thick wedge between them, enclosed by the lasting margins which are tightly sewn with thong (Plate CCCLXI).
A large goatskin heel stiffener is sewn to the upper. In addition, a small fragment of the toe of the slightly pointed insole remains. Like cat. no. 99, a thong is threaded through the insole at the waist, possibly to attach the pair of shoes for sale. Insole: 9 x 3.5 cm.

Footwear varia – uppers

Cat. no. 102. Collective number containing scraps of uppers belonging to other soles in this context (Plate CCCLXI).
Two scraps from vamps with decorative saddle stitching, a folded top edge, and a possible vamp seam stitched with tiny stitches using thin leather thong. Largest fragment (10) x (5) cm.

Cat. no. 103. Three scraps from the same upper with the stumps of torn loops, each with an openwork triangle stamped at the base (Plate CCCLXI).
Lightly impressed swags on the grain side. It is unclear whether a *carbatina* or a separately soled shoe is concerned. Worn and flaked cow hide, *c*. 3 mm thick. (12) x (5) cm.

Cat. no. 104. Back and ankle loop of a sturdy sandal or boot, of 3 mm thick cowhide, smoothed, with faint vertical impressions (Plate CCCLXII).
Does not appear to belong to any other shoe in the collection. (7.5) x (11) cm.

Footwear varia – soles

Cat. no. 105. Disintegrated fragments of broken up thonged soles, including a) blunt nosed front of an insole with scraps of outer tunnel stitched together with a small wedge between, b) decayed scrap of cow(?) hide upper attached to the thonged lasting margin and pieces of leather thong (Plate CCCLXII).
Some of these fragments may form the outer sole to cat. no. 103. Sole: (12) x 8 cm.

Cat. no. 106. Seven scraps from a disintegrated sole, not fitting, with a narrow strip thonged to the outer edge forming a sort of frame (not ill.).

Cat. no. 107. Four coarse cow hide off cuts thonged together to form some kind of multi-layer sole (sandal?) or packing (Plate CCCLXII). (9) x (4) cm.

Cat. no. 108. Fragments of a large insole with wrinkled edges, suggesting an inlay sole (not ill.). No signs of either stitching or nailing. (10.5) x (9.5) cm.

Cat. no. 109. Thonged repair sole, probably for a single piece shoe, or the reinforcement for a fibre sandal (Plate CCCLXII). (14.4) x (8.5) cm.

Non footwear

Cat. no. 110. Archer's brace, crudely cut from waste cowhide, thick, irregular and delaminated (Plate CCCLXII; Figure 8.1)). The two straps are ripped, but it seems that the grain was intentionally removed here perhaps to make a better fit. 17 x 16 cm.

Off cuts, waste, residues

Cat. no. 111. Coarse cow-hide off cuts, gr. rough and flaking, poor quality discarded leather (Plate CCCLXII). (12) x 10.5 cm.

Cat. no. 112. Delaminated and split calf skin, secondary off cut (not drawn). (12) x (8) cm.

Cat. no. 113. Totally disintegrated and split flakes of wrinkled cow hide, probably a crumpled up primary off cut (not drawn).

Cat. no. 114. Delaminated and split scraps of cow hide probably belonging to the same item, a large off cut (not drawn).

Cat. no. 115. Right at the bottom of the well: minute fragments of leather, some of them narrow loops from shoes, and scraps from a nailed shoe (not drawn).

Cat. no. 116. Numerous small fragments from disintegrated multi-layer thonged soles, some belonging to other larger fragments, as well as other decayed fragments of unidentifiable footwear (not drawn).

Cat. no. 117. Sieve residue containing small fragments probably from lasting margins (not drawn).

9. The ceramic building material

Tim R. Clerbaut and Sofie Vanhoutte

1. Introduction to the assemblage

This chapter presents an assessment of and some first insights into the ceramic building materials (CBM) recovered from the south-west corner site of the Oudenburg fort.[224] These preliminary conclusions are the result of an in-depth study on the material that is part of an ongoing doctoral research project[225]. Some special attention in this contribution goes to two groups of brick stamps of which the closer examination provided further insights on the logistics of CBM in the region for the later Roman period. The assemblage available for study is the result of an exhaustive, almost integral, recovery of all CBM found at the site[226]. No further triage was carried out during post-excavation processing. This provides many opportunities for detailed study of the material.

The entire assemblage was inventoried in full and consists of 13,214 fragments, representing the equivalent of around 2,988 kg. The size of the fragments varies considerably; the weight makes it easier to compare contexts and sites and to estimate the degree of fragmentation.

The CBM were inventoried, per context and per CBM type. A broad spectrum of various forms is present in the assemblage (Figure 9.1). Archaeologically complete pieces were listed in detail, with dimensions and weight. The specific characteristics of each type of building material were also listed. In total, 1,729 fragments (*c.* 13%) cannot be attributed to a specific type for various reasons (fragmentation, preservation, etc.).

With nearly 3000 kg of CBM the Oudenburg assemblage is by far the largest CBM assemblage known from a military site in Belgium (and beyond), especially given the limited excavated area. It stresses once more the vast amount of building materials that needed to be present on site to be able to achieve the sometimes ambitious building programs of the Roman army. However, it is not only the size of the assemblage that makes the Oudenburg assemblage interesting. The lion's share of the material can be attributed to one of the successive fort periods, which makes it possible to trace certain evolutions even more precisely in time from the start of the occupation around the end of the 2nd century to the early 5th century AD (Clerbaut *forthcoming*). The study of the CBM is not only important for a better understanding of the architecture of this military site and its evolution; this assemblage can also be considered a rare reference to CBM of the 3rd and 4th centuries in the region. In addition, the CBM can contribute to a better understanding of the construction of the bath building of fort period 5(A) (*c.* 4th century), of which only the floor of the hypocaust system and part of the *praefurnium* were preserved *in situ*.

In what follows, first the represented CBM types will be discussed (cf. Figure 9.1), after which we detail the information on the stamps, markings and other imprints, to finish with some specific forms of reuse of ceramic building material.

2. Overview of the represented CBM types

2.1. *Tegulae*

Of the 13,214 fragments of CBM, approximately 46% could be recognized as a *tegula* fragment (n: 6083). *Tegulae* were made by hand in a wooden mould or frame after which the upper surface was rubbed smooth; the lower surface remained rough (see Spitzlberger 1968, 102; Rook 1979a, 299, 301; Warry 2006a, Chapter 2). In general, the refinement of this finish is very divers throughout the assemblage. A substantial part is very roughly made and has a rather poor finish leaving various handling and production traces (smears, finger imprints, dents, etc.) clearly visible.

The technique is identical to the way *lateres* were produced. What is characteristic of *tegulae* and also contributes to their functional use as roofing material, is the presence of raised flanges along the long sides and the presence of interlocking corners. To describe the

224 **A first overview of the ceramic building materials (CBM) of the south-west corner site of the Oudenburg fort was published in 2013: Vanhoutte and Van Thienen 2013. With thanks to Sylvia Mazereel (Flanders Heritage Agency) for her assistance in the inventory and documentation of the CBM assemblage.**

225 **PhD research hosted at Ghent University and supported by Prof. dr. Wim De Clercq (Clerbaut *in preparation*).**

226 **From the Roman level only very small 'body' fragments (*i.e.* without rim/edge) were not recovered. From the post-Roman 'dark earth' level also larger body fragments – when non-diagnostic – were not collected.**

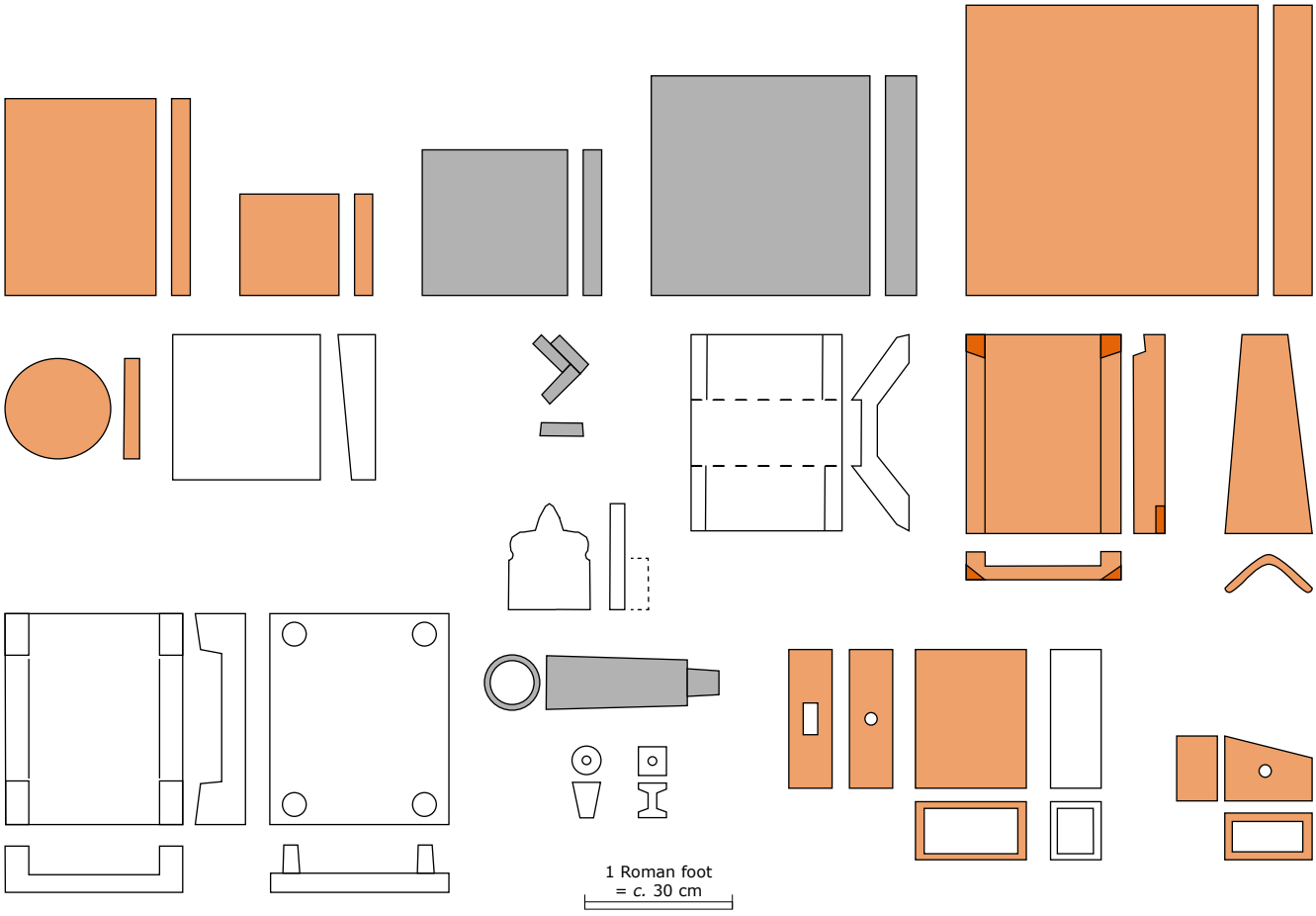

Figure 9.1. Overview of common CBM-types with indication of the represented (orange) and assumed (grey) types in the Oudenburg assemblage.

tegulae, the general methodology of Warry (2006) has been applied (Figure 9.2).

All four corners are easily recognizable. The way the flange is adjusted locally to allow interlocking of the roof tiles helps in the correct assignment of the corners and their position. The cutaways (or cutouts) were only made after the clay had already dried for some time; the individual (knife) cuts are often still visible.

At both top corners, the flange is (largely) cut away. Four types of upper cutaways could be recognized in the Oudenburg assemblage (Figure 9.3: Ua, Ub, Uc and Ud). A remarkable but for Oudenburg common type of upper cutaway has the flange cut away diagonally (Ud).

When shaping the bottom corners, a part of the bottom side (and the flange) is cut away to obtain a counterpart that would fit the top corners. Warry developed a typochronology for British roof tiles using seriation on the basis of stamped *tegulae* (Warry 2006b; Warry 2006a, 58 ff.). Following this study, the usefulness of this dating method was tested for our region. The general evolution of the lower cutaways can indeed be followed for the Low Countries (Ernst 2016; Clerbaut *in preparation*). In the Oudenburg assemblage we can define five types of lower cutaways (Figure 9.3: La, Lb (two subtypes), Lc , Ld (two subtypes) and Le). When comparing with the typology by Warry (2006a; 2006b), Oudenburg lower cutaway Lb is identifiable as Warry form type B, dated by Warry in the period AD 100-180. Oudenburg lower cutaway Ld corresponds to Warry form type C, attributed by Warry to the period AD 160-260. Oudenburg lower cutaway Lc matches Warry form type D that is believed to be dated in the period AD 240-380. The specific lower cutaway Le was apparently not encountered in Britain. Warry's form type A is neither present in the Oudenburg assemblage, which is logic as this is an early type, dated by Warry (2006a; 2006b) in the period AD 40-120.

There are many attempts in literature to also make a typochronology based on flange cross-sections (*e.g.* Brodribb 1987, 13; van Pruisen *et al*. 2007). However, it is dangerous to want to see more than there is: flanges were shaped by hand and were as such subject to a great deal of variation. The same flange may show different cross-sections depending on its position on the rim, and in addition the same *tegula* may have two flanges different in shape. The variation in flange cross-sections in the Oudenburg assemblage is very divers. Most cross-sections have more rounded edges, but some more angular examples do occur as well.

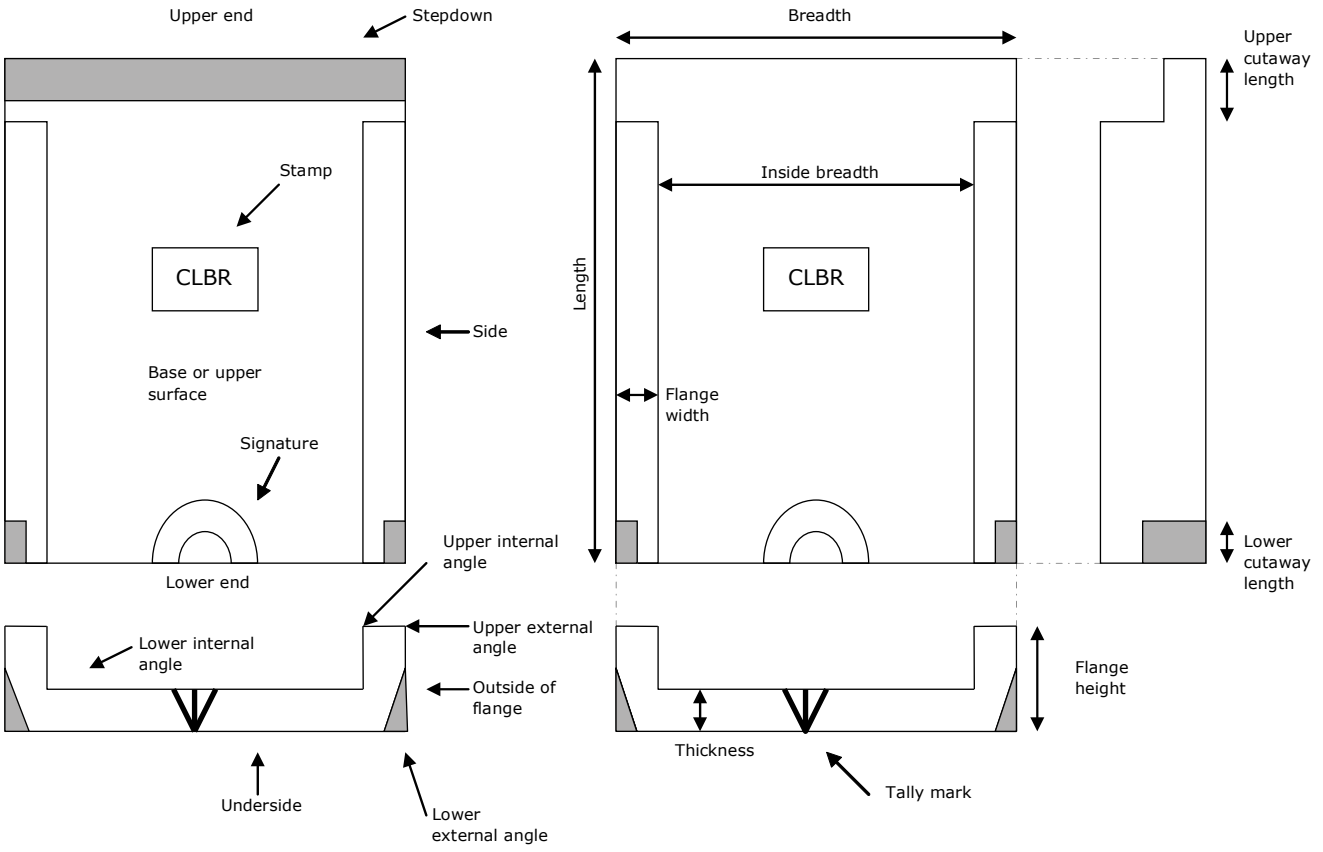

Figure 9.2. Overview of characteristics of Roman *tegulae* and proposed terminology by Warry (after: Warry 2006a, Fig. 1.1).

Fifteen (archaeologically) complete *tegulae* can be counted in the Oudenburg assemblage. According to Brodribb (1987) and based on his survey in Britain, the size of the average *tegula* is 43 by 33 cm. However, complete *tegulae* found at the *villa* site of Piddington (UK) indicate that there was a great variation in this (Ward 1999).

The two *tegulae* found at the bottom of the drainage gully from fort level 3, and based on their find context datable to the middle of the 3rd century AD, have a length of 43 to 44 cm and a width of about 31 cm (see the Appendix in this volume: Section 4.2, Figure 6). A hearth from fort level 4, datable to *c.* 260-300 AD, yielded a complete *tegula* measuring 42.5 cm by 32 cm. From find contexts of fort level 5 four (archaeologically) complete *tegulae* could be retrieved. Two of these were recovered from the walls of the heating duct of the bath house datable to the 4th century but may have been reused material[227] from fort period 4. The length of these four *tegulae* varies between 39 and 42 cm; their width is 30 to 31 cm.

An early medieval hearth located just next to the demolished bath building was constructed with complete Roman *tegulae* laid upside down (see Volume I, Chapter II, Section II.4.7.2: Figure 76, c-d). It is very likely that these roof tiles were recovered from the ruins of the late Roman bath building. They are 33 to 35 cm long and 27 to 30 cm wide (weight 4.6 to 5.3 kg). This is in line with the general chronological tendency towards smaller *tegulae* in the 4th century (*e.g.* Ward 1999, 14; Ernst 2016).

Tegulae were not only used as roofing material (generally in combination with *imbrices*). They were also used as flooring, as shown by the drain of the barrack building from fort period 3 (*c.* mid-3rd century, see above), in which two complete roof tiles had been laid upside down to prevent erosion by the water. They also served as building material for walls, for which *tegulae* were often reused and broken in recognizable patterns. When constructing walls in combination with natural stone and/or mortar, *tegulae* could be used as facing stone, bonding courses or infill of the core. An attested modification to obtain facing stones is to break *tegulae* lengthwise. The broken edges are orientated towards the core of the wall, using the flange as a face. On some Oudenburg *tegulae* the flange appears to have been deliberately chipped off, which can be deduced from the mortar remains on the break, confirming that these *tegulae* served as building blocks. Fragments of *tegulae (*and *lateres)* found in the robber trench at the north side of the fort (site Kapellestraat (ET24)) were enveloped by pink mortar and may have been the remains of facing stones or bonding courses in the defensive wall (Vanhoutte *et al.* 2014, 231). A *tegula* fragment of the south-west corner site, recovered from fort level 5, displays a distinct circular soot pattern. It indicates the (re)use of *tegulae* in de construction of *pilae* as well. According to the find level, it may well have been part of the hypocaust system of the 4th-century bath house (Figure 9.4: a).

227 **For a broader insight into the phenomenon of reuse and recycling of CBM: see Clerbaut and Komen 2016.**

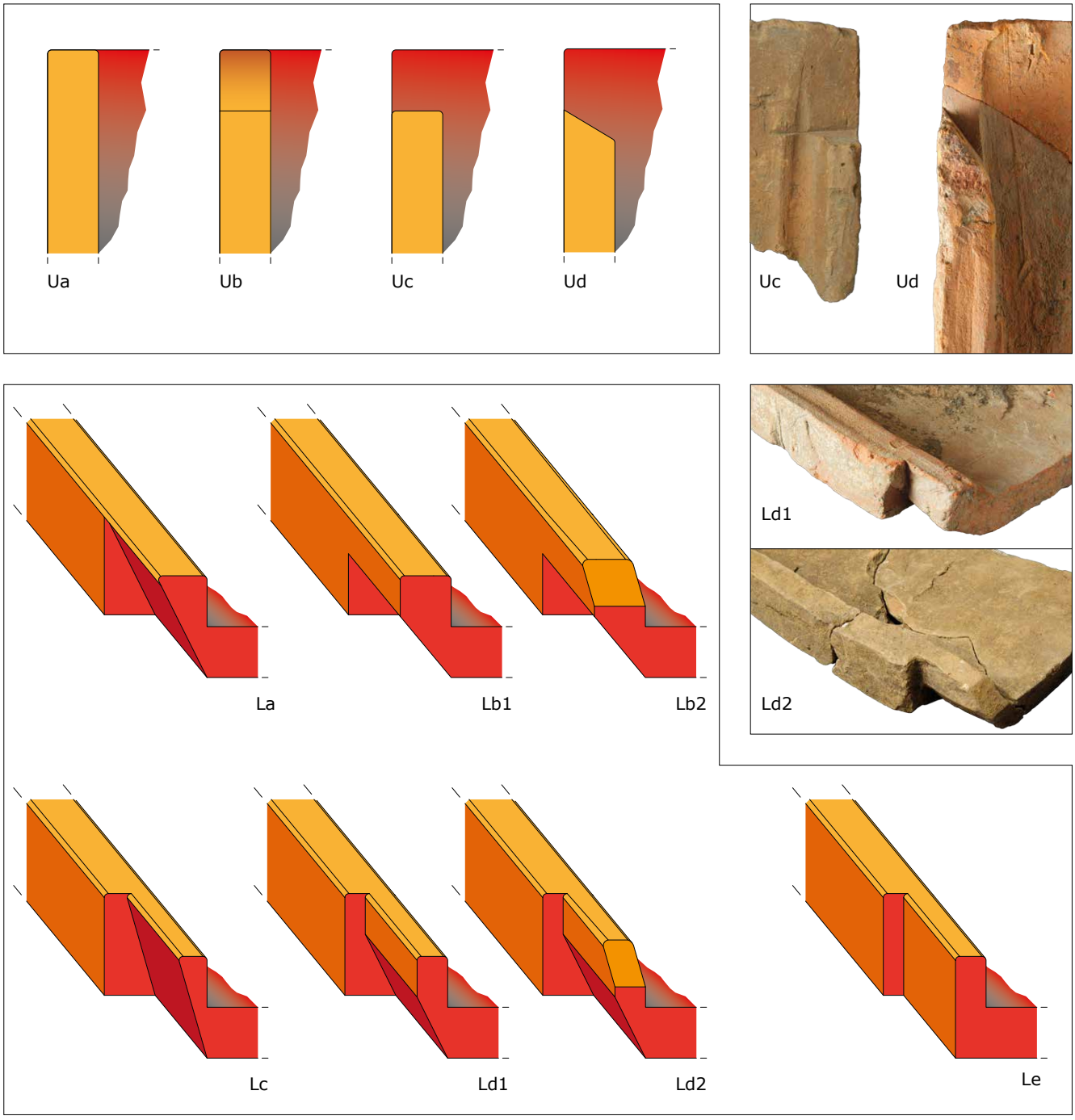

Figure 9.3. Upper (U) and lower (L) cutaway forms on *tegulae* in the Oudenburg assemblage.

One *tegula* fragment from the Oudenburg assemblage, also from fort level 5, shows the edge of a circular opening in the flat surface and can be identified as a *tegula con opaion* (Brodribb 1987, 19-20), which provided an opening in the roof surface mainly used as vent, exhaust or source of natural light. Such an exhaust could also be expanded by adding a chimney pot (Brodribb 1987, 31-32) (also known as 'Lichthäuschen' (Brandl and Federhofer 2010, 42, 47). A possible fragment of such a chimney pot (Figure 9.4: b), found in the preceding fort level 4 though, seems to have been made on a potter's wheel. The attribution of the fragment is not conclusive, as it may also be a rim fragment of a common pipe (*fistula*).

Furthermore, 23 *tegula* fragments show a nail hole. In most cases the perforation was made before firing (*ante cocturam*); two times it concerns a later perforation (*post cocturam*). The nail hole is, where it can be deduced, always located at the top centre of the *tegula*, less than 3 cm away from the rim. The nail hole creates a weak spot; the *tegula* often breaks at this point, making the nail hole less visible.

Figure 9.4. a: *tegula* fragment with sooth mark of a round *bessalis* tile. Photo: H. Denis (Flanders Heritage Agency). b: fragment of the lower rim of a possible chimney pot. Photo: P. Debeerst (FORTVNA/Photoeil).

The perforated *tegulae* are most probably the tiles that made up the bottom and/or top row of the roof. The low slope of the roof and the weight were sufficient to hold the tiles in place; however, in some cases it was decided to additionally secure specific parts of the roof.

2.2. *Imbrices*

The *imbrices* represent *c.* 24% (n: 3091) of the total assemblage. They have a curved general shape with a V-shaped or semicircular cross-section. They are designed to cover the opening between adjoining rows of *tegulae*.

However, like the *tegulae*, the *imbrices* were not only used as roofing material. They also served as construction material for hearths at the site. Alternative uses as a flue, drainage channel or for the construction of *pilae* (two *imbrices* placed vertically with their edges against each other) are known (cf. Graciani 2009, 726; Clerbaut *in preparation*) but were not attested at the Oudenburg site.

Complete *imbrices* were not found, but several complete cross-sections were. Larger pieces make it clear that the *imbrices* usually widen slightly towards the bottom. The slightly wider lower side could thus enclose the slightly narrower upper side of the underlying *imbrex* (cf. Ward 1999, 13).

The variety within the *imbrices* is enormous, both in the shape of the cross-section (from half-cylindrical to almost flat) and in thickness (from rather thin to very thick). When the number of *imbrices* fragments in relation to the number of *tegula* fragments is considered, the *imbrices* in almost all contexts represent about half of the number of *tegulae*. When the MAI is examined, these numbers are much closer to each other, which is in line with what can be assumed from the traditional roof configuration. The explanation for the discrepancy in the number of *imbrex* and *tegula* fragments does not need to be found in a larger fragmentation of the *tegulae* on site. As a flat and relatively thick shape, *tegulae* are robustly built and therefore less prone to breakage. *Imbrices*, on the other hand, are much more vulnerable to breakage due to their limited thickness and curved shape. Their higher fragmentation, as a result of which more small body fragments cannot be determined as *imbrex*, leads to their underrepresentation on site.

The total weight of a tiled roof must have been considerable when completely covered with ceramic tiles and presupposes very solid timber constructions as was also observed in the case of the barracks buildings of the fort.

Some *tegulae* and *imbrices* still have the remains of mortar attached to them. Even loose mortar fragments sometimes still show the negative impression of an *imbrex* or *tegula* (flange). Warry (2006a, 101) was able to demonstrate, using experimental archaeology, that it were probably only the *imbrices* that were secured with mortar, and not the *tegulae*, because the *imbrices* apparently did not fit so perfectly together and over the *tegulae*. Gazenbeek (2010) notes that this not only prevented the *imbrices* from slipping off, but possibly also served to keep the vermin out. An additional function can be found in sealing the roof to increase heat efficiency and to gain better control on the evacuation of smoke and other flue gasses.

2.3. *Lateres*

About 3% (n: 414) of the CBM assemblage can be recognized as a fragment of a Roman tile or *later*. It is not always easy to distinguish a fragment of a *later* from a *tegula* when rims or flanges are missing. The thickness of the pieces is not always a clear indicator. In general, *lateres* are thicker than *tegulae*. However, some *tegulae* are thicker than certain *lateres*. Pieces that could not be assigned with certainty, were classified as 'undetermined'. Within the *lateres* three basic shapes could be recognized: round, square and rectangular. Different types of *lateres* were common in the Roman Empire, which all had a standardized size. The standard dimensions do show some variations, though. A partial explanation for this can be found in the existence of two official measurements based on the Roman

Figure 9.5. a: square *bessalis* tile with traces of mortar. b: corner of a tile fragment with a round blob of clay (spacer?). Photos: H. Denis (Flanders Heritage Agency).

foot: the *pes drusianus* (33.3 cm) and the *pes monetalis* (29.6 cm). The fact that the raw material for CBM is also very susceptible to deformation and shrinkage (Bridger 1984; Brodribb 1987, 36), also plays a role in the fact that the pieces often turn out smaller than the known standards.

Among the fourteen (archaeologically) complete specimens collected at the site, the *bessalis* is the dominant type (Figure 9.5: a). These square tiles, the smallest in circulation with a standard side of 2/3 Roman foot, were mainly used in the construction of *pilae* within a hypocaust system. For this reason the term 'hypocaust tiles' is often mentioned when referring to this specific group. According to Brodribb (1987, 34), the average *bessalis* has a side of 19.8 cm and a thickness of 4.3 cm. That this type is numerically dominant within the assemblage is not surprising, since the remains of a heated bath building were found during the research. The lower mortar floor of this hypocaust system still showed the checkerboard pattern of the square bases of the *pilae* which are of similar size as the *bessales*. Most of the (fragments of) *bessales* were recovered from levels 5, 5+post and the post-Roman level; it is therefore very plausible that these came from the 4th-century bath complex. They often bear mortar remains or even fragments of the mortar joint. Such mortar remains were also preserved on some *bessales* recovered from fort level 4 though. They point to another, earlier hypocaust system nearby, dating to the second half of the 3rd century AD.

The *later bessalis* also exists as a round tile with the same dimensions. This type appears mainly from the 2nd century AD onwards (Graciani 2009, 723). Two specimens of this type were found on site. While one was recovered from the post-Roman level, a complete round *bessalis* belongs to a closed context of fort level 4, another indication for an earlier hypocaust system (whether or not belonging to a bath house) on the fort precinct, located outside the excavated area. Such round *bessales* were sometimes combined with the square *bessales*, a phenomenon that has already been observed in *e.g.* Nijmegen, Heerlen and Tongeren (Clerbaut *in preparation*). The round *bessalis* from the post-Roman level may be indicative that this was also the case in the 4th-century bath house, although it cannot be excluded that it is a dug-up piece of the assumed and earlier hypocaust system.

Several other *later* fragments have a preserved side of 28 to 30 cm. They can be assigned to *lateres pedales*, square tiles with a standard size of one Roman foot. At the Oudenburg site they probably served to cover the *pilae* formed out of *bessales*. *Pedales* were also used as a base for *pilae*, but since the preserved floor of the hypocaust at Oudenburg shows a checkerboard pattern of impressions and mortar layers with an average side of about 20 cm, the *pilae* were apparently erected directly on the *opus signinum* floor. The use of a base consisting of a *later pedalis* also seems to have gone out of fashion in the wider region by the late Roman period. Conversions in the baths of Heerlen and the construction of a new hypocaust in an urban *villa* in Tongeren show, on the basis of the preserved remains, that there too the *pilae* were placed directly on the (probably still partly wet) mortar floor.

Other *later* fragments, all belonging to fort level 5 and later levels, can be identified as *lateres sesquipedales* or *bipadeles. Lateres sesquipedales* have a side of one and a half Roman foot and formed the capping of the *pilae*. The type seems to have been used less frequently in *pilae* towards the late Roman period (Ward 1999, 43), as seems to be confirmed by the Oudenburg finds. Possibly the type was less commonly produced and application was limited to available reusable material, or other types were used (*e.g. lydion* tiles or reworked *tegulae*) to serve the function of cover plate.

The *later bipedalis* is the largest type with a standard size of two Roman feet. These *bipedales* had different functions (cf. Brodribb

1987, 41) but at Oudenburg they were probably used to cover the *pilae* to form a closed surface that could be used to pour the mortar floor onto. Their presence, even within highly fragmented material, can still be clearly demonstrated by the large thickness of the tiles. The thickness of these huge slabs can reach more than 10 cm, a thickness not known for other tile formats.

The only rectangular brick used by the Romans is the *lydion* (Brodribb 1987, 41) (one Roman foot by one foot and a half). Brodribb gives an average size of 40.3 by 28 by 4.1 cm, which seems to be more in line with what is found at the Oudenburg site and in the broader region (Clerbaut *in preparation*). The type seems to had rather a size of one foot by one foot and a third. They were mainly used in walls (as lintels or bonding courses), as flooring tile and possibly also for covering *pilae*. Only a few specimens from Oudenburg qualify for identification as a *lydion*. Many *later* fragments can be clearly assigned to the 4th-century bath house and some were reworked material in various hearths.

One exceptional piece should be mentioned here as well. It is a corner fragment of what appears to be a tile with a spherical thickening near the corner. Initially, this was thought to be a fragment of a *tegula mammata* (Figure 9.5: b). The *tegula mammata* is a wall plate with a boss in each corner, which could be conical or cylindrical in shape. This was the earliest method of distributing the warm air within the hollow space behind the inner wall. These wall plates remained in use until the 1st century AD and were eventually replaced by the increasing use of *tubuli* (Graciani 2009, 725). In view of the early dating, which precedes the entire fort development on site, the idea was raised that this might be a fragment from the older *vicus*, which was located nearby. After a thorough re-examination of the fragment, a simpler explanation is possible. The applied clay lump is not at all high enough to be used functionally in making a cavity when placed flush to the wall and is therefore not identifiable as part of a *tegula mammata*. On the basis of similar finds in the wider region, these clay lumps are regarded as additions to serve as spacers during the drying and/or firing process. Afterwards they apparently sometimes stayed unintentionally attached to the tiles (Clerbaut 2016; Clerbaut *in preparation*).

2.4. *Tubuli* (box tiles)

A total of 1,867 fragments (*c.* 14% of the CBM) were recognized as heating elements. These are almost exclusively *tubuli* or so-called box(-flue) tiles, hollow rectangular tubes which were stacked against the wall. Through these, the warm air from the underground hypocaust could be distributed. *Tubuli* appeared in the second half of the 1st century AD (Graciani 2009, 725; Rook 1979b, 306). They are characterized in the wider region by one or two openings in both sides and by a groove pattern on the front side(s) known as 'scoring'. These patterns promoted the adhesion of the mortar and although sometimes very decorative, they were not meant to be visible (Brodribb 1979, 78).

As for the openings, it is striking to note that these perforations are almost always absent in the Mediterranean world. It seems to be a tradition especially in the (northern) Roman provinces (Maréchal *et al.* 2021). The openings in the sides could be round, square or rectangular and their function remains rather debatable given their changing position and size (Brodribb 1979, 149; Clerbaut *in preparation* for a broader discussion). At Oudenburg, the perforations appear to be mainly circular, although some rectangular holes and a few conical openings are noted.

Whereas on British sites scoring often occurs on the front and the back (Betts *et al.* 1994, 8; Ward 1999, 48), within the Oudenburg assemblage – as far as can be determined – scoring is limited to the front only, probably the side of the inner wall.

Tubuli from the site show a large variation in size and in scoring patterns (Brodribb 1987, 74-77 and Betts *et al.* 1994 who describe the attested variability in Britain), which were examined in more detail and led to a better understanding of their production process (Figure 9.6) (for detailed results: see Maréchal *et al.* forthcoming, Clerbaut in preparation; cf. Winter 1958). The grooves were mainly applied with a comb, a sharp object or with the fingers[228] depending on the specific pattern (cf. Brodribb 1979, 149; Maréchal *et al.* 2021; Clerbaut *in preparation*). Net patterns, cross and star-shaped patterns, wavy lines and eight-shapes occur in all kinds of variations. The comb grooves vary in the number of teeth, the depth of the grooves and the width of the bands. Mortar remains are often preserved in the groove patterns; however, in many cases they are not. This suggests that these *tubuli* may have been used for purposes other than as heating elements that were mortared against the wall.

Very striking is the sudden presence of *tubuli* fragments on the site at fort level 2, where the southwestern corner was occupied by a military hospital in timber construction, without any traces of a hypocaust system. If we add to this the tubular fragments found at fort level 3, which can possibly be interpreted as residual material from fort level 2, the presence of these fragments becomes very remarkable (see Volume I, Chapter II, Section II.4.4.2.b: Figure 36). Also the 'scoring' found on the *tubuli* from fort level 2 (and 3) is very different from the material found in the later fort levels. The use of a six-toothed comb and especially star-shaped comb-stripe configurations are in use in this period, in contrast to *e.g.* incised net patterned motifs that are especially characteristic of fort levels 4 and 5. Two clusters of *tubuli* at fort level 2 (+3) can be distinguished, with the northeastern cluster possibly explaining this phenomenon. The double trenches found here can be recognized as remnants of cavity walls and *tubuli* were ideal elements to create such a hollow wall.

The large number of *tubuli* fragments from fort level 4 is also striking. When the find contexts from which at least five *tubuli* fragments were collected are examined, then no less than 64% of the fragments are found in hearths. The *tubuli* in this phase are thus mainly recycled material. The *tubuli* that were recovered from fort level 5 are almost all located in contexts later than the bath house of fort level 5A and can therefore be interpreted as demolition material from the 4th-century bath house. The large quantity of

228 Brodribb 1979, 149; Maréchal *et al.* 2021; Clerbaut *in preparation*.

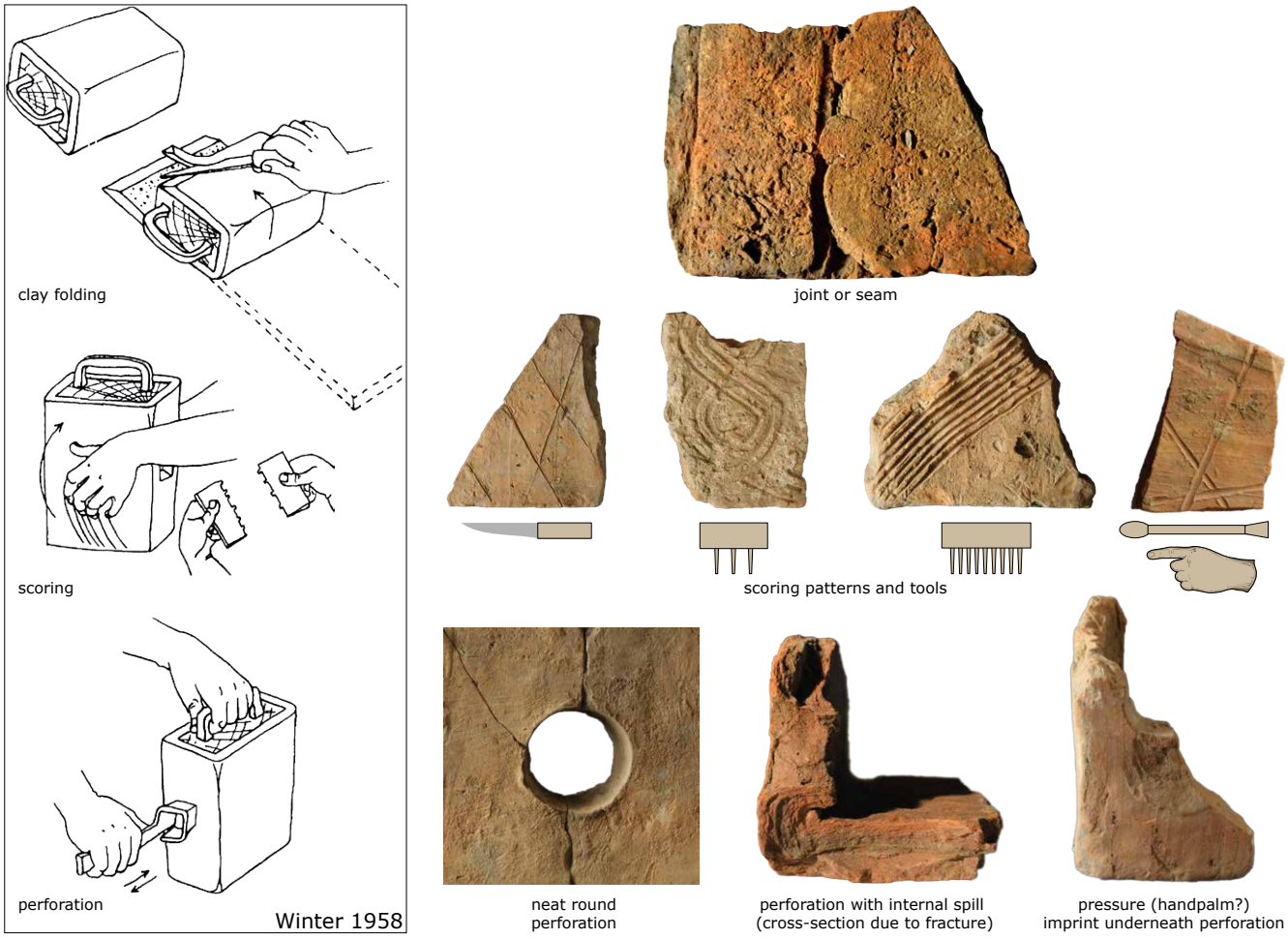

Figure 9.6. Production process of Roman box tiles (*tubuli*) and the used scoring techniques as illustrated by the Oudenburg finds. Photos: H. Denis (Flanders Heritage Agency) and the authors.

Figure 9.7. Perforated fragment of a hollow voussoir (*tubulus cuneatus*). Photo: H. Denis (Flanders Heritage Agency).

tubuli from the post-Roman level can most likely also be related to the bath building.

A specific derivative of the *tubulus* has also been found on the site, the so-called *tubulus cuneatus* (Brodribb 1987, 79) (Figure 9.7). This variant is a hollow voussoir that has its use in the construction of hollow arches to distribute the hot air and smoke from the flues in the walls to the chimney. The fragments are slightly trapezoidal and have a great resemblance with standard *tubuli* which makes them hard to recognize, especially in fragmented form. Important characteristics to look for are the perforations in the trapezoidal sides of the box tile while the scoring appears to be limited to the smallest side (which formed the interior of the arch). Due to their foreseen function their height is always limited and does not exceed their width (Clerbaut 2021).

More than twenty thin-walled fragments show a partial rectangular opening, in some cases with a preserved transition to a rim. Initially, it was assumed that these were so-called half-box(-flue) tiles. This attribution remains doubtful. None of the fragments seems to show a clear and completely preserved U-shaped cut in the middle of the rim. This does not exclude the possibility that the cutouts in the

Figure 9.8. ***Tegula*** **fragment with the round 'I V S T' stamp (left; photo: P. Debeerst, FORTVNA/Photoeil) and its find context in the wall of the** ***praefurnium*** **of the fort level 5 bath house (right).**

rim may have been located at the ends rather than in the middle of the side, especially because corner pieces are not represented. Such cutaways are also known from *tegulae*, so it cannot be ruled out that fragments from this group actually belong to a group of finer *tegulae* with a more angular cross-section.

3. Stamps, markings and other imprints

Ceramic building materials, especially *tegulae*, can show imprints which may or may not have been made intentionally. The following imprints or markings were made before firing (*ante cocturam*): stamps, signatures, so-called tally marks and imprints of human or animal nature. Almost every fragment also shows traces of the production method and the handling of the unbaked pieces. These imprints are relevant to reconstruct the production method but will not be discussed here in more detail. When several marks occur, the order of marking appears to be consistent: first the signature was applied, followed by the stamp (after which the cutouts and nail holes were made). Animal and human imprints close the line (Brodribb 1979; Warry 2006b). Within the Oudenburg assemblage, no overlapping impressions occur that could confirm this.

3.1. Stamps and their possible meaning

On only three *tegula* fragments (part of a) stamp could be recognized with any certainty. Two fragments belong to the same round die group, a third fragment consists of a single line without a clear framing. De Poorter and Claeys (1989) already remarked that from the second half of the 3rd century onwards, stamps became rare in the region. According to them this was probably because mainly local or regional tile factories became responsible for supplying the CBM products (De Poorter and Claeys 1989, 257-260).

Two circular stamps

A first die group, appearing on two roof tile fragments from the Oudenburg site, does not seem to have been found anywhere else.[229] A first tile fragment only shows the partially preserved stamp image and was recovered from the post-Roman so-called dark earth level covering the Roman site, which was very rich in Roman residual material. A larger fragment of a *tegula* bares a complete imprint of the same stamp (Figure 9.8). The *tegula* was reused as building material in the construction of the *praefurnium* of the 4th-century bath building. The reuse of the material makes it immediately clear that the dating of the stamp must be sought with some certainty before the construction of the bath house. Moreover, the preserved dimensions of the *tegula* point to a dating in the 3rd century (cf. *e.g.* Ernst 2016).

The image of the stamp is arranged according to a circular system in which the four characters are cross-wise. All characters are clear-cut and deeply impressed. The various recessed characters are sharply delineated. These characteristics, together with the presence of the circular segment at the edge of the stamp image (between the characters 'T' and 'S'), provide some information about the die used to make these impressions. One must think of a round metal stamp base on which the various sharply delineated metal letters were present in relief. Such metal stamps are not unknown in Roman context[230] and are also frequently found in relation to CBM[231]. Such stamps are found in both copper alloy and iron and with both recessed and embossed characters. These stamps have a broad functional use and are known all around the Empire.

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229 For a more detailed discussion of this die group: Clerbaut and Vanhoutte 2021; 2022.

230 For a representative overview of the variety from the Italic penisula: see *e.g.* Buonopane *et al.* (eds) 2014 and Cicala 2012. Several examples also occur along the Limes, including the iron stamp with raised letters from Mainz (Spitzlberger 1968, 110). Striking is the limited occurrence of (semi-)round stamps, a picture that also seems to emerge from the stamp impressions.

231 De Poorter and Claeys (1989) provide an overview of some regional examples. Forty impressions (66% of the discussed total) were printed with sunken letters. Of the five stamps recognized as military, three appear to consist of sunken characters. It should be noted that heavily sunk characters occur at least as frequently on non-military stamps. Striking examples can be found in the stamp texts CAVTI/CANTI and ISFP.

Round stamps are the exception rather than the rule. In civilian contexts they occur only sporadically. Using the work of Kurzmann (2006) as a guide, the use of round stamps in military context seems to occur more frequently[232]. Kurzmann already demonstrated, even based on non-exhaustive literature study, that at least ten different stamps with a verifiably round shape occurred throughout the entire Roman Empire.

As far as the reading of the Oudenburg stamp is concerned, the characters 'T' and 'S' form the most unambiguous elements of the stamp text. Two more characters occur that are less easy to interpret, although this is certainly not due to the condition of the stamp. All characters are sharply delineated and are pressed several millimetres deep into the clay, so that 'wear' of the letters is completely excluded. One of the characters that is more difficult to interpret is 'V'-shaped and offers the possibility of a double reading whereby the orientation of the character plays a decisive role. On the one hand, one can opt for the obvious reading as 'V' (the letter V or U); on the other hand, a reading as 'Λ'(A)[233] cannot be ruled out. The solution in the interpretation of this character can be found in the unambiguous orientation of the letter 'T' which is the possible measure[234] for the orientation of all characters. This supports the first reading where this character should be seen as 'V'.

The last character includes a vertical line with a short horizontal dash in the middle of the vertical axis (⊦ or ┤). The character must have been intended this way as it is not deformed or blurred. Therefore, a partially worn letter 'E', 'H' or 'F' should not be taken into account. Moreover, it concerns clearly a short horizontal dash and not a descending leg as is sometimes common in the writing of the letter 'L'.[235]

The horizontal dash can be interpreted as an additional element to the letter 'I' and as such as a 'reading aid'. In the case of the Spitzlberger 77 type, the character appears at the first 'I' in the stamp text 'LEG III ITALICA'. The character should be read as I' whereby the connected dash should be regarded as an 'isolation mark' or 'space'. The origin of this usage may be found in the ligature formation of a separator sign. This way, the letter 'I' ('- I') becomes '┤'. Illustrative for a comparable case are examples of type Spitzlberger 84. Consistently, the separator is dropped in places where the character '┤' appears, while in places with difficult ligature connection a normal separator is retained.

Now that all characters are known, the reading of the stamp as a whole can be examined. An additional difficulty with circular stamps (especially when the text cannot be understood immediately) is determining the beginning and the direction of the text. By analogy with other finds, some traditions become clear with circular inscriptions. The start of the stamp is often centred at the top or bottom of the text and is only rarely marked[236]. The number of stamps that starts at the top is by far the dominant one. Whenever the stamp starts at the top, the stamp text runs clockwise[237]. When the text starts at the bottom, the stamp text often runs counter-clockwise[238].

When all previous knowledge is applied, the character ⊦ forms the start of the text. The text can be read in clockwise direction as 'I V S T', in counter-clockwise direction as 'I T S V'[239]. The reading 'I V S T' is the most plausible, with the '⊦' as an 'I' in ligature with a 'space', indicating the beginning and the reading direction of the stamp.

A not illogical train of thought is to look for an abbreviation of a person's name, an army unit or a company in the characters. However, in comparison with other four-character stamps, it becomes clear that the text can hardly be linked to a person's name[240] or an military unit[241].

In a civilian context, however, a very similar find is known, both in terms of number of characters and general shape. It concerns a stamp with the text 'ISFP' (De Poorter and Claeys 1989, 97-105), which is separated by dot-shaped separators despite the already clearly present margins between the characters. The use of these separators should, in our view, be seen as a necessary aid for the reader to indicate that it is actually an abbreviation consisting

232 Besides stamps with LEG(io) VI and LEG(io) XXII, circular stamps of the COH(ors) IIII VIND(elicorum) and the *Classis Britannica* occur. Circular stamps of LEG(io) XXII are known from the *castellum* of Öhringen (von Sarwey and Hettner (Hrg.) 1897a, Taf. IV, B10-13), Osterburken (von Sarwey and Hettner (Hrg.) 1895, Taf. V, 3) and Hofheim (von Sarwey and Hettner (Hrg.) 1897b, Taf. VII, 44). For a broader overview: see Kurzmann 2006.

233 The spelling of the letter 'A' as an inverted 'V' without a transverse line occurs in various epigraphic examples, including on pottery and CBM. Examples on terra sigillata are very frequent. An example on CBM is found in the military stamps of LEG(io) II ITALICA (Kurzmann 2006) or the civil stamp 'FAL' (De Poorter & Claeys 1989: 68). Another striking example is the second stamp type on the site discussed below.

234 The authors are aware that several examples are known where some characters are mirrored both horizontally (upside down) and vertically (retrograde). The 'T' character seems to be fairly stable, partly because the retrograde variant does not differ from the original.

235 When using the character ⊦ (or ┤) it is to be noted that despite the horizontal (and not descending) transverse, a reading as 'L' also occurs sporadically, as for instance in the stamps of the type Spitzlberger 99 and 197 (ligature between 'I' and 'T') (Spitzlberger 1968).

236 Characters intended for that purpose are rare. It is usually a decorative element or a vertical line that divides the text frame, as in the example 'LEG VI VICTR P F * |', where both occur (Kurzmann 2006). In the absence of a real mark, in some cases a (slightly) wider white space can be observed.

237 The following circular stamps listed by Kurzmann (2006) start at the top centre and run in clockwise direction: LEG XXII Δ PPF, LEG XXII Δ P Δ P Δ F Δ M Δ I Δ PA Δ, LEG XXII Δ P Δ P Δ F Δ MACE Δ, LEG XXII Δ PR Δ PIA Δ F. A single example starts at the top left and also runs in clockwise direction: CL°BR (Seillier and Gosselin 1969, 369)

238 The following circular stamps listed by Kurzmann (2006) start at the bottom centre and run counter-clockwise: COH IIII VIND, LEG VI VICTR P F *.

239 The reading 'V S T ⊦' proposed by Nouwen as an abbreviation for 'V(exillatio) S(agittariorum) T(ungrorum) (et) H(eruliorum seniorum)' is also for this reason not plausible (Robert Nouwen pers. comm. 2007).

240 Four single characters are difficult to identify with proper names. The expectation is then usually only three single characters, possibly supplemented by the characters 'F(ecit)' or 'M(anu(factura)'.

241 Difficulties in arriving at a military unit as a reading include the unambiguous occurrence of characters such as 'L(egio)', 'VE(xillatio)', 'A(la)' and 'C(ohors/lassis)' which are very frequent in military abbreviations.

of several parts. This practice can also be seen in other stamps[242], showing that separators are used fairly consistently when the reader needs to see the characters separated from each other. The absence of these separators in the die from Oudenburg can be interpreted as an indication that the characters need to be read together. As a result, 'I V S T' should not be viewed as initials or as an acronym, but as a single (abbreviated) word. One might think of a proper name in the form of Ivst(vs)[243] or Ivst(ianvs)[244] (whether or not in the genitive). It is, however, very unusual to stamp building ceramic material with a simple singular name.

A 2nd-century find from the *castellum* of Böckingen (G) seems to offer the explanation for this stamp. It concerns a find interpreted as a 'control stamp' with the stamp text 'IVSTVM FECIT' (von Sarwey *et al.* (Hrg.) 1898, Taf. IV, 11). In spite of the strong simplification, some similarities with the Oudenburg stamp finds are immediately noticeable: a separator (in this case a leaf) indicates the start of the 'I' character and the reading direction is also clockwise. The Oudenburg stamp can therefore be completed as IVST(VM or VS?)[245] or even IVST(VM FECIT) which means as much as 'made to the standards' or 'made in the proper manner'. If the interpretation as a control stamp is also the case for Oudenburg, this could testify to a permanent (military?) control on the production of durable building materials well into the 3rd century AD.

A stamp with an Oudenburg-Aardenburg connection

Only one roof tile fragment represents a second die group at the site (Figure 9.9: a). The *tegula* fragment was found at fort level 4; however, it is a very abraded piece and most likely a residual piece from fort level 2 based on the similarities with stamps found at Aardenburg assignable to the first half of the 3rd century (Figure 9.9: b) The Oudenburg stamp reads C-Λ (with Λ representing A[246]) and is placed oblique towards the top/bottom of the *tegula.*

The characters have been pressed into the wet clay at some distance from each other with a metal stamp (*signaculum*). Such stamps are mainly known in iron and in the first instance are linked to burnmarking on barrels (and possibly also cattle) (Baratta 2007). The 'C -' was probably impressed less deep than the 'Λ'. The characters do not form a straight line indicating that the characters were pressed separately and that the metal stamp was probably formed by loose characters on individual stems. This would also explain the occurrence of a stamp at Aardenburg only consisting of the character Λ with similar dimensions and form as the Oudenburg character.

Brick stamps of similar style have been found in London (CVC), Saalburg (C [ ), Alteburg (C C), Petronell (Carnuntum) (COIA (Cohors I A(lpinorum)) (De Poorter and Claeys 1989; Kurzmann 2006), but only at Aardenburg very close parallels are found. The attested stamps at Aardenburg, recovered both inside and outside the fort, represent Λ, C Λ, C ∏ Λ and C ∏ S (Trimpe Burger 1999, 30-31; Besuijen 2008, 51; van Dierendonck and Vos 2013, 304-305)[247].

A close examination of the Oudenburg and Aardenburg stamps has pointed to the use of an identical character Λ but also to differences in the character C. This may either point to stamps made by the same manufacturer or stamps made by a different manufacturer but at the same factory[248]. At Aardenburg, nine of the uncovered C ∏ Λ tile stamps must have originally covered the roof of the *fanum*, attributed to the second phase of Aardenburg *castellum* II (van Dierendonck and Vos 2013, 304). The lack of parallels for the attested stamps makes their identification difficult. Thoen (1993, 27) was the first to suggest for the Aardenburg stamps the identification as *C(ohors) (Secunda) A(ntoniniana)*, in analogy to the known *auxilia* of the *Cohors II Treverorum Antoniniana*, a *cohors quingenaria peditata* originating from the region of Trier and which was stationed at the fort of Holzhausen an der Haide in *Germania Superior* (van Dierendonck and Vos 2013, 307, with reference to Baatz 2000, 112-113).

In general, an honorary title (such as *Antoniniana*) designates the emperor responsible for the initial installation of the unit or for a change in its composition. Maxfield has pointed to the common practice from the early 3rd century AD onwards that this epithet derived directly from the name of the reigning emperor and that it therefore altered when the emperor changed (Maxfield 1981, 234). At the end of the 2nd century the situation in the Roman Empire was turbulent. After the death of Commodus, the last real representative of the Antonine dynasty, the Empire was ravaged by a Civil War (AD 193-197), a period with rapidly changing power and pretenders to the reign. It was Septimius Severus who succeeded in establishing a stable reign. Haalebos suggests, based on new epigraphic evidence, that the honorary title *Antoniniana* was already adapted by Septimius Severus (AD 193-211) himself, although there is no direct link between his name and this honorary

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242 A striking (military) example with separation of the different parts of the text is CL°BR (Seillier and Gosselin 1969, 369).

243 Iustus occurs frequently in epigraphy. In most cases, however, it is the meaning of 'entitled' or 'lawful' in combinations such as 'iustus filius' ('rightful son'). As a name, Iustus occurs regularly and mainly as a *cognomen*. See *e.g.* Marcus M. Iustus, known as a potter in Lavoye (CAG-55: 320), a grafitto on a samian plate from Alphen including the name 'Ama(ndus?) Iust(us)' (van der Linden 2000, 119-120).

244 Iustianus as a name is widely spread in the Roman Empire with 24 EDCS attestations in, among others, *Britannia* (AE 1898, 0152) and *Germania Inferior* (CIL 13, 08772). Most of the attestations, however, come from the Italian peninsula and Pannonia (EDCS-online).

245 In all kinds of abbreviations, the antefix -'UM' is regularly omitted, as it is a very predictable (and for an abbreviation unnecessary) ending. *E.g.* on CBM: find from Chester 'co(ho)rtis prim(ae) Sunicor(um)' (AE 1914, 0293), find from Valkenburg 'coh(ors)] IIII Thrac(um) p(ia) f(idelis)' (AE 1989, 00559).

246 Cf. De Poorter and Claeys 1989, Kurzmann 2006. See for parallels on samian potter stamps: Hartley and Dickinson (eds) 2008-2012.

247 The character ∏ consists of two legs connected at the top; this connection could be clear or weak. The character most likely represents the number II.

248 A first macroscopic analysis of the fabrics of the Oudenburg and Aardenburg *tegula* fragments in question reveal large resemblances. Further petrographic research based on thin section analysis is ongoing (Clerbaut *et al. forthcoming*).

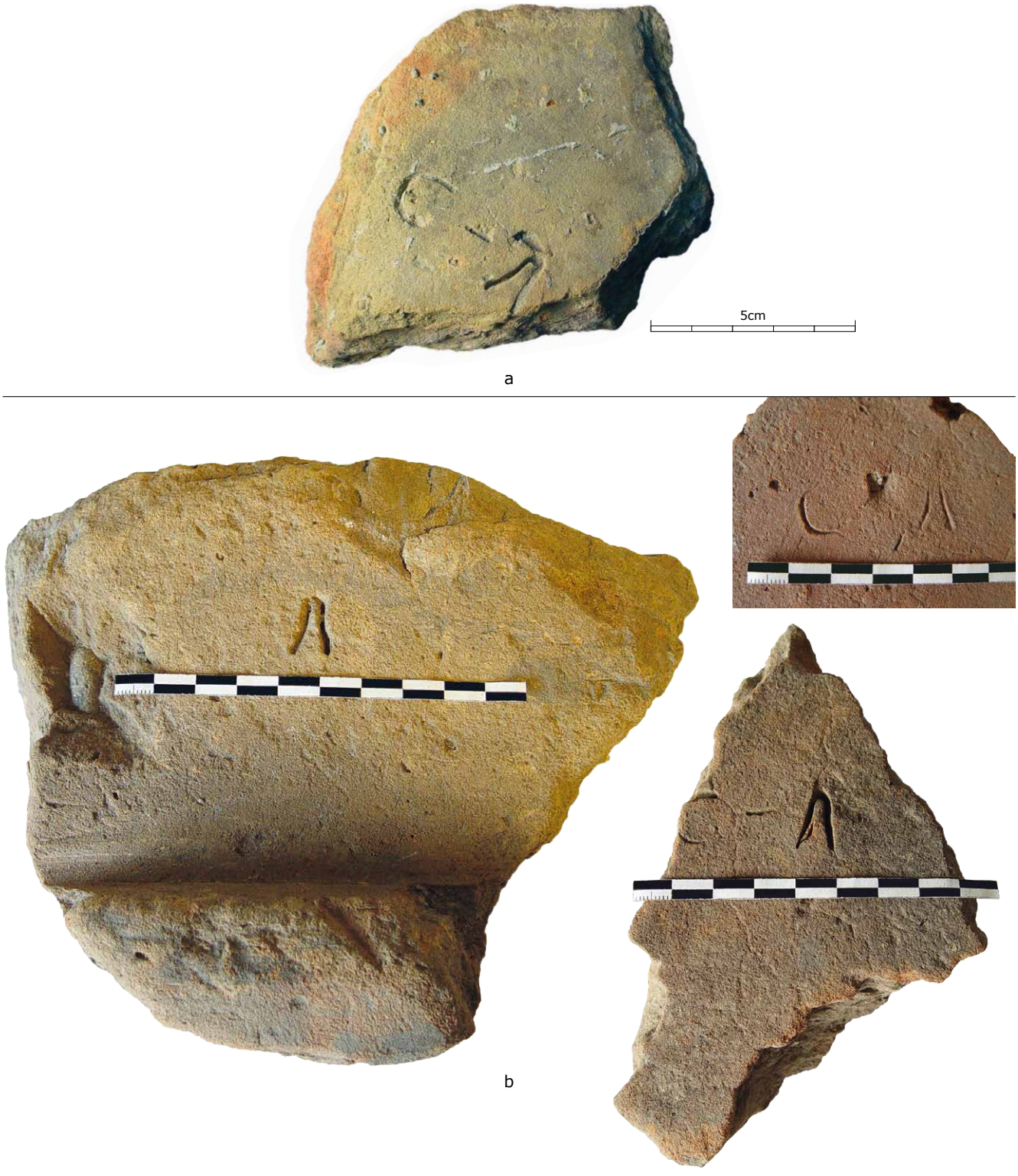

Figure 9.9. a. the linear 'C – A stamp' from Oudenburg. Photo: H. Denis (Flanders Heritage Agency). b. close references of stamps from Aardenburg: Photos by the authors.

title (Haalebos 2000, 42-43, 121-141)[249]. There is an argument to make for the early adaptation of the honorary title in an attempt of Septimius Severus to strengthen its still immature claim to power by reconnecting to the Antonine dynasty. This is in line with his successful attempt to manipulate the senate in restoring Commodus' memory by lifting the earlier *damnatio memoriae* and by giving Commodus the divine status (Freisenbruch 2010, 187). Also rewarding military units with an honorary title for their support could well have played a part in this complex political game.

If the title *Antoniniana* directly refers to the emperor's name, then Septimius Severus' son Caracalla (officially named Marcus Aurelius Antoninus) is the first who could have appointed the title during his reign (AD 211-217). But also Elagabalus (AD 218-222) reigned under the same name, stretching the possible date of the honorary title. The title *Severiana* for the cohors known from the C∏S stamps found at Aardenburg seems less debatable and refers to Emperor Severus Alexander (AD 222-235) and can therefore only be dated from AD 222 onwards. The aforementioned *Cohors II Treverorum* from Holzhausen demonstrates this clearly; its epithet changed from *Antoniniana* into *Severiana* after Severus Alexander (AD 222-235) became Emperor while the unit remained stationed at Holzhausen (Baatz 2000, 112-113). A similar situation can be assumed for the Aardenburg troops with a name change of the same unit from *Antoniniana* to *Severiana*.

When returning to the stamp text as known from the find at Oudenburg, it remains striking that a numeration in the considered stamps is lacking[250]. Moreover it is surprising that in both Oudenburg and Aardenburg stamps a reference to the origin or place of recruitment of the troops is absent. Were these troops recruited locally, or was it originally obvious that there was only one such unit and was it therefore not necessary to add an additional number nor an origin reference? Was it only eventually, with the installation of a second *cohors*, that a number was added to these new stamps? Or should the stamp be interpreted otherwise?

An alternative reading of this C Λ stamp, namely as *C(ohors) A(micorum)* can be an alternative interpretation. Such a reading would explain the absence of a number and of a reference to the origin. A *Cohors Amicorum* was a group of 'friends', advisors who formed part of the administrative support around an army commander, governor or emperor and who were in most cases responsible for the non-military government (Mommsen 1879; Étienne 1955, 258; Frank 1967, 312-313). The installation of such a group was common practice in the late Republic / Early Empire but remained in vogue until the reforms by Diocletianus who replaced them by a state administration (Kelemen 2013, 348-349). If the stamps in question should be read as such, then the production and/or the control over the supply of building material towards the Oudenburg and Aardenburg forts was organized by the *cohors amicorum* of a regional chief, maybe the governor or the army commander.

In any case, the presence of similar stamps at the Oudenburg and Aardenburg fort (C Λ / C – Λ and Λ) with an identical Λ character assumes a close connection between them and a concurrence of their fort occupations. This does not necessarily mean that a unit was moved from the one fort to the other, although this possibility cannot be excluded. It is just as possible that this *cohors* was responsible for the production of the ceramic building material which was distributed to both *castella*. The fact that outcrops of natural building stones in the direct vicinity of both *castella* are lacking, can be seen as an additional argument for a centralized organization to provide both sites with the needed raw materials (including bricks) for their construction.

3.2. Signatures

On 53 fragments, all part of *tegulae*, a signature[251] can be distinguished. This is somewhat remarkable, because signatures are not only found on *tegulae* but also on other shapes like *lateres* and *imbrices*. Especially the examples on *lateres* are common as well (cf. Clerbaut *in preparation*). Signatures were applied cursorily with one or more fingers or with a small *spatula* in the still wet clay. As a result, these marks are very shallow and can often only be distinguished by oblique light. For this reason they are regularly missed, especially on fragments with a somewhat worn surface.

On *tegulae* they have a rather predictable position. Signatures are usually close to the front of the roof tile or at least in the lower half of the body. This area is at the direct disposal of the tile maker during production and it is therefore likely that they were applied by him. It is possible that batches of greenlings of a (group of) tile maker(s) were marked in this way as part of the production administration and/or payment system (of temporary labouring force) (Clerbaut *in preparation*).

Among the signatures in the Oudenburg assemblage, the arch forms are particularly dominant, with the single arch joining the lower edge of the *tegula* as dominant form. Both double and triple arch patterns could be recorded as well. Two times a U-shaped signature was recorded. Furthermore, there are also signatures that consist of a single, double or triple straight finger sweep, which is situated parallel, perpendicular or oblique to the head. A single loop, a gamma-shaped pattern and an eye-shaped mark are exceptional forms of signature.

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249 Haalebos believes that the *Legio I Minervia Antoniniana* at Alphen aan den Rijn (*Albaniana*) already obtained it *c.* AD 196 (cf. Besuijen 2008, 51: footnote 159). However, the given chronological context seems to favour the specific association with Caracalla.

250 Cf. the many cohort stamps in which CO or COH is followed by a number (see Spaul 2000; Kurzmann 2006) or *e.g.* the two PRIMACORT stamps found at Aardenburg (cf. Besuijen 2008, 52). Exceptions do exist, see *e.g. cohors Aelia Expedita, cohors Apula, cohors Aurelia civium Romanorum, cohors Carietum et Veniaesum, cohors Lusitanorum, cohors quingenaria Maurorum equitata, cohors milliaria Maurorum equitata, cohors milliaria Numidarum, cohors Parthorum, cohors Raetorum et Vindelicorum, cohors Scutata Civium Romanorum, cohors Silaucensium, cohors Trapezuntiorum, cohors Trumplinorum* (see Spaul 2000; Kurzmann 2006).

251 The technical term 'signature' (Brodribb 1987, 135; Warry 2006a, 90-91; Havas 2009) is also used in Dutch and French literature. The more commonly used French term is 'marque digitée' (marking made by finger) *e.g.* Ferdière 2012; the commonly used German term is 'Wischzeichen / Wischmark' (smear mark) *e.g.* Brandl & Federhofer 2010.

Figure 9.10. Different imprints on *tegula* fragments. a. linear traces on the outside of a *tegula* flange (possible tally marks?). b. possible traces of rain. c. paw imprint of a cat. d. paw imprint of a dog. e. imprint of a hobbed shoe. Photos a and b: H. Denis (Flanders Heritage Agency), photos c, d, e: P. Debeerst (FORTVNA/Photoeil).

No clear patterns, at least not from the evidence present at Oudenburg, are visible in the use of a specific signature in a specific period, on a specific fabric group or form.

3.3. Other markings

Initially, possible tally marks (cf. Brodribb 1987, 135; Warry 2006a, 91-92) were recognized on nine flange fragments of *tegulae* (Figure 9.10: a). These are vertical or oblique incisions or grooves made on the (front) edge of *tegulae* during the drying process. It is assumed that these tally marks were applied at a later time than the signatures, namely when the clay was already substantially dried (or 'leather-hard'). The fact that the marks often consist of fine and shallow grooves cut into the edge with a sharp object seems to confirm this time of application. The incised grooves often represent Roman numerals, which contributes to various explanations of their function. It is very likely that this also concerns the marking of a batch of tiles, not by the moulders, but by those who further processed the products during drying/firing.

Figure 9.11. Reworked pieces of CBM into the form of round (perforated) disks. Photos: P. Debeerst (FORTVNA/Photoeil).

Whether the grooves on the Oudenburg fragments, of which some are somewhat brutally placed, actually represent tally marks is however rather doubtful. The groove patterns are on the outside of the flange and not on the front as is the case with most known examples in literature (Brodribb 1987; Warry 2006a)[252]. It is also striking that the groove patterns occur mainly near the corners of the *tegulae* and that they do not always seem to be the result of a deliberate (marking) action. An alternative explanation for these grooves can be deduced from experimental archaeological observations on the production of Roman brick and tile (Clerbaut *in preparation*). This clarified that the formation of (broader) grooves on the outside of the flange, especially near the corners, can be caused by the removal of roof tiles that unintentionally stick to the mould. To limit deformation of the still plastic tile, the greenling is wrenched from the wooden mould and the flange picked loose by using a sharp object or *spatula*.

3.4. Animal and other imprints

Of further interest are imprints who are mainly unintentional by nature. The largest group are animal paw imprints. In literature, animal footprints, like stamps, have traditionally been widely included. These impressions are the result of animals walking around the production site (and are therefore not an indication of the natural environment of the consumption site). It does, however, indicate that the drying process largely took place outdoors, either under the open sky or in (open) drying sheds or drying halls (Brodribb 1979, 212-215; Warry 2006a, 36; Brandl and Federhofer 2010, 18-19, 25-27).

A *tegula* fragment from the Oudenburg assemblage (Figure 9.10: b) proves that production took place outdoors and that the weather conditions could still partly affect the tiles laid out to dry. An irregular splash pattern is visible on the surface, most likely caused by raindrops.

Animal paw prints on *tegulae* clearly predominate at the Oudenburg site, although impressions occur on fragments of *lateres* and *imbrices* as well. The occurrence of animal paw prints on *imbrices* is uncommon and examples for the broader region are limited. An explanation is to be found in the curved character. Deformation makes the shape in most cases unusable, as a result of which the unfired clay would be immediately reworked, leaving almost none surviving imprints. In the Oudenburg assemblage, the identifiable paw prints mainly belong mainly to dogs and cats (Figure 9.10: c, d).

In addition to animal impressions, some fragmentary impressions of nailed or hobbed shoes also occur (Figure 9.10: e). Hobbed shoes were not only worn by the military, but also by non-military personnel. It is generally believed that these shoe impressions are also non-intentional. However, a certain regularity in shoe and foot impressions can be discerned in which mainly the front part seems to be imprinted and not (or rarely) the heel[253]. These impressions may possibly be seen as the result of a 'drying test' or 'hardness test' of tiles laid out to dry[254]. This gives these particular impressions a specific function, although accidental impressions will have occurred as well.

4. Some remarkable reuses

Ceramic building material was sometimes reworked for other purposes (cf. Clerbaut and Komen 2016). A total of 27 fragments of the Oudenburg assemblage was reworked into more or less round discs[255] (Figure 9.11). The smaller ones may have been gaming pieces, the larger ones may have served as lids or stoppers for jugs and/or amphorae. Six fragments of CBM were transformed into a perforated round disc: one was found

252 In the Netherlands, the believe that tally marks are situated on the external edge of the flange is based on a frequently reproduced sketch (van Pruisen *et al.* 2007). Cf. also the opinion of Gazenbeek (2009) on the matter.

253 A rare example of the imprint of a bare foot is known from the *vicus* of Kester (B) (Clerbaut, in De Groote *et al.* 2017b).

254 For a corpus of these imprints in the larger region and possible interpretations: see Clerbaut *in preparation*.

255 One was found in fort level 2, one in fort level 3, while five were recovered from fort level 4 and eight from fort level 5. The remaining discs come from later levels, but are likely to be mostly residual items.

in fort level 2, one in fort level 3, two in fort level 5 and two in the post-Roman level[256]. These may have been spindles. A small, almost cubical piece of 2 by 1,7 by 1,6 cm can possibly be recognized as a *tessera*. It is however remarkable that only a single piece was found and that mortar remains are missing. Two *tegula* flange fragments, one from fort level 4 and one from the post-Roman level (for which a medieval date cannot be excluded), show remarkable worn surfaces, fit well in the hand, and can probably be identified as grinding or polishing stones. One of these specimens can also be interpreted as a crayon given its elongated form and improvised tip.

5. Some general conclusions

A more in-depth study of the vast CBM assemblage of the south-west corner site of the Oudenburg fort is still ongoing within the context of a doctoral research project (Clerbaut *in preparation*). Nevertheless, this contribution already gives an overview of the rich potential of the available assemblage. A wide range of various types could be recognized and also the variation within the different types could be sufficiently indicated. This already led to some first chronological and technical insights.

The already in detail studied stamps provide a unique insight into the use of tile stamps in a period for which knowledge is limited and in which the stamping tradition is declining. The vast CBM assemblage of the south-west corner site only contains two different stamps, which is not surprising for a later Roman context.

A circular stamp, occurring twice and most likely belonging to the later 3rd century, can be identified as a control stamp and refers to the organization of regional CBM production centres.

For the C Λ stamp, most likely attributable to fort period 2, two designations can be considered. First, as 'Cohors (Secunda) Antoniniana' referring to a cohors unit with an honorary title for which several emperors of the first two decades (until AD 222 with Elagabalus) can be considered. Second, 'Cohors Amicorum' provides an alternative interpretation. In any case, similar stamps at the Aardenburg fort with an identical Λ character point to a close connection between both forts.

Further fabric analysis on the stamped fragments can possibly provide us with more insights into the production location and the logistics of the distribution of tiles.

The CBM assemblage yields significant information on the bath house of fort period 5A dating to the 4th century AD, as it bears evidence of several of the construction elements. The roof was covered with the for the 4th century characteristic smaller *tegulae.* The roof was likely equipped with *tegulae* con opaion providing openings to vent, exhaust or to obtain extra natural light. The hypocaust *pilae* were constructed with square *bessales*, erected directly – without larger base – on the *opus signinum* floor, corresponding with the traces on the *in situ* floor part. A round *bessalis* recovered from the post-Roman level may point to a combined use of square and round *bessales* in the bath house, or is a dug-up piece from an earlier hypocaust system of the second half of the 3rd century of which the presence in the vicinity of the excavated area is indicated by several finds in fort level 4 contexts. A *tegula* fragment from fort level 5 with a circular soot pattern, corresponding with the contours of a round *bessalis,* is not only indicative for the reuse of *tegulae* in the *pilae* of the bath house – or was it a dug-up piece of the earlier hypocaust system? – but may be at the same time a possible extra argument for the combined use of square and round *bessales.* The *bessales* were most likely covered with the *pedales* found on site, on top of which maybe *lateres sesquipedes* occurred, and certainly *lateres bipedales. Tubuli* or box-tiles, displaying a variety of combscoring patterns, served the distribution of the hot air throughout the bath house. The find of a *tubulus cuneatus* gives evidence of the presence of hollow arches constructed with such hollow voussoirs through which the hot air and smoke can be distributed from the *tubuli* to the chimney.

The high potential of the Oudenburg assemblage is partly due to a targeted collection strategy during the excavation whereby it was decided to collect the CBM in its entirety. Given the large amount of find material (and the respective weight) this is not an obvious choice. A limited collection of immediately conspicuous fragments in the field would undeniably have resulted in data loss. In unwashed state, important nuances are lost, such as the shallowly impressed stamps, finer impressions, technical production marks and traces of use (such as soot).

A further advantage is that most of the material can be linked to the stratified evidence present for the development of the fort. This gives the opportunity to place development within the CBM within a chronological framework which can at least serve as a loose guideline. For the building material, however, it is clear that through processes of use, reuse and recycling many building materials have a longer life cycle. The Oudenburg assemblage is clearly an interesting and unique witness of the (re)building of a late Roman military site in all its facets.

256 It cannot be excluded that the two finds from the post-Roman level are (early) medieval in date.

10. The stone implements

Sibrecht Reniere

1. Introduction to the assemblage and the study 'sourcing the stone'

This chapter focusses on the study of a varied category of stone implements that have been unearthed at the Oudenburg fort and includes artefacts from the south-west corner site (ET20) and the north-east corner sites Jacali (ET17) and Kapellestraat (ET24). Building materials and ornamental stones are not taken into account. The study is based on the results of doctoral research that has been carried out at the Historical Archaeological Research Group, Department of Archaeology from Ghent University (Reniere 2018)[257].

In total 845 stone implements were inventoried. A large selection is illustrated on Plates CCCLXIII-CCCLXXX. A first important category of stone implements consists of querns and mills, both designed for grinding purposes. A grinding couple consists of a *catillus* (upper rotating stone) and a *meta* (lower fixed stone). Querns are defined as hand-operated and are generally limited to a diameter of maximum 50 cm, whereas large diameter mills (> 50 cm) were driven by mechanical power (*e.g.* water or animal power).

A second category consists of ointment palettes, rectangular stone implements that were used for grinding minerals and herbs mixed with oil for preparing cosmetic or medical products.

A third group is in archaeological literature generally determined as 'whetstones'. They are believed to be used for sharpening the cutting edges or points of metal implements. However, it cannot be excluded that some of these macro-lithic tools were, in analogy with similar pre- and protohistoric predecessors, also applied for all kind of abrading, smoothing and polishing functions. They could for example have been used in different stages of the manufacturing process of objects made from various animal, vegetal and mineral materials (*e.g.* working of metal, bone, antler, amber, horn, ivory, wood, stone, etc.).

A fourth category is labelled as paraphernalia and discusses the remaining residual implements such as scale weights and mortars, of which only a limited number has been found.

The first part of this study touches upon the characterization of the used geo-materials and their provenance. In the second part the implements are subjected to a quantitative typological/morphological study whereas the third part discusses the results of the previous sections within a broader socio-economic and cultural context. This chapter wraps up with a general conclusion.

2. Methodological approach

2.1 Identification of the geo-materials

The determination of the raw geo-materials is based on macro- and mesoscopic observations. Additionally, we applied comparative petrographic analysis of thin-sections to fine-tune the observations on a microscopic level. For the basaltic lava rocks, besides thin-sections, complementary geochemical-statistical analysis (X-ray fluorescence or XRF) was carried out by T. Gluhak. Based on these analyses in combination with the comparison of literature and reference collections, lithostratigraphic ages, geological and geographical provenances are proposed.[258] We need to specify that not all microscopic descriptions are based on thin-sections from stone artefacts from Oudenburg. As this study is the result

257 **Funded by the Special Research Fund of Ghent University. I am very grateful to prof. dr. Wim De Clercq for giving me the opportunity to work on this project and for his support and guidance over the past years. I would also like to express my appreciation to dr. Sofie Vanhoutte for allowing me to study the very interesting Oudenburg stone tool assemblage and to Sylvia Mazereel (Flanders Heritage Agency) for all her graphic work.**

258 **We would like to thank senior geologists dr. Eric Goemaere (Royal Belgian Institute of Natural Sciences, Geological Survey of Belgium (RBINS, GSB)) and dr. Roland Dreesen (Ghent University) for their training, input and feedback on the petrographic study. We are grateful to dr. Roland Dreesen for his major contribution in the petrographic study of the Wealden sandstones. Furthermore we would like to express our gratitude to several colleagues for their collaboration and expertise in co-authored papers on the determination and characterization of several rocks: Else Hartoch, dr. Paul Picavet, dr. Aurélie Thiébaux, prof. dr. Gilles Fronteau (see for *e.g.* Dreesen *et al.* (2014a); Jäger *et al.* (2017); Picavet *et al.* (2018); Reniere *et al.* (2016)).**

of doctoral research, representative samples from various Roman sites were selected. We have chosen to integrate some of them[259] in this present study as they are based on comparative rock specimens, and thus relevant. Petrographically investigated samples from Oudenburg are indicated in Tables 10.3 and 10.5. The large variety of geo-materials of which the stone implements at the Oudenburg fort were made, will be discussed in Section 3 of this chapter.

2.2 Quantitative typological and morphological analysis

The objects that could be studied in detail have their own unique object-ID (cat. no.) and are listed in the respective inventories (Tables 10.3 and 10.5)[260]. Undetermined quern and mill fragments – too small to identify typologically – are not considered in these lists, but were taken into account in the general quantification (Table 10.3). The registration of the different typological parameters of querns and mills (*e.g.* feed hole type and rynd slot type, handle slot type, etc.) and their drawings are based on the commonly accepted guidelines, norms and methodology as devised by the French 'PCR Groupe Meule' (Buchenschutz *et al.* 2011)[261]. A summary can be found in Figures 10.1, 10.2 and 10.3.

As no generally accepted classification scheme for Roman **'whetstones'** exists, we developed our own, very basic system, based on already published data (see Reniere 2018 for a concise review). A first important parameter is the dimension, as it gives a first indication of the way a tool was used (active vs. passive, mobile vs. fixed). The second parameter is the general shape; the final parameter is the macroscopic determinable use-wear indicative for its function (abrader, polisher or whetstone).

We distinguish between small mobile or portable tools – that could be held in one's hand, nevertheless potentially used in both an active and passive way – and generally larger fixed tools – that could not be handled in one's hand and was thus exclusively used in a passive way. The limit of what could be held in one's hand is set on a width of approximately 10-12 cm, *i.e.* the range of what an adult hand palm can handle in a comfortable way (Woodbury 1954, 98). By 'active use' we understand a stone tool that is moved on a utensil that needs to be sharpened, polished etc. 'Passive use' implies a stone tool on which the utensil is moved to be sharpened, polished, etc.

Following shapes are distinguished:

Bar/rod: elongated shape that is much longer than wide. Bar-shaped tools have a square to (sub-)rectangular cross section. Rod-shaped tools have a circular to oval/elliptical cross section.

Tabular: a tabular shape is generally longer and wider than it is thick. Flat (plate shape or slab) as well as a thicker variant (block shape) occur.

Cube: a quasi-symmetrical shape that consists of six quasi equal squares. Through use, the edges become concave.

Spherical: a quasi-complete regular spherical shape (also referred to as 'ball' shape).

Expedient: this term is used for tools that are very irregular and not or barely shaped according to a certain design and that have been used in an expedient way.

Disc: a flat (generally thin) circular shape.

Furthermore, when possible, we differentiate between whetstones, polishers and abraders. This subdivision is mainly based on the appearance of particularly obvious use-wear traces that could be recorded with the naked eye. The observations were restricted to this very basic macroscopic method as we could not conduct a detailed use-wear analysis based on experimental use and microscopic research. As a result, we work with a very basic subdivision that is open for future adjustments and improvements.

Whetstones: are used to sharpen utensils and only bits of material are loosened and removed from the contact surface. They are mainly characterized by a fine-grained lithology and the presence of whetting planes and shallow striations on their working faces.

Polishing tools: (also called burnishing tools, '*brunissoir*' or '*polissoir*' in French) are used to create a very smooth and shiny surface. The interaction of the polisher and the contact surface can result in a sheen or polish/lustre. Only little or no material is loosened. The ideal lithology consists of a hard solid rock in combination with a low or even absent abrasive character (Pieters 2013, 99).

Abraders: are used to remove a substantial part of the contact surface in order to shape the contact material. The rubbing movements cause high pressure and friction on the contact surfaces, which results in a lot of loosened material (Pieters 2013, 82-101). They are differentiated from whetstones by the presence of deep U- and V-shaped grooves and by a lithology that is coarse enough to remove material.

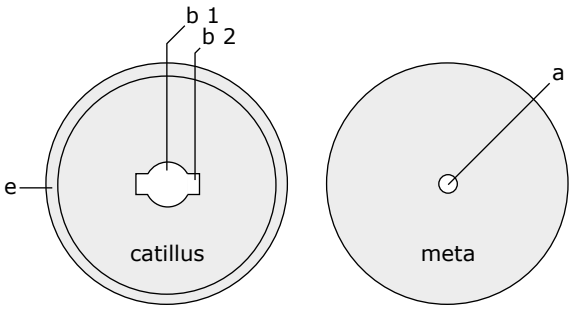
Just as for the sharpening tools, a general agreed classification scheme for **ointment palettes** does not exist. It is a very homogenous group of rectangular-shaped implements with a standard cross section. For reference descriptions one can refer to Riha (1986) or Künzl (1982).

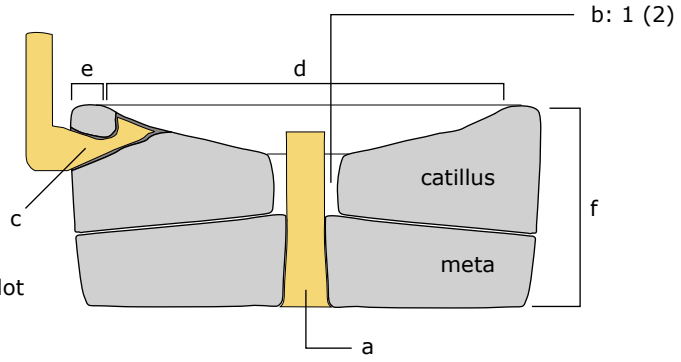
For the quantification of the stone tools we applied three methods: two quantitative ones and one qualitative method. The first quantitative one is a total stone count and counts the total of fragments within each rock group and within each tool category. The second one measures the weight of stone fragments per stone group and within each tool category. Both methods provide a

259 Applied for the quantitative important rock groups.

260 The numbering retained is the result of the inventory numbers from our doctoral research. '021' refers to the south-west corner site Spegelaere (ET20), '022' to the north-east corner site Jacali (ET17) and '023' to the north-east corner site Kapellestraat (ET24).

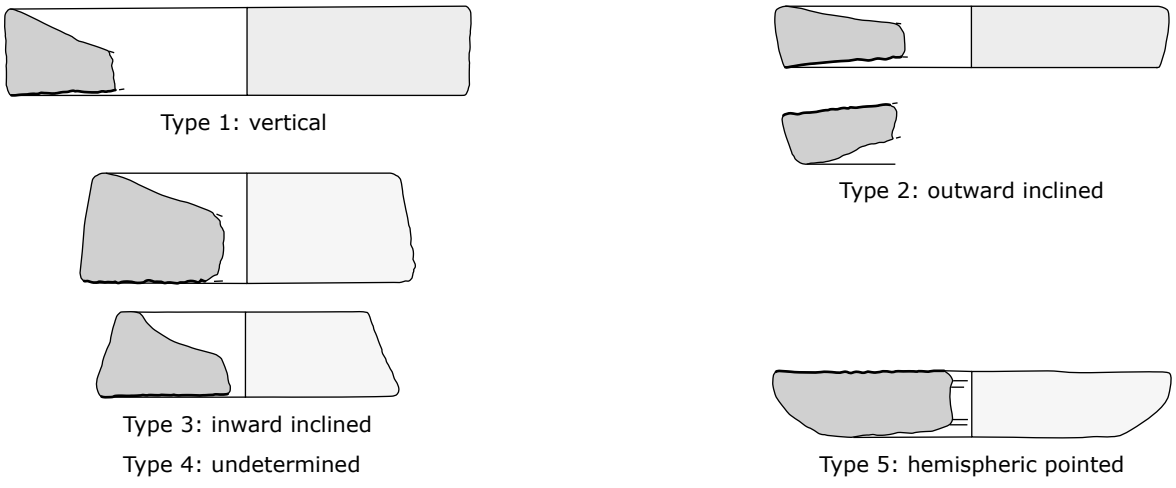
261 Zones of stone polish are depicted in light orange.





a: spindle hole + spindle
b: 1. feed hole, 2. rynd hole or slot
c: handle slot + handle
d: receptacle or hopper
e: rim
f: edge

components of a quern or mill

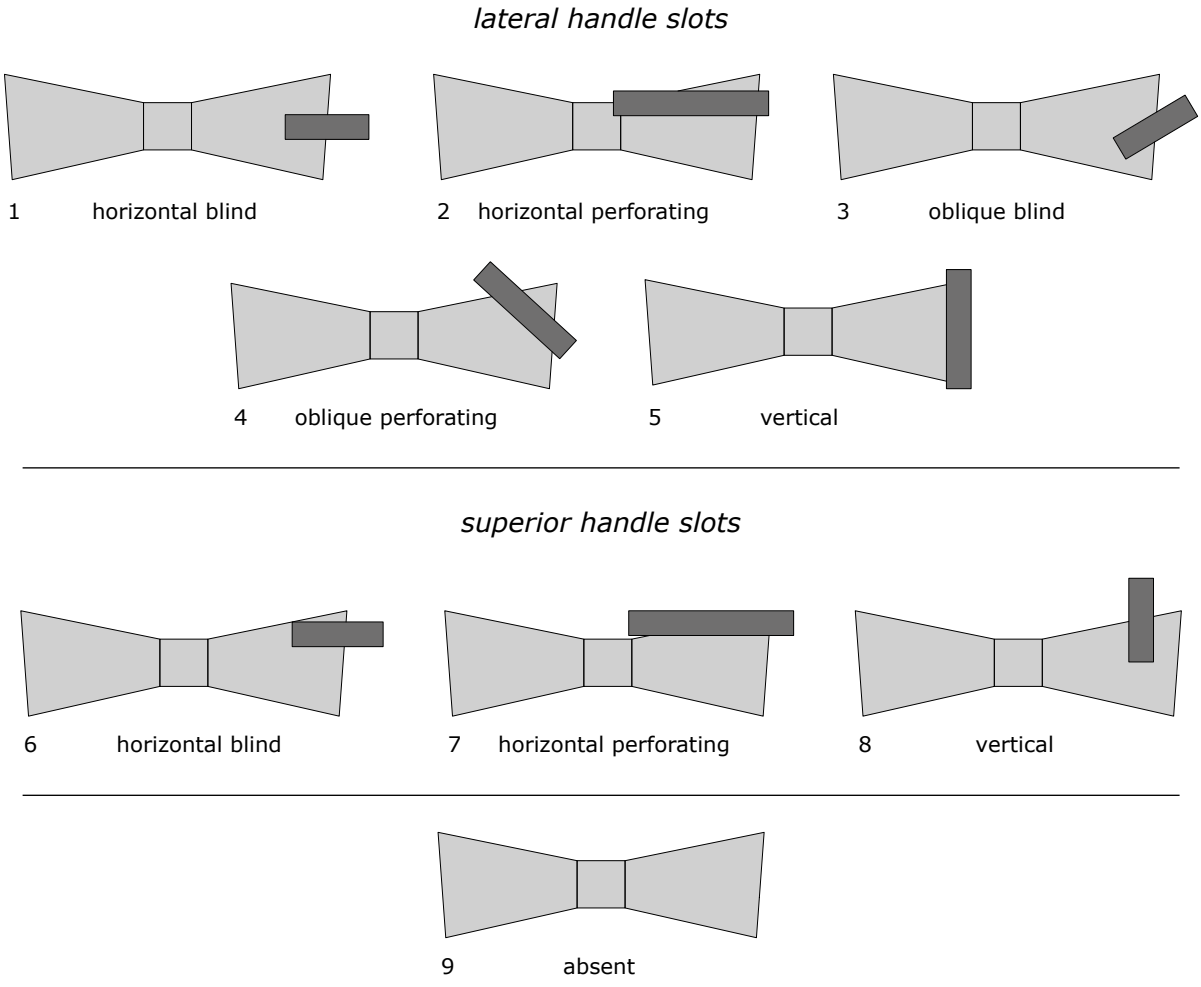


meta/catillus edge types

relative objective idea about the volume of stone that has been imported and used. However, the first quantification deals with the problem of potential overrepresentation due to a high fragmentation degree of certain (more brittle) rock groups. Main draw backs for the second method are the potential overrepresentation of thick, heavy large specimens and the complexing factor that weight is not a stable factor as a result of use-wear.

For the category of querns and mills we applied a third qualitative method[262], the minimum number of individuals (MNI). With

262 **This method was not applied for the other categories. The ointment palettes and paraphernalia are limited in number and easy to quantify with the first two methods. For the broad category of 'whetstones' the application of this qualitative method is much more complex due to very intensive use-wear and the lack of typological and morphological features to fall back on.**



dressing type

simple dressing	complex dressing					
	honeycomb dressing	**mixed dressing**	**furrowed dressing**			
random pecking pattern	"honeycomb" pattern	mixed pattern	simple furrows pattern		complex furrows pattern	
			straight	curved	straight	curved
type 1	**type 2**	**type 3**	**type 4**	**type 5**	**type 6**	**type 7**

Figure 10.2. Querns and mills typology & morphology. At the top: handle slot typology (after Jodry *et al.* 2011). At the bottom: dressing typology (after Lepareux-Couturier 2014).

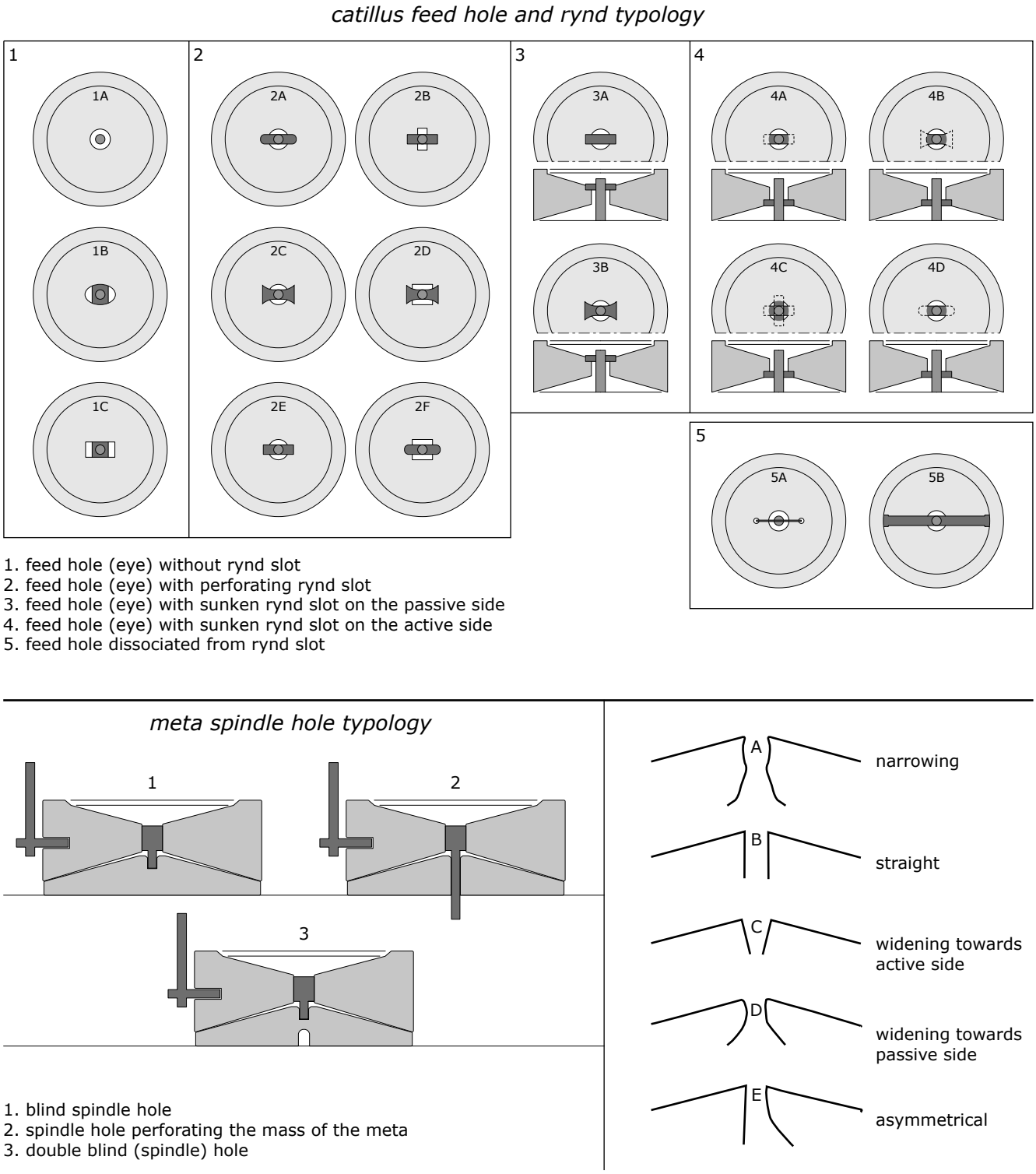


Figure 10.3. Querns and mills typology & morphology. At the top: *catillus* feed hole and rynd typology (after Robin *et al.* 2011). At the bottom: *meta* spindle hole typology (after Chaussat 2011).

this method one attempts to approach the number of individuals that is represented by the fragments in an assemblage by taking into account characteristic/diagnostic elements. For this approach it is of course important that an assemblage is quantified after the puzzling of fragments. Some of the disadvantages are the subjectivity of the method (for example when defining if two fragments originally belonged to the same individual) and the influence of fragmentation degree (highly fragmented objects are

potentially better represented). The quantifications are carried out per context. Within each context, a division is made between the different rock groups, quern or mill, and subsequently between *catillus*, *meta* and undetermined fragments. The countable elements are: rim fragments, rim-center fragments, center fragments and undetermined fragments. The latter are only counted as an individual if they are the only fragments to represent a rock group. Whenever another diagnostic fragment is present, the undetermined fragments are not taken into account. When rim fragments, rim-center fragments or center fragments from the same type cannot be linked physically, they are treated as a separate MNI. An exception is only applied within the same context, when it is very likely that the fragments belong to the same individual (*e.g.* the same rim height, lithological characteristics, etc.). When cross-fits occur on site level, corrections on context level have been made.

Undetermined fragments (*i.e.* objects of which could not be determined whether they are part of a *meta* or *catillus*) were not taken into account for the MNI count. This is especially important for sites where the stone fragments are found isolated over many different contexts. *E.g.* a site with five undetermined fragments from rock x found in five different contexts from the same chronological phase would normally be counted as five individuals in rock x. However, theoretically it is more likely that they represent at least one individual, especially in the case in which rock x is characterized by a high fragmentation degree. An exception is made when the 'undetermined fragment' is the only indicator for a particular rock group within the larger context of the site. We acknowledge that this a subjective method, but it provides for a workable way to tackle the potential overrepresentation of MNI. Finally we note that artefacts labelled as stray finds (*i.e.* without stratified evidence) are not taken into account for the MNI count.

3. A variety of geo-materials occurring in the assemblage

The Oudenburg stone tool assemblage consists of igneous rocks, sedimentary rocks and metamorphic rocks. In what follows a wide variety of at least 20 different lithologies is presented. For each lithology we discuss their macro- and microscopic appearance and their provenance.

3.1 Igneous rocks

3.1.1 Basaltic lava (BL)

The 'basalt'-like lava is an extrusive igneous rock. It is a fine-grained, grey to dark grey, vesicular rock with vesicles up to a few millimetres in size and common felsic xenolith inclusions. On the fresh surface, small clinopyroxene phenocrysts as well as occasional larger (up to 10 mm) sanidine phenocrysts can be observed. According to its modal mineral content, the lava can petrographically be defined as a tephritic phonolite (not as a true basalt) (based on thin-sections of eleven samples, see Table 10.3). The fine-grained matrix is mainly composed of nepheline, sanidine, clinopyroxene crystals, plagioclase and opaque ores with minor grains of leucite and apatite.

Table 10.1. Geochemical composition of the quern and millstone samples (°LOI: loss on ignition) (T. Gluhak).

	major elements (recalculated LOI-free) (%)												trace elements ppm																					
	SiO2	Al2O3	Fe2O3(t)	MnO	MgO	CaO	Na2O	K2O	TiO2	P2O5	LOI°	Sc	V	Cr	Co	Ni	Cu	Zn	Ga	Rb	Sr	Y	Zr	Nb	Ba	W	Pb	Th	U
cat. no.																																		
021-001	50,73	17,37	7,58	0,17	4,30	7,74	5,19	4,66	1,85	0,40	0,66	12	170	61	23	40	23	90	22	160	848	24	388	103	999	10	13	13,4	4
021-002	48,80	17,03	8,82	0,20	4,37	9,24	4,87	4,02	2,08	0,58	1,04	9	171	44	20	30	35	91	22	110	1588	32	326	128	1618	13	11	12,8	3
021-004	49,91	16,75	8,34	0,18	4,93	8,71	4,62	3,89	2,07	0,59	1,15	15	185	65	28	42	28	93	21	143	949	25	377	106	1068	10	12	14,7	4,9
021-005	49,12	16,44	8,83	0,18	4,98	9,35	4,72	3,58	2,16	0,64	0,86	14	238	55	27	46	32	87	22	126	1039	27	344	100	1196	12	12	11,6	4
021-030	48,91	16,54	8,80	0,18	5,21	9,25	4,62	3,81	2,18	0,50	0,51	16	226	61	26	45	33	83	20	123	1048	27	327	98	1203	12	10	11	3,4
021-040	49,22	16,72	8,53	0,18	5,07	8,84	4,58	4,28	2,12	0,47	0,51	15	225	79	26	52	32	84	21	134	986	25	338	99	1181	12	12	13,7	3,8
021-052	49,10	16,55	8,75	0,18	5,11	9,08	4,43	4,14	2,16	0,50	0,59	16	207	64	27	50	35	88	22	135	1063	28	344	105	1215	11	10	11,8	3,3
021-053	51,37	17,44	7,38	0,18	4,10	7,54	5,20	4,60	1,77	0,43	0,93	13	169	51	22	37	26	89	23	162	840	22	401	106	980	10	14	16,3	4,6
021-093	49,18	17,05	8,35	0,16	4,35	8,75	4,97	4,50	2,03	0,66	2,04	13	192	35	25	37	27	85	23	146	1045	26	383	111	1121	14	12	14,2	5
021-094	48,88	16,41	8,83	0,18	5,15	9,40	4,40	4,00	2,18	0,57	3,88	15	209	69	27	42	33	86	20	122	984	26	319	98	1129	11	14	11,4	4,2
021-102	48,97	16,52	8,81	0,18	5,21	9,19	4,51	3,93	2,19	0,49	0,52	13	216	71	26	48	31	80	21	124	1000	25	326	99	1191	9	10	11,6	3,9

Table 10.2. Results of the discriminant analysis (Discriminant Analysis: Affiliation to exact quarry with certain probability. Only when cluster analysis results in a Bellerberg provenance) (T. Gluhak).**

	Discriminant Analysis** (DA), stepwise					
	DA affiliation to			**affiliation probability (%)**		
cat. no.		DA function 1	DA function 2	**Mayener Grubenfeld**	**Ettringer Lay**	**Kottenheimer Winfeld**
021-001	**Kottenheimer Winfeld**	8.1973	-8.19624	0	0	**100**
021-002	**Mayener Grubenfeld**	-30.83302	0.7973	**97.86**	2.14	0
021-004	**Kottenheimer Winfeld**	8.9409	-0.56557	0	0	**100**
021-005	**Mayener Grubenfeld**	-6.24529	7.65495	**100**	0	0
021-030	**Mayener Grubenfeld**	0.13275	2.91835	**100**	0	0
021-040	**Ettringer Lay**	0.78213	-0.74971	0.82	**97.54**	1.64
021-052	**Mayener Grubenfeld**	-0.80335	1.99121	**100**	0	0
021-053	**Kottenheimer Winfeld**	8.3223	-7.99157	0	0	**100**
021-093	**Mayener Grubenfeld**	-9.36094	10.69873	**100**	0	0
021-094	**Mayener Grubenfeld**	2.16602	4.16957	**88.47**	0	11.53
021-102	**Kottenheimer Winfeld**	2.79177	5.13233	40.21	0	59.79

These tephritic phonolite lavas were most probably imported from the Eastern volcanic Eifel area in Western Germany. The *Vulkaneifel* is part of the Cenozoic Central European Volcanic Province and runs from the Pannonian Basin in the east until the French *Massif Central* in the west. The volcanic Eifel is situated on top of the Rhenish Massif composed of Triassic and Devonian sedimentary rocks and can be subdivided into three large volcanic fields: the Tertiary *Hocheifel* and the Quaternary East and West Eifel. The volcanic activity took mainly place during the Neogene, with a peak in the Miocene. This activity ceased around 5 Ma ago. However, a restart took place in the Quaternary, defining the East and West Eifel volcanic fields. The East Eifel covers an area of *c*. 400 square km. This region is composed of *c*. 100 eruptive centres, comprising scoria cones, few maars, tephra rings and lava flows. Most volcanism took place during the middle and late Quaternary. The eruptions started in the East Eifel and migrated towards the east, ending with enormous eruptions of the Laacher See Volcano (Gluhak and Hofmeister 2009). During these eruptions lava flows poured from volcanic cones and fissures. The congealment of the lava streams resulted in a vesicular lava that was formed by the escape and expansion of gases in the magma. This cooling process in the basaltic flow resulted furthermore in a contraction and the formation of hexagonal columns perpendicular on the initial stream (*i.e.* columnar jointing). The columnar splitting surfaces facilitated the work of quarryman to produce millstones (Gluhak 2010b; Mangartz 2008). Volcanic rocks were mined from pre-Roman times until modern times (20th century). During the Roman period, the quarries of the Eastern Eifel Bellerberg volcano in Mayen form the most important production site of the region, both for hand-mills, water mills and animal-geared mills (Mangartz 2008, 52-106).

Besides the German *Vulkaneifel*, we should note some other regions (without being exhaustive) where volcanic rocks were exploited, such as the *Massif Central* in France, Agde (Languedoc-Roussillon, France), Vogelsberg (Land of Hesse, Germany), some regions in Italy (Orvieto in Umbria, Vulture in Basilicata, Sardinia, Sicily etc.) and the Pannonian Basin (East-central Europe) (Gluhak and Hofmeister 2011; Mangartz 2008, 195-207; Peacock 1980). In older literature the Eifel region was frequently proposed as a source for millstones in Roman and medieval times in the region, often based only on macroscopic and petrographic observations (De Paepe and Vermeulen 1988; Kars 1980). Additional archaeometrical research is however needed to pinpoint the basalt lavas with more certainty to the Eifel region. Thanks to the recent detailed analytical geochemical-statistical methodology developed by Gluhak (2010b) it is possible to link Roman querns and millstones made of volcanic rocks to particular extraction sites, even to an individual quarry or lava flow in the *Vulkaneifel*.

In total eleven querns from the south-west corner site were sampled for detailed petrographical and geochemical analysis, carried out by T. Gluhak (Tables 10.1-3). In what follows we will focus on the results of these analyses. For more details about the applied methodology we refer to Reniere 2018. The rocks are classified according to their content in SiO2 and Na2O plus K2O, using the total alkali silica (TAS) diagram. The geochemical composition of the samples is given in Table 10.1. The Oudenburg samples cover the same fields as the Eastern Eifel Bellerberg quarries of Mayener Grubenfeld, Ettringer Lay and Kottenheimer Winfeld. The composition of the samples regarding *e.g.* MgO and SiO2, MgO and Fe2O3 and MgO-Nb confirm that the geochemical composition of the samples corresponds well to the Eastern Eifel Bellerberg Lava. Statistical analyses were used to confirm the Bellerberg origin and to determine the extraction sites of the individual querns within the Bellerberg quarries (for a detailed description of the cluster and discriminant analysis, see Gluhak and Hofmeister (2009; 2011). Seven samples are assigned to a specific extraction site with a probability of 100%, two with a probability of >97% and one with a probability of > 88,47 %. One sample, from quern 021-102, can be assigned to the Kottenheimer Winfeld with a probability of 59.79% and to the Mayener Grubenfeld with 40.21%. In conclusion, the results suggest that six millstones were extracted from the Mayener Grubenfeld quarry, four from the Kottenheimer Winfeld quarry and one from the Ettringer Lay quarry (Table 10.2). Based on these results in combination with macroscopic investigation it is argued that

probably all basaltic lava querns and mills from Oudenburg were imported from the Eastern Vulkaneifel.

3.1.2 Andesite-dacite porphyries: Porfido rosso antico and Porfido nero antico (PORF ROS and PORF NER)

Both rocks are intrusive igneous rocks, more particularly andesite-dacite porphyries with white to pink phenocrysts of plagioclase feldspar in a purple red groundmass. This color is due to the presence of piemontite (red to reddish-brown or red-black mineral of the epidote group) (Corsi Collection 2016). They are Precambrian in age. Outcrops occur in Egypt and Roman quarries are known in Gebel Dokhan in the Egyptian Eastern Desert. The *porfido rosso antico* and *porfido nero antico* are often referred to as Imperial Porphyries (Corsi Collection 2016).

3.2 Sedimentary siliciclastic rocks

3.2.1 Cambrian silt- and sandstones: Revin Group (CAMB SS 1)

This rock is a coarse micaceous siltstone or fine-grained and well-sorted argillaceous sandstone with a pronounced pervasive (slaty) cleavage. The colours vary from medium grey, medium dark grey to dark grey and even to greyish blue. Very characteristic in hand specimen is the pronounced cleavage and the occurrence of many mica flakes. Furthermore, one can regularly (although not always) observe dark mud chips and very small right-angled pyrite phantoms. These silt- and sandstones are also known under the term 'kwartsofyllade' (De Paepe and Vermeulen 1988). In excavation reports from the Netherlands they are often identified as phyllites (Houkes 2012; van Pruissen and Kars 2010).

In thin-section[263] this phyllitic rock shows quartz grains as principal component within a fine-grained clay matrix that has been completely recrystallized resulting in microphyllites. Within the matrix we observe small muscovites and iron-rich chlorites. Furthermore, evenly distributed thin elongated detrital muscovite flakes with a preferred parallel alignment occur in all samples. Some samples contain feldspars (*e.g.* lamellar twinned plagioclase) and rare lithic fragments. Furthermore, we observed rare tourmaline grains (often strongly weathered), rare rounded grains of zircon and rare little oval opaque minerals. Dark mud chips are typical for the coarser grained stones (sandstones), whereas pyrite crystals rather occur in the finer grained stones (siltstones).

The rock is Middle to Upper Cambrian in age (Revin Group, Petite-Commune Formation) (Thiébaux *et al.* 2016). Outcrops are known in the southern metamorphic region of the Rocroi Massif and in the Stavelot-Venn Massif. Based on comparative thin-section analysis and the thermal maturity of the rock (see Vanbrabant, in Jäger *et al.* 2017, 33-34) the provenance of this type of whetstones is assigned to the southern part of the Rocroi Inlier. Recently a large-scale Roman workshop with thousands of rough-outs and blanks was excavated near Rocroi at Le Châtelet-sur-Sormonne (Department of the Ardennes, France). The Revin Group outcrops near the site, suggesting a nearby quarry (Thiébaux *et al.* 2016, 570-572). Further research is needed to verify if a Roman production existed in the Stavelot-Venn Massif.

3.2.2 Cambrian silt- and sandstones: Deville Group (CAMB SS 2)

This rock type is a green fine- to coarse-grained micaceous generally poorly sorted sandstone. The rock can show coarse limpid grains of monocrystalline quartz in hand-specimen. Very fine-grained as well as coarser-grained stones occur.

In thin-section the stone is composed of quartz grains in a microcrystalline micaceous matrix (based on thin-section samples 021-222 and 021-110, Figure 10.4). We observe recrystallized clay minerals resulting in a microphyllite. These iron-rich chlorite minerals explain the green colour of the rock in hand specimen. The quartz consists of angular to subangular monocrystalline grains with undulose and uniform extinction. However, polycrystalline quartz occurs as well. Concentrations of several fresh feldspars vary from one sample to another (*e.g.* microcline, plagioclase and albite). We also note the presence of detrital muscovite flakes. Rock fragments are absent. Accessory minerals include tourmaline, rutile, zircon and tiny, elongated and bar-shaped opaque minerals (probably ilmenite).

This rock is Lower Cambrian in Age (Deville Group, La Longue-Haie Formation) (Thiébaux *et al.* 2016, 572). The La Longue-Haie Formation has outcrops in the northern and southern regions of the Rocroi Massif. The provenance of the whetstones can be assigned to the southern, metamorphic part of the Rocroi inlier. Potential outcrops in the Stavelot-Venn Massif cannot be excluded but, as already mentioned, further research is needed to verify if a Roman production existed in this area. Based on the find of whetstone rough-outs, this rock has been worked at the above mentioned workshop of Le Châtelet-sur-Sormonne. The nearest outcrop of the Deville Group however is situated 20 km to the east (Thiébaux *et al.* 2016, 570-572).

3.2.3 Lower Devonian coarse sandstones and (micro-) conglomerates or 'Macquenoise sandstone' (MSS)

The so-called Macquenoise sandstone is a compact coarse-grained sandstone or (micro-) conglomerate characterized by light grey colours (sometimes white to beige) with yellowish and pink shades (weathering colours). Very diagnostic is the limited amount of dark green to black tourmaline crystals (of a few millimeters large). Beside these, many mica flakes are easy recognizable with the naked eye in hand specimen. In some facies there is a pronounced schistosity or schistose foliation that bypasses the quartz granules.

In thin-section[264], this arenite appears to be poorly to moderately sorted and dominated by monocrystalline subrounded to

263 Description based on thin sections from comparative rocks (Reniere 2018).

264 Description based on thin sections from comparative rocks (Reniere 2018).

subangular quartz grains. The quartz grains show undulose extinctions and intern vacuoles of fluid inclusions (appearing as dark lines or specks), both indicating an intense deformation of the original crystal structure. A well-developed quartzitic structure dominates, as proved by many sutured grain contacts (as a result of pressure solution). In addition, an intergranular matrix is present (cf. white colour between the grains in hand specimen) that is composed of recrystallized micro-phyllites and fibrous quartz. Some zones show less-sutured quartz. Moreover, more quartz and rock grains are floating within the phyllitic recrystallized interstitial cement. Furthermore, we noted also the presence of rounded or subangular rock fragments (microquartzites, phyllites, fine sandstones and siltstones). Orange and brown colours in some of the thin-sections are the result of weathering and oxidation of iron-rich minerals. Very diagnostic are the scattered (dark) green-brown and blue tourmaline crystals. They appear as semi-euhedral or rounded grains and are often fractured. Another characteristic in some facies is the pronounced schistosity or schistose foliation that bypasses the grains, granules and pebbles. Mica grains undergoing solution transfers are aligned in this preferential orientation. These features are the result of a compressive tectonic phase linked to the Variscan tectonic cycle. The presence of numerous white powdery spots in this rock type has often been mistakenly interpreted as newly formed kaolinite, a weathering product of feldspar. This is the reason why this rock was originally identified as an arkose in the past (cf. 'arkoses d'Haybes/Macquenoise'). However, it should be stressed that these rocks are not real arkoses, because – from a lithological point of view – a real arkose is a sandstone containing at least 25% feldspars (according to the classification by Folk (1974, 214-216)).

The rock is Lochkovian in age (Fépin Formation, Lower Devonian, Paleozoic). Two major source areas are known in the Ardennes Massif, more especially around the Caledonian inliers, the Rocroi Massif and the Stavelot-Venn Massif. Around the Rocroi Massif they crop out from the region of Mondrepuis, Hirson and Macquenoise (Department of the Aisne-France, province of Hainaut-Belgium) through the region of Haybes and Gedinne (Department of the Ardenne, France and in the province of Namur-Belgium). Around the southern border of the Stavelot-Venn Massif they are present from Baraque de Fraiture onwards until Recht and Waimes (province of Liège and province of Luxembourg). Outcrops occur as well around the smaller Serpont inlier, more especially in Freux (province of Luxembourg, Belgium). The quern fragments from Oudenburg probably originate from the Roman quarry district in the region of Mondrepuis, Hirson and Macquenoise (Department of the Aisne-France, province of Hainaut-Belgium) as around the Stavelot-Venn Massif there is currently only evidence for proto-historical, medieval and modern exploitation (Picavet *et al.* 2018). Nevertheless, the existence of Roman quarrying in this region cannot be excluded, as younger extraction activities might have obliterated the earlier ones. Furthermore, Picavet (2017) recently identified a Neolithic or protohistoric saddle quern quarry around the Serpont inlier (Bois de la Hé, Freux, Libramont-Chevigny).

3.2.4 Lower Devonian coarse arkosic sandstone (ASS)

This type of rock belongs to a group of poorly sorted coarse-grained to microconglomeratic arkosic sandstones ('subarkose' according to the Folk (1974) classification) mainly composed of quartz granules and pebbles. Lithic fragments are also present in the rock and are dominated by light coloured (beige to grey) lithoclasts. The sample from Oudenburg however, is a finer-grained variety and lithoclasts are almost completely absent. Only a few coarse quartz grains or granules occur. The rock varies in colour from grey with salmon pink hues to pink and pale red and light brown.

In thin-section it is a poorly sorted arkosic sandstone that is dominated by monocrystalline quartz (based on thin-section sample 021-070, Figure 10.4). However some polycrystalline quartz are also present. The quartz is generally subangular with few dispersed rounded grains. Some zones have developed a quartzitic structure with very irregular and vague sutured contacts. In only a few places a phyllitic cement is present. Many quartz grains show undulose extinctions and intern vacuoles of fluid inclusions pointing to a mechanical deformation of the rock. The stone contains numerous feldspars crystals (orthoclase, microcline and albite) that are often partially or strongly weathered. Furthermore different rock fragments of sandstone, siltstone, slate, (micro-) quartzite and (strongly weathered) igneous rock do occur. We also noted the presence of accessory minerals: some small and thick detrital mica flakes (muscovite), 'muscovite chlorite sandwiches' and some rare tourmaline grains.

The rock is Lochkovian in age (Lower Devonian, lower third of the Oignies Formation. Goemaere and Hartoch (2015) locate outcrops of this specific rock at the southern and the southeastern borders of the Rocroi Massif through the region of Transinne (province of Luxemburg, Belgium). Millstone quarry sites have not been identified at present. However, some small undated quarries are known in the region of Gedinne (Goemaere and Hartoch 2015).

3.2.5 Paleozoic black micro-quartzite (PSS)

This rock is a dark-grey to black micro-quartzite (very fine-grained sandstone to siltstone) and can probably be ascribed to the Revin Group (Middle to Upper Cambrian).[265] They have outcrops to the south and south-east of the Rocroi Massif (France, Belgium) (Verniers *et al.* 2001). More schistose varieties of these rocks were used for the production of whetstones during the Roman period (see the aforementioned Cambrian silt- and sandstones (Deville and Revin Group)).

3.2.6 Paleozoic quartzitic (lithic) arenites (or sandstones) (GQL and Houiller SS)

This lithological category groups sandstones based on similar macroscopic characteristics. They correspond to fine- to coarse-grained (quartzitic) sandstones, light grey, grey, brown grey, bluish grey to dark grey in colour. Based on thin-section petrography of three samples, we define two subgroups: Lower Devonian quarzitic

265 **Only one complete ointment palette was macroscopically investigated. Thin section analysis was not possible.**

litharenites (samples 021-215, 021-136, Figure 10.4) and an Upper Carbonifereous litharenite (sample 021-213, Figure 10.4). As it is difficult to distinguish these subgroups in hand-specimen, we describe them together as one group (GQL).

Lower Devonian quarzitic litharenites (GQL)
In thin-section this is a well-sorted quartzitic (sub-) lithic sandstone that is dominated by subangular to subrounded quartz grains, developing a quartzitic structure. Because of an intense pressure-solution the contacts between the grains are sutured. The intensity of quartzitic structure differs from one thin-section to another. In some samples the original grain boundaries can no longer be identified, while in some other thin-sections we observe recrystallized clay minerals around the quartz grains resulting in brown colours. The weathering of chlorite present in the lithic fragments results in a chlorite cement (*e.g.* sample 021-136, Figure 10.4). The weathering of this ferruginous mineral, in his turn, results in orange-brown colours. Syntaxial quartz cement on detrital quartz grains is also present (*e.g.* sample 021-136). Furthermore the rock consists of a varying proportion of lithic debris like volcanic rock, shale, chert and other siliceous rock fragments. Following accessory minerals were noted: tourmaline, zircon, muscovite, biotite and opaque mineral particles.

These rocks are Lower Devonian in age (Lochkovian, Pragian or Emsian). Outcrops are located especially along the northern and eastern borders of the Dinant Synclinorium (Pragian and Emsian), in the Sambre and Meuse valleys. Furthermore the presence of outcrops north of the Rocroi and Stavelot-Venn massif is quite possible (Lochkovian and Emsian). The Pragian quarzitic litharenites could derive from the Bois d'Ausse Formation with outcrops along the northern and eastern limbs of the Dinant Synclinorium and in the Vesdre Nappe (Bultynck and Dejonghe 2001, 45).

Upper Carboniferous sandstone (Houiller SS)
In thin-section this rock is a badly sorted litharenite, characterized by a rich and varied assemblage of dark-coloured lithic fragments (Figure 10.4: 021-213). We observe fine-grained siliceous rock fragments, metamorphic rock fragments and schistose rock fragments (*e.g.* phyllites, microschists). Together with the angular to subangular detrital quartz, they are partly cemented by secondary quartz (in optical continuity with primary grains) and recrystallized clay minerals. As a result, some zones show a quartzitic structure in thin-section. Different varieties of quartz occur: quartz vein, metamorphic quartz and volcanic quartz, all pointing to various geological provenances. Furthermore we noticed a modest to low amount of weathered and fresh feldspars including plagioclase and microcline, some micas (muscovite) and chlorite. Occasionally organic material (coalified plant debris) has been observed in thin-section.

This rock is situated in the Late Upper Carboniferous (Silesian, Namurian and Westphalian). Several important sandstone beds occur within the Belgian Coal Measures Group, for example within the Andenne Formation (Namurian). Furthermore, there are many other potential sandstone beds in the Westphalian ('Westphalian sandstones') associated with particular coal seams, each bearing their own names (Dusar *et al.* 2009, 247). These rocks outcrop north of the Dinant Synclinorium, along the Meuse and the Sambre valleys.

3.2.7 Paleozoic river-borne pebble- and cobblestones (RIV SS)

This heterogeneous group of rocks[266] is composed of material that has been intensively rounded by fluvial transport. They represent an amalgam of very fine-, fine- to medium-grained quartzites and quartzitic sandstones. They display grey to dark-grey and greenish grey colours.

These cobbles and pebbles may derive from various fluvial gravel terrace deposits. The pebbles and boulders were generated as the result of the erosion of Paleozoic rocks of the Ardennes (*e.g.* Massif of Stavelot and Rocroi, Cambrian, Devonian and Carboniferous Formations), Vosges area (Lorraine) and the Rhenish Massif. During the glacial periods of the Pleistocene, intensive frost weathering lead to the splitting and disintegration of these rocks. Only the most resistant rock types survived. Limestones and fissile rock types are totally lacking. Boulders and pebbles were transported through meltwater and ice-rafting (huge boulders) and deposited further downstream in the Meuse valley of the province of Limburg (Campine plateau) and in the Lower Rhine region of Germany and the Netherlands. Alternatively, the cobbles and pebbles could have been collected upstream along the rivers, for example in the alluvial plain of the Meuse valley and its tributaries (Dhaeze and De Paepe 2004; Dreesen *et al.* 2014b; Dusar *et al.* 2009; Kars 1983).

3.2.8 Upper Devonian Famennian sandstone (FAM SS)

This is a (very) fine- to medium-grained, highly micaceous sandstone, light grey, grey to greenish grey in colour.[267] This rock is assigned to the upper Famennian (Upper Devonian). The different Famennian lithostratigraphic units outcrop in the Namur and Dinant Synclinoria, the Vesdre Nappe and the Theux Window. The upper Famennian (Condroz Sandstone Group) is especially well-exposed along the northern border of the Dinant Synclinorium. Following formations within this group contain micaceous sandstones: the Esneux Formation, the Ciney Formation, the Montfort Formation and the Evieux Formation (Bultynck and Dejonghe 2001, 58; Thorez *et al.* 2006).

3.2.9 Cretaceous Wealden sandstones (WEALD)

This rock is an (olive) greenish grey (when fresh) to light brownish gray (when weathered), very fine- to fine-grained, well-sorted, well-cemented and luster-mottled, calcareous quartz sandstone. Lustre mottling is the typical macroscopic appearance of so-called

266 Stone tools from this type of rock type were not microscopically investigated. For thin section descriptions of similar objects from other sites we refer to Reniere 2018, 175-176.

267 Stone tools from this type of rock type were not microscopically investigated. For thin section descriptions of similar objects from other sites we refer to Reniere 2018 , 171.

poikilitic calcite cement: it is the shimmering appearance of a broken surface of a calcareous sandstone, produced by the reflection of light from the cleavage faces of conspicuously large calcite crystals (cement) incorporating detrital sand grains. Sometimes a faint stratification (lamination) can be seen in hand specimens. Furthermore, tiny white shell fragments and dark-brown to black granules (carbonaceous material or phosphate grains?) can be observed as well.

In thin-section, the rock is a well-sorted, very fine- to fine-grained calcareous sandstone composed of angular to subangular quartz grains (based on samples 021-114, 021-161, 021-214 and 021-209; Figure 10.4)[268]. The quartz grains are both monocrystalline (dominant) and polycrystalline in origin. Their average grain-size varies between 80 and 150 µm. The sparitic (coarse-grained calcite) cement is poikilitic (lustre-mottled). Dark-green rounded grains of glauconite are present, but their number is restricted to a few specimens per thin-section. Locally, this glauconite is strongly oxidized (dark brown grains). Mica flakes (muscovite) are common. Lithic fragments are frequent, including chert, sericitic sandstone and quartzite. Relatively fresh K-feldspars and plagioclases are present. Bioclasts (fossil debris) are common but their frequency varies from one thin-section to another. These bioclasts are often concentrated in thin layers inducing a preferential orientation parallel to the bedding. They consist of strongly eroded (displaying borings) thin shell fragments (frequent; most probably pelecypods, with a lamellar texture), echinoderm fragments (common) such as crinoids (with a typical sieve structure), dark rounded phosphatic grains (collophanite, *e.g.* altered fish bones and teeth or ichtyoliths) and rare ostracod shells or fragmented plurilocular foraminifera. Most pelecypod and echinoderm fragments are strongly impregnated with framboidal pyrite, darkening the bioclasts. Irregular black carbonaceous debris of varying size are common in some thin-sections: these can be related to carbonized or charred plant remains, especially if anatomical structures (very rare) are still present (charcoal). Natural oxidation of the (slightly ferroan) calcite cement, pyrite or glauconite grains, may account for the characteristic light brownish grey patina of the stone.

This rock is attributed to the Wealden Clay Formation (Lower Cretaceous, Wealden Group) and was most probably extracted in the northwestern part of the Weald area in South-East England (Sussex). Within this dominantly clayey formation (thickness up to 450 m), at least 30 thin mappable sandstone units occur with an individual thickness of a few to a few tens of meters. For whetstones the Romans favoured thin-bedded flagstone-like sandstone beds, like for example the thinly bedded sandstone unit that has been assigned to a member status, known as the Horsham Sandstone. This fine-grained calcareous sandstone unit has a distinctly thin-bedded character allowing it to be easily split into slabs, ideal for the extraction of bar-shaped whetstones. Many other Wealden sandstone beds in the Wealden Clay Formation existed (over 30 beds) and a complete investigation of each of those sandstone beds (taking into account the lateral facies variation) is almost impossible. Therefore the term 'Wealden Sandstone' is used in a generic sense for any sandstone that is believed to originate from within the Wealden Group, but is otherwise of uncertain lithostratigraphic position. Our attribution is based on comparative petrography (incl. comparative grain size analysis) on samples from local *in situ* Wealden sandstone beds (*e.g.* Horsham sandstone member) and on thin-sections from the Wroxeter whetstone blanks studied by Allen and Scott (2014) that were assigned a similar provenance. For a more exhaustive analysis and discussion on the provenance analysis we refer to Reniere *et al.* 2018b.

Finally we note that in the past this rock type has been erroneously identified as Kentish Ragstone (Morey and Dunham 1953) and this term has been used (probably often incorrect) in later whetstone publications (*e.g.* Kars 1983, 29-31).

3.2.10 Cretaceous Greensand sandstone (GRS SS)

Although macroscopically this rock is very similar to the above described Wealden sandstones, petrographic investigation defines clear differences (sample 021-117, Figure 10.4)[269]. The cretaceous Greensand sandstone is a very fine-grained (silty) calcareous sandstone with subangular to subrounded sand grains and numerous strongly oxidized brown glauconite grains and few elongated thin-shelled debris. The sand is dominantly composed of monocrystalline quartz (sometimes with inclusions). Some feldspars and a few tourmaline minerals occur. In comparison with the Wealden samples, muscovite flakes, polycrystalline quartz (quartzitic grains), chert grains, black lithoclasts, crinoids and forams are lacking.

This rock can be attributed to the Lower and Upper Greensand Group (Lower Cretaceous) and was probably extracted from outcrops encircling the Weald in South-East England (Kent, Surrey and Sussex) (Allen 2014).[270] Other outcrops more to the north and west are also possible.

3.2.11 Upper Paleocene, Landen Group quartzarenites and quartzites (LG SS)

These quartz-rich quartzarenites are fine- to medium-grained silicified sandstones ranging from light grey to cream to whitish in colour, sometimes displaying red and pink shades.

In thin-section it is a very pure, fine- to medium-grained, quartz-rich sandstone (quartzarenite) (based on thin-section samples 021-178 and 021-200). It has a generally well-sorted texture with rounded to subrounded quartz grains. Most common are monocrystalline quartz grains with only few polycrystalline quartz. The interlocking quartz grains are cemented by syntaxial, secondary quartz overgrowths. The original grain morphology is visible by a clear dust rim. Depending on the degree of cementation, some samples can display a rather quartzitic texture. Sometimes the intergranular voids are not completely cemented or even completely devoid of cement producing a low to moderate (primary) porosity. Some samples can contain a moderate amount of glauconite

268 Petrographical descriptions and micrographs by dr. R. Dreesen.

269 Petrographical description and micrograph by dr. R. Dreesen.

270 We are grateful to prof. dr. J.R.L. Allen for this determination.

grains, whereas in other samples they are completely absent. Rock fragments are almost absent, only some resistant chert (flint) is observed. Occasional accessory minerals are tourmaline, zircon and rutile. Furthermore, some rare feldspars (*e.g.* microcline and plagioclase) are present.

This rock is of Thanetian and Lower Ypresian age (Late Paleocene – Early Eocene) and can be attributed to the Landen Group (former 'Landenian'). It consists of the Tienen Formation (Dormaal Member, former 'Upper Landenian') and Hannut Formation (Grandglise Member, former 'Lower Landenian') (De Geyter *et al.* 2006; Laga *et al.* 2001). In hand-specimen it is very difficult to distinguish between the different facies of the 'Landenian sandstones', except for some very typical varieties like *e.g.* the very fine-grained Wommersom quartzite. The presence of glauconite can be indicative for the Hannut Formation, the marine facies of the Landen Group. However, this easily weathering mineral is often lacking, even within the marine formations. Furthermore, the more porous and less cemented variants can probably situated in the same Hannut Formation. Nevertheless, also the sandstones from the Erquelinnes Member (Tienen Formation) are generally less well-cemented, less compacted and have a more sandy appearance (Veldeman *et al.* 2011).

Deposits of this type of rock are known from the Pays de Bray (north of the Paris Basin, France) until Landen (province of Vlaams-Brabant, Belgium) passing by Binche (province of Hainaut, Belgium). Some outcrops are known in northwestern France (surroundings of Arras, Béthune and Valenciennes) and from Belgium in the province of Hainaut. Similar rocks, like the Tienen and Wommersom 'quartzites' are reported from other Tertiary formations like the Formation of Tienen (Hesbaye area and province of Hainaut, Belgium). They were often extracted from isolated large surficial boulders, or so-called 'erratic sandstones', remaining silent witnesses of eroded sand deposits. Nevertheless, in more recent periods they were quarried *in situ* (Dusar *et al.* 2009). No quarry sites are documented for the Roman period.

3.2.12 Lower Eocene glauconite-bearing quartzarenite (VS)

This rock is a fine- to medium-grained greenish to bluish grey quartzitic and glauconite-bearing sandstone. Very diagnostic are the dark-green to black, round to oval glauconite grains in hand-specimen.[271] The rock is attributed to various formations and members of the Ieper and Zenne Group (Cenozoic, Paleogene, Lower Eocene, Middle to Late Ypresian). Outcrops of a 'northern facies' are known from central West Flanders (reaching from Bruges, Beernem to Tielt and Torhout) and northwestern East Flanders. Outcrops of a 'southern facies' are also known in southern East Flanders (De Jonghe *et al.* 1995; Dusar *et al.* 2009; Fobe 1996). Furthermore some sandstone blocks can be found on the beaches of Knokke (Belgium) and Cadzand and Nieuwvliet (the Netherlands). They originate from the erosion of offshore sand banks in the North Sea (Dusar *et al.* 2009). In the wider region it is referred to as 'fieldstone' ('veldsteen' in Dutch).

3.3 Sedimentary biochemical carbonate rocks

3.3.1 Tournai limestone (TLS)

This is a dark-grey, fine-grained, thin-bedded argillaceous and locally silicified limestone.[272] It has a typical shaly cleavage weathering resulting from the important clay content. Fresh raw material is dark bluish-grey to black in colour but it becomes pale-grey, beige to brown-beige through weathering (patina). Thin black chert lenses are quite common but they are restricted to particular stratigraphic levels. Macrofossils (*e.g.* crinoids, brachiopods, rugose and tabulate corals, and bryozoans) occur in some beds but they are lacking from the facies that was used for the production of the palettes.

The rock is Tournaisian in age (Tournai and Antoing Formation, Dinantian, Lower Carboniferous (Poty *et al.* 2001) and outcrops in the Scheldt valley in the Hainaut province (Belgium). Different potential quarries are located along the Scheldt banks, south-east of the city of Tournai.

3.3.2 Micritic limestone (MICR LS)

This rock is a pale-green micritic limestone consisting of lime mud (Figure 10.4: 021-171). Few phantoms of unspecified microfossils, filled with calcite and quartz, are observed. Abrasive particles or grains are almost absent. Presence of chlorite is possible. At present a geological age or provenance area could not be assigned.

3.4 Sedimentary biochemical rock: iron carbonate ore

Septarian concretion (SEPT)

One object has been determined as a septarian nodule or concretion. It is a light-brown to grey fine-grained rock and has a semi-nodular shape, with internal angular cavities or cracks. Such concretions are made of ferruginous carbonate with occasional siderite and pyrite coatings on the walls of the cavities. As a result of diagenetic mineral precipitation due to microbial activity, they occur as bread-like concretions within the Boom Clay Formation (Rupelian, Lower Oligocene), with outcrops known in northeastern Belgium (provinces of Antwerp and Limburg) (Vandenberghe *et al.* 2014).

271 Oudenburg stone tools from this type of rock were not microscopically investigated. For thin section descriptions of similar objects from other sites we refer to Reniere 2018.

272 This carbonate rock was not microscopically investigated.

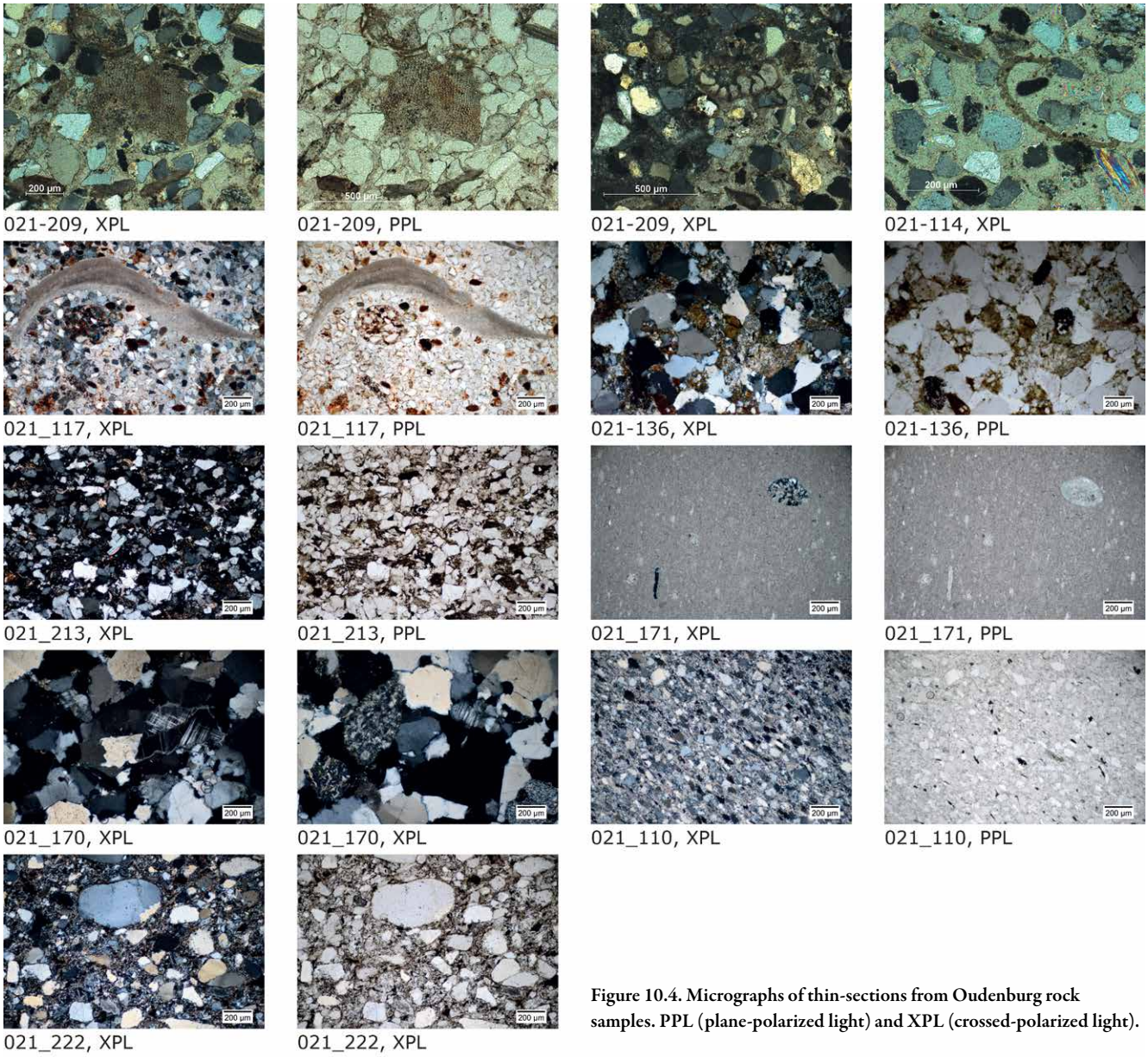


Figure 10.4. Micrographs of thin-sections from Oudenburg rock samples. PPL (plane-polarized light) and XPL (crossed-polarized light).

3.5. Metamorphic rock

3.5.1 Cipollino verde mandolato marble (CVM)

This is a weakly metamorphosed nodular limestone. Typical are the white, fine-grained calcareous and almond-shaped nodules. These show strongly chloritised rims and a paler green chlorite/calcite matrix. This limestone is assigned to the late Famennian (Paleozoic, Upper Devonian) and is found in the central Pyrenees, in the Campan river valley (Hautes-Pyrénées and Ariège departments, France) (Corsi Collection 2016). Antonelli (2002) pointed out that the Pont de la Taule quarry was active during the Roman period. Locally it is also known as 'marbre griotte' or 'marbre Campan' (Corsi Collection 2016).

3.5.2 Slate (SL)

Slate is a very fine-grained metamorphic rock, occuring as very thin plates with a grey to dark grey colour and has a pronounced cleavage leading to a good fissility. We can quote several potential provenances: the region of Jodoigne around the Brabant Massif (Cambrium), the region of Thiérache around the Rocroi Massif (Cambrium) and the broad region of the High Ardennes in the southern part of the province of Luxemburg (Lower Devonian, La Roche and Mirwart Formations) (Dusar *et al.* 2009, 383-394).

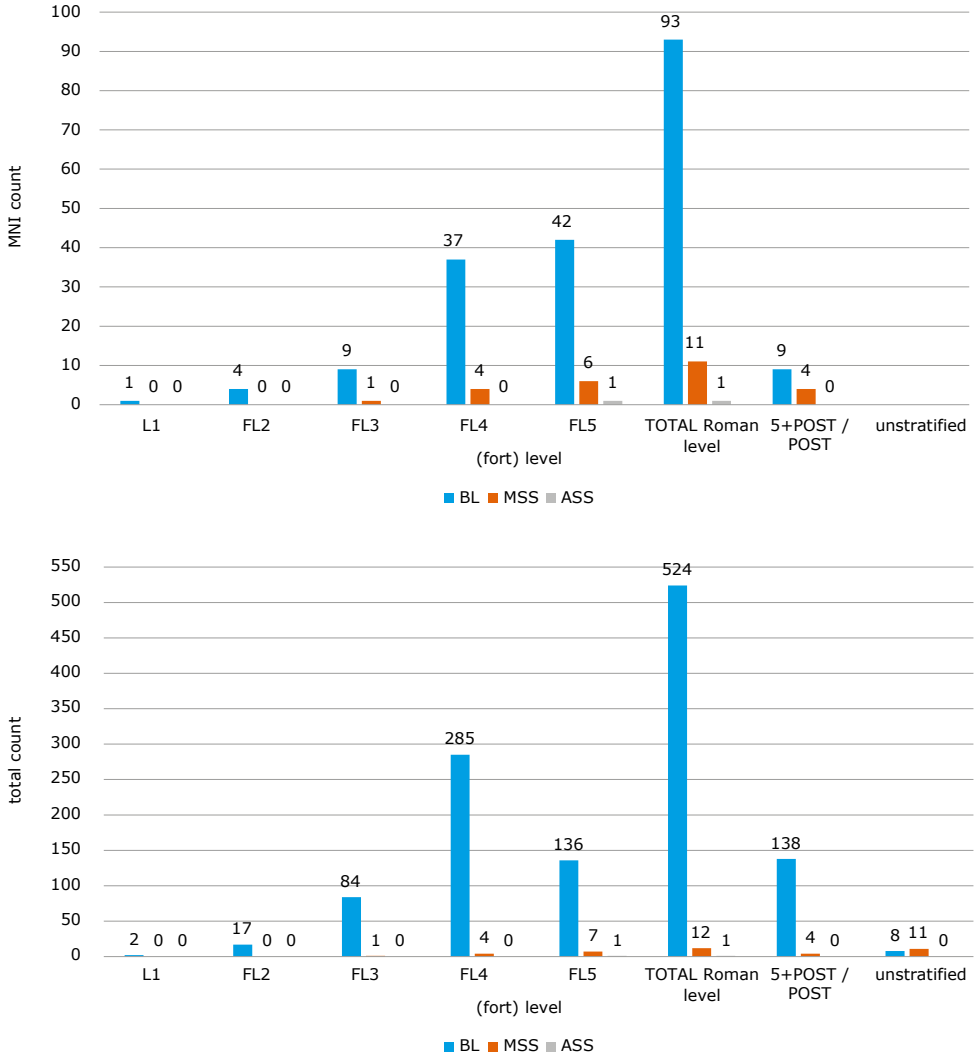


Figure 10.5. Querns and mills per lithological group according to the stratified evidence (MNI and total count).

4. Quantitative typological and morphological analysis

At the south-west corner site and the two north-east corner sites (site Jacali and site Kapellestraat) in total 845 (fragments of) stone implements were recovered.

Within the group of whetstones, polishers, abraders, mortars and paraphernalia we inventoried 138 stone objects, with a total weight of 16 kg (Table 10.5). At least nineteen different lithologies were identified. Best represented is the group of the bar- and rod-shaped whetstones carved in greyish blue Cambrian silt- and sandstone (CAMB SS 1, n=57). The second largest group consists of Wealden calcareous sandstone bar-shaped whetstones that were imported from the Weald area in South-East England (Sussex) (n=26). Two other quantitative important lithologies are the green Cambrian silt- and sandstones from the Deville Group (CAMB SS 2, n=11) and the Paleozoic quartzitic (lithic) sandstones (GQL, n=11) and yield exclusively bar- and rod-shaped whetstones. Furthermore we note the presence of Landen Group quartzarenites and quartzites (LG SS, n=7) and river-borne pebble- and cobblestones (RIV SS, n=5). They are characterized by an amalgam of different shapes and functions: bar, ball, cube, disc, plate and tabular-shaped objects used for whetting, polishing and abrading purposes. The remaining lithologies include different sandstones, limestone and slate and are only present with min. one to max. three objects with various shapes that were used for different purposes (Figure 10.6).

Within the group of ointment palettes we studied seven objects in detail. Another two complete specimens from old collections were also taken into account (Table 10.5). The ointment palettes are represented by four lithologies. Five palettes were imported from regional sources (Tournai limestone: n=4 and a black Paleozic microquartzite: n=1) whereas three others have a more exotic origin (Egypt: n=2 and French Pyrenees: n=1) (Figure 10.6).

Within the group of milling equipment we counted 698 fragments of querns and mills with a total weight of 342 kg representing 118 MNI (*catillus* or *meta*) (Table 10.3). The hand-operated querns are in the majority with 105 MNI. For the mechanical

driven mills we noted 13 MNI. In comparison with the other ground stone tools, the variability of raw materials for grinding equipment is less diverse. Only three different lithologies can discerned of which querns and mills carved in basaltic lava from the Eastern Eifel Bellerberg quarries are predominant: 102 out of 118 MNI (86.4%) or 670 out of 698 fragments (96%). The assemblage is completed by Macquenoise sandstone querns (27 fragments or 3.9%) or 15 MNI or 12.7%) and one arkosic sandstone mill (0.85% of the MNI) (Figure 10.5).

In terms of chronology, fort levels 4 and 5 have yielded the largest number of stone implements, followed by fort level 3 with a significantly smaller number (see Table 10.4 and Table 10.6-10.7, Figure 10.5). The first two fort levels are underrepresented in stone tool finds. In what follows each group will be discussed in more detail from a quantitative typological and morphological point of view.

4.1 Querns and mills

4.1.1 Macquenoise sandstone (MSS)

Within the group of Macquenoise sandstones we count 27 quern fragments (n=27, MNI=15) or six *meta* fragments (5 MNI), eleven *catillus* fragments (9 MNI) and ten undetermined fragments (1 MNI).

Meta (n=6, MNI=5)

Two different edge types can be determined: type 1 (n=3) and type 2 (n=2). The edge heights are situated between 3 and 6.4 cm. The diameter of all querns could be determined and ranges between 30 and 50.6 cm. Two fragments fit together (cat. nos 021-025 and 021-080, Plate CCCLXXII) and represent one half of a *meta* with a diameter of 50.6 cm and a weight of 15 kg. Quern 021-056 is a completely preserved *meta* with a diameter of 34 cm and a weight of 8.8 kg (Plate CCCLXXII).

The spindle holes are exclusively dominated by a type which perforates the stone (type 2). Following subtypes are observed: type 2a (n=1), type 2b (n=1) and type 2d (n=1). The spindle hole diameter ranges between 2.4 and 6.4 cm and their heights between 3.5 and 5.7 cm.

On quern 021-056 a superficial horizontal groove is observed along the edge. It is concave in profile and is 1 cm high. The inner surface of the groove is smoothed. It is not clear whether this kind of use-wear is linked with primary or secondary use. If of primary use it could potentially be linked with the way these querns were secured. A hypothesis is that they were mounted on a platform with a band or fittings made of metal or wood. Similar grooves are known on the edge of upper stones that are related with the presence of a metal band that served as a driving mechanism for hand driven querns (Jaccottey *et al.* 2011).

Catillus (n=11, MNI=9)

Two different edge types can be determined: type 1 (n=6) and type 2 (n=2). The edge heights are situated between 5.5 and 8.3 cm. Four diameters could be determined; they range between 32.7 and 35.4 cm.

Furthermore we notice a difference between *catilli* with (n=3) or without (n=2) an expressed rim (quasi-flat to slightly convex) around the edge. The difference between both is not always clear in view of the existence of intermediate forms with a slightly 'marked rim'. Exemplary for the difference between both is the comparison between *e.g.* quern 021-069 and quern 021-029 (Plate CCCLXXI).

Only six feed holes are preserved and are of type 2c (n=5) (circular eye with perforating dovetailed rynd hole) and of type 1a (n=1). Two feed hole diameters could be determined: 8.5 cm (cat. no. 021-106) and 9.8 cm (cat. no. 021-079) (Plate CCCLXXI). The three determined feed hole heights are: 3.5, 3.8 and 4.2 cm.

Three handle slots are preserved and consist of a lateral obliquely perforated handle socket (type 4), starting from the rim side until the upper part near the eye of the *catillus*. The handle hole itself has a circular shape. The only complete *catillus* is quern 021-106 (Plate CCCLXXI). It is a rather small quern stone of 35.4 cm diameter.[273] The quadrangular feed hole appears to be damaged and was in origin probably a type 2c with circular eye and dovetailed rynd hole. The active side consists of a complex of straight furrows organized in eight sectors.

Meta - catillus

The dressing of the active surfaces of *meta* and *catillus* stones is exclusively dominated by dressing type 6: a complex of straight furrows that are organized in several sectors. It is also known as segmental radial grooving (Shaffrey 2006, 31-34). Based on morphological/typological aspects and stratified evidence we believe that cat. no. 021-068 (Plate CCCLXXII) and cat. no. 021-069 (Plate CCCLXXI) could belong together as a quern couple (*catillus* and *meta*).

4.1.2 Lower Devonian coarse arkosic sandstone (ASS)

Only one large fragment of this rock has been found at Oudenburg and is determined as a *catillus* (cat. no. 021-070, n=1, MNI=1). It weighs 11.2 kg and has a diameter of 52.6 cm (Plate CCCLXX). As such it flirts with the limits of a hand driven versus mechanical driven mechanism. However, we lack further clear indications (*e.g.* handle slot, blind rynd seating, etc.) for the determination of a precise driving mechanism. It has a type 3 oval-shaped feed hole (maximum width of 12.5 cm; 5.2 cm high) and is characterized by a very particular stepped profile. It is comparable to a sunken rynd facility. However, it runs around the entire feed hole, which is not functional to install a rynd. A precise function is left undetermined. Furthermore we note the presence of four small U-shaped smoothed

273 **Its weight could not be defined. This *catillus* is part of the RAM (Roman Archaeological Museum Oudenburg) permanent exhibition collection and displayed in an inaccessible exhibition case.**

zones or notches on both the active and the passive side: two situated against the feed hole and the two others in line situated on the rim side. An important aspect here is that on the lower surface (the active side) and towards the broken edge, the smoothed zone continues on the fractured surface. This observation is in favour of secondary use, rather than a function that is linked with the driving mechanism. These zones could for example be the result of suspending the mill fragment with a rope. The *catillus* has an inward inclined edge (type 3) and an active side with a dressing type 6. At least five sectors consisting of parallel straight furrows are noticed. Compared with the in the wider region more common mills in coarse grained rock variant, this dressing type is remarkable. More frequent is a random pecking pattern. Furthermore they often show pronounced (sometimes deep) concentric grooves on the active surfaces and are the result of concentric wear. Another remarkable difference is the slightly domed profile of the non-active side of this *catillus* versus a more flat or hopper-shaped as mainly noted for the coarser-grained variants.

4.1.3 Basalt lava (BL)

Within the group of basaltic lava we count 670 fragments: 657 quern fragments and thirteen mill fragments (n=670, MNI=102). The hand driven quern category comprises 50 *meta* fragments (43 MNI), 54 *catillus* fragments (45 MNI) and two undetermined fragments (1 MNI). Within the category of the mechanical driven mills four *catillus* fragments (4 MNI), five *meta* fragments (5 MNI) and four undetermined fragments (4 MNI) are counted. Of the 670 fragments 551 pieces are too small to identify further and do not represent a MNI (Table 10.4).

Hand driven querns

Meta (n=50, MNI=43)

The edge types are dominated by vertical edges (type 1, n=17). Type 2 with outward inclined edge (n=7) and type 3 with inward inclined edge (n=6) also occur. The edge height varies between 2.6 and 9 cm (average height 4.7 cm, based on 30 specimens). The *meta* diameters vary between 36 and 45.4 cm and have an average diameter of 40.9 cm (based on nineteen specimens). This is conform to what is generally attested for *metae* in this type of rock (see *e.g.* Hörter 1994).

All spindle holes (n=7) perforate the mass of the quern (type 2, n=7) and are circular in shape. Both vertically shaped profiles (type 2b, n=3) as well as profiles widening towards the passive side (type 2d, n=8) occur. One specimen is too fragmented and consequently can only generally be classified as type 2. The spindle hole heights range between 3 and 6.8 cm and are in average 4.4 cm high (based on eight specimens). The spindle hole diameter varies between 3.3 and 4.8 cm and has an average of 4.1 cm (based on seven specimens). We notice the particular profile of quern 021-073 (type 2d) (Plate CCCLXIX), which narrows to the upper side as the result of a concave little bulge. Several spindle holes show traces of smoothing and polish along the inside, probably as a result of continuous friction with the spindle during grinding (*e.g.* cat. nos 021-014/059/073/088) (Plate CCCLXIX: 021-073, 021-088).

Typical for the lower stones is furthermore the strongly dished underside, which resulted in a lower weight, making these millstones much easier to handle, during transport for instance (Gluhak 2010a, 23) (see Plates CCCLXVIII-CCCLXIX).

Catillus (n=54, MNI=45)

The determinable edge types are almost exclusively dominated by vertical edges (type 1, n=14). Also inward inclined edges (type 3, n=5) and outward inclined edges (type 2, n=1) occur. The edge height varies between 3.2 and 8.1 cm, with an average of 5.6 cm (based on 26 specimens). The diameter varies between 31.2 and 44 cm, with an average of 40.1 cm (based on 18 specimens) and is herewith conform to what is generally attested for *catilli* in this rock (see *e.g.* Hörter 1994). A distinctive characteristic for basalt lava querns and mills is the presence of a wide band-shaped rim around the edge (Hörter 1994, 28; Mangartz 2008, 82). In Dutch literature it is often referred to as the 'Westerwijtwerd type'. It is the successor of the 'biconcave' type 'De Brillerij', which is typical for the (Late) Iron Age (Harsema 1979).

The determinable *catillus* rim types from Oudenburg (n=21) are dominated by an unpronounced band-shaped rim and is almost absent in transversal section (n=18) (type 2). It is only marked by a thin shallow carved circular line. These specimens are furthermore characterized by the quasi absence of a hopper and a wide rim (average width: 6.6 cm, min. 4.5 cm, max. 7 cm) (*e.g.* Plate CCCLXVII: 021-060, 021-094 and 021-102). Three querns have no pronounced rim and have an almost unpronounced or even absent hopper and are categorized as type 3 (Plate CCCLXVI: 021-047, 021-058). Type 1 with a prominent band-shaped rim that runs around the hopper and with a considerable height has not been noticed in Oudenburg.

The handle slot type is exclusively dominated by a superior placed horizontal sunken handle socket (or 'blind' handle hole) on top of the rim, which is often wedge-shaped and does not reach the eye (type 6, n=7) (Plate CCCLXV: 021-046, Plate CCCLXVI: 021-048, 021-052, Plate CCCLXVII: 021-078, 021-102). Within this group we categorize also quern 021-052 who has been provided with two different types of handle slots: type 6 and type 1 (Plate CCCLXVI). The latter is situated on the median part of the edge, has a V-shaped profile, is 3.2-3.5 cm deep and 2.2 cm high. The width cannot be recorded as it is only partly preserved (min. width of 1.6 cm).

Feed hole/rynd slot type 3 is quantitatively best represented with nine specimens out of fourteen. Seven are very fragmented and can only generally be determined as type 3. They are 4-6.7 cm high and between 4.6 cm (feed hole diameter) and 19.2 cm (rynd slot) wide. The remaining two represent two subtypes: 3a and 3b. One quern has a circular eye with a rectangular sunken rynd slot (type 3a: cat. no. 021-005, 1.8 cm high, 17.6 cm wide, Plate CCCLXV). The rectangular slot has a special transversal stepped profile on which we notice the presence of iron oxides. These traces are probably the result of use-wear caused by an iron rynd. The other querns have a dovetailed sunken rynd slot (type 3b, cat. no. 021-052: 2.7 cm high and 14.6 cm wide, Plate CCCLXVI). Particular about the latter is that it has an oval-shaped eye. One quern (cat. no. 021-015) is a syncretic type and merges a sunken rynd slot on top of the non-active

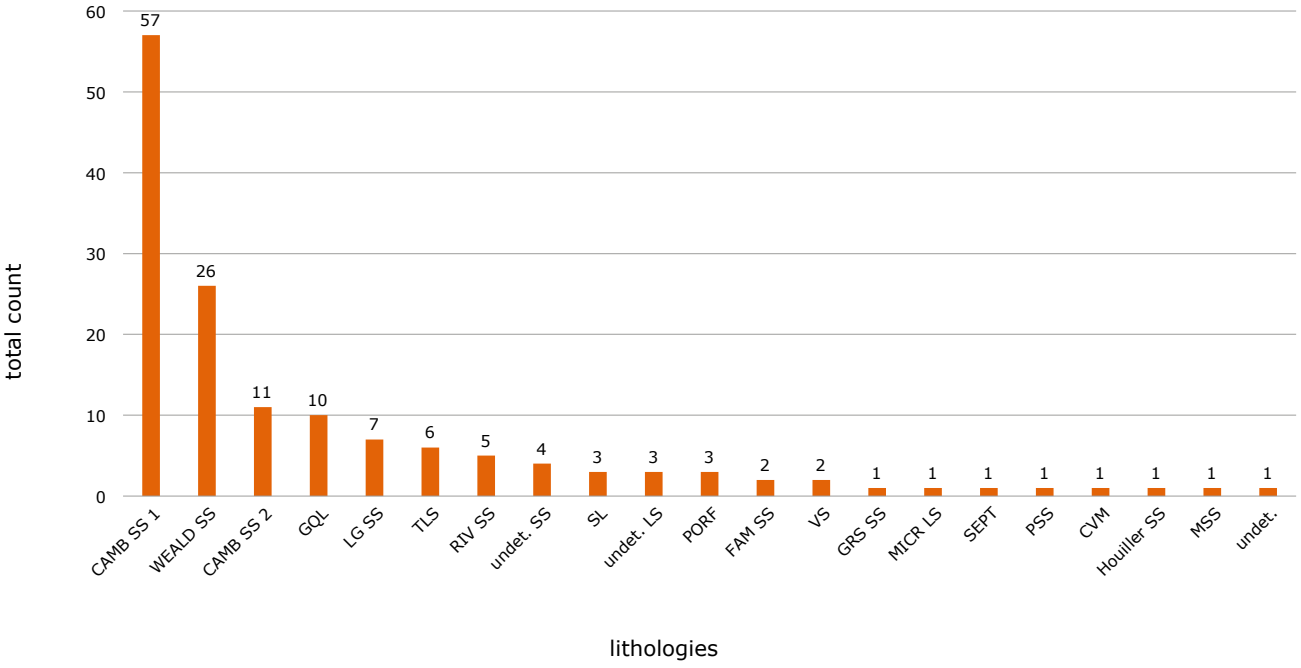


Figure 10.6. Whetstones, abraders, polishers, ointment palettes and paraphernalia per lithological group (total count, all (fort) levels).

quern face (type 3) with a shallow circular-shaped recess on the active side (type 4). The latter is difficult to interpret, as it is probably not deep enough to function as a real rynd slot. The feed hole is 2.7 cm high and 4.8 cm wide. Finally, within this type 3 there is another important typological feature that is worth drawing attention to, namely the connection between the rynd slot and the feed hole. There are two different ways in which they can be connected: or a little edge is situated between both (*e.g.* cat. nos 021-078, 021-062, 021-039 and 021-040), or the rynd slot is directly connected to the feed hole itself (*e.g.* cat. nos 021-103 (not ill.), 021-005 and 021-052) (Plate CCCLXV-CCCLXVII). One quern has a feed hole type 1a, a simple circular eye (cat. no. 021-094: 4.9 cm diameter, 2.7 cm high, Plate CCCLXVII). Type 2 (n=1) is represented by one quern (cat. no. 023- 003). The feed hole here has a circular to rectangular eye with a rectangular rynd hole (type 2b/e, 2.2 cm high and max. 15 cm wide). Two specimens could belong to either type 1 or type 2 (cat. nos 021-047 and 021-082, diameter 6.4 cm and feed hole height of 3-3.5 cm, Plate CCCLXVI and CCCLXVII).

Meta - catillus

The dressing of the *metae* and *catilli* consists almost exclusively of type 6. Some active surfaces became very smooth after intensive use and clear dressing patterns are difficult to distinguish in these rare cases. One *meta* could have been (re-)dressed with a type 1 pattern (cat. no. 021-053).

The groove patterns on the non-active faces and on the edges of both *catillus* and *meta* are very typical for basalt lava querns (*e.g.* Hartoch 2015; Jodry 2011, 88; Picavet 2011, 182; Shaffrey 2003, 154-155). Vertical parallel grooves occur on the edges; some exceptions with oblique grooves also occur. On the non-active faces of the *catillus* fragments we note the presence of (in general) four perpendicular sectors that consist of a series of parallel grooves running from the eye until the outer edge of the band-shaped rim. A comparable but less regular pattern exists on the non-active faces of *meta* stones. Due to the poor conservation of this rock type, these patterns became very vague or even totally disappeared. They seem to have had no function and until now they are generally interpreted as decoration (Hartoch 2015) or as a trade mark signature (Mangartz 2008, 82-83).

Meta 021-093 (Plate CCCLXIX) and *catillus* 021-094 (Plate CCCLXVII) were probably part of the same quern couple as both were found in the primary filling of waste pit OS4980 of fort level 4.

Provenance

Nine quern fragments (five *catilli*, three *metae* and one undetermined fragment) were geo-chemically analyzed (see above: discussion on geo-materials) and were produced in the quarries of Kottenheim Winfeld, Mayener Grubenfeld and Ettringer Lay (Table 10.1-10.3). Typological features could not be linked exclusively to a particular quarry provenance which implies that specialized shaping was not exclusively related to a specific quarry.

Mechanical driven mills

Meta (n=5, MNI=5)

One specimen has an edge type 1 (cat. no. 021-024), mill 021-001 an edge type 3 and mill 021-064 an edge type 2. Their heights are 5.6 cm (cat. no. 021-024), 12 cm (cat. no. 021-001), and min.

Table 10.3. Inventory of querns and mills (MD: mechanical driven; HD: hand driven; Ed.: edge, Fr.: fragment; Cent.: centre, Ed.-Cent.: edge to centre; KW: Kottenheimer Winfeld; MG: Mayener Grubenfeld; EL: Ettringer Lay) ('POST' stands for post-Roman level). Illustrated finds on Plates CCCLXIII-CCCLXXII. Italic: not illustrated.

cat. no.	(fort) level	rock	driving mechanism	*meta / catillus*	conservation	diam. (cm)	XRF/ thin-section	weight (kg)	MNI
021-001	2	BL	MD	MET	Ed.	67	KW	5.7	1
021-002	2	BL	HD	undet.	Fr.		MG	0.976	1
021-003	2	BL	HD	CAT	Ed.	40.4		0.811	1
021-004	3	BL	HD	MET	Ed.-Cent.	41.1	KW	1.502	1
021-005	3	BL	HD	CAT	Cent.		MG	2.467	1
021-006	3	BL	MD	undet.	Fr.			1.085	1
021-007	3	BL	HD	CAT	Fr.			0.539	1
021-008	3	BL	HD	MET	Ed.	38.5		0.944	1
021-009	3	BL	HD	MET	Ed.			0.114	1
021-010	3	BL	HD	CAT	Ed.			0.571	1
021-011	2+3	BL	HD	CAT	Fr.			0.585	1
021-012	3	MSS	HD	undet.	Fr.			0.676	1
021-013	3	BL	MD	MET	Fr.			3.6	1
021-014	3+4	BL	HD	MET	Cent.			0.756	1
021-015	3+4	BL	HD	CAT	Cent.			0.482	1
021-016	3+4	BL	HD	CAT	Ed.			1.368	1
021-017	4	BL	HD	MET	Ed.			0.182	1
021-018	4	BL	HD	CAT	Ed.	41.4		1.115	1
021-019	4	BL	MD	CAT	Ed.			2.731	1
021-020	4	BL	HD	MET	Ed.	40.2		0.541	1
021-021	4	BL	HD	MET	Ed.	40		0.657	1
021-022	4	BL	HD	MET	Ed.	39.8		0.995	1
021-023	4	BL	HD	CAT	Fr.			0.449	1
021-024	4	BL	MD	MET	Ed.	58.6		3.8	1
021-025	4	MSS	HD	MET	Ed.-Cent.	50.6		8.7	1
021-026	4	BL	HD	CAT	Ed.			1.453	1
021-027	4	BL	HD	CAT	Cent.			1.046	1
021-028	4	BL	HD	MET	Ed.			1.089	1
021-029	4	MSS	HD	CAT	Ed.-Cent.	33.6		2.305	1
021-030	4	BL	MD	CAT	Fr.		MG	14.8	1
021-031	4+5	BL	HD	MET	Ed.			0.314	1
021-032	4+5	BL	HD	MET	Ed.	41.1		1.822	1
021-033	4+5	MSS	HD	CAT	Ed.			1.706	1
021-034	4+5	BL	HD	MET	Ed.	40.8		1.78	1
021-035	4	BL	HD	MET	Fr.			0.706	1
021-036	4	MSS	HD	MET	Ed.	30		0.932	1
021-037	4	BL	HD	undet.	Fr.			0.351	0
021-038	4	BL	HD	CAT	Ed.			1.163	1
021-039	4	BL	HD	CAT	Ed.-Cent.	41.8		3.8	0
021-040	4	BL	HD	CAT	Ed.-Cent.	40.6	EL	2.08	1
021-041	4	BL	HD	CAT	Fr.			1.298	0
021-042	4	BL	HD	CAT	Ed.	39.4		0.285	0
021-043	4	BL	HD	MET	Ed.	41.7		1.678	1
021-044	4	BL	HD	MET	Cent.			1.611	1
021-045	4	BL	HD	MET	Ed.			0.292	1
021-046	5	BL	HD	CAT	Ed.	31.2		0.427	1
021-047	5	BL	HD	CAT	Ed.-Cent.	40.9		0.902	1

cat. no.	(fort) level	rock	driving mechanism	*meta* / *catillus*	conservation	diam. (cm)	XRF/ thin-section	weight (kg)	MNI
021-048	5	BL	HD	CAT	Ed.	39.2		0.579	1
021-049	5	BL	HD	MET	Ed.			0.158	1
021-050	5	BL	HD	MET	Ed.			0.642	1
021-051	5	BL	MD	undet.	Fr.			2.272	1
021-052	5	BL	HD	CAT	Ed.-Cent.	41	MG	6.9	1
021-053	5	BL	HD	MET	Ed.	40	KW	0.882	1
021-054	5	BL	HD	MET	Ed.	37.8		1.324	1
021-055	5	BL	HD	MET	Ed.-Cent.	42.8		5.5	1
021-056	POSTOST	MSS	HD	MET	Ed.-Cent.	34		8.8	1
021-057	1	BL	MD	MET	Fr.			4	1
021-058	5	BL	HD	CAT	Ed.	40.9		1.559	1
021-059	5	BL	HD	MET	Ed.-Cent.	43.2		4.3	1
021-060	5	BL	HD	CAT	Ed.	42.2		2.971	1
021-061	5	BL	HD	CAT	Ed.-Cent.	44		2.796	1
021-062	5	BL	HD	CAT	Cent.			0.619	1
021-063	5	BL	MD	CAT	Cent.			2.062	1
021-064	5	BL	MD	MET	Ed.			2.81	1
021-065	5	BL	HD	MET	Ed.	40.1		1.407	1
021-066	5	BL	HD	MET	Fr.			0.691	0
021-067	5	BL	HD	MET	Ed.			1.397	1
021-068	5	MSS	HD	MET	Ed.	32.7		0.593	1
021-069	5	MSS	HD	CAT	Ed.	32.7		1.034	1
021-070	5	ASS	HD	CAT	Ed.-Cent.	52.8	thin-section	11.2	1
021-071	4+5	BL	HD	CAT	Ed.			0.352	1
021-072	4+5	BL	HD	CAT	Ed.	40		1.351	1
021-073	4+5	BL	HD	MET	Ed.-Cent.	44		2.819	1
021-074	4+5	BL	HD	MET	Ed.	39.2		0.688	1
021-075	4+5	BL	HD	MET	Ed.	45.4		1.268	1
021-076	4+5	BL	HD	CAT	Ed.	41.2		1.011	1
021-077	4+5	BL	HD	MET	Ed.			1.232	1
021-078	4+5+POST	BL	HD	CAT	Ed.-Cent.	42.6		1.827	1
021-079	4+5+POST	MSS	HD	CAT	Ed.-Cent.	44		5.3	1
021-080	4+5	MSS	HD	MET	Ed.-Cent.	50.6		6.3	0
021-081	5	BL	HD	CAT	Ed.	38.2		0.438	1
021-082	5	BL	HD	CAT	Cent.			0.613	1
021-083	5	BL	HD	CAT	Ed.	39.1		0.702	1
021-084	5	MSS	HD	CAT	Fr.			0.352	1
021-085	5	BL	HD	CAT	Ed.			1.25	1
021-086	5	BL	HD	CAT	Fr.			0.834	0
021-087	5	MSS	HD	MET	Ed.-Cent.	32.7		2.257	1
021-088	5	BL	HD	MET	Ed.-Cent.	39.9		3.5	1
021-089	4	BL	HD	CAT	Fr.			1.689	1
021-090	4	BL	HD	MET	Ed.	43.6		1.859	1
021-091	4	BL	HD	CAT	Fr.			0.562	1
021-092	4	BL	HD	MET	Fr.			2.128	1
021-093	4	BL	HD	MET	Ed.		MG	0.251	1
021-094	4	BL	HD	CAT	Cent.		MG	1.32	1
021-095	4	BL	HD	CAT	Fr.			1.16	1

cat. no.	(fort) level	rock	driving mechanism	*meta* / *catillus*	conservation	diam. (cm)	XRF/ thin-section	weight (kg)	MNI
021-096	4	BL	HD	CAT	Fr.			0.826	1
021-097	4	BL	HD	MET	Ed.			0.724	1
021-098	4	BL	HD	MET	Ed.			0.611	1
021-099	4	BL	HD	MET	Ed.-Cent.	36		undet.	1
021-100	4	BL	HD	CAT	Cent.			0.959	1
021-101	4	BL	HD	CAT	Fr.			1.264	0
021-102	4	BL	HD	CAT	Ed.-Cent.	37.9	KW	1.634	1
021-103	4	BL	HD	CAT	Cent.			1.384	1
021-104	4	BL	HD	CAT	Fr.			0.787	0
021-105	4	BL	HD	MET	Fr.			1.248	1
021-106	POST	MSS	HD	CAT	Ed.-Cent.	35.4		undet.	1
021-240	POST	MSS	HD	CAT	Ed.-Cent.			1.903	1
021-241	unstr.	MSS	HD	CAT	Cent.			2.283	0
021-242	4	MSS	HD	CAT	Ed.-Cent.			undet.	1
021-243	unstr.	MSS	HD	CAT	Ed.-Cent.			undet.	0
021-244	4	BL	HD	MET	Fr.			0.677	0
021-245	4+5	BL	HD	CAT	Fr.			0.727	1
021-246	4	BL	MD	undet.	Fr.			8.1	1
021-247	5+POST	BL	HD	CAT	Fr.			0.764	1
021-248	5+POST	BL	HD	CAT	Cent.			0.877	1
021-249	5+POST	BL	HD	MET	Fr.			0.172	1
021-250	POST	BL	HD	CAT	Fr.			0.448	1
021-251	5	BL	HD	CAT	Fr.			0.538	1
021-252	5	BL	MD	undet.	Fr.			1.733	1
021-253	POST	BL	HD	MET	Fr.			0.211	1
021-254	POST	BL	HD	MET	Fr.			2.515	1
021-255	POST	BL	HD	CAT	Cent.			0.635	1
021-256	POST	BL	HD	MET	Cent.			2.731	1
021-257	unstr.	BL	HD	MET	Ed.-Cent.			3.312	0
021-258	unstr.	BL	HD	MET	Ed.-Cent.			3.212	0
021-259	unstr.	BL	HD	MET	Ed.			0.641	0
021-260	unstr.	BL	HD	CAT	Fr.			4.3	0
021-261	unstr.	BL	HD	MET	Ed.			0.895	0
021-262	unstr.	BL	HD	CAT	Cent.			1.238	0
021-263	unstr.	BL	HD	MET	Fr.			0.839	0
021-264	unstr.	BL	HD	CAT	Fr.			1.224	0
023-001	5	BL	HD	MET	Ed.	41.4		2.194	1
023-002	5	BL	HD	MET	Ed.-Cent.	42.5		6.6	1
023-003	5	BL	HD	CAT	Ed.-Cent.	42		3.8	1
023-004	2	BL	HD	MET	Ed.			1.31	1
023-011	5	MSS	HD	CAT	Ed.			0.139	1
023-012	5	BL	MD	CAT	Fr.			1.215	1
023-013	5	BL	HD	CAT	Ed.			2.243	1

9.4 cm for mill fragment 021-064. From two mills the diameter could be measured: 67 cm (cat. no. 021-001) and 58.6 cm (cat. no. 021-024); the diameter of mill 021-064 is uncertain (Plate CCCLXIV).

Catillus (n=4, MNI=4)

Object 021-063 is a very fragmented *catillus* centre fragment and is min. 11.3 cm high. Only a small part of the active face and the onset of a rectangular-shaped sunken rynd slot on the active side (type 4a) is preserved. The feed hole itself and the upper side are not preserved. The rynd slot measures min. 5.5 by 2.7 cm and is between 1.3 and 1.7 cm deep (Plate CCCLXIII).

Three specimens are very fragmented and interpreted as part of mechanical driven mills because of their considerable dimensions (cat. nos 021-019, 021-030 (Plate CCCLXIII) and 023-012 (not ill.)). Object 021-019 is a fragment of a *catillus* edge and has a min. height of 12.4 cm. The second, cat. no. 021-030, is a *catillus* fragment with a min. height of 23 cm and weighs 14.8 kg. Both faces are preserved: an active slightly concave face and a passive flat upper side. The latter shows a very limited onset of a small circular groove. Finally, the specimen from the northeastern site Oudenburg-Kapellestraat (cat. no. 023-012) is a small feed hole fragment with a diameter of min. 10 cm and a max. height of 11.1 cm.

The mechanical millstones are too fragmented to identify the specific driving mechanism. Only the type 4 rynd slot of cat. no. 021-063 points towards a 'Zugmantel type' *catillus* that was driven from the centre (cf. Baatz 1995). In this case both water or animal power are theoretically possible. Lateral driving mechanisms (*e.g.* cf. Haltern type) were not recognized.

Undetermined (n=4, MNI=4)

Four undetermined fragments were – based on their dimensions – identified as parts of a mechanical mill (Table 10.3).

Provenance

Two mechanical mill fragments were geo-chemically analyzed (see above: discussion on geo-materials) and were produced in the quarries of Kottenheim Winfeld (cat. no. 021-001) and Mayener Grubenfeld (cat. no. 021-030) (Table 10.1-10.3).

4.2 Ointment palettes

Within the Oudenburg stone assemblage nine ointment palettes from at least four different lithologies were inventoried (Tables 10.5 and 10.7, Plates CCCLXXIX and CCCLXXX).[274] Five specimens come from the south-west corner site (ET20), two from the northeastern corner site Kapellestraat (ET24), one from the Mertens excavations in 1977 centrally in the northern section of the fort (ET11) and one from the southern mid-Roman graveyard (ET14)[275].

Four specimens were manufactured in Tournai limestone: cat. nos 021-185, 021-186 and 023-006, and the complete palette recovered by Mertens' team in 1977 (inv. no. 77.OU.311). The complete palette from the southern mid-Roman graveyard was made of black micro-quartzite (inv.no. L32/14B). Three fragments, recovered from the south-west corner site, are more exotic and were imported from further away: one fragment is made from the French *cipollino verde mandolato* marble, a weakly metamorphosed nodular limestone (cat. no. 023-005). Two fragments consist of Egyptian andesite-dacite porphyries, representing a red and black variety (cat. nos 021-187 and 021-188). The lithology of one very small corner fragment could not be determined (cat. no. 021-184).

Ointment palettes are the result of a highly specialized production. Given the finely worked character of the palettes, one could expect a specialized stonemason and/or workshop to make these objects. The palettes have a typical rectangular shape with beveled edges. The edges consist almost always of a small upright rim (average height between 1 and 2 mm and maximum 5 mm), changing to a beveled surface. Most of the palettes are too fragmented to specify on complete dimensions. The two complete Oudenburg palettes measure 8 by 9.8 cm (micro-quartzite) and 5.6 by 7.8 cm (Tournai limestone). A cupule, often present on the ventral side of ointment palettes (Reniere *et al.* 2018a; Riha 1986) is only noticed on the complete palette from Tournai limestone (inv. no. 77.OU.311).

Most of the Oudenburg palettes have been intensively used and show (secondary) use-wear such as small superficial scratches that occur on all sides and in different orientations. The porphyry specimens show polishing marks that mainly occur on the ventral side. The polishing can be interpreted as the result of either grinding or whetting activity. It is possible that the ointment palettes could have had a secondary or complementary function as a whetstone for cosmetic and medical instruments like scalpels and probes (Gui 2011; Milne 1907; Riha 1986). The *cipollino verde mandolato* fragment looks like it has been broken and repaired again (Plate CCCLXXX: 023-005). Time and energy was invested to restore the object through smoothing the transversal broken edge. A similar pattern can be observed along the transversal edge from the ointment palette in black micro-quartzite, the 1993 graveyard find.

274 **The two complete palettes from earlier excavations could not be studied in detail: site ET11 (inv.no. 77.OU.311) and site ET14 (inv. no. L32/14B).**

275 **Although not from the fort site, the palette from the southern mid-Roman graveyard (ET14) has been taken into account because it was found in an interesting closed grave context that is related to the fort.**

Table 10.4. Quantification table of querns and mills.

(fort) level	rock	driving mechanism	*meta / catillus*	TOTAL	MNI	weight (kg)
1	BL	mechanical driven	meta	1	1	4
1	BL	undetermined	fragment	1	0	0.404
Total (fort) level 1				**2**	**1**	**4**
2	BL	hand driven	catillus	1	1	0.811
2	BL	hand driven	meta	1	1	1.31
2	BL	hand driven	fragment	1	1	0.976
2	BL	mechanical driven	meta	1	1	5.7
2	BL	undetermined	fragment	13	0	3262
Total fort level 2				**17**	**4**	**3262**
3	BL	hand driven	catillus	4	4	4162
3	BL	hand driven	meta	3	3	2.56
3	BL	mechanical driven	meta	1	1	3.6
3	BL	mechanical driven	fragment	1	1	1085
3	BL	undetermined	fragment	75	0	16456
	Subtotal BL			*84*	*9*	*21703*
3	MSS	hand driven	fragment	1	1	0.676
Total fort level 3				**85**	**10**	**21703**
4	BL	hand driven	catillus	21	16	26124
4	BL	hand driven	meta	18	17	16005
4	BL	hand driven	fragment	1	0	0.351
4	BL	mechanical driven	catillus	2	2	17531
4	BL	mechanical driven	meta	1	1	3.8
4	BL	mechanical driven	undet.	1	1	8.1
4	BL	undetermined	fragment	241	0	31192
	Subtotal BL			*285*	*37*	*90852*
4	MSS	hand driven	catillus	2	2	2305
4	MSS	hand driven	meta	2	2	9632
	Subtotal MSS			*4*	*4*	*11937*
Total fort level 4				**289**	**41**	**102789**
5	BL	hand driven	catillus	20	19	30.612
5	BL	hand driven	meta	19	18	38.518
5	BL	mechanical driven	catillus	1	1	2.062
5	BL	mechanical driven	meta	1	1	2.81
5	BL	mechanical driven	undet.	2	2	4.005
5	BL	undetermined	fragment	92	0	1.03
5	BL	mechanical driven	catillus	1	1	1.215
	Subtotal BL			*136*	*42*	*94.252*
5	MSS	hand driven	catillus	4	4	3.231
5	MSS	hand driven	meta	3	2	9.15
	Subtotal MSS			*7*	*6*	*12.381*
5	ASS	mechanical driven ?	catillus	1	1	11.2
Total fort level 5				**144**	**49**	**117.833**
Post-Roman	BL	hand driven	catillus	5	5	4.551
Post-Roman	BL	hand driven	meta	4	4	5.629
Post-Roman	BL	undetermined	fragment	129	0	15.111
	Subtotal BL			*138*	*9*	*25.291*
Post-Roman	MSS	hand driven	catillus	3	3	7.203
Post-Roman	MSS	hand driven	meta	1	1	8.8
	Subtotal MSS			*4*	*4*	*16.003*
Total Post-Roman level				**142**	**13**	**41.294**
unstratified	BL	hand driven	catillus	3	0	6.762
unstratified	BL	hand driven	meta	5	0	8.899
	Subtotal BL			*8*	*0*	*15.661*
unstratified	MSS	hand driven	catillus	2	0	2.283
unstratified	MSS	undetermined	fragment	9	0	4.671
	Subtotal MSS			*11*	*0*	*6.954*
Total unstratified				**19**	**0**	**22.615**
TOTAL				**698**	**118**	**341.784**

4.3 Whetstones, polishers, abraders and paraphernalia

4.3.1 Cambrian silt- and sandstones (Revin Group) (CAMB SS 1)

The stones carved from this type of rock (n=57) are exclusively mobile bar- and rod-shaped whetstones and were intentionally quarried and manufactured (Thiébaux *et al*. 2016) (Table 10.5, Plates CCCLXXIV, CCCLXXV and CCCLXXX). Most of them have a typical elliptic cross-section. They can vary from almost plate-shaped thin ellipses to more thick ellipses very close to a cylindrical cross-section (*e.g.* no. 021-205). However, as a result of intensive use, both shapes can occur on the same specimen.

The whetstones are very fragmented[276]. We count 24 end pieces, 21 fragments and eleven middle pieces. Only one (probably) complete whetstone is registered: cat. no. 022-002 (20.3 cm long) (Plate CCCLXXX). In average the whetstones are 1.7 cm thick and 3.2 cm wide. From a depot find with blanks in Xanten and from the rough-outs from the Châtelet-Sur-Sormonne workshop we know that their diameter varies between 2.1 and 3.4 cm and that their length is situated between 26.2 and 34.3 cm (Jäger *et al.* 2017; Thiébaux *et al*. 2016).

Use wear

Most common are short transversal striations as the result of whetting activity. They are mainly situated at the face edges and some can have slight diagonal orientations. Whetting planes are present on almost every whetstone and can be either flat or concave. We note also the presence of facetted edges (*e.g.* cat. no. 021-148, Plate CCCLXXIV).

In some cases, particular parts of the whetstones seem to have been whetted/worn away. Examples of this kind of use is shown in the median part of cat. nos 021-205 and 021-160 (Plate CCCLXXIV). This type of whetstone is defined as '*aiguisoir*' by Pieters (2013, 103) and is classified as a passive and mobile tool that was typically used to whet and maintain tools and that could be held in one hand and/or had a long edge (*e.g.* type knife). Other whetstones show an inverse pattern, most worn away towards the proximal and distal ends (*e.g.* cat. no. 022-004, Plate CCCLXXX). They coincide with the active and mobile used '*pierre à faux*' as defined by Pieters (2013, 105-106). According to Pieters it is a typical shape used to whet scythes and sickles, often described as a boat-shaped tool, and even still in use today. Although this hypothesis holds ground, we believe that this kind of wear/shape is not exclusively linked with the function of sharpening a scythe.

One whetstone shows percussion impact traces on its edge (cat. no. 022-004, Plate CCCLXXX). Finally, three whetstones exhibit abrading wear. Whetstone 021-210 has two thin longitudinal grooves, one in the centre of each face (Plate CCCLXXV). Whetstone 021-224 demonstrates short longitudinal and transversal grooves on both faces. Whetstone 021-148 reveals multiple parallel transversal U-shaped grooves on its facetted edge (2 mm. wide) (Plate CCCLXXIV). It is very difficult to say whether these different types of abrading wear are the result of primary, secondary or complementary use. As several specimens also display traces of whetting, some were probably primarily used as hones. Several whetstones show secondary use faces on broken ends.

Herringbone patterns ('*chevrons*') have only been noticed on a whetstone from site Kapellestraat (cat. no. 023-008, Plate CCCLXXX). The phenomenon of the herringbone pattern is until now badly known in the study region, and therefore seldomly recognized. In contrast, several herringbone whetstone finds are documented from Roman sites in Germany and the Netherlands (Bantelmann and Meier-Arendt 1973; Haberey 1941; Haupt 1980; Lanting 1974). Exemplary for these herringbone whetstones is the recently in detail published assemblage from Xanten with a dozen of blanks that are entirely covered with herringbones (Jäger *et al*. 2017). Based on this depot find and the blanks and rough-outs found in the Châtelet-sur-Sormonnne workshop (France) (Thiébaux *et al*. 2016), we know that this pattern originally covered the entire surface. As the result of intensive use the herringbones disappeared on the faces, and are hence only partly conserved on the edges. Why these herringbones were carved remains unclear. Several hypotheses can be put forward: an interpretation as trademark or stone mason signature, a functional interpretation or a decorative one (Jäger *et al.* 2017, 40).

One whetstone shows the onset of a perforation on one of its edges (cat. no. 021-125, Plate CCCLXXIV). This could be interpreted as an attempt to perforate the stone or it could indicate (secondary) abrading of an object with a conical point. Perforations were probably made for suspending, a phenomenon that is well known from medieval whetstones and touchstones (Hansen 2011; Jezek 2013; Kars 1983; Kars 1995; Resi 2011). In Gallo-Roman contexts they are quite rare.

4.3.2 Cambrian silt- and sandstones (Deville Group) (CAMB SS 2)

All objects within this litho-group consist of mobile bar- and rod-shaped whetstones (n=11) (Table 10.5, Plate CCCLXXV and CCCLXXX) and were extracted from a quarry (Thiébaux *et al.* 2016).

Whetstones with an elliptic cross-section predominate. Compared with whetstones from the Revin Group they demonstrate thicker ellipses with circular and sub-rectangular sections. Some have an almost rectangular cross section and show concave to extremely rounded edges (*e.g.* cat. nos 023-009 and 023-010, Plate CCCLXXX); one whetstone has a circular cross section (cat. no. 021-135, Plate CCCLXXV). The whetstones are very fragmented. We count eight end pieces and two middle pieces. One whetstone is potentially complete and measures 32.1 cm in length (cat. no. 021-141, Plate CCCLXXV). In average these whetstones are 2.3 cm thick and 3.6 cm wide.

276 **We differentiate between the following conservation categories: complete, end piece (only one end is conserved, a complete section is present), middle piece (no ends are preserved, a complete section is present) and fragment (middle piece of which we do not have a complete cross section).**

Transversal and diagonal striations occur on almost all specimens and are mainly present along the face edges. Furthermore, several kinds of whetting planes can be distinguished. On object 021-211 two facetted edges are present: note the particular sharp edges in transversal section (Plate CCCLXXV). The median zone of whetstone 021-211 is slightly worn away and on whetstone 021-166 the distal/proximal parts are worn away. On one specimen we register a locally developed lustre that appears exclusively on the whetstone faces (cat. no. 021-141). Only few abrading traces are observed within this rock group. One object (cat. no. 021-135, Plate CCCLXXV) shows several vague diagonal unpronounced short grooves on one face. These could be the result of abrading wear, after which they faded away through another type of use. On object 021-211 we note the presence of a partially conserved V-shaped groove end (Plate CCCLXXV). It is situated on the edge of a broken end and could indicate secondary use after the whetstone was broken. Finally, one object shows two thin grooves on a broken end (cat. no. 021-110, Plate CCCLXXV). Four specimens have broken ends of which the irregular surfaces demonstrate partly smoothed zones indicating re-use/secondary use.

4.3.3 Cretaceous Wealden sandstones (WEALD SS)

All stones carved from this rock are quasi exclusively small mobile bar-shaped whetstones and are quarried products (n=23)[277]. Three fragmented undefined plate-shaped objects should be mentioned (cat. nos 021-177, 021-233 and 021-234) (Table 10.5, Plate CCCLXXVI and CCCLXXX). The Wealden whetstones are characterized by a predominate parallelepiped shape with rectangular to quadrangular cross sections. After intense use, the edges and the faces of the Wealden stones became more concave resulting often in more oval sections.

A very characteristic morphological feature is the presence of shallow rebates along the edges. The rebates are interpreted as remnants of the manufacturing process. This process started with parallel grooves that were cut or sawn on each side of a slab of stone. Sawing this rock is facilitated by the presence of a calcite cement in between the quartz grains. The grooves were sufficiently deep to enable the bars to be successively snapped of by a sharp blow, after which the rough broken surface was smoothened (Atkinson 1942, 129-130). The rectangular profile of the Wroxeter rebates points towards a preference for sawing instead of cutting with a mason's point (Allen 2014, 9). Only few whetstones in our dataset have those typical rebates, as they disappear due to normal use (*e.g.* cat. nos 021-113, 021-114, 021-126, 021-163, 021-202 and 021-220). Sometimes they are completely worn away resulting in an oblique edge (*e.g.* cat. nos 021-136, 021-204, and 021-208). Together with the bar shape, the rebates constitute the two key morphological features as identified for the Wealden whetstone examples described by Allen (Allen 2014, Fig. 7.1: 1011, Fig. 7.17: 227 and 246).

277 **One potential specimen that could not be studied in detail (021-142) is included in this quantification. It is part of the permanent RAM (Roman Archaeological Museum Oudenburg) exhibition collection and on show in an inaccessible display case.**

In Wealden sandstone, we count ten middle pieces, seven end pieces and five fragments. Complete whetstones are lacking. The characteristic of the rock to easily split along stratification planes, explains the flagstone-like appearance of the whetstones and hence the easy formatting of the slab and the remarkably constant thickness of the bars. In average the whetstones are 2.6 cm wide and 1.8 cm thick.

These tools all show broken or smoothed (probably secondary used?) ends. Object 021-163 and 022-005 are good examples of both ends being completely smoothed. Furthermore, only few whetstones bear vague transversal small striations along their edges. Eight whetstones are more or less worn away in the centre (cat. nos 021-108, 021-113, 021-114, 021-126, 021-208, 021-220, 021-238 and 022-005). In longitudinal section this becomes apparent through a concave zone in the median part and thicker sections towards the (hypothetical) ends. They are similar to the '*aiguisoir*' described by Pieters (2013, 103); a passive and mobile tool typically used to whet and maintain tools and that could be held in one hand and/or had a long edge (*e.g.* type knife). Finally, one object (cat. no. 021-108) shows traces of (probably secondary) abrading wear: on one of its faces we note the presence of a transversal U-shaped groove and another shorter and less pronounced diagonal groove. Both are the result of passive use as the grooves are deeper in the centre than towards the ends.

4.3.4 Cretaceous Greensand sandstone (GRS SS)

Only one small mobile rod-shaped whetstone has been registered (cat. no. 021-117) (Table 10.5, Plate CCCLXXVII). The whetstone has an oval cross-section and is 1.8 cm wide and 0.9 cm thick. There is no particular use-wear apparent. For Greensand whetstones found in Roman Silchester it is suggested that they were the result of re-used rock objects, like querns, building material, etc. (Allen 2014, 60). Nevertheless, based on the shape of this specimen we believe it could have been extracted from a quarry and finished in a workshop.

4.3.5 Paleozoic quartzitic (lithic) sandstones (GQL) and Upper Carboniferous sandstone (Houiller SS)

Ten bar-shaped whetstones/polishers are made of Lower Devonian sandstones (n=10) and one is made of Upper Carboniferous sandstone and referred to as Houiller sandstone (n=1: cat. no. 021-213) (Table 10.5, Plate CCCLXXVII). They are characterized by rectangular sections with concave edges to elliptic/oval sections; two specimens have a clear rectangular section (cat. no. 021-215 and cat. no. 021-213). They are very fragmented and are in average 3.6 cm wide and 2.8 cm thick. We register four middle pieces, five end pieces and two fragments.

Due to their quartzitic lithology, striations and whetting planes are almost absent. The stones maintain a more regular face, even when intensively used. Only few stones show some vague striation marks which occur as very thin lines along the edges. Object 021-215 has a longitudinal section that narrows towards the median zone, probably as the result of a specific use (cf. type '*aiguisoir*' as determined by Pieters 2013). Almost all stones show traces of polish or lustre on the faces; they cluster on the face centre part and do not continue on the edges. Only object 021-237 has a polish on

one of its edges which is absent on its faces. The most quartzitic sandstones can have functioned as polishers. One whetstone shows traces of re-use on its broken end (cat. no. 021-216).

4.3.6 Paleozoic river-borne pebble- and cobblestones (RIV SS)

All five objects are small mobile and active and/or passive used tools that were collected stones from alluvial deposits (river beds) (n=5) (Table 10.5, Plate CCCLXXVIII). Based on their natural shape, we distinguish three different groups: two plate shapes, two bar shapes and one disc shape.

The plate-shaped objects are quite irregular and have a plate-shaped cross-section (cat. nos 021-198 and 021-235). They measure respectively 5.4 x 4.9 x 1.7 cm and 6.6 x 5 x 1.4 cm (length x width x thickness). Both pieces show traces of polish on their faces and edges; lustre is absent. They are interpreted as mobile polishers and were probably used in a passive way, although an active use cannot be excluded.

The bar-shaped objects have an irregular shape and are elongated objects with an oval or sub-rectangular/-quadrangular cross-section (cat. nos 021-170 and 021-232). They measure respectively 4.4 x 3.4 x 2.5 cm and 14.3 x 5 x 2.5 cm (length, width, thickness). Object 021-232 is complete and shows an intense polish on both opposite sides. The use-wear is concentrated on the face centre and does not continue along the edges. The polish does not cover the entire surface. This tool was probably used as a polisher in a passive way whereas the worked implement was moved over the active surface. Object 021-170 has smooth faces, without any polish. The tool was probably used as an active whetstone.

Object 021-194 is a small disc, but could not be studied in detail[278]. It can be interpreted as a small polishing tool. However, the similarity in shape with glass and bone counters may suggest a function as gaming piece (cf. in this volume Chapter 6, Section 3).

4.3.7 Upper Paleocene, Landen Group quartzarenites and quartzites (LG SS)

Seven implements were made of Landen Group quartzarenites and quartzites (n=7). Based on their morphology we distinguish four groups: tabular shapes (n=4), a cube (n=1), a spherical/ball shape (n=1) and a disc shape (n=1) (Table 10.5, Plate CCCLXXIX).

These tools are the result of an in *situ* extraction although in some cases recycling cannot be excluded. There is very little evidence nor are there indications for the precise mode of production. Some tools are probably the result of natural stone slabs that were only carved in the desired dimension and that were shaped further through use. Other tools however, like some large and small tabular-shaped tools, show more finely worked edges which can indicate a more intentional design in a specialized workshop.

4.3.7.1 Tabular-shaped tools

Within the group of tabular shaped tools, a further distinction can be made between whetting, polishing and abrading functions. Object 021-200 is a large fixed tool that was used in a passive way (18.6 x 15.5 x 5.4 cm; 1.6 kg). Both working faces show traces of polish. One side is slightly worn out and is very smooth with an almost complete covering polish. We note the presence of some (secondary?) parallel short abrading grooves along its edge. Morphologically it is very similar to '*les meulets*' as defined by Pieters (2013, 106), more precisely the large variant. The Oudenburg tool was probably used to sharpen or polish a broad spectrum of small edged tools (except for *e.g.* scythes that have a curved edge).

Three other objects are smaller and more mobile tabular-shaped tools. They were probably also used in a passive way. Cat. no. 021-178 is determined by a well-crafted and clear straight edge of max. 2.5 cm. It has two opposite very slightly concave smooth faces. Cat. no. 021-182 is a quasi-quadrangular plate-shaped tool (8.8 x 7.9 cm; 94 g) with a central concave worn down face (Plate CDXXXIII: no. 38). It has finely worked rounded edges indicating an intentional design in a workshop. It could have functioned as a whetstone for small edged tools. Cat. no. 021-197 is very fragmented but probably belongs to a similar type of small tabular-shaped tools.

4.3.7.2 A disc, a cube and a spherical shape

Object 021-191 has an irregular little disc-shape of 3.6 cm diameter and 2.4 cm thick (32g). It can be determined as a mobile and actively used expedient tool. One surface is concave, whereas the other is oblique. The edge is smoothed and one side shows a little U-shaped groove. It may indicate the use as an abrader.

Object 021-225 is an irregular cube-shaped tool. It is a little, portable, probably actively used whetstone with an irregular quadrangular cross section. It has a flat active face and a finely worked convex smooth edge.

One object has a quasi-regular spherical shape and is complete (cat. no. 022-006). It is a portable and actively used tool. It has a 3.4-3.7 cm diameter and weighs 67g. It is slightly facetted and has several use-wear faces. The stone tool shows similarities with prehistoric ground stone tools, 'type handstone', *e.g.* the 'basin mano' tools described by Adams (2002, 99-104). It cannot be excluded that the Oudenburg tool is in fact a re-used prehistoric tool.

4.3.8 Lower Eocene glauconite-bearing quartzarenite (VS)

Two implements consist of Lower Eocene glauconite-bearing quartzarenite (n=2) (Table 10.5). There are no indications that this type of stone was carefully shaped before use. The stone was probably collected at the outcrop as irregular stone slabs. On the spot, or afterwards on the site, the slabs could have been roughly shaped by some blows in order to obtain the desired dimension in function of the intended purpose. Through intensive use some tools may look like they were shaped more carefully than was originally the case (Reniere 2018).

278 **It is part of the permanent RAM exhibition collection and on show in an inaccessible display case.**

Object 021-180 has a very irregular natural shape and some vague use-wear traces indicate a very short expedient and passive use as whetstone or abrader. Object 021-176 is a small tabular-shaped tool with several facetted whetting planes. One side is very irregular and has not been worked. Several small grooves could also indicate an expedient abrading function (Plate CCCLXXIX).

4.3.9 Famennian sandstone (FAM SS)

Two tabular-shaped tools are carved in Famennian sandstone (n=2) (Table 10.5). They could have been collected at a natural stone outcrop (with or without shaping). However, the objects are too fragmented to determine the procurement strategy with certainty.

Object 021-196 is interpreted as a mobile passive abrader. It is a very fragmented object (8.3 x 6.8 cm, 46g) and only one slightly convex face is preserved on which we note the presence of two parallel V-shaped grooves of 0.1 cm wide (Plate CCCLXXIX). Object 021-181 is a fragment of what probably was a tabular-shaped whetstone. Only one smooth use-wear face is preserved.

4.3.10 Tournai limestone (TLS)

Five implements have been carved out of Tournai limestone (n=5) (Table 10.5). Three of them were identified as ointment palettes and were discussed earlier. Two objects are interpreted as tabular-shaped whetstones (Plate CCCLXXIX: 021-175 and 021-183). The largest specimen was used as a fixed and passive tool (cat. no. 021-175: 14.7 x 13.6 cm, max. 5.1 cm thick and 1679g). It is rectangular in section and has only one active side: a smoothed concave face. The opposite face is unworked but bears traces of smoothing through passive friction. Within the concave worn out zone we observe superficial parallel striations with both longitudinal and oblique orientations. Two worked smooth edges are preserved. On the transition of the active face to the broken edge we note the presence of a central positioned V-shaped groove (max. 0.7 cm wide). The other object is a small mobile but passive whetstone with a quasi-quadrangular shape and rectangular in section (cat. no. 021-183: 6.3 x 5.9 cm, max. 1.6 cm thick, 131g). It is a finely worked object, with precise shaped vertical edges. One face has a central, concavely worn out circular zone of 3 cm diameter. Both faces and edges show superficial striations. It is interpreted as a small passive whetstone, although a function as ointment palette cannot be excluded. Morphologically it is similar to object 021-182 carved in Landen Group quartzarenite which is also quasi quadrangular with a central concave worn down zone.

These stone tools probably had a particular whetting or even polishing function due to their very different lithology (soft fine-grained limestone) in comparison with for example the already discussed harder and coarser-grained sandstones (cf. *supra*).

4.3.11 Septarian concretion (SEPT)

One object (cat. no. 021-173) consists of a septarian concretion. It is an irregular natural shaped and semi-spherical object (9.3 x 7.7 x 4.8 cm, 445g) (Table 10.5, Plate CCCLXXVIII) that has probably been used as a passive mobile whetstone or polisher. The flat face has a very smooth surface (almost with a kind of greasy polish) and is covered with thin short parallel striations and grooves which do not surpass the edge. The opposite convex face is unworked but bears traces of smoothing through passive friction.

4.3.12 Macquenoise sandstone (MSS)

One object has been manufactured in Macquenoise sandstone (n=1), a rock that is well known for the production of querns and mills (cf. *supra*). Object 021-189 is a very regular shaped disc and weighs 203 g (Table 10.5, Plate CCCLXXVIII). It has a diameter of 5.9 cm and is 3.3 cm high. The edge is slightly convex. One surface is flat to lightly concave, whereas the opposite side is slightly convex. In the centre of the latter, a conical-shaped hole is positioned with a diameter of 1.3 cm and a 0.5 cm depth. On the same side, the surface shows a clear covering polish. The function of this object remains unclear. The shape could indicate a scale weight, although the polish does not fit in with this interpretation, unless it is the result of secondary use. The central hole, however, is a feature that is also known from several stone scale weights from Roman sites in Israel. According to Zilberstein *et al.* (2013) these holes were used to recalibrate scale weights, when damaged or produced slightly underweight. The holes were filled with the right amount of metal in order to achieve the correct weight. A similar disc (without hole, see *infra*) is known in a white undetermined limestone (cat. no. 021-190).

4.3.13 Slate (SL)

Three objects were carved in slate (n=3) (Table 10.5, Plate CCCLXXVIII), and are possibly re-worked roofing slates. They are very small and thin irregular disc-shaped objects (max. 0.4 cm thick). Only object 021-192 (1.9 cm diameter) has a very regularly shaped edge. It may have served as counter (cf. Chapter 6, Section 3 in this volume). Object 021-193 (5.1 cm diameter) shows very thin, superficial, multidirectional striations on both faces whereas object 021-172 (2.8 x 3.1 cm) has a more irregular shape and has a perforation of 0.4 cm diameter. On its broken edge two more, partially conserved, probable perforations are visible. Their precise function remains undetermined.

4.3.14 Micritic limestone (MICR LS)

One very fine-grained micritic limestone object is categorized as a bar-shaped whetstone (cat. no. 021-171; 7.6 x 2.5 cm, 26g) (Table 10.5, Plate CCCLXXVII). It is a very thin plate (max. 0.8 cm) and shows superficial multidirectional striations on both faces and edges. One end has a sloping edge and is probably the result of secondary use. Three parallel, very short and superficial (abrading?) grooves occur on one edge.

4.3.15 Undetermined limestones (undet. LS)

Three stone tools were made from limestone that yielded no further lithological determination (Table 10.5). The first object (cat. no. 021-190) is an irregular disc-shaped object and measures 8.3 x 7.4 cm, is max. 4.8 cm thick and weighs 436g (Plate CCCLXXVIII).

Table 10.5. Inventory of stone tools, other than querns and mills (whetstones, abraders, polishers, ointment palettes and paraphernalia) (L: length, W: weight, Tmax: maximum thickness, Tmin: minimum thickness) Illustrated finds on Plates CCCLXXIV-CCCLXXX. Italic: not illustrated.

cat. no.	(fort) level	rock	type	L (cm)	W (cm)	Tmax (cm)	Tmin (cm)	weight (g)	thin section
021-107	2	CAMB SS 1	bar-/rod-shaped whetstone	2.6	3	0.8	0.5	9	
021-108	2	WEALD SS	bar-/rod-shaped whetstone	9.8	2.9	2.4	1.7	121	
021-109	3	CAMB SS 1	bar-/rod-shaped whetstone	7.8	2.7	0.9	0.5	30	
021-110	3	CAMB SS 2	bar-/rod-shaped whetstone	9.3	3.3	1.4	0.9	70	X
021-111	3	CAMB SS 1	bar-/rod-shaped whetstone	4.7	3.3	1.4	undet.	30	
021-112	3	CAMB SS 2	bar-/rod-shaped whetstone	4.5	3.5	undet.	undet.	42	
021-113	3+4	WEALD SS	bar-/rod-shaped whetstone	8.9	2.4	2.1	1.3	93	
021-114	4	WEALD SS	bar-/rod-shaped whetstone	6.5	2.3	1.6	1.5	54	X
021-115	4	CAMB SS 1	bar-/rod-shaped whetstone	4	2.2	1.7	1.6	23	
021-116	4	CAMB SS 2	bar-/rod-shaped whetstone	5.1	3.7	2.1	1.8	65	
021-117	4	GRS SS	bar-/rod-shaped whetstone	3.1	1.8	0.9	0.9	10	X
021-118	4	CAMB SS 1	bar-/rod-shaped whetstone	9	3.2	2	1.7	102	
021-119	4	CAMB SS 1	bar-/rod-shaped whetstone	4	2.6	1.1	1	18	
021-120	4	CAMB SS 1	bar-/rod-shaped whetstone	3.3	2.7	0.8	0.8	12	
021-121	4	CAMB SS 1	bar-/rod-shaped whetstone	6	4	2.6	undet.	89	
021-122	4	CAMB SS 1	bar-/rod-shaped whetstone	3.5	undet.	undet.	undet.	12	
021-123	4	CAMB SS 1	bar-/rod-shaped whetstone	5.2	undet.	undet.	undet.	24	
021-124	4	CAMB SS 1	bar-/rod-shaped whetstone	3.9	2.7	1	0.8	19	
021-125	4	CAMB SS 1	bar-/rod-shaped whetstone	13.1	undet.	undet.	undet.	63	
021-126	4	WEALD SS	bar-/rod-shaped whetstone	11.9	2.4	2.4	2.1	131	
021-127	4	GQL	bar-/rod-shaped whetstone	8.4	3.3	2.8	2.5	121	
021-128	4	CAMB SS 1	bar-/rod-shaped whetstone	4.4	3.6	undet.	undet.	35	
021-129	4	GQL	bar-/rod-shaped whetstone	6.7	3.4	2.5	2.4	95	
021-130	4	CAMB SS 1	bar-/rod-shaped whetstone	10.2	2.9	1.4	0.9	63	
021-131	4	CAMB SS 1	bar-/rod-shaped whetstone	6.5	undet.	undet.	undet.	70	
021-132	4	WEALD SS	bar-/rod-shaped whetstone	undet.	undet.	undet.	undet.	undet.	
021-133	4	CAMB SS 1	bar-/rod-shaped whetstone	14	3.8	3.4	3.1	330	
021-134	4	GQL	bar-/rod-shaped whetstone	15.1	3.6	3	3.1	289	
021-135	4	CAMB SS 2	bar-/rod-shaped whetstone	9.3	3.1	3	2.8	148	
021-136	4	GQL	bar-/rod-shaped whetstone	7	4.1	3.4	3.1	189	X
021-137	4	CAMB SS 1	bar-/rod-shaped whetstone	4.9	3.3	undet.	undet.	36	
021-138	4	CAMB SS 1	bar-/rod-shaped whetstone	3.6	4.1	undet.	undet.	39	
021-139	4	CAMB SS 1	bar-/rod-shaped whetstone	5.3	3.9	undet.	undet.	48	
021-140	4	CAMB SS 1	bar-/rod-shaped whetstone	12	undet.	undet.	undet.	53	
021-141	4	CAMB SS 2	bar-/rod-shaped whetstone	32.1	3.8	2.8	1.5	620	
021-142	4	WEALD SS ?	bar-/rod-shaped whetstone						
021-143	4	CAMB SS 1	bar-/rod-shaped whetstone	14.3	3.2	2	undet.	131	
021-144	4+5	CAMB SS 1	bar-/rod-shaped whetstone	11.1	3.5	2.1	1.3	126	
021-145	4+5	CAMB SS 1	bar-/rod-shaped whetstone	5.3	3.7	undet.	undet.	34	
021-146	4+5	CAMB SS 1	bar-/rod-shaped whetstone	4.4	3.8	0.8	0.7	14	
021-147	4+5	CAMB SS 1	bar-/rod-shaped whetstone	2.7	3.2	undet.	undet.	23	
021-148	4+5	CAMB SS 1	bar-/rod-shaped whetstone	8.2	3.4	1.7	1.4	72	
021-149	4+5	CAMB SS 1	bar-/rod-shaped whetstone	3.2	3.1	undet.	undet.	23	
021-150	4+5	CAMB SS 1	bar-/rod-shaped whetstone	6.5	3.4	2.3	undet.	75	
021-151	4+5	CAMB SS 1	bar-/rod-shaped whetstone	3.7	3.4	undet.	undet.	29	
021-152	4+5	CAMB SS 1	bar-/rod-shaped whetstone	2.9	2.8	undet.	undet.	12	
021-153	4+5	CAMB SS 1	bar-/rod-shaped whetstone	10.6	3.6	2.1	2	112	
021-154	4+5	WEALD SS	bar-/rod-shaped whetstone	6.5	2.7	1.9	1	48	
021-155	4+5	CAMB SS 1	bar-/rod-shaped whetstone	7.5	2.3	1.7	1.6	47	
021-156	4+5	CAMB SS 1	bar-/rod-shaped whetstone	5.6	3.6	2.3	2.2	77	
021-157	4+5	CAMB SS 1	bar-/rod-shaped whetstone	4.8	2.6	0.9	0.5	20	
021-158	4+5	undet. SS	bar-/rod-shaped whetstone						
021-159	4+5	GQL	bar-/rod-shaped whetstone	5	3.7	undet.	undet.	65	

cat. no.	(fort) level	rock	type	L (cm)	W (cm)	Tmax (cm)	Tmin (cm)	weight (g)	thin section
021-160	4+5	CAMB SS 1	bar-/rod-shaped whetstone	12.7	3.3	1.4	1.1	94	
021-161	5	WEALD SS	bar-/rod-shaped whetstone	6.3	2.4	undet.	undet.	22	X
021-162	5	GQL	bar-/rod-shaped whetstone	7.1	4	2.5	2.4	101	
021-163	5	WEALD SS	bar-/rod-shaped whetstone	8.6	2.6	2.2	1.8	94	
021-164	5	CAMB SS 1	bar-/rod-shaped whetstone	3.2	3.2	undet.	undet.	39	
021-165	5	CAMB SS 1	bar-/rod-shaped whetstone	5.3	3.4	1.9	undet.	53	
021-166	5	CAMB SS 2	bar-/rod-shaped whetstone	15.8	5.1	3.4	2.1	391	
021-167	5	CAMB SS 1	bar-/rod-shaped whetstone	5.2	3.5	1.4	1.1	39	
021-168	5	CAMB SS 1	bar-/rod-shaped whetstone	11	3.4	2.2	1.7	132	
021-169	5	GQL	bar-/rod-shaped whetstone	7.3	4.1	3.1	3	159	
021-170	5	RIV SS	bar-shaped; polisher	4.4	3.4	2.5	2.1	52	
021-171	5	MICR LS	bar-/rod-shaped whetstone	7.6	2.5	0.8	0.8	26	X
021-172	3	SL	disc-shaped; undet.	2.8	3.1	0.3	0.2	4	
021-173	4+5	SEPT	expedient shaped; polisher	9.3	7.7	4.8	/	445	
021-174	4+5	undet. LS	irregular shaped; mortar ?	9.6	8.8	4.6	undet.	235	
021-175	4+5	TLS	tabular-/rectangular-shaped; whetstone ?	14.7	13.6	5.1	3.4	1679	
021-176	5	VS	tabular-shaped; whetstone	8.7	4.3	2.3	undet.	107	
021-177	4+5	WEALD SS	undet.	10.4	11.3	2.4	undet.	360	
021-178	3+4	LG SS	tabular-shaped; whetstone	7	5.6	2.5	1.5	115	X
021-179	5	undet. LS	cube-shaped; whetstone ?	3.6	3.4	2.4	2.3	36	
021-180	5	VS	expedient-shaped; abrader ?; whetstone ?	15.8	8.6	5.3	/	759	
021-181	4	FAM SS	tabular-shaped; whetstone ?	7.2	5	undet.	undet.	64	
021-182	4	LG SS	tabular-/plate-shaped; whetstone	8.8	7.9	undet.	ondet	94	
021-183	4	TLS	tabular-/rectangular-shaped; whetstone ?	6.3	5.9	1.6	1.5	131	
021-189	POST	MSS	disc-shaped; weight; other ?	5.9	5.9	3.3	3.3	203	
021-190	POST	undet. LS	disc-shaped; weight	8.3	7.4	4.8	4.6	436	
021-191	5+POST	LG SS	disc-shaped; whetstone	3.5	3.6	2.2	2.4	32	
021-192	4+5	SL	disc-shaped; undet.	1.8	1.9	0.2	0.2	1	
021-193	POST	SL	disc-shaped; undet.	5.1	5.1	0.4	0.4	19	
021-194	5+POST	RIV SS	disc-shaped; polisher ?	undet.	undet.	undet.	undet.	undet.	
021-195	5+POST	undet. SS	mortar-shaped; mortar	10	7.3	2.7	1.7	301	
021-196	5	FAM SS	tabular-shaped; abrader	8.3	6.8	1.6	0.5	46	
021-197	5+POST	LG SS	tabular-shaped; whetstone	5.9	4.6	1.1	1.1	42	
021-198	POST	RIV SS	plate-shaped; polisher	5.3	4.9	1.7	1	66	
021-199	POST	PORPH	plate-shaped; decorative	7.5	2.5	0.8	0.8	34	
021-200	4+5	LG SS	tabular-shaped; polisher	18.6	15.5	5.4	4.5	1626	X
021-201	4	undet. SS	bar-shaped; whetstone/abrader	7.3	4.6	3.1	2.8	127	
021-202	5+POST	WEALD SS	bar-/rod-shaped whetstone	5.8	2.1	1.5	1.5	39	
021-203	5+POST	CAMB SS 1	bar-/rod-shaped whetstone	5	2.8	2	1.7	38	
021-204	5+POST	WEALD SS	bar-/rod-shaped whetstone	6.6	3.4	undet.	undet.	35	
021-205	5+POST	CAMB SS 1	bar-/rod-shaped whetstone	10	2.5	2	1	66	X
021-206	5+POST	WEALD SS	bar-/rod-shaped whetstone	6.4	2	1.6	1.1	36	
021-207	4+5+POST	CAMB SS 2	bar-/rod-shaped whetstone	11.6	3.6	2.7	2.5	195	
021-208	4+5+POST	WEALD SS	bar-/rod-shaped whetstone	6.1	2.7	1.8	1.2	54	
021-209	4	WEALD SS	bar-/rod-shaped whetstone	5.4	3.7	1.6	nvt	54	X
021-210	unstr.	CAMB SS 1	bar-/rod-shaped whetstone	7.5	2.7	1	0.8	40	
021-211	POST	CAMB SS 2	bar-/rod-shaped whetstone	10.8	3.1	1.7	1.3	95	
021-212	POST	undet. SS	bar-/rod-shaped whetstone	2.5	3.5	undet.	0.8	22	X
021-213	POST	Houiller SS	bar-/rod-shaped whetstone	6.1	1.9	1.9	1.8	39	X
021-214	POST	WEALD SS	bar-/rod-shaped whetstone	4.3	2.3	1.5	1.4	32	X
021-215	POST	GQL	bar-/rod-shaped whetstone	2.2	3.4	2.5	1.9	29	X
021-216	POST	GQL	bar-/rod-shaped whetstone	10.4	4	2.9	1.9	212	
021-217	POST	CAMB SS 1	bar-/rod-shaped whetstone	8.9	3.3	1.3	1.2	60	
021-218	POST	CAMB SS 1	bar-/rod-shaped whetstone	7.4	2.4	undet.	2.2	55	

cat. no.	(fort) level	rock	type	L (cm)	W (cm)	Tmax (cm)	Tmin (cm)	weight (g)	thin section
021-219	POST	WEALD SS	bar-/rod-shaped whetstone	6	2.8	2.2	2.2	68	
021-220	POST	WEALD SS	bar-/rod-shaped whetstone	5.3	3.1	1.7	1.2	43	
021-221	POST	WEALD SS	bar-/rod-shaped whetstone	8	2.8	undet.	0.9	40	
021-222	POST	CAMB SS 2	bar-/rod-shaped whetstone	4.4	3.9	1.1	0.7	31	X
021-223	POST	CAMB SS 1	bar-/rod-shaped whetstone	4	3.8	2	undet.	48	
021-224	POST	CAMB SS 1	bar-/rod-shaped whetstone	3.9	3.4	0.8	0.6	21	
021-225	POST	LG SS	cube-shaped; whetstone	4.5	4.1	2.8	/	57	
021-226	POST	CAMB SS 1	bar-/rod-shaped whetstone	6.2	3.5	undet.	1.7	52	
021-227	POST	CAMB SS 1	bar-/rod-shaped whetstone	8.5	3.2	undet.	1.5	49	
021-228	POST	CAMB SS 1	bar-/rod-shaped whetstone	4.2	3.4	undet.	1.6	29	
021-229	POST	CAMB SS 1	bar-/rod-shaped whetstone	4.1	3.5	1.6	1.3	34	
021-230	POST	WEALD SS	bar-/rod-shaped whetstone	4	2.5	undet.	1	18	
021-231	POST	CAMB SS 1	bar-/rod-shaped whetstone	2.9	2.8	undet.	1.4	14	
021-232	POST	RIV SS	bar-shaped; polisher	14.3	5	2.5	1.5	276	
021-233	POST	WEALD SS	plate-shaped; undet.	5	4.5	1.3	0.8	41	
021-234	POST	WEALD SS	plate-shaped; undet.	5.6	4.3	1.3	1	37	
021-235	POST	RIV SS	plate-shaped; polisher	6.6	5	1.4	1.1	77	
021-236	POST	CAMB SS 1	bar-/rod-shaped whetstone	4.9	3.1	2.6	2.5	55	
021-237	POST	GQL	bar-/rod-shaped whetstone	14.3	4.4	2.9	2.5	292	
021-238	POST	WEALD SS	bar-/rod-shaped whetstone	6.4	2.9	2.2	1.8	77	
021-239	5+POST	WEALD SS	bar-/rod-shaped whetstone	undet.	undet.	undet.	undet.	undet.	
022-001	4+5	CAMB SS 1	bar-/rod-shaped whetstone	16.5	3.7	2.1	0.8	228	
022-002	4+5	CAMB SS 1	bar-/rod-shaped whetstone	20.3	3.6	1.8	1	212	
022-003	unstr.	CAMB SS 1	bar-/rod-shaped whetstone	12.5	3.5	2.4	1.9	182	
022-004	4+5	CAMB SS 1	bar-/rod-shaped whetstone	10.5	3.8	2.6	1.2	148	
022-005	unstr.	WEALD SS	bar-/rod-shaped whetstone	8.5	2.1	1.6	1.3	51	
022-006	unstr.	LG SS	spherical (ball)-shaped; undet.	3.4	3.7	3.6	undet.	67	
023-007	4	WEALD SS	bar-/rod-shaped whetstone	11.2	2.2	1.8	1.7	88	
023-008	4	CAMB SS 1	bar-/rod-shaped whetstone	15.6	2.9	1.4	1	85	
023-009	4	CAMB SS 2	bar-/rod-shaped whetstone	9	3.3	2.4	1.8	119	
023-010	4	CAMB SS 2	bar-/rod-shaped whetstone	5.9	3.5	2	1.8	69	
021-184	unstr.	undet.	ointment palette	4.7	2.3	0.8	0.3	12	
021-185	3	TLS	ointment palette	4.8	6.6	0.8	0.7	30	
021-186	5+POST	TLS	ointment palette	4.5	4.1	undet.	undet.	21	
021-187	POST	PORF NER	ointment palette	4.9	3.6	1.1		40	
021-188	5+POST	PORF ROS	ointment palette	4.9	3.3	0.9		30	
023-005	5	CVM	ointment palette	8.1	9.4	1.2		211	
023-006	5	TLS	ointment palette	5.4	5	1.2		38	
77.OU.311	unstr.	TLS	ointment palette	undet.	undet.	undet.	undet.	undet.	
L32/14B	1	PSS	ointment palette	undet.	undet.	undet.	undet.	undet.	

It has two parallel, flat faces and irregular but rounded edges. It is similar to object 021-189 from Macquenoise sandstone (see *supra*). The function of this object remains undetermined. The shape could be indicative for a scale weight. The second object (cat. no. 021-174) is a very fragmented and badly preserved limestone object. It has two perpendicular flat faces and one concave worn out face and may have been part of a mortar. Several of its faces show superficial small grooves. The third object (cat. no. 021-179) is a small cube-shaped artefact (3.6 x 2.4 x 2.3 cm; 36g). It has smooth faces, of which one shows a small groove. Its function is undetermined.

4.3.16 Undetermined sandstones (undet. SS)

Five stone tools were made from sandstone that yielded no further lithological determination (Table 10.5). A first object (cat. no. 021-212) is a quartzitic sandstone fragment of a bar-shaped whetstone with oval cross section. It is very fragmented and no clear use-wear traces can be determined. Two other objects (cat. nos 021-142 and 021-158, Plates CCCLXXVI and CCCLXXVII) are also bar/rod-shaped whetstones.[279] The fourth object (cat. no. 021-201) is a small passively or actively used bar-shaped whetstone or abrader (7.3 by 4.6 cm, 3.1 cm thick) (Plate CCCLXXVIII). Apart from one irregular (broken or unused) face, it is complete. It has two quasi parallel faces and an oblique edge. Finally, a mortar rim fragment (cat. no. 021-195) with one preserved handle and a diameter of

279 **They could not be studied in detail because they are part of the permanent RAM (Roman Archaeological Museum at Oudenburg) exhibition collection and on show in an inaccessible display case. 021-142 could be a Wealden sandstone.**

Table 10.6. Quantification table of whetstones, abraders, polishers and paraphernalia.

(fort) level	rock	tool type	TOTAL	weight (g)
2	CAMB SS 1	bar-/rod-shaped whetstone	1	9
2	WEALD SS	bar-/rod-shaped whetstone	1	121
Total fort level 2			**2**	**130**
3	CAMB SS 1	bar-/rod-shaped whetstone	2	60
3	CAMB SS 2	bar-/rod-shaped whetstone	2	112
3	SL	disc-shaped; undet.	1	4
Total fort level 3			**5**	**176**
4	CAMB SS 1	bar-/rod-shaped whetstone	19	1252
4	CAMB SS 2	bar-/rod-shaped whetstone	5	1021
4	FAM SS	tabular-shaped; whetstone ?	1	64
4	GQL	bar-/rod-shaped whetstone	4	694
4	GRS SS	bar-/rod-shaped whetstone	1	10
4	LG SS	tabular-/plate-shaped; whetstone	2	209
4	TLS	tabular-/rectangular-shaped; whetstone ?	1	131
4	undet. SS	bar-shaped; whetstone	1	127
4	WEALD SS ?	bar-/rod-shaped whetstone	1	undet.
4	WEALD SS	bar-/rod-shaped whetstone	6	420
Total fort level 4			**41**	**3928**
5	CAMB SS 1	bar-/rod-shaped whetstone	21	1609
5	CAMB SS 2	bar-/rod-shaped whetstone	1	391
5	FAM SS	tabular-shaped; abrader	1	46
5	GQL	bar-/rod-shaped whetstone	3	325
5	undet. LS	cube-shaped; whetstone ?	1	36
5	undet. LS	irregular shaped; mortar ?	1	235
5	MICR LS	bar-/rod-shaped whetstone	1	26
5	RIV SS	bar- shaped; polisher	1	52
5	VS	expedient-shaped; abrader ?; whetstone ?	1	759
5	VS	tabular-shaped; whetstone	1	107
5	WEALD SS	bar-/rod-shaped whetstone	3	164
5	WEALD SS	undet.	1	360
5	undet. SS	bar-/rod-shaped whetstone	1	undet.
5	TLS	tabular-/rectangular-shaped; whetstone ?	1	1679
5	SEPT	expedient-shaped; polisher	1	445
5	LG SS	tabular-shaped; polisher	1	1626
5	SL	disc-shaped; undet.	1	1
Total fort level 5			**41**	**7861**
Post-Roman	CAMB SS 1	bar-/rod-shaped whetstone	12	521
Post-Roman	CAMB SS 2	bar-/rod-shaped whetstone	3	321
Post-Roman	GQL	bar-/rod-shaped whetstone	3	533
Post-Roman	Houiller SS	bar-/rod-shaped whetstone	1	39
Post-Roman	undet. LS	disc-shaped; weight	1	436
Post-Roman	SL	disc-shaped; undet.	1	19
Post-Roman	LG SS	cube-shaped; whetstone	1	57
Post-Roman	LG SS	disc-shaped; whetstone	1	32
Post-Roman	LG SS	tabular-shaped; whetstone	1	42
Post-Roman	RIV SS	disc-shaped; polisher ?	1	0
Post-Roman	PORF	plate-shaped; decorative	1	34
Post-Roman	RIV SS	bar-shaped; polisher	1	276
Post-Roman	RIV SS	plate-shaped; polisher	2	143
Post-Roman	undet. SS	bar-/rod-shaped whetstone	1	22
Post-Roman	WEALD SS	bar-/rod-shaped whetstone	11	442
Post-Roman	WEALD SS	plate-shaped; undet.	2	78
Post-Roman	undet. SS (Quesnois ?)	mortar-shaped; mortar	1	301
Total Post-Roman level			**44**	**3296**
unstratified	CAMB SS 1	bar-/rod-shaped whetstone	2	222
unstratified	LG SS	ball-shaped; undet.	1	67
unstratified	MSS	disc-shaped; weight; other ?	1	203
unstratified	WEALD SS	bar-/rod-shaped whetstone	1	51
Total unstratified			**5**	**543**
TOTAL			**138**	**15934**

(fort) level	rock	tool type	TOT	weight (g)
1	PSS	ointment palette	1	undet.
Subtotal (fort) level 1			**1**	**undet.**
3	TLS	ointment palette	1	30
Subtotal fort level 3			**1**	**30**
5	TLS	ointment palette	1	38
5	CVM	ointment palette	1	211
Subtotal fort level 5			**2**	**249**
Post-Roman	TLS	ointment palette	1	21
Post-Roman	PORF NER	ointment palette	1	40
Post-Roman	PORF ROS	ointment palette	1	30
Subtotal Post-Roman level			**3**	**91**
unstratified	undet.	ointment palette	1	12
unstratified	TLS	ointment palette	1	undet.
TOTAL			**9**	**(>)382**

Table 10.7. Quantification table of ointment palettes.

31 cm has been carved in a white medium grained sandstone which can probably be determined as 'Quesnois sandstone' from northern France (region of Douai-Valenciennes) (Plate CCCLXXVIII).[280]

5. A further analysis. On the socio-economics and cultural dynamics

5.1 Querns and mills

The Oudenburg fort is almost exclusively supplied by basaltic lava querns and mills from the Eastern Eifel Bellerberg quarries. The assemblage is completed with Macquenoise sandstone querns and one arkosic sandstone mill (Figure 10.5). In comparison with other civil sites in the *civitas Menapiorum*, the variability of rocks used for milling is very low. Small hand operated querns carved in Landen Group sandstone and red Devonian sandstone and conglomerate are for example completely absent in the fort. On civil sites the assemblages are more mixed (Reniere 2018), although a notable increase of basaltic lava querns through time can be demonstrated. This is a phenomenon that could be explained by military influence and which will be discussed further below.

It is interesting to note that the sandstone milling equipment is only present from fort period 3 onwards, *i.e.* from the middle of the 3rd century onwards. The find assemblages of the early phases of the *castellum* (from fort levels 1 and 2) dating to the late 2nd and first half of the 3rd century exclusively consist of basaltic lava specimens. However, this observation should be approached with caution as these two earliest levels only yielded a limited number of querns (5 MNI). Furthermore, the site has a very complex stratigraphy with a high degree of residuality due to the long occupation history, as evidenced for the pottery and glass assemblages for example (see in this volume Chapters 1 and 6). The intrinsic qualities of stone to be re-used emphasize even more the potential of residuality in the assemblage of the stone implements. Nevertheless, the overall dominance of basaltic lava is indisputable.

The basaltic lava milling assemblage is characterized by the presence of both hand driven querns (89 MNI) and mechanical driven mills (13 MNI)[281]. Interesting to note is that each fort level yielded at least one mechanical driven mill fragment, whereas the hand driven querns only appear from the second fort level onwards. Based on inscriptions found on quern and mill edges, Junkelmann argued that each *contubernium* (eight men) had their own quern (Junkelmann 1997, 117), and that each *centuria* (ten *contubernia*) could have its own mechanical mill. We might wonder if the mills were used for specific reasons. Maybe their presence can be explained by the need to centralize grain processing for specific social groups like higher ranked military or maybe for exchange with the inhabitants of the adjacent military settlement? Another hypothesis is that these mills could have functioned in the context of large-scale cereal- and flour-processing for malt- or ale production (Shaffrey 2015).

Because of their high fragmentation, the specific driving mechanism of the mechanical mills cannot be assessed. Both central driven animal and water powered mills are theoretically possible (Zugmantel type), although the presence of a Haltern type of mill with a lateral driving mechanism using the capstan-principle cannot be excluded either. The presence of mechanical mills in the fort appears to be corroborated by the find of iron milling equipment in fort level 4[282]. At the south-west corner site, an iron feed cone (IR.C83: Plate CCLXXVIII) and two possible bearings (IR.I01 and IR.I02: Plate CCCI) were recovered at fort level 4. A feed cone was positioned onto the head of a millstone spindle and functioned as feed valve and agitator for the grain that was poured into the hopper (Fort and Tisserand 2016; Watts 2011). The bearings were mounted at the bottom of the installation and functioned as pivoting base for the spindle. Similar iron milling equipment is known from agglomerations like Velzeke, Wijnegem, Grobbendonk and Liberchies (Demanet and Vilvorder 2013; Reniere *et al*. 2014).

280 Preliminary determination by dr. Roland Dreesen. A petrographic study is ongoing.

281 The real number may be lower, as five fragments are interpreted with high probability as mechanical driven, but due to the fragmentation this could not be asserted with 100% certainty.

282 I am very grateful to colleague T. Clerbaut (Ghent University) for introducing me to this subject. It resulted in the identification of several other iron milling specimens in Flanders.

It is furthermore interesting to indicate that in the *civitas Menapiorum* the only other mechanical millstones from basaltic lava – a complete Zugmantel-type millstone couple from Aalter Loveld (Reniere 2018; Thoen and Sas 1993) – has also been found in a military context. Other mechanical mills in the region were manufactured from Macquenoise sandstone and only appear in large agglomerations. In contrast to this distribution pattern are the lateral driven arkosic sandstone mills that are found on different types of sites, including rural settlements[283]. Only one variant of this type of mill has been registered at the Oudenburg site, and deviates in terms of lithology and typology (cat. no. 021-070) (see earlier). Indications for a precise driving mechanism are lacking. As it has a diameter of 52.6 cm, it flirts with the limits of a hand driven versus mechanical driven mechanism.

Within the group of hand driven querns we noticed the dominance of a particular rim-, rynd- and handle slot type. In what follows we will discuss each of these features in more detail. The upper stones of basaltic lava querns are typically characterized by the presence of a band-shaped rim around their edge. In addition to the generally agreed classification scheme for the Eifel querns (Hörter 1994; Mangartz 2008), we differentiated between three subtypes. Whereas subtype 1 has a prominent marked rim, subtype 2 is only marked by a shallow carved circular line. The third subtype has no marked rim at all. In the *civitas Menapiorum*, an interesting difference in distribution pattern is recorded between subtype 1 and 2. The latter is predominantly found in the Oudenburg *castellum* (18 out of 23 recorded querns), whereas subtype 1 is completely absent within the fort and is predominantly found on rural settlements, although also occurring in the agglomeration of Harelbeke (site Dennenlaan). Two *catillus* quern fragments from the *castellum* of Maldegem Vake[284] (Dhaeze 2011) however can be determined as hand driven querns with a rim subtype 1; they illustrate that this type was also circulating in military contexts. Other sites where a rim subtype 2 was found, are Oudenburg – Riethove (site ET26) and Aardenburg – Hof van Buize II, both sites at the military settlements closely connected with the adjacent forts. Three other specimens were found at the sites of Tielrode, Harelbeke (B) and Walcheren (NL).[285] The occurrence of subtype 2 is furthermore mainly situated in the late Roman period during the 3rd and 4th centuries, with only a 2nd-century date for the querns from Tielrode and Harelbeke.

A second typological feature is a particular feed hole and rynd slot type (type 3). It is characterized by a complex of a perforating eye combined with a sunken rynd slot on the passive side of the *catillus*. In the Oudenburg *castellum* it appears to be linked almost exclusively with basaltic lava querns (eleven out of twelve). As they are situated in fort levels 3, 4 and 5, they can all be dated to the (later) 3rd and 4th century AD (two from fort level 3, six from fort level 4, two from fort level 5 and one from fort level 4+5+post).

The third typological feature concerns the handle slot. It is a superior placed horizontal sunken handle socket (or 'blind' handle hole) on top of the rim, which is often wedge-shaped and which does not reach the eye (type 6). Ten out of twelve registered examples in the *civitas Menapiorum* were carved in basaltic lava and were found on sites with a military occupation or close military link, dated from the late 2nd to the 4th century (Oudenburg *castellum*: n=6, Oudenburg Riethove: n=1 and Aardenburg: n= 1).[286] The two other sites yielding basalt lava querns with similar handle slots are Menen – Kortewaagstraat (n=1)[287] and Walcheren (n=1).

When compared with the dataset studied by Picavet (2019) in the framework of his doctoral research, there appears to be a strong link between the geographical occurrence of handle slot type 6 and querns from basalt lava. Twenty-seven out of 64 studied basalt lava querns from Roman sites situated between Seine and Rhine have a handle slot type 6 and cluster in two separate regions: a northern region along the North Sea coast and a southern cluster in the region of Arlon (southern province of Luxemburg, Belgium) and the Titelberg (Luxemburg) (Picavet 2019, 247-252). The small northern cluster consists of three closely located rural sites that are related with salt production, whereas a larger southern cluster is dominated by examples from agglomerations, a *vicus* and *villa* sites. In the region in between these two clusters (between the rivers Lys/Scheldt and the river Meuse valley), type 4 is the predominant handle slot. In this area, handle slots of type 6 are quasi completely absent within the group of basaltic lava querns or even in any other rock (Picavet 2019, Figs 249-250, 249/251). This image is further corroborated by the recently published inventory of querns and mills from Tongeren (Hartoch 2015), where type 6 is completely absent.

In German literature dealing with the Eifel productions, only type 2 and type 4 handle slots are documented for the Roman period (Gluhak 2010b; Hörter 1994; Hörter *et al*. 1951; Mangartz 2008). A rare type 6 example of probable Eifel provenance and found in the late 19th century can be mentioned. The precise find context and location are not known, but the quern probably originated from the vicinity of Trier (Hettner 1893, nos 629, 218).[288] Other rare examples are known from German Late Iron age contexts. Staubitz (2007, Tafel 5: 43, 44) discusses two querns from volcanic rock with a handle slot type 6 from the Heideträнk *oppidum*. Another small quern of which the rock is not determined, with a handle slot type 6 was found at the Manching *oppidum* (Jacobi 1974, Tafel 95: 1783). Finally we can refer to a quern in local stone from the Altenburg *oppidum* in central Germany (Wefers 2006). In Britain Roman basaltic lava querns are only provided with handle slots of type 4 (King 1986; Shaffrey 2015). Type 6 does occur, but only on querns made from other rock (*e.g.*

283 For a discussion on these mills and their function: see Reniere 2018.

284 These two – published – querns could not be traced and studied in detail within the doctoral research referred to here.

285 Another example is known from Asper Jolleveld (De Paepe and Vermeulen 1988). It was not studied in the framework of our PhD. The published object could not be traced and studied in detail.

286 One additional unpublished quern fragment found on the military site of Aalter Loveldlaan and dated AD 150-175 should also be mentioned (private collection). The quern has all characteristics as mentioned above: a rim sub type 2, handle slot type 6 and a rynd type 3. This fragment is not part of our inventory, as it came to light in the final phase of our research.

287 Dhaeze *et al.* 2015.

288 I am very grateful to dr. S. Wenzel (Römisch-Germanisches Zentralmuseum, Leibniz-Forschungsinstitut für Archäologie) for providing German references (see also the Heldenbergen reference).

Old Red Sandstone) dating to the Late Iron Age and early Roman period (Shaffrey 2006). Type 6 handle slots were however much more widely spread in southern Gaul, from the fifth century B.C. onwards (*e.g.* querns from southern France: Longepierre 2012; Py 1992) and from the Iberian Peninsula and Italy (examples cited in Picavet 2019, 251)). Picavet (2019) argues that this type may have his origins in the South and that it became more widespread in northern regions with the arrival of Roman military in the Eifel.

Querns with a rim subtype 2 and/or a rynd type 3 were found in the 2nd-century shipwreck of 'De Meern' in the Netherlands (Mangartz 2007) and the 2nd-century Roman *vicus* of Heldenbergen (Germany) (Wolfgang 2003, Tafel 51: D27, D29n, D30, D31, Tafel 52: D33, D34). Furthermore a Roman quern from basaltic lava provided with a feed hole/rynd type 3 is known from Tongeren (Hartoch 2015, 273-276: cat. no. 50). Twelve other examples were reported by Picavet and most of them are found in agglomerations (*e.g.* Heerlen, Bavay, Titelberg, Altrier) (Picavet 2011, 212, Fig. 41.65; Picavet 2019, 244, Fig. 246A). Finally, within the Tongeren assemblage we note the presence of at least five specimens (of which two large diameter mills) with a rim subtype 2 (Hartoch 2015, cat. nos 6, 7, 21, 36 and 69).

Now we have compared with adjacent areas, we can wonder whether basaltic lava querns with the above discussed typological features have a predominant military connotation in the study region and if so, why? Although some of these features are present on querns found on other than military sites in the study region, these appear to be in the minority. Most commonly encountered on non-military sites are querns with rim subtype 2. Besides on rural sites they are also present in agglomerations and on sites with a close link to military occupation. Less common are feed holes and rynd slots of type 3. In our study region they are almost exclusively found on military sites. The few examples from outside the study region appear to be absent on rural sites and are only found in larger agglomerations or urban centres (Picavet 2019). Regarding handle slot type 6, a similar pattern is noted. They are predominantly found in agglomerations and on sites with a close link to military occupation. An exception are the few finds of this type on rural sites in the coastal area of northern France. However, given the context of salt production, a strong link to military contact cannot be excluded neither. Another exception is the quern from the shipwreck 'De Meern', of which the shipmaster probably had close contacts with the Roman army – he could have been a veteran – (De Groot and Morel 2007, 341-345) while sailing up and down the limes.

All in all, we strongly believe in a military connotation for the above discussed typological features in our region, although more observations and future research are needed to corroborate this preliminary hypothesis. The explanation for the phenomenon remains rather unclear. Whereas the band-shaped rim subtype 2 appears to be almost an exclusively stylistic and 'decorative' feature (though, it is related with a less pronounced hopper), the rynd and handle slot have a specific functional aspect that is related to the driving mechanism. Did the military prefer this way of driving and was it part of their military *habitus*? Through the application of a rynd type 3, the centering of *meta* and *catillus* was improved. Furthermore, it could theoretically facilitate a tentering mechanism (although the quern from 'De Meern' illustrates the opposite). It cannot be excluded that similar features from similar basaltic lava querns from other (rural) sites are underrepresented due to the generally poor conservation degree of this type of rock. Moreover, the large Oudenburg assemblage is dominated by basaltic lava querns and is characterized by an in average higher conservation degree in comparison to other sites and as such can potentially give a biased image. Notwithstanding the fact that further research is needed to support or contradict this hypothesis, it seems that, based on the current observations and data, a military link existed with the basaltic lava querns and the discussed features.

Geochemical analyses carried out on querns with the above discussed typological features shed light on how the military supply of querns and mills was actually organized. These analyses have shown that they could not be linked exclusively to a particular quarry. For example, querns with edge type 1 are allocated to Kottenheimer Winfeld, Ettringer Lay as well as Mayener Grubenfeld. The same goes for querns made from edge type 2, quarried in four different quarry districts: Ettringer Lay, Mayener Grubenfeld, Kottenheimer Winfeld and Hochsimmer, as well as querns with a sunken rynd slot type 3 who have provenances in both Ettringer Lay and Mayener Grubenfeld. This implies that the different quarries were not specialized in the production of one specific (sub-)type. This should not come as a surprise, as many workshops are known in the surrounding areas of the Bellerberg. The final shaping probably took place in workshops in the direct vicinity, like in the *vicus* of Mayen (Hunold 2016) or at Andernach.

It is for example not known if the army had its own quarries and/or if they worked with contractors or sent out *vexillationes*. The boat cargo of La Wanzenau that was loaded with blanks, heading to the fort of Strasbourg, suggests that final shaping was perhaps done at the fort itself (Peacock 2013, 153). This practice occurred indeed as *e.g.* illustrated by the unfinished local sandstone blank in the German Mainhardt fort along the limes (Baatz 2010). In the region under study no indications have been found so far. Traces of redressing on the active surfaces of various querns illustrate that stone was worked (be it to a certain degree) on the consumption site. Maybe the military owned their own workshops or had exclusive contracts with some of them for the production of their own querns. These workshops, on their turn, could have ordered their blanks in different quarries. Another option is that final shaping took place on quarry level and that there was no specialization in finishing particular types which could mean the military did not have exclusive rights and ordered their querns along with others.

To conclude on the mechanisms and organization of military supply of milling equipment, it is interesting to note that two basaltic lava mill fragments from Oudenburg were produced in Kottenheimer Winfeld and Mayener Grubenfeld (cat. nos 021-001 and 021-030). This resembles the dataset from Tongeren (Gluhak *et al.* 2015) where all the mechanical powered mills from the Eifel were manufactured in these two quarries (both four specimens). This could be indicative for a specialization of large blanks in the Kottenheimer Winfeld and Mayener Grubenfeld quarries. However, more comparative research is needed to verify such a preliminary hypothesis.

Another important issue is why the Roman military preferred the basaltic lava over other available stones. Green (2017) suggested that the querns and mills in question were cheaper in production than many of those made of the locally available stones. Because of the price they would have been the preferred commodities, notwithstanding the disadvantages. They produced grit in the flour and wore more rapidly[289] unlike some local stones, *e.g.* puddingstones. An additional, maybe more convincing, argument is their relative low weight. As every *contubernium* had its own quern (Junkelmann 1997, 117), specimens of low weight were probably preferred by the military as they were easier transportable (Peacock 2013). This argument might be supported by the fact that in the Mediterranean, lava rock was generally widespread (Peacock 1980) and the military was already familiar with its advantages. During their early campaigns in the North they will have become familiar with the Eifel lava as a proper equivalent for the necessary milling equipment (Junkelmann 1997, 118). Furthermore, the nearby river Rhine will have encouraged the choice, facilitating fast and cheap (bulk) transport along the limes, over sea and further inland. The ports of Domburg and Colijnsplaat and/or the military *vici* could have functioned as redistribution centres for the *civitas Menapiorum*. Epigraphic evidence draws an image of the close trading and shipping contacts between the Rhineland and the Gaulish and British coastal area (Stuart and Bogaers 2001). Along with the basaltic lava milling equipment, Mayen pottery and volcanic tuff blocks were imported from the same region.

For a long time there has been the perception in Roman Britain that lava querns were (exclusively) part of army equipment. More recently, this idea has been refined. It is now more generally accepted that the basaltic lava stones were initially brought in as part of military equipment and that the Roman military was the catalyst for a more general distribution (Green 2017; Peacock 2013; Shaffrey 2015). Regarding this military influence on the Eifel products supply, we believe in a similar scenario for the *civitas Menapiorum*.

In his study on North Sea and Channel connectivity, Morris (2010) suggested a peak of Eifel import in the period AD 70-165, although it is now more and more apparent that the querns and mills continued to be imported on a large scale in subsequent periods (Peacock 2013, 154). Green (2017) states that they were increasingly adopted by local populations over time, which eventually led to the decline of more local and regional querns. According to this author, many Romano-British assemblages in the east and south of England were dominated by lava querns. The ports of London and Colchester probably functioned as major centres of arrival and redistribution (Green 2017; Peacock 2013).

In the *civitas Menapiorum* we note a general increasing trend over time for basaltic lava querns. Although they were already present from the first century onwards, it takes until the second half of the 2nd century to observe a notable increase in their numbers. From the first half of the 3rd century the dominance becomes very clear as the basaltic lava takes the lead when compared to other rock. This dominance continues in the subsequent periods. Although this image is biased to a certain degree – especially for the later periods and in particular with the fort assemblage of Oudenburg -, it is obvious that there is an overall increasing trend (Reniere 2018). The important turning point in their supply in the late 2nd century could be explained by the increasing presence of military in the northern part of the territory during this period (*e.g.* the forts of Oudenburg, Aardenburg, Aalter and Maldegem) which could have acted as a stimulant for their civil distribution in the wider northern region.

289 That basaltic lava has a fast wear – a belief that is repeated in literature – should in our opinion be verified with experimental archaeology. It is a very hard rock and due to its vesicularity it probably did not need frequent redressing to remain effective.

5.2 Ointment palettes

When compared to other sites in the region, ointment palettes are almost exclusively found in larger agglomerations like military installations (*e.g.* Aardenburg, Maldegem, Oudenburg), towns and *vici* (*e.g.* Tongeren, Blicquy, Heerlen, Velzeke, etc.) while only few examples are known from rural sites (Reniere *et al.* 2018a). This distribution pattern can be interpreted as a reflection of the Romanized identity of soldiers (families) and the inhabitants of urbanized agglomerations. Cities, *vici* and military forts can be seen as a hub for a Mediterranean style of living, expressed through material culture of which stone ointment palettes are only one example. In comparison, farmers, *villa* residents or *villa* owners also had access, although more exclusively, to these commodities.

Regarding their function there is also a potential link with the presence of the *valetudinarium* at fort level 2 and the bath house at fort level 5A in the south-west corner of the Oudenburg fort. The presence of stone ointment palettes together with other medical instruments like a probe, a *ligula* and a *spatula* could be linked with the practice of a physician (see Volume I, Chapter II.4.4.2.b). We know that doctors were present in military camps: the *Classis Britannica* for example, had its own oculist (Allason-Jones 1999). Medical and cosmetic practice is also known in the context of antique bath houses. Künzl (2002) refers to Roman baths where several objects related with medicine and cosmetics were found, among which ointment palettes (Barbara thermae, Trier). We can also refer to two ointment palette finds in the bath complex at Heerlen (Reniere *et al*. 2018a).

A Vindolanda letter indicates that the women of the military families were expected to deal with the day-to-day health problems (Allason-Jones 1999). This could also be the case at Oudenburg, as gender-related finds point to the presence of women in the fort (see Volume I, Chapter V.3.4.2). In this respect it is worth drawing attention to the occurrence of one complete palette in microquartzite (inv. no. L32/14B) as burial gift in the niche of a cremation grave of a woman, located in the mid-Roman southern graveyard (site ET14). It was part of a high-status double cremation grave situated within an enclosure and interpreted as belonging to a married couple (Hollevoet 1994) (see also Volume I, Chapter IV.2.3). Ointment palettes are commonly encountered as burial gift. In a review of 50 palettes from the wider region, fifteen were found in a funerary context (Reniere *et al*. 2018a), including

graves from Tongeren, Blicquy and Heerlen. In these contexts they are commonly associated with *spatulae* or other potential medical or cosmetic utensils. It is clear that these objects had an important connotation for the deceased and that they were a way of expressing their identity.

Four out of nine palettes were manufactured from Tournai limestone. Three others consist of more exotic stones that were imported from much further away, far outside the study region. Only one microquartzitic palette was imported from southern Belgium. A similar pattern can be noted for five palettes from the fort of Aardenburg: three were carved in Tournai limestone whereas two others have an exotic origin. Striking is the absence of the Trier Diabase from Western Germany and the quasi absence of Paleozoic sandstones from the Rocroi Massif. They appear to be better represented in contexts from the *civitas Tungrorum*. The important number of Tournai limestone palettes could be explained by the omni-presence of similar limestone building material that was quarried along the river Scheldt in the southern part of the *civitas Menapiorum*.

Finally, it is interesting to note that within the reviewed dataset of 50 specimens, all the exotic imports in the research area are exclusively found on the military sites of Oudenburg and Aardenburg. Five palettes were manufactured from expensive decorative stones that were traded and transported over long distances (*e.g.* from Greece, Turkey, Egypt and the Pyrenees). These objects can be considered as luxury goods purchased and used by the Roman military to showcase wealth and prestige and/or as the result of a personal belonging that travelled a long way with its owner. Somehow it can inform us also about the socio-cultural identity of the inhabitants of the military camp and their complex trade and exchange networks they had access to. In this context we should bear in mind the complex life history of these small portable implements. A good illustration of this complex 'biography' is the 'exotic' palette in *cipollino verde mandolato* found at the south-west corner site of the Oudenburg fort. The palette had been broken at a certain moment and was repaired. Whether it was the initial owner who did this or its predecessor who found the broken stone slab, people clearly invested time and energy to restore the palette by smoothing the broken edge. It is a case in which the high value of the object is reflected and in which the potential complex 'cultural biography' is illustrated.

5.3 Whetstones, polishers, abraders and paraphernalia

Best represented at the Oudenburg site are the bar- and rod-shaped whetstones with 109 out of 138 specimens. They are ideal tools to shape and sharpen the cutting edge of long bladed tools like knives, sickles, scythes, daggers and swords. Other metal implements like axes, needles, scissors, arrows, etc. could also be whetted with this type of whetting implement. Some of the whetstones bear traces of (secondary) abrading activities which are indicative for a multifunctional use. This large group of bar- and rod-shaped whetstones is represented by at least seven different lithologies (CAMB SS 1/2, GQL, Houiller SS, WEALD SS, GRS SS, MICR LS, undet. SS), a much higher rock variability in comparison with the grinding equipment. One could wonder whether their petrographic characteristics (*e.g.* grain size, mineralogy, cementation degree, etc.) played a role in their selection in function of specific whetting activities and/or worked alloys. For example, the very soft and very fine-grained micritic limestone will certainly have served another purpose than the group of Cambrian silt- and sandstone tools or the quartzitic lithic sandstones.

Most dominant within the bar- and rod-shaped whetstones are the Cambrian silt- and sandstones (CAMB SS 1 and CAMB SS 2, n=68). They are found over the entire region on different site types and were part of a major North Gaulish whetstone production, traded over a large territory (Jäger *et al*. 2017; Lanting 1974; Thiébaux *et al.* 2016). The depot find from Xanten furthermore illustrates that they were already traded in bulk from the early Roman period onwards (Haupt 1980; Jäger *et al*. 2017). Unlike suggested in some recent reports of Dutch archaeological research following Lanting (1974) (*e.g.* Houkes 2012, van Pruissen and Kars 2010), we did not observe a correlation between military contexts or agglomerations on the one hand, and this type of whetstones on the other (nor the herringbone 'decorated' variants, typical for CAMB SS 1 varieties, occurring on both military and local rural sites).

Remarkable within the group of bar- and rod-shaped whetstones is furthermore the presence of 23 Wealden calcareous sandstones (WEALD SS). They are the second largest group within the bar- and rod-shaped whetstone assemblage and it is for the first time that they are reported on the continent. They have been studied together with Wealden whetstone finds from adjacent areas that were analyzed within the context of the doctoral research of Thiébaux (2018). The recently published results (Reniere *et al*. 2018b) will be discussed as a separate case-study further below.

Furthermore we note the presence of tabular and plate-shaped tools. With thirteen specimens they are far less represented then the bar- and rod-shaped tools. They are carved out of at least six different lithologies (TLS, VS, FAM SS, LG SS, RIV SS, WEALD SS). They have mainly functioned as passively used whetstones, for example for short bladed tools like a chisel or an axe or to sharpen needles and small knifes. Several ones show also indications for an abrading and polishing function. Remarkable is the find of two tools made of Tournai limestone, rather rare to have been used as ground stone tool. In the region this stone is mainly known as building material and for the manufacture of ointment palettes. Based on its petrographic characteristics it will have been applied for a particular application. Within the same context we mention the presence of an irregular natural shaped and semi-spherical object in a 'septarian concretion' that was probably used as a passive mobile whetstone or polisher. The worked face shows a very smooth surface with a kind of greasy polish and is covered with thin short parallel striations and grooves which do not surpass the edge. Again, this is indicative for a very particular kind of whetting or polishing activity. A similar rock and tool type has so far not been recognized on sites in the wider region.

Several small tools were very mobile and used as active tools. Within the group of sandstones we note a spherical/ball- and cube-shaped

tool. Another cube-shaped tool was made from an undetermined limestone and will have had a specific function as also discussed earlier for the Tournai limestone and micritic limestone. Special is also the find of three small disc-shaped objects made of slate with grooves that could be indicative for a particular function.

All these stone implements may well have served in the different stages (manufacture, maintenance and reparation) of various crafts activities that were practiced at the fort: metalworking with copper alloy and iron, woodworking, carpentry, textile and leather working, and agricultural and agro-pastoral activities (cf. Volume I, Chapter II.4.6.2.c; in this volume Chapter 3, Sections 3.6-3.7 and 5.7-5.8). Regarding the function of the above discussed tools, we should stress that although the focus is traditionally on working metal implements, other worked materials have to be considered as well. In analogy with morphologically similar examples from Pre- and Protohistory, it cannot be excluded that they continued to be used to work other materials like for example wood and bone (Reniere 2018). We can cite the example of a Roman bone processing workshop that was recently excavated in France[290] or refer to a medieval antler comb workshop from Haithabu where associated ground stone tools were found (Resi 1990, 47-52). Finally we can mention the passages in the 'Natural History' of Pliny the Elder in which the abrasive use of stone for other than metal implements is discussed, for example the polishing of stone and ivory objects (Schroeder 1930, 8-24). In order to verify these hypotheses, experimental research in combination with use-wear analyses is actually carried out at Ghent University[291].

The Wealden case

In the context of a comparative research carried out by several scholars (Reniere *et al*. 2018b), a total of 55 Wealden whetstones from 21 archaeological sites – of which 23 whetstone (fragments) from the Oudenburg fort – were inventoried in the provinces of *Gallia Belgica* and *Germania Inferior*, actual Belgium, France and the Netherlands.

The results reveal a remarkable distribution pattern: it appears that the whetstones cluster (although not exclusively) in well-connected central places like urban sites (public towns), agglomerations (towns) and military sites whereas in comparison the bar- and rod-shaped whetstones from Cambrian silt- and sandstones, the dominant production in the region, supplied a whole range of different types of sites. This contrasts with their distribution in *Britannia*, where Wealden whetstones have a very widespread distribution and appear on all kind of sites (Allen 2014).

The Wealden whetstones are one of the very few proofs of British Roman stone export to the Continent. In contrast to other cross-Channel traded and exchanged commodities like pottery, olive oil, etc. (Morris 2010), there is little evidence for stone export from Roman Britain (Pearson 2006). We can report some rare occurrences such as that of a British altar of Millstone Grit from Bordeaux (France) and a Millstone Grit millstone in Boulogne-Sur-Mer (Green 2017, 174; Pearson 2006, 87). On the other hand, there are clear indications for stone import in the opposite direction, from the Continent towards Britain: German basalt lava and French puddingstone querns (Green 2017, 167; Morris 2010) and building and decorative stones from Northern France and even more exotic stones from the Mediterranean realm (Birch and Cordiner 2014, 310; Dourdin 2011; Russell 2013, 162-163).

In order to reveal the mechanisms that lie behind this particular distribution mechanism, we have to question the potential process by which objects are moved in societies. Are they the result of movement of personal possessions, gift exchange, redistributive exchange, market exchange, war booty? Objects could of course move through several different mechanisms during their lifetime between the quarry and the deposition in an archaeological context (Morris 2010, 7-9).

The Wealden whetstones on the Continent could indeed be the result of trade. This hypothesis would imply that people from the countryside merely did not have access to the whetstones. These tools might have been exclusively meant for specialized craftsmen who were established in towns and cities or military camps. The particular mineralogical characteristics could be linked with this hypothesis. However, more archaeological evidence from Britain or the Continent is needed to proof this potential link with specialized craftsmen.

Given the low number of finds on the Continent, another mechanism that could have played a role is personal mobility: the small portable tools were purchased on the British market, obtained as gift or redistributive exchange or directly taken from the quarry or workshop and subsequently crossed the Channel as the personal belonging of individuals. One can easily assume that people that crossed the Channel had a higher mobility and belonged to other social classes than ordinary local peasants living in the countryside. They were merchants, elite, (civil) Roman officials, travelling craftsmen and military that were living in the well-connected places where most Wealden whetstones were found. Amongst these people with a high mobility, three important elements point towards the army as a significant agent.

The cluster of finds in the military fort of Oudenburg is a first important argument for the role of military agency in their distribution. It is not surprising to find British imports on this site as it was part of a connected defence system (cf. *Litus Saxonicum* from the 4th century onwards, and even earlier: see Volume I, Chapter V.1.7) and as such well connected to Roman Britain. Besides the whetstones[292], notable quantities of Romano-British pottery (fine wares, mortaria, coarse pottery) have been encountered in late 3rd-century and later contexts at the Oudenburg shore fort (see resp. Chapters 1.A.2, 1.B.3, 1.B.5.1 in this volume). Another important

290 Pers. comm. dr. P. Picavet.

291 *'Whetstones' on the cutting edge. Understanding the cultural biography of Roman and medieval macrolithic tools through the application of use-wear analysis. From domestic and agricultural activities to specialized craft productions*, Ghent University postdoctoral fellowship BOF20/PDO/046.

292 Only one whetstone is situated in fort level 2. Ten whetstones were found at fort levels 4 (n=7) and 5 (n=3). Eleven come from the post-Roman layers, probably re-deposited material. Another whetstone was found unstratified.

link are the bronze bracelets from several late Roman female graves of Graveyard A that show similarities to examples found at the fort of Portchester (Sas 2004; Vanhoutte 2015, 64). From the same site, seven whetstones from Wealden sandstone are reported (Allen 2014, 115). We do not know if the whetstones from Oudenburg were part of the daily equipment of the military or if they were linked with a specific artisanal activity. There could be a link with the local brooch production (cf. Volume I, Chapter II.4.6.2.c; in this volume Chapter 3, Section 3.6.1).

A second military link can be found in the large-scale iron industry of the Weald. Throughout history, this region is traditionally known for its iron production through iron ore exploitation in the form of siderite (Cleere and Crossley 1995). Based on stamped tiles found on several sites in the eastern Weald, it is suggested that there was a close relationship between the production of iron and the *Classis Britannica*. Furthermore we know of tiles manufactured from Wealden clays that were found at the naval base of the fleet in Boulogne-Sur-Mer (Peacock 1977a, 12). Some authors believe that the Roman iron exploitation in the Weald was directly state-controlled and they even suggest that the Weald was administered as an Imperial estate (Cleere 1974). By operating in the broader region, officials of the *Classis Britannica* must have had access to the Wealden production. Therefore, they can be seen as important agents, responsible for their continental distribution.

A third argument is linked with two early Roman finds around Arras and the role of the Attrebates during the first two invasions of southern Britain. For an exhaustive discussion on this argument we refer to Reniere *et al.* 2018b.

All in all we believe that the Wealden whetstones are an exceptional category of whetstones that were only accessible to a limited group of people within society like military and specialized craftsmen. However, we do not exclude that more rural finds exist but were not recognized so far. Future research and finds from well-documented contexts will point out whether our hypothesis holds ground.

5.4 Paraphernalia

Two disc-shaped objects can probably be identified as scale weights. One is manufactured of Macquenoise sandstone whereas the other consists of an undetermined limestone. Similar discs are known in the wider region like the Tournai limestone examples from Aardenburg (Reniere 2018) and Roeselare Haven (Reniere 2016). Similar stone scale weights are also known from the Mediterranean, for example from Jerusalem (Israel) (Zilberstein *et al.* 2013).

Two stone objects are identified as mortar fragments (cat. nos 021-174 and 021-195; fort level 5 and post-roman level). The stone mortar is a typical element of Mediterranean material culture and implies a strong 'Romanization' (Bertrand and Tendron 2012). Similar stone mortars from Roman civil rural sites are not documented in the region under study. In the wider region, mortars of similar type are known from the *burgus* (small road fort) of Taviers in the current province of Namur (Vilvorder 2013) and from the Richborough fort (Dunning 1968)[293]. The cosmetic and medical functions dedicated to stone mortars by Pliny the Elder in his 'Natural History' have been confirmed by discoveries in Aquitaine (F) and Rimini (I), however, functions in culinary activities are not excluded (Verbrugghe 2016). A cosmetic and medical function could well go along with the ointment palette finds and the presence of the *valetudinarium* at fort level 2.

6. Conclusions on the provenance, use and socio-economics of querns, mills, whetstones and other stone implements at the Oudenburg fort

The excavations at the military site of Oudenburg yielded a large assemblage of stone implements. We counted 845 stone artefacts (or fragments) with a total weight of 358 kg. The assemblage consists mainly of milling equipment and whetstones. Furthermore we noticed also the presence of polishing and abrading tools, ointment palettes, a rare mortar and two probable scale weights. They were carved out of an amalgam of at least 20 lithologies and represent as many provenances.

Only few were retrieved from local and regional sources (*i.e.* local: within a perimeter of max. 30 km, regional: within a perimeter of 30-100 km). A restricted number of glauconite bearing quartzarenites (fieldstone) were used as expedient tools; these stones were found in the direct vicinity of the site. Building material, ointment palettes and sharpening/polishing tools from Tournai limestone and tools from Landen Group quartzarenite and quartzite were imported from regional outcrops or quarries further away. One could wonder if the Tournai limestone quarries were (partly) administered by the military as also similar finds (palettes and construction material) are known from the military sites of Aardenburg, Aalter and Maldegem.

The majority of the stone artefacts was however imported from extra-regional sources (>100 km). Many of the sandstones have their provenance in southern Belgium, along and south of the Sambre and Meuse valleys and around the Stavelot-Venn and Rocroi Massif. The latter was a very important exploitation area during the Roman period, with quarries that exploited rock for the production of querns, mills and whetstones. From the same region we reported also a complete ointment palette from a high-status cremation grave at the southern graveyard. Despite the fact that their products had a very widespread distribution within the surrounding *civitates* (Picavet *et al*. 2018; Thiébaux 2018), only a limited number of querns and one mill from Lower Devonian rocks are reported in the military assemblage of Oudenburg. On the contrary, the Cambrian silt- and sandstone whetstones dominate the Oudenburg sharpening tool assemblage.

From further away are the quantitative important categories of basaltic lava querns and mills from the German Eifel region and the Wealden sandstone whetstones from South-East England

293 **Of the eleven mortars presented by Dunning (1968), the examples 1, 4, 5 and 7 of Pl. LXVI (from sources in Britain) and examples 10 and 11 of Pl. LXVII (of white marble) are close parallels for the Oudenburg sandstone mortar.**

(Sussex). Even more exotic are the three ointment palettes of which the raw materials come from the French Pyrenees and Egypt. These implements travelled over long distances and are illustrative for the large and widespread network the military had access to. We have shown that the Oudenburg fort was almost exclusively supplied by basaltic lava querns and mills. Furthermore we have illustrated the existence of a particular quern design that appears to be linked with the military. The Eifel milling equipment was imported together with Mayen pottery and volcanic tuff blocks and one could wonder to which extent the military was involved in the exploitation and wider distribution of these stone commodities. Their supply was probably assured through military contracts and/or taxation. A similar hypothesis could be put forward for the earlier mentioned Tournai limestones. As such they could have functioned as a kind of catalyst for the inland local and civil distribution. The sandstone querns could however be part of a more civil supply mechanism and are illustrative for the potential socio-economical interactions and dynamics between military and local communities. Regarding the Wealden stones supply mechanism, argumentation has been made that it is not one of pure trade. Although several factors might have operated simultaneously, it has been suggested that personal mobility was an important distribution mechanism. There could be a link with the large-scale (probably partly state-controlled) iron industry of the Weald and the role of the *Classis Britannica*. However, we cannot exclude the role of other potential agents like merchants, elite, (civil) Roman officials or travelling craftsmen who were living in well-connected places where these particular whetting tools were found. If it were products of trade they were probably intended for specialized craftsmen.

With regard to the variability of tools and their different functions, we see that the milling equipment of the military consisted of both mechanical driven and hand operated querns. It is believed that each *contubernium* had its own quern to provide in the daily needs. The larger mills could have played a role in supplying higher ranked officials and military or be used in more specialized activities like malt or ale production. One could wonder if the limited number of sandstone querns were imported for a special reason, for a particular grinding activity or if they were only the result of civil contacts. Most dominant within the whetstone assemblage are the bar/rod-shaped tools, carved out of various types of sandstones. They were probably mainly used for maintenance activities of long bladed tools and could fit well in the domestic, craft and more specialized equipment of a military. Other tools like tabular-shaped whetstones, abraders and polishers could be indicative for other and maybe more specialized craft activities. Although low in numbers, it is interesting to note that several of these tools were made of rocks that are absent on civil sites in the region: the Wealden calcareous sandstone bar-shaped whetstones, a greensand sandstone, Tournai limestone tabular-shaped tools, a micritic limestone tool and a septarian concretion polisher. Their presence could be explained by particular supply mechanisms (cf. the Wealden whetstones) in combination with their specific petrographic characteristics that were important in the context of specialized activities.

Finally, the presence of ointment palettes and two mortars can be understood as a reflection of the Romanized identity of soldiers and their families. The presence of the different palettes and probably also the stone mortar show that medical/cosmetical activities were practiced, maybe by female inhabitants of the fort. Forts can be seen as hubs for a new, Mediterranean-inspired culture and style of living, expressed through material culture, of which these stone ointment palettes are an example. From that point of view, it is also interesting to note that ointment palettes from very exotic as well as regional rocks were present.

Appendix. The key context assemblages

Sofie Vanhoutte

1. Introduction: key context assemblages as windows to chronology and insights into functionality, cultural habits and changing exchange (networks) throughout the fort's occupation

Key contexts were selected for every fort level in order to obtain more insight into the chronology of the successive fort levels and with regards to the character of the respective find assemblages. More specifically, they are studied in order to investigate whether or in what degree they can contribute to the understanding of the function of the fort area at the respective fort level and whether they can give insight into the everyday life of the fort inhabitants. Pottery is mainly indicative in terms of chronology, economic relationships and dependence on local/regional versus extra-regional markets, and cultural aspects with regards to food and drinking habits. Metal objects and other small finds offer a window on other aspects of everyday life as well as to a functional interpretation of the fort area.

Key contexts are considered as stratigraphically, quantitatively and qualitatively reliable contexts. Key contexts per fort level were primarily chosen based upon their firm stratified position and the closed character of the feature or structure. The second criterion was formed by the pottery assemblage spectrum, both in terms of quantity and the presence of diagnostic and datable pottery sherds next to a minority or at least a definable portion of residual and/or intrusive finds. The diagnostic and datable pottery fragments are primarily represented by the imported wares, and more specifically the imported fine wares. However, for fort levels 1, 2 and 3, contexts meeting these criteria are not numerous. For fort level 1 contexts, inevitably an exception has been made upon the quantitative and qualitative criteria, since this level yielded only one context meeting these criteria (context OS 30916). It is opted here to present also other find assemblages which can contribute to a chronological conclusion for fort level 1. For fort levels 2 and 3 key contexts with close chronological indicators appear to be scarce; some key contexts are selected for the variety in the pottery spectrum they represent. Obviously, more closed contexts are available with less (or hardly any, whether or not diagnostic) fine wares but mainly common wares; these definitely deserve attention in future research.

The pottery from the different key contexts has been subdivided, ordered and presented by fabric and in a range from fine to coarse wares as follows: samian (SA), colour-coated and black-slipped wares (CC/BS), fine oxidized (FO) and mica-dusted wares (MD), Pompeian Red ware (PR), flagons and jar-amphorae (FL), amphorae (AM), dolia (DOL), mortaria (MOR), coarse oxidized (CO OX), fine reduced[294] (FO), coarse reduced (RE), and finally handmade wares (HA). Closed forms precede open forms; when considering the samian wares, the decorated fragments are shown per fabric first. As for the samian, the fabric group classification predominates the form classification. As for the reduced and handmade wares, imports are shown at the end of the group.

Of most of the key context assemblages, the samian assemblages have already been discussed in detail in Chapter 1.A.1 in this volume, in Section 11. Only the respective conclusions are repeated here. For the bibliographical references concerning dates of fabrics and types already occurring in the studies in-depth throughout this volume, the author wishes to refer to these respective studies. The accompanying tables give an overview of all pottery fragments present in the context in question[295], with sherd counts and the minimum number of individuals listed[296] [297]. The detailed inventory of the respective context assemblages follows in a separate table.

Three large pottery assemblages from key contexts were studied in depth in a collaboration with other specialists. The study of the pottery assemblage from the large waste-pit OS 4980 from fort level 4 (Vanhoutte *et al.* 2009c) was executed in collaboration with W. De

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294 **It would be best to put the fine reduced (beakers) behind the CC/BS wares as they both are 'fine' wares. However, since the distinction between fine reduced and coarse reduced wares is sometimes very difficult, it was chosen here to position the fine reduced wares as first group of the reduced wares.**

295 **As for the decorations, when not specified, the described decoration is situated on the exterior surface.**

296 **When not specified, pottery sherds listed in one and the same record are joining sherds; otherwise this is clarified.**

297 **Within the analysis of a context, a 'maximal' MNI approach is targeted, not only considering the rim fragments but unique base or body fragments as well. Within this approach, a body sherd of a pottery group not represented otherwise in the context is therefore also considered as one MNI. Percentages of sherd counts and of MNI are only recorded when the assemblage contains more than 100 fragments.**

Figure 1. Location of the selected key contexts of fort level 1.

Clercq and W. Dhaeze; the same goes for the pottery of the double well OS 2562 (Vanhoutte *et al.* 2009b). The pottery of the well OS 22926 from fort level 4 was studied in close collaboration with W. De Clercq. The pottery from this context was processed and classified for the first time by T. Bruyninckx in 2007 within the context of her Master thesis (Bruyninckx 2007). B. Mignauw processed and studied the ceramics from the large water-basin (from construction pit to its latest waste fillings) for his Master thesis in 2005 (Mignauw 2005).

Apart from the pottery, also the other diagnostic cultural artefacts are included in the analysis when present in the context. Coin identifications were made by J. van Heesch (see also Chapter 2 in this volume), glass identifications by P. Cosyns (see also Chapter 6 in this volume), the analyses of the leather shoes by C. van Driel-Murray (see also Chapter 8 in this volume) and the identification of the stone objects by S. Reniere (see also Chapter 10 in this volume). Identifications and dating proposals of late Roman samian roller stamps were provided by L. Bakker, W. Dijkman and P. Van Ossel (see also Chapter 1.A.1 in this volume, Section 8.2).

2. Key context assemblages from fort level 1

Only very few find contexts which can undoubtedly be assigned to fort level 1, yielded a significant find assemblage from which conclusions can be drawn on a chronological level. Therefore, for this level it is necessary to integrate also contexts with only a very small number of (indicative) pottery sherds.

The key contexts of fort level 1 did not yield any coins; other chronological elements besides pottery are also lacking. As will be clear, only some contexts yielded other find categories, albeit very limited.

The selected key context assemblages for fort level 1 are represented by earthen rampart levels OS 30905 and OS 30916 assignable to this level, pits OS 6002 and OS 70976 both related to Construction I or its adjacent unit, pit OS 72136, and construction slot OS 11267-287 of Construction IV (Figure 1; see Plates CCCLXXXI-CCCLXXXVI). The other features, whether construction slots, postholes or pits, of Constructions I, II and III, only yielded limited ceramic assemblages without indicative pottery sherds. These comprise fragments of flagons, grey wheel-turned and

Table 1. The pottery categories of context OS 30905, in sherd count and in MNI.

OS 30905	sherd count	MNI
SA	9	5
CC/BS	2	2
FL	15	2
MOR	1	1
CO OX	1	1
RE	8	2
HA	11	1
undet.	1	0
TOTAL	**48**	**14**

Table 2. Inventory of the pottery of context OS 30905 (Plate CCCLXXXI).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
	SA	LEZ SA	Drag. 18/31	dish				**1**		1				**1**
	SA	LEZ SA	Drag. 33	cup				**1**		1				**1**
	SA	CG SA	undet.					**1**		1				
	SA	ARG SA	undet.					**1**		1				**1**
2	**SA**	RHZ SA	Drag. 31	dish/shallow bowl				**1**	1					**1**
	SA	RHZ SA	Drag. 31	dish/shallow bowl				**1**		1				
	SA	RHZ SA	Drag. 31/32/36R	dish/shallow bowl				**1**			1			
1	**SA**	EG SA	Drag. 37	bowl	ovolo too small to identify			**1**		1				**1**
	SA	EG SA	undet.					**1**	1					
	CC/BS	KOL CC	Hees 17a / NB 40 / Höpken E1/E2	dish		orange	central part with edge of base	**1**			1			**1**
	CC/BS	MOS BS		beaker			very small, fine individual	**1**		1				**1**
	FL	NOG FL		tableware flagon			loose sherds from different flagons	**13**		13				**1**
	FL	COL FL		tableware flagon				**2**		2				**1**
3	**MOR**	RHI MOR (?)	VV348	mortarium				**1**	1					**1**
	CO OX	EIF CO OX	undet.	pot/jug			small lip fragment	**1**	1					**1**
	RE	NOM FR		beaker				**3**		3				**1**
4	**RE**	NOM RE	bowl II.A.5	bowl	burnishing on exterior rim			**1**	1					**1**
	RE	NOM RE					loose sherds from different vessels	**4**		4				
5	**HA**	NOM HA	bowl II.A.3a	bowl			coating on exterior rim	**1**	1					**1**
	HA	NOM HA					loose sherds from different vessels	**10**		10				
	undet. (AM?)	SG/ NARB?	amphora?				chip	**1**		1				
	TOTAL							**48**	**6**	**40**	**2**	**0**	**0**	**14**

handmade wares. Only one rim fragment of a Lezoux Drag. 38 collared bowl, a typical type for the second half of the 2nd century (Webster 1996, 51), and one body fragment of a Bavay-Famars mortarium, are significant, both belonging to pit OS 72732 situated at the south-east corner of Construction I (Figure 1).

2.1 Earthen rampart OS 30905-30916

This context comprises the material found in the lowest level of the earthen rampart related to the installation of the first fort (OS 30905) and in a burnt layer full of charcoal (OS 30916), most likely representing the end of fort level 1.

2.1.1 Earthen rampart context OS 30905

However representing only a small quantity (48 fragments accounting for fourteen MNI; Tables 1-2), the pottery assemblage from the lowest level of the earthen rampart yields a few chronological indicators for the installation of the first fort (see Plate CCCLXXXI). The five samian MNI with at least two Lezoux individuals (one ill.: no. 2), one from the Argonne, one from Rheinzabern and one only generally assigned to the East Gaulish potteries (no. 1), generally point to the second half of the 2nd-early 3rd century. Although only two individuals are involved, the co-occurrence of fragments of the Cologne colour-coated dish Hees 17a / NB 40 / Höpken E1/E2 with orange slip and of a beaker in black-slipped *Moselkeramik* (both not ill.) puts the assemblage in a period from *c.* AD 180 onwards. The curly mortarium rim VV348, probably from the Rhineland and showing an inner bead not reaching higher than the rim (no. 3), relates to the 2nd-century mortarium repertoire (Willems 2005). With such low number of fragments, representing a variety of forms and types, further functional conclusions are not justified. Worth mentioning is the presence of a collared bowl II.A.5 in North Menapian reduced ware and bowl II.A.3a in North Menapian handmade fabric; the latter will appear to be the most popular handmade bowl at the Oudenburg fort.

2.1.2 Earthen rampart context OS 30916

More information can be retrieved from context OS 30916, representing a fire layer full of pottery fragments. The high number of pottery sherds, the several large fragments and complete or nearly complete profiles and the almost complete but fragmented Gauloise 4 amphora, indicate that this assemblage represents a waste dump in primary position (Plates CCCLXXXII-CCCLXXXV). Functionally, the assemblage is dominated by tablewares and cooking/kitchen vessels, next to a significant number of drinking vessels (Tables 3-4; Figure 2).

The pottery comprises 862 fragments, accounting for 90 MNI. Most of the samian was supplied by Central Gaulish potteries, mainly from Lezoux (nos 1-7). With La Madeleine (no. 8), Trier (no. 10), Rheinzabern and an unspecified East Gaulish fabric (no. 9) each represented by only one individual, the dominance of Lezoux points to the 2nd century for this assemblage. The presence of the potter Iustus II (no. 2) dates this assemblage after AD 160. Two Drag. 43/45 mortarium wall fragments, one in Lezoux fabric and one in Rheinzabern fabric, point to a date certainly after AD 170/175. The four beakers of the colour-coated and black-slipped ware group enable us to narrow down the date range. The presence of two NB 33 beakers in *Moselkeramik* (nos 11-12), next to two Cologne beakers, namely one Hees 2 (no. 14) and one Hees 3b (no. 13), places this assemblage after AD 180. One mica-dusted pot with everted rim (no. 15) belongs to a North Gaulish production. The flagon group points to the diversity in flagons at the earliest fort. They were mostly of regional origin, mainly from the Low Lands Ware 1 production (nos 16-20), but Bavay-Famars and Cologne flagons were also present. The almost complete Gauloise 4 amphora with potter's mark on the shoulder (no. 23) most likely became fragmented after its deposition at this particular spot. Based on its form, this example can be dated in the last quarter of the 2nd century AD.

Significant in the mortarium assemblage is the absence of vessels from the Rhineland while these products dominate the 3rd-century assemblages at the Oudenburg fort. At least two mortaria with curly collar originate from Bavay-Famars (nos 21-22). Body fragments belong to at least one Noyon mortarium. Noyon products, made from the 1st century to the first half of the 3rd century, appear to be rare at the Oudenburg fort; they hardly reached our region. The very small mortarium rim fragment from the Lower Nene Valley potteries, should be interpreted as an intrusive item (from the robber trench of the stone defensive wall). Although the Lower Nene Valley potteries already produced from AD 150 onwards, their wider distribution is only known from *c.* AD 250 onwards. Moreover, all other Lower Nene Valley imports at Oudenburg only appear from fort level 3 onwards. Intrusion is also assumed for the presence of both late Roman Eifelware sherds, a Mayen NB 104 (no. 24) and a Speicher body fragment. They most likely belonged to the robber trench of the late Roman defensive wall cutting this earthen rampart level at the western side.

Interesting to notice is the low number of reduced wheel-turned wares versus the handmade pottery, respectively 20.0% and 44.4% of the MNI counts. Significant is the presence of the Low Lands Ware 1 large pot type Holwerda 141a (no. 38), a form hardly present in the later fort levels. This type can be dated to the second half of the 2nd century (Holwerda 1923, 124). All other wheel-turned greywares originate from the North Menapian potteries. At least 38 fragments, accounting for seven MNI, can be classified as fine reduced wares. They represent beakers of high quality, mainly beaker type V.1 (nos 25-29), an imitation of a North French form. Beaker or pot (no. 30) is close to beaker type III.7. The ten coarse reduced individuals represent a variety of kitchen vessels, with two jars/pots (nos 32-33), one jar/bowl (no. 34), four bowls (ill.: nos 35-36), one dish (no. 37) and two lids (not ill.). The jars/pots and bowls are each represented by different types.

The handmade pottery dominates this assemblage; it accounts for almost half of the individuals. With twelve bowls, seven individuals dish/bowl, twelve jars/pots and seven individuals jar/bottle, the assemblage is clearly dominated by bowl and pot forms. The spectrum is very homogeneous. Apart from two bowls II.A.2 (one ill.: no. 52) (one with spout, not ill.), the bowl form II.A.3a dominates (nos 53-57), with one with spout (not ill.) and one variant form II.A.3b (not ill.). The jars/pots mainly represent the

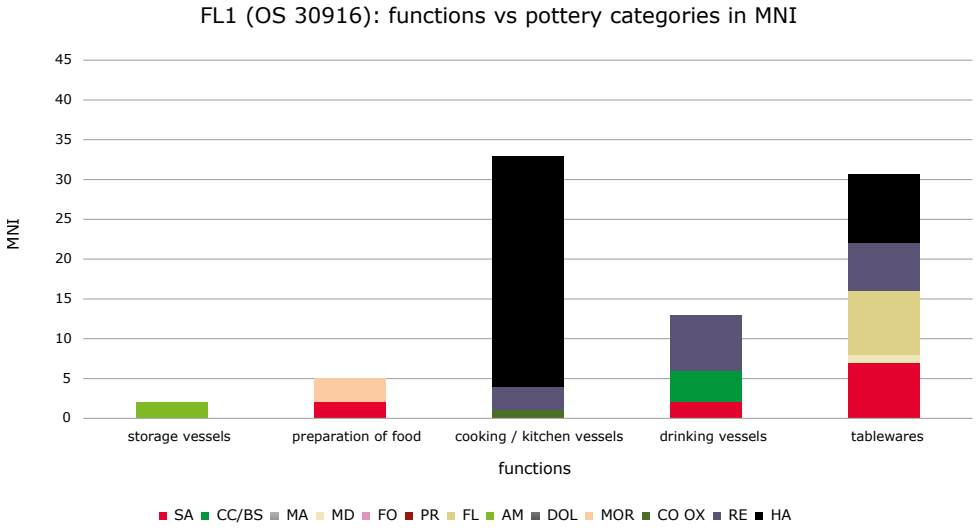

Figure 2. The pottery of context OS 30916: functions versus fabrics.

Table 3. The pottery categories of context OS 30916, in sherd count and in MNI.

OS 30916	sherd count	%	MNI	MNI%
SA	23	2.7	11	12.2
CC/BS	26	3.0	4	4.4
MD	1	0.1	1	1.1
FL	377	43.7	8	8.9
AM	48	5.6	2	2.2
MOR	7	0.8	4	4.4
CO OX	3	0.3	2	2.2
RE	85	9.9	18	20.0
HA	292	33.9	40	44.4
TOTAL	**862**	**100.0**	**90**	**100.0**

pot III.2 (nos 39-45); in addition, one jar/bottle III.1 (no. 50) and three pots III.6 (nos 46-48) could be counted. Vertical linear burnishing appears to be a popular decoration pattern (nos 39, 40, 43, 51), but comb scoring was still frequently applied, often in combination with burnished patterns (nos 41-44, 48, 50).

An oddity in the handmade assemblage is a roughly formed item used as lid (no. 58). The form can be recognized as a Morini cup (Vidal *et al.* 2014) (see also Chapter 1.B.5.2 in this volume). By making perforations in the base it was reused here as a lid, confirmed by the soot on the exterior and interior of the rim. The fabric is not conclusive: it resembles the coarse variant of the North Menapian handmade wares and would in that case represent an imitation. The reuse as lid however contradicts this and pleads in favour of a cup imported from the *civitas* of the Morini (to the south of the *civitas Menapiorum*).

In addition to pottery, this context yielded three metal finds identified as fittings. In copper alloy a fragment of a ring fitting can be mentioned (CA.J40; not ill.), in iron a D shaped fitting (IR.J053: no. 59) and a double-spiked loop (IR.J247; not ill.). In addition, 42 iron nails, 56 shoe spike clusters and 26 iron fragments of bars, rods and sheet were recovered.

2.2 Pit OS 72136

The pottery assemblage of the 30 cm deep pit OS 72136, accounting for only seventeen fragments of at least four individuals (Table 5), is selected here for the presence of a North African lid (Plate CCCLXXXVI: top: no. 1). In the analysis of the few North African items recovered at the south-west corner site, a case has been made to interpret this lid as a casual import brought in by a soldier, a native of North Africa, as part of his personal luggage (cf. Chapter 1.B.4 in this volume). The other pottery in this pit, comprising fragments of a tableware flagon, a fine reduced beaker (no. 2) and a cooking pot NOM HA III.2 (no. 3), cannot contribute chronologically.

The attribution of this pit to the first military occupation implies that the construction slot cutting this pit, obviously also relates to the earliest fort level, albeit in a later building phase. It is important to emphasize here that the orientation of this slot, not in line with the axes of the fort, can therefore not be used as an indication for non-military attribution.

2.3 Pit OS 6002

The content of this pit, clearly related to Construction I or the adjacent unit to the back, represents the vessels in use by the soldiers living in these *contubernia*. The small pottery assemblage, accounting for 23 fragments and six MNI (Table 6), confirms the use of Cologne beakers in the earliest fort, as shown by the large Hees 3 fragment (Plate CCCLXXXVI: central, no. 1). A roughcast decorated body fragment belonged to another Cologne beaker. The rest of the assemblage is dominated by handmade fragments; four individuals can be distinguished. Apart from a shoulder fragment of a beaker, three bowls of type II.A.3a are present (one ill.: no. 2).

Apart from pottery, five small unidentified copper alloy fragments were recovered, next to eight iron nails, fifteen clusters of iron shoe spikes and one fragment of iron slag. The latter points to metalworking at the site. A large iron slag waste found more to the east and likely to be the *in situ* remains of an oven structure (Plate XXVIII: structure 'm') can most likely be attributed to fort level 1 as well.

Table 4. Inventory of the pottery of context OS 30916 (Plates CCCLXXXII-CCCLXXXV).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
1	**SA**	LEZ SA	Drag. 37	bowl	no freeze preserved			**1**	1					**1**
2	**SA**	LEZ SA	Drag. 37	bowl	decoration DS13			**2**		1	1			
3	**SA**	LEZ SA	Drag. 33	cup				**2**	1	1			1	**1**
4	**SA**	LEZ SA	Drag. 33	cup				**2**	2					**1**
5	**SA**	LEZ SA	Curle 23	dish/shallow bowl	stamp SS79 (five-fold rosette)			**4**	2		2		1	**1**
	SA	LEZ SA	Drag. 18/31	dish/shallow bowl				**1**	1					**1**
	SA	LEZ SA	Drag. 18/31 or 31	dish/shallow bowl				**1**		1				
	SA	LEZ SA	Drag. 18/31 or 31	dish/shallow bowl				**1**		1				
	SA	LEZ SA	Drag. 43/45	mortarium				**1**		1				**1**
7	**SA**	LEZ SA	undet.	dish/bowl	stamp SS8			**2**		1	1			
	SA	LEZ SA	undet.	undet.				**1**		1				
6	**SA**	CG SA	Drag. 18/31 or 31	dish/shallow bowl				**1**	1					**1**
8	**SA**	MAD SA	Drag. 37	bowl	decoration DS20			**1**		1				**1**
9	**SA**	EG SA (TRI or MAD)	Drag. 18/31	dish/shallow bowl				**1**	1					**1**
10	**SA**	TRI SA	Drag. 18/31	dish/shallow bowl	stamp SS15			**1**			1			**1**
	SA	RHZ SA	Drag. 43/45	mortarium				**1**		1				**1**
11	**CC/BS**	MOS BS	NB 33	beaker	rouletting		three rows of rouletting	**12**	4	7	1		1	**1**
12	**CC/BS**	MOS BS	NB 33	beaker	rouletting		only lower row of rouletting preserved (broad)	**2**		1	1			**1**
	CC/BS	MOS BS	undet.	beaker	rouletting			**1**		1				
	CC/BS	MOS BS	undet.	beaker	rouletting			**1**		1				
13	**CC/BS**	KOL CC	Hees 3b	beaker	rouletting			**8**	5	3				**1**
14	**CC/BS**	KOL CC	Hees 2	beaker				**1**	1					**1**
	CC/BS	KOL CC	undet.	beaker	barbotine decoration			**1**		1				
15	**MD**	NOG MD	pot with everted rim	jar				**1**	1					**1**
	FL	BAFA SAPO FL	undet.	tableware flagon				**2**		2				**1**
	FL	KOL FL						**1**		1				
	FL	KOL FL	undet.	tableware flagon				**2**		2				**1**
16	**FL**	NOG FL	everted, thickened, rib-bon-shaped rim	tableware flagon		white slip	twofold handle	**2**	1			1		**1**
17	**FL**	NOG FL (LLW)	triangular rim	tableware flagon			complete rim; twofold handle	**1**	1					**1**
18	**FL**	NOG FL (LLW)	slightly everted, small, rib-bon-shaped rim	tableware flagon				**1**	1					**1**
19	**FL**	NOG FL (LLW)	upstanding, concave rim with rounded lip	tableware flagon				**1**	1					**1**

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
20	**FL**	NOG FL		tableware flagon	graffito ante cocturam on the shoulder, possibly size or content indication		shoulder fragment with handle	**1**		1				
	FL	NOG FL (LLW)	everted, slightly thickened rim	tableware flagon		white slip		**1**	1					**1**
	FL	NOG FL (LLW)	undet.	tableware flagon			very small fragment	**1**	1					**1**
	FL	NOG FL (LLW)					twofold handle	**1**				1		
	FL	NOG FL					different base fragment of different flagons, too small to identify further	**6**			6			
	FL	NOG FL (LLW)			many sherds with ribs, most with burnishing	no slip	body fragments of at least two different individuals; 1x2, 1x3	**114**		114				
	FL	NOG FL (LLW)				white slip	body fragments of at least two different individuals; 1x2	**40**		40				
	FL	NOG FL (LLW)					central base fragment with intentional perforation	**2**			2			
	FL	NOG FL		flagons			loose sherds from different flagons	**201**		201				
	AM	BAT AM	Dr. 20	amphora				**1**		1				**1**
	AM	NARB AM	G4	amphora				**1**		1				
23	**AM**	NARB AM	G4	amphora	graffito ante cocturam on the shoulder		almost complete profile (but no rim preserved); with spot on the shoulder as a result of the stacking in the furnace	**46**		42	1	3		**1**
21	**MOR**	BAFA MOR	VV349-350	mortarium			curly collar with upstanding rim	**1**	1					**1**
22	**MOR**	BAFA MOR	VV349-350-351	mortarium			curly collar with upstanding rim, not completely preserved	**2**	1	1				**1**
	MOR	BAFA MOR	VV349-350	mortarium				**1**		1				
	MOR	LNV WW	Symonds and Wade (1999) 35?	mortarium			very small fragment of rim	**1**	1					**1**
	MOR	NOY MOR	undet.	mortarium				**1**		1				**1**
	MOR	NOY MOR	undet.	mortarium			chip	**1**		1				
	CO OX	SPE CO	undet.	pot/jug				**1**			1			**1**
24	**CO OX**	MAY CO	NB 104	bowl				**2**	1	1				**1**
25	**RE**	NOM FR	beaker V.1	beaker	burnished rim and neck			**2**	1	1				**1**
26	**RE**	NOM FR	beaker V.1	beaker	burnished rim and neck			**1**	1					**1**
27	**RE**	NOM FR	beaker V.1	beaker	burnished rim and neck			**1**	1					**1**
	RE	NOM FR	beaker V.1	beaker	burnished rim and neck			**1**	1					**1**
28	**RE**	NOM FR	beaker V.1	beaker	burnished rim and neck			**1**	1					**1**
29	**RE**	NOM FR	beaker V.1	beaker	burnished rim; fine burnished horizontal lines on neck			**1**	1					**1**

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
30	**RE**	NOM FR	close to beaker III.7	beaker	burnished rim and neck			**2**	2					**1**
31	**RE**	NOM FR		beaker	horizontal linear burnishing and zigzag groove decoration on top		high quality, very neatly executed, hard fabric and fine-walled	**2**		2				
	RE	NOM FR		beaker	rouletting and/or knife-trimming		loose sherds from different beakers	**10**		10				
	RE	NOM FR		beaker	fine horizontal burnished lines		loose sherds from different beakers	**3**		3				
	RE	NOM FR		beaker	complete burnishing		loose sherds from different beakers	**5**		5				
	RE	NOM FR		beaker				**1**		1				
	RE	NOM FR	beaker V.1	beaker			loose fragments of long straight necks of different beakers	**8**		8				
32	**RE**	NOM RE	jar III.2	jar	burnished rim and shoulder			**1**	1					**1**
33	**RE**	NOM RE	jar III.4	jar				**1**	1					**1**
34	**RE**	NOM RE	jar/bowl with inturned, flattened rim	jar/bowl	burnished rim and top body			**1**	1					**1**
35	**RE**	NOM RE	bowl IV.2.var	bowl	burnished rim and top body			**1**	1					**1**
36	**RE**	NOM RE	carinated bowl IV.3	carinated bowl	burnishing			**1**	1					**1**
	RE	NOM RE	carinated? bowl with horizontal rim with lid-seat groove	carinated bowl?				**1**	1					**1**
37	**RE**	NOM RE	dish II.A.5	dish	burnishing on rim			**1**	1					**1**
	RE	NOM RE	bowl II.A.3a	bowl			thickened rim at the inside	**1**	1					**1**
	RE	NOM RE	lid VII.1 but with strong interior undercut	lid				**1**	1					**1**
	RE	NOM RE	lid VII.3	lid				**1**	1					**1**
	RE	NOM RE		beaker				**2**			2			
	RE	NOM RE		beaker			intentional central post cocturam perforation	**2**			2			
	RE	NOM RE		beaker			base fragments of different vessels	**4**			4			
	RE	NOM RE		jar				**1**			1			
	RE	NOM RE					sherds from different vessels; 1x3	**24**		24				
38	**RE**	LLW1	Holwerda 141a	container				**4**	4					**1**
52	**HA**	NOM HA	bowl II.A.2	bowl	burnished rim; burnished interior (alternating with area exterior rim); vertical burnished lines on exterior body			**1**	1				1	**1**
	HA	NOM HA	bowl II.A.2p	bowl			only pouring lip fragment	**1**	1					**1**

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
53	**HA**	NOM HA	bowl II.A.3a	bowl	burnished exterior rim; burnished interior			**1**	1					**1**
54	**HA**	NOM HA	bowl II.A.3a	bowl	burnished top and exterior rim			**3**	3					**1**
55	**HA**	NOM HA	bowl II.A.3a	bowl	burnished top and exterior rim			**1**	1					**1**
56	**HA**	NOM HA	bowl II.A.3a	bowl	burnished top and exterior rim; vertical burnished lines on interior			**5**	5					**1**
	HA	NOM HA	bowl II.A.3a	bowl	burnished top and exterior rim			**1**	1					**1**
	HA	NOM HA	bowl II.A.3a	bowl	burnished top and exterior rim			**1**	1					**1**
	HA	NOM HA	bowl II.A.3a	bowl	burnished top and exterior rim			**1**	1					**1**
57	**HA**	NOM HA	bowl II.A.3a	bowl	burnished exterior rim; regular horizontal comb-scoring on body			**2**	2					**1**
	HA	NOM HA	bowl II.A.3ap	bowl			only pouring lip fragment	**1**	1					**1**
	HA	NOM HA	bowl? II.A.3b	bowl?	completely burnished		thin-walled	**1**	1					**1**
	HA	NOM HA	dish/bowl II.A.2	dish/bowl			six rim fragments of six different vessels	**6**	6					**6**
	HA	NOM HA	dish/bowl II.A.3a	dish/bowl			small rim fragment	**1**	1					**1**
39	**HA**	NOM HA	jar III.2	jar	burnished interior rim and neck; vertical parallel burnished lines		completely oxidised fabric and surface	**14**	2	12				**1**
40	**HA**	NOM HA	jar III.2	jar	burnished interior rim and neck; vertical parallel burnished lines		coating on interior rim	**2**	2					**1**
41	**HA**	NOM HA	jar III.2	jar	burnished rim; irregular comb-scoring on body			**3**	2	1				**1**
42	**HA**	NOM HA	jar III.2	jar	burnished top and inside rim and neck; regular vertical comb-scoring and vertical burnished lines			**3**	2	1				**1**
43	**HA**	NOM HA	jar III.2	jar	burnished top and inside rim; irregular comb-scoring and vertical burnished lines on body			**2**	2					**1**
44	**HA**	NOM HA	jar III.2	jar	burnished inside rim and neck			**2**	2					**1**
45	**HA**	NOM HA	jar III.2	jar	regular vertical comb-scoring on body			**1**	1					**1**
	HA	NOM HA	jar III.2	jar	burnished inside rim			**1**	1					**1**
49	**HA**	NOM HA	jar III.2 or 6	jar	burnished top of rim and neck			**1**	1					**1**

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
46	**HA**	NOM HA	jar III.6	jar	burnished top and inside rim			**1**	1					**1**
47	**HA**	NOM HA	jar III.6	jar	burnished rim top and shoulder			**1**	1					**1**
48	**HA**	NOM HA	jar III.6	jar	burnished top of rim; burnished shoulder, comb-scoring and crossing burnished lines on body			**1**	1					**1**
50	**HA**	NOM HA	jar/bottle III.1	jar/bottle	burnished inside rim; burnished lattice decoration			**2**	1	1				**1**
51	**HA**	NOM HA	jar/bottle III.2	jar/bottle	burnished neck; vertical parallel burnished lines on body			**1**	1					**1**
	HA	NOM HA	jar/bottle III.2	jar/bottle			small fragment of rim	**2**	2					**1**
	HA	NOM HA	jar/bottle III.2	jar/bottle			small rim fragments, of four different individuals	**14**	14					
58	**HA**	NOM HA	imitation of Morini cup, reused as lid	lid	completely burnished		roughly made; small post cocturam perforations in the base; soot on exterior and interior rim	**1**	1				1	**1**
	HA	NOM HA	undet.	undet.			rim fragment too small to identify	**1**	1					**1**
	HA	NOM HA		jar	comb-scoring on body			**1**			1			
	HA	NOM HA		jar	comb-scoring and vertical parallel burnished lines		probably all from same individual; 2x2	**10**		10				
	HA	NOM HA					base fragments of different vessels	**10**			10			
	HA	NOM HA						**2**			2			
	HA	NOM HA					complete base	**1**			1			
	HA	NOM HA			vertical comb-scoring on body		almost complete base	**2**			2			
	HA	NOM HA					complete base	**1**			1			
	HA	NOM HA					central base fragment	**1**			1			
	HA	NOM HA			vertical burnished lines			**1**		1				
	HA	NOM HA			vertical parallel burnished lines		from different vessels	**2**		2				
	HA	NOM HA			burnished lattice decoration		shoulder fragment	**1**		1				
	HA	NOM HA			crossing burnished lines and zones			**1**		1				
	HA	NOM HA			crossing burnished lines			**1**		1				
	HA	NOM HA			comb-scoring			**1**		1				
	HA	NOM HA			burnished lattice decoration		from different vessels	**5**		5				
	HA	NOM HA			comb-scoring and vertical wide parallel burnished lines			**1**		1				
	HA	NOM HA			comb-scoring and vertical parallel burnished lines			**1**		1				

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
	HA	NOM HA			comb-scoring and burnished areas			**1**		1				
	HA	NOM HA			burnished shoulder with underneath grouped burnished lines in large tent motifs		large shoulder fragment	**1**		1				
	HA	NOM HA			comb-scoring and burnished lattice decoration			**1**		1				
	HA	NOM HA			undecorated		loose sherds, different vessels	**118**		118				
	HA	NOM HA			complete or zonal burnishing		from different vessels	**7**		7				
	HA	NOM HA			comb-scoring		from different vessels	**43**		43				
	TOTAL							**862**	**116**	**697**	**44**	**5**	**5**	**90**

Table 5. Inventory of the pottery of context OS 72136 (Plate CCCLXXXVI).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
	FL	NOG FL		tableware flagon		remains of white slip	1x2 joining	**3**		3				**1**
1	**CO OX**	NAF CO	Hayes (1972) 196	lid				**2**	2					**1**
2	**RE**	NOM FR		beaker				**2**			2			
	RE	NOM FR		beaker	rouletting			**1**		1				**1**
3	**HA**	NOM HA	jar III.2	cooking pot/ jar	zonal burnishing on interior rim and exterior neck			**9**	1	8				**1**
	TOTAL							**17**	**3**	**12**	**2**	**0**	**0**	**4**

Table 6. Inventory of the pottery of context OS 6002 (Plate CCCLXXXVI).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
1	**CC/BS**	KOL CC	Hees 3	beaker			dark grey slip	**3**	3					**1**
	CC/BS	KOL CC	undet.	beaker	clay pellet or grog roughcast decoration			**1**		1				**1**
	RE	NOM RE						**1**		1				**1**
2	**HA**	NOM HA	bowl II.A.3a	bowl	burnishing on exterior rim		little bit of coating on interior rim	**1**	1					**1**
	HA	NOM HA	bowl II.A.3a	bowl				**1**	1					**1**
	HA	NOM HA	bowl II.A.3a	bowl				**1**	1					
	HA	NOM HA		beaker			shoulder fragment	**1**		1				**1**
	HA	NOM HA			completely burnished			**1**		1				
	HA	NOM HA			comb-scoring		loose sherds, different vessels	**3**		3				
	HA	NOM HA			undecorated		loose sherds, different vessels?	**7**		7				
	HA	NOM HA			vertical parallel burnished lines		from different vessels	**2**		2				
	HA	NOM HA			burnished lattice decoration			**1**		1				
	TOTAL							**23**	**6**	**17**	**0**	**0**	**0**	**6**

Table 7. The pottery categories of context OS 70976, in sherd count and in MNI.

OS 70976	sherd count	MNI
SA	6	1
CC/BS	2	1
FL	12	1
RE	5	3
HA	28	5
TOTAL	**53**	**11**

Table 8. Inventory of the pottery of context OS 70976 (Plate CCCLXXXVI).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
1	**SA**	RHZ SA	Drag. 33	cup				**6**	5	1				**1**
2	**CC/BS**	KOL CC	Hees 2 or 3	beaker		dark green	small individual; complete base	**2**		1	1			**1**
3	**FL**	NOG FL		tableware flagon		white slip	large neck fragment with start of both handles	**9**		9				**1**
	FL	NOG FL				white slip remains	loose sherds, from different vessels	**2**		2				
	FL	NOG FL				white slip remains	with start of handle	**1**		1				
4	**RE**	BRU RE		beaker	knife-trimming		complete base	**2**		1	1			**1**
	RE	NOM FR		beaker	knife-trimming			**1**		1				**1**
	RE	NOM RE			undecorated			**1**		1				**1**
	RE	NOM RE			undecorated			**1**		1				
5	**HA**	NOM HA	jar III.2	pot	irregular, dense comb-scoring on the body; zonal burnishing on interior and exterior rim and neck; burnished zone towards the base			**3**	1	2				**1**
6	**HA**	NOM HA	jar III.2	pot				**2**	1	1				**1**
7	**HA**	NOM HA	jar III.2	pot	burnishing on interior and exterior rim and neck			**1**		1				**1**
8	**HA**	NOM HA	jar III.2	pot	linear burnishing on the body (vertical parallel lines), vertical comb-scoring near the base, burnishing of top interior rim and exterior rim and neck		coating on interior rim	**1**	1					**1**
9	**HA**	NOM HA		pot	irregular vertical comb-scoring on body		calcareous deposit on interior surface	**5**		3	2			
	HA	NOM HA	bowl II.A.3a	bowl	burnished zone above base			**1**	1				1	**1**
	HA	NOM HA		pot	comb-scoring		loose sherds of jar 5 or 9	**13**		13				
	HA	NOM HA			burnished lattice decoration			**1**		1				
	HA	NOM HA			undecorated			**1**		1				
	TOTAL							**53**	**9**	**40**	**4**	**0**	**1**	**11**

Table 9. Inventory of the pottery of context OS 11267-286 (Plate CCCLXXXVII).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
1	**SA**	TRI SA	Drag. 37	bowl	decoration DS62			**1**		1				**1**
2	**FL**	NOG FL	triangular, ribbon-shaped rim	tableware flagon			threefold handles	**3**	1			2		**1**

Figure 3. Location of the selected key contexts of fort level 2.

Table 10. The pottery categories of context OS 70977, in sherd count and in MNI.

OS 70977	sherd count	MNI
SA	8	5
CC/MA?	1	1
AM	1	1
FL	5	1
RE	3	2
TOTAL	**18**	**10**

2.4 Pit OS 70976

The content of pit OS 70976[298] most likely represents waste from the 'household' of this *contubernium* as well (Construction I) (Plate CCCLXXXVI: below; Tables 7-8). The Rheinzabern Drag. 33 cup (no. 1), with a rather large diameter of 130 mm, most probably dates not earlier than the end of the 2nd century. Apart from a Cologne beaker Hees 2 or 3 (no. 2), the beaker type Bayard 3 (no. 4) draws attention, since it originates from Bruay-Labuissière in the Attrebates region. The flagon (no. 3) belongs to a regional production. The identifiable common kitchen vessels are all in handmade technique: four jars/pots, representing open as well as closed pots of type III.2, of different sizes (nos 5-8) and a bowl II.A.3a (no. 10). The applied decorations confirm that comb scoring was popular, next to burnishing patterns, like the vertical linear burnishing of pot no. 8. Apart from pottery, pit OS 70976 only yielded two iron nails and four clusters of shoe spikes.

2.5 Construction slot OS 11267-286

The post trenches of Construction IV hardly yielded any material, apart from some isolated small handmade and reduced pottery fragments. However, the only two pottery fragments found in construction slot OS 11267-286[299] deserve close attention (Table 9). Apart from the complete upper part of a regional tableware flagon (Plate CCCLXXXVII: top: no. 2), the Drag. 37 fragment

298 **Plate CDLVII: feature section 7/24.**

299 **Plate CDLIX: feature section 1/94.**

(no. 1) represents an important chronological indicator for fort level 1. The decoration by Comitialis of Trier (AD 170-240) confirms a *terminus post quem* date of AD 170 for fort level 1.

3. Key context assemblages from fort level 2

Six contexts are selected as representative assemblages for fort level 2: pit OS 70977 presumably from fort level 2A, drainage gully OS 23966/70920/83780 related to the installation of the military hospital (fort level 2B), construction slots OS 80964 and OS 82843-845 situated in the northern part of the building complex, pit OS 72767 located in one of the larger rooms (R14) at the western side of the building complex, and pit OS 72540a situated at the back of the hospital, between its rear wall and the start of the earthen rampart (Figure 3; Plates CCCLXXXVII-CCCXCIV). Only the drainage gully and construction slot OS 80964 yielded one coin each; however, they cannot contribute to the chronology of fort level 2.

3.1 Pit OS 70977

Pit OS 70977[300] only yielded a small pottery assemblage, accounting for eighteen fragments or ten individuals, half of the latter taken up by the samian (Tables 10-11; Plate CCCLXXXVII: below). The co-occurrence of a Trier Drag. 37 bowl (fragment) made by the Censor-Dexter group (AD 180-240) (no. 3), a 'classic' Drag. 46 cup (no. 1) and Drag. 33 cup (no. 3) from Lezoux, a rather large, flaring Drag. 33 cup from Trier (no. 4) and a Drag. 18/31 or 31 from Rheinzabern (no. 5) seems to point to the early 3rd century. The fine, two-handled tableware flagon is a Low Lands Ware 1 product (no. 6). Large parts of the interior were covered with a black coating which probably ran down from the coated neck and interior rim. As flagons with preserved wood caps from the harbour of Voorburg (*Forum Hadriani*) show (Van Kerckhove 2014, 470), this coating must have been applied to seal the caps. A base belongs to a North Menapian fine reduced beaker (no. 8); another base is a fragment of a coarse reduced (jar or) bowl (no. 9). The handle of a Dressel 20 amphora (no. 7) displays the classic fabric of the 2nd century and is probably a residual item.

One body fragment with reddish painted decoration is most interesting. It can possibly be identified as Oxfordshire Parchment ware, which would date the deposition of this assemblage after AD 240 (Young 1977). However, with only one body fragment (moreover the only one known for the site) this identification should be considered cautiously. If the identification is right, this fragment can only be explained as an intrusive find from fort level 2B.

Besides pottery, the pit only yielded two iron nails and an iron sheet fragment.

3.2 Drainage gully OS 23966-70920-83780

This drainage gully[301] yielded one coin, an unattributed copper alloy *sestertius* which can only be generally dated to the 1st-2nd century.

With 330 pottery fragments accounting for 55 MNI, this is the earliest context from the fort site large enough to offer perspectives when comparing percentages (Tables 12-13; Plates CCCLXXXVIII-CCCXC). This assemblage is dominated by tablewares (Figure 4). The samian with eleven MNI is still reminiscent of the late 2nd century with the dominance of Lezoux products (six MNI) and the presence of an Argonne Drag. 30R (no. 5), mainly a 2nd-century form. The fragment of a Trier decorated bowl of Comitialis (no. 6) (AD 170-240) and a complete Trier Drag. 45 mortarium (no. 7) point to a date from the late 2nd century onwards. However, the large diameters of the Lezoux (nos 1-2) and the Argonne (no. 3) Drag. 33 cups remind one of the evolution to larger sizes the East Gaulish Drag. 33 cups underwent during the 3rd century. A Drag. 32 dish from Rheinzabern completes the samian assemblage.

A nearly complete Hees 17a / NB 40 / Höpken E1/E2 dish with orange slip from Cologne (no. 9) can only be generally dated to AD 100-250. A mica-dusted body fragment displays a North Menapian fabric. The flagons, all tableware examples, originate mostly from North Gaulish potteries (mainly Low Lands Ware 1 fabric) (nos 10-13), although flagons from Bavay-Famars and from Cologne are also present at this level (only represented by a few body fragments each). The fabric of the body fragment of a mortarium refers to Soller.

Fine reduced beakers are well-represented in this context, mainly displaying large sizes. A beaker type III.7 (no. 14), at least three beakers type V.1 (nos 15-17) to which also the two beaker bases with knife-trimming decoration are related (nos 18-19), and a stud-beaker type III.9st (no. 25) are North Menapian products. However, the total of seven beaker bases indicates that at least two more beakers should be counted. One of these beaker bases (no. 23) shows a crack which originated during the firing in the oven. It did not prevent the sale of this beaker of inferior quality to the army unit. Truncated beakers were also imported from the Bruay-Labuissière workshops, as several body and neck fragments testify.

The coarse reduced group is mainly formed by North Menapian products, mostly bowls of several types (nos 26-31) next to two lids (nos 32-33). A pot with concave neck (no. 34) originates from the Bruay-Labuissière kilns, while a cooking bowl type Reims J2 (no. 35) represents a rare import from the Champagne region. The latter was most likely exported during the initial phase of production of this type datable to the period AD 150-230/240.

The handmade pottery consists completely of North Menapian products. They only represent jars/pots and bowls. The pots, open as well as closed forms, mainly display type III.2, in different sizes and varieties (nos 36-40), next to one jar III.1 (no. 41) and one pot III.6 (no. 42). The bowls mainly represent type II.A.3a (nos 46-51, the

300 Plate CDLXVIII: feature section 7/40.

301 Plates CDLXV and DCLXII: several feature sections.

Table 11. Inventory of the pottery of context OS 70977 (Plate CCCLXXXVII).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
3	**SA**	LEZ SA	Drag. 33	cup				**1**	1					**1**
2	**SA**	LEZ SA	Drag. 46	cup			joining base sherd in nearby context of the same level	**4**	2	2			1	**1**
1	**SA**	TRI SA	Drag. 37	decorated bowl	decoration DS56			**1**		1				**1**
4	**SA**	TRI SA	Drag. 33	cup				**1**	1					**1**
5	**SA**	RHZ SA	Drag. 18/31 or 31	dish/shallow bowl				**1**	1					**1**
	CC/MA?	OXF PA?			reddish painted decoration?			**1**		1				**1**
6	**FL**	NOG FL (LLW)		tableware flagon	burnished	completely covered with white slip	very fine; start of two handles; interior: ran-down black coating	**4**		4				**1**
	FL	NOG FL (LLW)		tableware flagon	burnished			**1**		1				
7	**AM**	BAT	Dr. 20					**1**				1		**1**
8	**RE**	NOM FR		beaker				**1**			1			**1**
	RE	NOM FR						**1**		1				
9	**RE**	NOM RE		jar/bowl				**1**			1			**1**
	TOTAL							**18**	**5**	**10**	**2**	**1**	**1**	**10**

latter with spout and coating rim) or II.A.3b (nos 52-54), except for one bowl II.A.2 (no. 45). Comb-scoring and burnishing patterns (mainly linear and crossing) are popular decoration designs, often in combination.

In addition to pottery, this drainage gully yielded a possible finger ring (CA.B277: no. 56), a rim fragment of an unattributed glass vessel in pale blue green colour (not ill.) and a large assemblage of 88 iron nails and 44 shoe spike clusters. Ten clusters of the latter probably belonged to the same shoe sole.

3.3 Construction slot OS 80964

This context yielded one coin, a copper alloy *sestertius* of Antoninus Pius (138-161) which may still have been in use during fort period 2.

The rather small pottery assemblage of construction slot OS 80964[302], accounting for 72 fragments and twenty-one MNI (Tables 14-15; Plate CCCXCI), does not contain chronological indicators which can contribute to a narrow dating of fort level 2. However, this assemblage contains a few interesting elements in terms of material distribution and imported products. The Argonne Drag. 43 mortarium collar (no. 1) can only be generally dated after AD 170. Striking is the presence of a mortarium close to Haltern 60 / Oberaden 73 originating from the Rhône Valley (no. 3). This type is typical for the 1st century; therefore, this individual can only be interpreted as a residual item dug-up from a pre-fort structure. The mortarium must have been (nearly) intact. The vessel, present with six fragments in this context, was found scattered over the Roman level as joining sherds were found in four different contexts of fort level 3 and one joining sherd in a fort level 4 context. This example illustrates well the dispersion that some pottery underwent during the occupation of the fort. The Soller mortarium (no. 2), found in this context as three fragments, has known a similar course. Joining sherds were found in one other fort level 2 context and as dug-up pieces in two fort level 3 contexts and in one fort level 5 context; another two joining sherds were found unstratified.

Another important element in this assemblage is the clear presence of Bruay-Labuissière products, with one truncated beaker (no. 4) and one open pot with bulging neck (no. 6) which might have been a large double-lobed pot. Parallels for the latter at Amiens were dated before the middle of the 3rd century. Other fine reduced beakers, only preserved as bases, come from the North Menapian potteries. Fragments of a tableware flagon and of a storage ware flagon have a North Gaulish origin. The North Menapian reduced wheel-turned group comprises one jar/pot type III.4 (no. 5), one bowl type II.A.4 (no. 7), one bowl type IV.3 (not ill.) and one dish type IV.2 (no. 8). All handmade vessels are of North Menapian production and account for four individuals (not ill.): one jar/pot III.2, two jars/bottles III.2 and one unattributed small vessel rim.

Apart from pottery, the fill of this construction slot yielded some iron items: 32 nails, one piece of sheet and an unidentifiable fragment. Two quern fragments of which the largest is illustrated (no. 9; cf. Chapter 10 in this volume: cat. no. 021-002), are made of basalt lava.

302 **Plate CDLXV: feature section 8/319.**

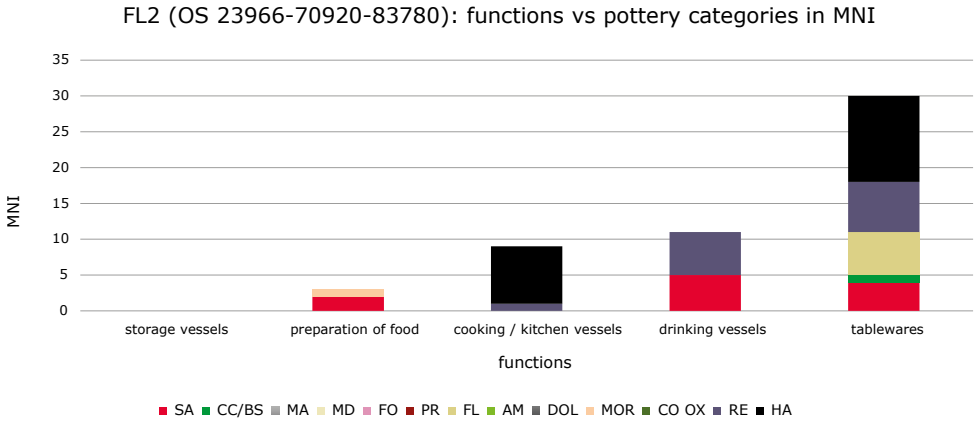

Figure 4. The pottery of context OS 23966/70920/83780: functions versus fabrics.

Table 12. The pottery categories of context OS 23966/70920/83780, in sherd count and in MNI.

OS 23966/70920/83780	sherd count	%	MNI	MNI%
SA	16	4.8	11	19.3
CC/BS	15	4.5	1	1.8
MD	1	0.3	1	1.8
FL	42	12.7	6	10.5
MOR	1	0.3	1	1.8
RE	96	29.1	16	28.1
HA	159	48.2	21	36.8
TOTAL	**330**	**100.0**	**57**	**100**

3.4 Construction slot OS 82843-845

Although very small, this pottery assemblage is very important since it contains a strong chronological indicator for fort level 2 (Table 16; Plate CCCXCII: top)[303]. The Drag. 37 fragment (no. 1) can be attributed to the Rheinzabern potters Iulius II-Iulianus I, active in the period AD 220-255; however, several studies have pointed to a date for this workshop even after AD 233 (cf. Chapter 1.A.1 in this volume). Hence, this fragment yields a *terminus post quem* of at least AD 220 for this fort level 2B. This fragment was accompanied by a Drag. 31 of Lezoux (no. 2). At least one North Gaulish and one Cologne tableware flagon are present. The reduced and the handmade group both only represent one individual: a NOM RE V.1 beaker and a NOM HA III.8 closed pot with vertical burnished lines on the body (no. 3). A grey pottery fragment, probably of a North Menapian reduced wheel-turned vessel, was reworked as counter (no. 4). Apart from pottery, the fill of this construction slot only yielded seven iron nails and two unidentifiable iron pieces.

3.5 Pit OS 72767

Pit OS 72767[304] was located in room R14 of the military hospital of fort level 2B. The four samian fragments representing a beaker, a Drag. 36 dish (no. 1), a mortarium Drag. 43/45 and a Drag. 31R dish (no. 2), cannot yield a narrow dating range. The pottery content of this pit, accounting for 60 fragments or eleven MNI (Tables 17-18; Plate CCCXCII: below), is specifically interesting for its functional significance. The nearly complete lower part of a Dressel 20 amphora (no. 5) and the large storage jar of which the complete base was preserved (no. 7), represent a storage function. The small handmade pot (no. 6) can also be associated with such a use. The large fragment of a Soller mortarium (no. 4) points to the preparation of food. This pottery assemblage can be an indication that room R14 served as storage facility – with pit OS 72767 as remnant of a storage pit -, next to room R13 which supposedly was a kitchen based on the presence of a large central hearth. Many of the handmade fragments from pit OS 72767 were severely burnt through fire, with some deformations as result. Worth drawing attention to is the presence of a body fragment of a Bavay-Famars mortarium (not ill.) and a truncated beaker from the Bruay-Labuissière workshops (3), confirming this supply axe from the South to the Oudenburg fort in fort level 2.

The fill of this pit also yielded a distorted copper alloy sheet fragment with rim, possibly from a vessel. Furthermore, 34 iron nails and nine iron fragments can be mentioned: two sheet fragments, a rod and three unidentifiable pieces.

3.6 Pit OS 72540a

The pottery assemblage of pit OS 72540a[305] is particularly interesting for the variety of North Menapian vessels it contains (Tables 19-20; Plates CCCXCIII-CCCXCIV). The imported wares are represented by a burnt, small version of a Drag. 36 dish (no. 1) and two mortaria from Bavay-Famars. One of the latter has a hooked flange with low inner bead still reminiscent of the 2nd century. However, the VV 352-353 mortarium with hooked curly flange (no. 2) has a higher inner bead, a typical 3rd-century element (Willems 2005). The North Menapian reduced group and handmade group represent more or less equal shares. The reduced group comprises one complete beaker type III.9 (no. 3), one bowl type II.A.4st (no. 4), one nearly complete bowl type IV.3 (no. 6), one dish type II.A.5 (no. 7) and one lid type VII.2 (no. 8). The

303 Plate CDLXIV: feature sections 8/424-426, 431, 323, 324, 305, 306.
304 Plate CDLXVIII: feature section 7/54b.
305 Plate CDLXVIII: feature section 7/64b.

Table 13. Inventory of the pottery of context OS 23966-70920-83780 (Plates CCCLXXXVIII-CCCXC).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
	SA	LEZ SA	Déch. 72	beaker				**1**	1					**1**
1	**SA**	LEZ SA	Drag. 33	cup			joining base fragment in pit of level 3	**2**	1	1			1	**1**
	SA	LEZ SA	Drag. 33	cup				**1**	1					**1**
2	**SA**	LEZ SA	Drag. 33	cup				**1**	1					**1**
	SA	LEZ SA	Drag. 33	cup				**1**			1			
4	**SA**	LEZ SA	Drag. 18/31 or 31	dish				**1**			1			**1**
	SA	LEZ SA	Drag. 45	mortarium				**1**		1				**1**
5	**SA**	ARG SA	Drag. 30R	decorated bowl			joining rim fragment found in a level of fort level 2	**1**	1					**1**
3	**SA**	ARG SA	Drag. 33	cup				**1**		1				**1**
6	**SA**	TRI SA	Drag. 37	decorated bowl	decoration DS63			**1**		1				**1**
7	**SA**	TRI SA	Drag. 45	mortarium	graffito post cocturam SERGII C[			**4**	2	1	1		1	**1**
8	**SA**	RHZ SA	Drag. 32	dish				**1**	1					**1**
9	**CC/BS**	KOL CC	Hees 17a / NB 40 / Höpken E1/E2	dish		orange to dark brown		**15**	5		10		1	**1**
	MD	NOM MD		undet.				**1**		1				**1**
10	**FL**	NOG FL		tableware flagon		white slip	black coating on interior wall; high quality	**2**		1	1			**1**
11	**FL**	NOG FL		tableware flagon	burnished surface		white sediment on interior wall	**2**			2			**1**
12	**FL**	NOG FL		tableware flagon	burnished surface			**1**			1			**1**
13	**FL**	NOG FL		tableware flagon	burnished surface; graffito post coctur-am: cross		black coating on interior base	**1**			1			**1**
	FL	NOG FL		tableware flagon		white slip	loose sherds from different flagons	**4**		4				
	FL	NOG FL		tableware flagon			black coating on interior	**1**		1				
	FL	NOG FL		tableware flagon			start of small handle	**1**		1				
	FL	NOG FL		tableware flagon				**1**		1				
	FL	NOG FL		tableware flagon	burnished surface		loose sherds from different flagons; 1x2	**16**		16				
	FL	NOG FL (LLW)		tableware flagon		white slip		**5**		5				
	FL	NOG FL		tableware flagon			loose sherds from different flagons	**3**		3				
	FL	BAFA FL		tableware flagon				**1**		1				**1**
	FL	BAFA FL		tableware flagon	ribbed body		soapy fabric	**1**		1				
	FL	KOL FL		tableware flagon				**1**		1				
	FL	KOL FL		tableware flagon				**2**		2				**1**

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
	MOR	SOL MOR		mortarium				**1**		1				**1**
14	**RE**	NOM FR	beaker III.7	beaker	burnished surface			**1**	1					**1**
15	**RE**	NOM FR	beaker V.1	beaker	burnished rim and neck			**1**	1					**1**
16	**RE**	NOM FR	beaker V.1	beaker	burnished horizontal lines			**1**	1					**1**
17	**RE**	NOM FR	beaker V.1	beaker				**1**	1					**1**
18	**RE**	NOM FR	beaker V.1	beaker	rouletting and horizontal burnishing		complete base	**1**			1			
19	**RE**	NOM FR	beaker V.1	beaker	knife-trimming and burnishing		complete base	**1**			1			
20	**RE**	NOM FR		beaker			slim foot	**1**			1			
21	**RE**	NOM FR		beaker			slim foot	**1**			1			
22	**RE**	NOM FR		beaker			marked base	**1**			1			
23	**RE**	NOM FR		beaker			marked base, complete; with crack due to overfiring	**1**			1			
24	**RE**	NOM FR		beaker			complete base	**1**			1			
25	**RE**	NOM FR	beaker III.9st	stud-beaker			1x3	**4**		4				**1**
	RE	NOM FR		beaker	burnished body			**3**		3				
	RE	NOM FR		beakers	burnished and/ or knife-trimmed decoration and/or rouletted		body fragments of different beakers	**15**		15				
	RE	NOM FR		beaker	burnished surface			**1**		1				
	RE	BRU RE (FR)		beaker	burnished surface			**4**		4				
	RE	BRU RE (FR)		beaker	knife-trimming			**7**		7				**1**
	RE	BRU RE (FR)	truncated beaker	beaker	horizontal linear burnishing		two neck fragments	**2**		2				
26	**RE**	NOM RE	bowl IV.3?	bowl?	burnished hoizontal lines outside; inside completely burnished?			**1**	1					**1**
27	**RE**	NOM RE	bowl IV.3	bowl	horizontal linear burnishing; burnished rim			**1**	1					**1**
28	**RE**	NOM RE	bowl IV.3	bowl	fine horizontal burnished lines on body		black coating on the interior wall	**1**	1					**1**
29	**RE**	NOM RE	bowl IV.4	bowl	burnished hoizontal lines outside; inside completely burnished?			**1**	1					**1**
30	**RE**	NOM RE	bowl IV.4?	bowl				**1**	1					**1**
31	**RE**	NOM RE	bowl II.A.2var.	bowl	minor horizontal linear burnishing			**1**	1					**1**
	RE	NOM RE		bowl			small fragment	**1**			1			

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
32	**RE**	NOM RE	lid VII.1	lid				**1**	1					**1**
33	**RE**	NOM RE	lid VII.3	lid				**1**	1					**1**
	RE	NOM RE					loose sherds from different vessels	**38**		38				
34	**RE**	BRU RE		pot with concave neck	burnished surface			**1**	1					**1**
35	**RE**	CHAM RE	Reims J2	cooking-bowl				**1**	1					**1**
36	**HA**	NOM HA	pot III.2	jar, small	burnished rim and neck; vertical burnished lines			**1**	1					**1**
37	**HA**	NOM HA	jar III.2	jar	burnished inside rim			**1**	1					**1**
38	**HA**	NOM HA	jar III.2	jar	burnished rim and neck; irregular comb-scoring on body with on the upper half of the body parallel vertical burnished lines on top		remains of black coating on interior rim	**5**	1	3	1		1	**1**
39	**HA**	NOM HA	jar III.2	jar	burnished inside rim			**1**	1					**1**
40	**HA**	NOM HA	jar III.2	jar	burnished inside rim and outside neck			**1**	1					**1**
41	**HA**	NOM HA	jar III.1	jar	burnished inside rim			**8**	2	6				**1**
42	**HA**	NOM HA	jar III.6	jar				**1**	1					**1**
43	**HA**	NOM HA	bowl III.5?	bowl?	burnished inside rim			**3**	3					**1**
44	**HA**	NOM HA		jar	vertical comb-scoring on body and zonal burnishing above base			**2**		1	1			
45	**HA**	NOM HA	bowl II.A.2	bowl	zonal burnishing outside rim and thick vertical burnished lines on body			**1**	1					**1**
46	**HA**	NOM HA	bowl II.A.3a	bowl	zonal burnishing outside rim and fine vertical burnished lines on body			**1**	1					**1**
47	**HA**	NOM HA	bowl II.A.3a	bowl	burnished rim; fine radial burnished lines on interior; crossing burnished lines on exterior body; zonal burnishing above base			**2**	1	1				**1**
48	**HA**	NOM HA	bowl II.A.3a	bowl	interior completely burnished; zonal burnishing outside rim			**2**	2					**1**
49	**HA**	NOM HA	bowl II.A.3a	bowl	interior completely burnished; zonal burnishing outside rim			**1**	1					**1**
50	**HA**	NOM HA	bowl II.A.3a	bowl	burnished top and outside rim			**2**	1	1				**1**

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
51	**HA**	NOM HA	bowl II.1.3ap	bowl	coating on rim (top and outside rim)			**1**	1					**1**
52	**HA**	NOM HA	bowl II.A.3b	bowl	burnished top and outside rim (zonal); comb-scoring on body			**1**	1					**1**
53	**HA**	NOM HA	bowl II.A.3b	bowl	burnished top and outside rim (zonal); vertical burnished lines on body; completely burnished interior			**2**	2					**1**
54	**HA**	NOM HA	bowl II.A.3b	bowl	burnished top and outside rim (zonal); burnished interior below bend			**1**	1					**1**
55	**HA**	NOM HA					worked base (edges chopped off) to use as lid or counter	**1**			1			
	HA	NOM HA		beakers/pots	parallel vertical burnished lines		shoulder fragments from different beakers?	**4**		4				
	HA	NOM HA		bowl	burnished surface			**2**			2			
	HA	NOM HA	III.3a	bowl/dish				**1**	1					**1**
	HA	NOM HA		jar				**1**			1			
	HA	NOM HA		jar				**2**		2				
	HA	NOM HA		jar			loose base fragments from different jars	**5**		5				
	HA	NOM HA	jar III.1	jar				**1**	1					**1**
	HA	NOM HA		undet.			fragment too small to specify	**1**	1					**1**
	HA	NOM HA			thick crossing burnished lines			**1**		1				
	HA	NOM HA			undecorated		loose sherds from different vessels; 2x2	**22**		22				
	HA	NOM HA			comb-scoring		loose sherds from different vessels	**5**		5				
	HA	NOM HA			horizontal comb-scoring with crossing burnished lines on top		loose sherds from different vessels	**3**		3				
	HA	NOM HA			undecorated		loose sherds from different vessels	**44**		44				
	HA	NOM HA			comb-scoring		loose sherds from different vessels	**23**		23				
	HA	NOM HA			comb-scoring and parallel vertical burnished lines		from two different vessels?	**2**		2				
	HA	NOM HA			crossing burnished lines			**1**		1				
	HA	NOM HA			dense burnished lattice decoration			**1**		1				
	HA	NOM HA			thick parallel vertical burnished lines		from two different vessels	**2**		2				
	TOTAL							**330**	**53**	**245**	**32**	**0**	**4**	**57**

Table 14. The pottery categories of context OS 80964, in sherd count and in MNI.

OS 80964	sherd count	MNI
SA	4	2
MOR	9	2
AM	1	1
FL	4	2
RE	24	10
HA	30	4
TOTAL	**72**	**21**

Table 15. Inventory of the pottery of context OS 80964 (Plate CCCXCI).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
	SA	LEZ SA	undet.					**1**		1				**1**
1	**SA**	ARG SA	Drag. 43	mortarium				**2**	2					**1**
	SA	ARG SA	undet.					**1**		1				
	FL	NOG FL		tableware flagon	burnished		loose sherds from different flagons	**3**		3				**1**
	FL	NOG FL		storage ware flagon?	groove	remains of white slip	fragment of large vessel	**1**		1				**1**
	AM	BAT AM	Dr. 20	amphora			small fragment	**1**		1				**1**
2	**MOR**	SOL MOR	VV 337 / Haupt 8	mortarium			joining sherds in one other level 2 context (1 sherd), in two level 3 contexts (2 rim sherds), in one level 5 context (1 rim sherd) and two joining sherds found unstratified	**3**		2	1			**1**
3	**MOR**	RHO MOR	close to Haltern 60 / Oberaden 73	mortarium			joining sherds in four different contexts of level 3 (in total 12 sherds) and one joining sherd in a level 4 context	**6**	4	2				**1**
4	**FR**	BRU RE (FR)	truncated beaker Tuffreau-Libre (1980b) type IIb	beaker				**3**	1	2				**1**
	FR	NOM RE		beaker			3 different base fragments, two of which from slim foot	**3**			3			**1**
	FR	NOM RE		beaker			pronounced base	**1**			1			**1**
5	**RE**	NOM RE	jar III.4	jar				**1**	1					**1**
7	**RE**	NOM RE	bowl II.A.4	bowl	burnished rim; burnished lattice decoration on body			**1**	1					**1**
8	**RE**	NOM RE	dish IV.2	dish				**1**	1					**1**
	RE	NOM RE	bowl IV.3					**1**	1					**1**
	RE	NOM RE		jar?				**1**			1			
	RE	NOM RE			undecorated		loose sherds from different vessels	**8**		8				
6	**RE**	BRU RE	open pot with bulging neck	pot				**1**	1					**1**
	RE	BRU RE		undet.				**3**		3				
	HA	NOM HA	jar III.2	jar			partly oxidized	**1**	1					**1**
	HA	NOM HA		large jar	horizontal comb-scoring			**1**		1				
	HA	NOM HA		jar				**1**			1			
	HA	NOM HA	III.2	jar/bottle			small rim fragments from 2 different vessels	**2**	2					**2**

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
	HA	NOM HA						**1**			1			
	HA	NOM HA		undet.			too small to identify the vessel type	**1**	1					**1**
	HA	NOM HA			undecorated		loose sherds from different vessels; some with oxidised aspect; 1x2	**13**		13				
	HA	NOM HA			crossing burnished lines		1x2 joining; from 2 different vessels	**3**		3				
	HA	NOM HA			burnished area			**1**		1				
	HA	NOM HA			comb-scoring		from different vessels	**2**		2				
	HA	NOM HA			vertical parallel burnished lines		from three different vessels	**4**		4				
	TOTAL							**72**	**16**	**48**	**8**	**0**	**0**	**19**

Table 16. Inventory of the pottery of OS 82843-845 (Plate CCCXCII).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
2	**SA**	LEZ SA	Drag. 31	dish/shallow bowl				**1**	1					**1**
1	**SA**	RHZ SA	Drag. 37	decorated bowl	decoration DS120			**1**		1				**1**
	FL	NOG FL (LLW)		tableware flagon				**4**		4				**1**
	FL	NOG FL (LLW)		tableware flagon				**2**		2				
	FL	KOL FL		tableware flagon				**1**		1				**1**
	RE	NOM FR	beaker V.1	beaker				**1**		1				**1**
	RE	NOM RE						**1**		1				
3	**HA**	NOM HA	pot III.8	pot	burnished rim and neck; vertical parallel burnished lines			**5**	1	4				**1**
	HA	NOM HA			undecorated		loose sherds from different vessels	**4**		4				
	HA	NOM HA			undecorated		oxidized fabric and surface	**1**		1				
	HA	NOM HA			complete burnishing			**1**		1				
	HA	NOM HA			crossing burnished lines			**1**		1				
	HA	NOM HA			comb-scoring			**1**		1				
	TOTAL							**24**	**2**	**22**	**0**	**0**	**0**	**6**

handmade group is represented by one open pot type III.1 (no. 9), one closed pot type III.2 (no. 10), one jar type III.6 (no. 11), one bowl type II.A.3a (no. 13) and one complete bowl with spout type II.A.3ap (no. 12).

This pottery assemblage is dominated by kitchen wares. The mortaria refer to the preparation of food; the pots, dish, bowls and lids represent the functions of food preparation and cooking in general. Only the Drag. 36 dish (no. 1) and the beaker (no. 3) are tableware vessels. Located behind the back of room R13 of the hospital complex which can be identified as kitchen based on the large central hearth, this pit may well represent its waste.

Besides pottery, this pit yielded two complete, but heavily corroded, shoemaker's anvils (IR.C68 and IR.C69; cf. in this volume Chapter 3, Section 5.7). As they were complete and found corroded together, they must represent a primary deposition. The workshop of a shoe maker can be supposed in the vicinity of this pit; maybe he worked in one of the rooms at the rear of the hospital complex. Also sixteen shoe spike clusters were found in this pit; several probably belonged to the same shoe sole. The find spectrum can be completed with ten iron nails and six iron riveted sheet and rod fragments.

Table 17. The pottery categories of context OS 72767, in sherd count and in MNI.

OS 72767	sherd count	MNI
SA	5	4
MOR	2	2
AM	6	1
RE	9	2
HA	38	2
TOTAL	**60**	**11**

Table 18. Inventory of the pottery of context OS 72767 (Plate CCCXCII).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
	SA	ARG SA	Déch. 72?	beaker				**1**		1				**1**
1	**SA**	RHZ SA?	Drag. 36	dish/shallow bowl				**2**		1	1			**1**
	SA	RHZ SA	Drag. 43/45	mortarium				**1**		1				**1**
2	**SA**	burnt	Drag. 31R	dish/shallow bowl				**1**			1			**1**
5	**AM**	BAT AM	Dr. 20	amphora			almost complete amphora bottom, with complete interior clay ball with graffito ante cocturam	**1**			1			**1**
	AM	BAT AM	Dr. 20	amphora			loose sherds; burnt to black	**5**		5				
	MOR	BAFA MOR		mortarium				**1**		1				**1**
4	**MOR**	SOL MOR	VV 337 / Haupt 8 without groove	mortarium			joining rim sherd in level 4 context	**1**	1					**1**
3	**RE**	BRU RE/ FR	truncated beaker Tuffreau Libre (1980b) IIb	beaker				**3**	1	2				**1**
	RE	NOM RE						**1**			1			**1**
	RE	NOM RE			comb-scoring			**4**		4				
	RE	NOM RE			crossing comb-scoring with on top burnished lattice decoration in other direction			**1**		1				
6	**HA**	NOM HA		small pot	burnished zone above base			**1**	1					**1**
	HA	NOM HA		jar				**1**			1			
	HA	NOM HA		jar	comb-scoring (crossing) underside base		1x2	**2**			2			
	HA	NOM HA	III.2	jar/bottle				**1**	1					**1**
7	**HA**	NOM HA		storage jar	burnished zone above base; complete burnished bottom base; vague comb-scoring on body		complete base, very large volume	**10**		9	1			
	HA	NOM HA			undecorated		loose sherds from different vessels; 1x2	**13**		13				
	HA	NOM HA			comb-scoring		loose sherds from different vessels	**4**		4				
	HA	NOM HA			different types of burnished decoration: linear crossing, lattice and zonal		loose sherds from different vesssels	**5**		5				
	HA	NOM HA						**1**			1			
	TOTAL							**60**	**4**	**47**	**9**	**0**	**0**	**11**

Table 19. The pottery categories of context OS 72540a, in sherd count and in MNI.

OS 72540a	sherd count	MNI
SA	1	1
MOR	2	2
FL	7	1
RE	32	7
HA	43	5
TOTAL	**85**	**16**

Table 20. Inventory of the pottery of context OS 72540a (Plates CCCXCIII-CCCXCIV).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
1	**SA**	burnt	Drag. 36 (small version)	dish/shallow bowl				**1**	1					**1**
	FL	NOG FL (LLW)				one fragment with white slip	loose sherds from different flagons	**6**		6				
	FL	NOG FL (LLW)		tableware flagon				**1**			1			**1**
	MOR	BAFA MOR	Stuart 149	mortarium			fragment of rim interior with start of spout; hooked flange and inner bead not higher than the flange	**1**	1					**1**
2	**MOR**	BAFA MOR	VV 352-353	mortarium		white slip		**1**	1					**1**
3	**RE**	NOM FR	beaker III.9	beaker				**2**	2				1	**1**
	RE	NOM FR	beaker III.9st	beaker			stud	**1**		1				**1**
4	**RE**	NOM RE	bowl II.A.4st	bowl	burnished rim; fine, irregular crossing, burnished lines on shoulder/body?			**4**	2	2				**1**
5	**RE**	NOM RE	bowl II.A.3b	bowl	burnished rim; thick horizontal burnished lines on body			**3**	1	2				**1**
6	**RE**	NOM RE	bowl IV.3	bowl	burnished rim; wavy burnished line (grooved) on upper half body; burnished lower half body			**7**	3	2	2		1	**1**
7	**RE**	NOM RE	dish II.A.5	dish	burnished rim			**3**	1	2				**1**
8	**RE**	NOM RE	lid VII.2	lid				**1**	1					**1**
	RE	NOM RE		bowl			all from different bowls; undecorated fragments	**4**		2	2			
	RE	NOM RE			undecorated		loose sherds from different vessels	**7**		7				
9	**HA**	NOM HA	jar III.1	jar	burnished interior rim and shoulder; vertical parallel burnished lines on body			**2**	2					**1**
10	**HA**	NOM HA	jar III.2	jar	burnished rim and neck/body?			**1**	1					**1**
11	**HA**	NOM HA	jar III.6	jar	undecorated			**3**	3					**1**

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
12	**HA**	NOM HA	bowl II.A.3ap	bowl	burnished rim; crossing burnished lines on interior; irregular vertical burnished lines on exterior body			**6**	4	1	1			**1**
13	**HA**	NOM HA	bowl II.A.3a	bowl				**1**	1					**1**
	RE	NOM FR		beaker	highly polished			**2**		2				
	HA	NOM HA		jar	crossing grouped burnished lines		2x2	**10**		10				
	HA	NOM HA		dish/bowl				**1**			1			
	HA	NOM HA						**1**			1			
	HA	NOM HA					loose sherds from different vessels; 1x2	**12**		12				
	HA	NOM HA			vertical parallel burnished lines			**1**		1				
	HA	NOM HA			comb-scoring		loose sherds from different vessels	**3**		3				
	TOTAL							**85**	**24**	**53**	**8**	**0**	**2**	**16**

4. Key context assemblages from fort level 3

The selected key contexts for fort level 3 are the central hearth OS 70950 of Unit II, the drainage gully OS 1169 of Unit IVb, pit OS 71445 and the large pit OS 80925 (Figure 5; Plates CCCXCV-CDII). Only drainage gully OS 1169 yielded a coin.

4.1 Hearth OS 70950

The central hearth of Unit II was laid out with smashed up pottery, accounting for five MNI (Table 21; Plate CCCXCV). This context is most interesting in terms of the taphonomy processes at the site. Some complete or nearly complete vessels, apparently out of use for some reason, were broken up to construct a horizontal hearth level. As will be clear, some fragments were residual items, dug-up from earlier levels. However, the more complete vessels were clearly vessels used until shortly before they were smashed up and can be considered as representative vessels for fort level 3. Evidently, although the pottery level was covered by a clay layer on top of which fire was stoked, many fragments suffered from the heat.

The Rhône mortarium (type Haltern 60/Oberaden 73) (no. 1) has already been discussed in key context OS 80964 of fort level 2, where it apparently was buried for the first time after it was presumably dug up from a pre-fort structure as its 1st-century date assumes. A large part of the mortarium got further dispersed and its fragments travelled through the Roman stratigraphy and even higher up. A large fragment was used to construct the hearth level discussed here. Another three fort level 3 contexts contained fragments and a fragment representing the complete profile even ended up in the post-Roman level.

Apart from a burnt rim fragment that remains unattributed (no. 3), the pottery comprises three almost complete North Menapian vessels; they represent three popular forms of the 3rd century and their form and decoration patterns are representative for fort level 3. A reduced wheel-turned bottle type III.2 only lacks its lip (no. 2). Underneath the burnished neck and shoulder, the body shows a combination of several decorative patterns: a burnished lattice decoration and horizontal comb-scoring combined with vertical linear burnished lines. The handmade open pot type III.2 (no. 4) shows nail or rod impressions on the rim, a decoration which was very popular in the 2nd century but which still occurred, less often, in the 3rd century. Its body is decorated in three zones: horizontal comb-scoring, a regular combination of horizontal and vertical comb-scoring, and complete burnishing of the lower part of the vessel. A complete handmade bowl type II.A.3 (no. 5) is completely burnished on the inside and has vertical burnished lines on its exterior.

4.2 Drainage gully OS 1169

Where the gully[306] started – its southern end at Unit IVb -, its bottom was covered by two complete roof tiles of the *tegula* type, clearly to prevent erosion where the water came in (Figure 6). They were positioned upside down and covered with a mortar layer. The sizes of these *tegulae* represent current sizes in the mid-Roman period (Brodribb 1987; Ward 1999; Warry 2006a/b), with respectively 43 by 31 cm (9.887 kg) and 44 by 31 cm (8.400 kg) (see also Chapter 9 in this volume).

This context yielded one coin, a copper alloy *sestertius* which can only be generally dated to the period AD 150-250.

The pottery assemblage of this context accounts for 262 fragments or 37 MNI (Tables 22-23; Plate CCCXCVI), with a significant presence of drinking vessels and tablewares (Figure 7). As discussed in the samian study, this context can be dated well based on the small samian assemblage it contains (twelve fragments, seven MNI). The samian originates from the Argonne and, mainly, from Rheinzabern.

306 Plate CDLXXIII: feature sections 1/3, 1/4.

Figure 5. Location of the selected key contexts of fort level 3.

The Argonne is represented by the rim of a Drag. 38 collared bowl (not ill.) and a Drag. 45 mortarium (no. 2), Rheinzabern by a Lud. VSb beaker with cut-glass decoration (no. 1), a beaker footring, a Drag. 36 rim, a Drag. 31 body fragment and a Drag. 43/45 body sherd. A fragment of another Rheinzabern cut-glass beaker fits with an individual of context OS 80925 (see further). Especially the presence in this context of the cut-glass decorated beakers is very significant. At Oudenburg, these only appear from fort level 3 onwards. Bird has demonstrated that they can be dated well into the 3rd century (Bird 1993, 4).

Apart from a chip of a Cologne colour-coated beaker, the CC/BS category is represented by a body fragment of a black-slipped motto beaker in *Moselkeramik* which can be dated generally to AD 180-275. This context contains one of the earliest Lower Nene Valley mortarium imports to the Oudenburg fort. As the mortarium type HP M42 (no. 4) can be dated from AD 250 onwards, its presence in this context is most significant for the chronology of fort level 3. A mortarium base with repair hole belongs to a Soller product (no. 5). The several tableware flagon fragments, with only one MNI but with sherds obviously belonging to different flagons, all originate from the Low Lands Ware 1 workshops.

The reduced wares are slightly more important than the handmade wares. They are all North Menapian products (not ill.). The North Menapian reduced group comprises two beakers, a beaker type V.1 and one of type III.9, next to seven pots (four of type III.2, one of type III.3 and two of type VI.2), a bowl (type II.A.2), a dish (type IV.1) and a lid (type VII.2). The North Menapian handmade group is represented by two beakers/pots III.9, five jars/pots (one III.1, four of type III.2 of which one storage jar) and three dishes/bowls of type II.A.3a. The jars/pots of both groups are mainly decorated by burnishing patterns, next to comb-scoring.

Some glass items were recovered from this gully: a counter of plano-convex type made of black/green glass (no. 6), a body fragment of a cylindrical vessel made of decolourised glass (not ill.), generally dated to the first half of the 1st to 3rd century, and a base fragment, probably from a bowl Isings 96 (not ill.), in decolourised glass, generally dated to the second half of the 3rd to the beginning of the 5th century. The latter emphasizes a date after AD 250 for this fort level.

The gully also yielded a massive lead weight of *c.* 3.5 cm diameter, with an iron attachment point; its loop was broken off. The iron

Table 21. Inventory of the pottery of context OS 70950.

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
1	**MOR**	RHO MOR	Haltern 60 / Oberaden 73	mortarium			horizontal rim without curl; dug-up fragment from mortarium originally (?) from level 2 (key context OS 80964) but spread out in four different level 3 contexts and with one sherd in the post-Roman level (complete profile); here reused in the hearth level	**4**	2	2				**1**
3	**RE/PR?**	burnt	lid or dish?				one small rim fragment	**1**	1					**1**
2	**RE**	NOM RE	bottle III.2	bottle	neck and upper part shoulder completely burnished; crossing burnished lines on shoulder; horizontal wheelturning comb-scoring with on top vertical parallel burnished lines		almost complete profile; only rim missing	**69**		64	5			**1**
4	**HA**	NOM HA	jar III.2	jar	nail or rod impressions on the lip; burnished inside rim; horizontal comb-scoring on upper half body; alternating vertical and horizontal comb-scoring upper half of lower body; lower half of lower body completely burnished			**136**	9	116	11		1	**1**
5	**HA**	NOM HA	bowl II.A.3ap	bowl	completely burnished interior and outside rim; some vertical burnished lines on exterior body			**14**	7	6	1			**1**
	TOTAL							**224**	**19**	**188**	**17**	**0**	**1**	**5**

finds only comprise a loop-hinge (IR.J102), 139 nails, two shoe spike clusters and seventeen unattributed fragments.

4.3 Pit OS 71445

Pit OS 71445[307] was covered by a stone gravel layer of a later phase of fort level 3. The pottery assemblage stands for 169 fragments, for 22 MNI (Tables 24-25; Plate CCCXCVII). The pit only contained eight samian fragments, representing at least five individuals. Apart from one Argonne Drag. 43 mortarium rim (no. 1) and one burnt mortarium fragment, the assemblage contains only Trier and Rheinzabern products. A collar fragment of a Trier Drag. 43/45 mortarium, a Drag. 31 base with unidentifiable stamp (SS31) (no. 2) and a dish fragment originate from Trier. The Rheinzabern potteries are responsible for a Drag. 37 rim (however no freeze preserved), a Drag. 45 mortarium fragment and an unidentified wall sherd.

A North Gaulish flagon is only represented by a body fragment. The rest of the pottery assemblage is formed by wheel-turned reduced vessels and handmade pottery; they are equally shared. The wheel-turned group accounting for seven MNI, contains three fine reduced beakers. Two of them come from the North Menapian potteries: a completely burnished beaker of type III.9 (no. 3) and a beaker with knife-trimming decoration (of beaker type V.1), only represented by a body fragment. A beaker which can be related to the Bayard type 3 beakers found at Amiens, belongs to the Bruay-Labuissière production (no. 4). According to Bayard, this type can be dated between the middle of the 2nd and the middle of the 3rd century (Bayard 1980, 189). The coarse reduced group only contains North Menapian products: a jar type III.2 (no. 6), a jar type III.3 (no. 5), a dish type IV.1 (no. 8) and a bowl type IV.3 (no. 7). The handmade pottery, accounting for eight MNI, completely belongs to the North Menapian production with two jars type III.2 (one ill.: no. 9), a jar type III.6, three dishes (nos 10, 12 and 13) and two bowls (of which one ill.: no. 11). Both the jar (no. 9) and dish (no. 13) have coated rims; the coating must have prevented food from adhering to the vessel.

One neck/shoulder fragment (not ill.) is worth drawing attention to, as it shows the top of an arcaded comb-score pattern. The fragment is similar to an individual with such decoration and a double row of finger-tip impressions on the rim, recovered from the primary fill of the large waste-pit OS 4980 of fort level 4 (cf. Vanhoutte *et al.* 2009c, 130: Fig. 31, 4). Similar forms with such comb-scored patterns are known from the Yser-Aa region, as a collection of old finds recovered during peat-extraction at Wulpen near Veurne close to the Yser contains several of such pots (unpublished material; pers. comm. M. Dewilde, research by M. Dewilde and F. Verhaeghe). An origin in that region is probable. A parallel for this type is known from the 3rd-century New Fresh Warf pottery group in London (Richardson 1986,

307 **Plate CDLXXVI: feature section 7/258.**

Figure 6. The two complete roof tiles found on the floor of gully OS 1169.

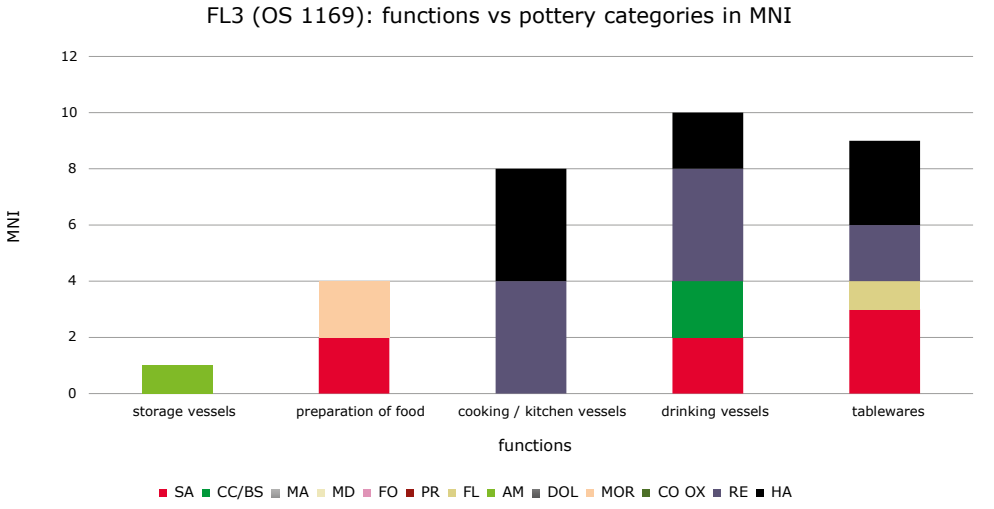

Figure 7. The pottery of context OS 1169: functions versus fabrics.

126: Fig. 1, no 185). Comparison of hand specimens revealed a close resemblance between the London and the Oudenburg pieces.

Apart from pottery, this pit also yielded the central fragment of a bone hair pin (AHBI.B143; not ill.), thirteen iron nails and four unattributed iron fragments.

4.4 Pit OS 80925

After pit OS 80925[308] was filled in, most likely during the final phase of fort level 3, a large pit of the initial phase of fort level 4 has cut this structure. Later, a layer of sand sods levelled the area, on top

Table 22. The pottery categories of context OS 1169, in sherd count and in MNI.

OS 1169	sherd count	%	MNI	MNI%
SA	12	4.6	7	18.9
CC/BS	2	0.8	2	5.4
MOR	4	1.5	2	5.4
AM	1	0.4	1	2.7
FL	13	5.0	1	2.7
RE	102	38.9	14	37.8
HA	128	48.9	10	27.0
TOTAL	262	100.0	37	100

308 Plate CDLXXV: feature section 8/238.

Table 23. Inventory of the pottery of context OS 1169 (Plate CCCXCVI).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP/ GRIT	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
	SA	ARG SA	Drag. 38	collared bowl				**1**	1					**1**
2	**SA**	ARG SA	Drag. 45	mortarium				**1**	1					**1**
1	**SA**	RHZ SA	Déch. 72 / Lud. VSb	beaker	cut-glass decoration		one sherd left in this context from individual dug-up into fort level 4 and found for the most part in a level (12 fragments) and a layer (1 fragment) of fort level 4 located several metres to the west; also four joining fragments in a mixed level to the west	**1**		1				**1**
	SA	RHZ SA	Déch. 72 / Lud. VSb	beaker			from individual scattered over different contexts and levels: 2 joining sherds in key context OS 80925 from fort level 3, 3 joining fragments in 2 different pits of fort level 4, 6 joining fragments in 3 levels and 2 pits of fort level 5, 3 joining fragments in a mixed level	**1**		1				**1**
	SA	RHZ SA	Lud. V series	beaker (globular or tulip-shaped)			footring	**1**			1			
	SA	RHZ SA	Drag. 31	dish				**1**		1				**1**
	SA	RHZ SA	Drag. 36	dish				**1**	1					**1**
	SA	RHZ SA	Drag. 43/45	mortarium			inner slip abraded	**1**		1				**1**
	SA	RHZ SA	undet.					**1**		1				
	SA	burnt	Drag. 36	dish				**1**		1				
	SA	burnt	undet.				from different vessels	**2**		2				
	CC/BS	KOL CC		beaker		interi-or and exteri-or slip abraded	chip	**1**		1				**1**
3	**CC/BS**	MOS BS	motto beaker	beaker	white barbotine and white painted decoration; part of motto (only one letter) preserved: I			**1**		1				**1**
4	**MOR**	LNV WW	HP M42	mortarium		black grit	horizontal rim; one loose, burnt body fragment	**3**	2	1				**1**
5	**MOR**	SOL MOR		mortarium			one repair hole	**1**			1			**1**
	FL	NOG FL (LLW)	everted rounded rim	tableware flagon			high quality (fine)	**1**	1					**1**
	FL	NOG FL (LLW)		tableware flagon	ribbed and burnished			**2**		2				
	FL	NOG FL (LLW)					loose sherds from different flagons	**10**		10				
	AM	BAT AM	Dr. 20	amphora				**1**		1				**1**
	RE	NOM FR	beaker V.1	beaker	burnished body with knife-trimmed decoration			**28**	4	24				**1**
	RE	NOM FR	beaker III.9	beaker	completely burnished			**5**	2	3				**1**
	RE	NOM FR		beaker			2 different individuals	**2**	2					**2**
	RE	NOM FR		beaker	burnished			**1**		1				
	RE	NOM FR/RE		beaker			complete base	**1**			1			
	RE	NOM RE	jar III.2	jar			4 different individuals	**4**	4					**4**
	RE	NOM RE	jar III.3	jar				**1**	1					**1**
	RE	NOM RE	jar VI.2	jar			2 different individuals	**2**	2					**2**

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP/ GRIT	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
	RE	NOM RE	bowl II.A.2	bowl	burnished completely		fine-walled	**1**	1					**1**
	RE	NOM RE	dish IV.1	dish				**2**	2					**1**
	RE	NOM RE	lid VII.2	lid	concentric burnished lines on top			**1**	1					**1**
	RE	NOM RE			comb-scoring		loose sherds from different vessels	**6**		6				
	RE	NOM RE			comb-scoring with on top crossing burnished lines			**2**		2				
	RE	NOM RE			crossing burnished lines			**1**		1				
	RE	NOM RE			fine burnished lines		loose sherds from different vessels	**3**		3				
	RE	NOM RE			completely burnished		loose sherds from different vessels	**2**		2				
	RE	NOM RE			undecorated		loose sherds from different vessels	**38**		38				
	RE	NOM RE						**2**			2			
	HA	NOM HA	III.9	beaker or pot			2 different individuals	**2**	2					**2**
	HA	NOM HA	jar III.1	jar				**1**	1					**1**
	HA	NOM HA	jar III.2	jar	burnished inside rim		3 different individuals	**4**	4					**3**
	HA	NOM HA		jar			6 different base fragments	**6**			6			
	HA	NOM HA	storage jar III.2	storage pot	burnished inside rim			**1**	1					**1**
	HA	NOM HA	II.A.3a	dish or bowl	completely burnished rim			**2**	2					**1**
	HA	NOM HA	II.A.3a	dish or bowl	burnished outside rim			**1**	1					**1**
	HA	NOM HA	II.A.3a	dish or bowl	burnished outside and inside rim; with groove deliminating outside rim		fine-walled	**1**	1					**1**
	HA	NOM HA			different decorations present: mainly burnished patterns, some comb-scoring, some undecorated		loose sherds from different vessels	**110**		110				
	TOTAL							**262**	**37**	**214**	**11**	**0**	**0**	**37**

of which several hearths of a workshop (Unit VII) of fort level 4 succeeded each other.

This large pit contained a pottery assemblage of 616 fragments, accounting for 85 MNI (Tables 26-27; Plates CCCXCVIII-CDII), in which tablewares dominate (Figure 8). Joining sherds across the pit indicate that the pit was filled in rapidly and that the content of its fillings can be considered as a homogeneous assemblage. The samian wares, well-present in this context with 4.4% of the total sherd count and 18.8% of the total MNI, accounts for at least sixteen individuals. They comprise several chronological indicators.

The samian spectrum is dominated by East Gaulish products. The Central Gaulish potters are represented by a Drag. 33 cup (complete profile) (no. 1) and a body fragment of a Drag. 43/45 mortarium. A complete profile of a Drag. 36 dish is a rare product from Les Martres-de-Veyre (no. 2), clearly a residual item. The Argonne fabric is represented by a Drag. 45 mortarium rim with lion head spout (no. 3) and a body fragment of a dish. A body fragment belongs to a Drag. 37 decorated bowl of Dubitatus-Dubitus, working at Trier in the period AD 200-260 (no. 4). Other Trier fragments are a rim (no. 5) and two bases of Drag. 31(R) dishes (one ill.: no. 6). The Rheinzabern spectrum dominates with two beakers (nos 7-8), two dishes Drag. 36 (nos 9-10) and at least one Drag. 43 mortarium, represented by a rim fragment (not ill.), to which a base may have belonged (no. 11). A large body fragment belongs to a plain beaker Lud. Ve (no. 7); wall sherds with cut-glass are from a beaker Lud. VSb (no. 8) of which joining sherds were found in context OS 1169 (see above) and in later levels as dug-up material. The East Gaulish assemblage is completed by another Drag. 33 cup (no. 12). Fragments from a Drag. 36 dish (no. 14), a possible Drag. 31 dish and a Drag. 45 mortarium are burnt. Very significant is a central base fragment of a Drag. 18/31 (no. 13). Although burnt, the presence of a *Strich* stamp (SS95) points to its East Gaulish origin and a mid-3rd-century date. Also the cut-glass decorated beaker indicates that time-span.

Table 24. The pottery categories of context OS 71445, in sherd count and in MNI.

OS 71445	sherd count	%	MNI	MNI%
SA	8	4.7	5	22.7
FL	1	0.6	1	4.5
RE	104	61.5	7	31.8
HA	56	33.1	9	40.9
TOTAL	**169**	**100.0**	**22**	**100**

Table 25. Inventory of the pottery of context OS 71445 (Plate CCCXCVII).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
1	**SA**	ARG SA	Drag. 43	mortarium			joining rim sherd found in gully of level 3	**1**	1					**1**
2	**SA**	TRI SA	Drag. 31	dish/shallow bowl	stamp SS31			**1**			1			**1**
	SA	TRI SA	Drag. 43/45	mortarium			collar fragment	**1**	1					**1**
	SA	TRI SA (B)	dish	dish				**1**		1				
	SA	RHZ SA	Drag. 37	mortarium	no freeze preserved			**1**	1					**1**
	SA	RHZ SA	Drag. 45	mortarium				**1**		1				**1**
	SA	RHZ SA	undet.					**1**		1				
	SA	burnt	Drag. 45	mortarium				**1**		1				
	FL	NOG FL						**1**		1				**1**
3	**RE**	NOM FR	beaker III.9	beaker	completely burnished			**53**	4	49				**1**
	RE	NOM FR		beaker				**2**		2				
	RE	NOM FR		beaker	knife-trimming			**4**		4				**1**
4	**RE**	BRU RE	beaker type Bayard (1980) 3	beaker				**1**			1			**1**
6	**RE**	NOM RE	jar III.2	jar	burnished inside rim; burnished horizontal line base neck			**1**	1					**1**
5	**RE**	NOM RE	jar III.3	jar			burnt after breakage	**3**	3					**1**
7	**RE**	NOM RE	bowl IV.3	bowl	burnished top of rim			**1**	1					**1**
8	**RE**	NOM RE	dish IV.1	dish	burnished top of rim; horizontal burnished lines on body			**1**	1					**1**
	RE	NOM RE			mainly undecorated sherds, some with burnished patterns, some with horizontal wheelturning comb-scoring		loose sherds from different vessels	**38**		38				
	HA	NOM HA	jar III.2	jar				**1**	1					**1**
	HA	NOM HA	jar III.6 with sharply bent rim	jar			neck and shoulder fragment; identical vessel found in key context OS 4980 from fort level 4	**1**	1					**1**
9	**HA**	NOM HA	jar/storage pot III.2	large jar	burnished outside rim and neck; vertical burnished lines on shoulder		black coating on top and inside rim	**1**	1					**1**
	HA	NOM HA		jar	parallel vertical burnished lines on exterior body			**1**			1			
	HA	NOM HA		jar	crossing burnished lines			**10**		10				

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
11	**HA**	NOM HA	bowl III.A.3a	bowl	burnished top and outside rim; on exterior body irregular comb-scoring and crossing burnished lines on top			**3**	2	1				**1**
	HA	NOM HA	bowl III.A.3b	bowl				**1**	1					**1**
	HA	NOM HA		bowl	completely burnished			**1**			1			
13	**HA**	NOM HA	dish II.A.2	dish	burnished interior; vertical burnished lines on exterior body		black coating on inside and outside rim	**2**	2					**1**
10	**HA**	NOM HA	dish II.A.3a	dish	burnished interior; completely burnished exterior			**1**	1				1	**1**
12	**HA**	NOM HA	dish II.A.3b	dish	burnished interior; burnished outside rim (zonal)			**1**	1					**1**
	HA	NOM HA						**2**			2			
	HA	NOM HA					base fragment from different vessels	**3**			3			
	HA	NOM HA			undecorated			**23**		23				
	HA	NOM HA			comb-scoring			**1**		1				
	HA	NOM HA			burnished lattice decoration			**1**		1				
	HA	NOM HA			irregular crossing burnished lines			**2**		2				
	HA	NOM (?) HA			neck and shoulder fragment	arcaded comb-scoring decoration		**1**		1				**1**
	TOTAL							**169**	**23**	**137**	**9**	**0**	**1**	**22**

Table 26. The pottery categories of context OS 80925, in sherd count and in MNI.

OS 80925	sherd count	%	MNI	MNI%
SA	27	4,4	16	18,8
CC/BS	9	1,5	4	4,7
MOR	7	1,1	2	2,4
PR	2	0,3	1	1,2
CO OX	1	0,2	1	1,2
FL	71	11,6	2	2,4
RE	254	41,5	30	35,3
HA	241	39,4	29	34,1
TOTAL	**612**	**100,0**	**85**	**100**

Two body fragments belong to two Cologne colour-coated beakers (one ill.: no. 16). The *Moselkeramik* is represented by a large fragment of a NB 33a (no. 15) and a body sherd of a NB 33 motto beaker (no. 17). A Pompeian Red ware dish of type Blicquy 5 (no. 18) originates from the Cambrai region. The 71 flagon fragments all belong to North Gaulish productions, of which several clearly to the Low Lands Ware 1 industry. Based on the rims, two individuals can be identified (nos 19-20); however, the bases, handles (nos 21-24) and the differences in body fragments assume more individuals. They mainly represent tableware flagons; one rim (no. 20) clearly belonged to a storage ware flagon or amphora. The assemblage counts two mortaria: one complete profile of a Bavay-Famars example of type VV 352-353 (no. 25), clearly well-used, and a rim fragment of a Rhine mortarium type VV 337 (not ill.). The late 3rd-century date of the complete base of a Mayen jar or jug (no. 26) is not in line with the rest of the pottery assemblage and assumes this is an intrusive find, possibly from the post-Roman robber trench from the bath house of fort level 5 and cutting the south side of pit OS 80925.

The reduced and handmade groups are represented in equal quantities: respectively 41.5% and 39.4% when seen in sherd count, 35.3% and 34.1% when considered in MNI. Together they form *c.* 80% or *c.* 70% of the pottery assemblage. Both are dominated by North Menapian products.

The fine reduced group contains at least nine individuals, of which at least eight beakers (nos 27-30 and 32-37). Six of them are of North Menapian origin, of which at least three of type V.1 (nos 27-29); example (no. 27) is intact and shows several rows of rouletting. One beaker is of type III.9 (no. 30). The pot of type III.8 (no. 33) most likely also had a function as beaker. Two beakers are imports. The beaker with bulging neck of type Tuffreau-Libre IIa (no. 31) cannot be attributed to a specific North Gaulish production. The straight necked beaker Bayard (1980) type 4 (no. 32) comes from the Bruay-Labuissière kilns. This type is known to have been produced until the middle of the 3rd century. The coarse reduced group comprises twenty-one individuals; they represent pots, bowls and lids, dishes are lacking. Six pots are of type III.2 (nos 38-43), two of type III.3 (nos 44-45). Several base fragments probably belonging to these rims, demonstrate comb-scoring patterns (nos 46-49) or are undecorated (nos 50-51). The bowls are of type IV.3 (nos 52-53), type IV.4 (nos 54), type II.A.3a (nos 55-56) and one rim can be identified as fragment of a bowl/jar II.B.1 (no. 57). The three bowl bases (nos 58-60) are probably related to the previous bowl rims. Five lids, one of type VII.1 (no. 61), one VII.1/2 and three lids

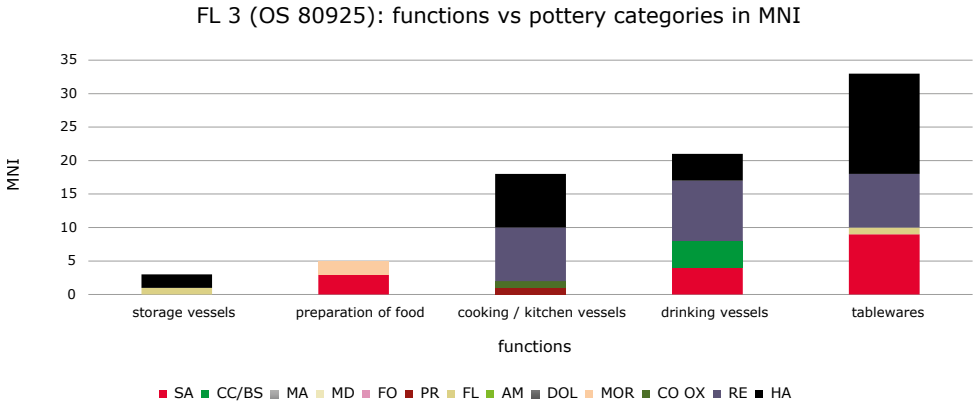

Figure 8. The pottery of context OS 80925: functions versus fabrics.

of type VII.2 (two ill.: nos 62-63) complete the North Menapian reduced assemblage. Only two 'unusual' products are recorded. The pot with lattice burnished decoration on the shoulder (no. 64) is a Bruay-Labuissière product; its type, Bayard (1980) 32, is known until the middle of the 3rd century. The pot/beaker (no. 65) is similar to known Lyons-la-Forêt products, based on both form and decoration, but displays a different fabric. As this particular type knows no parallels at other North Gaulish production sites, it should be considered as an imitation. Whether it was produced in the North Menapian workshops, remains uncertain for now.

With 242 fragments and 29 MNI, the handmade group accounts for *c.* 34% to over 39% of the total assemblage, depending on the quantification method. The handmade group consists solely of North Menapian products; they represent beakers, pots, bowls and dishes. This group contains at least four beakers, all of type III.9 (nos 66-72). One example (no. 66) represents a small, undecorated version and was almost complete. Of the three other individuals (nos 67-69) it cannot be determined whether they were stud-beakers (type III.9st) or not. In any case, three body fragments of such stud-beakers (nos 70-72) definitely belonged to three different individuals. Ten pots are of type III.2 (nos 73-80) and display a variety of rim forms. Two of them can be identified as storage pots (nos 79- 80); also the bases (nos 81-82) belonged to storage jars but it could not be determined whether they belonged to the above-mentioned individuals. At least four bowls are present, two of type II.A.4 (nos 85-86), one of type II.A.3ap (with spout: no. 84) and one variant of type II.A.2 (no. 83). While the reduced group did not contain dishes, the handmade group comprises at least eleven dish individuals (nos 88-95). Represented types are dish type II.A.2 (four MNI; three ill.: nos 88-90), II.A.3a (five MNI; three ill.: nos 91-93), II.A.3b (no. 94) and II.A.4 (no. 95). Only one handmade base fragment (not ill.) is of Romano-British origin. The base belongs to a BB1 dish type Bestwall 8/5 and represents one of the earliest Romano-British coarse pottery imports at the Oudenburg site. This type can be generally dated to *c.* AD 220-290/300.

Apart from pottery, several other finds were recovered from this pit. Only one unattributed thick-walled decolourised glass vessel fragment was present. A rounded hair pin head made of jet (no. 96) and two bone hair pins (one ill.: AHBI.B021 (no. 97) and AHBI. B116) are indicators for female presence at this fort level. Only a few items in copper alloy were recorded: a scoop probe (CA. B292: no. 98), a fragment of a ring fitting (CA.J53), a fragment of a distorted sheet and a small bar fragment. The iron assemblage mostly comprises fitting material: a circular link (IR.J386), half of a circular link (IR.J430), a rectangular link with double-spiked loop attached (IR.J434), next to 102 nails, 25 fragments of bars, rods and sheet, and 25 shoe spike clusters. A fishing-net sinker of *c.* 7 cm long (no. 99) consisting of a folded lead sheeting in the shape of a small tube (cf. Dütting and Hoss 2014) completes the find assemblage of pit OS 80925.

5. Key context assemblages from fort level 4

Many of the contexts of fort level 4 are characterized by a large quantity of pottery. Selected as key contexts for this level are those contexts yielding a varied spectrum with firm chronological indicators. Several of the key contexts yielded coins. This level is the earliest that can be chronologically defined by dendrochronological dates. The key contexts for this level are pit OS 7949 of Unit I and representing the initial phase of fort level 4, large waste-pit OS 4980, hearth OS 7932, well OS 22926, fire layer OS 8905B of Unit V and fire layer OS 7957/7971 of Unit II (Figure 9; Plates CDIII-CDXLIII).

5.1 Pit OS 7949

Pit OS 7949[309] represents the initial phase of workshop Unit I, located along the western earthen rampart. At some point this pit was closed off by a clay level, on top of which two – contemporaneous or successive? – hearths (hearth 3 and hearth 4) were installed. This context OS 7949 yielded three coins, but they do not result in valuable *tpq* dates for this context: a silver *denarius* of Antoninus Pius, a copper alloy *dupondius* of possibly Marcus Aurelius and an undetermined copper alloy *as*. The large find assemblage is illustrated on Plates CDIII-CDVIII.

309 **Plate CDLXXXI: feature sections 7/208-209.**

Table 27. Inventory of the pottery of context OS 80925 (Plates CCCXCVIII-CDI).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
1	**SA**	LEZ SA	Drag. 33	cup				4	1	1	2			**1**
	SA	LEZ SA	Drag. 43/45	mortarium				1		1				**1**
2	**SA**	LMV SA	Drag. 36	dish			two joining sherds in levels of level 3	2	2				1	**1**
3	**SA**	ARG SA	Drag. 45	mortarium			lion head	1	1					**1**
	SA	ARG SA	dish	dish				1		1				**1**
4	**SA**	TRI SA	Drag. 37	decorated bowl	see DS72			1	1					**1**
5	**SA**	TRI SA	Drag. 31	dish				1	1					
6	**SA**	TRI SA	Drag. 31R	dish			possibly dug-up find from level 2: joining base sherd found in level of level 2	1			1			**1**
	SA	TRI SA	Drag. 31R	dish				1			1			**1**
7	**SA**	RHZ SA	Lud. Ve	beaker	undecorated		large body fragment	1			1			**1**
8	**SA**	RHZ SA	Déch. 72 / Lud. VSb	beaker	cut-glass decoration		fragment of individual of which the body fragments are scattered over different contexts and levels: one joining sherd in key context OS 1169 of level 3, 3 joining fragments in two different pits of level 4, 6 joining sherds in 5 different contexts of level 5, 3 joining fragments found in a mixed level	2		2				**1**
12	**SA**	EG SA	Drag. 33	cup				1	1					**1**
9	**SA**	RHZ SA	Drag. 36	dish				1	1					**1**
10	**SA**	RHZ SA	Drag. 36	dish				1	1					**1**
	SA	RHZ SA	Drag. 43	mortarium				1	1					**1**
11	**SA**	RHZ SA	Drag. 43/45	mortarium				1			1			
	SA	RHZ SA	undet.				from different vessels	2			2			
14	**SA**	burnt	Drag. 36	dish				1	1					**1**
13	**SA**	burnt	Drag. 18/31	dish	Strich stamp see SS94			1			1			**1**
	SA	burnt	Drag. 31?	dish				1		1				
	SA	burnt	Drag. 45	mortarium				1		1				
16	**CC/BS**	KOL CC		beaker	rouletting (feather: knife-trimming?)	dark grey slip		1		1				**1**
	CC/BS	KOL CC		beaker		interior and exterior dark brown slip	lower body sherd of thick-walled beaker	1		1				**1**
15	**CC/BS**	MOS BS	NB 33a / Symonds Trier form 1 with tall neck	beaker	rouletting			3	1	2				**1**
17	**CC/BS**	MOS BS	NB 33 motto beaker	beaker	white barbotine decoration and rouletting			1		1				**1**
	CC/BS	MOS BS		beaker				1		1				
	CC/BS	MOS BS		beaker	rouletting			1		1				
	CC/BS	burnt (British?)		beaker				1		1				
18	**PR**	CAM PR	Blicquy 5	cooking dish		creamish slip	marked base, edge ridge underside base	2	1		1			**1**

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
19	**FL**	NOG FL	strongly everted, flattened rim	tableware flagon		white slip		1	1					**1**
20	**FL/AM**	NOG FL/AM	everted, ribbon-shaped rim	storageware flagon / amphora				1	1					**1**
21	**FL**	NOG FL		tableware flagon				1			1			
22	**FL**	NOG FL		tableware flagon	zonal burnishing above base			1			1			
23	**FL**	NOG FL		tableware flagon				1				1		
24	**FL**	NOG FL		tableware flagon				1				1		
	FL	NOG FL (LLW)		tableware flagon	ribs and burnished body zone			8		8				
	FL	NOG FL (LLW)		tableware flagon	ribs and completely burnished			4		4				
	FL	NOG FL		tableware flagon	burnished		burnt to black	10		10				
	FL	NOG FL					loose sherds from different flagons	43		43				
25	**MOR**	BAFA MOR	VV 352-353	mortarium			short bending collar with upstanding rim; complete spout; interior bottom base abraded, with one small deeper spot (typical wearing out for mixing liquid)	6	5		1		1	**1**
	MOR	RHI MOR	VV 337	mortarium			vertical rim; only lip of rim preserved	1	1					**1**
26	**CO OX**	MAY CO		jar/jug			complete base	1			1			**1**
27	**RE**	NOM FR	beaker V.1	beaker	rows of rouletting; burnished neck		complete beaker	1	1				1	**1**
28	**RE**	NOM FR	beaker V.1	beaker	burnished top of rim and neck			1	1					**1**
29	**RE**	NOM FR	beaker V.1	beaker	burnished top and inside rim and neck			1	1					**1**
	RE	NOM FR	beaker V.1	beaker	knife-trimming and horizontal burnished lines			1		1				
	RE	NOM FR	beaker V.1	beaker	parallel horizontal burnished lines			1		1				
	RE	NOM FR	beaker V.1	beaker	parallel vertical burnished lines			1		1				
30	**RE**	NOM FR	beaker III.9	beaker	burnished neck			1	1					**1**
	RE	NOM FR		beaker			everted rim, too small to identify the type	1	1					**1**
	RE	NOM FR		beaker			everted rim, too small to identify the type	1	1					**1**
	RE	NOM FR		beaker	rouletting			2		2				
	RE	NOM FR		beaker			body fragments from different beakers	5		5				
	RE	NOM FR		beaker	burnished		fine-walled	2		2				
	RE	NOM FR		beaker	burnished		fine-walled	2		2				
35	**RE**	NOM FR		beaker			slim foot	1			1			
36	**RE**	NOM FR		beaker			complete, slim foot	1			1			
37	**RE**	NOM FR		beaker	vertical burnished lines, grouped			1			1			
	RE	NOM FR		beaker	horizontal burnishing		fine-walled	2		2				

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
	RE	NOM FR		beaker			two shoulder fragments from different beakers	2		2				
34	**RE**	NOM FR		beaker				1			1			
	RE	NOM FR/RE		large beaker	rib			1		1				
	RE	NOM FR/RE		beaker	burnished		fine-walled	1			1			
	RE	NOM FR/RE		beaker				1			1			
31	**RE**	NOM FR	pot III.8	pot	burnished top of rim, neck and shoulder			1	1					**1**
32	**RE**	NOG FR/RE	beaker with bulging neck	beaker	burnished top of rim and shoulder			1	1					**1**
33	**RE**	BRU RE	straight necked truncated beaker Bayard (1980) type 4	beaker	burnished inside rim			1	1					**1**
38	**RE**	NOM RE	pot III.2	pot	burnished horizontal line on neck			1	1					**1**
39	**RE**	NOM RE	pot III.2	pot	burnished top rim and burnished horizontal lines on neck			1	1					**1**
40	**RE**	NOM RE	jar III.2	jar	burnished top of rim, neck and shoulder			1	1					**1**
41	**RE**	NOM RE	jar III.2	jar	burnished top of rim, neck and shoulder			1	1					**1**
42	**RE**	NOM RE	jar III.2	jar	burnished top of rim; burnished horizontal lines on neck			1	1					**1**
43	**RE**	NOM RE	jar III.2	jar	finger or rod impressions on rim top		3/4 of rim	6	6					**1**
44	**RE**	NOM RE	jar III.3	jar				1	1					**1**
45	**RE**	NOM RE	jar III.3	jar				1	1					**1**
46	**RE**	NOM RE		jar	irregular crossing comb-scoring			3		1	2			
47	**RE**	NOM RE		jar	irregular crossing comb-scoring			7		5	2			
48	**RE**	NOM RE		jar	irregular crossing comb-scoring			2		1	1			
49	**RE**	NOM RE		jar	vague irregular comb-scoring			2			2			
50	**RE**	NOM RE		jar	horizontal wheelturning comb-scoring			1			1			
51	**RE**	NOM RE		jar	undecorated			1			1			
52	**RE**	NOM RE	bowl IV.3	bowl	burnished top of rim; linear burnishing on the upper half (horizontal lines on top of grouped vertical lines); zonal burnishing on the lower body with radial grouped burnished lines; radial burnished lines on the lower interior			5	2	2	1		1	**1**

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
53	**RE**	NOM RE	bowl IV.3	bowl	burnished top and inside rim; some horizontal burnished lines on the body			2	2					**1**
54	**RE**	NOM RE	bowl IV.4	bowl	burnished top of rim			1	1					**1**
55	**RE**	NOM RE	bowl II.A.3a	bowl	burnished top of rim			1	1					**1**
56	**RE**	NOM RE	bowl II.A.3a	bowl	burnished outside rim (zonal)			1	1					**1**
57	**RE**	NOM RE	bowl or jar II.B.1?	bowl?	burnished top of rim			1	1					**1**
58	**RE**	NOM RE		bowl	burnished exterior; horizontal burnished lines interior			1			1			
59	**RE**	NOM RE		bowl			black coating: zone on interior above base	1			1			
60	**RE**	NOM RE		bowl				1			1			
61	**RE**	NOM RE	lid VII.1	lid				1	1					**1**
62	**RE**	NOM RE	lid VII.2	lid	horizontal burnished lines		not joining base but from same individual	4	3		1			**1**
63	**RE**	NOM RE	lid VII.2	lid				1	1					**1**
	RE	NOM RE	lid VII.1/2	lid	horizontal burnished line			1	1					**1**
	RE	NOM RE	lid VII.2	lid				1	1					**1**
	RE	NOM RE		bowl?	burnished exterior			1			1			
	RE	NOM RE		jar			complete base	1			1			
	RE	NOM RE		jar				1			1			
	RE	NOM RE		jar	horizontal wheelturning comb-scoring			1			1			
	RE	NOM RE		jar			not joining, but from same vessel; drops of coating on the interior	2		2				
	RE	NOM RE		jar	horizontal wheelturning comb-scoring and vertical parallel burnished lines on top		3 joining sherds	7		7				
	RE	NOM RE		jar	vertical parallel burnished lines		from different vessels	2		2				
	RE	NOM RE		jar?			almost complete base	1			1			
	RE	NOM RE		jar? (small)				1			1			
	RE	NOM RE			undecorated / comb-scoring / linear burnished patterns		loose sherds from different vessels; 6x2, 1x3	148		148				
64	**RE**	BRU RE	pot Bayard (1980) type 32	pot	burnished rim and shoulder; underneath shoulder area of burnished lattice decoration			3	3					**1**
65	**RE**	LLF RE? Or imitation in NOM RE?	typical Lyons-la-Forêt beaker type	beaker	burnished top of rim, neck and vertical burnished lines on body			1	1					**1**

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
66	**HA**	NOM HA	beaker III.9	beaker	burnished neck and shoulder; parallel vertical burnished lines on upper half body		almost complete beaker; oxidized spots	7	1	3	3		1	**1**
67	**HA**	NOM HA	beaker III.9	beaker	parallel vertical burnished lines on shoulder		black coating inside rim and neck	1	1					**1**
68	**HA**	NOM HA	beaker III.9	beaker	parallel vertical burnished lines on shoulder		black coating inside rim and neck	1	1					**1**
69	**HA**	NOM HA	beaker III.9	beaker	burnished top of rim and neck			1	1					**1**
70	**HA**	NOM HA	beaker III.9st	beaker			body fragment with stud	1		1				
71	**HA**	NOM HA	beaker III.9st	beaker	zonal burnishing		body fragment with stud	1		1				
72	**HA**	NOM HA	beaker III.9st	beaker	completely burnished		body fragment with stud	1		1				
	HA	NOM HA		beaker	vertical fine burnished lines		shoulder fragment	1		1				
73	**HA**	NOM HA	jar III.2	jar	horizontal burnished thick line on shoulder and underneath vertical burnished lines		black coating on interior rim	1	1					**1**
74	**HA**	NOM HA	jar III.2	jar	burnished inside rim and neck			2	2					**1**
75	**HA**	NOM HA	jar III.2	jar	vague vertical comb-scoring			1	1					**1**
76	**HA**	NOM HA	jar III.2	jar				1	1					**1**
77	**HA**	NOM HA	jar III.2	jar	burnished top and inside rim		oxidized surface	1	1					**1**
78	**HA**	NOM HA	jar III.2	jar	burnished top of rim and neck			1	1					**1**
	HA	NOM HA	jar III.2	jar			2 small rim fragments from different individuals	2	2					**2**
	HA	NOM HA		jar	crossing burnished lines			5		5				
	HA	NOM HA		jar			base fragments from different jars; 1x2	16			16			
79	**HA**	NOM HA	storage pot III.2	storage jar	burnished top and inside rim and neck			1	1					**1**
80	**HA**	NOM HA	storage pot III.2	storage jar	burnished inside rim and neck			1	1					**1**
81	**HA**	NOM HA		storage jar	completely burnished exterior			2		1	1			
82	**HA**	NOM HA		storage jar	completely burnished exterior			2			2			
	HA	NOM HA		jar	completely burnished			1		1				
83	**HA**	NOM HA	variant on bowl II.A.2	bowl	burnished body and burnished lower interior		handmade but wheel-turned finishing?	1	1					**1**
84	**HA**	NOM HA	bowl II.A.3ap	bowl	burnished top of rim and burnished interior beneath bend			3	3					**1**

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
85	**HA**	NOM HA	bowl II.A.4	bowl	burnished top of rim; burnished body with extra vertical lines; radial vertical burnished lines on interior below bent (itsel marked by horizontal burnished line)		black coating rim exterior	1	1					**1**
86	**HA**	NOM HA	bowl II.A.4	bowl	vertical burnished lines on body with zonal burnishing below; some crossing burnished lines on interior		black coating rim exterior crossing rib	1	1					**1**
87	**HA**	NOM HA		bowl	zonal burnishing body above base; interior completely burnished			1			1			
	HA	NOM HA		bowl				2			2			
	HA	NOM HA		bowl	one side burnished; other side fine burnished lines			1			1			
	HA	NOM HA		bowl	completely burnished on both sides			1		1				
	HA	NOM HA		bowl	parallel vertical burnished lines on exterior; completely burnished interior			2		2				
88	**HA**	NOM HA	dish II.A.2	dish	vertical burnished lines on exterior body; interior completely burnished		black coating on top and outside rim	1	1					**1**
89	**HA**	NOM HA	dish II.A.2	dish	interior completely burnished; exterior rim burnished		black coating on interior and exterior rim	1	1				1	**1**
90	**HA**	NOM HA	dish II.A.2	dish	horizontal burnished lines at the interior bent and radial burnished lines beneath the bend on the interior lower body		black coating on exterior rim: large zone	1	1					**1**
	HA	NOM HA	dish II.A.2	dish				1	1					**1**
91	**HA**	NOM HA	dish II.A.3a	dish	zonal burnishing at exterior bend; interior completely burnished below bend		black coating on top of rim	1	1					**1**
92	**HA**	NOM HA	dish II.A.3a	dish	radial burnished lines on interior below bend			1	1					**1**
93	**HA**	NOM HA	dish II.A.3a	dish	zonal burnishing interior rim			1	1					**1**
	HA	NOM HA	dish II.A.3a	dish			very abraded	5	3	2				**1**
	HA	NOM HA	dish II.A.3a	dish	zonal burnishing interior rim			1	1					**1**
94	**HA**	NOM HA	dish II.A.3b	dish	linear burnishing patterns: on exterior body horizontal lines with on top vertical lines; on interior body below bend: radial lines delignated by horizontal lines		black coating on top of rim and from lip to exterior bend	3	2		1		1	**1**

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
95	**HA**	NOM HA	dish II.A.4	dish	radial burnished lines on both exterior and interior body (below bend) (much denser on the interior and here delignated by horizontal line at the bend)		black coating on exterior rim	1	1					**1**
	HA	NOM HA		dish/bowl	completely burnished on both sides			2			2			
	HA	NOM HA			horizontal comb-scoring with on top burnished lattice decoration			3		3				
	HA	NOM HA			parallel burnished lines		fragments from different vessels	6		6				
	HA	NOM HA			undecorated / comb-scoring / linear burnished patterns		3x2; 1x4	149		149				
	TOTAL							**612**	**97**	**444**	**69**	**2**	**7**	**85**

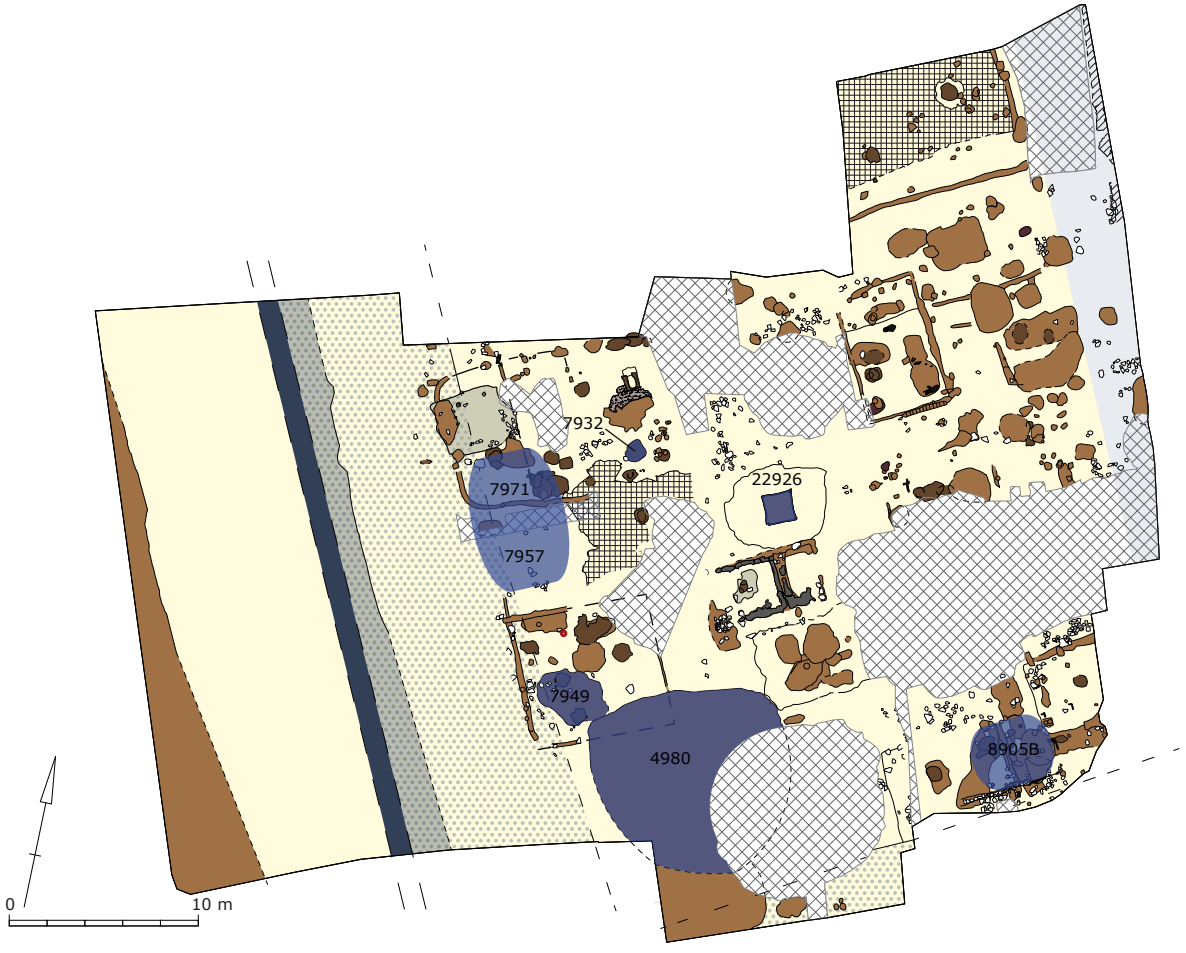

Figure 9. Location of the selected key contexts of fort level 4.

5.1.1 The pottery

A lot of pottery was recovered from this pit (2029 fragments; 135 MNI), together with a large number of bronze production waste. The pottery consists mainly of reduced and handmade wares (together 73.5% of the total MNI) and an important share of samian (22.1% of the total MNI), together accounting for no less than 95.6% of the MNI of the total assemblage (Tables 28-29).

The samian accounts for 82 fragments, representing 30 MNI. The East Gaulish products dominate, with Rheinzabern (nos 8-20) taking the lead over Trier (nos 4-5). The Argonne (nos 2-3) and La Madeleine (no. 1) only count for respectively two and one MNI. One North Gaulish rim fragment of a Chenet 330 mortarium joins a complete profile found in the nearby large waste-pit OS 4980 (see further). Striking is the presence of at least six mortaria individuals, all of type Drag. 45. In the samian study (Chapter 1.A.1 in this volume) it is argued that they were brought to this workshop for repair. Most of the identified samian potters represent date ranges too early or too wide to specify the date of this context. Only Perpetuus, the maker of a Drag. 37 bowl (no. 9), yields a *tpq* date of AD 230 as he was active in Rheinzabern in the period AD 230-275. Important chronological indicators are the small Trier dish NB 11b (no. 4) and the cut-glass decorated beaker (no. 12); they are indicative for a date around the middle of the 3rd century at the earliest.

Some isolated fragments of other pottery categories were found in the pit fill. The only colour-coated fragment is a complete base (no. 21), recognized as a beaker possibly in late Trier fabric with white painted decoration. However, this is a production generally dated after AD 300 (or at least from the end of the 3rd century onwards), a date not in line with that resulting from the rest of the pottery in this context. Another possibility is that it is a product in La Lorraine black-slipped ware, a production dated to the 3rd century which was hardly distributed outside the Trier region though (Vilvorder in Brulet *et al.* (réd.) 2010, 356-357). The tableware flagon fragments are all of North Gaulish production; only one MNI could be counted (no. 22). A Pompeian Red ware cooking dish of type Blicquy 5 comes from the Cambrai region (no. 23). A beaker or flagon in marbled ware, only represented by a body fragment, originates from the Lower Rhineland. Some small amphora fragments belong to a Dressel 20 and a Gauloise 4. These minority wares in this context probably rather represent accidental items which came along with the earth filling in this pit.

Based on MNI, the quantities of the reduced group and the handmade group are in the same range, with respectively 33.8% and 39.7% of the total MNI of the pottery assemblage. However, the handmade wares account for a lot more fragments, 75.8% of the total sherd count versus 17.9% for the reduced group. This can easily be explained by the higher amount of handmade vessels of large size.

The reduced group only contains a small portion of fine reduced wares, accounting for six MNI (nos 24-30). They can all be identified as beakers; included is closed pot type III.8 (no. 24); however a pot form, it was most likely used as a beaker. These beakers are mainly North Menapian products. Two beakers are imports from the Bruay-Labuissière kiln sites (nos 26-27). Both the beaker with bulging neck (no. 26) and the double-lobed beaker (no. 27) are known on sites in the North of France as late 3rd-century products. The coarse reduced group (40 MNI) comprises jars, bowls and lids. Except for one pot type III.6 (no. 40; with a burnished zigzag pattern on the shoulder, unique for the site assemblage), the jars are all of type III.2 (nos 31-39). At least five, possibly seven reduced bowls are present in the assemblage (three of type IV.3 (nos 41-43), one bowl type II.A.3a (no. 44) and one possible bowl type IV.4 (not ill.)), next to four lids (two of type VII.2 (nos 46-47) and two of type VII.3 (not ill.)).

The handmade group, accounting for 53 MNI, is dominated by the North Menapian production. Only two imports can be detected in this group, a Romano-British dish and an unattributed jar. The latter is only represented by three body fragments; they display a dark grey, quartz-rich fabric and a surface with rough feel. They come close to fabrics from the Ardres region, but remain unattributed. Within the North Menapian group, a small tray draws attention as it is unknown in the other pottery assemblages of the site (no. 47). Being roughly made, it may have had a function in the workshop's bronze working activities. Eight vessels can be considered as (large) beakers, although some of them are described as pot forms. Three 'beakers' are of type III.9/9st: example no. 49 has studs, example no. 50 does not. One beaker/pot is of type III.10(st) (not ill.). Two body fragments with studs indicate that in total at least three stud 'beakers' were present. Two beakers/pots are of type III.8 (no. 56); one body fragment (no. 53) also belongs to this type as it joins an individual of fire layer OS 7957/7971 (see further) (no. 102). Several body fragments (nos 51-55) indicate that these 'beakers' were richly decorated. Also the small pot II.A.1 (no. 57) can have served as beaker. The rest of the handmade group mainly consists of pots and bowls, a few dishes and one lid. The group of twenty-one pots is very homogeneous: three pots are of type III.1 (nos 58-59) of which one large storage pot (no. 69); the other eighteen pots are of type III.2 (ill.: nos 60-68), of which six are clearly large storage vessels (nos 64-68). Of the eleven bowls, one is of type II.A.2 (no. 70), three of type II.A.3a (ill.: nos 71-72), one of type II.A.3b (not ill.) and six bowls are of type II.A.4 (ill.: nos 73-76). Two dishes are recorded: a dish type II.A.4 (no. 77) and a dish II.A.3a (not ill.). The handmade assemblage contains one lid, of type VII.1 (not ill.), a rarity in the handmade spectrum of the Oudenburg site. A base of a large pot was clearly reworked, most likely to function as lid (no. 78). One BB1 dish Bestwall type 8/5 completes the handmade repertoire and is an exception in this almost exclusively North Menapian assemblage. This dish type can generally be dated to *c.* AD 220-290/300.

5.1.2 Other finds

Apart from pottery, pit OS 7949 yielded a large assemblage of metal finds, mainly of copper alloy. In total 93 copper alloy objects were recovered, next to 25 unattributed sheet fragments and one rod fragment. No less than nine brooches and seventeen items of brooch production waste were preserved, indicating that this pit contained waste of a bronze workshop. Nine brooches (ill.: nos 81-87) are all simple one-piece sprung brooches with wire bow of Böhme (1972) type 14 / Almgren (1897) type 15. They are characterized by a

Table 28. The pottery categories of context OS 7949, in sherd count and in MNI.

OS 7949	sherd count	%	MNI	MNI%
SA	82	4.0	30	21.9
CC/BS	1	0.0	1	0.7
MA	1	0.0	1	0.7
PR	4	0.2	1	0.7
AM	6	0.3	2	1.5
FL	35	1.7	1	0.7
RE	352	17.3	47	34.3
HA	1551	76.3	54	39.4
TOTAL	**2032**	**100.0**	**137**	**100**

more or less angular bow and spring with three or four coils and internal chord, classified by Heeren and van der Feijst (2017) as type 45a8. The brooch production waste, ranging from the rough semimanufactures (nos 88-90) and untwisted products (nos 91-96) to failed items (nos 97-101), represent the different stages in the production process of these one-piece sprung brooches (for further discussion: see in this volume Chapter 3, Section 3.6.1). Although heavily corroded, the fragment of a bracelet (no. 102) can be recognized as belonging to the type with stylized snakehead ends. The curve of the bow seems to indicate that this is a production waste. The other copper alloy items comprise a presumed annular buckle (no. 80), two netting needles (nos 103-104), a presumed weaving comb (no. 105), three decorative nails or lock pins (nos 106-108), the central base fragment of a vessel (no. 109) and an unattributed folded sheet item (not ill.). Although the items themselves show no flaws (of course often difficult to distinguish with heavily corroded material), it remains possible that at least part of these items are end products of this workshop or were here for repair. The latter may also have been the case for the large iron round mount (IR.H02: no. 110), most likely a horse gear trapping. As for the rest of the iron assemblage, no further indications for the functional significance of this workshop can be noted. A laminated spring of a lock (IR.D/I088, not ill.), a loop hinge (IR.J135), 84 iron nails, 169 fragments of rods, shafts and sheet, may have belonged to the construction, infrastructure and furnishing of the workshop. One piece of iron slag material refers to the metalworking activities at the site. Thirty-one shoe spike clusters of which one shows a fan-shaped pattern, complete the iron find spectrum. Also two lead items were recovered from the pit. A fork shaped piece (no. 111) may possibly represent a lead joint for the repair of pottery vessels[310]; the three legs would then fit in holes made in the vessel. The other item, perhaps a small handle, remains unattributed (no. 112).

Furthermore, the pit yielded five small glass items (not ill.). Two vessel fragments and one amorphous piece of glass remain unattributed. A rim fragment belonged to a beaker Isings 85 / Rütti 98 and can be dated in the second half of the 2nd – first half of the 3rd century. Finally, a small, spherical blue bead is worth drawing attention to; this type of bead was in use from the 3rd to the early 5th century AD. It is one of the small finds indicating female presence in fort period 4.

5.2 Large waste-pit OS 4980

The large waste-pit OS 4980 is situated in the south-west corner of the workshop area, along the earthen rampart, and has already been discussed in Volume I, Chapter II, Section II.4.6.2.a. Sections through this huge context are illustrated on Plate XLI. As for its find assemblage, next to an early *sestertius* (possibly Trajanus) and an unattributed coin, this context yielded a small coin hoard consisting of 32 low quality silver coins (coin hoard 1). Its closing coin is a late issue of Gallienus which can be dated to AD 267-268, an important *tpq* for the filling in of this pit. Since radiate copies are absent, while these are abundant in the final layers of fort level 4, it is likely that rubbish pit OS 4980 functioned in the period *c.* AD 267/268-275.

As is clear from the amount and the variety of finds recovered from this pit, its primary fill can be identified as a large waste dump. The many large potsherds, some almost intact vessels, the many cross joins of pottery found scattered throughout the different layers and the freshness of the majority of the pottery sherds, all indicate that this considerable infill happened within a short time-span and that the objects were thrown into the pit deliberately, immediately or shortly after they became unfit for use.

It is important to draw attention here to some significant conclusions from the study of the animal bones recovered from this pit (study by A. Ervynck and A. Lentacker, both Flanders Heritage Agency). Several *scapulae* of domestic cattle bearing a perforation were recovered. Such a perforation is the result of the mounting, drying and smoking of the shoulder hams whereby a metal peg was driven through the bone. Such finds are common on Roman sites. They point to the practice of making a preservable meat product (Ervynck and Lentacker in Vanhoutte *et al.* 2009b, 70). The *scapula* can be related to several iron meat cleavers of fort level 4 which also point to butcher's activities nearby. Five of the seven cleavers found at the site, can be assigned to fort level 4. The pit fillings also yielded two dogs, and at least two horses were found spread over different layers. Furthermore, several layers yielded foetuses or stillborn animals of cow, pig as well as sheep. These finds confirm the use as a waste-pit but emphasize that the pit contained far more than just consumption waste. Moreover, it also yielded a human bone, a *scapula* of an adult. How this bone ended up in the waste-pit, is difficult to assess. Also in well OS 2562 of fort level 5, a human bone (*humerus*) has been recovered (Vanhoutte *et al.* 2009b, 76: Fig. 47). The deposition of human remains in Roman wells or cesspits is not an unusual phenomenon, as finds at Tongeren, Braives, Liberchies, Elewijt and Velzeke testify to (Ervynck and Lentacker, in Vanhoutte *et al.* 2009b, 103, with references). Such a deposition probably had a ritual significance, as was presumably also the case for the human bone in waste-pit OS 4980, but how it should be interpreted, is unclear.

310 With thanks to P. Franzen (Nijmegen) for sharing this idea.

Table 29. Inventory of the pottery of context OS 7949 (Plates CDIII-CDVI).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
1	**SA**	MAD SA	Drag. 37	decorated bowl	see DS19			**1**		1				**1**
2	**SA**	ARG SA	Drag. 45	mortarium				**1**	1					**1**
3	**SA**	ARG SA? (burnt)	Drag. 45	mortarium				**4**	1	3				**1**
	SA	ARG SA? (burnt)	Drag. 45	mortarium				**1**		1				
4	**SA**	TRI SA	Lud. Sch F (Gose 44) / Nied 11b	dish small				**1**	1					**1**
	SA	TRI SA (C)	Drag. 33	cup				**1**	1					**1**
	SA	TRI SA (A)	Drag. 36	dish				**1**		1				**1**
5	**SA**	TRI SA (B)	Drag. 31	dish				**1**	1					**1**
	SA	TRI SA (B)	Drag. 31	dish			from different dishes	**3**	1	2				
	SA	TRI SA (B)	dish	dish				**1**		1				
	SA	TRI SA	dish	dish				**1**			1			
	SA	TRI SA (B)	dish or bowl	dish or bowl			from different vessels	**3**		3				
	SA	TRI SA	dish or bowl	dish or bowl				**1**		1				
	SA	TRI SA (B)	Drag. 45	mortarium			very large mortarium	**1**		1				
	SA	TRI SA	Drag. 45	mortarium				**1**		1				
6	**SA**	TRI SA (B)	Drag. 45	mortarium			complete lion shaped spout	**1**	1					**1**
7	**SA**	TRI SA (B)	Drag. 45	mortarium			traces of spout attachment	**1**	1					**1**
	SA	TRI SA	Drag. 45	mortarium			tip of left ear bat shaped spout	**1**	1					**1**
	SA	TRI SA (A)	undet.	undet.				**1**		1				
	SA	TRI SA (B)	undet.	undet.				**1**		1				
	SA	TRI SA	undet.	undet.				**1**		1				
8	**SA**	RHZ SA? (burnt)	Drag. 37	decorated bowl	see DS142			**2**	1	1				**1**
9	**SA**	RHZ SA	Drag. 37	decorated bowl	see DS128			**1**			1			**1**
10	**SA**	RHZ SA	Drag. 37	decorated bowl	see DS136			**1**		1				**1**
11	**SA**	RHZ SA	Drag. 37R	decorated bowl				**1**		1				**1**
12	**SA**	RHZ SA	Déch. 72	beaker				**1**		1				**1**
	SA	RHZ SA	beaker (Déch. 72?)	beaker				**1**		1				
	SA	RHZ SA	Drag. 33	cup				**1**		1				**1**
16	**SA**	RHZ SA	Drag. 36	dish				**6**	5		1		1	**1**
	SA	RHZ SA	Drag. 36	dish				**1**	1					**1**
17	**SA**	RHZ SA	Drag. 32	dish				**1**	1					**1**
	SA	RHZ SA	Drag. 32	dish			3 different individuals	**3**	3					**3**
19	**SA**	RHZ SA	Drag. 18/31	dish	stamp SS59			**1**			1			**1**
13	**SA**	RHZ SA	Drag. 31	dish				**1**	1					**1**
14	**SA**	RHZ SA	Drag. 31	dish				**1**	1					**1**

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
15	**SA**	RHZ SA	Drag. 31	dish	stamp SS63			**1**			1			**1**
	SA	RHZ SA	Drag. 31	dish				**1**	1					**1**
18	**SA**	RHZ SA	Lud. Th or TI	dish				**1**	1					**1**
20	**SA**	RHZ SA? (burnt)	dish	dish	stamp SS76			**5**		2	3			
	SA	RHZ SA	dish	dish			heavily worn on the inside	**1**			1			
	SA	RHZ SA	dish	dish			all from different dishes	**10**		8	2			
	SA	RHZ SA	dish or bowl	dish or bowl			all from different vessels	**6**		6				
	SA	RHZ SA	Drag. 45	mortarium			heavily worn on the inside	**1**	1					**1**
	SA	RHZ SA	Drag. 45	mortarium				**1**		1				
	SA	RHZ SA	Drag. 43/45	mortarium				**1**		1				
	SA	burnt	Drag. 36	dish				**1**		1				
	SA	burnt	undet.	undet.			from different individuals	**2**		2				
	SA	NOG SA	Chenet 330	mortarium			partially burnt to black; apparently this rim sherd is a dug-up find since a complete profile (1 rim sherd, 1 body sherd, 1 base sherd) was found in the primary filling-in of key context OS 4980 of the same fort level 4; inner coating almost completely abraded, grit very worn	**1**	1					**1**
21	**CC/BS**	TRI CC	undet.	beaker	white painted decoration: some small white paint drops		complete base	**1**			1			**1**
22	**FL**	NOG FL		tableware flagon			with start of handle	**1**		1				**1**
	FL	NOG FL		tableware flagon			loose body fragments of different flagons; 1x2	**32**		32				
	FL	NOG FL		tableware flagon				**2**			2			
	PR	CAM PR	plate	cooking plate				**3**		3				
23	**PR**	CAM PR	Blicquy 5	cooking plate				**1**	1					**1**
	MA	LOR MA	undet.	beaker or flagon				**1**		1				**1**
	AM	BAT AM	Dr. 20				loose body fragments	**5**		5				**1**
	AM	NAR AM	G4					**1**		1				**1**
24	**RE**	NOM FR	beaker III.9	beaker				**1**	1					**1**
27	**RE**	NOM FR		beaker	burnished zonal decoration with below burnished lattice decoration			**1**		1				
28	**RE**	NOM FR		beaker	burnished lattice decoration		not joining (only one illustrated)	**2**		2				

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
29	**RE**	NOM FR		beaker	burnished zonal decoration with above burnished crossing lines			**1**		1				
	RE	NOM FR		beaker				**1**	1					**1**
	RE	NOM FR		beaker				**1**	1					**1**
	RE	NOM FR		beaker	knife-trimming			**2**		2				
	RE	NOM FR		beaker			loose sherds of different beakers	**18**		18				
	RE	NOM FR		beaker			complete base with high foot	**1**			1			
	RE	NOM FR		beaker	burnished body			**1**			1			
	RE	NOM FR		beaker			central base fragments from different beakers	**3**			3			
	RE	NOM FR		beaker	knife-trimming		body fragments from different beakers	**3**		3				
	RE	NOM FR		beaker	burnished			**1**		1				
	RE	NOM FR		beaker	burnished			**2**		2				
	RE	NOM FR		large beaker	completely burnished (vertical burnishing)			**4**		4				
25	**RE**	BRU RE	truncated beaker with bulging neck type Tuffreau-Libre IIa	beaker	burnished rim and shoulder			**1**	1					**1**
26	**RE**	BRU RE	double-lobed beaker type Tuffreau-Libre IIc	beaker	burnished rim and horizontal burnished lines on the shoulder			**1**	1					**1**
30	**RE**	NOM RE	pot III.2?	small pot	small dot impressions on the lip of the rim			**1**	1					**1**
31	**RE**	NOM RE	pot III.2?	pot	burnished inside rim and complete outside rim, neck and shoulder			**3**	3					**1**
32	**RE**	NOM RE	pot III.2	pot	burnished inside rim, neck and shoulder			**1**	1					**1**
33	**RE**	NOM RE	pot III.2	pot	burnished inside rim; exterior body completely burnished		half of rim	**3**	3					**1**
34	**RE**	NOM RE	pot III.2	pot	burnished inside rim and neck			**1**	1					**1**
35	**RE**	NOM RE	pot III.2	pot	burnished top of rim and horizontal burnished lines on neck and shoulder			**1**	1					**1**
36	**RE**	NOM RE	pot III.2	pot	burnished neck			**2**	2					**1**
37	**RE**	NOM RE	pot III.2	pot			half of rim	**4**	4					**1**
38	**RE**	NOM RE	pot III.2	pot	burnished top of rim; horizontal burnished lines on neck and shoulder			**1**	1					**1**
	RE	NOM RE	pot III.2	pot			rim fragments from different jars	**19**	19					**19**
39	**RE**	NOM RE	pot III.6	pot	roughly applied burnishing decoration: zigzag motif on shoulder with below horizontal lines		ovoid body slightly carinated	**1**	1					**1**

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
40	**RE**	NOM RE	bowl IV.3	bowl	burnished inside rim and zonal burnishing on body			**1**	1					**1**
41	**RE**	NOM RE	bowl IV.3	bowl	burnished inside rim and horizontal burnished lines on body			**1**	1					**1**
42	**RE**	NOM RE	bowl IV.3	bowl	burnished rim and horizontal burnished lines on the body		broken off on intentional perforation	**1**	1					**1**
43	**RE**	NOM RE	bowl II.A.3a	bowl	zonal burnishing on outside rim; zonal burnishing above base		complete interior rooted; 3/4 rim	**11**	11					**1**
	RE	NOM RE	bowl IV.4?	bowl				**1**	1					**1**
	RE	NOM RE	dish/bowl II.A.3	dish/bowl			small rim fragment	**1**	1					**1**
44	**RE**	NOM RE	jar/bowl II.B.1?	jar/bowl				**1**	1					**1**
45	**RE**	NOM RE	lid VII.2	lid	concentric burnished lines on upperside		half or rim	**5**	5					**1**
46	**RE**	NOM RE	lid VII.2	lid	concentric burnished lines on upperside			**1**	1					**1**
	RE	NOM RE	lid VII.3	lid			small rim fragment	**1**	1					**1**
	RE	NOM RE	lid VII.3	lid			small rim fragment	**1**	1					**1**
	RE	NOM RE		jar			almost complete base	**3**			3			**1**
	RE	NOM RE		jar			very hard fabric; almost complete diameter base	**6**			6			
	RE	NOM RE		jar	crossing comb-scoring			**1**			1			
	RE	NOM RE					from different vessels	**2**			2			
	RE	NOM RE					base fragments from different vessels	**9**			9			
	RE	NOM RE			vertical comb-scoring			**2**			2			
	RE	NOM RE			undecorated / different burnished patterns / comb-scoring			**220**		220				
	RE	NOG RE		pot			unattributed dark grey, quartz rich fabric, not North-Menapian, surface with rough feel	**3**		3			1	**1**
47	**HA**	NOM HA		small tray			roughly made	**2**	2				1	**1**
48	**HA**	NOM HA	pot III.8	beaker/pot	burnished top of rim and outside rim and neck until shoulder; burnished tent motif on body consisting of grouped lines			**14**	4	10				**1**
49	**HA**	NOM HA	beaker III.9st	beaker	burnished outside rim, neck and shoulder, and zonal burnishing on body; vertical grooves between the studs		black coating on inside rim	**8**	2	6				**1**
50	**HA**	NOM HA	beaker III.9	beaker	burnished inside rim and outside neck; vertical parallel burnished lines on shoulder		half of vessel	**6**		6				**1**
	HA	NOM HA	beaker III.9	beaker			shoulder fragment	**2**		2				

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
	HA	NOM HA	beaker III.9	beaker				**4**	4					**1**
51	**HA**	NOM HA	beaker III.9/10st	beaker	completely burnished; impressed dots between the studs			**1**		1				
52	**HA**	NOM HA	beaker III.9/10st	beaker	completely burnished body; two rows of studs		not joining sherds but from same individual	**7**		7				
	HA	NOM HA	beaker III.9/10st	beaker			two body fragments with stud, from different beakers	**2**		2				
53	**HA**	NOM HA	pot III.8	pot/beaker	vertical parallel grooves and pattern of impressed dots, underneath vague crossing burnished lines		shoulder fragment; joins individual (99) of key context OS 7957/7971 (fire layer to the north)	**3**		3				
54	**HA**	NOM HA	pot/beaker III.8/9/10?	pot/beaker	impressed dots within triangular			**1**		1				
55	**HA**	NOM HA	pot/beaker III.8/9/10?	pot/beaker	grouped burnished lines, dense pattern, alternating directions (herringbone motif?)			**1**		1				
	HA	NOM HA	beaker III.10	beaker				**1**	1					**1**
56	**HA**	NOM HA	pot III.8	pot/beaker	burnished inside rim and exterior neck; horizontal burnished lines on upper body			**1**	1					**1**
	HA	NOM HA	pot III.8	pot/beaker small			small rim fragments	**2**	2					**1**
57	**HA**	NOM HA	beaker II.A.1	beaker			black coating on exterior rim and neck	**1**	1					**1**
	HA	NOM HA	small globular beaker	beaker			shoulder fragment	**1**		1				
	HA	NOM HA		beaker				**1**	1					**1**
58	**HA**	NOM HA	jar III.1	jar				**1**	1					**1**
59	**HA**	NOM HA	jar III.1	jar	horizontal burnished line below neck		black coating on interior rim up till bend	**1**	1					**1**
60	**HA**	NOM HA	jar III.2	jar				**1**	1					**1**
61	**HA**	NOM HA	jar/bottle III.2	jar/bottle	crossing burnished lines on body delignated by two horizontal burnished lines above		black coating on top and inside rim	**3**	2	1				**1**
62	**HA**	NOM HA	jar III.2	jar				**4**	2	2				**1**
63	**HA**	NOM HA	jar III.2	jar	burnished top and inside rim			**4**	4					**1**
	HA	NOM HA	jar III.2	small jar	burnished inside rim and outside neck			**2**	2					**1**
	HA	NOM HA	jar III.2	small jar				**3**	3					**1**
	HA	NOM HA	jar III.2	small jar				**3**	3					**1**

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
	HA	NOM HA	jar III.2	small jar			rim fragments from different jars	**5**	5					**1**
	HA	NOM HA	jar III.2	small jar	burnished inside rim			**1**	1					**1**
	HA	NOM HA	jar III.2	jar	burnished inside rim			**1**	1					**1**
	HA	NOM HA	jar III.2	small jar				**3**	3					**1**
	HA	NOM HA	jar III.2 but fine, upstanding, slightly everted rim	small jar				**9**	9					**1**
	HA	NOM HA		jar/beaker			base fragments from different vessels; 2x2	**43**			43			
64	**HA**	NOM HA	(storage) pot III.2	(storage) pot	burnished top and inside rim; horizontal burnishing on shoulder			**3**	3					**1**
65	**HA**	NOM HA	jar/storage pot III.2	jar/storage pot	crossing burnished lines on shoulder delignated by horizontal burnished zone above		black coating on top and inside rim	**1**	1					**1**
66	**HA**	NOM HA	storage pot III.2	storage pot	burnished inside rim and top shoulder; crossing thick burnished lines (lattice) on shoulder			**3**	1	2				**1**
67	**HA**	NOM HA	storage pot III.2	storage pot	burnished inside rim and neck			**1**	1					**1**
68	**HA**	NOM HA	storage pot or bowl III.2	storage pot/ large bowl	burnished top and inside rim; horizontal burnished lines on neck and shoulder with below vague irregular vertical burnished lines			**1**	1					**1**
	HA	NOM HA	storage pot III.2	storage pot	groove on shoulder			**3**	1	2				**1**
69	**HA**	NOM HA	storage pot II.A.1	storage pot			black coating on rim and exterior shoulder	**1**	1					**1**
	HA	NOM HA		jar			1x4, 1x2, 1x2 joining sherds from 3 different shoulder fragments	**8**		8				
	HA	NOM HA		jar			shoulder fragments from different jars	**12**		12				
	HA	NOM HA		jar				**2**			2			
70	**HA**	NOM HA	bowl II.A.2	bowl	burnished outside rim; burnished interior below rim		with slightly contracted rim	**3**	3					**1**
71	**HA**	NOM HA	bowl II.A.3a	bowl	burnished top of rim and complete exterior; burnished interior below rim			**3**	3					**1**
72	**HA**	NOM HA	bowl II.A.3a	bowl	burnished top of rim and complete exterior; burnished interior below rim			**1**	1					**1**

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
73	**HA**	NOM HA	bowl II.A.4	bowl	burnished outside rim; vertical burnished lines on exterior body; grouped radial burnished lines on interior delignated by horizontal burnished line at bend			**1**	1					**1**
74	**HA**	NOM HA	bowl II.A.4	bowl	burnished top of rim and complete exterior; burnished interior below rim			**2**	2					**1**
75	**HA**	NOM HA	bowl II.A.4	bowl			black coating on top of rim	**1**	1					**1**
76	**HA**	NOM HA	bowl II.A.4	bowl	burnished top of rim and complete exterior			**1**	1					**1**
	HA	NOM HA	bowl II.A.3a	bowl			rim fragments from different bowls	**4**	4					**1**
	HA	NOM HA	bowl II.A.3b	bowl				**1**	1					**1**
	HA	NOM HA	bowl II.A.4	bowl			2 different individuals, similar to 74	**2**	2					**2**
	HA	NOM HA	dish/bowl II.A.2	dish/bowl				**1**	1					**1**
	HA	NOM HA	dish/bowl II.A.3	dish/bowl			1x3 and 1x2 joining sherds, from 2 different individuals	**5**	5					**2**
	HA	NOM HA	dish/bowl II.A.3	dish/bowl			rim fragments from different vessels	**5**	5					**5**
	HA	NOM HA	dish II.A.3a	dish				**1**	1					**1**
77	**HA**	NOM HA	dish II.A.4	dish	burnished top and outside rim; only a few irregular crossing burnished lines on the exterior body; radial burnished lines on the interior below horizontal burnished line at the bend			**1**	1					**1**
	HA	NOM HA		dish	interior completely burnished		central base fragment from thick plate	**1**			1			
	HA	NOM HA		bowl	completely burnished inside			**1**			1			
	HA	NOM HA		bowl?			small rim fragments from different closed forms, too small to identify	**3**	3					
	HA	NOM HA		dish/bowl			base fragments from different vessels	**4**			4			
	HA	NOM HA	lid VII.1	lid				**1**	1					**1**
78	**HA**	NOM HA		base reused as lid?	comb-scoring		complete base, worked edges	**3**			3			
	HA	NOM HA			burnished patters / grooves / comb-scoring		body fragments from different vessels	**20**		20				

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
	HA	NOM HA					small rim fragments from different vessels, too small to identify	**3**	3					
	HA	NOM HA					different shoulder fragments	**4**		4				
	HA	NOM HA			completely burnished or zonal burnishing (horizontal or vertical)		body fragments from different vessels; 1x3	**102**		102				
	HA	NOM HA			comb-scoring		body fragments from different vessels; 2x2	**75**		75				
	HA	NOM HA			linear burnished patterns		body fragments from different vessels; 1x2	**272**		272				
	HA	NOM HA			undecorated		loose fragments from different vessels	**847**		847				
79	**HA**	BB1	Bestwall type 8/5	dish			burnished arcading on the side; scrolling on the outside	**5**	4		1		1	**1**
	HA	BB1	undet.	dish or bowl			burnished scrolling on the underside	**1**		1				
	TOTAL							**2032**	**202**	**1733**	**97**	**0**	**4**	**137**

5.2.1 The pottery

The large amount of pottery sherds (5640 fragments for 729 MNI) has been studied in depth (Vanhoutte *et al.* 2009c; Figure 10). The samian wares, accounting for 75 MNI or 10.3% of the total MNI (see also Chapter 1.A.1, Section 11 in this volume), point to a date for the samian assemblage around the middle of the 3rd century, *c.* AD 250-260. This conclusion is primarily based on the comparisons with notable parallel samian assemblages from the Trier Massenfund (*c.* AD 240-260 (Huld-Zetsche 1971)), the Trier Louis-Lintz-Strasse (*c.* AD 260-275 (Loeschke 1923)) and the Shadwell London watch-tower site (*c.* AD 250 (Bird 2002)). Other pottery categories rather point to a slightly later date. The presence of the Gruppe II (Künzl 1997) motto-beaker indicates a date after *c.* AD 260 for the fill of the pit. Two Mayen lid-seated jars in coarse oxidized ware of transition type Niederbieber 89/Alzey 27 also point to the late 3rd century. The slightly earlier date suggested by the samian may be related to the longer life-span of these vessels, exemplified by the complete, well-used – based on the cutting traces – Drag. 38 of Central Gaulish origin, which must have been discarded at least 30 years after the assumed last productions at the Central Gaulish workshops intended for export to the North of Gaul. Based on the pottery evidence, a date around AD 260 or shortly afterwards (*c.* AD 260-270) was defined for the infill of the pit. However, the coin evidence, only available after the publication of the pottery study, reveals that this date has to be shifted even a bit more. A closing coin of Gallienus, identified as a late type of his reign, yields a *tpq* date of AD 267/268, and together with the absence of radiate copies, this results in a very specific date for the infill between AD 267/268 and 275.

Without repeating the complete ceramic analysis published in 2009 (Vanhoutte *et al.* 2009c), it is important to draw attention to some specific import products found within this large rubbish pit. Several imports came from *Britannia* and from the east (Rhineland and Eifel region), some from the North of France.

Within the colour-coated wares assemblage, one flagon or beaker in Hadham red-slipped ware could be identified, at least four Lower Nene Valley colour-coated products (one flagon, three beakers), and at least four *Moselkeramik* beakers, of which one motto beaker was already mentioned above.

Some reduced vessels were imported from the North of France. The infill of the pit yielded two truncated beakers and a bowl from Bruay-Labuissière (Plate CLXXIV: nos 6, 11 and 30), three pots from La Calotterie (Plate CLXXV: nos 36-38) and two carinated bowls from the Cambrai region (Plate CLXXV: nos 40 and 41)[311].

The Romano-British coarse pottery accounts for six MNI. At least one individual is a BB2 beaded carinated bowl, dated prior to AD 250/260. The four BB1 dishes of Bestwall type 8/5 can be dated *c.* AD 220-290/300 and one rim of a BB1 dish Bestwall type 8/12 to the period *c.* AD 290/300-370. It would suggest that the rubbish pit still functioned at least at the very end of the 3rd century. However, it is the only conclusive indication from the pottery assemblage for such a late date, although the Mayen lid-seated jars may correspond with this date. Moreover, the absence of radiate

311 **After further fabric analyses, the identifications of these products from the North of France have changed slightly compared to the published data in Vanhoutte *et al.* 2009c; cf. also Chapter 1.B.5.2 in this volume.**

copies, so abundant in the final layers of fort level 4, may indicate that the date of the infill should be set within the time-span AD 268-275. The type 8/12 dish should probably be considered as an intrusive find from the closing-off level on top of the waste-pit, dated to the end of fort level 4.

The five mortaria recovered from the pit demonstrate the dominance of the Rhineland supply, with a complete vessel and a complete profile from Soller, a complete mortarium and a complete profile from the Rhine-Meuse-Eifel region, and a complete profile from the Rhineland (cf. Chapter 1.B.3: Figure 1.56). Body fragments belonged to an Oxfordshire White Ware mortarium. Five individuals can be counted in the coarse oxidized ware assemblage: two bases of Urmitz pots, one body fragment of a Speicher vessel and two rims of Mayen NB 87/Alzei 27 pots, already mentioned. The co-occurrence of these three productions also point to a date in the late(r) 3rd century.

5.2.2 Other finds

Apart from pottery, this large waste-pit yielded a vast amount of metal finds next to some items of other find categories (Plates CDIX-CDXIV). While the waste-pit lay open, three copper alloy vessels were deposited towards the centre of the pit (Figure 11). As they were nicely put together, and with one of the vessels placed inside the other, they most likely represent a deliberate act with a specific meaning. Although in a bad state of preservation, they were more or less intact. Dish/plate no. 2 (CA.D112) was found on the bottom of cauldron no. 1 (CA.D088), with next to it bucket no. 3 (CA.D090/91) (Plate CDIX).

An iron spearhead (no. 38) refers to the military life. Several copper alloy brooches and bracelets, an iron buckle (no. 39) and shoes are related to a more personal atmosphere. At least 33 shoes were recovered from this pit (see Chapter 8 in this volume). They were all worn and represent discarded, re-deposited material as their condition was poor, components were missing and only a few pairs can be recognized. Moreover, some shoes look as if they had dried and rotted before they were sealed off, fitting in well with the interpretation of this structure as a large rubbish pit. It is no surprise that also several iron spike clusters were recovered, amongst a large shoe sole fragment and another eighteen shoe spike clusters).

The crossbow brooch (CA.B020: no. 11) of type *Armbrustscharnierfibel* Riha 6.4.4 (Van Thienen type 0; cf. Chapter 3, Section 4 in this volume) can be dated prior to AD 280. The six one-piece sprung brooches with angular wire bow (one ill.: no. 12) and the eleven semimanufactures of such brooches (four ill.: nos 13-16) present in this pit, relate to the brooch production waste found in pit OS 7949 of Unit I. This may indicate that the waste-pit functioned while workshop Unit I, where such brooches were made, was active. However, as pit OS 4980 cuts the initial level of Unit I and also the edge of pit OS 7949, it is more likely that the brooch production waste in context OS 4980 is to be explained as dug-up items. Three bracelet fragments are clearly production waste. They may have ended up in the waste-pit in the same way as the brooch production waste, by cutting pit OS 7949. In this pit, a presumed failed item of bracelet production was found (see OS 7949: no. 102). The items found in waste-pit OS 4980 may confirm that also bracelets were produced at workshop Unit I, at least in its initial phase. Fragment no. 21 represents a bracelet semimanufacture of which one half probably broke off during the production process. Items nos 22 and 23 are clearly products which failed during production. The four bracelets of the type with small animal head ends (nos 17-20) were found clustered on top of each other and interlocking. They do not seem to represent production waste, but were rather discarded items.

Other items related to personal life are a copper alloy hair pin (CA.B278: no. 24), three bone hair pins (AHBI.B029, B031, B032: nos 8-10), a wooden pin, presumably a hair pin (no. 50), and a fragment of a glass bracelet (no. 7), all items indicating female presence. Also the small mirror glass (no. 4) was likely used by a woman (cf. Chapter 6 in this volume). The scoop probe (CA.B289: no. 25) may have had a cosmetic or a medical function. A counter, made of a Dressel 20 amphora sherd, refers to gaming and social life on the site.

A decorative nail or lock pin (no. 26) and a small handle (no. 27) are related to furnishing. This is also the case for the iron handle (no. 42). Two iron lock springs (one ill.: no. 43) and an iron spring bolt (no. 44) probably once belonged to a door. In addition to the copper alloy vessel hoard consisting of a bucket (no. 3) and a cauldron with a plate in it (nos 1 and 2) and obviously put in the pit with care, a sieve was thrown in the waste-pit. Its handle (no. 28) possibly belongs to several sheet fragments with perforated decoration (CA.D165 and 166). Two riveted plates (one ill.: no. 29) refer to the repair of vessels, an activity which probably also took place in the workshops of fort level 4. The find of a scales with related hooked chain (no. 30) and a scales weight (no. 31) fits in well with the function of the surrounding area as a production site – clearly, production brought along weighing and measuring activities – but may also be related to a market function.

The two round mounts, one of large size (CA.A/H45: no. 32) and one medium-sized (CA.A/H38: no. 33), most likely horse trappings, are indicative for the presence of cavalry. The bridle ring (no. 34) can also be connected to this. Other copper alloy and iron items were multifunctional (such as (structural) fittings) or remain unattributed: different kinds of copper alloy fittings (nos 35-37 and one not ill.: CA.J31), an iron link (not ill.) and an iron ring-headed pin (no. 47), double-spiked loops (nos 45 and 46 and one not ill.), two curved copper alloy strips (of bracelets?), six fragments of different copper alloy bars, several copper alloy sheet fragments, 251 iron nails and 86 iron fragments of bars, rods, shafts, sheet. Three iron slags, a lead off-cut (no. 48), two molten lead pieces and two bar-shaped whetstones (nos 55-56; cf. Chapter 10 in this volume: cat. nos 021-126 and 021-127 resp.) are related to the metalworking activities at the workshops of this fort level 4. Two identifiable basalt lava quern fragments, a *catillus* fragment (no. 53) and a *meta* fragment (cat. no. 54) (cf. Chapter 10 in this volume: cat. nos 021-094 and 021-093 resp.) refer to cereal processing nearby, which has already been assumed based on the concentrations of charred cereals found at different locations at this fort level 4 (see Volume I, Chapter II, Section II.4.6.2.c). Two molten glass lumps

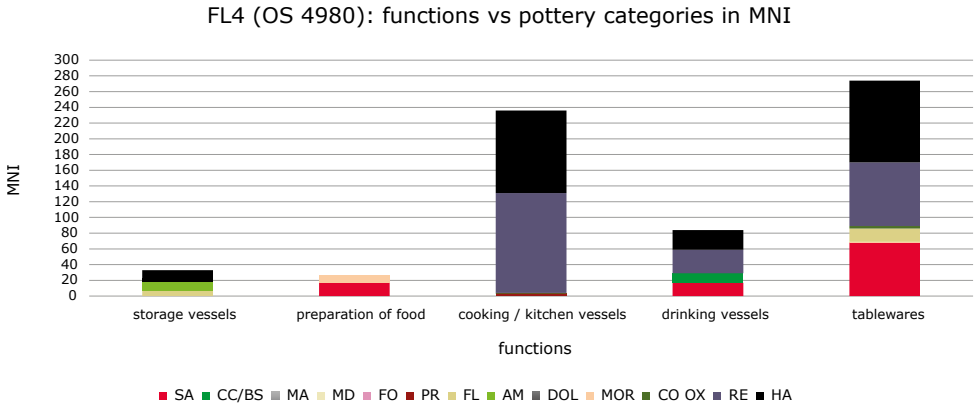

Figure 10. The pottery of context OS 4980: functions versus fabrics.

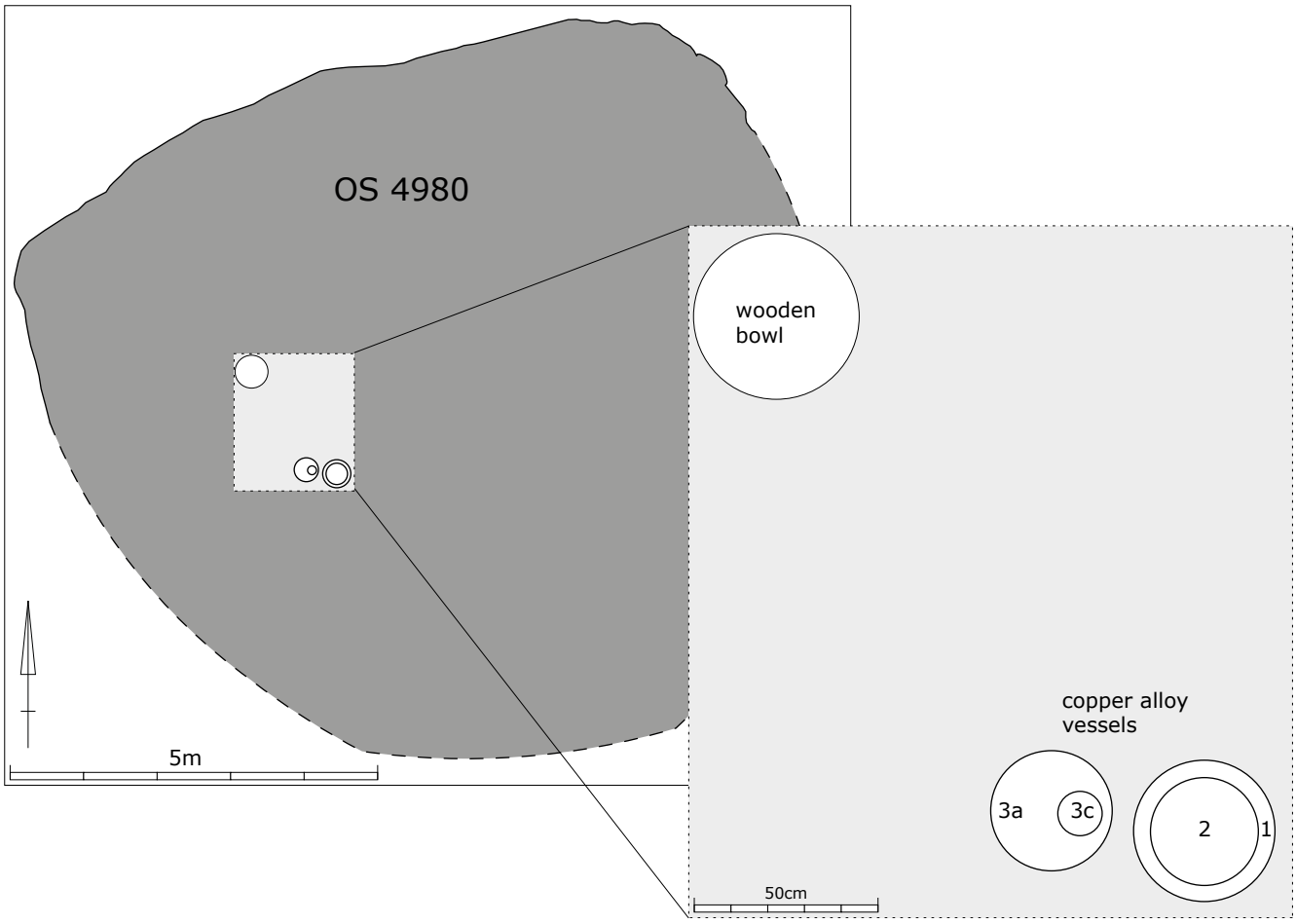

Figure 11. Location of the wooden bowl and the copper alloy vessels in the primary infill of the large waste-pit OS 4980.

are difficult to interpret; it is uncertain whether they represent evidence for secondary glass production or simply the result of a fierce enduring fire. The rubbish pit also yielded eleven glass vessel fragments, mainly of bowls (*e.g.* example no. 5) and bottles (*e.g.* a fragment of a Frontinus bottle no. 6). Five glass items are fragments of window panes.

The remains of a wooden bowl with a rim diameter of *c.* 45 cm. (no. 52) found on the bottom of the pit, and of a small wooden bowl (no. 51) indicate that one has to take into account that not only ceramic and metal vessels were in use. Some wooden vessels were also recovered from the primary infill of the large water basin OS 4923 (see further) and in the double well OS 2562 (Vanhoutte *et al.* 2009b, 54-55). Their role was most likely much more significant than can be understood from the limited amount of items preserved in waterlogged structures.

5.3 Well OS 22926

Well OS 22926, situated in the centre of the workshop area, yields several chronological indicators and is a key context to get insights into the chronology of fort level 4. The structure represents different moments in time: within the framework several levels can be distinguished, belonging to the construction of the well, its use (level I), its abandonment (level II), and its final use as rubbish pit (levels IV and V) until the final closing off with a fire layer extending over a larger area than the well itself (level VI) (Plate XLII; Figure 12).

Dendrochronological analysis of the boards of the framework resulted in a felling date between AD 260 and 275 (Haneca 2009). This context yielded a total of 33 coins of which nineteen belonged to a small coin hoard, possibly representing the content of a purse (coin hoard 5). On the bottom of the clay layer of structure level II, on the transition with level I, a very worn, copper alloy *sestertius* of Hadrianus was found, dated to AD 120-125[312]. Such *sestertii* still circulated until AD 270 and possibly even longer. The coin in question is likely to be such a coin still circulating in fort period 4, rather than a residual piece. It may even have been a closure offering when the well was abandoned. The nineteen bad silver coins forming the small coin hoard 5, with a total weight of 46.93 g, were recovered from structure level V. Fifteen of these coins can be recognized as billon *antoniniani* or *antoniniani* copies of Gallienus (260-268), Postumus (260-269) or Claudius II (268-270), all with a diameter around 15 mm. Four other coins of the coin hoard, with a diameter of *c.* 22 mm, are presumed older *antoniniani* or *antoniniani* copies, dated to AD 215-260. More precise identifications were not possible due to the very corroded state of the coins. Structure levels V and VI yielded another eleven coins: one *as* or *dupondius* by Postumus (probably from an unofficial workshop), two radiate copies of Tetricus I, two radiate copies of Tetricus II, two undetermined radiate copies and four *antoniniani* or *antoniniani* copies with radiate crowns dated to AD 266-300. The presence of the radiate copies of Tetricus I and II date the infill of structure OS 22926 definitely after AD 274. However, this *tpq* date can shift towards the end of the 3rd century since these radiate copies still circulated until *c.* AD 300 and possibly even later (see Chapter 2 in this volume).

5.3.1 The pottery

Well OS 22926, from construction pit to the final infill (level V), yielded 1281 pottery fragments. The following analysis discusses them according to the taphonomic unit to which they belonged.

5.3.1.1 Construction pit

The pottery recovered from the construction pit accounts for 301 fragments, for 74 MNI (Tables 30-31; Plates CDXV-CDXVI). They represent many small fragments and for a large part these can be considered as residual material dug up during the construction of the pit. The samian assemblage can only be generally dated to the period AD 170 – 3rd century. The pottery categories represent a similar proportional and functional distribution as pottery assemblages from the previous fort levels. The tableware flagons are all Low Lands Ware 1 products; the storage ware flagon or rather amphora is another North Gaulish product. The reduced group and the handmade group represent an equal share, both accounting for 27 MNI. It is worth drawing attention to some specific pottery individuals. Within the reduced assemblage, five fine reduced beakers can be counted. In addition to two North Menapian beakers of type V.1 (nos 17 and 18), body fragments represent a truncated beaker with bulging neck from Bruay-Labuissière (not ill.), a type dated from the late 3rd century onwards. Another beaker, of North Gaulish fabric (no. 19), probably also of the truncated type, has a rather long everted rim. The fine finishing classifies the thin-walled individual (no. 20) also in the beaker group. In the coarse reduced group, one jar with everted rim is in Low Lands Ware 1 fabric (no. 21). The rest of the reduced assemblage consists of North Menapian vessels: twelve pots (nos 22-27), at least three bowls (nos 28-30), two dishes (nos 32-33) and two lids (one ill.: no. 34), all of current 3rd-century types. Also the handmade assemblage shows a composition known from the previous level, both in functions and in types, and is dominated by the North Menapian productions: sixteen pots (nos 36-48, 55), with at least one storage pot (nos 48 and 55) and two pots/beakers of type III.8 (nos 36 and 37), three bowls (nos 49-51) and four dishes (nos 52-54). One body fragment belongs to a BB1 cooking pot, which can be dated to AD 250-370. One base fragment (no. 56) closely resembles vessel no. 58 of key context OS 30916 of fort level 1 (see before), identified as (an imitation of) a Morini cup (in context OS 30916 reused as lid).

5.3.1.2 Structure level I

As can be expected, level I yielded only a small amount of pottery fragments, as this level represents the final phase of its function as actual well (Plate CDXVII: top; Table 32). These pottery fragments fell into the well after its last clearing out; some may have been pushed in from level II. Apart from some reduced vessel fragments (nos 2-5) and a handmade rim fragment (no. 6), a fragment of a Rheinzabern Drag. 37 bowl is worth drawing attention to. The potter group Iulius II – Iulianus I was active AD 220-255. The dendrochronological results already pointed to a construction date definitely after AD 260 for this well. This bowl fragment may be an indication that the bowls of this potter group were still supplied to the fort during fort level 4, as could also be assumed from their presence in the large waste-pit OS 4980 (see before, and cf. Vanhoutte *et al.* 2009c).

5.3.1.3 Structure level II

The pottery assemblage from level II stands in strong contrast with that of level I. The significant number of pottery in this level II obviously represents the abandonment of the well as water structure (Plate CDXVII: below; Table 33). The closure as a source of water (and hence the transition to a use as waste-pit) clearly included one or more actions with a specific meaning, as can be deduced from the find of an isolated, nearly complete shoe on the bottom of this level. It could be recognized as a ritual deposit, a closure offering, an interpretation enhanced by the fact that the shoe was for a left

312 **Type Mattingly (1936) 1263; front:]TRAIAN – HADRIANV[, bust of Hadrian with laurel wreath to the right.**

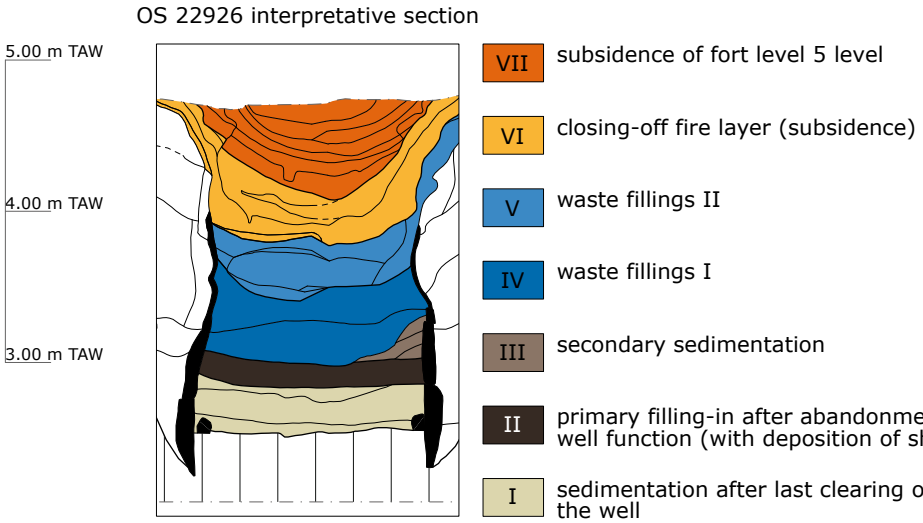

Figure 12. Interpretative section drawing of well OS 22926 marking the successive levels of construction and infill.

foot and very worn (cf. Chapter 8 in this volume). Also the above-mentioned coin, found at the transition of level II with level I, may be interpreted as a ritual deposit when the well was put out of use. The possibility remains that the nearly complete pots nos 2 and 3 were thrown into the well as a deliberate act. Both these North Menapian handmade closed pots represent type III.9, one with studs (no. 3) and one without (no. 2). Although typologically seen as pots, these vessels were possibly used as large beakers, and maybe as collective beakers as De Clercq (2009) suggested for the stud pots. This function may enhance the idea that these two beakers/pots were deliberately thrown into the well.

5.3.1.4 Structure levels IV and V

Structure levels IV and V clearly represent waste dumps. The pottery fragments from these levels were catalogued separately, but should be considered as two loads of waste thrown in the well structure rapidly following one other. In total, they yielded 754 pottery fragments, accounting for 110 MNI (Figure 14; Tables 34-35; Plates CDXVIII-CDXXIII). The large size of many of the fragments and several complete or nearly complete vessels indicate that a lot of pottery was thrown in the pit not long after they were used.

The samian assemblages from these two levels have been discussed as one assemblage in the samian study (see Chapter 1.A.1). Very significant is that the samian wares, next to some burnt individuals, are all of Trier or Rheinzabern fabric and that these productions are equally shared. Trier vessels in level IV are nos 1, 2 and 3 (Plate CDXVIII), in level V nos 1-8 (Plate CDXX); Rheinzabern is represented by no. 4 in level IV (Plate CDXVIII) and by nos 9 to 23 in level V (Plate CDXX). The samian assemblage *an sich* cannot be dated later than the middle of the 3rd century, demonstrating the long life-span samian vessels must have had.

Colour-coated/black-slipped wares were only scarcely present in levels IV and V. Some Cologne colour-coated fragments are probably residual items (for level IV: Plate CDXVIII, no. 6). That was probably not the case for the beaker in *Moselkeramik* of level V (Plate CDXXI: no. 27) and the Oxfordshire red-slipped flanged bowl in level IV (Plate CDXVIII: no. 5). The latter can be dated after AD 240.

Table 30. The pottery categories of context OS 22926 – construction pit, in sherd count and in MNI.

OS 22926 construction pit	sherd count	%	MNI	MNI%
SA	12	4.0	7	9.5
CC/BS	3	1.0	3	4.1
MD	6	2.0	1	1.4
MOR	5	1.7	1	1.4
PR	2	0.7	1	1.4
FL	31	10.3	6	8.1
DOL	1	0.3	1	1.4
RE	107	35.5	27	36.5
HA	134	44.5	27	36.5
TOTAL	**301**	**100.0**	**74**	**100**

Only eight flagon individuals can be counted; except for one from Cologne (level IV: Plate CDXIX, no. 9), they are all North Gaulish products (level IV: Plate CDIX, nos 7-8; level V: Plate CDXXI, nos 28-31). While these illustrated examples are all tableware flagons, two rims belonged to storage ware flagons or amphorae (level V: Plate CDXXI, nos 32-33). Only a few amphorae sherds are present, belonging to one or more Dressel 20 amphorae (one fragment with part of an administrative graffito: Plate CDXXI, no. 34) and a Gauloise 13 amphora. The three mortaria were supplied by the Soller kiln sites (level IV: Plate CDXIX, no. 10; level V: Plate CDXXI, nos 35-36).

The reduced wares were still dominated by the North Menapian products, but this time the Low Lands Ware 1 industry is also responsible for some products. A remarkable North Menapian beaker was recovered from level IV, almost intact except for its missing base (Figure 13). The beaker of high quality, very well

Table 31. Inventory of the pottery of context OS 22926 – construction pit (Plates CDXV-CDXVI).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
1	**SA**	LEZ SA	Drag. 33	cup				**1**	1					**1**
2	**SA**	LEZ SA	Drag. 33	cup				**1**			1			
3	**SA**	LEZ SA	Drag. 18/31	dish				**1**			1			**1**
4	**SA**	TRI SA	Drag. 18/31-31	dish				**1**	1					**1**
5	**SA**	TRI SA	Drag. 45	mortarium				**4**	4					**1**
6	**SA**	RHZ SA	Drag. 37	decorated bowl	decoration DS149			**1**		1				**1**
7	**SA**	RHZ SA	Drag. 32	dish				**1**	1					**1**
	SA	RHZ SA	Drag. 45/43	mortarium				**1**		1				**1**
	SA	RHZ SA						**1**		1				
	CC/BS	KOL CC	Hees 3	beaker				**1**	1					**1**
8	**CC/BS**	KOL CC	Hees 2b	beaker	barbotine decoration with hunting scene		complete base	**1**			1			**1**
9	**CC/BS**	KOL CC	necked beaker	beaker	knife-trimming			**1**		1				**1**
10	**MD**	NOG MD		flagon				**1**				1		**1**
	MD	NOG MD					2x2	**5**		5				
	MOR	BAFA MOR	VV 352-353	mortarium			base fragment joining complete profile from key context OS 80925 FL 3	**1**			1			**1**
	MOR	BAFA MOR		mortarium				**1**		1				
	MOR	BAFA MOR		mortarium				**3**		3				
11	**FL**	NOG FL (LLW1)	everted, ribbon shaped rim	tableware flagon			handle in one piece	**1**	1					**1**
12	**FL**	NOG FL (LLW1)		tableware flagon			handle in one piece	**1**				1		**1**
13	**FL**	NOG FL (LLW1)		tableware flagon			twofold handle	**1**				1		**1**
14	**FL**	NOG FL (LLW1)		tableware flagon			twofold handle	**1**				1		**1**
	FL	NOG FL (LLW1)		tableware flagon				**1**			1			
	FL	NOG FL (LLW1)		tableware flagon				**2**				2		**1**
	FL	NOG FL (LLW1)		tableware flagon		red burnished slip		**2**		2				
	FL	NOG FL (LLW1)		tableware flagon				**4**		4				
	FL	NOG FL (LLW1)		tableware flagon		white slip		**5**		5				
	FL	NOG FL (LLW1)		tableware flagon	burnishing			**12**		12				
15	**AM**	NOG AM (SCH)	wall-sided rim	amphora				**1**	1					**1**
	DOL	NOG DOL		dolium				**1**		1				**1**
16	**PR**	CAM PR		cooking plate				**1**			1			**1**
	PR	CAM PR		cooking plate				**1**	1					
17	**RE**	NOM FR	beaker V.1	beaker	burnished rim			**1**	1					**1**
	RE	NOM FR		beaker	rouletting		from different beakers?	**2**		2				

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
	RE	NOM FR		beaker				**2**		2				
18	**RE**	NOM RE	beaker V.1	beaker	burnished rim			**1**	1					**1**
	RE	BRU FR/ RE	truncated beaker with bulging neck Tuffreau-Libre IIa	beaker				**4**		4				**1**
19	**RE**	NOG FR	probably long-necked truncated beaker	beaker	burnished rim and exterior body			**1**	1					**1**
20	**RE**	NOG FR		beaker	burnished rim and exterior body			**1**	1					**1**
21	**RE**	LLW 1 RE	jar with everted rim	jar/pot	burnished rim and horizontal linear burnishing on neck and shoulder			**1**	1					**1**
22	**RE**	NOM RE	pot III.2	jar/pot	burnished rim			**1**	1					**1**
23	**RE**	NOM RE	pot III.2	jar	burnished rim			**2**	2					**1**
24	**RE**	NOM RE	pot III.2	jar/pot	burnished rim			**1**	1					**1**
	RE	NOM RE	pot III.2	jar/pot			rim fragments from 7 different vessels	**7**	7					**7**
25	**RE**	NOM RE	pot III.3	jar/pot				**1**	1					**1**
	RE	NOM RE	pot III.3	jar/pot				**1**	1					**1**
26	**RE**	NOM RE		jar/pot	horizontal comb scoring			**1**			1			
27	**RE**	NOM RE		jar/pot	vertical comb scoring			**1**			1			
28	**RE**	NOM RE	bowl IV.3	bowl	fine horizontal burnished lines on body		fine fabric in which a pottery inclusion can be recognized as a fragment of a FR vessel	**2**	2					**1**
29	**RE**	NOM RE	bowl IV.4	bowl	burnished rim			**1**	1					**1**
30	**RE**	NOM RE	bowl IV.4	bowl				**1**	1					**1**
31	**RE**	NOM RE	dish/bowl II.A.3a	dish/bowl				**2**	2					**1**
32	**RE**	NOM RE	dish IV.2	dish	burnished upper part of body; horizontal and radial grouped burnished lines on the interior lower half			**9**	1	7	1		1	**1**
33	**RE**	NOM RE	dish IV.1	dish	some horizontal burnished lines on body			**1**	1					**1**
	RE	NOM RE	lid VII.1	lid				**1**	1					**1**
34	**RE**	NOM RE	lid VII.2	lid				**1**	1					**1**
35	**RE**	NOG RE		bowl	horizontal linear burnishing on body			**1**	1					**1**
	RE	NOG RE		bowl				**1**		1				
	RE	NOM RE						**1**			1			
	RE	NOM RE					loose sherds from different vessels	**58**		58				
36	**HA**	NOM HA	pot III.8	pot	burnished interior rim and exterior rim and neck; incised linear decoration on shoulder			**1**	1					**1**
37	**HA**	NOM HA	pot III.8	pot	burnished interior and exterior rim and neck; vertical and crossing burnishing pattern on shoulder and body			**1**	1					**1**
38	**HA**	NOM HA	pot III.2	jar/pot				**1**	1					**1**
39	**HA**	NOM HA	pot III.2	jar/pot				**1**	1					**1**
40	**HA**	NOM HA	pot III.2	jar/pot	burnished rim and shoulder			**1**	1					**1**
41	**HA**	NOM HA	pot III.2	jar/pot	burnished shoulder			**1**	1					**1**

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
42	**HA**	NOM HA	pot III.2	jar/pot				**1**	1					**1**
43	**HA**	NOM HA	pot III.2	jar/pot				**1**	1					**1**
44	**HA**	NOM HA	pot III.2	jar/pot				**1**	1					**1**
45	**HA**	NOM HA	pot III.2	jar/pot				**1**	1					**1**
	HA	NOM HA	pot III.2				1x5; 3 different individuals	**7**	7					**3**
47	**HA**	NOM HA	pot III.2?	pot				**1**	1					**1**
46	**HA**	NOM HA	pot III.6	jar/pot				**1**	1					**1**
48	**HA**	NOM HA	storage pot II.A.1	storage pot				**1**	1					**1**
49	**HA**	NOM HA	bowl II.A.3a	bowl				**2**	2					**1**
50	**HA**	NOM HA	bowl II.A.3a	bowl	burnished interior lower half			**1**	1					**1**
51	**HA**	NOM HA	bowl II.A.3b	bowl	burnished exterior body below bend			**2**	2					**1**
52	**HA**	NOM HA	dish II.A.3a	dish	burnished rim and interior			**1**	1				1	**1**
53	**HA**	NOM HA	dish II.A.3a	dish	burnished zone below rim			**1**	1					**1**
54	**HA**	NOM HA	dish II.A.3a	dish	interior and exterior completely burnished			**1**	1					**1**
	HA	NOM HA	dish II.A.3a	dish				**1**	1					**1**
	HA	NOM HA	dish/bowl II.A.3a	dish/bowl			1x3; 2 different vessels	**4**	4					**2**
55	**HA**	NOM HA		storage pot	crossing burnished patterns on exterior body (above base)			**2**			2			
56	**HA**	NOM HA	imitation of Morini cup?				base or lid knob cf. OS 30916 FL 1: no 58	**1**			1			**1**
	HA	NOM HA					loose sherds from different vessels; 2x6	**93**		93				
	HA	NOM HA					base fragments from different vessels; 1x2	**4**			4			
	HA	BB1		cooking pot				**1**		1				**1**
	TOTAL							**301**	**73**	**205**	**17**	**6**	**2**	**74**

Table 32. Inventory of the pottery of context OS 22926 – structure level I (Plate CDXVII).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
1	**SA**	RHZ SA	Drag.37	decorated bowl	decoration DS124			**1**		1				**1**
2	**RE**	NOM FR		beaker				**1**			1			**1**
3	**RE**	NOM FR		beaker				**1**			1			**1**
4	**RE**	NOM RE						**1**			1			**1**
5	**RE**	NOM RE						**6**			6			**1**
	RE	NOM RE					loose body sherds	**3**		3				
6	**HA**	NOM HA	bowl II.A.3a	bowl				**1**	1					**1**
	TOTAL							**14**	**1**	**4**	**9**	**0**	**0**	**6**

Table 33. Inventory of the pottery of context OS 22926 – structure level II (Plate CDXVII).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
1	**FL**	NOG FL (LLW1)		tableware flagon	burnished body			**5**			5			**1**
	FR	NOM FR		beaker				**1**		1				**1**
	RE	NOM RE						**1**		1				
2	**HA**	NOM HA	pot III.9	pot	fine vertical burnished lines on upper part body (shoulder)		black coating on inside rim and exterior rim and neck	**83**	1	81	1		1	**1**
3	**HA**	NOM HA	pot III.9st	pot	body completely burnished (vertically), two rows of coarse rouletting on shoulder		black coating on inside rim and exterior rim and neck	**96**	1	94	1		1	**1**
4	**HA**	NOM HA	pot III.2	jar/pot			traces of black coating on rim?	**2**	2					**1**
5	**HA**	NOM HA		storage pot	irregular vertical comb-scoring on body; crossing comb-scoring on bottom base			**4**			4			**1**
	HA	NOM HA					body fragments from different vessels	**20**		20				
	TOTAL							**212**	**4**	**197**	**11**	**0**	**2**	**6**

burnished, can be recognized as a variant of type III.9 with ribs on the body. No parallels are known for this example.

The other North Menapian vessels represent the current 3rd-century repertoire and their spectrum does not differ from that encountered in the key contexts of the earlier fort levels. A new type seems to be the bowl with bending rim found in level V (Plate CDXXII, no. 49). Two large, nearly complete, closed pots (nos 47 and 48) of known types (respectively type III.2 and type II.A.1) probably served as storage pots. At least three LLW1 products could be recognized: a beaker/pot (level IV: Plate CDXIX, no. 13) and two S-profiled bowls (level V: Plate CDXXI, nos 45 and 46). The latter can be identified as Chenet 342 prototypes. They closely resemble examples with similar fabric and form found at Breda in contexts dated AD 250-300 (van Enckevort 2004, type Vt 76-77). Five vessels can be attributed to the Bruay-Labuissière productions: level IV yielded a beaker (Plate CDXIX, no. 12), level V two beakers (Plate CDXXI, nos 41 and 42), a bowl (no. 52) and a lid (no. 53). Beaker no. 12 represents a straight-necked truncated beaker, type Tuffreau-Libre IIb, generally dated until the middle of the 3rd century. The other Bruay-Labuissière vessels refer to a date from the late 3rd century onwards: a truncated beaker with bulging neck, type Tuffreau-Libre IIa (level V: Plate CDXXI, no. 41), a large, almost complete double-lobed beaker of type Tuffreau-Libre IIc (only its base is missing; level V: no. 42), a bowl with vertical upright rim (level V: no. 52) and a lid with three perforations (level V: no. 53). One base found in level IV (Plate CDXIX, no. 18) displays a silt-sized black fabric but could not be recognized as a known Romano-British production.

This pottery assemblage is the first one in which the reduced wares are more important than the handmade pottery based on MNI. While the reduced group shows a diversity in forms and types, and functions (both tablewares as cooking wares are represented), the handmade assemblages of both levels IV (Plate CDXIX: nos 19-23) and V (Plate CDXXII: nos 54-61) display a more limited spectrum. The closed pots are best represented in the handmade assemblage (level IV: Plate CDXIX, nos 20-21, level V: Plate CDXXII-CDXXIII, nos 55-65), of which three large pots probably served for storage (Plate CDXXIII: nos 63-65). Level IV also yielded a complete, open pot of type III.2, with a combination of decorative patterns of comb-scoring and burnishing (Figure 13). In level V, some bowls and dishes complement the assemblage (Plate CDXXIII: nos 69-75). Only level IV yielded one fragment of a BB1 cooking pot. This context is also the earliest in which some handmade ware fragments in Germanic tradition appear: four body fragments representing three different fabrics.

The pottery assemblage of well OS 22926 shows the same general patterns as that from the large waste-pit OS 4980 (Figure 14). The majority of the pottery was intended for the preparation and consumption of food and drinks. The kitchen wares are dominated by cooking pots. The current storage vessels are hardly present (dolia and amphorae) and their function seems to have been taken over by large reduced vessels and regional storage ware flagons or jar-amphorae. The significance of tableware flagons is limited. In the spectrum of the tableware, the beakers in fine wares are rare and their function seems to have been taken over by (large) beakers in reduced wares and handmade wares. The production centres of Trier and Rheinzabern appear to have evenly determined the samian market in the last phase of fort level 4.

5.3.2 Other finds

Well OS 22926 only yielded four glass items, all found in the waste fillings. They comprise two fragments of window panes, one

Figure 13. a: exceptional, high-quality North Menapian beaker. b: open pot NOM HA III.2. Both vessels are recovered from the waste infill (structure level IV) of well OS 22926.

presumably residual fragment of a large bottle, and a base fragment of a hemispherical beaker Isings 96 (Plate CDXXIV: no. 1), dated to the second half of the 3rd – first half of the 4th century.

Furthermore, a sword hilt grip was recovered from the waste fillings, made of antler (AHBI.A08: Plate CDXXIV, no. 2). In the construction pit, a bone hair pin was found (AHBI.B055: no. 3), another indication for female presence at fort level 4. A counter, made from a Dressel 20 amphora sherd (no. 24), was found in the waste fillings.

The copper alloy finds recovered from well OS 22926 were all found in waste fillings level IV and V (Plate CDXXIV). Two items belong to the personal atmosphere: a presumed annular brooch (CA.B039: no. 4) and the mirror sheet of a hand mirror (CA. B288: no. 5). The latter may also be related to female presence (see in this volume Chapter 3, Section 3.4.4). Other items belong to the domestic atmosphere: a jug (CA.D072: no. 6), fragments of a sieve (CA.D169: not ill.), remains of an undetermined vessel (CA.D206: not ill.). A concentration of sheet fragments may also have belonged to a large vessel. The rectangular repair plate (CA.D/C122: no. 7) was presumably intended for the repair of a vessel. Such a repair plate was also found in the large waste-pit OS 4980 (see before). One can assume that such repairs were executed at the workshops of fort level 4. Two bridle rings (CA.H03, H05: nos 8, 9) indicate the presence of carts and horses. They can be related to the two iron harness bells (see below).

Iron items were found in different levels of the well (Plate CDXXV-CDXXVI). The construction pit yielded a lamp (IR.D049: no. 14) and two fittings (IR.J328, J329: not ill.;). A harness bell for a draft animal (IR.H17: no. 17) and a ring with ring-headed pin (IR.J078: no. 20) belonged to the top of level I and represent the earliest items thrown into the well after its abandonment. Accompanied by the harness bell, the ring with ring-headed pin could be identified as part of a bridle bit. Most iron objects were found in the waste fillings level IV and V though. Several shoes must have been thrown in the well, as a complete shoe sole was preserved evidenced by corroded iron spikes (IR.B08: not ill.) and another twenty-one spike clusters indicate. The waste fillings yielded furthermore another very large harness bell for a draft animal (IR.H16: no. 16) and some tools. The large and complete anvil (IR.C01: no. 11) was found partly in and on top of the waste fillings, probably subsided by its weight. It must have been used in one of the workshops surrounding the well where metalworking activities have been attested. Clearly, throwing this anvil into the well was a deliberate act for a specific purpose. Its position makes clear that it cannot be considered as a closure offering. Being one of the last items thrown in the well, and surrounded and partly covered by a fire and demolition layer related to the end of fort level 4, this anvil may have been discarded to avoid that invaders could find it. This massive block consisted of a huge amount of iron, thus representing high value, and one would not want this rich source to fall into the hands of the wrong people.

The awl (Plate CDXXV: IR.C71), a tool for leatherworking, probably belonged to a shoemaker, as several shoes found in the

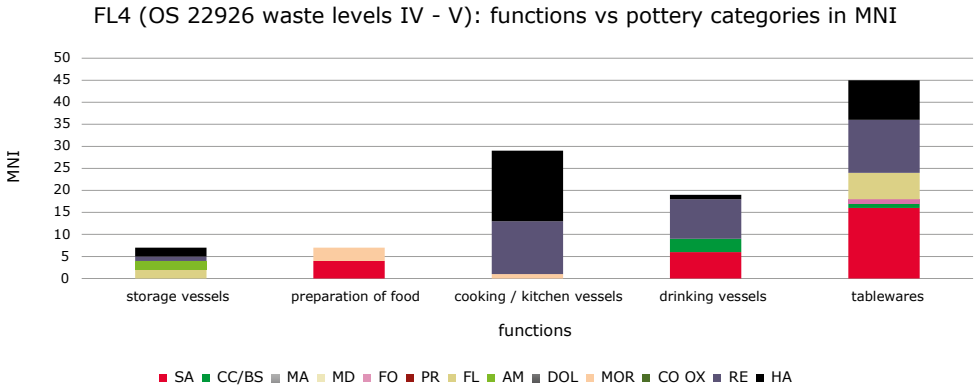

Figure 14. The pottery of context OS 22926 – structure levels IV and V (waste infills): functions versus fabrics.

large waste-pit OS 4980 have indicated that a local shoemaker must have been active in the vicinity of the pit (see Chapter 8). A double-sided wool comb (IR.C73: no. 13) refers to textile working. Other items can only be generally interpreted as fittings (IR J054, J063, K05: Plate CDXXVI, nos 18, 19, 21). Finally, 276 iron nails should be mentioned, which can be related to construction, infrastructure or furnishing, next to 130 fragments of sheet, rods and shafts which remain unattributed.

A very significant find should be drawn attention to here, even though it was found in the fire layer (level VI) on top of the waste fillings, and as such it does not belong to the well structure itself. It can be identified as part of a chain for a cauldron (IR D056: Plate CDXXV, no. 15) and refers to the hearths and culinary activities at this fort level 4.

Also related to the metalworking activities are 24 iron slags, three melt lead pieces (two ill.: Plate CDXXVII, nos 22 and 23) and two whetstones/abraders (Plate CDXXVII: nos 26 and 27; cf. Chapter 10: cat. nos 021-133 and 021-201 resp.), found in the waste fillings. Also mill fragments refer to activities in the workshop area. We already mentioned concentrations of charred cereals at Unit II and Unit V. Apart from some fragments in volcanic rock, a large quern fragment (*meta*) in Macquenoise sandstone (no. 25; Chapter 10 in this volume: cat. no. 021-036) was recovered from the waste fillings.

5.4 Fire layer OS 8905B of Unit V

Context OS 8905B represents the fire layer of the burnt workshop Unit V; for its find assemblage, see Plates CDXXVIII-CDXXXIII. Although not a closed context, it has been selected as its contours can be defined very well: this fire layer extended over the whole preserved area of the workshop and was delignated by the remains of the charred beams of its construction.

This fire layer contained five coins. Apart from two undetermined ones, three copper alloy *antoniniani* yield a *tpq* date for the fire, definitely after AD 260. They consist of an issue by Valerianus I, dated to AD 253-260, a coin of Salonina dated to AD 260-265 and an unattributed issue which can be related to the period AD 260-270 based on its form. The absence of radiate copies may indicate that this fire layer is not related to the final phase of fort level 4, as is the case for the following context fire layer OS 7957/7971. However, this absence may not be a conclusive argument for such a small area. No fort level 4 features cut the burnt workshop; there seems to be no more activity on this location.

Table 34. The pottery categories of context OS 22926 – structure levels IV and V (waste fillings), in sherd count and in MNI.

OS 22926 level IV	sherd count	%	MNI	MNI%
SA	18	6.6	5	21.7
CC/BS	5	1.8	3	13.0
FL	29	10.6	3	13.0
MOR	2	0.7	1	4.3
RE	83	30.3	8	34.8
HA	137	50.0	3	13.0
TOTAL	**274**	**100.0**	**23**	**100**

OS 22926 level V	sherd count	%	MNI	MNI%
SA	47	9.8	21	24.1
CC/BS	1	0.2	1	1.1
FO	2	0.4	1	1.1
FL	49	10.2	5	5.7
AM	6	1.3	2	2.3
MOR	3	0.6	2	2.3
CO OX	1	0.2	1	1.1
RE	217	45.2	29	33.3
HA	154	32.1	25	28.7
TOTAL	**480**	**100.0**	**87**	**100**

5.4.1 The pottery

The pottery assemblage of this fire layer comprises 580 fragments, only accounting for 24 MNI (Tables 36-37; Plate CDXXVIII). Most of the pottery was very fragmentary; in contrast, four large samian dish fragments, clearly primary deposits, were recovered from this layer. Since Unit V was a workshop, the presence of four samian dishes is rather surprising.

Three of them bear a name stamp and they demonstrate that only one of these dishes can have been made at the time of fort level 4, namely the Drag. 32 dish (no. 1) made by Iucundus v of Trier active in AD 160-260. The latter dish had fresh breaks and did not suffer much from fire. Three joining sherds were found in two other contexts

Table 35. Inventory of the pottery of context OS 22926 – structure levels IV and V (Plates CDXVIII-CDXXIII).

OS 22926 structure level	ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
IV	1	**SA**	TRI SA (A)	Drag. 37	decorated bowl	start of ovolo			**1**	1					**1**
IV	2	**SA**	TRI SA	Drag. 36	dish			1x4; 1x2	**6**	6					**1**
IV	3	**SA**	TRI SA	Drag. 36	dish				**2**	2					**1**
IV		**SA**	TRI SA					two chips	**3**		3				
IV	4	**SA**	RHZ SA	Drag. 45	mortarium				**1**	1					**1**
IV		**SA**	RHZ SA		dish/bowl			fragment near base of dish or bowl with cutting traces	**1**		1				**1**
IV		**SA**	RHZ SA						**1**		1				
IV		**SA**	RHZ SA					secondary burnt	**1**		1				
IV		**SA**	RHZ SA					secondary burnt	**1**		1				
IV		**SA**	RHZ SA					chip	**1**		1				
IV	6	**CC**	KOL CC		beaker	edge of knife-trimming decoration			**1**		1				**1**
IV		**CC**	KOL CC		beaker			beaker with indentations?	**3**		3				**1**
IV	5	**CC**	OXF RS	flanged bowl copying Drag. 38	bowl				**1**			1			**1**
IV	8	**FL**	NOG FL (LLW1)	everted, profiled rim	tableware flagon			complete rim	**3**	3					**1**
IV	7	**FL**	NOG FL (LLW1)	triangular rim type	tableware flagon		white slip on rim		**1**	1					**1**
IV		**FL**	NOG FL (LLW1)		tableware flagon			one shoulder fragment, one body fragment with ribs, some fragments with remains of white slip; loose sherds from different flagons	**23**		23				
IV		**FL**	NOG FL (LLW1)		tableware flagon				**1**			1			
IV	9	**FL**	KOL FL		tableware flagon				**1**			1			**1**
IV	10	**MOR**	SOL MOR		mortarium				**2**	2					**1**
IV	11	**RE**	NOM FR	beaker III.9 variant	beaker	completely burnished		base missing	**31**	5	26				**1**
IV		**RE**	NOM FR		beaker				**3**		3				
IV		**RE**	NOM FR	beaker V.1	beaker	burnished			**1**	1					**1**
IV	12	**RE**	BRU RE	truncated beaker Tuffreau-Libre IIb	beaker				**1**	1					**1**
IV	13	**RE**	LLW I FR		beaker/closed pot				**1**	1					**1**
IV	14	**RE**	NOM RE	pot III.2	pot/jar				**1**	1					**1**
IV		**RE**	NOM RE		pot/jar	vertical comb-scoring near base, with horizontal wheelturned comb-scoring above		body fragment near base	**1**		1				
IV	15	**RE**	NOM RE	bowl IV.2 variant	bowl				**1**	1					**1**
IV		**RE**	NOM RE	undet.	undet.				**1**	1					**1**
IV	16	**RE**	NOM RE						**1**			1			
IV	17	**RE**	NOM RE						**1**			1			
IV	18	**RE**	undet. (British?)					silt-sized black fabric	**1**			1			
IV		**RE**	NOM RE						**1**		1				

OS 22926 structure level	ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
IV		**RE**	NOM RE					loose sherds from different vessels	**38**		38				
IV		**HA**	NOM HA		beaker	vertical parallel burnished lines		shoulder fragment	**1**		1				
IV	19	**HA**	NOM HA	pot III.2	open pot				**56**	1	54	1		1	**1**
IV	20	**HA**	NOM HA	pot III.2	pot/jar				**3**	3					**1**
	21	**HA**	NOM HA	pot III.2	pot/jar					1					
IV	22	**HA**	NOM HA		pot/jar	horizontal wheelturned comb-scoring, with above edge of burnished pattern			**1**			1			
IV	23	**HA**	NOM HA		jar/bowl				**1**			1			
IV		**HA**	NOM HA					secondary burnt	**2**		2				
IV		**HA**	NOM HA						**1**			1			
IV		**HA**	NOM HA					loose sherds from different vessels	**69**		69				
IV		**HA**	NOM HA						**2**		2				
IV		**HA**	NOM HA?					quartz rich fabric with inclusions of large angular grog and of smaller grog of white fabric (of Cologne colour-coated vessel sherds?)			1				
IV		**HA**	BB1	cooking pot	pot				**1**		1				**1**
		TOTAL IV							**274**	**32**	**234**	**10**	**0**	**1**	**22**
V	1	**SA**	TRI SA	Drag. 37	decorated bowl	small part of ovolo: too small to identify			**1**		1				
V	2	**SA**	TRI SA	Drag. 37	decorated bowl	no decoration preserved		graffito MESSIE/ MESSIC	**1**			1			**1**
V		**SA**	TRI SA	Drag. 37	decorated bowl	no decoration preserved			**1**			1			
V		**SA**	TRI SA	Drag. 54	beaker				**1**		1				**1**
V	3	**SA**	TRI SA	Drag. 31	dish/shallow bowl				**1**	1					**1**
V	4	**SA**	TRI SA	Drag. 31	dish/shallow bowl				**1**	1					**1**
V		**SA**	TRI SA	Drag. 31	dish/shallow bowl				**1**	1					**1**
V	5	**SA**	TRI SA	Drag. 36	dish				**1**	1					**1**
V	6	**SA**	TRI SA	Drag. 36?	dish	stamp SS29			**1**			1			
V	7	**SA**	TRI SA	Drag. 36?	dish	stamp SS85 (Strich)			**1**			1			**1**
V		**SA**	TRI SA	Drag. 36	dish				**1**		1				
V		**SA**	TRI SA	Drag. 36	dish				**1**			1			
V	8	**SA**	TRI SA		undet.	stamp SS28			**1**			1			
V		**SA**	TRI SA	Drag. 43/45	mortarium			from different vessels	**2**		1	1			
V		**SA**	TRI SA	Drag. 45	mortarium				**1**	1					**1**
V		**SA**	TRI SA	Drag. 45	mortarium			joining sherd in a layer of fort level 5 (dug-up fragment)	**1**	1					**1**
V		**SA**	TRI SA		undet.			from different vessels	**2**		2				
V	9	**SA**	RHZ SA	Drag. 37	decorated bowl	decoration DS144			**1**		1				**1**
V	10	**SA**	RHZ SA	Drag. 37	decorated bowl	decoration DS126			**1**		1				**1**
V	11	**SA**	RHZ SA	Drag. 37	decorated bowl	decoration DS90			**1**		1				
V	12	**SA**	RHZ SA	Drag. 37	decorated bowl	fragment of double smooth medallion or arcade with probably back legs of animal running to the left			**1**		1				**1**

OS 22926 structure level	ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
V	13	**SA**	RHZ SA	Drag. 37	decorated bowl			late type of base	**1**			1			
V	14	**SA**	RHZ SA	Lud. VMg	beaker	barbotine decoration			**1**		1				**1**
V	15	**SA**	RHZ SA	Drag. 33	cup				**1**	1					**1**
V	16	**SA**	RHZ SA	Drag. 18/31-31	dish				**1**	1					**1**
V	17	**SA**	RHZ SA	Drag. 18/31-31	dish				**1**	1					**1**
V	19	**SA**	RHZ SA	Drag. 18/31-31	dish	stamp SS35			**1**			1			
V	18	**SA**	RHZ SA	Drag. 36	dish				**1**	1					**1**
V	20	**SA**	RHZ SA		dish	stamp SS69			**1**			1			
V	21	**SA**	RHZ SA	Drag. 31R-32R	dish/shallow bowl				**1**			1			
V		**SA**	RHZ SA	Drag. 31-32-36	dish/shallow bowl			from different vessels	**2**			2			
V	22	**SA**	RHZ SA		dish			complete base; small remains of hard mortar on the inner surface and on the break	**1**		1				
V		**SA**	RHZ SA		dish/bowl			cutting marks	**1**		1				
V		**SA**	RHZ SA	Drag. 43/45	mortarium				**1**		1				
V	23	**SA**	RHZ SA	Drag. 43/45	mortarium				**1**			1			**1**
V	24	**SA**	burnt	Drag. 33	cup				**1**	1					**1**
V	25	**SA**	burnt	Drag. 33	cup				**1**	1					**1**
V		**SA**	burnt	Drag. 33	cup				**1**			1			
V		**SA**	burnt	Drag. 31	dish/shallow bowl			from different vessels	**2**	1		1			
V		**SA**	burnt	Drag. 31	dish				**1**	1					
V		**SA**	burnt	Drag. 36	dish				**1**		1				
V	26	**SA**	burnt	Drag. 36	dish				**1**	1					**1**
V		**SA**	burnt	Drag. 43	mortarium				**1**	1					
V	27	**CC**	MOS BS		beaker				**1**			1			**1**
V		**FO**	SAV FO	collared bowl imitation	bowl				**2**		2				**1**
V	28	**FL**	NOG FL TW	triangular rim type	tableware flagon	burnished body		two-handled; twofold handles	**1**	1					**1**
V	29	**FL**	NOG FL TW	constricted rim type	tableware flagon	burnished body, with ribs		two-handled; one-piece handles	**4**	4					**1**
V	30	**FL**	NOG FL TW	everted, rounded rim type	tableware flagon			two-handled; one-piece handles	**1**	1					**1**
V	31	**FL**	NOG FL TW		tableware flagon				**1**			1			
V	32	**FL**	NOG FL SW	triangular rim type	storage ware flagon / amphora				**1**	1					**1**
V	33	**FL**	NOG FL SW	collared rim type	storage ware flagon / amphora				**1**	1					**1**
V		**FL**	NOG FL TW		tableware flagon			from different vessels	**2**			2			
V		**FL**	NOG FL TW		tableware flagon	without burnishing		loose sherds from different flagons	**13**		13				
V		**FL**	NOG FL TW		tableware flagon			with burnishing; 1x4 (possibly from individual 28); two body fragments with ribs	**24**		24				
V		**FL**	NOG FL TW		tableware flagon			one-piece handle	**1**				1		

OS 22926 structure level	ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
V	34	**AM**	BAT AM	Dressel 20	amphora			medium-sized fragment with repair hole and with graffito ante cocturam (part of administrative graffito: 'A'?)	**3**		3				**1**
V		**AM**	GAL AM	Gauloise 13	amphora				**1**		1				**1**
V		**AM**	BAT AM		amphora			burnt	**2**		2				
V	35	**MOR**	SOL MOR	VV 337 / Haupt 7	mortarium				**1**	1					**1**
V	36	**MOR**	SOL MOR	VV 337 variant	mortarium				**1**	1					**1**
V		**MOR**	SOL MOR		mortarium				**1**		1				
V		**CO OX**	NOM OX	everted, rounded rim	small pot				**1**	1					**1**
V	37	**RE**	NOM FR	beaker III.9	beaker	burnished			**4**	4					
V	38	**RE**	NOM FR		beaker	burnished			**3**			3			**1**
V	39	**RE**	NOM FR		beaker	burnished body			**2**			2			**1**
V	40	**RE**	NOM FR		beaker				**1**			1			**1**
V		**RE**	NOM FR		beaker			1x3; from 2 different vessels	**4**		4				
V		**RE**	NOM FR		beaker	vertically burnished body			**1**			1			**1**
V	41	**RE**	BRU RE/FR	truncated beaker with bulging neck Tuffreau-Libre IIa	beaker				**1**	1					**1**
V	42	**RE**	BRU RE/FR	double-lobed beaker Tuffreau-Libre type IIc	beaker			chalk residu of liquid (water?) on the inside	**20**	20					**1**
V	43	**RE**	NOM RE	pot III.2	jar/pot				**1**	1					**1**
V	44	**RE**	NOM RE	open pot III.2?	pot/bowl	burnished interior rim and exterior body			**1**	1					**1**
V	47	**RE**	NOM RE	pot III.2	pot (closed)	horizontal burnishing		2x2; 1x5; 1x3; 1x15	**42**	4	35	3		1	**1**
V		**RE**	NOM RE	pot III.2	jar/pot			1x2 joining sherds; from 8 different vessels	**9**	9					**8**
V	48	**RE**	NOM RE	(storage) pot II.A.1	pot (closed)	horizontal wheel-turned comb-scoring, very neat		1x5; 4x2; 1x8	**35**	3	30	2		1	**1**
V	49	**RE**	NOM RE	bowl with bending rim					**1**	1					**1**
V		**RE**	NOM RE	dish II.A.4	dish				**1**	1					**1**
V	50	**RE**	NOM RE	dish/bowl II.A.3a	dish/bowl	burnished exterior		oxidised appearance	**1**	1					**1**
V		**RE**	NOM RE	dish/bowl II.A.3a	dish/bowl			oxidised appearance	**1**	1					**1**
V	51	**RE**	NOM RE	dish IV.1	dish	burnished exterior			**1**	1					**1**
V		**RE**	NOM RE		dish				**1**			1			
V		**RE**	NOM RE	undet.	bowl?				**1**	1					**1**
V		**RE**	NOM RE					loose sherds; from different vessels	**7**		4	3			
V		**RE**	NOM RE		lid				**1**	1					**1**
V		**RE**	NOM RE					loose sherds from different individuals	**71**		71				
V	45	**RE**	LLW 1 RE	Chenet 342 predecessor	bowl	burnished rim			**1**	1					**1**

OS 22926 structure level	ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
V	46	**RE**	LLW 1 RE	Chenet 342 predecessor	bowl	burnished rim and neck			**1**	1					**1**
V		**RE**	LLW 1 RE					from different vessels	**2**			2			
V	52	**RE**	BRU RE	bowl with vertical upright rim	bowl	burnished rim; horizontal burnished lines on interior below bend, with radial grouped burnished lines on top			**1**	1					**1**
V		**RE**	BRU RE	dish/bowl with vertical upright rim, rounded lip marked by groove underneath	dish/bowl				**1**	1					**1**
V	53	**RE**	BRU RE		lid			lid knob with three perforations ante cocturam	**1**			1			
V	54	**HA**	NOM HA	pot III.9	pot/beaker	burnished interior rim			**1**	1					**1**
V		**HA**	NOM HA	pot III.9	pot/beaker	decorations of impressed dots			**1**		1				
V	55	**HA**	NOM HA	pot III.2	jar/pot	burnished rim and exterior body and neck			**1**	1					**1**
V	56	**HA**	NOM HA	pot III.2	jar/pot				**1**	1					**1**
V	57	**HA**	NOM HA	pot III.2	jar/pot	burnished rim and neck; vertical parallel burnished lines on shoulder			**1**	1					**1**
V	58	**HA**	NOM HA	pot III.2	jar/pot	burnished rim and neck			**3**	3					**1**
V	59	**HA**	NOM HA	pot III.5	jar/pot			verbrand	**1**	1					**1**
V	60	**HA**	NOM HA	pot III.2	jar/pot	burnished rim and neck; strip of vertical comb-scoring on shoulder, underlined by burnished line		burnt after breakage	**2**	2					**1**
V	61	**HA**	NOM HA	pot III.2	jar/pot				**1**	1					**1**
V	62	**HA**	NOM HA	pot III.2	jar/pot			1x7; 1x2	**9**	9					**1**
V		**HA**	NOM HA	pot III.2	jar/pot			from different vessels	**2**	2					**1**
V	63	**HA**	NOM HA	(storage) pot III.2	storage pot	burnished strip below neck; crossing burnished lines on body		burnt	**1**	1					**1**
V	64	**HA**	NOM HA	(storage) pot III.2	storage pot				**1**	1					
V	65	**HA**	NOM HA	(storage) pot III.2	storage pot	fingertop impressions on the lip			**1**	1					**1**
V	66	**HA**	NOM HA		jar/pot				**1**			1			
V	67	**HA**	NOM HA		jar/pot	vertical comb-scoring		burnt	**1**			1			
V	68	**HA**	NOM HA		jar/pot	burnished body			**1**			1			
V	73	**HA**	NOM HA	dish II.A.2	dish				**1**	1				1	**1**
V	74	**HA**	NOM HA	dish II.A.2	dish	burnished exterior rim and zone above base; interior completely burnished below bend			**1**	1				1	**1**
V	75	**HA**	NOM HA		dish?				**4**	1	2	1		1	**1**
V		**HA**	NOM HA		dish				**1**			1			

OS 22926 structure level	ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
V		**HA**	NOM HA		dish				**1**			1			
V	69	**HA**	NOM HA	bowl II.A.3a	bowl				**1**	1					**1**
V	70	**HA**	NOM HA	bowl II.A.3ap	bowl				**1**	1					**1**
V	71	**HA**	NOM HA	bowl II.A.4	bowl				**2**	2					**1**
V	72	**HA**	NOM HA		bowl				**3**			3			
V	75	**HA**	NOM HA	bowl II.A.3a	bowl				**1**			1			**1**
V		**HA**	NOM HA	bowl II.A.3a	bowl				**1**	1					**1**
V		**HA**	NOM HA	dish/bowl II.A.3a	dish/bowl				**1**	1					**1**
V		**HA**	NOM HA			burnished lines		loose sherds from different vessels	**20**		20				
V		**HA**	NOM HA			comb-scoring		loose sherds from different vessels	**5**		5				
V		**HA**	NOM HA			complete burnishing			**1**		1				
V		**HA**	NOM HA			undecorated		loose sherds from different vessels	77		76	1			
V		**HA**	HA SHELL						**1**		1				**1**
V		**HA**	GERM FTW						**2**		2				**1**
V		**HA**	GERM STW						**1**		1				**1**
		TOTAL V							**480**	**115**	**314**	**50**	**1**	**5**	**86**

of fort level 4. According to their name stamps, both the Drag. 36 dishes (nos 2 and 3; Figure 15) were very old at the time of the fire. Dish no. 2 was made by Atta who worked in Rheinzabern in the period AD 170-220. Potter Giamillus v of Rheinzabern was active in the period AD 120-200 and stamped dish no. 3. According to their stamps, these dishes were respectively at least 40 and 60 years old at the time of the fire. These dishes, although heavily burnt, also looked very abraded and will have been used for a very long time.

The rest of the pottery assemblage represents forms and types encountered in previous contexts. At least one Soller and one Rhine mortarium (no. 5) could be identified, but they represent small fragments. Both the tableware flagon no. 7 and the storage ware flagon or (jar)amphora no. 6 are North Gaulish products. Only beakers were encountered in the reduced assemblage, however in very fragmentary state, while the handmade assemblage consists solely of pots (ill.: nos 11-13) and at least one storage pot (nos 16-17). The pot individuals are mainly represented by small-sized rim fragments, and the handmade assemblage consists of many loose body fragments. Only of storage pot no. 16 a larger fragment was preserved.

One handmade vessel is most significant and its presence at this workshop is most striking. Vessel no. 9 represents a feeding bottle, a strong indication for the presence of mothers or nurses and babies within the fort precinct.

This pottery assemblage as part of the fire layer of a burnt workshop for metalworking, is rather odd. The four samian dishes do not fit in and moreover, two of them were very abraded and old at the time of the fire. Also all the fine reduced and all the handmade (cooking) pots do not seem to fit in with the function of this workshop, especially the feeding bottle does not. In addition, it is very significant that next to the samian dishes, the remainder of the pottery is very fragmentary. It is remarkable that, although two samian dishes were so old, they could be reconstructed to nearly complete vessels. It is unclear what mechanisms were in play here. In contrast, the storage pot, of which a large part was preserved, may well have belonged to the original workshop.

5.4.2 Other finds

The fire layer of the burnt workshop Unit V yielded in total 272 copper alloy items. Only 24 of them are identifiable items (Plates CDXXIX-CDXXXI). Seven pieces of melt bronze and slag were recovered; they are related to the bronze working activities at the workshop. All other 252 items remain unattributed; they comprise sheet fragments, some of them riveted, fragments of bars, rods, shafts, and unidentifiable pieces. As a result of their poor state of preservation, most metal finds of the burnt layer of Unit V were lifted in blocks of soil. The radiographic research of these blocks pointed to the presence of bronze droplets, indicative for cast activities in this workshop.

Three one-piece sprung brooches with angular wire bow (CA.B136, B140, B141: not ill.) together with a brooch waste product (CA.B/C96: no. 18) and two semimanufactures of such brooches (CA.B/C210, C211: not ill.), similar to the ones at Unit I, indicate that these brooches were also produced in Unit V.

The fire layer also yielded several vessels. Two handles belonged to sieves or dippers (CA.D076, D077: nos 22 and 23). As several

Figure 15. The two burnt samian Drag. 36 dishes recovered from the fire layer OS 8905B.

body fragments of sieves were recovered, it is likely that the handles belonged to these sieves. The other preserved vessels or vessel fragments are a decorated jug handle (CA.D074: no. 21), a baking tin (CA.D089: no. 24), a small plate (CA.D113: no. 25), a dish (CA.D115: no. 26) and two undetermined vessels (CA.D197, D198: not ill.).

Other copper alloy items comprise a netting needle (CA.C14: no. 19), a knife scabbard (CA.D065: no. 20), a decorative nail or lock pin (CA.D146: not ill.), a small handle (CA.D149: not ill.), a bridle ring (CA.H14: no. 27), a strip fitting no. (CA.J24: no. 28) and an item shaped as an open ring, so far unattributed (CA.K12: no. 29). Many of these items, such as the vessels and maybe the knife scabbard, the netting needle and the bridle ring, may have been in the workshop for repair. Other objects, like the decorative nail and the strip fitting, can also have belonged to a chest in the workshop, although perhaps such a chest did not fit in a workshop space.

In total 113 iron items were recovered from this fire layer, mostly nails and unattributed fragments. Four spike clusters represent shoe sole fragments. Three tools can be identified: a chisel for metalworking (IR.C11: Plate CDXXXII, no. 30); an adze (IR. C27: no. 31) and a saw (IR.C41: no. 32) related to woodworking.

A weight (IR.G08: no. 34) can be related to exchange practices or measuring activities in the production process. A bridle ring (IR. H12: no. 35) is another item from fort level 4 referring to carts and horses. A lock plate (IR.D/I069: no. 33), in this case probably belonging to a door, five double-spiked loops, a staple clamp and two links are likely remains of the construction and infrastructure of the workshop.

The fire layer contained no iron slag; iron slag was neither recovered amongst the hearth structures of Unit V. This is an indication that Unit V was only reserved for bronze working. Amidst the burnt debris, a large folded, thick sheet of lead was recovered, *c.* 46.0 by 23.0 cm wide (Plate CDXXXII: no. 36). The several cuts in the sheet indicate it was used to clip smaller cuttings for further processing. Apart from four fragments of melt lead, no lead items were recovered from the fire layer or from the hearth levels at workshop Unit V. It is therefore uncertain how this lead working is to be understood. It is possible that it had a function as additive in alloys.

Table 36. The pottery categories of context OS 8905B, in sherd count and in MNI.

OS 8905B	sherd count	MNI
SA	30	4
FL	31	2
MOR	43	2
AM	1	1
DOL	3	1
RE	18	4
HA	454	10
TOTAL	**580**	**24**

From the fire layer several quern fragments were recovered, all made in basalt lava and counting for at least 3 MNI. Of one of the two *catillus* fragments the diameter can be measured, *c.* 40 cm (Plate CDXXXIII: no. 37; cf. Chapter 10 in this volume: cat. no. 021-102). The querns may refer to the aforementioned cereal processing nearby. Very significant in this respect is the concentration of charred cereals alongside the charred beam at the east side of Unit V.

Clearly related to the metalworking activities at this workshop are three bar/rod-shaped whetstones (nos 39-41; cf. Chapter 10 in this volume: cat. nos 021-132, 021-130, 021-131 resp.); the polisher cat. no. 021-173 (Plate CCCLXXVIII) found in this fire layer may also be related. An almost complete, square plate (no. 38; Chapter 10 in this volume: cat. no. 021-182), heavily burnt, presumably functioned as grinding plate, rather than having a cosmetic or medical function. However, the feeding bottle (see before) was not a vessel to expect in a workshop either, and it cannot be excluded that this cosmetic plate was thrown in the fire.

Table 37. Inventory of the pottery of context OS 8905B (Plate CDXXVIII).

ILL.	CATE-GORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
1	**SA**	TRI SA (A)	Drag. 32	dish/shallow bowl	stamp SS20		two joining rim sherds and one joining base sherd in two other contexts of fort level 4	**2**	2				1	**1**
2	**SA**	RHZ SA	Drag. 36	dish	stamp SS32		burnt and very abraded	**14**	4	9	1		1	**1**
3	**SA**	RHZ SA	Drag. 36	dish	stamp SS47		burnt and abraded	**10**	4	3	3		1	**1**
	SA	RHZ SA	Drag. 36	dish				**1**		1				
4	**SA**	burnt	dish	dish			burnt and abraded	**3**		2	1			**1**
5	**MOR**	RHI MOR	VV 337 / Haupt 8	mortarium				**1**	1					**1**
	MOR	RHI MOR		mortarium				**3**		1	2			
	MOR	SOL MOR		mortarium			mainly chips	**7**		7				
	MOR	SOL MOR		mortarium			mainly chips	**25**		25				
	MOR	SOL MOR		mortarium			only top of rim preserved; 1x2	**7**	1	6				**1**
	AM	BAT AM	Dressel 20	amphora				**1**		1				**1**
6	**FL**	NOG FL	wide everted, thick rib-bon-shaped rim	storage ware flagon / amphora		white slip		**1**	1					**1**
7	**FL**	NOG FL	everted, cut-off rim	tableware flagon			complete rim	**1**	1					**1**
	FL	NOG FL					loose sherds from different flagons	**10**		10				
	FL	NOG FL (LLW)		tableware flagon	burnished zones on the body		2x5	**19**		19				
	DOL	NOG DOL					1x2; copper alloy remains on break	**3**		3				**1**
8	**RE**	NOM FR	beaker III.9	beaker				**2**	2					**1**
	RE	NOM FR		beaker			from different individuals, but fragments too small to specify	**3**	3					**3**
	RE	NOM FR		beaker	rouletting and burnished lines and zones		oxidized fabric (due to the fire?)	**1**		1				
	RE	NOM FR		beaker	vertical burnished lines			**2**		2				
	RE	NOM FR		beaker	knife-trimming and horizontal burnished lines			**1**		1				
	RE	NOM FR		beaker	completely burnished			**1**		1				
	RE	NOM FR		beaker	knife-trimming and horizontal burnished lines			**3**		3				
	RE	NOM FR/ RE					1x2 joining sherds; base fragments from different vessels	**5**			5			
9	**HA**	NOM HA	small version beaker type III.9	feeding bottle				**6**	2	4				**1**
10	**HA**	NOM HA	beaker III.9	beaker				**1**	1					**1**

ILL.	CATE-GORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
14	**HA**	NOM HA		beaker	completely burnished; with grooved lattice decoration and impressed dots		shoulder fragment	**1**		1				
15	**HA**	NOM HA		jar/beaker	zonal burnishing and burnished lattice decoration underneath			**2**		2				
11	**HA**	NOM HA	pot III.1	jar/pot			completely burnt	**5**	4	1				**1**
12	**HA**	NOM HA	pot III.2	jar/pot				**2**	2					**1**
13	**HA**	NOM HA	pot III.2	jar/pot	burnished rim			**1**	1					**1**
	HA	NOM HA	pot III.2	jar			1x2 joining sherds; 2 different vessels	**3**	3					**2**
	HA	NOM HA	pot III.2	jar			only lip preserved; burnt and with copper alloy remains attached	**1**	1					**1**
16	**HA**	NOM HA	storage pot III.1?	storage pot	zonal burnishing on outside rim and top shoulder, and with underneath thick crossing burnished lines		(not integrated in the NOM typology as the rim diameter, and hence the specific type, cannot be determined)	**58**	1	57				**1**
17	**HA**	NOM HA		jar/storage pot	vertical comb-scoring			**3**			3			
	HA	NOM HA		jar				**3**			3			
	HA	NOM HA		jar	vertical comb-scoring		burnt and abraded	**3**		1	2			
	HA	NOM HA		jar			possibly from same individual; several fragments heavily burnt; 1x4	**31**		31				
	HA	NOM HA					completely burnt and misshapen by the fire, with copper alloy attached	**1**	1					**1**
	HA	NOM HA					loose sherds from different vessels	**5**		5				
	HA	NOM HA					base fragments from different vessels	**3**			3			
	HA	NOM HA					burnt exterior	**1**			1			
	HA	NOM HA					loose sherds from different vessels; burnt to various degrees; with copper alloy remains attached	**19**		19				
	HA	NOM HA					from different vessels; misshapen by fire; 1x3	**9**		9				
	HA	NOM HA					loose sherds from different vessels; burnt, with iron remains attached	**20**		20				
	HA	NOM HA			undecorated / comb-scoring / burnished patterns		loose sherds from different vessels	**276**		276				
	TOTAL							**580**	**35**	**521**	**24**	**0**	**3**	**24**

One can conclude that the pottery and the other finds in the fire layer probably did not experience the same depositional process. While many of the metal and other small finds can be related to or explained within the workshop's activities, a lot of the pottery might have been thrown into the fire; perhaps as part of earth loads in an attempt to extinguish the fire?

5.5 Fire layer OS 7957/7971

Although not a closed context, this fire layer of the end phase of fort level 4, has been selected as key context since it shows some important changes in the pottery assemblage in comparison to previous contexts. The representative finds can be found on Plates CDXXXIV-CDXLII.

In total 82 coins were recovered from this fire layer, 40 of which belonged to two coins hoards (coin hoard 2 and 3: see Chapter 2 in this volume). The first coin hoard consisted of a cluster of coins, completely rotten, all undetermined billon issues of the 3rd century. The second coin hoard (coin hoard 3) is formed by ten connected coins, all radiate copies dated to AD 275-300+. Also the other coins were in very bad state of preservation and heavily corroded. They comprise one unattributed *sestertius*, two unattributed coins dated to AD 250-300+, one *antoninianus* dated AD 266-274/275, seven *antoniniani* or copies dated AD 266-300+, eight radiate copies dated AD 275-300+, 22 undetermined issues generally dated to the 3rd-4th centuries, and one undetermined Roman coin. The coin evidence concludes to a *tpq* date for the fire layer, and thus the end of fort level 4, after AD 275, but possibly much later.

5.5.1 The pottery

This fire layer comprised a considerable amount of pottery, accounting for 1728 fragments or 202 MNI (Table 38; Figure 16; Plates CDXXXIV-CDXXXIX). As this fire closes off the workshop level, and mainly Unit II, it is surprising to observe such a high percentage of samian wares, accounting for 19.8% of the total MNI. The variety in the samian and colour-coated fabrics indicates a high residual percentage in the assemblage. For this reason, enclosing the detailed inventory is considered to be of no added value. The *Moselkeramik* beakers (nos 28-29) can be dated until *c.* AD 275, but the four Cologne colour-coated beaker fragments, with at least one MNI (no. 27), are definitely earlier material, dated prior to AD 250. The samian assemblage comprises three MNI of Lezoux (ill.: nos 1-2), two MNI of Argonne (ill.: no. 3), six MNI of Trier (ill.: nos 4-8), thirteen MNI of Rheinzabern (ill.: 9-20) and one MNI in North Gaulish fabric (not ill.), next to fifteen burnt MNI (ill.: 21-26). The Lezoux vessels, and maybe also those from the Argonne, represent earlier material. The assemblage covers a wide range of samian forms and types, with beakers, cups, dishes, bowls and mortaria. The preserved decorations and stamps indicate that also at least part of the East Gaulish samian wares are of an earlier date than indicated by the coin evidence. The Trier potters Afer (no. 4) and Censor-Dexter (no. 5) were active respectively in AD 190-240 and AD 180-240. The Drag. 37 bowl no. 10 was decorated by the Rheinzabern group Iulius II-Iulianus I, active in AD 220-255. For bowl no. 11 different potters can be taken into account but they all worked between AD 170 and 260. Flavianus of Rheinzabern stamped vessel no. 19; he worked in the period AD 160-260. A minimum of fifteen years can be attested between the latest possible date of production of the attributed decorated bowls and stamped samian (AD 260) and the earliest possible date for the fire (AD 275).

With such a variety in fabrics and the presence of residual material, and with a pottery spectrum seemingly not in line with the function of the workshops, it is likely that the same depositional processes are in play as for the previous context, fire layer OS 8905B. Most of the pottery probably represents a secondary deposition. Since fire layer OS 7957/7971 consisted of a thick layer of burnt sand (cf. profiles 7.1/7.2 layer 111), it seems that sand had been thrown onto the fire in order to extinguish it. Possibly, most of the pottery represents waste dumps used to throw onto the fire. This would definitely explain the very fragmentary state of most of the pottery and the very different character of the pottery as opposed to what one would expect at a workshop for metalworking. It could also be an explanation for the presence of a handmade body sherd covered by the remains of chalk plates of sea pox, indicating that it lay in brackish or sea water for some time before it was brought back into the fort to be thrown away in a waste-pit, where it was eventually dug up again, presumably to be thrown onto the fire.

The fine wares, both samian and colour-coated wares together, account for eight beakers, a very low number in comparison to the other forms represented in the samian assemblage. As could also be observed in previous contexts, their function seems to have been largely taken over by fine reduced and also handmade beakers; the latter were mainly large individuals which are typologically classified as closed pots.

In general, the pottery assemblage shows a similar repertoire as the previous contexts of fort level 4. Two changes can be noticed, though. Some North Gaulish products now occur, next to reduced vessels produced by the North Menapian industry and some Bruay-Labuissière products already present in previous phases. Also some new forms and types appear in the reduced assemblage.

In contrast to all previous contexts, storage wares are clearly of some significance in this context (Figure 16). This context is the first in which several dolia individuals are present, although still only limited with three MNI. They represent three different fabrics. One dolium was produced in the Rhineland, possibly in the Soller kilns (no. 38). The body fragments with applied decorative strips with fingertip impressions (nos 39 and 40) possibly belonged to this individual. Four dolium body fragments display the same fabric as the Gauloise 3 amphorae. Another four dolium body fragments have a sandy fabric of unattributed North Gaulish origin. The long-distance trade amphorae are represented by 48 fragments, but they only account for two MNI: one Dressel 20 (one fragment with graffito *ante cocturam*: no. 37) and one Gauloise 13. However, as noticed already in the previous contexts of fort level 4, also the regional potteries appear to have supplied (jar-)amphorae (no. 36). The tableware flagons were all produced

at North Gaulish potteries (*e.g.* no. 34), apart from one Bavay-Famars flagon, represented by a neck fragment.

Of the five mortaria, the Noyon fragment probably represents a residual piece. Two mortaria came from the Rhineland (ill.: no. 42), of which one more specifically from the Soller kilns. The Oxfordshire White ware mortarium of type Young M18.2 (no. 41) can be dated between AD 240 and 300.

The fine reduced beakers are well-represented with twelve MNI. The North Menapian beakers are of type III.9 (nos 43-44) and type V.1 (no. 45). Two beakers can be attributed to the Bruay-Labuissière production; the rim fragments probably belong to truncated beakers with bulging neck which are dated from the late 3rd century onwards (nos 47-48). New is the occurrence of some North Gaulish beakers (nos 49-51). Also counted as a fine reduced vessel are the base fragments of a dish in a North Gaulish, very hard fabric and very well burnished (no. 52).

The coarse reduced assemblage for the most part represents the known North Menapian 3rd-century repertoire, with a dominance of cooking pots (29 MNI; ill.: nos 53-75, 88), seven dishes (nos 76-82), four bowls (nos 83-86) and four lids (ill.: nos 89-91). One pot can be identified as a Bruay-Labuissière product (no. 92). New is the occurrence of vessels in North Gaulish fabric. Eleven individuals can be counted (nos 93-98, 100-101). The closed pot/beaker (no. 93) recalls a North Menapian type but displays a fabric with small shell inclusions. Other vessels show new forms not encountered in the North Menapian repertoire (nos 94-101). The dish/bowl no. 101 has a beige, oxidized appearance, like several bases and body fragments in the assemblage due to the fire, but seems to be a North Gaulish, in origin reduced, product. The base (no. 99) displays a black, silt-sized fabric but could not be recognized as a product of a known Romano-British kiln site. The beaded-and-flanged bowl no. 97 is clearly a North Gaulish imitation of a Romano-British type which was well-spread from AD 240 onwards (see Chapter 1.B.5.1). The increased presence of North Gaulish vessels may indicate that the North Menapian industry had already ceased production at that time and that other pottery centres had to be approached to supply products to the Oudenburg fort.

Also in the handmade assemblage, pots dominate with 28 MNI (ill.: nos 109-129); at least two of them can be identified as storage pots (nos 128-129). Large beakers/pots are well-represented with ten MNI (nos 102-108); the dishes and bowls both account for at least eight MNI each (dishes: ill.: nos 130-136; bowls: ill.: nos 137-140, 143-144). It is surprising that, while the fire layer covered a workshop area, it contained so many vessels intended for the preparation and consumption of food (Figure 16).

5.5.2 Other finds

Fire layer OS 7957/7971 yielded two bone hair pins (AHBI.B087, B089: Plate CDXL, nos 146-147), again pointing to a female presence within the fort precinct during fort period 4. A fragment of a terracotta figurine (no. 145), originating from the Rhineland, likely represents the legs of a standing figure with falling dress folds (cf. Chapter 7 in this volume). Only small glass fragments were recovered, not yielding much information: two fragments of window panes, four fragments of vessels, three unattributed items. The previous finds possibly experienced the same depositional process as most of the pottery (see above).

The copper alloy assemblage is very heterogeneous (Plate CDXL). Twenty-two items were recorded in the catalogue. Another 73 items cannot offer any significant information (fragments of sheet, rods, bars, shafts). Directly related to the bronze working activities at Unit II are a melt bronze piece (CA.C05: no. 152) and another two small bronze slag pieces (not ill.). Worth drawing attention to is the absence of bronze droplets, which characterized the copper alloy assemblage of the fire layer OS 8905B of Unit V (see before). It may indicate that bronze casting did not occur in this (part of the) workshop Unit II. Three mounts (CA.A/H24: no. 148, CA.A/H76: no. 149, CA.A/H91: not ill.) probably belonged to horse equipment, although the small mount (no. 148) could also have adorned a soldier's belt. Also a small harness bell (CA.HA36: no. 157) refers to horse equipment. The three brooches (only one ill.: no. 151 (CA.B060)) and two brooch semi-manufactures (CA.B/C195, B/C209: not ill.) find their parallels in pit OS 7949 and refer to the brooch production activities. Presumably, these were not restricted to Unit I, but also took place at Unit II and V. The other copper alloy items comprise a richly decorated, presumed belt plate (CA.B008: no. 150), a netting needle (CA.C08: no. 153), two decorative nails or lock pins (CA.D144 and D145: not ill.), a presumed decorative nail (furniture element?) (CA.D021: no. 154), and three vessels, namely a bowl (CA.D102: no. 155), a casserole (CA.D107: no. 156) and a sieve (not ill.) of which the handle (CA.D150) and some body fragments (CA.D168) were found. Three circular links complete the list of copper alloy finds. For the presumed belt plate, no close parallels could be found in literature. Its decoration with a floral design, in this case with glass inlay, recalls late Roman belt plates. Although the item in question is corroded, it can be observed that the two broken sides are cut very straight. Possibly this item was at the workshop for repair. The same scenario can be assumed for most of the copper alloy items.

Amongst the iron finds (Plate CDXLI), a hammer for metalworking (IR.C05: no. 158) can be directly linked to the workshop's activities. The spring of a lock (IR.D/I089: not ill.), a large key (IR.D/I111: no. 159), part of a chain corroded onto a hooked bar (IR.J005: no. 160), a chain element (IR.J007: no. 161), and six more items identifiable as structural fittings, can all be related to construction and infrastructure. Also the 432 iron nails from this layer can be interpreted this way.

The fire layer yielded at least six quern individuals, at least two *catilli* and four *meta,* all made of basalt lava (ill.: Plate CDXLII, nos 162-164; cf. Chapter 10 in this volume: cat. nos 021-139, 021-040 and 021-099 resp.). The *meta* no. 164 has joining pieces from the workshop level itself. These large quern fragments, which were obviously not moved over a long distance, are very indicative of the cereal processing which obviously also took place in this area or nearby. Particularly the north side of Unit II was characterized by concentrations of charred cereals. As these concentrations

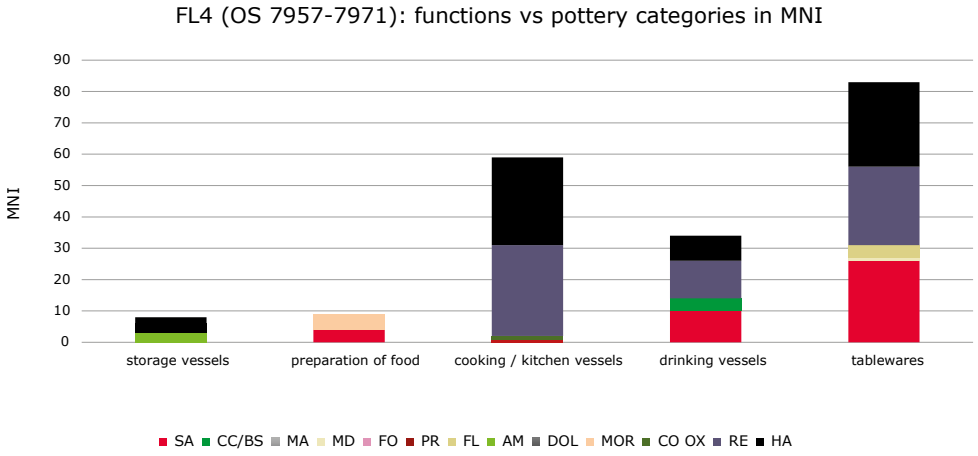

Figure 16. The pottery of context OS 7957/7971: functions versus fabrics.

hardly yielded chaff remains, these cereals were already prepared for further processing (see for discussion: Volume I, Chapter II, Section II.4.6.2.c).

Although covering a workshop area, the find assemblage of the fire layer OS 7957/7971 represents a wide variety of items, representing different functions, of which at first sight several items seemingly have little to do with the workshop. Finds such as the melt bronze (no. 152), the hammer (no. 158), the querns (nos 162-164) and the bar/rod-shaped whetstone (no. 165; Chapter 10 in this volume: cat. no. 021-138) are directly related to the workshops of which was already suggested that they must have been multifunctional spaces. Many copper alloy finds may have been at the workshop for repair. Other items, like the statuette, the hair pins and the small round mount, probably experienced the same depositional process as most of the pottery, of which can be suggested that they belonged to earth loads thrown onto the fire in order to extinguish it or for another, unclear reason.

Table 38. The pottery categories of context OS 7957/7971, in sherd count and in MNI.

OS 7957-7971	sherd count	%	MNI	MNI%
SA	114	6.6	40	19.8
CC/BS	15	0.9	4	2.0
MD	1	0.1	1	0.5
PR	1	0.1	1	0.5
FL	149	8.6	4	2.0
AM	49	2.8	3	1.5
DOL	13	0.8	3	1.5
MOR	13	0.8	5	2.5
CO OX	1	0.1	1	0.5
RE	490	28.4	74	36.6
HA	880	51.0	66	32.7
TOTAL	**1726**	**100.0**	**202**	**100**

5.6 Hearth OS 7932

Context OS 7932 (hearth 18) was part of Unit II and was found in a severely destroyed state. The large amount of fragments of ceramic building material on a bed of clay are the last remains of the hearth level. Several burnt daub pieces may point to an upstanding structure around it or to a furnace rather than a hearth. The fire layer immediately surrounding the hearth, contained five coins, all radiate copies which can be dated *c.* AD 275-300+. The hearth or furnace structure belonged to the final level of fort level 4, directly covered by the mentioned fire layer representing the end of fort level 4 at this site. Within the hearth remains, a small but very significant pottery assemblage in terms of chronology was found (Plate CDXLIII; Tables 39-40). The pottery accounts for 64 fragments for ten MNI. A samian central dish fragment (no. 1) bears the name of Capitolinus of Rheinzabern, active in the period AD 170-260. Fragments forming the complete profile of a *Moselkeramik* necked globular motto beaker (no. 2) of type NB 33 and similar to Symonds Trier form 1, Group 36, fig. 28, can be classified according to Künzl's (1997) typology in Gruppe IV and dated AD 280-310/315. Another body fragment belongs to a similar beaker. The mortarium (no. 3) is an Oxfordshire White Ware production, but finds no parallel in the known typologies. It can be generally dated to AD 240-400. Only some small copper alloy fragments were preserved in this structure: the rim of folded sheet, a small rod fragment and an unidentifiable fragment. As this hearth represents the final level of hearths at the workshop area, directly covered by the fire layer marking the end of fort level 4, the presence of the motto beaker in this context is very significant for the dating of the end of this fort level.

6. Key context assemblages from fort level 5

The find contexts from fort level 5 are generally characterized by a high percentage of residual, dug-up material. Contexts yielding a considerable number of pottery fragments undoubtedly late Roman in date, are limited in number. However, based on the stratified evidence, certain features which did not yield (much) conclusive material, can be attributed to fort level 5 with certainty. As is clear

Table 39. The pottery categories of context OS 7932, in sherd count and in MNI.

OS 7932	sherd count	MNI
SA	4	3
CC/BS	5	2
FL	7	1
MOR	4	1
RE	31	2
HA	13	1
TOTAL	**64**	**10**

Table 40. Inventory of the pottery of context OS 7932 (Plate CDXLIII).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
	SA	RHZ SA	beaker	beaker				**1**		1				**1**
1	**SA**	RHZ SA	dish	dish	stamp SS34			**1**			1			**1**
	SA	burnt	Drag. 31/32/36	dish/shallow bowl				**1**		1				
	SA	burnt	Drag. 45	mortarium				**1**			1			**1**
2	**CC/BS**	MOS BS	NB 33 motto beaker	beaker	white barbotine and white painted decoration		beaded line with underneath the letter E, part of wavy delignating the decoration; complete base	**4**	1	2	1		1	**1**
	CC/BS	MOS BS	motto beaker	beaker	start of white painted motif			**1**		1				**1**
3	**MOR**	OXF WW	curved rim type	mortarium			horizontal rim; only 1x2 fitting but all of same individual	**4**	2	2				**1**
	FL	NOG FL					burnt	**6**		6				
	FL	NOG FL		reused as lid or counter			half of base, edges clearly filed for reuse; burnt, with chalk remains	**1**			1			**1**
	RE	NOM FR		beaker			small, fine-walled beaker	**4**		4				**1**
	RE	NOM FR		beaker			loose sherds from different beakers	**3**		3				
	RE	NOM RE	jar III.2	jar				**2**	2					**1**
	RE	NOM RE						**1**			1			
	RE	NOM RE					1x2 joining shoulder fragments; loose sherds from different vessels	**21**		21				
	HA	NOM HA		beaker	burnished			**1**		1				**1**
	HA	NOM HA					loose sherds from different vessels; several fragments with oxidised spots	**12**		12				
	TOTAL							**64**	**5**	**54**	**5**	**0**	**1**	**10**

from the respective pottery studies, though, much of the 4th-/early 5th-century pottery has been found in the transition level 5+post and the post-Roman level. Based on the many cross joins between pottery fragments of fort level 5 and fragments found within the 5+post and post-Roman levels, it seems likely that the top of fort level 5 features and structures (and probably even some complete features?) had been (partly) dug away by the later inhabitants of the site.

The double well structure OS 2562 and the large water-basin OS 4923 are the two most important key contexts of fort level 5. They represent the two phases of fort level 5. Construction slot OS 7200 of the presumed stable structure (j) and pit OS 10908/8924A are also selected as key contexts, although they bear witness of a high degree of residuality. Both can be assigned to fort level 5B. Other contexts such as road level OS 8937 (fort level 5A) and construction

slot OS 8670 (fort level 5B) are referred to as they contain some interesting elements (Figure 17).

6.1 Fort level 5A

Due to the almost complete robbing out of the bath house of fort level 5A, no features were preserved which could be directly related to this structure and contained representative material. Construction slots (g) and (h) and gully (d), which were clearly related to the bath house based on stratified evidence, only yielded a very limited amount of pottery none of which of clear 4th-century date.

6.1.1 Road level OS 8937

Road level OS 8937, to the south of the bath house, was not preserved intact. Although not a closed context, it is important to mention some pottery found in this level as it represents chronological indicators for fort level 5A. Related to the nature of the structure, its pottery is very fragmented and comprises a lot of residual material. Several fragments point to the 4th century though, such as for example the Oxfordshire red-slipped Young C51, a copy of a Drag. 38 collared bowl, although this type was already produced from AD 240 onwards (AD 240-400) (cf. Chapter 1.A.2 in this volume: no. 74). Two joining body sherds belong to a late Trier beaker, of type Symonds Trier form 1 and generally dated to AD 300-400. Several Mayen fragments refer to the 4th century. The three rims represent pot NB 89/Alzei 27 and Alzei 27, bowl type transition NB 104 / Alzei 28 and bowl Alzei 28. A beaded-and-flanged bowl of Lyne and Jefferies type 5B.5 in Alice Holt/Farnham greyware may also have belonged to the 4th century although a general date of AD 270-350 is considered for this type. The absence of clear late 4th-century or later pottery supports the attribution of this road level to fort level 5A based on stratified evidence as it has been cut by the construction pit of the later basin OS 4923.

6.1.2 Construction pit of well structure OS 2562

Only one closed context, clearly related to fort level 5A, yielded a substantial amount of pottery and other finds: the construction pit of the double well structure OS 2562. It must have been dug certainly after AD 319 since dendrochronological research has yielded a felling date of AD 319-329 for boards which can be related to the construction of the initial (outer) well. The complete structure and its finds have been studied in depth and published in detail (Vanhoutte *et al.* 2009b). However, it is important to integrate here the pottery data of the construction pit to enhance insights into the changes in the pottery repertoire regarding to that of fort level 4.

The construction pit of OS 2562 yielded eleven coins, but apart from an unattributed *sestertius* and a radiate copy only generally dated to AD 275-300+, they all remain undetermined (3rd-4th century).

This context yielded a lot of residual, dug-up material from earlier levels. For an exhaustive listing of the pottery, we refer to Vanhoutte *et al.* 2009b. Here we focus on the 4th-century ceramics.

In total, 801 pottery fragments, for 175 MNI, were recovered from the construction pit (Table 41; Plates CDXLIV-CDXLV). The samian wares account for 81 fragments or 31 MNI. Most of them are dated to the 2nd and 3rd centuries (nos 1-15) pointing to residual, dug-up material. The late Argonne fabric is only attested with some body fragments belonging to Chenet 320 bowls; however, no decoration was preserved.

Also in the non-samian fine wares, several fragments are residual (*e.g.* ill.: no. 16). Of eight fragments it can be assumed that they belonged to fort period 5[313]: four fragments with the coarser, late Trier fabric with dull coating (AD 300-400), a tri-partite ear of a 4th-century flagon from the Argonne (ARG RS), probably of type Chenet 345 (no. 17), the collar base of an Oxfordshire red-slipped mortarium Young C97 (AD 240-400), a beaker fragment, possibly of the New Forest production (AD 260-370) and a fragment of an indented beaker, possibly a Lower Nene Valley product (LNV CC).

The fine reduced ware accounts for six fragments of North Gaulish origin, of which three have a North Menapian fabric and are thus residual (ill.: no. 18). The six amphorae fragments belong to Dressel 20 amphorae and are also residual at this level. This is probably also the case for the dolium in Low Lands Ware 1 (no. 21), but the dolium fragment in the North Gaulish fabric GAL DOL, similar to that of the G3 amphorae, may well have belonged to fort period 5. The Blicquy V dish type, represented by two Pompeian Red ware fragments, still continued to be produced until at least the early 4th century. The mortaria fragments – only body fragments were preserved – all belong to Romano-British examples, with one Oxfordshire White Ware mortarium, one in fabric 1 and one in fabric 3/6 (cf. Chapter 1.B.3 in this volume). Most of the flagon ware fragments belonged to tableware flagons and display rims already encountered at fort level 4 (nos 19-20).

The coarse oxidized wares, all *Eifelware*, are indicative of the 4th century, apart from two rims of Urmitzer products (*c.* AD 190-260) which should be considered as residual. The rim of an Alzei 34 comes from Speicher (no. 22) and can be classified as type Alzei 34C according to Brulet, and therefore dated in the second or third quarter of the 4th century (Brulet 2010c, 418). The rim of a cooking pot of transition type NB 89/Alzei 27 is an Eifel imitation produced in the *civitas Tungrorum* (MEV OX) (not ill.). All other Eifel fragments originate from Mayen (ten fragments). The types present are dish Alzei 34C (no. 23), bowl Alzei 28 (NB 104) (nos 24-25), and the cooking pot with lid-seated rim, of type NB 89, of transition type NB 89/Alzei 27 (no. 26) as well as of type Alzei 27 (no. 27). A base fragment (no. 28) belongs to a pot or a jug. Dish Alzei 34 (or Pirling 126), bowl Alzei 28 (or Pirling 120) and cooking pot Alzei 27 (or Pirling 105/106 (with ear)) were, according to the grave finds at Krefeld-Gellep, in use during the entire 4th century (Pirling 1966, 92, 94). The dish Alzei 34 can be identified more specifically as Alzei 34C, based on Brulet dated to the second or third quarter of the 4th century. A date between the last quarter of the 3rd and the middle of the 4th century can be

313 **The two fragments of Hadham oxidized ware listed in the publication (Vanhoutte et al. 2009c, 37) were wrongly classified as part of the construction pit assemblage but belong to other structure levels of OS 2562.**

Figure 17. Location of the selected key contexts of fort level 5.

assumed for the bowls Alzei 28 as they are close to Brulet's Alzei 28E (Brulet 2010c, 416, 418). Cooking pot transition NB 89/Alzei 27 has already been attested in the late 3rd-century pottery assemblage of the large waste-pit OS 4980 of fort level 4. Cooking pot Alzei 27 is one of the most occurring vessel types at the graveyard of Krefeld-Gellep. The sickle-shaped rim profiles, of which has been concluded by von Petrikovits and Gilles that they occur after the middle of the 4th century (von Petrikovits 1937, 333; Gilles 1994, 119), are lacking in the assemblage of the construction pit. Rim no. 26 corresponds with type Alzei 27E of Brulet's typology and as such can be dated to the first quarter of the 4th century. Rim no. 27 finds its closest parallel in type Alzei 27I although the inner lip of the Oudenburg example is higher. Brulet dates this subtype in the second and third quarter of the 4th century (Brulet 2010c, 415, 418). Hence, the Mayen assemblage dates the filling of the construction pit after AD 325.

The reduced wares account for 348 fragments or 77 MNI. They all have a North Gaulish origin, except one. A rim fragment (no. 29) belongs to a Alice Holt/Farnham beaded-and-flanged bowl Lyne and Jefferies type 5B, a product of the later phase of this Romano-British industry dated in the period *c.* AD 250/270-400. A large part of the reduced wheel-turned pottery represents the repertoire of the second half of the 3rd century and corresponds with the assemblage from the large waste-pit OS 4980 of fort level 4. Most of them can be identified as North Menapian coarse reduced ware, representing a variety of bowls and cooking pots, and one lid (ill.: nos 29-34). The other part of the reduced assemblage is characterized by North Gaulish fabrics and refers mainly to the very late 3rd century and mainly the 4th century. One body fragment belongs to a double-lobed beaker/pot of type Tuffreau-Libre IIc (no. 35), a type dated at Bruay-Labuissière from the late 3rd century onwards (Tuffreau-Libre 1980a). This type already occurred at the Oudenburg fort in the final layers of fort level 4 (*e.g.* key context OS 22926). Three S-profiled bowls (ill.: nos 38-39) closely resemble Chenet 342 prototypes. Several reduced vessels can be attributed exclusively to the 4th century: two bowls type Brulet E4 (ill.: no. 40) and three pots type Brulet E7 (ill.: nos 36-37). This type is one of the index fossils of the 4th-century pottery repertoire at the *civitas Atrebatum* where it became popular from the middle of the 4th century onwards (Tuffreau-Libre and Jacques 1992, 108; Corsiez 2006, 353). A lid-seated rim of a cooking pot, imitating the type NB 89/Alzei 27 in Eifelware, is characterized by a grey fabric with white flint inclusions (not ill.). Other examples come from the final fillings of the inner well. This fabric has also been attested at Saint-Quentin (l'Aisne) (pers. comm. X. Deru, Unversité Lille 3)

Table 41. The pottery categories of context OS 2562 – construction pit, in sherd count and in MNI.

OS 2562 CP	sherd count	%	MNI	MNI%
SA	81	10.1	31	17.7
CC/BS	14	1.7	8	4.6
FO	3	0.4	2	1.1
FR	6	0.7	3	1.7
PR	2	0.2	2	1.1
FL	101	12.6	6	3.4
AM	6	0.7	1	0.6
DOL	3	0.4	2	1.1
MOR	5	0.6	2	1.1
CO OX	14	1.7	10	5.7
RE	348	43.4	77	44.0
HA	217	27.1	31	17.7
undet.	1	0.1	0	0.0
TOTAL	801	100	175	100

and at Hérin (Valenciennes) (pers. comm. R. Clotuche, Inrap) in northern France. Finally, two rim fragments belong to 4th-century vessels originating from La Calotterie: a carinated bowl with an inner gully-shaped rim (no. 42) and a pot with small, beaded, everted rim and no neck (no. 41).

The rest of the pottery assemblage, 217 fragments accounting for 31 MNI, consists of handmade wares. Except for two fragments, they display both the North Menapian fabric and repertoire of the late 2nd – 3rd century (ill.: nos 44-49). One pottery fragment represents the complete profile of a BB1 dish of Bestwall type 8/5, dated to *c.* AD 220 and 290/300. One rim fragment belongs to a roughly made handmade dish or bowl with a fabric characterized by vegetal inclusions (GERM CHT), a late Roman handmade fabric (cf. Chapter 1.C.2 in this volume).

6.2 Fort level 5B

6.2.1 Construction slot OS 8670

Context OS 8670, the west-east construction slot (m) in the north of the south-west site, belongs to fort level 5B based on stratified evidence. Next to a lot of residual, 3rd-century material, the assemblage yielded several 4th-century (or later) pottery fragments (not ill.). The late Roman samian wares are represented by a North Gaulish Chenet 326 collared bowl of which the complete profile could be reconstructed by means of four joining fragments from another context of fort level 5 and from the 5+post level, and by a base of a North Gaulish Chenet 328-330 mortarium. A small version of an Oxfordshire red-slipped Young C97 mortarium (AD 240-400) could also have belonged to the 4th century. The same can be supposed of an everted-rim jar of uncertain Bestwall type in coarse BB1 fabric (AD 270-400) (see Chapter 1.B.5.1 in this volume: R-B no. 17) and a small bead-rim vessel of unknown type in very fine BB1 variant (R-B no. 21). Very indicative are the reduced S-profiled fragments and one foot representing at least two Chenet 324 bowls. This type only appears in the late 4th century. At Arras, this bowl type occurs in contexts dated to *c.* AD 390 – first quarter 5th century (Tuffreau-Libre and Jacques 1992, 108). The presence of these bowls in context OS 8670 confirms the attribution of this construction slot to fort level 5B.

6.2.2 Basin OS 4923

6.2.2.1 Construction pit

The very large construction pit of basin OS 4923[314] yielded a large amount of residual material. From the construction pit, ten coins were recovered, but apart from eight issues dated to the 2nd and/or 3rd century and one undetermined coin, only one dates to the 4th century, a nummus *Victoriae Laetae Princ Per* from the period AD 320-325. Illustrative for the residuality within the pottery assemblage is the samian assemblage. On a total of 228, only 22 fragments can be identified as late Roman (or 9.6%), accounting for twelve MNI on a total of 58 (or 20.7%): three Argonne and one North Gaulish Chenet 320 bowls, eight North Gaulish mortaria of type Chenet 328-330.

Most significant for the chronology of this structure and of fort level 5B is the presence of three, identifiable, roller-stamped Chenet 320 bowl fragments: one stamp UC 94 and two stamps UC 64. Both can be dated in the last quarter of the 4th – first quarter of the 5th century (cf. Chapter 1.A.1, Section 11.6.2). Several reduced fragments can be recognized as belonging to bowl type Chenet 342. This type of bowl, generally designated as a late Roman '*terra nigra*' foot-vessel, has been found at Arras in contexts dated to *c.* AD 390-first quarter 5th century (Tuffreau-Libre and Jacques 1992, 108). In burials at Vron, this bowl type has been dated to AD 370-435/445 (Seillier 1991). In general, the Chenet 342 vessel can be considered as a characteristic grave good in burials in northwestern Gaul for the period *c.* AD 370-450 (Van Thienen 2016, 236; Van Thienen *et al.* 2017). A pot with internal gully rim originating from the Champagne region is close to Reims P10 forms which are dated to AD 370/380-420. Very significant are some ten fragments of handmade pottery in Germanic style. Body fragments show stone inclusions, whether or not with additional tempering; one rim and one body fragment represent chaff-tempered ware and belonged to egg-shaped pots (cf. Chapter 1.C.2).

A final element important to draw attention to, is the presence of almost half of a very large quern fragment, a *catillus* with a diameter of *c.* 53 cm, made of Lower Devonian coarse arkosic sandstone, in the lowest level of the construction pit (Plate CDL: no. 61). A smaller piece recovered from the primary infill of the basin joins this fragment. The large fragment in the construction pit may not have been thrown in the pit as waste. Clarke has demonstrated that querns also had a symbolic meaning, in addition to their functional significance, as they can represent the sun or the circle of life

314 B. Mignauw processed and studied the ceramics from the large water-basin (from construction pit to its latest waste fillings) a first time for his master thesis in 2005 (Mignauw 2005).

(Clarke 2000, 24) or they are associated with a prosperous harvest (Clarke 1997, 75). Their deposition could therefore have had a ritual connotation and the placement of a quern – almost exactly half of the *catillus* – at the bottom of the construction pit could be interpreted as a construction votive.

6.2.2.2 Primary infill

Also the primary waste fillings of basin OS 4923 testify of a high degree of residuality. Indicative finds are illustrated on Plates CDXLVI-CDL. Only one coin was preserved in this level, a *nummus* of Licinius, minted at London and dated to AD 310-315. The pottery of the primary infill of basin OS 4923 counts for 348 fragments with a MNI of 78 (Table 42: top). However, when leaving out the pottery sherds which can be identified with certainty as residual only a total of 230 fragments for 33 MNI remains (Table 42: below; Table 43). These numbers will probably still be overestimated, the more since some late Roman pottery fragments may have belonged to fort level 5A and were already residual at fort level 5B.

The pottery

Of the samian wares, accounting for 62 fragments for 27 MNI, only thirteen fragments (or 20.9%) or six MNI (or 22.2%) are of late Roman date. All other samian fragments refer to the late 2nd – 3rd century (Plate CDXLVI: nos 1, 8-10, 11-15) and are residual, dug-up material. The late Roman samian comprises four North Gaulish mortaria fragments, for one MNI, of the type Chenet 328-330, and nine fragments or five MNI of Argonne Chenet 320 bowls (nos 2-7). This functional distribution – mortaria in North Gaulish fabric and Chenet 320 bowls in Argonne fabric – is very representative for the general picture observed at fort level 5. The four preserved Argonne roller stamps (nos 2-5) yield three identifications: NS 3149 (no. 2), NS 3233 (no. 4) and NS 30 008 (no. 3), of which only the first two can be dated and this in the period between AD 325 and 375.

The colour-coated and black-slipped ware is represented by six individuals. The Cologne beaker fragment with hunting scene (no. 17) is clearly a residual item. This is also the case for the Argonne black-slipped necked globular beaker of type NB 33 with long neck (no. 16) which can be dated to AD 200-300. The complete base of an Oxfordshire black-slipped beaker, a body fragment of a Hadham black-slipped dish or bowl, and body fragments of a beaker in late Trier fabric with white painted decoration can be attributed to the 4th century.

The fine ware repertoire is completed by an unattributed fine oxidized body fragment and a handle with fin of a mica-dusted *oenochoe* or flagon (no. 18), possibly originating from the Oxfordshire region based on its fabric. The flagon ware group only comprises two handles and body fragments of which one shows a Meuse Valley fabric; all others are of North Gaulish origin (nos 19-20). It cannot be determined whether these are residual material or not. The Dressel 20 amphorae sherds certainly are. However, the Gauloise 13 fragments (ill.: no. 21) and the North African amphora sherd can definitely belong to fort period 5. In the mortarium assemblage, only the Bavay-Famars mortarium of type VV 351 with typical 2nd-century rim (no. 22) can be identified as residual. This is uncertain in the case of the Soller mortarium (no. 23). The other mortarium types probably still occurred in the late 4th century: an Oxfordshire White Ware mortarium (body fragment) and two presumed North Gaulish imitations of Romano-British mortaria types (fabric 5) (nos 24-25). Striking is the absence of Eifelware, and particularly Mayen products, in the assemblage. In coarse oxidized fabric, only a North African everted-rim pot is represented (Plate CDXLVII: no. 26).

In the reduced ware group, only one long-distance import can be discerned: the rim of a BB2 jar (no. 42). Of the seventeen remaining reduced individuals, nine MNI can be identified as 4th-century types, eight as belonging to the 3rd-century North Menapian repertoire of beakers, pots, bowls and lids (nos 36-41). The 4th-century North Gaulish vessels (nos 29-35) comprise two beakers Brulet B4.3 (nos 27-28), one pot Brulet E7 (no. 29) and three bowls Brulet E4 (nos 33-35) amongst other pots (nos 30-32). Two bases can be identified as belonging to Chenet 342 bowls, a vessel typical for the late 4th – first half 5th century as discussed above (not ill.).

The handmade assemblage only comprises 44 fragments, or 12.6% of the total sherd count. Apart from three fragments representing two individuals, they are all residual, dug-up, North Menapian pottery from earlier levels (nos 43-46). One BB1 dish represents Bestwall type 6/6 (no. 47), dated to AD 290/300-370. Two handmade fragments in Germanic style display a very coarse fabric with red grog, quartz and white stone inclusions. This handmade group of the primary infill of OS 4923 illustrates well that at fort level 5(B) handmade wares were hardly in use. After the cessation of the North Menapian industry, regional handmade wares were no longer of any meaning. BB1 products still came in, but must be considered as casual items retrieved through contacts.

Other finds

The primary infill of the large water-basin also yielded a small glass assemblage (Plate CDXLVIII). Most of the twelve vessel fragments represent items of earlier date. The fragment of a black/green glass bracelet, joining a fragment dug up in the dark earth level, belongs to Cosyns type A1, generally dated to the 2nd – first half 4th century (no. 48). It points to female presence at the site. A rather unique fragment is the rim of an engraved glass bowl of the so-called Wint-Hill group (no. 49) (see Chapter 6 in this volume). This type of bowls is dated in the second third of the 4th century AD but later dates are not excluded (Harden 1960). The fragment most likely shows part of an animal, and although too fragmentary to define with certainty, this was probably an element of a classical hunting scene. Part of a similar engraved bowl was found in grave 122 of the late Roman military graveyard A (Mertens and Van Impe 1971, 151: Afb. 63; 152), most likely belonging to the first phase of the cemetery.

Other significant finds are a triangular-backed single-sided comb, made of antler (AHBI.B003: Plate CDXLVIII, no. 53), dated to the 4th-first half 5th century, and three bone hair pins (AHBI. B056, 062, 063: nos 50-52). Since the comb is almost complete, it must represent an item thrown directly into the basin. As for the hair pins, it cannot be excluded that they are residual. However,

since these fine items are preserved very well, except for one broken-off point, it seems likely that these too were not dug-up items but rather thrown into the basin after use. In this case, they are clear evidence for female presence at fort level 5B.

The metal finds from the primary infill do not yield much information. Only one small copper alloy rod was preserved, besides 57 iron nails and 54 heavily corroded, unidentifiable bar-like and sheet fragments. The only identifiable iron finds are a heavy, simple blade key (IR.D/I108: Plate CDXLVIII, no. 54) and two fragments of a ring-headed bar (IR.J070-071: no. 55). Lead is represented by some sheet fragments.

In contrast, this context is most interesting for its assemblage of wooden items (Plate CDXLIX). Only two other structures, the bottom levels of the large waste-pit OS 4980 (see above) and the double well OS 2562 (see Vanhoutte *et al.* 2009b), yielded objects made out of wood. A small fragment of a double-sided wooden comb (no. 56), with a preserved height of 3.9 cm, is the only known example of the site. It emphasizes that one should take into account the presence of wooden combs when considering their counterparts made of antler or bone. A slender pin with thickening and which seems to be as good as complete (18.0 cm long) can be identified as a spindle (no. 57). The remains of two wooden vessels were recovered: a wheel-turned bowl (no. 58) and a large fragment of a robust vessel (no. 59) made of alder[315] resembling the one found in the double well OS 2562 (Vanhoutte *et al.* 2009b, 55: Fig. 28). The wooden object no. 60, 14.3 cm long, consists of a point (5.2 cm long) on a round-sectioned piece (9.1 cm long) (on one side damaged) with a diameter of 3.8/3.9 cm; the item seems complete. Analogies were not found in literature, but the form may recall an object from Valkenburg-Marktveld, recovered in the gully situated north of the cemetery, although the object referred to is much longer[316]. It was identified as a presumed lever, a windlass or an axle, possibly from a (military?) machine. It was made of beech which favors such a function as this wood is hard and tough but not so durable as oak (van Rijn 1993, 165); the light colour of the Oudenburg object may indicate that it was also made of such wood[317]. Therefore, a function as axle of a cart can be suggested for the Oudenburg item.

Furthermore, the primary infill of large basin OS 4923 yielded at least ten leather shoes and some off cuts pointing to shoemaking at the fort (see Chapter 8). Finally, a fragment of a quern made of Lower Devonian coarse arkosic sandstone matches half of a quern recovered from the construction pit (Plate CDL: no. 61).

6.2.3 Construction slot OS 7200

The content of construction slot OS 7200[318] cannot contribute chronologically. Its assemblage is rather an illustration of the high degree of residuality one faces at fort level 5 (Table 44; Plate CDL, below). Four coins were recovered from context OS 7200 but they represent earlier levels of the site: a *sestertius* of Hadrianus, a radiate copy of Tetricus II and two undetermined coins. Of the six samian individuals (nos 1-3), only one is of a late type: a North Gaulish mortarium of type Chenet 330 (no. 3). A fragment of a beaker of the New Forest production (AD 260-370) and a late mortarium type, possibly of Romano-British origin, may be representative of fort period 5. This is definitely the case for the two double-lobed beakers of type Brulet B4.2 with rounded lip (cf. Brulet *et al.* 2012, 152). All other individuals belong to the 3rd-century North Menapian repertoire (nos 6-9), as is also the case for the totality of the individuals in the handmade assemblage (nos 10-13). Except for one Germanic-style chaff-tempered sherd, the complete handmade assemblage can be considered as residual, dug up material. This context seems to indicate the low significance of Germanic pottery at fort level 5; it clearly did not assume the function of the handmade wares during the late 2nd and 3rd century at the Oudenburg fort. Apart from pottery and some coins, this context only yielded a circular link with oval shaped cross section (CA J01: no. 14), an item which may have had multiple functions.

Table 42. Top: the pottery categories of context OS 4923 – primary infill, in sherd count and in MNI. Below: the pottery counts of the primary infill of basin OS 4923 when leaving out het fragments which can be identified with certainty as residual.

OS 4923 PF	sherd count	%	MNI	MNI%
SA	62	17.8	27	34.6
CC/BS	15	4.3	6	7.7
FO	1	0.3	1	1.3
MD	1	0.3	1	1.3
FL	35	10.1	3	3.8
AM	11	3.2	3	3.8
MOR	7	2.0	5	6.4
CO OX	9	2.6	1	1.3
RE	163	46.8	18	23.1
HA	44	12.6	13	16.7
TOTAL	**348**	**100.0**	**78**	**100**

OS 4923 PF no 'residual'	sherd count	%	MNI	MNI%
SA	13	5.7	6	18.2
CC/BS	8	3.5	3	9.1
FO	1	0.4	1	3.0
MD	1	0.4	1	3.0
FL	35	15.2	3	9.1
AM	8	3.5	2	6.1
MOR	6	2.6	4	12.1
CO OX	9	3.9	1	3.0
RE	146	63.5	10	30.3
HA	3	1.3	2	6.1
TOTAL	**230**	**100.0**	**33**	**100**

315 Identification by dr. K. Deforce (Flanders Heritage Agency).

316 The Valkenburg item consists of an end formed into a blunt point, a middle piece originally rectangular in section, and another end, which is broken off, with a rectangular section with rounded corners. The preserved length is 1.05 m, with a point of 21 cm and a middle piece of 47 cm (van Rijn 1993, 165).

317 Due to the conservation treatment, the wood could not be analyzed.

318 Plate CDXCIII: feature section 7/196-197.

Table 43. Inventory of the pottery of context OS 4923 – primary infill that can be considered as non-residual (Plates CDXLVI-CDXLVII).

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
	SA	NOG SA (burnt to black)	Chenet 328-330	mortarium		burnt to black		**1**		1				
	SA	NOG SA (DTS. BE-NO)	Chenet 328-330	mortarium				**1**		1				**1**
	SA	NOG SA (DTS. BE-NO)	Chenet 328-330	mortarium		slightly burnt		**2**		2				
2	**SA**	ARG SA	Chenet 320	decorated bowl	roller stamp NS 3149			**1**	1					**1**
3	**SA**	ARG SA	Chenet 320	decorated bowl	roller stamp NS 30 008			**1**		1				**1**
4	**SA**	ARG SA	Chenet 320	decorated bowl	roller stamp NS 3233			**1**		1				**1**
5	**SA**	ARG SA	Chenet 320	decorated bowl	roller stamp decoration too small to identify			**1**		1				**1**
6	**SA**	ARG SA	Chenet 320	decorated bowl	no decoration preserved			**4**	2	2				**1**
7	**SA**	ARG SA	Chenet 320	decorated bowl	no decoration preserved			**1**	1					
	CC/BS	OXF BS		beaker			complete base	**1**			1			**1**
	CC/BS	HAD BW		bowl or dish			mortar remains on surface and breaks	**1**		1				**1**
	CC/BS	late Trier?		beaker	white painted decoration			**6**		6				**1**
	FO	undet.						**1**		1				**1**
18	**MD**	OXF? MD		*oenochoe* or flagon			handle with fin	**1**				1		**1**
19	**FL**	NOG FL		tableware flagon		white slip	ribbed handle	**1**				1		**1**
20	**FL**	NOG FL		tableware flagon			one-piece handle	**1**				1		**1**
	FL	NOG FL		tableware flagon				**1**			1			
	FL	NOG FL		tableware flagon			loose sherds from different flagons; 2x2	**31**		31				
	FL	MEV FL		tableware flagon				**1**		1				**1**
	AM	GAL AM	G13	amphora				**6**		6				
21	**AM**	GAL AM	G13	amphora			small handle fragment, with fin	**1**				1		**1**
	AM	NAF AM		amphora				**1**		1				**1**
23	**MOR**	SOL MOR	VV 337 / Haupt 9	mortarium			vertical rim; burnt	**2**	2					**1**
	MOR	SOL MOR		mortarium				**1**			1			
	MOR	OXF WW		mortarium				**1**		1				**1**
24	**MOR**	NOG? MOR (fabric 5)	VV 352, similar to SW TZ types 131-5, p. 169, figs. 4.13-4, nos 238-49	mortarium			curved collar with upstanding rim; white grit; remains of white slip; burnt to black	**1**	1					**1**
25	**MOR**	NOG? MOR (fabric 5)		mortarium			not white slipped; white grit; base of collar broken off	**1**	1					**1**

ILL.	CATEGORY	FABRIC	TYPE	FORM / FUNCTION	DECORATION / STAMP	SLIP	COMMENTS	SHERD COUNT	R	W	B	H	CP	MNI
26	**CO OX**	NAF OX	everted-rim pot	pot	wheelturning scoring on the body			**9**	1	5	3			**1**
27	**RE**	NOG FR	beaker Brulet B4.3	beaker			large individual	**2**	2					**1**
28	**RE**	NOG FR	beaker Brulet B4.3	beaker			high quality, metallic surface; small individual	**3**		2	1			**1**
	RE	NOG FR	beaker Brulet B4.3	beaker				**1**		1				
	RE	NOG FR		beaker			high foot	**1**			1			
	RE	NOG FR		beaker			small individual; small fragment	**1**		1				
29	**RE**	NOG RE	pot Brulet E7 / Tuffreau-Libre 'vase à panse ronde' XIa	pot				**1**	1					**1**
30	**RE**	NOG RE		pot				**1**	1					**1**
31	**RE**	NOG RE		pot				**1**	1					**1**
32	**RE**	NOG RE		pot				**1**	1					**1**
33	**RE**	NOG RE	bowl Brulet E4 / Tuffreau-Libre 'bol rond Ia'	bowl	burnished rim; linear burnishing on interior			**1**	1					**1**
34	**RE**	NOG RE	bowl Brulet E4 / Tuffreau-Libre 'bol rond Ia'	bowl				**2**	2					**1**
35	**RE**	NOG RE	bowl Brulet E4 / Tuffreau-Libre 'bol rond Ia'	bowl	burnished rim and exterior			**2**	2					**1**
	RE	NOG RE		bowl				**1**			1			
	RE	NOG RE	bowl Chenet 342	bowl				**1**			1			
	RE	NOG RE	bowl Chenet 342	bowl				**1**			1			
	RE	NOM/ NOG RE		beaker				**1**			1			
	RE	NOM/ NOG? FR		beakers			1x2; fragments from different beakers, thin-walled	**8**		8				
	RE	NOM/ NOG RE		bowl				**1**			1			
	RE	NOM/ NOG RE					loose fragments of different vessels	**112**		112				
	RE	NOM/ NOG RE					base fragments of two different vessels	**2**			2			
42	**RE**	BB2		jar				**2**	1	1				**1**
	HA	GERM STW					very coarse fabric with red grog, quartz, white stone inclusions	**2**		2				**1**
47	**HA**	BB1	developed beaded and flanged bowl Bestwall type 6.6	bowl	burnished arcading			**1**	1					**1**
	TOTAL							**230**	**22**	**189**	**15**	**4**	**0**	**33**

6.2.4 Pit OS 10908/8924A

This context has been discovered as a pit but was most likely formed as a subsidence on top of two earlier large features[319] of fort level 4. Nevertheless, this feature or level, attributed to fort level 5B, yielded a substantial amount of finds (Plates CDLI-CDLIII). Five coins were recovered from this context but they all represent issues from earlier periods: two *sestertii*, a radiate copy and two undetermined coins.

6.2.4.1 The pottery

Like the other contexts of fort level 5, the pottery assemblage of context OS 10908/8924A witnesses of a high degree of residuality (Plate CDLI). The pottery of this context counts for 215 fragments with a MNI of 46 (Table 45: top). However, when leaving out the pottery sherds which can be identified with certainty as residual only a total of 50 fragments for 21 MNI remains (Table 45: below). As can be assumed, these numbers will probably still be overestimated, the more since some late Roman pottery fragments may have belonged to fort level 5A and were already residual at fort level 5B.

The samian wares, accounting for eleven fragments or eight MNI, are mostly late 2nd and 3rd century vessel fragments (nos 1-3, 5). Only two 4th-century individuals can be discerned: an Argonne Chenet 320 bowl rim, however without the decoration preserved, and a burnt decorated bowl of type Trier I, 8b or Chenet 325 (no. 4). Although burnt, based on its type, the latter most likely belongs to the late Roman Trier samian production, an industry with only a very limited distribution (Vilvorder in Brulet *et al.* (réd.) 2010, 259). This bowl is the only product encountered from this industry at the south-west corner site and at the Oudenburg sites in general. Its type can be dated in the first half of the 4th century (Vilvorder in Brulet *et al.* (réd.) 2010, 259). This bowl probably did not reach the Oudenburg fort as a regular import, but rather through contacts or accompanying another trade product.

Imports referring to the 4th century are a colour-coated beaker of the New Forest in Fulford fabric 1a (metallic) (AD 300-400), a Mayen Alzei 27(C/E) cooking pot, and possibly also a Gauloise 13 and a North African amphora; all these individuals are represented only very fragmentary. In the reduced ware group, the residual, North Menapian assemblage (with six MNI: nos 14-18) and the North Gaulish assemblage (with five or six MNI: nos 8-12, possibly also no. 13) are equally shared. The La Calotterie fragment and the fragment of a vessel made of a kaolinite rich clay, possibly originating from the same region, are too small to determine whether they are residual items or not. Very interesting, though, is the presence of two Alice Holt/Farnham greyware bowls: a beaded-and-flanged bowl of Lyne and Jefferies type 5B.6 (no. 19) and a type 5B.8 (no. 20). Both types can be dated *c.* AD 270-420.

The handmade assemblage consists mostly of North Menapian products representing the late 2nd-3rd century repertoire (nos 21-25), next to two Romano-British BB1 vessels. A developed beaded-and-flanged bowl of type Bestwall 6/5 can be dated to *c.* AD 280-300, and probably originally belonged to fort level 4. The straight-sided dish Bestwall type 8/12 (no. 26) is most likely representative for fort level 5 as it can be dated to *c.* AD 290/300-370. Late Roman handmade pottery is only represented by four body fragments. Two of them are chaff-tempered, another two are characterized by shell inclusions.

Table 44. The pottery categories of context OS 7200, in sherd count and in MNI.

OS 7200	sherd count	MNI
SA	8	6
CC/BS	1	1
FL	11	1
MOR	1	1
RE	30	7
HA	41	7
TOTAL	**92**	**23**

6.2.4.2 Other finds

One of the most significant finds in this context is the marble *Venus Pudica* figurine of *c.* 17 cm high (Plate CDLII: no. 27). As discussed in Chapter 7 in this volume, this statuette must have belonged to the public atmosphere. Based on the choice of material and the theme of Venus after bathing, this figurine most likely had adorned a niche in the baths of fort level 5A. Its presence in the pit indicates that the baths were abandoned before the level of this context came into existence which may confirm that the baths were out of use at fort level 5B.

Two bone hair pins (AHBI.B045, B049: nos 28-29) again confirm a female presence at the site. However, hair pin no. 28 shows traces of re-use, as a writing or a toilet instrument perhaps; hence, it may well have been an item from an earlier level that was found on site and reused at fort level 5. The copper alloy finds comprise a cotter hinge, part of furnishing (CA.D061: no. 30) and a steelyard hook (CA.G12: no. 31). A semimanufacture of a simple one-piece sprung brooch (not ill.) can be interpreted as a dug-up item from fort level 4. Other copper alloy items only consist of small sheet fragments and two fine rod fragments. Next to 123 iron nails, eleven unattributed fragments and two iron slag pieces, two iron objects were preserved: part of a presumed pitchfork (IR.C57: no. 32) and a handle of a vessel or for furnishing (IR.D037: no. 33).

Most striking is the presence of three large fragments of querns in basalt lava, all three identifiable as a *meta* (Plate CDLIII: nos 34-36 (with resp. diameters of 42.8, 37.8 and 40.0 cm); Chapter 10 in this volume: cat. nos 021-055, 021-054, 021-053 resp.). Especially quern no. 34, of which more than half was preserved, is too large to have been a dug-up item and indicates the presence of these querns in this area at fort level 5.

319 Plate CDLXXXVII: feature sections 1/99a-b. Pit/subsidence OS 10908/8924A covered these features.

Table 45. Top: the pottery categories of context OS 10908/8924A, in sherd count and in MNI. Below: The pottery counts of context OS 10908/8924A when leaving out the fragments which can be identified with certainty as residual.

OS 10908-8924A	sherd count	MNI
SA	11	8
CC/BS	1	1
FL	12	1
AM	17	3
CO OX	6	1
RE	63	16
HA	105	16
TOTAL	**215**	**46**

OS 10908-8924A no 'residual'	sherd count	MNI
SA	4	2
CC/BS	1	1
FL	12	1
AM	7	2
CO OX	6	1
RE	13	10
HA	7	4
TOTAL	**50**	**21**

6.2.5 Double well OS 2562: waste fillings into the inner well

It is important to draw extra attention here to the final waste fillings into the inner well of structure OS 2562 (Figure 18) as they comprise a vast amount of pottery and other items, representing the material culture of the final occupation at the fort site. These structure levels 3 and 4 are dominated by building material debris (mortar, Tournai limestone, loam) of the dismantling of fort structures, alternated by sand and silt layers (Vanhoutte *et al.* 2009b, 81). It cannot be determined whether these waste fillings date from the final end of the fort's occupation or whether later inhabitants of the fort precinct, after the abandonment of the fort, filled in the remaining pit with debris and waste from the surrounding levels. Whatever scenario considered, the vast amount of finds from these structure levels 3 and 4 clearly represents the material culture of the last fort inhabitants. These finds are discussed in detail in Vanhoutte *et al.* 2009b, 82-89); in what follows, attention is drawn to some significant elements in the pottery assemblage.

Together, these levels contained 462 pottery fragments, accounting for 124 MNI. Although again a high degree of residuality was observed, a representative assemblage shows the latest pottery in use at the site, dated to the late 4th and the first decades of the 5th century. The samian wares have been discussed in the samian study (see Chapter 1.A.1 in this volume). The represented roller stamps result in a *tpq* date of at least AD 390 for the waste fillings, but their date is likely to be much later. The Mayen wares are well-represented but it is significant to notice that the very late, sickle-shaped Alzei 27 rim profile cannot be recognized.

The reduced assemblage shows the repertoire in use during the final fort phase. At least four double-lobed beakers Brulet B4.2 (Tuffreau-

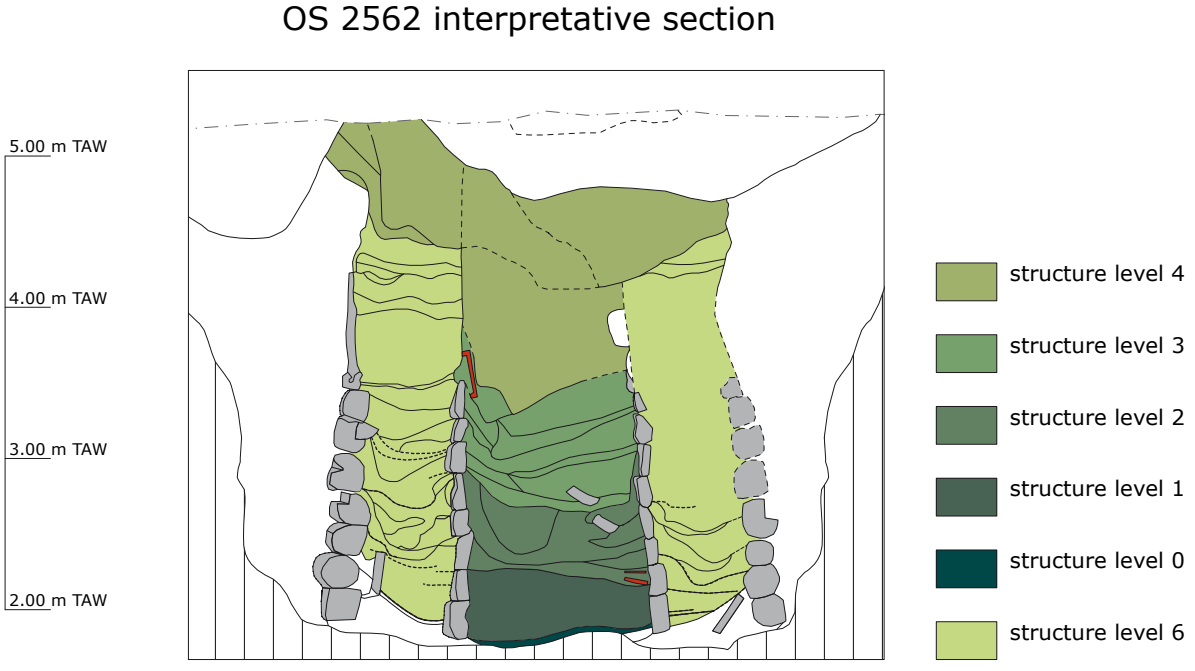

Figure 18. Interpretative section drawing of double well OS 2562 marking the successive levels of construction and infill.

Libre 'vase bilobé' IIa; Corsiez (2006) GO4) with wider upper lobe could be distinguished (Figure 19: 1-4). This type of beaker was also a popular grave good at Graveyard A (Mertens and Van Impe 1971, 28, Pl. LXX; cf. Volume I, Chapter IV, Section IV.3.2.2).

Represented by seven MNI is bowl Brulet E4 (Tuffreau-Libre 'bol rond' Ia; Corsiez (2006) B5) (Figure 19: 5-8). The fabric distinguishes these bowls from the similar type in the North Menapian repertoire (type II.A.3a). Type Brulet E4 was mainly popular from the middle of the 4th century onwards. It probably already occurred during the first half of the 4th century, but became a general type only from the middle of that century onwards, to continue until the beginning of the 5th century (Tuffreau-Libre and Jacques 1992, 105-108; Corsiez 2006, 354).

Another type of late Roman bowl, with thickened, bending rim to the outside, type Brulet E5 (Tuffreau-Libre 'bol rond' VIIa; Corsiez (2006) P9) is represented by three individuals (Figure 19: 9-11). This type appears in the Atrebatian region in the period AD 360-380 (Tuffreau-Libre 1980a; Corsiez 2006).

Two examples of S-shaped bowls with thickened rim (Figure 19: 12, 14) and a bowl with everted rim (no. 13) are of types well-present in late Roman contexts at Tournai (Brulet 1996a, Fig. 25: no. 3; Brulet and Verslype (dir.) 1999, Fig. 50: nos 40-46). Only one Chenet 342 bowl rim could be discerned in the assemblage. As already mentioned, this type is characteristic from the very end of the 4th century onwards.

Apart from beakers and bowls, several types of cooking pots are present in the reduced assemblage. Represented by three individuals is the type with everted, hooked, undercut rim Brulet E7 (Tuffreau-Libre 'vase à panse ronde' XIa; Corsiez (2006) P9) (Figure 19: 15-117). This type was already present in the construction pit of structure OS 2562 (see before). As mentioned before, this type is one of the index fossils of the 4th-century pottery spectrum at the *civitas Atrebatum* where it mainly occurred from the middle of the 4th century onwards (Tuffreau-Libre and Jacques 1992, 108; Corsiez 2006, 353). Another

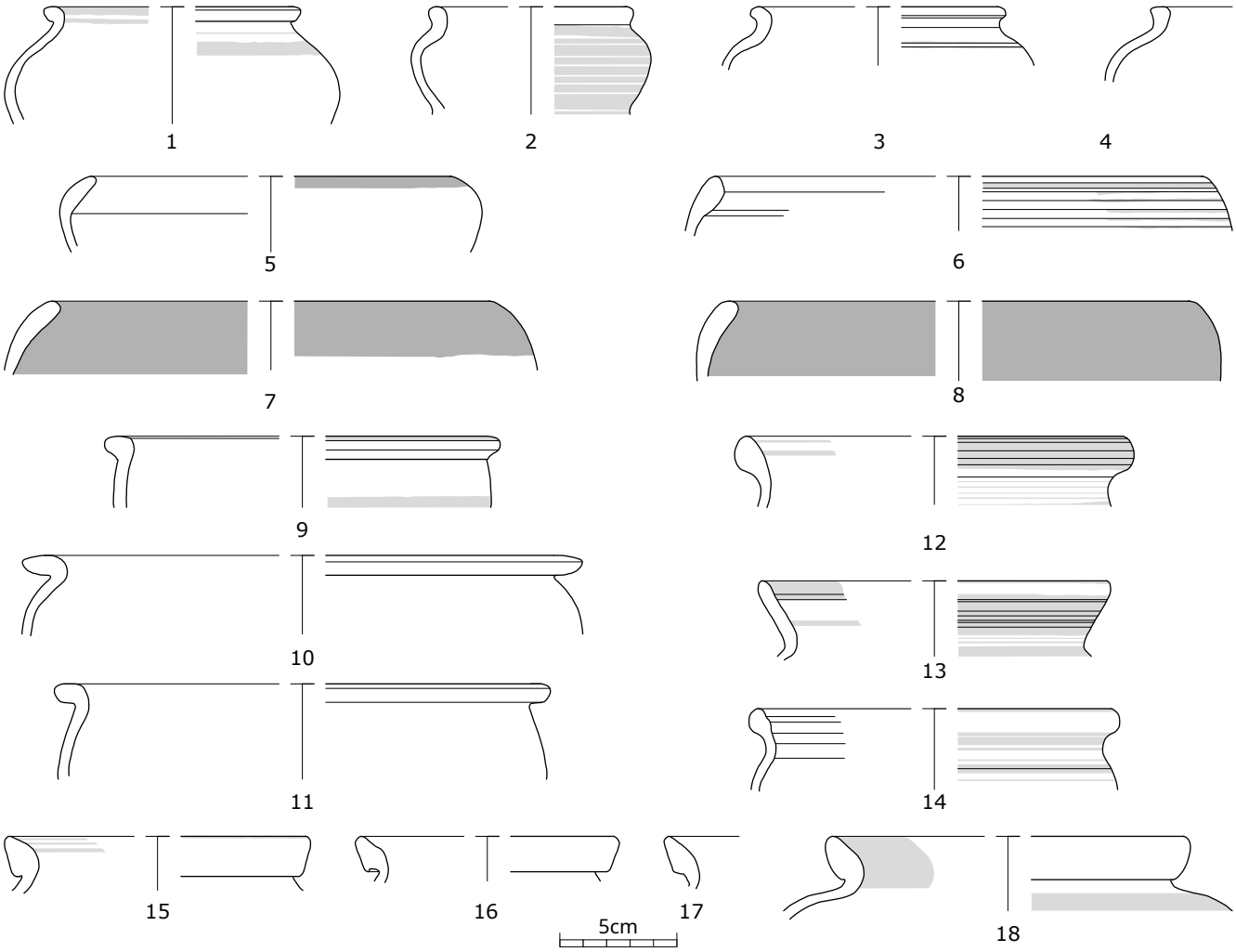

Figure 19. 1-4: double-lobed beakers Brulet B4.2; 5-8: examples of bowl Brulet E4; 9-11: three bowls which can be identified as type Brulet E5; 12-14: S-shaped bowls of late Roman type recovered from the waste fillings of well OS 2562; 15-18: pots of type Brulet E7 or variant. All recovered from the waste fillings of well OS 2562.

rim displays a similar profile, but without it being undercut; it can be identified as a variant of type Brulet E7 (Figure 19: 18). The same type has been attested on the site Tournai *Saint-Pierre* (Brulet and Verslype (dir.) 1999, Fig. 51: no. 81).

Other cooking pots have a lid-seated rim inspired by the NB 89/Alzei 27 pots in Eifelware, and can be considered as regional imitations of these Eifel pots (cf. Herbin 2001, 87) (see Chapter 1.B.4 in this volume). One of these individuals displays a pale grey fabric tempered with white flint inclusions. It has also been encountered with one individual in the construction pit (see before) and in the final waste fillings into the large basin OS 4923 (Mignauw 2005, 133). Similar vessels are known at sites at Saint-Quentin and Hérin, as already mentioned for the examples found in the construction pit of this structure.

Except for a few fragments, all handmade sherds can be recognized as North Menapian products and are thus residual, dug-up items. Three fragments (three MNI) have a chaff-tempered fabric (GERM CHT); two fragments, representing only one MNI, have a shell-tempered fabric (HA SHELL). While rim fragments from other contexts (see before) indicate that the GERM CHT fabric is represented by egg-shaped pots, the HA SHELL fabric is represented here by a type of cooking pot that resembles the main cooking pot type of the former North Menapian potteries, with S-shaped profile, short neck and everted rim (cf. Chapter 1.C.1 in this volume).

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In the later Roman period the North Sea and Channel region was the scene of seaborne attacks, political crises, army reforms, Germanic invasions and changing imperial defence strategies. Literary evidence for this era is poor. On the other hand the Shore forts can yield highly significant information, but have been subject to little study in recent decades. At the Belgian coastal fort at Oudenburg large-scale excavations in the first decade of the 21st century revealed a strikingly well-preserved chronological, spatial and functional evolution of this military base, with five main fort periods running from the late 2nd until the early 5th century AD. For the first time within the context of the Shore forts securely datable structural evidence demonstrates the stages in progression of a mid- to late Roman fort where the horizons can be related to historically recorded processes and events in the region. Political, economic and social developments can be seen within this evidence, as a result of the assessment of the huge quantity of well-stratified finds types. Reports on the finds assemblage by specialist experts, using various analytical methods, represent 'touchstones' for regional military and later Roman studies in the North-West provinces.

The study of Oudenburg, and in relationship to other Shore forts, enables exploration of 'change and continuity' and 'identity', in respect of the everyday lives of soldiers, and in their interaction with other forts and wider regional spheres. This is achieved by examining find contexts as reflections of the socio-cultural world. The study of 'military identities' is further emphasized through looking at the associated graveyards wherein the direct relationship with the successive fort periods is established. It is clear this fort was closely connected with the British forts and that there occurred an increasing Germanic influence as the fort transformed into a community of military families.

This is volume three and contains all the plates that illustrate volumes one and two.

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