VINCE VAN THIENEN · CLARISSA AGRICOLA · OLE STILBORG · STIJN HEEREN

CHARACTERISING TERRA NIGRA FOOT-VESSELS OF THE LATE ROMAN PERIOD (4TH-5TH CENTURY) FROM GERMANY, THE NETHERLANDS AND BELGIUM

In the north-west continental frontier regions of the Roman Empire, grey to black wheel-thrown pottery is frequently found in archaeological contexts of the Late Roman period (4th-5th century). These ceramics are often described as »*terra nigra*-like« vessels for which some scholars assume a Gallo-Roman development while others argue a Germanic origin. Their specific production location is unknown due to the lack of direct production evidence as well as the unclear definition of this pottery group. The name »terra nigra« might imply a connection to the fine wares of the earlier Roman period, but there is, in fact, a considerable variation in the quality of this Late Roman ceramic group. It ranges from very fine to plain wares, and handmade pottery is also sometimes assigned to this group. It is not the intent of this article to change the embedded names for this group, but in order to be consistent and to avoid confusion with the earlier fine ware – which is called terra nigra – the term of »Late Roman Terra Nigra« (LRTN) will be used consequently in this article to refer to wheel-thrown grey to black pottery from the 4th and 5th century.

The first aim of this article is to address the obscurity surrounding the definition of this ceramic group and the typology of the foot-vessels, which is the most common form of LRTN, by giving a brief overview of the research history, followed by an overview of the three most frequent types of LRTN foot-vessels and their distribution. The second objective is to investigate the composition of this ceramic group based on geochemical and petrographic characteristics. And third, to propose new avenues of interpretation regarding the social, cultural and economic role of the foot-vessel in the Late Roman period in northern Gaul and the adjacent regions in Germania Magna.

PAST RESEARCH

In 1941 G. Chenet published his famous work on the Argonne terra sigillata of the 4th century, from the production centre in northern France. Although it was about red-fired (oxidising) ceramics, it explicitly stated that form 342, characterised by a high hollow foot and a more or less S-shaped outward curving rim, also occurred in reduced firing technique with a grey colour. G. Chenet noted the similarity of this form 342 to handmade vessels of the Rhine-Weser-Germanic pottery and presumed some relation with »Germanic invasions«, although he maintained that the vessels he described represented a provincial-Roman production (Chenet 1941, 91-92).

In 1967, W. A. van Es published the Germanic site of Wijster (prov. Drenthe/NL), north of the Rhine. Some 150 sherds belonging to the larger group of LRTN vessels were found here (van Es 1967). He distinguished two groups: a Germanic group of funnel-like high vessels and a Roman group similar to the Chenet 342 form. Referring to G. Chenet, W. A. van Es assumed a Roman origin of this material, treating the LRTN vessels as imports (van Es 1967, 158-168). Soon after, H. Schoppa (1970a; 1970b) described two assemblages (Castrop-Rauxel »Erin« [Kr. Recklinghausen/D] and Kamen-Westick [Kr. Unna/D]) and in addition to the Chenet 342 vessels, he also found diverging forms. At the same time, G. Mildenberger worked in North

Hesse and compared the finds with the terra nigra of the so-called Hellweg area east of the Rhine between the rivers Lippe and Ruhr, and found more sites and relatively high numbers of LRTN vessels. Many of these vessels were executed in a white or light grey fabric with a darker grey surface and this fabric was called the Hellwegware by G. Mildenberger (1972).

Although H. Schoppa and G. Mildenberger were the first German scholars to study this ceramic group, the main reference in German literature comes from the finds made at the now famous cemetery of Krefeld-Gellep (D). The second volume on Krefeld-Gellep (Pirling 1974) contained two graves each with a vessel on a high foot, executed in a blue-grey fabric (Gellep 273 and 274). R. Pirling posed the question of provenance for this pottery without answering it and supposed that this form of vessel played a role in the development of Merovingian biconical pots (Pirling 1974, 56-57 Typentafel 5). Notably, no reference to type Chenet 342 was made for these two types, although another vessel type – Gellep form 252 – was related to the Chenet forms because they had a polished black smoked surface covering the body of the sherd (Pirling/Siepen 2006, 188). Despite the similarities in the fabric between these two forms, the flat base of Gellep 252 did not conform to the high foot of Chenet 342 (Pirling 1974, 42-43 Typentafel 2).

In the early 1990s, a settlement was excavated not far from Wijster, called Raalte-Heeten (prov. Overijssel/NL). Forms resembling Chenet 342 were found in a wide variety of fabrics, from lustrous glosses to plain wares. The forms ranged between vessels on a high foot and flat-bottomed vessels. The high numbers and some (assumed) misfired bowls led to the hypothesis that some of the vessels were produced here (Erdrich 1998). A few years later, another probable production site, Colmschate-Skibaan (Deventer, prov. Overijssel/NL) was published by I. Hermsen, who also produced new distribution maps (Hermsen/Bartels 2007, 130).

Despite R. Pirling's careful distinction between forms and fabrics – Chenet 342 and Gellep 252 in fabrics with a completely black surface and Gellep 273/274 in plain blue-grey fabric – this method was not applied by the more recent researchers. Chenet 342 and Gellep 273 are used interchangeably and often either one of these is used as a *pars pro toto* for the complete group of grey to black vessels (Erdrich 1998; Hermsen/Bartels 2007; Lanting/Van der Plicht 2009/2010, 99-101). When studying the site of Wijk bij Duurstede-De Geer (prov. Utrecht/NL), S. Heeren (in prep.) observed that certain typological features coincided with fabrics. The foot-vessels are divided based on differences in foot-shapes which revealed a correlation between form and fabric. S. Heeren found that the foot characteristic for Gellep 273 occurred in a pale fabric with a smooth grey surface, while the massive foot shapes were either brown, black or approach a rather handmade appearance. Additionally, the high hollow foot (cf. Chenet 342) occurred in various grey to dark, plain and quite coarse fabrics (Heeren in prep.). Notably, LRTN sherds with a dark or brown gloss, assumedly from the Argonne area (rég. Grand Est/F), are absent from the Wijk bij Duurstede site, but present at Gennep (prov. Limburg/NL; Heidinga/Offenberg 1992 for a preliminary site report; Verhoeven 2003 for the pottery).

The presumed production site that M. Erdrich studied, Raalte, is situated outside the Roman Empire, just north of the Limes. Given that historical sources place the Salian Franks in this area, M. Erdrich declared the whole ceramic group as a Frankish-Salian artefact (Erdrich 1998). Following M. Erdrich, J. Lanting and J. Van der Plicht approached these ceramics very one-dimensionally. All terra nigra groups, from the Early Principate until the Merovingian biconical pots, were treated as one cultural style and considered to have a Frankish origin. The assumed workshops on Roman soil would have produced this type of pottery to cater for the tastes of the Frankish auxiliary units of the Late Roman army (Lanting/Van der Plicht 2009/2010, 99-101).

Soon after that, an extensive publication concerning LRTN was produced by M. Hegewisch (2011). His aim was to study the knowledge transmission and adoption of pottery techniques using the fast wheel outside the Roman Empire, and consequently focused on the Germanic area. Like R. Pirling, he made a distinction between the various form traditions and fabrics. For the high foot vessels – like Chenet 342 and Gellep 273 – he noted

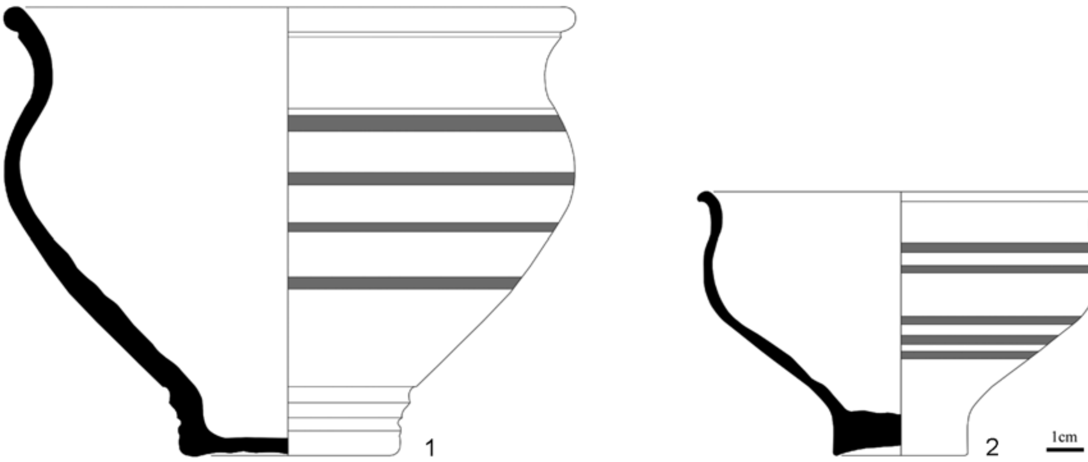


Fig. 1 Examples of LRTN foot-vessels Gellep 273 (**1**) and Gellep 274 (**2**). – (Drawings C. Agricola).

the recent trend of interpreting these as Germanic forms but did not discard the option that this pottery group was actually produced in the Argonne area (Hegewisch 2011, 161-164). Additionally, the most recent contribution, by L. Bakker, introduced terra nigra vessels decorated with roulette stamps, much like the Samian ware from the Argonne. Given the scarcity of this group and its relative high numbers in Haus Bürgel (Kr. Mettmann/D) not far from Cologne, he surmises the production of these vessels near that site (Bakker 2015).
In the review delivered here, we illustrate the common problem of using different parameters to classify the same ceramic group, making it problematic to compare results of multiple studies. Furthermore, the small-scaled regionality of most studies and the separate use of various typologies result in insufficient knowledge of the distinction and/or overlap of these different types. Overall, the Chenet identification is heavily set in the French literature whereas the Gellep classification occurs most in German literature. Researchers from Belgium have favoured the French parallels, whereas Dutch scholars have (inconsequently) used both typologies. Additionally, the incoherent fabric descriptions by different authors and the absence of an objective and general definition of the term »terra nigra« complicate the matter even further.
In order to address this typological obscurity, we will briefly present the most frequent foot-vessel forms from both typologies and evaluate their general distribution.

TYPOLOGY AND DISTRIBUTION

Gellep 273 and 274

Between the rivers Lippe and Ruhr in the Hellweg region in Germany, the LRTN group is closely associated with foot-vessels of the types Gellep 273 and 274 (**fig. 1**). Based on a macroscopical and typological comparison in the current study of the Hellweg pottery[1], both types are found to occur in a fabric that appears to be limited to the Hellweg area. Good comparisons can be found in the typology of the cemetery from Krefeld-Gellep (Pirling/Siepen 2006, 189). The type Gellep 273 is described as a bowl, while the type Gellep 274 is a downscaled cup-like variation of Gellep 273. The basic form of both Gellep 274 and 273 can be described as high oval: the neck is funnel-shaped and bends slightly outwards, and between the neck and the vaulted shoulder is often an offset or a slight groove which separates the two areas. Below the shoulder, the vessel becomes narrower and ends in a clearly separated foot.

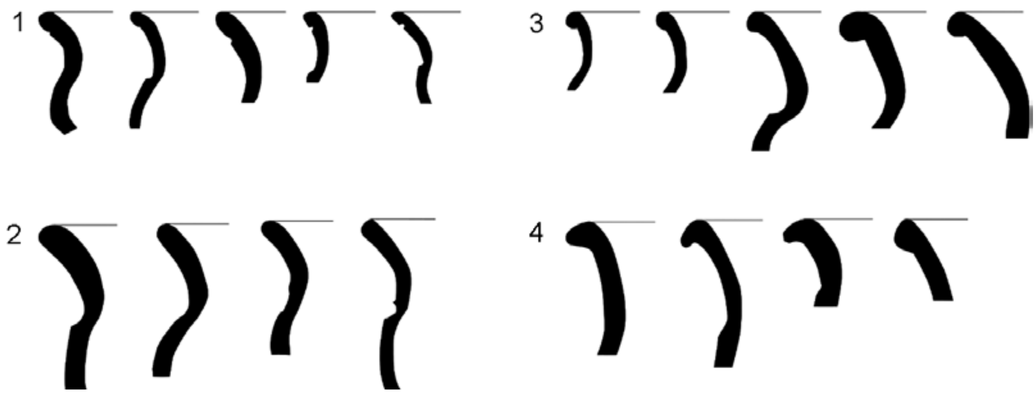


Fig. 2 Main rim types for LRTN foot-vessels Gellep 273 and 274. – (Drawings C. Agricola).

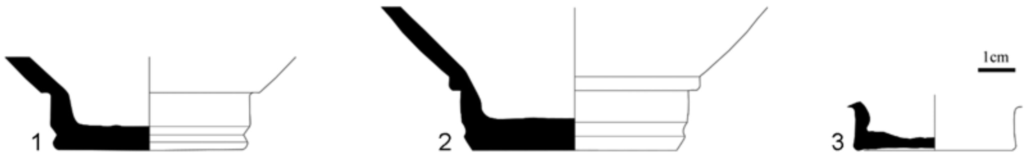


Fig. 3 Main foot types for LRTN foot-vessels Gellep 273 and 274. – (Drawings C. Agricola).

Fig. 4 Variation in rim types for the Chenet 342 from Belgium and the Netherlands. – (Drawings J. Angenon).

These two vessel types demonstrate four main rim-variations (**fig. 2**): the first rim type is characterised by a sub-rounded rim profile, which is separated from the neck by a groove (Schoppa 1970a, 114; 1970b, 39). The second rim type is smooth and shows no further structure. A few sherds possess a slightly thickened rim lip (Schoppa 1970a, 114; 1970b, 39). The third shows a completely beaded rim profile. A more or less distinctive groove separates the rim from the neck (Schoppa 1970a, 114; 1970b, 40). A characteristic of the fourth type is a triangular rim profile, i.e. the rim is pointed at the end and the overall profile appears almost triangular.

In addition to the rim types, it is possible to distinguish three main foot-variations (**fig. 3**). The main general characteristic is a cylindrical form which is separated from the body by an angular indentation. At the end of the foot is a distinctive groove and the bottom edge is often wiped off (**fig. 3, 1**, after foot type a Schoppa 1970b, 40). The second form shows many similarities to the first type, the only difference is the rounded cordon which separates the foot from the body (**fig. 3, 2**, after foot type b Schoppa 1970b, 40). The third variety demonstrates a smooth and straight shape with occasionally a wiped bottom edge (**fig. 3, 3**, after foot types c and d Schoppa 1970b, 40).

Chenet 342

As mentioned in the introduction, the Chenet 342 type was established by G. Chenet (1941) in his study of the Argonne pottery from the 4th century. The 342-form is described as a cup with an outward-curving rim on a conical or cylindrical hollow foot, fired in either oxidised or reduced atmosphere. Here, we will focus solely on the LRTN vessels, i.e. in reduced firing conditions. The rim and shoulder of this shape are fairly consistent, with small variations in the same rim shape (**fig. 4**).

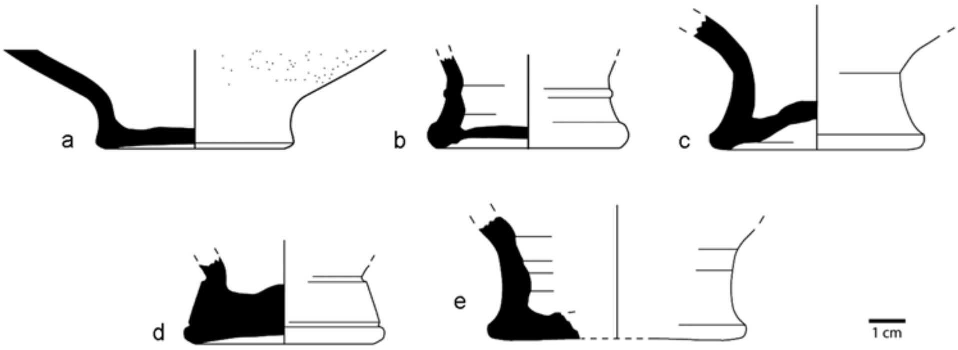


Fig. 5 Variation in foot types for the Chenet 342 from Belgium and the Netherlands. – (Drawings J. Angenon).

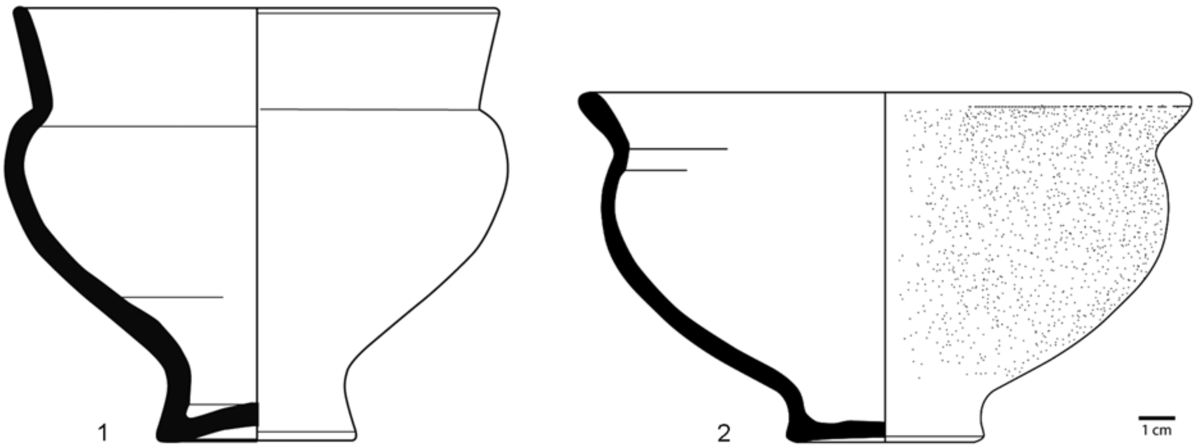


Fig. 6 Examples of LRTN foot-vessels Chenet 342a (**1**) and Chenet 342b (**2**). – (Drawings J. Angenon).

The foot, however, can occur in a variety of shapes, both hollow and solid. The most frequent shape for the Chenet 342 vessels in the study area is the cylindrical hollow foot with a slight (**fig. 5a**), medium (**fig. 5b**) or high (**fig. 5c**) elevation. Additionally, a conical to cylindrical massive foot (**fig. 5d**) and a cylindrical to square hollow and flat foot occur in lesser numbers (**fig. 5e**). The exterior finishing varies between grooves, lines or smooth surfaces. Usually, no roulette, awl or impression motifs are present, although exceptions do occur as is proven by one sherd known from Neerharen-Rekem (prov. Limburg/B; Stroobants 2013, 75).

A chronological development in the general form was established in the region of Pas-de-Calais (F). C. Seillier (1991) noticed that the earliest vessels have a variable width and the height is equal to or slightly smaller than the diameter of the rim. Additionally, these Chenet 342a vessels are mostly undecorated, with the exception of grooves and lines, with either a high massif or hollow foot (**fig. 6**). This subtype is found to be similar to the Argonne vessels and is dated from burials in Vron (dép. Somme/F) to 370-435/445 AD. The 342b variant is much larger in diameter than in height and inclines more towards a bowl than a cup (**fig. 6**). These vessels again are sparsely decorated and have either a hollow or massif foot, although not as high as the 342a. Based on the burials, the 342b is dated to 435/445-450/460 AD and can potentially be a predecessor to later Merovingian vessels (Seillier 1991, 62-70).

In general, the Chenet 342 vessel is frequently found in burials in north-west Gaul for the 4th and 5th century (c. 350-450 AD), although the more recent discoveries from Belgium and the Netherlands also often derive from contexts associated with settlement depositions and water features such as wells, basins, ditches and

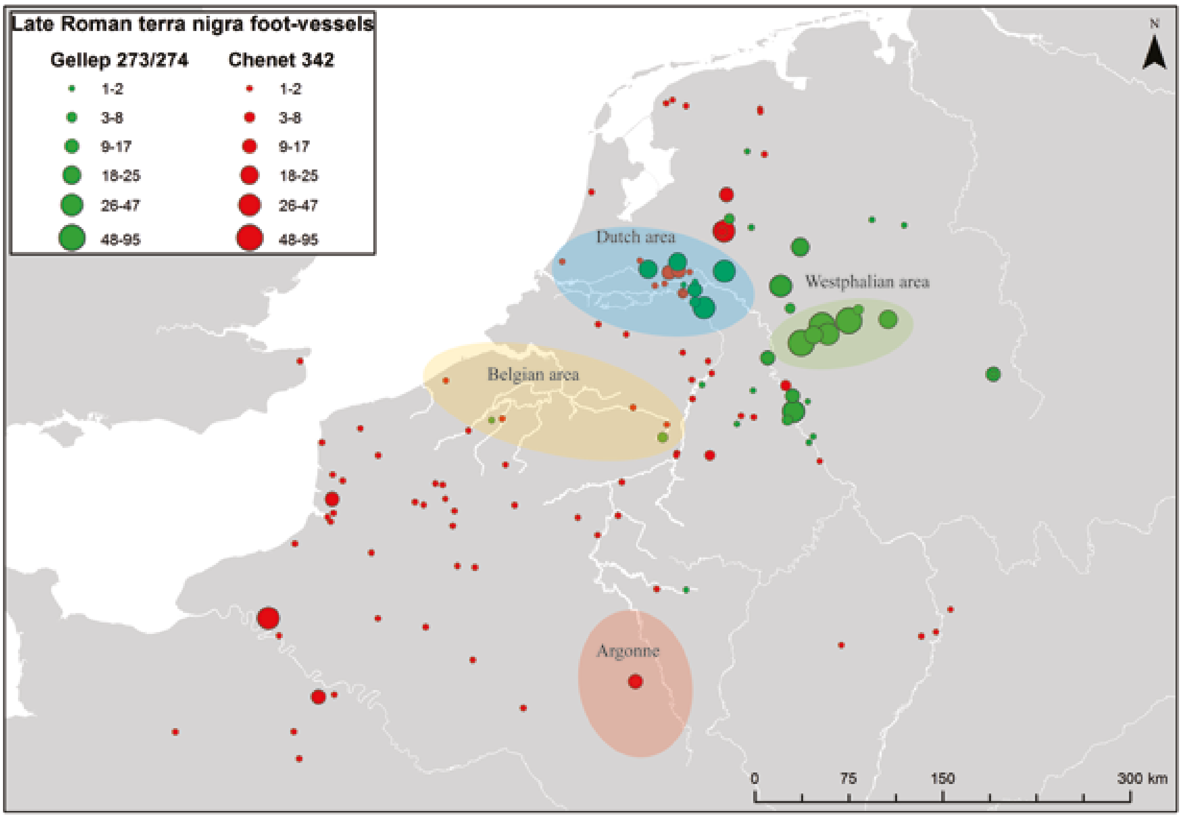


Fig. 7 Distribution map of Gellep 273-274 and Chenet 342. Samples for ceramic analyses were collected from the Westphalian (green), Dutch (blue) and Belgian (yellow) areas. The Late Roman production centre at Argonne is marked in red. – (Map V. Van Thienen from the data provided by C. Agricola and S. Heeren).

pits. Evidence of localised production is only known from Lavoye (dép. Meuse/F) in association with a kiln and a burial dated around 360 AD (Chenet 1941, 92). Production in the Argonne area is often assumed but lacks direct evidence.

Distribution

The general distribution of the LRTN foot-vessels is concentrated mainly to the region stretching from north-west Germany to the Dutch river area over the eastern Netherlands, with a wider dispersion in other parts of Germany, the Netherlands, Belgium and France. A distinction has been made here between the Chenet 342 and the Gellep 273/274. It has to be noted that this distribution is subject to potential misidentifications. Additionally, this map (**fig. 7**) is not an exhaustive overview of all types of LRTN, but simply reflects the state of research into the foot-vessels described above. From this map, we can see a large, dense concentration of Gellep-vessels distributed along the Rhine, mostly on the east bank. The Chenet-vessels are more widely dispersed in lower concentrations per site with only sporadic large quantities. The general distribution stretches mainly from present-day Frisia in the northern Netherlands to the Rhine in the Alsace region and the Seine in France, with only a few exceptions known from south of the Seine. When the Chenet and Gellep foot-vessel types are separated, it becomes clear that there are two different patterns with a significant overlap in the Dutch river area.

But to what extent does this distribution reflect the actual spread of these foot-vessels in antiquity? The distribution might be distorted due to unequal attention for this ceramic group in various areas or mark a regional distinction in the knowledge and interest in the 4th and 5th centuries. To the extent of our knowledge, we can issue some statements on this matter. First, the lack of finds in the coastal area of the western Netherlands might be attributed to flooding and unfavourable discovery conditions. As was also argued recently for other groups of material culture like Late Roman Samian ware, glass and brooches (Heeren/van der Feijst 2017, 365-375. 406-408). In contrast, the relative scarcity of the southern Netherlands and north-western part of Belgium appears authentic, given the recent extensive studies on these parts (Roymans/Heeren/De Clercq 2017; Van Thienen 2016)[2]. Second, the absence of finds in the Trier-Moselle area is less secure and more research is needed. However, it has to be noted that the important work of L. Hussong and H. Cüppers on the Trierer Kaiserthermen (1972) holds no foot-vessels, nor does the work of H. Bernhard (1984/1985) on the Upper Rhine. Although H. Bernhard studied other types of terra nigra, differing both in form (low and wide bowls) and in fabric (brownish rather than black/grey) to the material presented here, he specifically states that the Chenet 342 form does not occur in his study area and only two finds could potentially be related to the Chenet type (Bernhard 1984/1985, 92-93). And third, although the more dispersed distribution in southern Belgium and northern France could be argued to be influenced by the current state of research, the extensive work performed in Belgium (e.g. Brulet/Vilvorder/Delage 2010) and in France in the areas of Paris (e.g. Van Ossel 1992; Gaidon-Bunuel/Barat/Van Ossel 2006; Van Ossel/Séguier 2006) and Pas-de-Calais (e.g. Bouquillon/Leclaire/Tuffreau-Libre 1994; Seillier 1991) argues a reliable reflection of the overall distribution pattern. Furthermore, other groups of material culture from this period, like brooches and hairpins, demonstrate more or less a similar distribution (Böhme 1974; Heeren 2017).
To conclude on the distribution pattern, we have to keep in mind that not all typological identifications of LRTN are easily compared and that regional differences could be influenced by variations in soil types or archaeological visibility. However, the supra-regional pattern, i.e. the near absence of these LRTN foot-vessels in the Trier-Moselle area and south of the Seine, as well as the high numbers of vessels from both Chenet and Gellep typologies in the Dutch river area, is believed to reflect the historical reality in antiquity.

CERAMIC ANALYSES

Methodology

This comparative study uses sherds from both Gellep and Chenet type foot-vessels from a total of 27 sites from Germany, the Netherlands and Belgium (**tab. 1**). The first macroscopical and microscopical observations focus on surface and fabric properties. The second part applies geochemical and petrographic analyses to determine the chemical and mineralogical composition of this ware to investigate matters of technology, provenance and distribution. In total, 397 sherds were analysed by XRF and 102 thin sections were studied by ceramic petrography, of which a selection of 37 thin sections was directly compared for production group identification. At the present stage of investigation, the two analytical data sets are not correlated as the sample overlap for various reasons is very limited. However, their general results regarding production diversity and possible trade are comparable and complemental. It should be added that the interpretation of the ceramic analyses is severely hampered by the lack of excavated workshops and of knowledge on the technological variation within each workshop as well as by the lack of research into the effects of clay levigation.

country	site	CP	XRF	country	site	CP	XRF
B	Gavere	1		NL	Beneden Leeuwen	1	
B	Kruishoutem	1		NL	Bennekom		14
B	Lanaken	3		NL	Beuningen	3	1
B	Lummen	4		NL	Breda	8	
B	Oudenburg	24		NL	Cuijk	1	
B	Temse	1		NL	Didam-Aalsbergen		9
B	Tongeren	3		NL	Ede		16
				NL	Geldrop	1	
D	Borken-West	4	38	NL	Ressen	5	3
D	Castrop-Rauxel/Ickern	6	64	NL	Rijswijk	10	
D	Essen-Hinsel		38	NL	Tiel-Passewaaij	11	1
D	Kamen-Westick new finds	1	45	NL	Wehl	2	46
D	Soest-Ardey	1	11	NL	Wijchen	1	
D	Zeche Erin new finds		33	NL	Wijk bij Duurstede	10	

Tab. 1 Number of samples analysed by ceramic petrography (CP) and X-ray fluorescence (XRF) per site. – Total number of samples CP = 102; XRF = 397.

Chemical analyses by portable XRF

A portable energy dispersive X-ray fluorescence (P-XRF) device of the type XL3t 900s He GOLDD+ by the company Thermo Scientific Niton was used to perform the geochemical analyses. The spectrometer has a 50 kV X-ray tube with Ag anode and a measuring spot of 8 mm². The measurements were performed in air at room temperature (c. 20 °C). A specific empirical calibration for archaeological pottery was used, based upon the geochemical data of 140 sherds of different fabrics which have been formerly analysed with wavelength dispersive X-ray fluorescence (WD-XRF) (Helfert 2013, 25). The total measurement time amounted to 360 s depending on the different measuring filters (Helfert 2013, 31): 120 s for the light filter, 90 s for the main filter, 90 s for the low filter and 60 s for the high filter. In total 19 elements were measured and used for the evaluation: Si, Al, Ti, Fe, Mn, Ca, K, P, V, Cr, Ni, Cu, Zn, Rb, Sr, Y, Zr, Nb and Ba. Only rim and bottom sherds have been analysed. Each sherd was measured at three different fresh breaks to reduce the contamination effects of the soil in which the samples have been deposited. Furthermore, influences of a special treatment of the surface such as coatings or sintering were avoided as well (Helfert/Böhme 2010, 21-23; Behrendt/Mielke/Mecking 2012, 95-98). To evaluate the geochemical data, the average values of the triple measurements were calculated in IBM SPSS. Working with the average value minimises the effect of inhomogeneity and temper in the fabric on the analysis (Helfert/Böhme 2010, 22; Behrendt/Mielke/Mecking 2012, 99-101).

Ceramic petrography

The selection of samples was driven by the intention to cover most of the distribution area as well as the fabric variety of the LRTN foot-vessels. Rim and bottom sherds were preferred for thin sectioning (0.03 mm slices of ceramic material), although when these elements were not available, body sherds were selected instead. To establish the mineralogical composition and identify potential temper, the thin sections were studied under a polarising microscope (×10 to ×40) using plane polarised light (PPL) and crossed polars (XP). The petrographic analysis does not only look at the mineralogical properties of the ceramics but its technological aspects as well. The homogenisation (i.e. the kneading of the tempered fabrics) and traces of building technique are of interest to understand and characterise the craft. The effects of firing – temperature and atmosphere – as well as results of use and post-depositional alterations/pollution may also be noted. Thus, the thin section method also supplies crucial information for understanding the results of chemical analyses in terms of craft actions or later alterations.

Fabric descriptions

In the following section, we will briefly describe the fabric variety of the selected sherds from the German Hellweg region in Westphalia, the Netherlands and Belgium. These observations were made on fresh breaks either by the naked eye or under a stereo microscope with low magnification.

First, the sherds from Westphalia – both Gellep 273 and 274 – appear in one overall fabric that can be divided into two sub-fabrics. The overall distinctive feature of the general fabric is the high quality white or grey fine clay and an absence of visible temper. The surface colour varies between light grey and black, often containing spots that are darker or lighter in colour. Some vessels show a metallic hue which is caused by smoking at the end of the firing. During this process, which occurs in a reduced firing atmosphere, carbon is deposited on the surface of the pottery as lustrous carbon and causes the characteristic metallic hue (Noll 1991, 175-181; Heimann et al. 2014, 90-91). The spots at the surface of the vessels might be caused by their close position to each other in the kiln.

The first macroscopical sub-fabric (A) from Westphalia rarely contains non-plastic elements, although there are occasionally heterogeneous particles of different sizes. Very rare are bright, rounded quartz particles with a size of 0.5-1 mm. Additionally, grey or black particles of 0.5 mm are sometimes visible. Elongated pores occur rarely or in moderate quantities, of which the quantity varies for each sherd. Furthermore, grey or bright white particles are present which can be seen only in the polished breaks. The particles usually have a size of less than 0.1 mm and are moderately to heavily distributed.

The second macroscopical sub-fabric (B) from Westphalia is distinct from the first one, although the separation of these two groups can be difficult. Often it is only possible to do so based on a polished break. Besides the elongated pores of sub-fabric A, small rounded pores of 0.1-0.2 mm occur in the sherd. These pores are present in moderate to abundant quantities. The grey or black particles are more common in this group and range up to 1 mm in size. Like sub-fabric A, there are grey or bright white particles which can only be seen in the polished fractures. They are present in moderate to abundant quantities and in some sherds, the particles can measure up to 0.1-0.2 mm in size.

In contrast to the Westphalian ceramics, most of the Dutch and Belgian foot-vessels seem to be of the Chenet 342 form, although an occasional Gellep 273/274 can also be encountered. Often the fractured nature of the pots makes it difficult to typologically distinguish between Chenet or Gellep. The fabrics of the Dutch-Belgian sherds generally vary from a white/light grey colour in a fresh break to very dark grey or brown-grey, in accordance with a reduced atmosphere. Although the clay is mostly fine to very fine, the quartz grains can be seen to vary between rounded and angular, clear to clouded, and can differ much in size as well. Occasional black inclusions and micas can be observed, as well as elongated pores. Often the clay used appears to be rich in iron oxide concentrations, which is sometimes mistaken for »*chamotte*« (small red grog fragments). None of the sherds appears to have been tempered. On the surface, a mainly dark exterior was attempted, dull or polished, but lighter examples occur as well. A few samples have a metallic hue, both dark and light. Overall, the Dutch-Belgian fabrics show a technological relation to the Westphalian fabrics, but they appear in larger surface variations and seem to have less consistent fabric

properties. Furthermore, the surface and fabric variability of the Dutch-Belgian samples failed to reveal any trends with which to classify them in distinct (sub)groups.
From the observations stated above, it can be concluded that the general technique for the LRTN foot-vessels suggests a rather homogenised and well-prepared high-quality clay, and the surface and fabric variations remain within a fixed spectrum of desired effects that differs per region. A general distinction can be made between the more concentrated and consistent Westphalian fabrics, and the highly variable and more diffused distribution of a range of fabrics that have been grouped as the Dutch-Belgian fabrics until a more specified distinction can be made.

Geochemical results

The results presented here are based on the total of 397 samples from 13 different sites, of which 210 samples derive from the Netherlands and 187 from sites in the German Hellweg region in Westphalia. The samples of the Hellweg region consist of the main fabric of the vessel forms Gellep 273 and 274, whereas the Dutch samples consist of the various fabrics and vessels of the Chenet 342 form. The samples from the Netherlands cover the entire variation of the Dutch-Belgian fabrics and are thus considered as a proxy for the chemical characteristics of most Belgian vessels as well.
The relation between the elements silicium and aluminium (**fig. 8**) shows two correlation lines. One is linked to the Westphalian fabric samples while the other is mainly linked to the Dutch samples. This relation provides information about the proportion of clay and sand in the fabric. These results indicate that the correlation line of silicium and aluminium could be a sign of possibly levigated clays which derive from the same clay source (Schneider 1988; Helfert 2010). From the diagram, it is clear that the Westphalian fabric and the Dutch-Belgian fabrics were made from different clays. However, there is a spread of samples between the two correlation lines. These intersections may be caused by the adding of temper during clay preparation, depositional effects or a mistaken fabric classification. The scattered samples can also be explained by the scattering of the element silicium caused by the measuring method of P-XRF (Helfert et al. 2011, 12). Additionally, below the correlation lines is a small group of outliers that does not match the other samples. These differences in silicium and aluminium content could be caused by adding a different temper. It is possible that these samples are exceptions or derive from a different clay source.
In order to validate these results, other elements were compared as well. The chart of titanium and niobium (**fig. 9**) shows an obvious separation between the Dutch samples and the ones from the Hellweg. In the case of the Hellweg samples, it is possible to observe a faint separation in two groups, although the difference is not very distinct. For this reason, the Hellweg samples are addressed here as one chemical group. Compared to the Dutch, the Hellweg samples are characterised by a higher titanium and niobium content. Moreover, the Dutch samples form a clearly defined group with lower titanium and niobium contents. Nevertheless, there is a small group of Dutch samples overlapping with the ones from the Hellweg. In order to verify or falsify these results, additional bivariate and trivariate diagrams were made.
More confirmation to distinguish between a geochemical group from the Hellwig samples and a separate group for the Dutch samples can be found in the diagram of the elements iron and niobium (**fig. 10**). Furthermore, the group of Dutch samples showing an intersection with the samples of the Hellweg in the previous diagram of titanium and niobium (**fig. 9**), is separated from the remaining samples and form another group. The trivariate diagram of the elements iron, potassium and niobium (**fig. 11**) confirms both the previous results and the formation of the groups. In all diagrams, a few samples of the Hellweg fabric are visible in the group of the Dutch samples. This can be explained by wrong classification, measurement errors or exceptions, or be a true example of an exchange between the two areas.

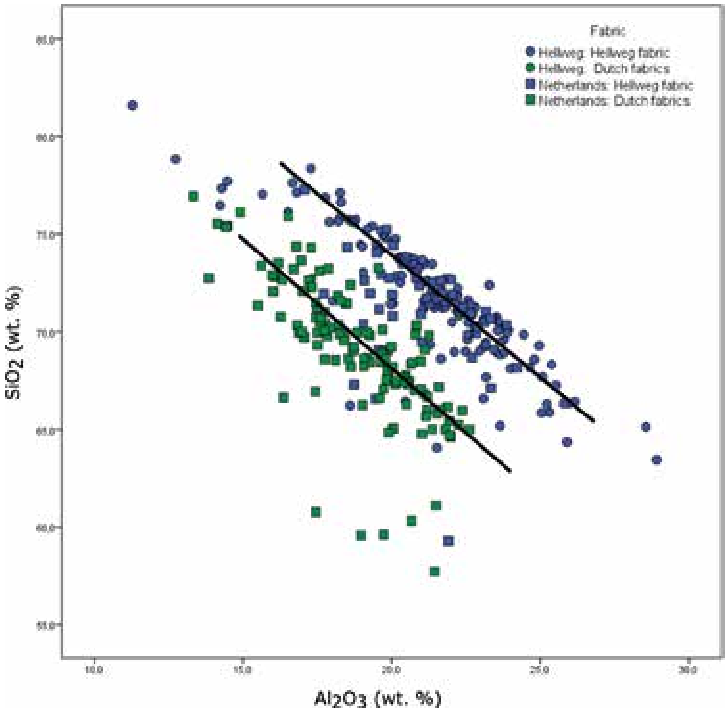


Fig. 8 Diagram of SiO_2 and Al_2O_3. The Hellweg samples (circles) and Dutch samples (squares) form two different correlation lines consisting of the Westphalian fabric (blue) and the Dutch-Belgian fabrics (green) (n = 397). – (Illustration C. Agricola).

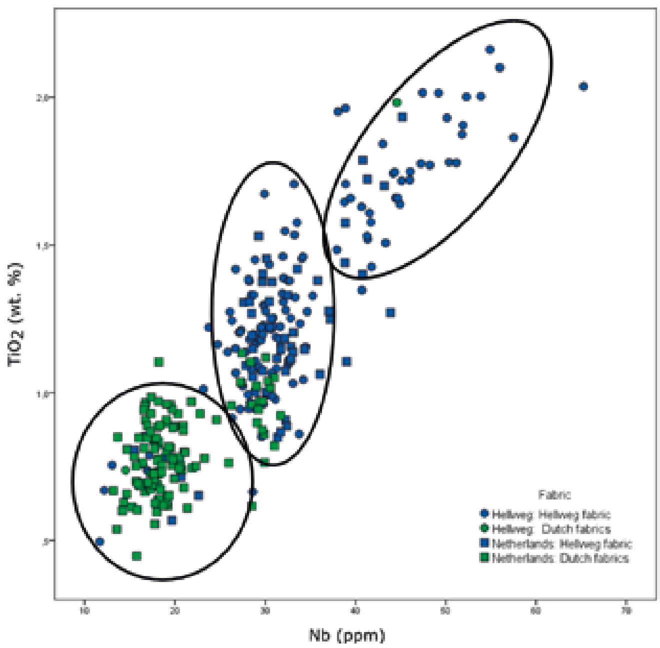


Fig. 9 Diagram of TiO_2 and Nb. Due to the different contents of titanium and niobium, two different groups are emerging between the Hellweg and Dutch samples (n = 397). – (Illustration C. Agricola).

Petrographic results

The petrographic results presented here are based on a total of 102 samples from Belgium, the Netherlands and Germany. From Belgium and the Netherlands, a total of 83 samples were analysed, from which a selection of 25 thin sections was studied in direct comparison with twelve Westphalian samples. This Westphalian material can initially be classified into five groups (preliminary results), whereas the Dutch-Belgian material has a different classification into four groups. The Dutch-Belgian petrographic groups are hereafter referred to as the Low Countries groups. In order to assess the overall interregional character of the LRTN

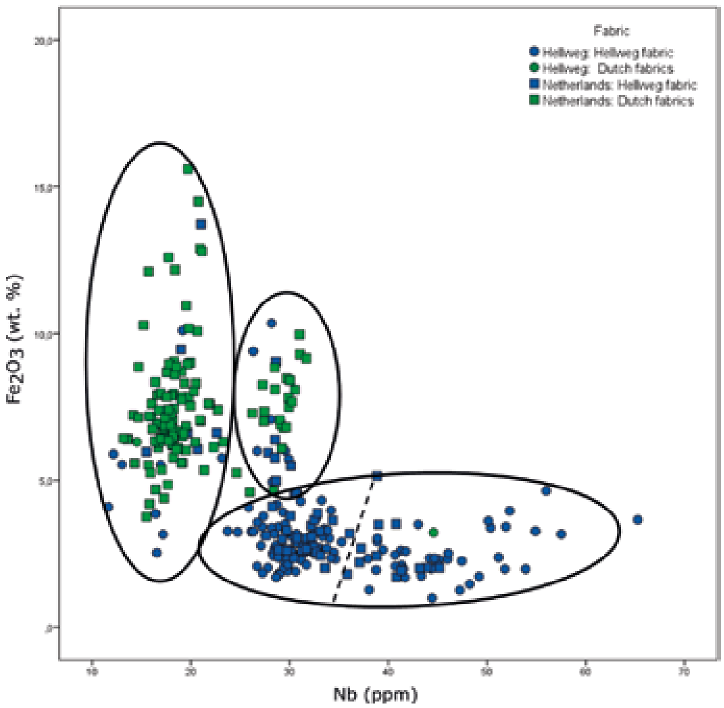


Fig. 10 Diagram of Fe_2O_3 and Nb. Discernible is the separation between the Hellweg and the Dutch samples. A small group differs from the main group of Dutch-Belgian fabrics by higher niobium contents (n = 397). – (Illustration C. Agricola).

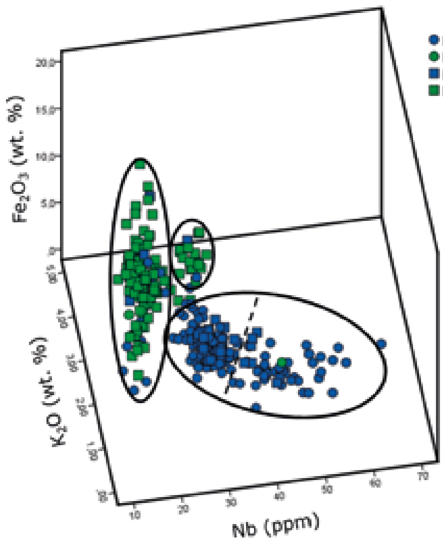


Fig. 11 Diagram of Fe_2O_3, K_2O and Nb. The group formation in **figs 8-10** shows also up in this diagram of the three elements and confirms the differentiation between the Westphalian and Dutch-Belgian fabrics (n = 397). – (Illustration C. Agricola).

foot-vessels, only the most similar groups of both regions have been chosen to be presented here. We will, therefore, focus on the results of thin section analyses from the site of Castrop-Rauxel/Ickern group 1 (CR/I1; 4 samples) and the Low Countries group 1 (LC 1; 50 samples), as they point to a possible link between all areas. To make a statistical comparison of the sorting of the naturally occurring fine fractions of the clays, the grains cut by the horizontal cross-hair in the ocular (100× magnification) at four random locations in the sample have been measured (longest axis) and counted.

Castrop-Rauxel/Ickern (CR/I) – group 1

The first group is labelled the Castrop-Rauxel/Ickern (CR/I) – group 1 and consists of four samples which share a set of mineralogical characteristics (**tab. 2**). This group represents the main group among the twelve West-

observations	CR/I 1 (Ts 1)	CR/I 1 (Ts 2)	LC 1A1 (Ts M10)	LC 1A1 (Ts M13)
coarseness	medium	fine	medium	medium
sorting	sorted	sorted	sorted	sorted
silt	abundant	rich	abundant	abundant
fine sand	very few	common	very few	sparse
sand	–	–	–	–
mica	common	common	common	common
iron oxide	common	sparse	common	common
accessory minerals	amphibole/pyroxene, zircon, muscovite, isotropic minerals	amphibole/pyroxene, zircon, muscovite, isotropic minerals	amphibole/pyroxene, zircon, muscovite, biotite, isotropic minerals	amphibole/pyroxene, zircon, muscovite, isotropic minerals
plant fragments	–	very few	–	–
flint grains	common	common	very few	very few
temper				
type	natural/levigated	natural/levigated	natural/levigated	natural/levigated
max. grain	0.4 mm	0.5 mm	0.4 mm	0.6 mm

Tab. 2 Description of the mineralogical similarities from a selection of four representative thin sections from the CR/I 1 and the LC 1 groups. – (Table O. Stilborg).

phalian thin sections considered for this study[3]. They are made from silt rich clays with dark minerals, zircon, muscovite needles, small grains of an isotropic mineral and small flint grains. No temper has been added. There are some differences in the amount and sorting of the non-plastic fractions (max. grain varies between 0.4 and 0.6 mm) as well as in the amount and distribution of the iron oxide, but the differences correspond to what can be expected within the same clay bed. In addition, the sorting of two of the samples indicates that they may have been levigated. When we consider the relationship between the number and the average size of these grains in the fine fraction of three of the samples (cf. **fig. 14**), we see that they are situated along a line. The two presumably levigated samples have the highest counts of grains and the smallest average grain sizes in accordance with what would be the expected result of a levigation. The effects of various levigation strategies in relation to different types of raw clays is a question that lacks sufficient research.

Low Countries (LC) – group 1

The second group of petrographic samples is labelled the Low Countries (LC) – group 1. These samples are characterised by sorted clays rich in silt and with a limited number of dark minerals, which often include some grains of zircon and isotropic minerals (**tab. 1**). The amount of muscovite (white mica) varies and is high in some fabrics. Most fabrics contain a few microcrystalline grains, such as chert or siltstone. The clays are probably levigated although this quality of raw clay can occur naturally as well. LC 1 can be divided into five subgroups. Both subgroup 1A and 1A1 distinguish themselves based on their general likeness in sorting (**fig. 12a-b**). Their max. grain size varies from 0.3 to 0.9 mm. Additionally, the subgroup 1A1 is characterised by a large amount of muscovite and the large similarity of the different samples. Subgroup 1B distinguishes itself by a high content of silt with a max. grain size of 0.5 mm (**fig. 12c**), whereas 1C has less silt (**fig. 12d**). The final subgroup 1D is defined mainly by a larger amount of microcrystalline grains (**fig. 12e**).

Comparison of LC 1 and CR/I 1

The dominance of group 1 among the Low Countries material is evident from the presence of 50 samples out of the total 83 gathered from the Netherlands and Belgium. Subgroups 1A and 1A1 together take up

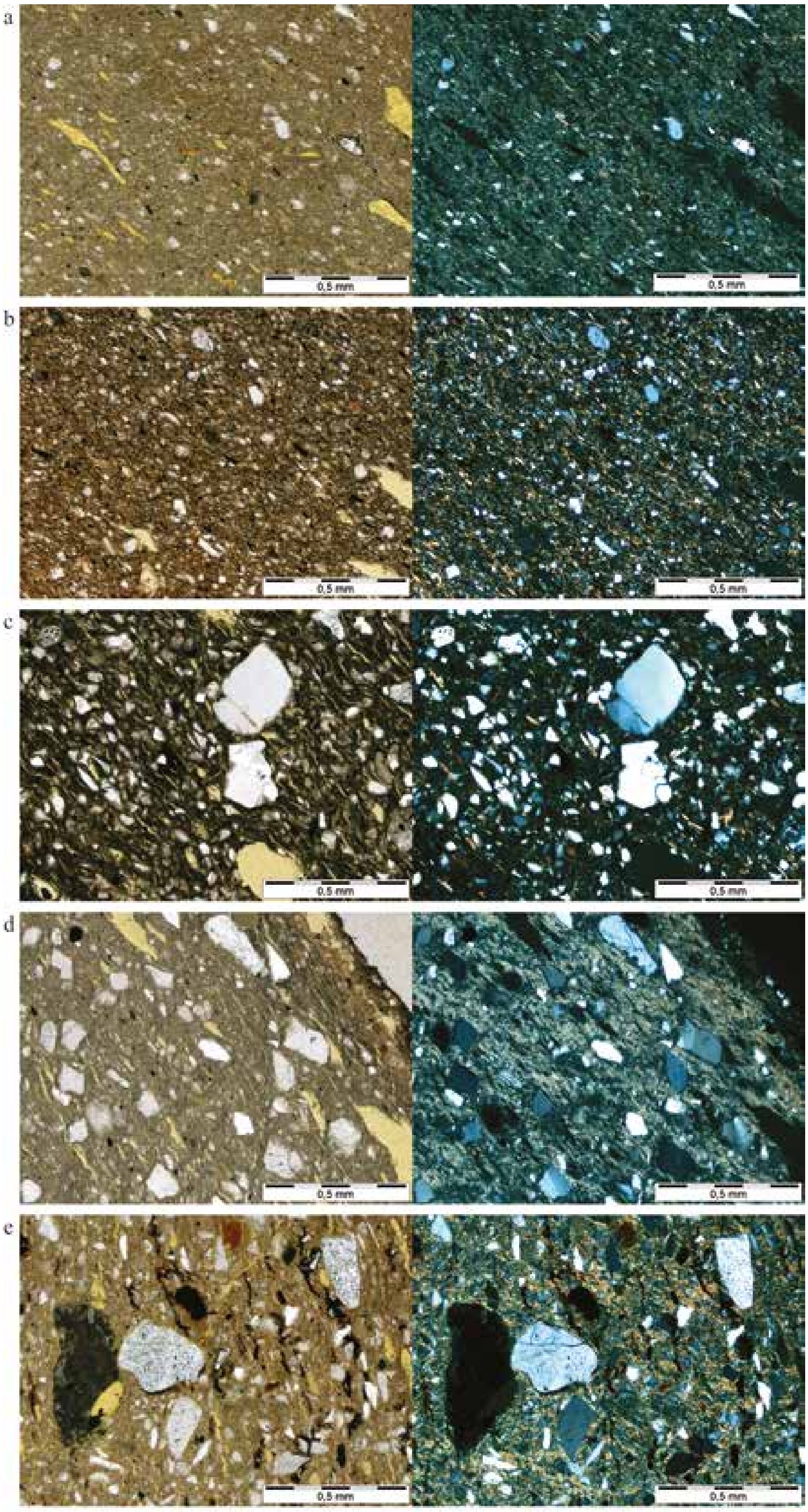
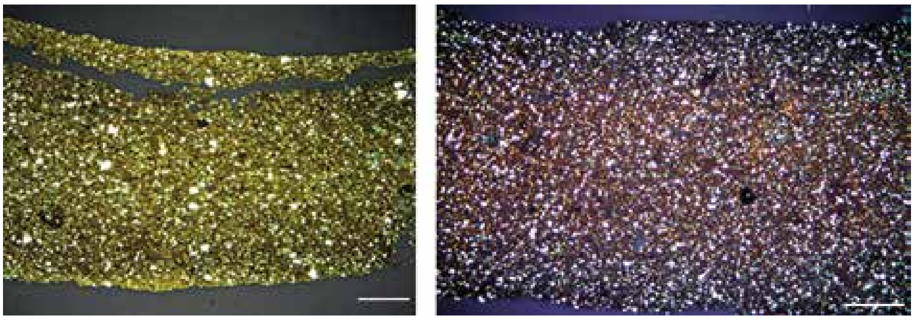


Fig. 12 Microphotographs of thin sections in plain polarised light (PPL) and crossed polars (XP) from the Dutch-Belgian (DB) subgroups: **a** subgroup 1A (Wehl, prov. Gelderland/NL). – **b** subgroup 1A1 (Lummen, prov. Limburg/B). – **c** subgroup 1B (Breda, prov. Noord-Brabant/NL). – **d** subgroup 1C (Tongeren, prov. Limburg/B). – **e** subgroup 1D (Wijk bij Duurstede, prov. Utrecht/NL). – (Photos V. Van Thienen). – Scale bar 0.5 mm.

approximately two-thirds of this group, followed by 1D with a quarter of the population. Subgroups 1B and 1C are less frequently occurring. Samples of 1B are only found in Breda (prov. Noord-Brabant) in the Netherlands and subgroup 1C only presents itself on the Belgian sites of Oudenburg (prov. West-Vlaanderen)

Fig. 13 Microscope photo of thin sections: **1** Temse (prov. Oost-Vlaanderen/B), LC 1A. – **2** Castrop-Rauxel/Ickern (Kr. Recklinghausen/D), CR/I 1. – (Photos O. Stilborg). – Scale bar 1 mm.

1  2

and Tongeren (prov. Limburg). The main subgroup 1A has the largest spread over 12 of the 18 sites, followed by 1A1 and 1D equally showing up on little less than half of the sites.

From the description given in **table 2**, it becomes apparent that there is a good mineralogical correlation between the thin sections from LC 1A(1) and the smaller CR/I 1 (**fig. 13**). Furthermore, when the sorting is compared by analysing the fine fraction, there is a good match between the samples with a finer sorting from both groups, presumably indicating levigation (**fig. 14**). The coarser sorted samples of the CR/I 1 may be examples of less well-executed levigation or of fabrics made from the raw clay (observe the correlation line in the chemical results, **fig. 8**). Based on mineralogy and sorting, this small assemblage of vessels might represent products from the same production area or workshop. However, the geochemical results of the four CR/I samples are located in the Westphalian fabrics group and contradict the shared production notion. Given the small number of samples, the results remain inconclusive.

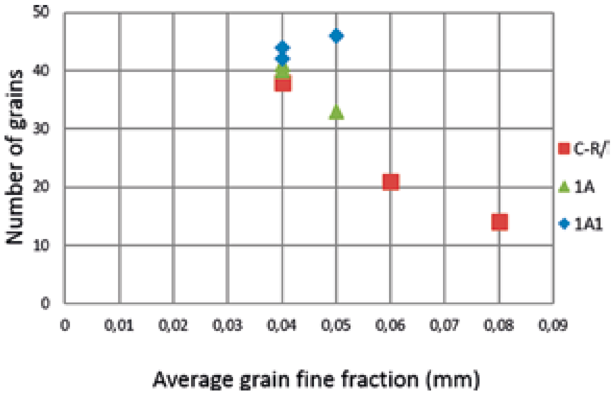


Fig. 14 Diagram of the relationship between number of grains and average grain size in the fine fraction of the clays in selected thin section samples of LC 1(A) from Belgium (Oudenburg, Lummen, Kruishoutem, Lanaken, Temse), the Netherlands (Wijk bij Duurstede); and of CR/I 1 from Westphalia (Castrop-Rauxel/Ickern). – (Illustration O. Stilborg).

To reach a higher degree of certainty on the matter, more comparative analysis is necessary, preferably from secure production wasters.

DISCUSSION ON PRODUCTION AND CONSUMPTION OF LATE ROMAN TERRA NIGRA FOOT-VESSELS

The geochemical and petrographic results indicate a complex production process which cannot be explained by a singular model. Firstly, from the chemical analysis, it becomes clear that there is a distinction between the Westphalian and the Dutch samples related to differences in the clay source. Secondly, the general conclusion derived from the petrographic comparison is the use of levigated clays, which is supported by the chemical results for aluminium and silicium (**fig. 8**). Whether this levigation is of natural or anthropogenic origin is not clear; although, it is certain that the majority of the Westphalian samples has a different clay source than the Dutch and, in extension, the Belgian samples. Yet, this does not tell us how many workshops or production centres there were, nor their exact location. Nevertheless, the similarities in mineralogy, grain size and count between the petrographic LC 1 and the CR/I 1 (**tab. 1; figs 13-14**) could indicate a shared origin although the geochemical results rather point to a shared production technique. In contrast to these provenance uncertainties, it is clear that there are at least two larger productions present based on levigated clays of varying qualities: one in the Dutch-Belgian area and one in the Westphalian area (possibly the Hellweg region), alongside a number of smaller productions or imitations. The latter to some extent used natural fine clays with similar characteristics, probably due to the same general geological setting, or had knowledge of the levigation technique to clean the clay.

Furthermore, the differences in production can be interpreted as a matter of scale. D. P. Peacock's modes of production (1982) examined the different scales of ceramic production in the Roman Empire and C. Caple (2006) linked this model to object scale. Following these models, the LRTN foot-vessels are craft products rather than the result of mass production: hundreds in contrast to thousands of comparable objects in the archaeological record (Caple 2006, 17-18). Craft products may come from »individual« or »nucleated« workshops, and are defined as products made principally for exchange or sale and most likely distributed in an organised fashion. If the LRTN was the result of a »manufactory«, we would expect to see larger numbers of uniform objects.

Another mode of organised production offered by D. P. Peacock (1982) is the »estate and military production«, which involves one or more craftsmen making products for an organisation, such as the military, a villa-estate, the provincial or state government. This implies an employment by that organisation with access to specialised equipment and facilities. Production organised in such a manner would correspond with the larger productions indicated by the geochemical results. A scenario can be imagined in which former manufactory workers were employed by newly rising estates or military productions to serve local or regional needs in the Rhine frontier zone and the surrounding areas.

In addition, not much consensus exists on the origin, function and symbolic value of these Late Roman foot-vessels. Both G. Chenet (1941) and R. Pirling (1974) already considered it a Germanic idea in a Roman body, indicating a Germanic vessel made by Roman techniques as well as workshops. The evidence presented here supports the notion of multiple production centres. When the distribution is considered as evidence for a potential origin or provenance source, at least one major production must be located in the Westphalian region, conforming to the Westphalian fabric, outside the Roman Empire. The dense distribution of the Gellep shapes along the Lower Rhine frontier, the earlier dates and the link with the von Uslar type pots from the 2nd and 3rd century (von Uslar 1938) argue for a Germanic origin. G. Chenet, however, noted a link with Iron Age vessels (Chenet 1941, 91) and remarked that the foot-vessel returned to Gaul at a certain point in the 3rd century. Given that the basic S-shaped form is a rather intuitive shape for a drinking vessel, it also occurs in other cultures over time, such as in the Iron Age or Hellenistic Greece for instance. This argues against a singular development. In either case, whether they have a Roman or Germanic heritage, the distribution of the more dispersed Chenet 342 and the clustered Gellep 273/274 implies that this form was widely appreciated in northern Gaul and the neighbouring regions across the Rhine.

To fully understand the value of the LRTN foot-vessels, it is necessary not only to discover its origin but also its function and use. Although other uses cannot be ruled out at this point, we continue on the assumption that these foot-vessels served a drinking purpose. Without knowledge of its place in consumption, there is little way to reconstruct their social or cultural value. The interregional comparison, however, permitted us to compare contextual information on a larger scale than before. It is observed that there is a lack of a clear association to one specific social class or cultural group. A good explanation can be provided by considering these Late Roman foot-vessels as products of merging identities and social practice. It is likely that the social aspect of drinking became tied to these foot-vessels during the 3rd and 4th century and formed an intrinsic part in the uniting of different groups present in a multicultural region. This importance of drinking practices is supported by glass cups and beakers (Esmonde Cleary 2013, 391-392; Foy 1951; Isings 1957, 129-143; Pirling/Siepen 2006, 239-261). By the later 4th and 5th centuries, the foot-vessels would have been part of

a merged regional tradition and identity of the larger northern frontier zone, in multiple layers of the military and rural-civilian society.
This explanation is supported further by the dense overlap zone on both sides of the northern Rhine frontier (i.e. Dutch river area), which indicates that the frontier zone served as the largest consumption market, and argues the influence of social and cultural interaction in the origin and development of the LRTN foot-vessels. Moreover, this socio-cultural change could explain the observed patterns without having to resort to ethnicity as an explanatory factor for these ceramics. Furthermore, this matches the observed wide variability in shape, type and fabrics as well. If the primary element was to partake in social drinking, it would have been less important in what style, technique or material the drinking vessel was made. Consequently, the type of drinking vessel was chosen based on personal taste, individual resources and access to production workshops or consumer markets, rather than guided by their workshop provenance.
Finally, it has to be noted that other elements will have played an active role in the distribution and production as well, given that the studied regions are connected by trade, mobility and (return) migration in both directions (Halsall 2007). The landscape is highly connected by the many navigable rivers (especially the Rhine, Ruhr and Meuse); but also by the North Sea coast and the land roads connecting the hinterlands of northern Gaul with the Rhine frontier. Easy transport and access to interregional networks had undoubtedly much influence over the directionality of trade, travel and migration. Many questions remain to be answered, but the results of this interregional study demonstrate the value of the LRTN as a ceramic ware for investigating changes in north-western Europe during the 4th and 5th century.

CONCLUSIONS ON THE FIRST CHARACTERISATION

From the interregional fabric, geochemical and petrographic comparison of the LRTN foot-vessels of forms Chenet 342, Gellep 273 and 274, it can be concluded that not just one workshop was responsible for the production of this pottery. At least two major productions using different clay sources have been identified, although their provenance remains uncertain. The relation with the fabrics argues a large production in the Westphalian area, possibly the Hellweg region, and another major production in the Dutch-Belgian territory. These major productions created products of a certain fine quality, evident from the selection of fine clays and the probable use of levigation and wheel-turning techniques, likely meant to have a tableware function. In addition to large-scale productions, smaller workshops have probably existed as well on the level of a household or a small craft workshop.
The discussion concerning the consumption of these foot-vessels has less tangible proof than its production, although their distribution, the lack of socio-cultural distinction in sites or contexts and the possible function as tableware meant for drinking argue a development caused by the merging of Germanic, Roman, military, rural and civilian identities from the 3rd to the 5th century. This hybridisation could have resulted in a joined »northern« regional identity of the general Lower Rhine frontier zone.

Acknowledgements

This study is related to the research project »Decline and fall? Social and cultural dynamics in the Low Countries in the Late Roman Empire (AD 270-450)« supported by the Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO) and the Fonds Wetenschappelijk Onderzoek – Vlaanderen (FWO) (GA04612N); and the ongoing dissertation project of C. Agricola »Der Wert des Besonderen – Spätrömische Terra Nigra des 3. bis 5. Jahrhunderts« which is embedded in the Graduiertenkolleg 1576/2 »Wert und Äquivalent« at the Goethe-Universität Frankfurt am Main. – Furthermore, we wish to thank the following for allowing us to perform analyses on their collections: Agentschap Onroerend Erfgoed, Gallo-Romeins Museum Tongeren, Gemeentemuseum Temse, Studiebureau Archeologie, Provinciaal Depot Bodemvondsten Gelderland, Bureau Erfgoed Breda, Rijksmuseum voor Oudheden, Leiden, and LWL-Archäologie für Westfalen, Außenstelle Münster.

Notes

1) All references to Hellweg pottery and Westphalian (sub)fabrics are part of the ongoing dissertation of C. Agricola at the Goethe-Universität Frankfurt am Main.

2) Results of the »Decline and fall?« project (2012-2016) on Late Roman archaeology in the Low Countries were published in Roymans / Heeren / De Clercq 2017, others can be found in the dissertation of Van Thienen (2016) or are forthcoming.

3) This comparison is based on the ongoing pilot study of the petrography of Westphalian LRTN by C. Agricola and O. Stilborg and will be extended to more samples. Although it is acknowledged that a group of four samples is small, its identification sufficiently indicates the character of the production groups that are explored in this interregional study and thus provides a working model to be tested with future analyses.

References

Agricola unpubl.: C. Agricola, Der Wert des Besonderen – Spätrömische Terra Nigra des 3. bis 5. Jahrhunderts [ongoing diss., Univ. Frankfurt a. M.].

Bakker 2015: L. Bakker, Spätrömische Terra nigra mit Rollstempeldekor aus Kastell »Haus Bürgel« bei Monheim-Baumberg, Kreis Mettmann (Nordrhein-Westfalen / D). In: P. Henrich / Ch. Miks / J. Obmann / M. Wieland (eds), Non solum … sed etiam. Festschrift für Thomas Fischer zum 65. Geburtstag (Rahden / Westf. 2015) 1-10.

Bernhard 1984/1985: H. Bernhard, Studien zur spätrömischen Terra Nigra zwischen Rhein, Main und Neckar. Saalburg-Jahrbuch 40-41, 1984/1985, 34-120.

Behrendt / Mielke / Mecking 2012: S. Behrendt / D. P. Mielke / O. Mecking, Die portable Röntgenfluoreszenzanalyse (P-RFA) in der Keramikforschung: Grundlagen und Potenzial. Restaurierung und Archäologie 5, 2012, 93-110.

Böhme 1974: H. Böhme, Germanische Grabfunde des 4. und 5. Jahrhunderts zwischen unterer Elbe und Loire. Studien zur Chronologie und Bevölkerungsgeschichte. Münchner Beiträge zur Vor- und Frühgeschichte 9 (München 1974).

Bouquillon / Leclaire / Tuffreau-Libre 1994: A. Bouquillon / A. Leclaire / M. Tuffreau-Libre, La terra nigra tardive à Arras (Pas-de-Calais): études en laboratoire. In: La céramique du Bas-Empire en Gaule Belgique et dans les régions voisines. Actes de la table ronde de céramologie gallo-romaine, Arras, 8-10 octobre 1991. Revue du Nord 4 (Villeneuve d'Ascq 1994) 213-224.

Brulet / Vilvorder / Delage 2010: R. Brulet / F. Vilvorder / R. Delage (eds), La céramique romaine en Gaule du Nord. Dictionnaire des céramiques. La vaisselle à large diffusion (Turnhout 2010).

Caple 2006: Ch. Caple, Objects: reluctant witnesses to the past (London, New York 2006).

Chenet 1941: G. Chenet, La céramique gallo-romaine d'Argonne du IV[e] siècle et la terre sigillée décorée à la molette. Fouilles et documentes d'archéologie antique en France 1 (Mâcon 1941).

Erdrich 1998: M. Erdrich, Terra Nigra-Fussschalen wie Chenet 342 oder Gellep 273: eine salisch-fränkische Keramikgattung. Germania 76/2, 1998, 875-884.

van Es 1967: W. A. van Es, Wijster: A native village beyond the imperial frontier. Palaeohistoria 11, 1967, 28-595.

Esmonde Cleary 2013: S. Esmonde Cleary, The Roman West, AD 200-500. An Archaeological Study (Cambridge 2013).

Foy 1995: D. Foy, Le verre de l'antiquité tardive et du haut moyen âge: typologie, chronologie, diffusion (Guiry-en-Vexin 1995).

Gaidon-Bunuel / Barat / Van Ossel 2006: M. A. Gaidon-Bunuel / Y. Barat / P. Van Ossel, Les céramiques du mithraeum de Septeuil (Yvelines): un ensemble du troisième quart du IV[e] s. de notre ère dans la région parisienne. In: Van Ossel / Séguier 2006, 137-160.

Halsall 2007: G. Halsall, Barbarian migrations and the Roman West, 376-568 (Cambridge 2007).

Heeren 2017: S. Heeren, From Germania Inferior to Germania Secunda and beyond. A case study of migration, transformation and decline. In: Roymans / Heeren / De Clercq 2017, 149-178.

in prep.: S. Heeren, Draaischijfaardewerk uit de Romeinse tijd. In: J. G. Aarts / S. Heeren (eds), Wijk bij Duurstede-De Geer in de Romeinse tijd en vroege middeleeuwen. Graven naar de wortels van Dorestad (in prep.).

Heeren / van der Feijst 2017: S. Heeren / L. van der Feijst, Fibulae uit de Lage Landen. Brooches from the Low Countries. Beschrijving, analyse en interpretatie van een archeologische vondstcategorie (Amersfoort 2017).

Hegewisch 2011: M. Hegewisch, Zur Drehscheibenkeramik im Westen der Germania Magna. Anfänge, Weiterentwicklung und Verbreitung. In: Drehscheibentöpferei im Barbaricum. Technologietransfer und Professionalisierung eines Handwerks am Rande des Römischen Imperiums. Akten der internationalen Tagung in Bonn vom 11. bis 14. Juni 2009. Bonner Beiträge zur Vor- und Frühgeschichtlichen Archäologie 13 (Bonn 2011) 119-174.

Heidinga / Offenberg 1992: H. A. Heidinga / G. A. M. Offenberg, Op zoek naar de vijfde eeuw. De Franken tussen Rijn en Maas (Amsterdam 1992).

Heimann et al. 2014: R. B. Heimann / G. Heimann / J. Maggetti / M. Maggetti, Ancient and Historical Ceramics: Materials, Technology, Art, and Culinary Traditions (Stuttgart 2014).

Helfert 2010: M. Helfert, Groß-Gerau II. Die römischen Töpfereien von Groß-Gerau »Auf Esch«. Archäologische und archäometrische Untersuchungen zur Keramikproduktion im Kastellvicus. Frankfurter Archäologische Schriften 11 (Bonn 2010).

2013: M. Helfert, Die portable energiedispersive Röntgenfluoreszenzanalyse (P-ED-RFA). Studie zu methodischen und analytischen Grundlagen ihrer Anwendung in der archäologischen Keramikforschung. In: B. Ramminger / O. Stilborg (eds), Naturwissenschaftliche Analysen vor- und frühgeschichtlicher Keramik. III: Methoden, Anwendungsbereiche, Auswertungsmöglichkeiten. Universitätsforschungen zur Prähistorischen Archäologie 238 (Bonn 2013) 15-47.

Helfert / Böhme 2010: M. Helfert / D. Böhme, Herkunftsbestimmung von römischer Keramik mittels portabler energiedispersiver Röntgenfluoreszenzanalyse (P-ED-RFA). Erste Ergebnisse einer anwendungsbezogenen Teststudie. In: B. Ramminger / O. Stilborg (eds), Naturwissenschaftliche Analysen vor- und frühgeschichtlicher Keramik. I: Methoden, Anwendungsbereiche, Auswertungsmöglichkeiten. Universitätsforschungen zur Prähistorischen Archäologie 176 (Bonn 2010) 11-30.

Helfert et al. 2011: M. Helfert / O. Mecking / F. Lang / H.-M. von Kaenel, Neue Perspektiven für die Keramikanalytik. Zur Evaluation der portablen energiedispersiven Röntgenfluoreszenzanalyse (P-ED-RFA) als neues Verfahren für die geochemische Analyse von Keramik in der Archäologie. Frankfurter Elektronische Rundschau zur Altertumskunde 14, 2011, 1-30.

Hermsen/Bartels 2007: I. Hermsen / M. H. Bartels, Een afdaling in het verleden: archeologisch onderzoek van bewoningsresten uit de prehistorie en de Romeinse tijd op het terrein Colmschate-Skibaan (gemeente Deventer). Rapportages Archeologie Deventer 19 (Deventer 2007).

Hussong/Cüppers 1972: L. Hussong / H. Cüppers, Die Trierer Kaiserthermen. 2: Die spätrömische und frühmittelalterliche Keramik. Trierer Grabungen und Forschungen 1, 2 (Mainz am Rhein 1972).

Isings 1957: C. Isings, Roman glass from dated finds. Archaeologica Traiectina 2 (Groningen 1957).

Lanting/Van der Plicht 2009/2010: J. Lanting / J. Van der Plicht, De ^{14}C-chronologie van de Nederlandse pre-en protohistorie VI: Romeinse tijd en Merovingische periode, deel A: historische bronnen en chronologische thema's. Palaeohistoria 51-52, 2009/2010, 27-168.

Mildenberger 1972: G. Mildenberger, Terra Nigra aus Nordhessen. Fundberichte aus Hessen 12, 1972, 104-126.

Noll 1991: W. Noll, Alte Keramiken und ihre Pigmente. Studien zu Material und Technologie (Stuttgart 1991).

Peacock 1982: D. P. Peacock, Pottery in the Roman world: an ethnoarchaeological approach (Michigan 1982).

Pirling 1974: R. Pirling, Das römisch-fränkische Gräberfeld von Krefeld-Gellep, 1960-1963. Die fränkischen Altertümer des Rheinlandes 8 (Berlin 1974).

Pirling/Siepen 2006: R. Pirling / M. Siepen, Die Funde aus den römischen Gräbern von Krefeld-Gellep: Katalog der Gräber 6348-6361. Germanische Denkmäler der Völkerwanderungszeit 20 (Stuttgart 2006).

Roymans/Heeren/De Clercq 2017: N. Roymans / S. Heeren / W. De Clercq (eds), Social dynamics in the northwest frontiers of the Late Roman Empire. Beyond decline or transformation. Amsterdam Archaeological Studies 26 (Amsterdam 2017).

Schneider 1988: G. Schneider, Chemische Zusammensetzung römischer Keramik. In: Wetterauer Ware – Eine römische Keramik im Rhein-Main-Gebiet. Schriften des Frankfurter Museums für Vor- und Frühgeschichte 10 (Bonn 1988) 303-327.

Schoppa 1970a: H. Schoppa, Die germanische Siedlung auf dem Gelände der Zeche Erin in Castrop-Rauxel. 7. Die römische Keramik. In: H. Beck (ed.), Spätkaiserzeitliche Funde in Westfalen. Bodenaltertümer Westfalens 12 (Münster 1970) 111-117.

1970b: H. Schoppa, Funde aus der germanischen Siedlung Westick bei Kamen, Kreis Unna. 1. Das römische Handelsgut. In: H. Beck (ed.), Spätkaiserzeitliche Funde in Westfalen. Bodenaltertümer Westfalens 12 (Münster 1970) 22-49.

Seillier 1991: C. Seillier, Évolution d'un type de céramique romaine tardive en Gaule du Nord-Ouest (IV^{e}-V^{e} siècles). Bulletin de la Commission départementale d'histoire et d'archéologie du Pas-de-Calais 13/1, 1991, 61-72.

Stroobants 2013: F. Stroobants, Coins and coin use at the late Roman village of Neerharen-Rekem. Relicta 10, 2013, 71-128.

von Uslar 1938: R. von Uslar, Westgermanische Bodenfunde des ersten bis dritten Jahrhunderts nach Christus aus Mittel- und Westdeutschland. Germanische Denkmäler der Frühzeit 3 (Berlin 1938).

Van Ossel 1992: P. Van Ossel, Etablissements ruraux de l'Antiquité tardive dans le nord de la Gaule. Gallia supplément 51 (Paris 1992).

Van Ossel/Séguier 2006: P. Van Ossel / J.-M. Séguier, Les céramiques de l'Antiquité tardive en Île-de-France et dans le Bassin parisien. 1: Ensembles régionaux. Diocesis Galliarum. Document de travail 7 (Nanterre 2006).

Van Thienen 2016: V. Van Thienen, Abandoned, neglected and revived. Aspects of Late Roman society in Northern Gaul [unpubl. thesis, Ghent 2016].

Verhoeven 2003: A. Verhoeven, Bemerkungen zur völkerwanderungszeitlichen Keramik aus Gennep (Niederlande). In: E. Taayke / J. H. Looijenga / O. H. Hersema / H. R. Reinders (eds), Essays on the Early Franks. Groningen Archaeological Studies 1 (Groningen 2003) 115-127.

Zusammenfassung / Summary / Résumé

Charakterisierung von Terra Nigra-Fußschalen der spätrömischen Zeit (4.-5. Jh.) aus Deutschland, den Niederlanden und Belgien

In der nördlichen Grenzregion des Römischen Reiches und der Germania magna ist an spätrömischen Fundorten (4. und 5. Jh.) häufig graue oder schwarze Drehscheibenkeramik zu finden. Charakteristisch für diese sind die Gefäßtypen Chenet 342 sowie Gellep 273/274. Trotz der Gemeinsamkeiten der Fußschalen dieser spätrömischen Terra Nigra-Gruppe ist wenig über deren Produktion, Verwendung und soziokulturelle Bedeutung bekannt. Nach einer kurzen Zusammenfassung der Forschungsgeschichte führt die vorliegende Studie eine erste überregionale und umfassende Beschreibung dieser Keramikgruppe durch. Die Schwerpunkte liegen dabei vor allem in der Betrachtung von Ähnlichkeiten und Unterschieden der geochemischen und mineralogischen Eigenschaften der Funde aus Deutschland, den Niederlanden und Belgien. Mithilfe der portablen RFA sowie petrographischer Dünnschliffanalysen konnte die Existenz mehrerer kleinerer Töpfereien sowie mindestens zwei verschiedener größerer Töpfereien in Westfalen und den Niederlanden wahrscheinlich gemacht werden. Auf Grundlage der überregionalen Studie werden neue Deutungsansätze zum Ursprung, der Funktion und dem symbolischen Wert der Fußschalen im Hinblick auf die zunehmende Hybridisierung der Gesellschaft zu beiden Seiten der niederrheinischen Grenze des Römischen Reiches vorgeschlagen.

Characterising Terra Nigra Foot-Vessels of the Late Roman Period (4th-5th Century) from Germany, the Netherlands and Belgium

In the northern frontier region of the Roman Empire and Germania Magna, grey to black wheel-thrown pottery is frequently encountered on Late Roman sites (4th and 5th centuries). Despite the commonality of the foot-vessels of this Late Roman Terra Nigra group, not much is known about their production, consumption or socio-cultural meaning. After a brief overview of the research history, this study presents the first interregional and comprehensive characterisation of this ceramic group by focussing on the similarities in fabric, chemical and mineralogical properties of the Chenet 342 and Gellep 273/274 type foot-vessels from Germany, the Netherlands and Belgium. The combination of portable XRF and ceramic petrography demonstrated the existence of at least two distinct major production areas in Westphalia and the Low Countries, alongside numerous smaller production workshops. Because of the interregional scale of this study, new ideas are proposed considering the origin, function and symbolic value of these Late Roman foot-vessels in light of the increasing hybridisation of societies along both sides of the Lower Rhine frontier.

Caractérisation de coupes à pied en Terra Nigra de l'antiquité tardive (4e-5e siècles) en provenance d'Allemagne, des Pays-Bas et de Belgique

Les sites des régions frontalières de l'empire romain et de la Germanie des 4e et 5e siècles livrent fréquemment des céramiques tournées grises à noires. Les formes les plus caractéristiques sont de type Chenet 342 et Gellep 273/274. Bien que les coupes à pied en Terra Nigra soient communs, on ne sait que peu de choses de leur production, leur utilisation ou leur valeur socio-culturelle. Après un bref historique de la recherche, cet article présente la première étude interrégionale exhaustive qui décrit ce groupe céramique en se concentrant sur les similarités de fabrication et les propriétés chimiques et minéralogiques entre l'Allemagne, Pays-Bas et Belgique. A l'aide d'un spectromètre XRF portable et d'analyses pétrographiques de lames minces, l'éxistence de plusieurs petits ateliers et d'au moins deux ateliers d'importance différente en Westphalie et aux Pays-Bas sont proposés. Sur la base de cette étude suprarégionale, de nouvelles propositions sont faites quant à l'origine, la fonction et la valeur symbolique de ces coupes à pied au regard de l'hybridatisation progressive de la société sur les deux rives du Rhin aux frontières de l'empire romain. Traduction: L. Bernard

Schlüsselwörter / Keywords / Mots clés

Nördliches Gallien / römische Kaiserzeit / Keramik / Keramikanalysen / Verbreitung
Northern Gaul / Roman Period / pottery / ceramic analyses / distribution
Gaules du Nord / période romaine / céramique / analyses de céramique / distribution

Vince Van Thienen
Universiteit Gent
Vakgroep Archeologie
Sint-Pieternieuwstraat 35
B - 9000 Gent
vince.vanthienen@ugent.be

Ole Stilborg
SKEA (Stilborg Keramikanalys)
Arkeologiska Forskningslaboratoriet, Inst. för Arkeologi och Klassisk Kultur
Stockholms Universitet
Lilla Frescativägen 7
S - 10691 Stockholm
skea@stilborg.se

Clarissa Agricola
Goethe-Universität Frankfurt am Main
Institut für Archäologische Wissenschaften
Abteilung II Archäologie und Geschichte der römischen Provinzen
Norbert-Wollheim-Platz 1
60629 Frankfurt a. M.
agricola@em.uni-frankfurt.de

Stijn Heeren
Vrije Universiteit
Faculty of Humanities
Department of Arts, History and Ancient Studies
De Boelelaan 1105
NL - 1081 HV Amsterdam
s.heeren@vu.nl