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Investigating migration and mobility in the Early Roman frontier. The case of the Batavi in the Dutch Rhine delta (c. 50/30 BC–AD 40)

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Introduction¹

Migration and human mobility are structural phenomena and key issues for communities and society as a whole, not just in our own time but also in the past. As a research topic, it can help us to better understand the complex dynamics of change and development within societies. Although an important theme since archaeology's beginnings as a discipline, migration has only quite recently become a research subject in its own right. This is at least partly related to the 'third science revolution'², when scientific methods began to be applied in approaches to archaeological research topics³. The introduction of new methodologies

¹ This paper is part of a pilot study titled "Tiel-Medel as a key site for innovative research into migration and ethnogenesis in the Roman Northwest frontier", funded by the Dutch Research Council (NWO) (File number 342-60-004, project leader Dr Stijn Heeren, project fund 'Dutch archaeological finds of international significance'), the province of Gelderland and the province of North Holland. The following people were directly involved in this project: Dr Stijn Heeren (*Vrije Universiteit Amsterdam*), Prof. Nico Roymans (*Vrije Universiteit Amsterdam*), Dr Diederick Habermehl (*Vrije Universiteit Amsterdam*), Julie Van Kerckhove (*Aardewerk & Archeologie*), Dr Henk van der Velde (ADC ArcheoProjecten), and Dr Lisette Kootker (*Vrije Universiteit Amsterdam*). In addition, Gerard Boreel (*Aardewerk & Archeologie*) and Dr Dennis Braekmans (Leiden University) contributed to the analysis and paper. WD-XRF measurements were executed and thin-sections prepared at the Faculty

of Science at the *Vrije Universiteit Amsterdam*. Dr Pieter Vroon (*Vrije Universiteit Amsterdam*) assisted in interpreting the chemical analysis of the pottery. The study is divided into two separate parts, one focused on the Early Roman period, the other on the Late Roman period. The latter looks at migration through the analysis of human burials. The results of this study are published elsewhere (KOOTKER et al. 2022).

² KRISTIANSEN 2014.

³ Strontium isotope studies and aDNA analyses have made it possible to study the geographical origin of human and animal remains (BENTLEY 2006; see CALLAWAY 2018 for an overview of the debate on ancient DNA; further see REICH 2018; KRAUSE / TRAPPE 2019). Chemical, petrographical, and MGR analyses of pottery have opened up new possibilities for studying the provenance of ceramic materials. These methodologies in particular will have a central role in this paper.



Fig. 1. Map of the research region, showing the main sites mentioned in the paper. For a detailed map of the Tiel region, see *Figure 2*.

has created an increased need for nuanced, interdisciplinary, and theoretically informed studies of migration⁴.

In this paper, we wish to study Roman-period migration by combining, comparing, and contrasting historical, archaeological, and science-based evidence and methodologies. We believe that a truly interdisciplinary approach focusing on material from a restricted region and period is a novel approach. We will focus specifically on the highly dynamic earliest Roman period (c. 50/30 BC–AD 40) in the Dutch Lower Rhine river delta (*Fig. 1*). After a highly disruptive conquest phase during the 50s BC, the Lower Rhine frontier zone of the Roman Empire began to take shape. Roman literary sources inform us about military events, shifting intertribal power relations, and significant movements of people during these decades. As a consequence, the debate on migration during this period has relied heavily on written evidence⁵. Until recently, archaeology has lacked the methods, data, and theoretical framework to make a significant contribution to the debate or to evaluate historically documented migrations. In recent decades, however, much more high-quality settlement data and material have become available, as well as possibilities for specialised analyses.

⁴ E. g. ECKARDT 2010; MELLER et al. 2017; CENTRO ITALIANO DI STUDI SULL'ALTO MEDIOEVO 2019;

ROYMANS / HABERMEHL 2023.

⁵ ROYMANS 2004; POLAK / KOOISTRA 2013.

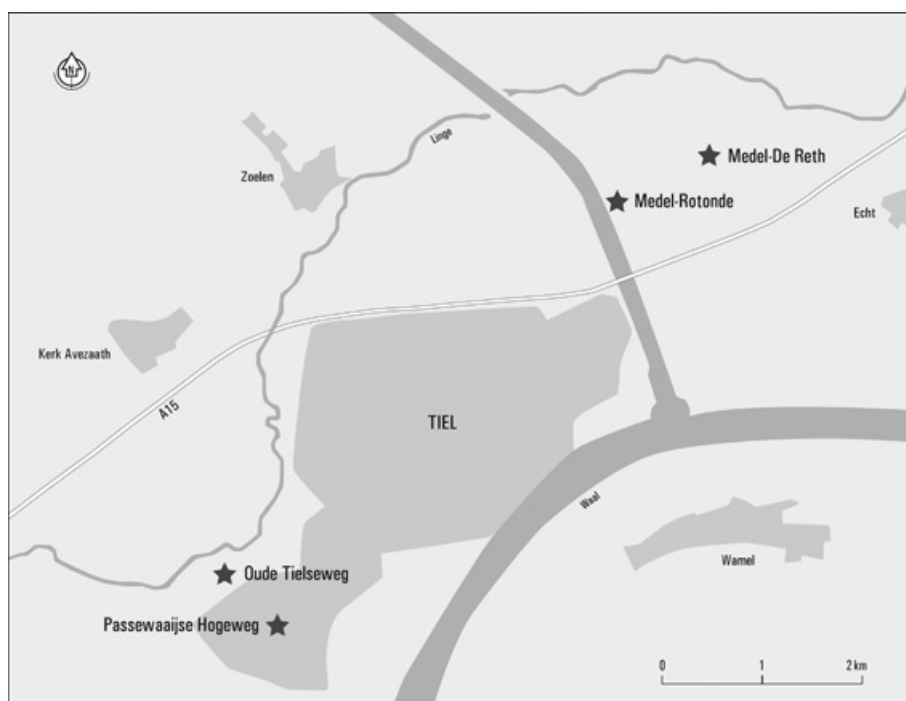


Fig. 2. Map of the Tiel region with the locations of the four main settlement sites.

The case study presented in this paper has three main objectives:

- to develop a strategy for an integrated, interdisciplinary approach to the study of migration (and mobility in general)⁶, combining, comparing, and contrasting historical, archaeological, and science-based evidence and methodologies. In the present study, the archaeological evidence includes house architecture, handmade pottery, coinage, metal objects, and strontium isotope analyses of faunal skeletal remains⁷. The historical sources include the works of Caesar, Tacitus, and Cassius Dio.
- to apply the methodology to high-quality archaeological evidence from a specific region within the Dutch Lower Rhine delta, dated to the earliest phases of the Roman period, between c. 50/30 BC and AD 40 (*Figs 1; 2*). Whereas the origin, migration, and development of the Batavian society has received most attention until now, our aim here is to enrich and diversify the available evidence and to reframe questions about the social and cultural dynamics, migration, and ethnogenesis in this frontier region during the Early Roman period.
- to contribute to the research agenda on this topic, defining research foci and questions that should be prioritised in further research on migration and mobility for this period.

⁶ We consider migration as one specific form of human mobility. Given our approach of studying first generation settlers, and the specific historical context, our case study addresses migration. However, most of the methods we use and discuss are

suitable to address human mobility more widely as well.

⁷ As human skeletal remains are lacking from the dataset, the analysis of graves and aDNA was not included in our approach.

Characteristics of the approach

As mentioned in the previous section, the approach proposed in this paper is both interdisciplinary and integrative. It aims to combine and compare a variety of evidence and methodologies⁸. More specifically, it explores a number of key characteristics in some detail. Our approach is characterised by:

- a contextualised analysis of high-quality, well-published archaeological data with a relatively high chronological resolution. For contexts to be selected for our study, data on both settlement features and the associated material culture needed to be available, thus enabling analyses down to the level of the individual farmstead in rural settlements.
- an evaluation of conventional archaeological concepts and methods, and of science-based methodologies. As Stefan Burmeister emphasises, methods of the natural sciences alone cannot provide historical insights. This can only be achieved within the framework of the cultural sciences. Archaeology can offer an interpretational framework for science-based results⁹, while science-based data can provide new avenues of research and critically reassess conventional archaeological methods, theories, and ideas¹⁰.
- a specific focus on first-generation settlers and their farmsteads, grounded in both archaeology and social theory. First-generation migrant settlers arrive in a new area, bringing with them a small quantity of mobile material culture (handmade pottery, clothes, jewellery) and practicing culturally-specific day-to-day actions (*habitus*)¹¹. At the same time, we know that social interaction and issues of personal identity may influence the choice of material culture to a large extent. Therefore, not every migrant carries the material culture of their homeland and not every piece of material culture of a foreign style is handled by migrants alone: there may be various reasons why that style is attractive to others. After arriving in an inhabited area, pottery styles and domestic architecture may change quickly, while pottery techniques and the interior division of houses and outbuildings may change much more slowly¹². Change can mean that artefacts or styles of various origins are used alongside one another, or take the form of hybridisation, bringing two styles together in a new artefact or building¹³. We are therefore aware that even first-generation settlers may display a hybrid or mixed material culture. In cases of migration to an almost uninhabited land, changes in architecture and material culture will be much more restricted¹⁴.
- attention to historical contexts and the critical use of historical data. It is currently important for archaeology to restart the dialogue with historical research, while remaining aware of the pitfalls of using historical data, such as over-simplistic equations

⁸ Here, it must be emphasised that for this pilot project we have chosen to mainly focus on evidence for change in material culture, for migration, and for newcomers. As a result, we have left the broader study of possible continuities in material culture and population largely unexplored. Such a broader study, contrasting change and continuity, could and should be part of a follow-up project.

⁹ BURMEISTER 2017, 65.

¹⁰ GEARY 2019.

¹¹ *Habitus* is a concept that has been widely applied and discussed throughout the archaeological dis-

cipline. It can be understood as learned cultural structures, an ingrained system of dispositions (BOURDIEU 1977; 1990; ROBB 2010, 495). These structures are not static. They provide the basis for regulated improvisation (BOURDIEU 1977; ROBB 2010, 495). It is practices by human beings that create and reproduce the structure in which the actions are embedded (BOURDIEU 1977; 1990; GIDDENS 1979; 1984; DE CERTEAU 2002).

¹² HAMEROW 1999; BURMEISTER 2000; 2017.

¹³ See below (*footnote 18*) for elaboration.

¹⁴ HEEREN 2017.

between group mobility, culture, ethnicity, and even language¹⁵. Today, archaeology's point of departure differs fundamentally from that of a few decades ago. Equipped with a much larger dataset, new methods and techniques for getting to grips with human mobility, and renewed theoretical insights from the social sciences, we are in a much better position to contextualise and critically assess written information¹⁶. Furthermore, critically assessed historical data can provide us with a framework for interpreting the results of archaeological analyses, whether science-based or using more traditional methodologies. For our study, historical sources on ethnic migrations, interactions between the Roman authorities and indigenous groups, and the military events in our regions are of vital importance.

- an understanding of the complexities of migration and mobility, based on social studies¹⁷. With regard to our main source, material culture, we need to be aware of the complexities, one of which is cultural hybridisation¹⁸. Immigrant societies in particular demonstrate flexibility in their cultural practices, which may thwart any attempt at identifying migration in archaeological terms directly¹⁹. Furthermore, we aim to adopt both bottom-up and top-down approaches, focusing on both the local and the 'global'²⁰. This includes attention for the reasons for migration (push factors, pull factors) and for migration networks²¹. In our case study, we specifically consider the role of imperial agency and the use of force, as the power relations between Roman military authorities and indigenous groups were highly asymmetric.

The settlement of the Batavi in the Dutch river delta. The historical evidence

The Dutch river area is an interesting region for the archaeological study of migrations because we also have a substantial set of historical data at our disposal, which enables us to sketch a high-quality picture of the social dynamics in the region in the earliest Roman period. The historical sources inform us about both the conquest period and the early post-conquest period.

At the time of the Caesarian conquest the Dutch eastern river area probably belonged to the northern part of the Eburonian polity. The Roman conquest had dramatic consequences for the indigenous population in the Lower Rhine frontier zone. Recent

¹⁵ ALT / SCHÖNFELDER 2017; FERNÁNDEZ-GÖTZ 2018, 180–182; BURMEISTER 2019, 231.

¹⁶ ROYMANS et al. 2020; ROYMANS / HABERMEHL 2023.

¹⁷ BURMEISTER 2000; PRIEN 2005; MAXWELL / OLIVER 2017; BURMEISTER 2017; DRIESSEN 2018; MANNING 2020.

¹⁸ Early in the 21st century hybridity or hybridisation became a prominent concept for studying processes of cultural change. Hybrids can be understood as a social, material, or cultural mixture, emerging from the liminal space where two different cultural entities overlap (KNAPP 2008, 59; STOCKHAMMER 2012, 45). In this paper, the focus lies on hybrid artefacts (such as pottery and houses) and – indirectly – hybrid practices (house building and pottery making). Important work on hybridity includes that

by BHABHA (1994), ANTONACCIO (2003; 2010), VAN DOMMELEN (2006), BURKE (2009), JIMÉNEZ (2011), and STOCKHAMMER (2012). Over the years, the concept of hybridity has been criticised, among others, for its background in natural sciences and for its political connotation in post-colonial studies (STOCKHAMMER 2012, 46). For this reason, alternative concepts and terms have been suggested, among them “borrowing”, “appropriation”, “creolisation”, “syncretism”, and “cultural entanglement” (see BURKE 2009, 34–65; STOCKHAMMER 2012, 47–51).

¹⁹ BURMEISTER 2017, 60.

²⁰ HAKENBECK 2008, 20.

²¹ PRIEN 2005; MAXWELL / OLIVER 2017; MANNING 2020.

²² ROYMANS 2019.

demographic research points to a serious demographic regression in the 1st century BC, suggesting that Caesar's reports of genocidal military campaigns in this area should be taken seriously²².

Somewhere in the period between Caesar's departure from Gaul and the start of Drusus' Germanic campaigns in 12 BC, the Batavi settled in the Rhine / Meuse delta. According to Tacitus, they formed a subgroup of the Chatti, which had split off after an internal dispute and moved to an 'empty land' (*vacua cultoribus*) in the Rhine delta²³. A *terminus ante quem* for their settlement is 12 BC, the year in which Drusus used the Batavian territory as an operating base for his offensives in Germania. The recently advanced date of the oldest legionary camp at Nijmegen (19/17 BC; NL)²⁴ invites us to re-open the discussion on the migration of the Batavi. We know that several Roman generals (Hirtius in 44 and Carrinas in 29 BC) had suppressed revolts in Gaul and taken action against invading Germanic groups. Agrippa, governor of Gaul in 39 BC, is said to have been the first Roman governor after Caesar to cross the Rhine and campaign against Germanic groups, probably with the intent to relieve the pressure of Suebian groups on the Rhine border. Agrippa also organised the crossing of the Ubii from the east bank of the Rhine to the west. The date is not specified but is usually linked to the second governorship of Agrippa in 19 BC²⁵, thereby referring to the shifting distribution pattern of type Scheers 57 silver *quinarii* from the right to the left bank of the Rhine and the definitive abandonment of the Dünsberg oppidum (Hesse, DE) in former Ubian territory in the second decade BC. Agrippa seems to have been of special significance in Rome's arrangements with Germanic groups in the Lower Rhine region. Kemmers argues on numismatic grounds that the construction of the first legionary camp at Nijmegen can be linked to Agrippa's second governorship of 19–18 or 18–17 BC²⁶. The arrival of the Batavi may have been contemporaneous with the construction of this first *castra* at Nijmegen or may have occurred earlier.

Although Agrippa's involvement in the Batavian migration remains speculative, there is no doubt that the Batavi did not simply move on their own initiative and that their decision should be understood in the context of Roman frontier policy. Underlying this was a clientship treaty, later referred to by Tacitus as an *antiqua societas*²⁷. A key element was the compulsory supply of auxiliary troops. Batavi provided irregular troops for the *Germania* expeditions led by Drusus, Germanicus and Tiberius²⁸. This marked the beginnings of their large-scale exploitation by Rome as a breeding ground for soldiers.

We can conclude that Tacitus' narrative of the origin of the Batavi is that of a people who had simply moved from the right to the left bank of the Lower Rhine. This narrative raises a series of key questions for archaeologists: Can archaeology confirm the influx of a group from an area east of the Rhine? Was the area previously uninhabited? When did the exploitation of this group as a mass supplier of auxiliary troops begin?

²³ Tac. Germ. 29.

²⁴ KEMMERS 2005.

²⁵ ECK 2004, 46–55.

²⁶ KEMMERS 2005.

²⁷ Tac. Germ. 29; Tac. hist. 4.12; ROYMANS 2004, ch. 5.

²⁸ Irregular Germanic auxiliary formations or their

leaders are known for the Batavi under Chariovalda (Tac. ann. 2.11), the Cherusci under Arminius (Tac. ann. 2.10), the Cananefates (Tac. ann. 4.73), and the Frisii (Cass. Dio 54.32). The Chauci served in AD 15 and 16 as auxiliaries in Germanicus' army (Tac. ann. 1.60.1; 2.17). See also ROYMANS / HABERMEHL 2023.

Site	Selected farmsteads	Selected feature for pottery	Context date	Reference
Tiel-Medel-De Reth	ditched enclosure 2/5 and house 2	ditched enclosure 2/5; ditches 1, 3, 4, 6, 11; pits 1, 8; layer 21	30–1 BC; AD 1–25	HABERMEHL et al. 2019
Tiel-Passewaaijse Hogeweg	house 8 and 16	house 8; ditch 1	15 BC– AD 30; 50–15 BC	HEEREN 2006
Tiel-Medel-Rotonde	house 1	ditch 1; granary 1	AD 10–40	HEEREN 2005
Tiel-Oude Tielseweg	house 2	pit 343	AD 0/25–50	VERHELST 2001

Tab. 1. The four rural settlements in the Tiel region and the features selected for analysis.

The empirical basis: four rural settlements in the Dutch Betuwe region

The main empirical basis of this study comprises four rural settlements from the Dutch Lower Rhine region. All four settlements are situated within the municipality of Tiel: Tiel-Medel-De Reth, Tiel-Medel-Rotonde, Tiel-Oude Tielseweg, and Tiel-Passewaaijse Hogeweg (*Fig. 2*). These settlements were excavated during the past two decades and have been analysed and published in detail²⁹. Such high-quality data allows for the detailed reconstruction of development trajectories in rural habitation between the Late Iron Age and the Roman period as well as the detailed study of the material culture of individual farmsteads³⁰. For this study, specific farmsteads and contexts were selected for analysis (*Tab. 1*). Our focus is on ‘first-generation’ farmsteads, associated with the repopulation of the region after the serious demographic regression during the latest phase of the Late Iron Age. Our criterion involves coherent and sufficiently large assemblages of find material for which context information is available.

All four settlements are rural settlements, characterised by one or more contemporary farmsteads with post-built farmhouses and outbuildings (see *Fig. 3* for two examples). Pits, wells and ditches are present in addition to these buildings. The settlements are situated within a dynamic fluvial landscape, characterised by active rivers and residual channels. The farmsteads were situated on the riverbanks of residual channels, which provided water, fish, and probably also a means of transport. Although some of these settlements had clearly been inhabited during the Late Iron Age, there is generally a clear gap between the Late Iron Age habitation and the earliest Roman period activities³¹.

²⁹ VERHELST 2001; HEEREN 2005; 2006; HABERMEHL et al. 2019. These excavations can be seen against the background of the rich tradition of rural settlement studies that took off in the Netherlands from the 1980s onwards (ROYMANS / HEEREN 2004).

³⁰ Considerable effort went into analysing assemblages of metal finds, coins and (handmade) pottery. HEEREN 2006, 91–103; VAN KERCKHOVE 2006;

VERHELST 2006; VAN KERCKHOVE 2009; VAN RENSOUDE / VAN KERCKHOVE 2009; VAN KERCKHOVE / HABERMEHL 2017; 2019; VAN RENSOUDE / HABERMEHL 2017; HABERMEHL et al. 2019.

³¹ Such discontinuity can be found in many rural settlements within this region. See ROYMANS 2019 for a detailed analysis.



Fig. 3. Two of the farmsteads selected for this study, situated at the sites of Tiel-Passewaaijse Hogeweg (house 16, left) and Tiel-Medel-Rotonde (house 1, right). The post-built byre houses are indicated in grey. After HEEREN 2006, 80 (modified); 2005, 13 (modified).

The Early Roman settlement of Tiel-Medel-De Reth involves two farmsteads situated on the east bank of a residual channel³². The main structure of the earliest farmstead, dated to the last decades BC, has a somewhat atypical layout, characterised by a rectangular ditched enclosure with two opposing entrances in the long sides (ditched enclosure 2/5; *Fig. 4*). Although associated postholes were not documented, it seems plausible that this ditched enclosure was actually part of a timber house. We are probably dealing here with a 'wall-ditch structure' or a house constructed on a raised earthen platform³³. The second farmstead is somewhat younger, probably dating to the first decades AD, and involves a fragmentarily preserved two-aisled post-built house surrounded by a house ditch (house 2; *Fig. 4*). Both farmsteads and several associated pits and ditches were selected for analysis in this study (*Tab. 1*).

Two of the earliest farmsteads were selected from the rural settlement of Tiel-Passewaaijse Hogeweg. The oldest farmstead was dated between c. 50 and 15 BC (*Fig. 3*). The associated house (house 16; *Fig. 4*) is a rather long, two-aisled structure³⁴. The handmade pottery from the ditch surrounding the house (ditch 1) was selected for analysis. The second farmstead was dated between c. 15 BC and AD 30 and is characterised by a 33 m long combined two- / three-aisled house with wall ditches (house 8; *Fig. 4*). Again, ditches were dug directly around the house, from which the handmade pottery was selected for analysis.

The settlement of Tiel-Medel-Rotonde was first inhabited during the period between c. AD 10 and 40. The earliest farmstead (*Fig. 3*) was characterised by a two-aisled

³² During the Late Iron Age, the same location was also inhabited between 150 and 70 BC. It probably remained uninhabited in the period leading up to resettlement during the earliest Roman times.

³³ For further discussion on and references for this type of buildings, see below.

³⁴ This house can be considered a parallel with the Oss-Ussen 5 type house and the Wijk bij Duurstede-De Horden 1d type house (Vos 2002, 23; 2009; HEEREN 2006, 239–241). Unusual features are the partly paired wall posts and its considerable length.

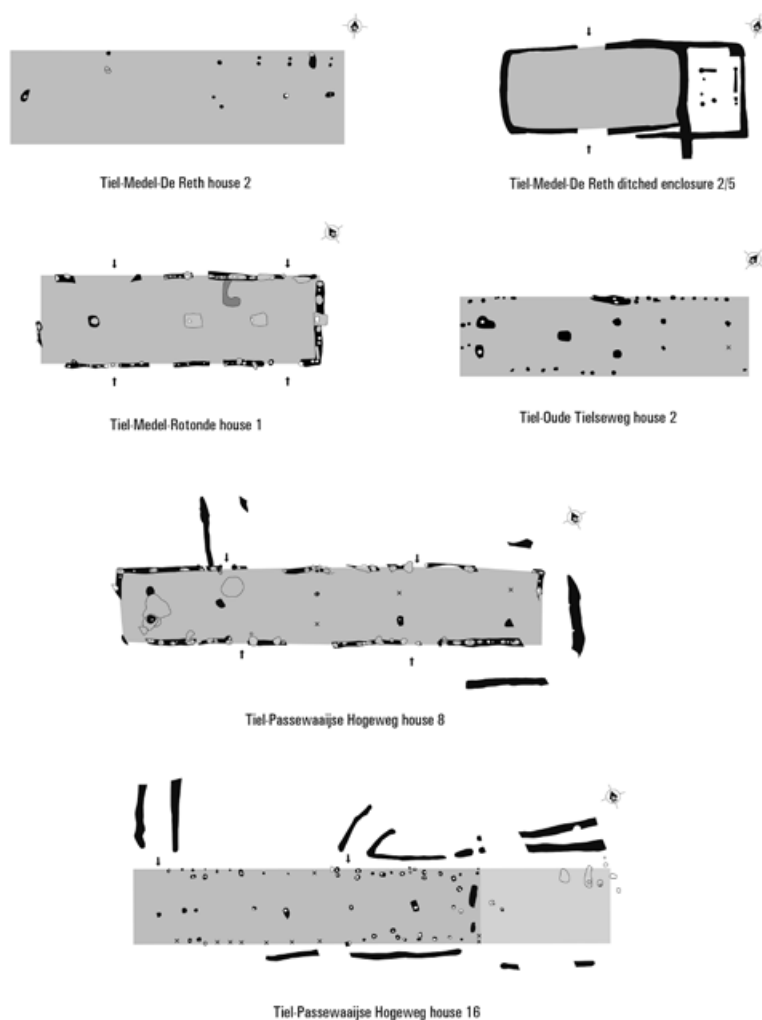


Fig. 4. Selected houses from the four settlements in the Tiel region. After VERHELST 2001, suppl. 6 fig. 9; HABERMEHL et al. 2019, 748; 858; HEEREN 2005, 14; 2006, 224; 240. – Scale 1 : 600.

Alphen-Ekeren type post-built house (*Fig. 4*) as well as a post-built granary and several pits. The pottery for analysis was collected from the ditch surrounding the farmstead (ditch 1) and the features of the granary (granary 1).

The fourth settlement, Tiel-Oude Tielseweg, was probably first settled around the start of the common era (Augustan period), although its use may have continued into the period between c. AD 25 and 50, as the wheel-turned pottery suggests³⁵. The Augustan starting date is well supported on the basis of the associated pottery assemblage, discussed below. The associated house (house 2; *Fig. 4*) has a combined two- / three-aisled plan with a partial wall ditch. The material from ditch 1717 and nearby pit 343 was selected for the pottery study.

³⁵ VERHELST 2001, 20–23.

House architecture

The study of house building can facilitate research into migration in important ways. From the 1980s onwards, the study of post-built houses has developed into a rich tradition in the Netherlands. Over the years, hundreds of house plans have been excavated and published in detail³⁶. The main focus has generally been typological, but in some cases it has broadened to include building technology and the reconstruction of above-ground structures. However, the sociocultural dimension of the house and house building has remained largely understudied. In this section we would like to explore how developments in house building during the earliest Roman period can be reconstructed and how they can shed light on migration and the social dynamics of groups.

In archaeology and anthropology the house is regarded as a locus for day-to-day social and economic interaction, production and the reproduction of social identities³⁷. The house and its inhabitants live in a mutually constituting relationship. As such, houses represent close indicators of *habitus* – the very way in which we live in the world, how we view the world, but also how we act³⁸. In the case of migration, whereby migrants arrive in new lands and encounter other groups, *habitus* is renegotiated within the new (social, physical and cultural) context. The relationship between cultural identity (or even ethnicity) and house building is of special interest here. Did migrants bring their building traditions from their homelands and apply them in their new environments? And can we associate new building styles and techniques with certain regions of origin? In a critical essay on the relationship between house architecture and ethnicity, studied within the context of the colonisation of the northern Americas, Ágústa Edwald Maxwell and Jeff Oliver point out that the emphasis on the concept of ethnicity to explain important architectural variation masks a much more complex reality. The authors illustrate how building in a new homeland may entail different forms of sharing of skills and knowledge, the mediation of traditions and the formation of (new) communities³⁹. They suggest a rather loose association between ethnicity and settler architecture. Furthermore, they stress that house building in the new land was not a straightforward matter of transferring designs from the homeland, with a few necessary amendments, but rather a creative process of assembling different ideas and materials that were intimately linked to the geographies and biographies of place. Similar patterns are also reconstructed by Burmeister, again discussing architectural developments in North America.⁴⁰ For example, the log cabin, initially introduced by Finnish settlers, was soon adopted by other immigrant groups, while other elements of Finnish culture disappeared without a trace⁴¹. And while a specific barn type from southern Germany was readily accepted by other immigrant groups, British settlers – who were long dominant (at least in numerical terms) – had a negligible influence on the architecture of the Americas⁴².

The above discussion illustrates the complexities of architectural study in a dynamic setting and provides a possible framework for interpreting architectural developments in the Rhine delta during the highly dynamic Early Roman period. Below we will shed light on developments, changes or continuities in house building between the latest phases of the Late Iron Age and the Early Roman period. Our aim is to shed more light on the dynamics

³⁶ See among others SCHINKEL 1998; HEEREN 2006; VAN RENSWOUDE / VAN KERCKHOVE 2009; WATERBOLK 2009; LANGE et al. 2014.

³⁷ For studies on domestic architecture, the household, and the social dimensions of houses, e. g. RAPOPORT 1982; 1989; WILK / RATHJE 1982; HINGLEY 1989;

1990; BECK 2007.

³⁸ RAPOPORT 1989.

³⁹ MAXWELL / OLIVER 2017, 28–29.

⁴⁰ BURMEISTER 2017, 58–60.

⁴¹ BURMEISTER 2017, 58.

⁴² JORDAN 1985, 155; BURMEISTER 2017, 59.

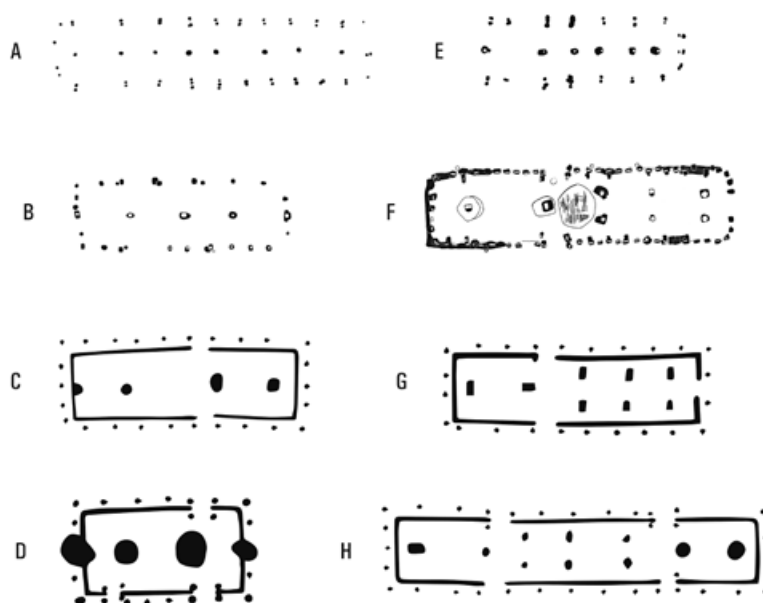


Fig. 5. Different variants of long houses encountered in the Dutch river area in the Early Roman period. House A is a Late Iron Age type. After SCHINKEL 1998, 123–124 (A); HIDDINK 2005, 87 (B); HIDDINK 2014, 188 (E); Vos 2009, 78 (F); WESSELINGH 2000, 18 (C–D.G–H). – Scale 1 : 600.

of change and the complexities at work and to possibly identify the provenance of certain influences, without falling into the trap of assuming simplified and direct cultural or even ethnic associations.

Pre-Roman house-building traditions

Generally speaking, the Rhine delta is a region characterised by post-built byre houses, combining a living section and a stall under a single roof⁴³. South of the Rhine, during the Middle and Late Iron Age, the roofs of these rather lightly built houses were generally supported by a single row of central posts and the walls consisted of vertical posts dug into the ground individually. Houses of the well-represented Haps type (also known as Oss-Ussen type 4) developed around the transition period between the Early and Middle Iron Age (c. 500 BC) and continued to be built until the middle of the Late Iron Age⁴⁴. During the Late Iron Age, another house type (termed Oss-Ussen 5) evolved from the Haps type. These two-aisled houses were rather narrow and were characterised by paired wall posts, which supported the wattle-and-daub walls on two sides (*Fig. 5A*)⁴⁵. Although some variants of these main types developed over time, the house-building tradition of the later Iron Age was relatively stable, with rather limited variety.

⁴³ These are termed *Woonstalhuizen* or *Wohnstallhäuser* in Dutch and German respectively.

⁴⁴ Houses of this type can be found in the Dutch river area, the sandy regions to the south and at least the northern parts of the loess region. Haps-type houses were also built north of the Rhine: in the Dutch

Veluwe region in the Netherlands, and in North Rhine-Westphalia and Lower Saxony in Germany. See HIDDINK 2014, 182; NÜSSE 2014, 37; DE VRIES 2021, 37–38.

⁴⁵ HIDDINK 2014, 187.

Developments in house building during the Early Roman period

For the Rhine delta we can reconstruct rather rapid developments in house building during the last decades BC. These include the appearance of houses with construction features, plans and dimensions that clearly deviate from the pre-existing house-building traditions described above (see *Fig. 5* for an overview). We also see hybrid forms emerge, combining elements from different traditions. Generally speaking, we notice a marked increase in heterogeneity of building styles within the rural settlements of the Early Roman period. In fact, different house types occurred alongside each other in many of these settlements.

A first development of interest concerns the appearance of sturdier two-aisled houses with particularly deep-set roof-bearing posts and often wall ditches, generally termed Alphen-Ekeren type buildings⁴⁶. House 1 at Tiel-Medel-Rotonde is a typical example (*Fig. 4*; for other examples see *Fig. 5B–D*). These houses would eventually evolve to become the most common house type in rural settlements during the first three centuries AD. The precise dynamic and meaning of this development cannot be fully reconstructed and understood as yet. Of particular interest are the hybrid house plans, which combine the general structure and wall construction of the ‘traditional’ Oss-Ussen 5 type house with the deeply set central posts typical of the Alphen-Ekeren type (see *Fig. 5E*)⁴⁷. House 16 at Tiel-Passewaaijse Hogeweg can probably be regarded as such a hybrid (see *Fig. 4*). Although much remains unclear for now, the introduction of new building techniques is significant, especially during the transition phase between the Late Iron Age and Roman period.

A second development entails the introduction of a new house type, combining two- and three-aisled sections within a single house⁴⁸. Such houses were documented at both Tiel-Oude Tielseweg (house 2) and Tiel-Passewaaijse Hogeweg (house 8) (see *Fig. 4*; for other examples see *Fig. 5F–H*). These often (very) long buildings are unknown from the pre-Roman period and should probably be understood as a hybrid creation, combining elements from the two-aisled and three-aisled house-building traditions associated with the regions south and north of the Rhine respectively. This house type is especially well documented in the Dutch river area and the northern parts of the sandy regions of Dutch Brabant and Limburg⁴⁹. However, examples have also been found in Paderborn-Wewer⁵⁰, Sendenhorst-Alberloh⁵¹, Delmenhorst, Vreden and Bonn-Villich-Müldorf in Germany⁵². Except for Bonn, these sites are situated well north of the Rhine, in North Rhine-Westphalia and

⁴⁶ Cf. SLOFSTRA 1991, 137–145, following De Boe. Oss-Ussen type 8 (SCHINKEL 1998, appendix; WESSELINGH 2000) and De Horden type 1 (Vos 2002; 2009) are nearly identical. The Alphen-Ekeren type house is a relatively widespread phenomenon. Our research region is situated in the northernmost part of the distribution area for Alphen-Ekeren type houses.

⁴⁷ SLOFSTRA 1991, 137–145.

⁴⁸ In our research region, houses like this are referred to as Oss-Ussen type 9 (SCHINKEL 1998, appendix; WESSELINGH 2000). Vos defined houses with combined two- / three-aisled sections as De Horden type 3 (Vos 2002; 2009).

⁴⁹ NÜSSE 2014, 61; VAN ENCKEVORT / HENDRIKS 2014, 244–245. Among the settlements discussed in this paper, houses of this type are found in Tiel-Oude Tielseweg, Geldermalsen-Hondsgemet, Wijk bij Duurstede-De Horden and Tiel-Passewaaijse Hogeweg.

⁵⁰ PAPE 2000, fig. 2; defined as an Oss-Ussen type 9 building by NÜSSE 2014.

⁵¹ EGGENSTEIN 2003, pl. 85.

⁵² See NÜSSE 2014, 61. Apart from the Oss-Ussen type 9 and the Noordbarge type, Nüsse defines a Vreden type within the category of combined two- / three-aisled buildings. For Bonn-Villich-Müldorf, see FRANK 2013.

Lower Saxony (near Münster, Paderborn and Bremen). For Bonn, Frank interprets these houses as an innovation, introduced by (Germanic) settlers from the north / east⁵³.

The first appearance of the combined two- / three-aisled houses can probably be dated to the transitional phase between the Late Iron Age and the Roman period, the final decades BC⁵⁴. Hans-Jörg Nüsse regards the Dutch river area as the core region of the combined two- / three-aisled houses, from where this house type spread further north. However, we would like to suggest that this hybrid form may actually have developed north of the Rhine before spreading towards our research region. Unfortunately, the resolution of the chronological data is insufficient at present to definitively reconstruct the dynamics of the introduction and development of this house type.

A specific new element that can be found in both Alphen-Ekeren type houses and combined two- / three-aisled buildings is the wall ditch. These ditches held a wall structure that was partly dug in. They can be documented in houses at Tiel-Oude Tielseweg (house 2), Tiel-Medel-Rotonde (house 1) and Tiel-Passewaaijse Hogeweg (house 8) (see *Fig. 4*; for other examples see *Fig. 5C.D.G.H*). Once again, this new construction feature was introduced in our region during the transition phase between the Late Iron Age and the Roman period and again we seem to be dealing with non-local influences, possibly from further north or east⁵⁵.

A third example of a newly introduced house type is less well documented and more hypothetical than the first two. These are wall-ditch houses or houses constructed on earthen platforms. Often, such structures are not easily recognised as houses, as they are mainly marked by ditches rather than a clear configuration of postholes. Houses of this type are mainly known from the regions north of the Lower Rhine⁵⁶. They were not common south of the Rhine, or at least have not often been recognised as such. Nonetheless, some examples have been documented in recent years⁵⁷. One of these is the early ditched enclosure of Tiel-Medel-De Reth (ditched enclosure 2/5; *Fig. 4*), referred to above. Its shape, dimensions and opposing entrances marked by special deposits seem to indicate that this structure should be interpreted as a residence, even though postholes are absent altogether.

A final category to be explored here concerns the buildings that seem to represent a continuation of pre-existing building traditions of the Late Iron Age. In several settlements

⁵³ FRANK 2013.

⁵⁴ NÜSSE 2014, 64; VAN ENCKEVORT / HENDRIKS 2014; VAN RENSWOUDE / BOREEL 2014. In Dutch Drenthe (Noordbarge, Peelo, Emmen), two- / three-aisled houses, defined as the Noordbarge type by WATERBOLK (2009), can be dated between the latest phases of the Late Iron Age and the earliest Roman period. The German Delmenhorst house could possibly even be dated as early as the 2nd century BC, but this dating is indirect and not definitive (NÜSSE 2014, 65). The house at Paderborn-Wewer was dated between c. 50/40 BC and AD 10/20. Earlier examples of houses with a combined two- and three-aisled construction are mentioned by Karen M. de Vries, although these do not seem to be directly comparable to the combined two/three-aisled houses discussed in this paper (DE VRIES 2021,

37–38).

⁵⁵ DE VRIES 2021, 43; 72. In the German Rhineland, the introduction of wall ditches is often associated with (Elbe) Germanic influences (HEIMBERG 2002/03, 75).

⁵⁶ They have been well documented in the Assendelver polders in the province of North Holland and the settlement of Paddepoel in the northern coastal region of Groningen (VAN ES 1970, 213–215; THERKORN 1987).

⁵⁷ A wall-ditch structure was identified in an Early Roman period settlement at Utrecht-Terweide (DEN HARTOG 2017, 116–117), as well as a possible second one, or a platform. A further wall-ditch structure from the Early Roman period was found in Midden-Delfland, in the western coastal region of the Netherlands (VAN LONDEN 2006, 25–31).

within the research region, we can find house plans clearly comparable to the Late Iron Age Oss-Ussen 5-type houses⁵⁸. Interestingly, these houses can be found side by side with the new house types described above. At the settlement of Tiel-Medel-De Reth, an Oss-Ussen 5 type house (house 2; *Fig. 4*) was constructed not far from the somewhat older wall-ditch building (ditched enclosure 2/5; *Fig. 4*).

Interpreting developments in house building

A number of observations can be made on the basis of the above analysis:

- during the last decades BC we can see a rapid change in house architecture, including the introduction of new forms, structures and techniques.
- during this same phase, rural settlements were characterised by a marked heterogeneity in house architecture. Different types of houses also co-existed within a single settlement.
- some houses can be identified as hybrid creations, combining architectural aspects or elements that seem to have originated from different traditions.
- the combined two- / three-aisled house is well known from the Dutch river area but can also be found in the region east and north of the Lower Rhine.
- some houses indicate the continuity of pre-existing house-building traditions.

These observations on house architecture suggest that the earliest phase of the Roman period was one of significant change and development. Now, the question rises how these rapid changes can be understood. As mentioned, houses can be regarded as close indicators of habitus. The practice of building houses – including the choices that agents made about the dimensions of the house, the arrangement of the roof-supporting posts and the construction of the walls – is an integral part of the learned cultural structures and can probably be seen as expressing and shaping social identity⁵⁹. Furthermore, such (technical) practices are constructed and reproduced in social interaction, within or across boundaries⁶⁰. The significant heterogeneity in domestic architecture and the influx of new ideas, skills and traditions point to the different cultural backgrounds of the people that built them. The habitus of the first generation of settlers will have been closely associated with their regions of origin. The emergence of new hybrid house forms is an indication for the exchange of technological knowledge, skills and practices between groups with different cultural backgrounds. During the earliest decades of the Roman period our region probably was a liminal space where different cultural entities overlapped, leading to the emergence of cultural hybridity⁶¹. How exactly we should understand the motivations for these exchanges is difficult to determine on the basis of our data. Social expressions as well as functional aspects may have influenced the emergence of the hybrid forms. Perhaps,

⁵⁸ HIDDINK 2014, 187–190. Examples are known from Tiel-Medel-De Reth, dated to the first decades AD (HABERMEHL et al. 2019, 858–859), and Geldermalsen-Hondsgemet (VAN RENSWOUDE / VAN KERCKHOVE 2009, 93–94; 494; 505; 513). At the settlement of Tiel-Passewaaijse Hogeweg, an Oss-Ussen type 5 house was dated between c. 60 and 15 BC (HEEREN 2006, 239). In addition, a small Haps-type house (or variant), dated to the early

phase of the Early Roman period, was documented at Geldermalsen-Hondsgemet (VAN RENSWOUDE / VAN KERCKHOVE 2009, 503; 511).

⁵⁹ DE VRIES 2021, 35.

⁶⁰ GOSSELAIN 2000, 209.

⁶¹ STOCKHAMMER 2012, 45. On different responses to cultural encounter and exchange, see BURKE 2009, 79–101.

the new hybrid forms (and the practices behind them) were a way to create and facilitate new relationships between families or groups of different cultural background, within a developing society characterised by a significant share of newcomers from different regions.

Handmade pottery

Like house architecture, handmade pottery can also make a significant contribution to the complex discussion on mobility and migration. As pottery is one of the best preserved and most widely consumed goods, thousands of sherds are at our disposal for analysis. It is generally assumed that handmade pottery was mainly produced within a household setting, conforming to traditions passed down from generation to generation⁶². As such, it is part of the habitus of people and its style and provenance can inform us about their cultural and geographical background⁶³. After the Roman conquest, the handmade pottery spectrum underwent substantial changes in the region under study and beyond. The appearance of new techniques, shapes and decorations raises the question of whether these changes were the result of new influences on the locally produced pottery, of trade or of the migration of people who brought their pottery and traditions with them.

We will investigate the potential of a multidisciplinary approach, combining scientific methods (petrography, WD-XRF, SEM-EDS and MGR; see below) with traditional stylistic and technological analysis (e. g. vessel type, tempering, and decoration). This approach produces a definition of coherent pottery groups and helps to determine their provenance. What is innovative about this new approach is that stylistic information is no longer taken as a primary criterion in the classification process but is used as part of a more integrated methodology. This allows us to prevent bias and to better reconstruct the complexities and dynamics behind the developments in handmade pottery assemblages.

The pottery for this pilot study (12 064 sherds in total) was selected from four rural settlements in the Tiel region; 83 samples were selected for scientific analysis and an additional 36 samples for reference (see below).

A reflection on current research

Research on the relationship between pottery and mobility has traditionally focused on ‘pottery style groups’ as an indication of provenance. A survey of the existing literature reveals three major limitations of this stylistic approach when studying Early Roman handmade pottery: 1) the direct association of ‘style groups’ with provenance regions; 2) the use of ethnic labels; and 3) the lack of science-based provenance studies, not only for pottery from consumption sites, but also for new pottery types, which are inserted into ‘regional’ typologies.

Regarding the first limitation, it is important to emphasise that in pre-Roman times the production of handmade pottery was embedded in a strong regional framework, following ancestral traditions. Despite occasional evidence of trade, gifts and interregional influence,

⁶² See VAN DEN BROEKE 2012, 196 and HEEREN 2014, 163–166 on the presumed local production of handmade pottery.

⁶³ On the relationship between material culture (style, technique) and identity, see DIETLER / HERBICH 1998; GOSSELAIN 2000; ANTONACCIO 2010. Techniques should be viewed within their social context

as product and producer of habitus. As GOSSELAIN (2000, 209) states: “One learns specific abilities and acquires specific tastes by interacting with relatives, friends, neighbors, or members of any form of social group to which one belongs or with which one interacts, within or across boundaries.”

most pre-Roman handmade pottery was locally produced and therefore indigenous⁶⁴, thus allowing the definition of 'pottery style groups', regional typologies and local typologies⁶⁵. After the Roman conquest, however, these well-known 'pottery style groups' and typologies were augmented or even abruptly replaced by new vessel types, decorations and technological characteristics (such as temper)⁶⁶. On the assumption that even the newly introduced handmade pottery was locally produced, most studies point to the migration of groups of people bringing traditions from formerly well-defined stylistic groups or regions⁶⁷. Other studies also take account of trade, ritual proceedings and even the exchange of women⁶⁸. However, it is important to emphasise that stylistic and technical developments also occurred in the supposed provenance regions, thereby removing stylistic and technological similarities as a suitable and self-contained provenance tool during dynamic periods.

A second limitation of the stylistic approach entails the use of ethnic labels. There is a tendency, when attempting to identify the provenance of newly introduced pottery, vessel types, decorations and technological characteristics, to attach 'culture groups', or in a broader sense 'ethnic groups', to known 'pottery style groups'⁶⁹. Applying ethnic labels such as 'Chaukian pottery' or 'Batavian pottery' implies that these 'style groups' are directly related to ethnically homogeneous groups of people, reinforcing the stalemate into which the study of Early Roman hand-made pottery has manoeuvred itself.

A third limitation of the traditional stylistic approach is the lack of systematic scientifically based provenance studies, which complicates the interpretation of pottery assemblages. Studies that involve provenance research deploy it either to confirm macroscopically determined groups, after which provenance is still based on 'stylistic parallels'⁷⁰, or to associate pottery with local clay resources on the assumption that the handmade pottery is locally produced⁷¹.

Studying pottery from a period that is highly dynamic in socioeconomic terms requires a release from the constraints imposed by a 'stylistic' approach alone. Instead, by acknowledging the high level of mobility of goods, ideas and people, this pilot study proposes an integrated approach in which scientific methods are used alongside traditional ones. It also examines the potential of this new approach. Both a summary of the approach and a selection of the archaeologically most relevant results will be presented in this article. A full description of the scientific methodology and results will be presented elsewhere⁷².

⁶⁴ VAN DEN BROEKE 2012, 196; HEEREN 2014.

⁶⁵ Pottery style groups are based on stylistic and technological characteristics (DE CLERCQ 2009, 460–461). Typologies are based on vessel types and can be, though not necessarily, part of style groups. For the Netherlands, see for example VAN HEERINGEN 1992 for the Broekpolder II and Santpoort II pottery style groups in the western part of the Netherlands, VAN KERCKHOVE 2009 for the style group of the Betuwe region, TAAYKE 1996 for the regional typologies for Friesland, Groningen and Drenthe, VAN DEN BROEKE 2012 for the regional typology based on the Oss-Ussen site and VAN ES 1970 for the local typology of the Groningen-Paddepoel site.

⁶⁶ VAN KERCKHOVE 2019, 261–264.

⁶⁷ For *Wijk bij Duurstede*, Taayke lists several pottery styles (TAAYKE 2002, 190–205) and connects

their style characteristics with immigrants (see also TAAYKE 2017, 66–67).

⁶⁸ NIEUWHOF 2017, 298–299.

⁶⁹ For the handmade pottery from the Utrecht region as an example, Taayke discerns several pottery styles such as the 'Chaukian pottery style', suggesting a Chaukian enclave in Leidsche Rijn (TAAYKE 2017, 66–67). The excavation's project leader, on the other hand, raises the possibility of an indigenous site whose inhabitants had a Chaukian background. The early component of wheel-thrown pottery could point to a military function (DEN HARTOG 2017, 6).

⁷⁰ For example, VAN DEN BROEKE 2014.

⁷¹ For example, ABBINK 1999.

⁷² VAN KERCKHOVE in prep.; VAN KERCKHOVE / BOREEL / BRAEKMANS in prep.

Approach

This pilot study combines scientific methods to determine the mineralogical and chemical composition of the pottery (petrography, Matrix Grouping by Refiring, WD-XRF and SEM-EDS) with traditional methods (the registration of pottery characteristics and comparing these 'style elements' with well-described assemblages in the literature).

After an initial scan to determine the quality and potential of the pottery assemblages, a total of 20 well-dated, pottery-rich, undisturbed contexts were selected from first-generation farmsteads in four rural settlements dating to the pre-Claudian period⁷³. Together, these contexts contain 12 064 sherds, which were described, quantified and documented. From this assemblage, 74 samples were selected for scientific analysis, based on the completeness of the pottery profile. As the initial hypothesis was that a large proportion of the pottery could be associated with the coastal area of the Netherlands, an additional 27 pottery samples were collected from the regions of Friesland, Groningen, North Holland and South Holland and subjected to the same scientific analysis. Another nine samples were selected from Late Iron Age contexts to serve as reference samples for locally produced pottery⁷⁴. Reference sherds were not collected from Germany, regrettably, since it later turned out to be a likely candidate as region of provenance.

Traditional methods used in this study were the registration and quantification of pottery characteristics such as wall and rim finishing, wall and rim decoration, firing atmosphere, tempering, vessel shape and (regional) type. A detailed description of the quantified pottery characteristics for each assemblage and site will be presented in a separate article⁷⁵.

Compositional and technological analysis was carried out by means of the following: optical microscopy (petrography), Matrix Grouping by Refiring (MGR), WD-XRF and SEM-EDS. Petrography entails the microscopic analysis of thin sections and allows classification based on clay matrix, voids and inclusions⁷⁶. MGR is based on the assumption that the chemical and mineralogical composition of the clay (mixture) is reflected in its thermal behaviour during firing⁷⁷. Samples were refired and classified according to colour variation at 1000 °C, 1100 °C, and 1200 °C and texture at 1200 °C. Major chemical elements of the matrix were analysed using a variable pressure scanning electron microscope with an attached EDX system (SEM-EDS). Bulk chemical analysis of major, minor and trace elements was conducted using WD-XRF.

The results have been approached as a multivariate dataset consisting of both qualitative and quantitative data. Fabric classes are based on the different scientific analyses, while a subsequent comparison with reference data (i. e. the geology of north-western Europe and published data) enabled clustering into pottery provenance groups, resulting in a hypothetical provenance. The established fabric classes and provenance groups are consistent with the chemical data after dimensional reduction by means of principal component analysis (PCA).

The final pottery provenance groups and their fabric classes were compared with the documented vessel types and other stylistic and technological characteristics. This comparison has yielded insights into the distribution of certain 'style characteristics', but above all into the complex and heterogeneous traditions in which production was embedded.

⁷³ Tiel-Medel-De Reth, Tiel-Medel-Rotonde, Tiel-Passewaaijse Hogeweg, and Tiel-Oude Tielseweg; see above.

⁷⁴ Tiel-Medel-De Reth and Geldermalsen-Hondsge-met.

⁷⁵ VAN KERCKHOVE et al. in prep.

⁷⁶ WHITBREAD 1995; QUINN 2013.

⁷⁷ Based on the work of HULTHÉN 1976; MIRT 1998; MIRT / DAVIT 2004 and DASKIEWICZ / MARITAN 2017.

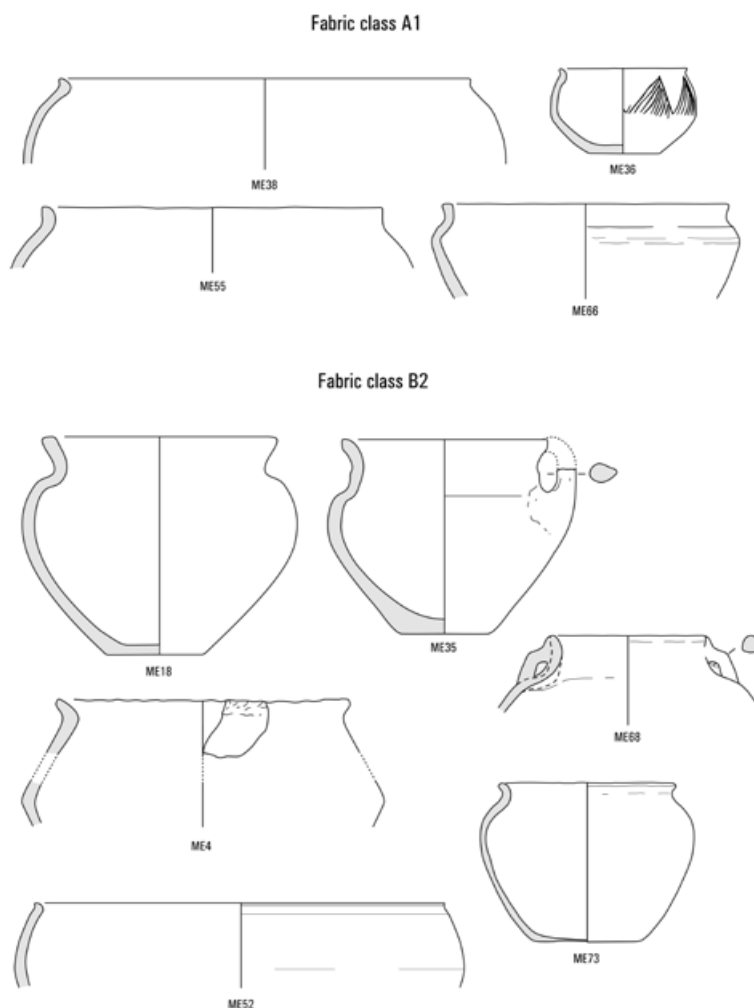


Fig. 6. Selection of pottery from fabric classes A1 and B2. – Scale 1 : 4.

A detailed description of all the methods used, the pottery classes and their detailed provenance attribution will be the subject of a forthcoming article⁷⁸. The next section describes the main fabric classes for the four major provenance groups.

Presentation of the pottery provenance groups

The analysis allowed for the 74 samples with unknown provenance to be classified into 19 fabric classes that cluster into at least seven pottery provenance groups. A summarised description of the four numerically most important groups and their fabric classes is given below.

⁷⁸ VAN KERCKHOVE / BOREEL / BRAEKMANS in prep.

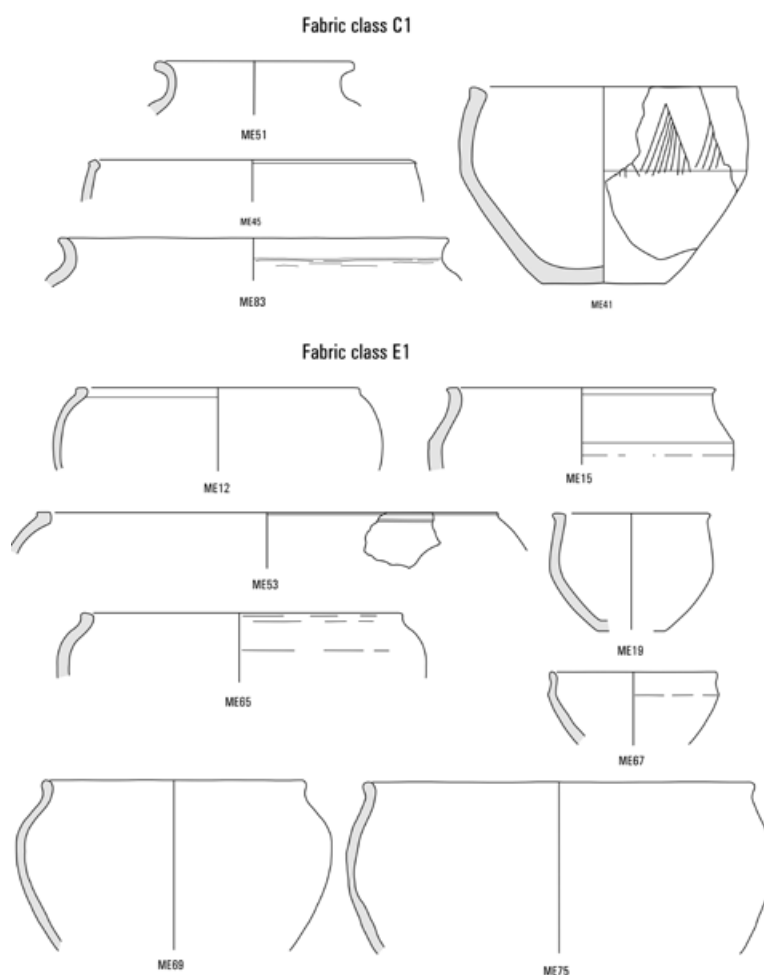


Fig. 7. Selection of pottery from fabric classes C1 and E1. – Scale 1 : 4.

West-central Germany: fabric classes A1, B2, C1, and E1

Four fabric classes (A1, B2, C1 and E1) can be assigned to this provenance group, located in west-central Germany (Figs 6 and 7). Pottery from this provenance group was found at all four sampled sites. Apart from gradual vitrification and sintering differences at around 1200 °C, these four fabric classes make up a homogeneous group according to the MGR. While fabric class B2 has been predominantly tempered with organic material and classes C1 and E1 mainly with grog, a combination of the two occurs in all three classes. Based on its mineralogical content of artificially added fragments of oolitic limestone, calcite crystals, and fragments of (altered) limestone, an area coinciding with the modern German *Westfälische Bucht*, *Niedersächsisch-Hessisches Bergland*, and the eastern parts of the *Rheinisches Schiefergebirge* is tentatively proposed as the provenance for this group.

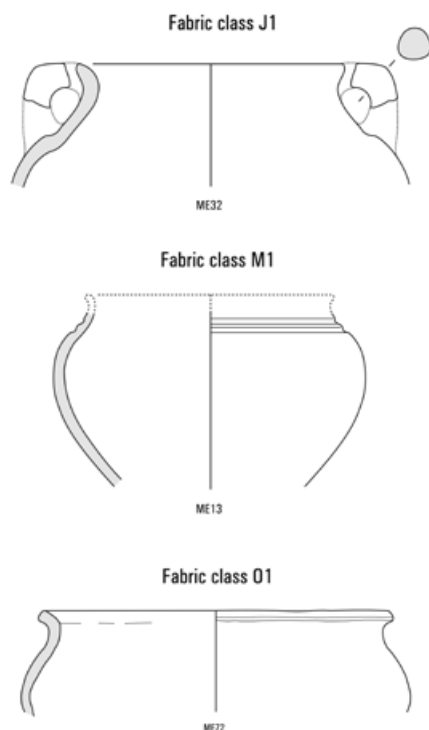


Fig. 8. Selection of pottery from fabric classes J1, M1, and O1. – Scale 1: 4.

Northern Dutch coastal area: fabric classes J1, J2, and M1

Three fabric classes (J1, J2, and M1) can be assigned to this provenance group, which is traced back to the northern Dutch coastal area (*Fig. 8*). Pottery from this group has been found at the sites of Tiel-Medel-De Reth and Tiel-Passewaaijse Hogeweg. Classes can only be fully distinguished at 1200 °C through MGR analysis. Fabrics show a well-sorted, silt-sized fraction of quartz tempered with organic material, occasionally combined with grog. Fabric classes J1 and J2 bear a strong resemblance to the reference material from the Groningen-Paddepoel site, while M1 affiliates to the Frisian Oostergo area. Consequently, the northern Dutch coastal area is proposed as the provenance for this group.

Western Dutch coastal area: fabric class O1

A single fabric class (O1) can be assigned to a provenance group traced back to the Western Dutch coastal area (*Fig. 8*). Pottery from this group has been found at the sites of Tiel-Medel-De Reth and Tiel-Passewaaijse Hogeweg. This fabric class fully melts to a black, green and bright red spotted glass and shows little artificial tempering with organic material. Fabric class O1 is very similar to the Den Haag-Rotterdamsebaan reference samples. Consequently, the western Dutch coastal area is proposed as the provenance for this group.

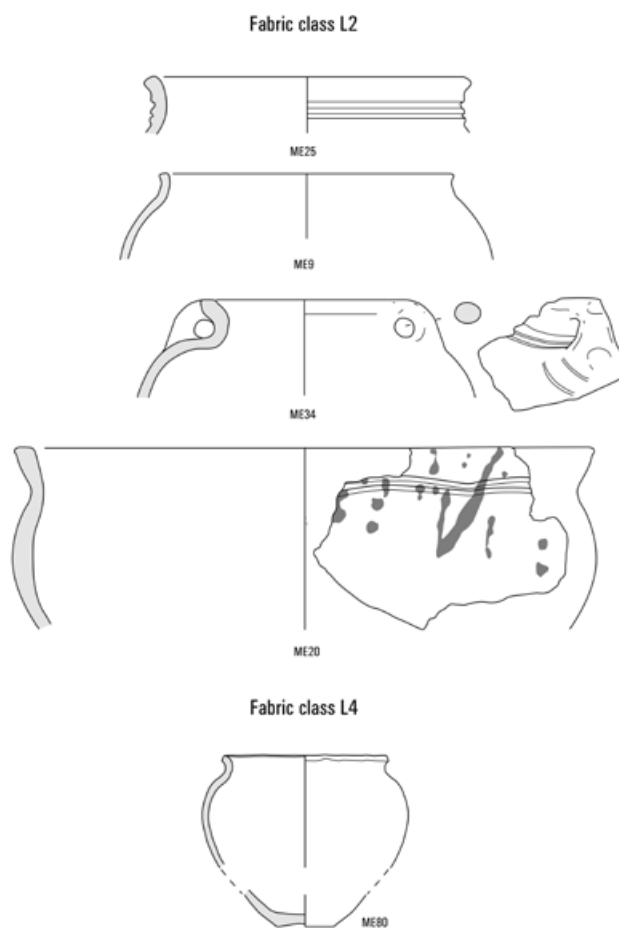


Fig. 9. Selection of pottery from fabric classes L2 and L4. – Scale 1 : 4.

Local Dutch river area: fabric classes L2, L3, and L4

Three fabric classes (L2, L3, and L4) can be assigned to a provenance group from the local Dutch river area (*Fig. 9*). Pottery from this group was found at Tiel-Medel-De Reth, Tiel-Oude Tielseweg, and Tiel-Passewaaijse Hogeweg. The inhomogeneous clay shows a high integrity during refiring. Fabrics have been tempered with sand and / or grog. Fabric classes L2, L3, and L4 are very similar to the analysed late Iron Age samples from Geldermalsen-Hondsgemet and Tiel-Medel-De Reth. The Late Iron Age pottery was presumably produced with local clays. Consequently, fabric classes L2, L3, and L4 are also presumed to have been produced locally.

Chemical composition of fabric classes and pottery provenance groups

The presented classification of the samples (based on macroscopic and microscopic fabric description and refiring (MGR)) was visually compared with the result of a multivariate PCA analysis on the major and minor elemental concentrations measured using WD-XRF (*Fig. 10*). Preliminary results show that the four major pottery reference groups described above are also replicated in the PCA score plot. In addition, various fabric classes within

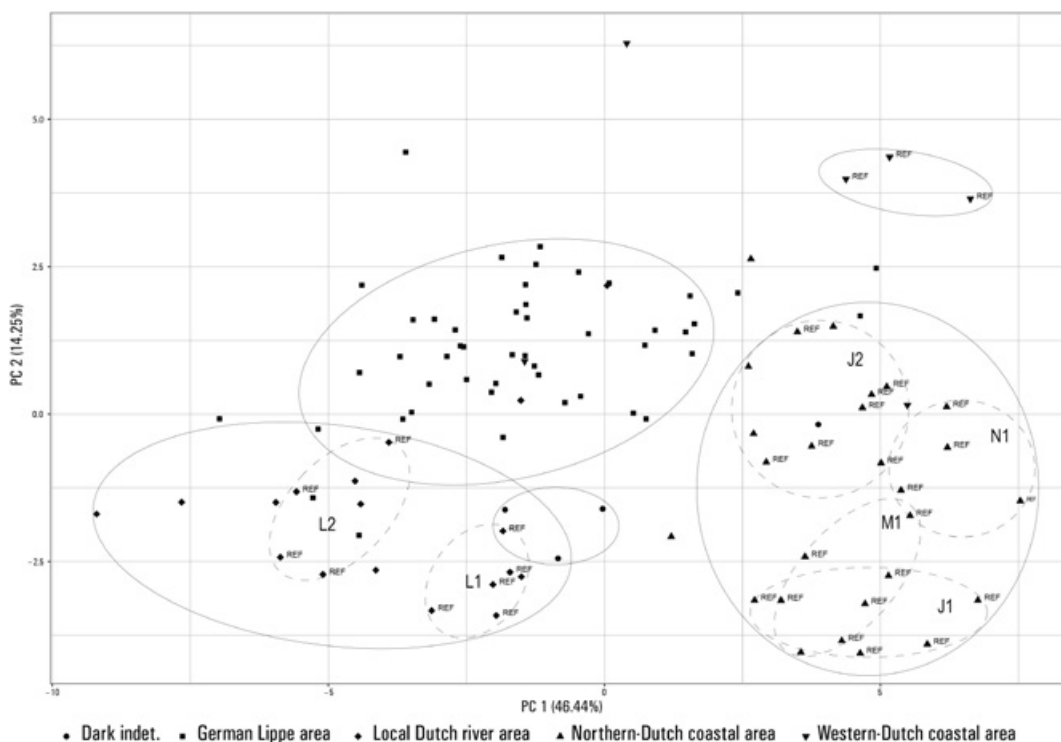


Fig. 10. The PCA score plot of the first two PCs of the major and minor elemental concentrations measured using WD-XRF.

these groups can be distinguished as clusters. Several samples chemically coincide with one of the reference groups from the local Dutch river area or the northern or western Dutch coastal area. Unexpectedly, one of the clusters is clearly different from the reference material (*Fig. 10*). These samples are characterised by a much higher Fe and Zn content as well as a relatively high trace element content (in particular Rb). This cluster coincides with the west-central German pottery provenance group, as defined above. SEM-EDS results are consistent with WD-XRF measurements. Although there is a focus on major elements in the ceramic matrices, comparable patterns and clusters can be distinguished.

The provenance groups in comparison with the vessel types and other pottery characteristics

The pottery assemblages from the four sites in the Tiel region are characterised by a considerable heterogeneity. Specific vessel types may bear a resemblance to types from an earlier 'pottery style group', traditionally assigned to a particular geographic region or even a 'culture group' and which at the same time display decoration types typical of another. Vessel types within the assemblages also show quite some variability, implying an array of possible provenance regions. To avoid bias, the most prominent vessel types and styles have therefore been grouped and generally described, allowing comparison with parallels from other regions and with the results of the science-based fabric analysis.

A first, heterogeneous, group of vessel types can be referred to as 'neckless bowls and jars with developed rim'. The bowls can be globular or slightly biconical. This group is well represented within the studied assemblages from the Tiel region (fabric class A1: ME38,

ME36 and ME55; fabric class C1: ME41; fabric class E1: ME12, ME19; fabric class B2: ME52). In the Netherlands, bowls of this type are found in Wijk bij Duurstede, Oss-Ussen, Rijswijk-De Bult, and the Groningen and Drenthe areas⁷⁹. But they are also widespread in the neighbouring coastal region of north-western Germany, further inland between Rhine and Elbe, and the distribution area of the Rhine-Weser-Germanic (RWG) pottery⁸⁰. In particular, the Lippe region (Westphalia, Germany) should be mentioned⁸¹. Some rims are faceted (fabric class C1: ME45, fabric class E1: ME53)⁸². The biconical variants of these neckless bowls are closely related to the *situla*-like von Uslar I vessels (see below). This is particularly the case for ME4 (fabric class B2) and ME 15 (fabric class E1)⁸³. The fabric analysis suggests that the pottery from this group of types, within the studied assemblages from Tiel, originated from west-central Germany.

A second group of types is similar to the '*situla*-like type von Uslar I'⁸⁴. During the Augustan period, it was especially widespread in the distribution area of RWG pottery and more rarely in the coastal region of north-western Germany⁸⁵. In the Tiel region, it is only modestly represented (fabric class E1: ME67, fabric class A1: ME66). The fabrics of this group of types yields a similar picture to the group of 'neckless bowls with developed rim'. The fabric analysis indicates that the pottery from this group originated from west-central Germany.

⁷⁹ Wijk bij Duurstede (TAAYKE 2002): the rounded bowl Hulst type A2 and the more biconical bowl Hulst type B2. The biconical variants seem to be slightly younger in Wijk bij Duurstede. Oss-Ussen (VAN DEN BROEKE 2012): the rounded bowls Van den Broeke type 22 and the biconical forms Van den Broeke type 33/34. The latter evolved into the typical biconical bowls and pots that are common in the *civitas Batavorum* for the period between c. AD 40 and 70 (VAN KERCKHOVE 2009). Rijswijk-De Bult (BLOEMERS 1978): Bloemers types IA–D. Groningen area (TAAYKE 1996): Groningen type K4. This biconical variant from Groningen can be dated from c. AD 50 onwards according to Taayke, but only from c. AD 100 onwards according to Nieuwhof (based on the find complexes in Ezinge; NIEUWHOF 2014, 57; 59–60). The round variant type Groningen K3/Paddepoel IV (TAAYKE 1996; VAN ES 1970) is interpreted by Taayke as 'Chaukian' or 'Wierum-style'. Drenthe area (TAAYKE 1996): type Drenthe K2.

⁸⁰ From the Roman conquest onwards, the indigenous pottery style from the RWG region saw many changes. In the first phase, these changes were instigated by immigrants from the "Przeworsk Kultur", who settled in North Hesse and the Lippe region; and in the second phase by Elbe-Germanic influences. From c. AD 50 onwards the actual 'RWG-style' kicked off, with a hybrid pottery style incorporating the many influences from the previ-

ous period (MEYER 2009, 65). This type group is closely related to the type von Uslar I–II, but also von Uslar III (VON USLAR 1938). For parallels, see Hofheim I (especially the developed rims; WALTER 2000, fig. 3,2–5), Oelde-Sünningshausen (EGGENSTEIN 2003, 158 pl. 89), Haltern (VON USLAR 1949, fig. 8,3; 9,10–13), Engter (PAPE 1993, fig. 2.8–9), Mardorf (MEYER 2000, fig. 8,1) and Waldgirmes (RASBACH 2013, fig. 6, second drawing).

⁸¹ Delbrück-Anreppen (EGGENSTEIN 2003, pl. 46,17.9.8), Bergkamen-Oberaden (EGGENSTEIN 2003, pl. 20,9–11), Haltern (EGGENSTEIN 2003, pl. 61h).

⁸² The appearance of thickened, faceted rims can be explained by the immigration of people from the "Przeworsk Kultur" (MEYER 2009). See also PAPE 1999, 356–357 (with further reference to HALPAAP 1994, 47) for the Osnabrück region and their link to the "Przeworsk Kultur" and their presumed relationship to 'Elbe-Germanic' pottery.

⁸³ This is also the case for its Groningen counterpart K4 (TAAYKE 1996). For German parallels for ME4 and ME15, see HALPAAP 1994, fig. 22.2 (Soest-Ardey) and FRANK 2013, fig. 3,4.5 (Niederkassel).

⁸⁴ And the transition type von Uslar I/II.

⁸⁵ Waldgirmes (RASBACH 2013, fig. 6 [first drawing]); Haltern (VON USLAR 1949); von Uslar I in the RWG region (MEYER 2009); von Uslar I in Northwest Germany (NÖSLER 2018, 250).

'Globular bowls with small everted, rounded rims' make up a third group of types. This group is closely related to the globular variant of 'neckless bowls with developed rim' group (see above). They are well represented in the Dutch provinces of Groningen, Drenthe and Overijssel, the area around Nijmegen and Oss and the coastal region of north-western Germany and the distribution area of RWG pottery⁸⁶. This group of types appears to have been produced locally in the Tiel region (fabric class L4: ME80, with slightly flattened rim variant) as well as in west-central Germany (fabric class E1: ME69, ME75).

Another group of vessels was produced in the style of pottery commonly found in the coastal regions of the Netherlands (South and North Holland, Friesland, Groningen) and of north-western Germany⁸⁷. In the literature, pottery in this style is also referred to as 'Frisian'⁸⁸. Vessels in this group of styles show fabrics such as fabric class B2 (ME18, ME35, ME68), fabric class C1 (ME51, ME83), fabric class M1 (Oostergo: ME13), J1 (Groningen: ME32) and fabric class L2 (ME20, ME25, ME34). The wide array of provenances leads to three important conclusions. Firstly, although 'Frisian'-style vessels from Germany have been described in other studies⁸⁹, this research demonstrates for the first time that at least part of this material was locally produced in Germany. Secondly, the so-called 'Frisian'-style pottery was also produced locally in the Tiel region. Thirdly, pottery in this style from the Tiel region was also produced in the northern regions.

A specific group of decoration consists of upward pointing, or 'standing', triangles as a geometrical decoration pattern. They mostly resemble the triangles on 1st-century AD pottery found in the coastal region of Groningen and north-western Germany⁹⁰, although the northern Dutch triangles point downwards instead of upwards. Small wall sherds with a similar geometrical decoration are found in Mardorf (Hesse) and Haltern (Lower Rhine)⁹¹. Fabric analysis on the other hand shows that the vessels with this decoration type were produced in west-central Germany (fabric classes A1 and C1: ME36, ME41, ME42, ME43). Parallels for this kind of decoration have not yet been found in this region.

Discussion

The analysis of the pottery assemblages from four rural settlements in the Tiel region has led to some interesting results that will be briefly summarised and discussed here.

The most prominent result is the confirmation of the observed break with locally produced Late Iron Age pottery. Most of the 12 000-plus sherds show non-local fabric characteristics, which is confirmed by compositional analysis. Such high quantities of non-local pottery should most probably be understood as having been brought to the Tiel region by immigrants taking their entire household with them. The small number of samples that were produced locally shows a mix of 'style elements', demonstrating the mobility of ideas and traditions, most probably introduced by the same immigrants. Comparable indications of hybridity were also observed in house architecture.

⁸⁶ Groningen Gw5a (TAAYKE 1996; NIEUWHOF 2014); van den Broeke 52 in Oss-Ussen (VAN DEN BROEKE 2012); Hulst C2a in Wijk bij Duurstede (TAAYKE 2002); North Drenthe G5 (TAAYKE 1996); Varsen, Overijssel (SCHOLTE LUBBERINK 2017, fig. 5.20a, 11.13.15.26); Nijmegen-Kops Plateau (VAN DEN BROEKE 2014, fig. 17.5). See TAAYKE 1996 on the North German coastal region. For the RWG area, see Delbrücken-Anreppen (EGGENSTEIN 2003,

pl. 45,1).

⁸⁷ Types Hulst C1 and C2 in Wijk bij Duurstede (TAAYKE 2002, with further reference to HULST 1981).

⁸⁸ VAN DEN BROEKE 2018.

⁸⁹ CARROL 2001; BLOEMERS 1973.

⁹⁰ TAAYKE 2017, 66.

⁹¹ Haltern (VON USLAR 1949, fig. 16,6–7); Mardorf (MEYER 2000, fig. 8,19.21.24).

This study shows that during the Early Roman period, in which migration is often mentioned in the written sources, traditional ‘pottery style groups’ were transformed dramatically, prohibiting the direct association of these style groups with specific provenance regions based on ‘style characteristics’. Fabric analysis has demonstrated that the pottery can be classified into 19 fabric classes that cluster into seven pottery provenance groups. The four numerically most important are: west-central Germany (possibly the Lippe region), the northern Dutch coastal area (Oostergo and Groningen), the western Dutch coastal area (Den Haag region) and the local Dutch river area. Comparing these groups with the stylistic and technological characteristics, it appears that there is no clear-cut link between ‘pottery styles’ and ‘provenance regions’. ‘Frisian’-style vessels, for example, were produced in west-central Germany and brought to the Tiel region. At the same time, vessels with similar style characteristics were also produced locally as well as in the northern Dutch coastal area.

An unexpected result is the marked heterogeneity of the pottery provenance within the studied assemblage from the Tiel region. A whole array of provenance regions, groups of vessel types and (hybrid) styles as well as inter-site variation strongly suggest a high degree of mobility and a diverse and heterogeneous composition of society across a wide region. For example, the ‘Frisian’-style pottery, irrespective of its provenance, is well represented at the site of Tiel-Medel-De Reth, but is rather scarce at the other three sites. Pottery from the west-central Germany provenance group is best represented at the sites of Tiel-Passewaaijse Hogeweg, Tiel-Oude Tielseweg, and Tiel-Medel-Rotonde. Most locally produced pottery was found at Tiel-Medel-De Reth. Whether these patterns should be explained from a demographic point of view or whether they point to subtle chronological differences has to be subject of future research.

This pilot study proposes a multidisciplinary and integrative approach in which several scientific methods (petrography, MGR, SEM, WD-XRF) are combined with traditional methods (such as the study of vessel types, decorations, temper), challenging the constraints of a predominantly stylistic approach. This new approach yields promising results and offers great potential for gaining a better understanding of the much-debated themes of human mobility, cultural interaction and migration.

The Sr isotope analysis of animal bones

The application of stable and radiogenic isotope systems in zooarchaeological research such as strontium (Sr) has matured over the past decade. A shift from sporadic application to frequent implementation is evident, allowing new insights into matters such as faunal palaeomobility patterns, surplus production, and trade and exchange⁹². Sr isotopes that are incorporated into our tissues through our diet serve as geochemical signatures that can be used to link archaeological skeletal remains to a specific geologic area. The Sr isotope composition of dental enamel ($^{87}\text{Sr}/^{86}\text{Sr}$), the material least prone to diagenetic alterations⁹³, is directly related to the $^{87}\text{Sr}/^{86}\text{Sr}$ of the consumed foods during the enamel mineralisation and maturation period, i. e. childhood. Comparison between the enamel’s $^{87}\text{Sr}/^{86}\text{Sr}$ and the expected local or regional bioavailable $^{87}\text{Sr}/^{86}\text{Sr}$ allows for the identification of mobility⁹⁴. The accuracy of Sr isotope data interpretation strongly depends on the availability and accuracy of reference databases and maps (isoscapes)⁹⁵.

⁹² E. g. BRUSGAARD et al. 2019; GROOT et al. 2020.

⁹³ BUDD et al. 2000.

⁹⁴ BENTLEY 2006 with references.

⁹⁵ E. g. EVANS et al. 2010; KOOTKER et al. 2016a; WILLMES et al. 2018.

Period	Site	Toponym	Taxon	Element	Sample ID	⁸⁷ Sr/ ⁸⁶ Sr	2SE
LIA	Gelder- malsen	Hondsgemet	<i>Bos taurus</i>	M1	V83.287	0.708683	0.000007
				M1	V108.149	0.708783	0.000008
				M1	V59.117	0.708785	0.000008
				M3	V83.287	0.710966	0.000008
				M1	V73.217	0.712594	0.000006
				M1	V73.211	0.708587	0.000008
ERA	Tiel	Medel-De Reth	<i>Bos taurus</i>	M1	V3140	0.708766	0.000009
				M1	V3862	0.709585	0.000010
				M1	V5802	0.708793	0.000008
				M1	V3392	0.709353	0.000009
				M1	V3137	0.708816	0.000008
			<i>Ovis aries</i> / <i>Capra hircus</i>	M1	V3130	0.708806	0.000007
				M1	V4097	0.708750	0.000006
				P4	V4255	0.708820	0.000008
				M2	V3994	0.708774	0.000008
				Tiel	Medel-Rotonde	<i>Bos taurus</i>	M1
	dP3	V10.72	0.709079				0.000008
	P4	V10.84	0.708995				0.000008
	M3	V10.72	0.708953				0.000006
	M1	V9.33	0.708857				0.000008
	M1	V10.72	0.708833				0.000009
	Tiel	Oude Tielseweg	<i>Bos taurus</i>	dP4	S343	0.708830	0.000007
			<i>Ovis aries</i> / <i>Capra hircus</i>	M1	S343	0.708798	0.000010
		dP4	S343	0.708790	0.000006		
	Tiel	Passewaaijse Hogeweg	<i>Bos taurus</i>	M2	V6	0.708379	0.000009
				M2	V145	0.708783	0.000009
				M1	V128	0.708795	0.000007

Tab. 2. Sr isotope data from 27 animals (*Bos taurus* and *Ovis aries / Capra hircus*) from Geldermalsen and Tiel. Key: LIA – Late Iron Age; ERA – Early Roman Age; M1 – first molar; M2 – second molar; M3 – third molar; dP3 – deciduous third premolar; dP4 – deciduous fourth premolar; 2SE – two standard error.

In the virtual absence of human skeletal remains from the Early Roman Period⁹⁶, faunal samples dating to the Late Iron Age and Early Roman period were selected for Sr isotope analysis, as palaeomobility patterns from domesticated faunal species are undoubtedly connected with human behaviour. A total of 27 individuals from four archaeological sites in Tiel and Geldermalsen were selected, representing *Bos taurus* and *Ovis aries / Capra hircus*⁹⁷.

⁹⁶ Just two for our region; see KOOTKER et al. 2022.

⁹⁷ The dental elements were mechanically cleaned with an acid-cleaned diamond-tipped burr until clean, crisp white dental enamel was visible. Approx. 2 ± 1 mg of enamel powder was sampled, collected

in HCl-cleaned Eppendorfs, and transferred to a class-1000 clean laboratory facility at the *Vrije Universiteit Amsterdam*. Strontium column extraction and sample loading were performed following the protocols published in KOOTKER (2016b). The iso-

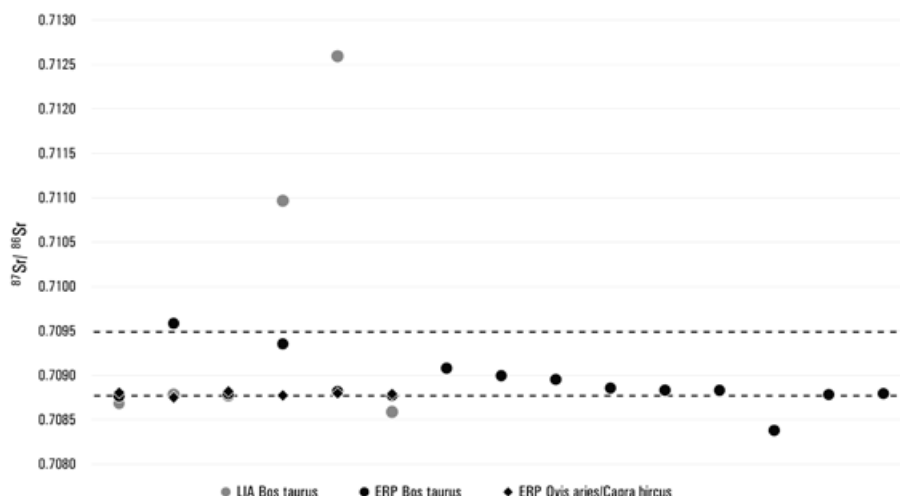


Fig. 11. Sr isotope data from 27 animals (*Bos taurus* and *Ovis aries* / *Capra hircus*) from Geldermalsen and Tiel. Key: - - - expected minimum and maximum $^{87}\text{Sr}/^{86}\text{Sr}$ for the Tiel and Geldermalsen region; LIA – Late Iron Age; ERP – Early Roman period.

The data are presented in *Tab. 2* and *Fig. 11*. Based on the available baseline data, the expected regional bioavailable $^{87}\text{Sr}/^{86}\text{Sr}$ range between about 0.7088 and 0.7095⁹⁸. The difference between the Late Iron Age and Early Roman period results is striking. Nearly 67 % (four of the six) of the cattle dating to the Late Iron Age from Geldermalsen-Hondsgemet exhibit Sr ratios that are either slightly below the expected minimum $^{87}\text{Sr}/^{86}\text{Sr}$ for the Geldermalsen region, or far above the expected maximum. For individuals V83.287, V73.217 and V73.211, it can be concluded that they did not originate from the Geldermalsen region, but were imported from at least two different geological areas. This evidence of animal imports in the Late Iron age complements the data obtained earlier⁹⁹. These results show that the animals came from various regions, highlighting the use of wide-ranging trade / exchange networks. For the Early Roman period, the import of animals is less evident. Except for one, *Bos taurus* (V6) from Tiel-Passewaaijse Hogeweg, all faunal data are consistent with the expected local bioavailable $^{87}\text{Sr}/^{86}\text{Sr}$ range.

At first glance, the results presented above seem to be at odds with the results of the analyses of both pottery and house architecture. Whereas the latter analyses showed clear indications of marked non-local influx during the Early Roman period, the Sr isotope analysis seems to indicate a dominance of the ‘local’, although mobility between two isotopically similar regions cannot be ruled out. Two points should be made regarding these results. Firstly, we should be aware that although non-local animals may theoretically have been brought in on the hoof by settlers from outside the region, the relatively short life cycle

tope compositions were measured with a Thermo ScientificTM Triton PlusTM instrument using a static routine. Strontium ratios were corrected for mass fractionation to $\text{Sr}/^{88}\text{Sr}$ ratio of 0.1194. All measurements were referenced to the within-run value of the NBS987 standard (0.710254 ± 0.000018

(2SD) during the course of this study, $n = 84$). The total procedural blanks ($n = 4$) contained between 12.5 and 49.2 pg strontium.

⁹⁸ KOOTKER et al. 2016a.

⁹⁹ KOOTKER et al. 2018; GROOT et al. 2020.

	MDR	TPH	HTC	WDH	UTW	GMH	L	Total
Avaucia	10	24	2	9	3	21	1?	70
As Republic, Rome	1?	-	-	-	1	-	-	2
Nemausus as, Nimes	1	-	1	-	-	1	2 (1)	5
Moneyer's as, Rome	3 (3)	-	5 (5)	-	8 (3)	2	3 (2)	24
Sestertius, Rome	-	-	-	-	-	2 (1)	-	2
Altar as, Lyon I	6	4	2	-	12 (4)	4	6 (2)	35
Semis, Lyon	-	1	-	-	-	-	-	1

Tab. 3. Overview of Republican and Augustan bronze coins from seven excavated rural settlements in the Batavian river area. Countermarked coins are shown between brackets. Some of the coins will have still circulated under Tiberius. MDR: Tiel-Medel-De Reth; TPH: Tiel-Passewaaijse Hogeweg; HTC: Houten-Castellum; WDH: Wijk bij Duurstede-De Horden; UTW: Utrecht-Terweide; GMH: Geldermalsen-Hondsgemet; L: Lent.

of domestic animals seriously reduces the chances of identifying cattle that were brought in by first-generation immigrants. Secondly, the possible absence of non-local animals can perhaps be understood within the context of this specific period. It is highly possible that existing structures of (gift) exchange, transhumance and raiding practices were discontinued after the disruptive events of the Roman conquest. The first-generation settlers were not (yet) integrated into exchange networks and thus most animals were bred and held locally.

New forms of mobility: the exploitation of the Batavi as a soldiering people

Historical sources, too, offer us interesting clues for the study of human mobility in the Lower Rhine delta. The written sources suggest close military links between the newly created Batavian community and the Roman Empire. This theme draws our attention to new patterns of mobility and connectivity relating to Rome's exploitation of the Batavi as a soldiering people. This mobility ranged from seasonal service in irregular auxiliary formations and service in the imperial bodyguard in Rome to long-term service in auxiliary units as professional soldiers¹⁰⁰. This raises the question as to what extent this early military service is materialised in the archaeological record of rural settlements in the Batavian area. We proceed here from the assumption that (ex-)soldiers interacted in some way with their homeland, in particular via patterns of return migration. We will explore this theme by analysing two categories of metal finds from excavated rural settlements in the Batavian river area: early Roman bronze coins and Roman-style militaria. Metal detection at rural settlements has dramatically improved our knowledge of material culture in the earliest Roman period. Bronze objects in particular are well preserved in river clay soils, where they occur in large numbers in the topsoil of settlement sites and in deposits of settlement waste in residual channels.

In our study of the earliest influx of Roman coins we have focused on bronze coinages, since early silver denarii generally have a long circulation period and are therefore

¹⁰⁰ ROYMANS 2004, chs 5 and 10. For an overview of the rich epigraphical evidence on the military

service of Batavian individuals, see DERKS 2009.

	helmet	armour	shield	sword	sword belt	horse gear	reference
Houten-Hofstad-Diepriool	>4	2	-	-	1	-	SCHURMANS 2005; VAN RENSWOUDE / HABERMEHL 2017
Oosterhout-Van Boetzelaerstraat	2	1	-	2	3	40	NICOLAY 2007, 104–107
Tiel-Passewaaijse Hogeweg	1	1	-	1	3	39	NICOLAY 2007, 99–104
Tiel-Oude Tielseweg	1	-	-	-	1	9	NICOLAY 2007, 99–104
Geldermalsen-Hondsgemet	-	4	-	-	2	5	VAN RENSWOUDE / VAN KERCKHOVE 2009
Beneden Leeuwen-De Ret	-	3	2	1	2	11	NICOLAY 2007, 194
Wijk bij Duurstede-De Horden	-	2	-	1	9	44	NICOLAY 2007, 91–95
Kesteren-De Woerd	-	2	-	1	3	17	NICOLAY 2007, 111–112
Wijk bij Duurstede-De Geer	-	1	-	-	-	7	NICOLAY 2007, 95–97
Wijchen-Tienakker	-	1	1	-	1	7	NICOLAY 2007, 112–115
Houten-Castellum	-	1	-	2	2	11	VAN RENSWOUDE / HABERMEHL 2017
Tiel-Medel-Hazenkamp/De Reth	-	3	1	2	-	32	HABERMEHL et al. 2019
Houten-Zuid 8A	-	-	1	-	1	2	NICOLAY 2007, 107–110
Utrecht-Terweide	-	-	2	2	1	13	DEN HARTOG 2009
Arnhem-De Laar 6/7	-	-	-	1	1	9	NICOLAY 2007, 194
Tiel-Medel-Rotonde	-	-	-	1	-	10	HEEREN 2005
Lent-Dijkteruglegging	-	-	-	1	1	1	HEIRBAUT / KOOT 2016
Lent-Steltsestraat	-	-	-	1?	-	12	NICOLAY 2007, 194
Geldermalsen-Rijs en Ooyen	-	-	-	-	1	13	NICOLAY 2007, 194
Groesbeek-Klein Amerika	-	-	-	-	1	18	NICOLAY 2007, 107
Oss-Westerveld	-	-	-	-	1	4	NICOLAY 2007, 97–99
Arnhem-De Laar 4	-	-	-	-	-	8	NICOLAY 2007, 194

Tab. 4. Overview of metal parts of 1st-century AD Roman military equipment and horse gear from (partially) excavated rural settlements in the Batavian river area.

unsuitable as chronological markers. Our assumption is that the earliest bronze coinages reflect auxiliary payments by the Roman army and have nothing to do with agrarian surplus production for markets or the payment of taxes. They illustrate a close link between the rural and the military community.

Table 3 presents an overview of the bronze coins from the Late Republican and Augustan period found in seven excavated rural settlements. From at least the late Augustan period onwards, there was a substantial influx of coins, probably as payment to (irregular) auxiliaries. This numismatic evidence points to intensive troop supply by the Batavian community, which had an impact on almost every settlement and even household. In the Batavian

river area there are also indications of auxiliary service in the middle-Augustan period. Of interest are the considerable number of rural sites where Nemausus I coins (struck 16–8 BC) or Vienna / Copia bronzes (minted late 30s – early 20s BC) have been found¹⁰¹.

A second method for investigating the impact of early recruitment among the Batavi is to study Roman militaria from rural contexts. An important contribution is Nicolay's work on Roman military equipment from the Batavian region. A problem, however, is that the earliest militaria often cannot be dated more accurately than '1st century AD'. We should also be aware that the first generation of auxiliaries was still armed in the traditional native style. *Table 4* presents an overview of Roman militaria from 22 rural settlements. The best represented items are bronze fittings of *gladii* of type Mainz and Pompeii, *cingulum* buckles and fittings, shield edgings, and hinges and tie-hooks of plate armour, all militaria made in Roman workshops that are regularly encountered in the army camps along the Rhine. However, we should bear in mind that the earliest generation of irregular auxiliaries still used simple, native-style equipment made of iron, which is strongly underrepresented in our archaeological record. From the late Augustan period onward this indigenous weaponry was gradually replaced by Roman-style equipment.

Final discussion

In this paper, we have set out to explore and apply an interdisciplinary, integrated approach to migration and mobility. Our specific research focus was the habitation of four rural settlements in the Lower Rhine delta during the decades around the start of our era. Having analysed several categories of evidence using a variety of methodologies, it is time to connect the dots and reflect on what we have learned.

The analyses of handmade pottery, house architecture and metal finds have proven to be the most revealing when it comes to shedding light on the social and cultural dynamics in our research region. In fact, the results of the first two analyses show interesting parallels that deserve further exploration here¹⁰². First of all, in both pottery and house architecture we find a substantial, if not dominant, emergence of new forms, structures and techniques during the second half of the 1st century BC. There seems to be a break with pre-existing traditions and structures, although some indications of continuity can also be found¹⁰³. In addition, the dominance of local animals during the Early Roman period might also suggest such a break. Pre-existing animal exchange networks possibly broke down during the transition phase between the Iron Age and the Roman period. Another striking feature is the marked heterogeneity in both handmade pottery and house architecture. Even within a single settlement, we find houses and pots that can be associated with different cultural traditions and different regions of origin. Furthermore, there are indications of cultural hybridisation or entanglement, whereby elements of different traditions are used to create new ones. With regard to the provenance of the newly introduced elements, the pottery fabric analysis has suggested a number of different regions of provenance, of which the

¹⁰¹ ROYMANS / AARTS 2005. Roymans is working on a full publication of this early numismatic material from the second half of the 1st century BC in the Batavian region, using the NUMIS and PAN databanks.

¹⁰² Both pottery and house plans can be regarded as part of the inner, private sphere of society. As habitus is more likely to have a stronger persistence

in this inner sphere, it is better suited as evidence for migration (BURMEISTER 2017, 61).

¹⁰³ That the region was not totally deserted between c. 50–25 BC is also suggested by the coin evidence from the sanctuary at Empel, which covers the entire second half of the 1st century BC (ROYMANS / AARTS 2005; ROYMANS 2019).

northern coastal region and the German Lippe region are the most important. Interestingly, the study of house architecture points in the same direction, with two- / three-aisled houses also being found in the region around the Lippe (e.g. at Paderborn and Sendenhorst) and atypical features like the ditched enclosure (feature 2/5) from Tiel-Medel-De Reth suggesting a link with the northern Dutch coastal zone. The above-described patterns and developments show interesting parallels with two German studies that deserve a mention here. In a first study, Robert Heiner reconstructs the development of the Rhine-Weser-Germanic (RWG) pottery (tradition) during the Early Roman period as a complex, multi-faceted process with influences from the Elbe-Germanic region, the Lower Rhine region and north-western Germany¹⁰⁴. Similarly, for the northern parts of German Hesse, Meyer identifies a patchwork of architectural forms, showing influences from the North Sea coastal region, from eastern Germany (Berlin region) and the northern parts of the *Mittelgebirge*¹⁰⁵. This heterogeneous architectural picture is typical of the Early Roman period. During the further Roman period a more uniform house-building tradition developed¹⁰⁶.

This raises the question of how the reconstructed developments can be associated with human migration. First of all, it must be emphasised that the influx of new forms, shapes, ideas and techniques seems to have been rather swift and broad. This, together with the clear break with pre-existing traditions in house building and pottery style, can be understood as an indication of a significant sociocultural shift in the region. The people who introduced these new cultural elements and created new hybrid forms – in interaction with others within this assumedly multi-ethnic society – were most likely immigrants. The chemical analysis of pottery fabrics confirms this idea, as it has shown that non-local pottery predominated in all the studied farmsteads and originated from different regions (including west-central Germany, and the northern and western Dutch coastal areas). In fact, no indications were found within the pottery assemblages of the continuation of pre-existing traditions. As this quantity of non-local pottery cannot be explained as solely the result of exchange or external influence, immigrants must have played an important role here. A further illustration is found at Tiel-Medel-De Reth, where pottery in non-local style was produced locally. This clearly illustrates the presence of immigrants practicing their traditional craft in their new land.

Technical practices, such as house building and pottery making, will have been constructed and reproduced in networks of social interaction. By immigrating to a new land, these networks will also have changed significantly, eventually leading to changes in habitus. For the first generation of immigrants, however, these processes of change seem to have been rather limited still. The heterogeneity found in both pottery and domestic architecture seems to indicate that during this period immigrants still held on to social and cultural identities that had their roots in the regions of origins.

After having presented evidence for a substantial settlement of migrants in our research region during the decades around the start of our era, we now have to address the question what this all means for our picture of the genesis of a Batavian community in the Rhine delta. The traditional picture is mainly based on historical sources and entails a single move of an already existing Batavian people from the right bank across the Rhine (probably present-day North Hesse) to an empty land in the Dutch river area. The picture that emerges from our study suggests, however, a more heterogeneous and complex situation,

¹⁰⁴ HEINER 2000, 71; see also MEYER 2013.

¹⁰⁶ MEYER 2013, 72–73.

¹⁰⁵ MEYER 2013, 73.

whereby different groups migrated to our region, probably over a longer period of time, originating from different regions and arriving in a land where a (probably limited) residual population was still living. Consequently, we can conclude that the population of our research region was of a more heterogeneous composition than is generally assumed. The Batavians seem to have been the result of a gradual ethnogenesis of a group from a complex, poly-ethnic background¹⁰⁷. That this notion of a shared ethnic identity really meant something for the local population in the first centuries AD, is proven in a unique way by over 40 inscriptions in which individuals identify themselves as *Batavus* or *natione Batavus* ('born a Batavian')¹⁰⁸.

For a proper understanding of the Batavian ethnogenesis, it is essential that we also consider the role of imperial agency and the use of force. The migrations in the Germanic frontier zone should be understood within the specific context of the Germanic Wars of Augustus and Tiberius¹⁰⁹. This earliest phase of the Roman period was closely connected with war, crisis and highly asymmetric power relations between Roman military authorities and indigenous groups. In this context it is difficult to imagine that Germanic groups could settle in the Rhine delta without the permission of the Roman military command. Consequently, we should not underestimate force as a factor in migration¹¹⁰. Forced migration could be related to internal conflict, military pressure by rival Germanic groups or Roman military pressure¹¹¹. It is also important to realise that Rome needed manpower for its military campaigns in *Germania*. Germanic groups that had accepted the authority of Rome were often directly exploited as suppliers of auxiliary troops. These troops consisted of irregular warbands led by native commanders. It is highly possible that the immigrations that we encounter in our research region should be understood within this context of ethnic recruitment¹¹². Such an interpretation is confirmed by numismatic evidence, indicating an intensive military exploitation of the Batavi by Rome from at least the middle-Augustan period onwards. Furthermore, exceptional imports from the Augustan-Tiberian period, found in rural settlements, probably also ended up there through military networks of exchange¹¹³.

As a final theme, let us reflect on the methodology proposed and applied in this paper. This interdisciplinary, integrated approach has proven to be a successful strategy for providing a more complex and nuanced picture of group migration processes and the processes that occur in the immigration area. Each category of evidence and each methodology contributes in its own way to our understanding of the processes at hand. While the archaeological evidence allows us to reconstruct developments at the level of the farmstead, the historical sources place these within the broader context of the dramatic military confrontation of the Roman Empire with Germanic groups and the (military) strategies and needs of Rome. More specifically, the handmade pottery and house architecture shed light

¹⁰⁷ Cf. ROYMANS / HABERMEHL 2023.

¹⁰⁸ DERKS 2009.

¹⁰⁹ We prefer an 'imperialist' perspective for understanding group migrations in the Early Roman frontier zone, since this draws our attention – more than approaches based on 'new materialism', 'Romanisation', or 'globalisation' theory – to the importance of imperial power networks. Cf. the discussion in FERNÁNDEZ-GÖTZ et al. 2020.

¹¹⁰ On forced migration, see DRIESSEN 2018.

¹¹¹ ROYMANS / HABERMEHL 2023.

¹¹² Military networks may also have facilitated the process of migration to our region. On migration networks, see MANNING 2020, 9.

¹¹³ This evidence suggests that the military exploitation of the Batavi by Rome was not a later development but a practice that had directly started as soon as immigrant groups had settled in the area.

on change, development and heterogeneity in the region. The metal finds better inform us about the backgrounds of and motivations for migration. It is specifically the combined use of these different kinds of data and methodologies, as well as a proper theoretical framework, that provide the most powerful model. The need for such an integrated approach can be illustrated by the combined stylistic and science-based analysis of hand-made pottery. This analysis has shed more light on the complexities at hand, in this case the less-than-straightforward relationship between pottery style and provenance. It is clear that style and chemical data cannot be studied separately if we wish to reconstruct historical complexities but must be analysed in comparison with each other. Another example concerns the outcomes of the Sr isotope analysis of animal bones. If studied separately from other analyses, these results could create the false impression that the earliest Roman period was one of stability and lack of mobility.

We would like to conclude with suggestions for further research. In general, it must be said that, although this pilot study has shown the potential of the approach presented here, further development and application is greatly needed. More specifically, a number of research topics could be defined that deserve further study. First of all, it would be desirable to establish a broader empirical basis, analysing more pottery assemblages with science-based fabric analysis so that more light can be shed on diversity and heterogeneity within the region, comparing patterns from individual farmsteads, settlements and (micro) regions. This would enable a further definition of immigrant groups and reconstruct their geographical and chronological distribution within the Dutch river area. At the same time, it would be helpful to expand the dataset of house plans, especially in the German regions, and to further develop the analysis. Another interesting avenue of research would involve the broadening of the chronological scope of the study to the period after AD 25/40. How did house architecture and pottery develop after the early, highly heterogeneous phase studied in this paper?

In our view, the pilot study presented in this paper clearly illustrates the potential of the suggested approach for the study of migration and mobility. We hope to inspire further research, thereby increasing cooperation between disciplines, as well as further comparative studies of the formative phase of the Roman Empire in other frontier zones.

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Abstract: Migration and mobility in the Early Roman frontier. The case of the Batavi in the Dutch Rhine delta (c. 50/30 BC–AD 40)

The study of migration is essential for understanding the earliest phases of the Roman period in the Lower Rhine delta. This paper applies an integrated and interdisciplinary approach, combining and comparing historical, archaeological and science-based evidence and methodologies, allowing a more detailed reconstruction of immigration during this period. Our study suggests that various groups migrated to our region, probably over a longer period of time, originating from different regions and arriving in a land with a (probably limited) residual population. This marked and varied immigration should be understood in the context of Roman frontier policy and the (ethnic) recruitment of Germanic groups by the Roman military.

Zusammenfassung: Migration und Mobilität entlang der frühen römischen Grenze. Das Beispiel der Bataver im niederländischen Rheindelta (ca. 50/30 v. Chr.–40 n. Chr.)

Die Untersuchung von Migration ist für das Verständnis der frühesten Phasen der römischen Zeit im Niederrheindelta von wesentlicher Bedeutung. In dieser Arbeit wird ein integrierter und interdisziplinärer Ansatz angewandt, der historische, archäologische und wissenschaftliche Daten und Methoden kombiniert und vergleicht und so eine detailliertere Rekonstruktion der Einwanderung in dieser Zeit ermöglicht. Unsere Untersuchung deutet darauf hin, dass verschiedene Gruppen in unsere Region eingewandert sind, wahrscheinlich über einen längeren Zeitraum hinweg, aus unterschiedlichen Regionen stammend und in einem Land mit einer (wahrscheinlich begrenzten) Restbevölkerung ankommend. Diese ausgeprägte und vielfältige Einwanderung ist im Zusammenhang mit der römischen Grenzpolitik und der (ethnischen) Rekrutierung germanischer Gruppen durch das römische Militär zu sehen.

Résumé: Migration et mobilité le long de la frontière au début de l'époque romaine. L'exemple des Bataves dans le delta du Rhin (env. 50/30 av. J.-C.–40 ap. J.-C.)

L'étude de la migration revêt une importance toute particulière pour la compréhension des premières phases de l'époque romaine dans le delta du Rhin. L'approche adoptée dans ce travail est intégrée et interdisciplinaire, combinant et comparant des données historiques, archéologiques et scientifiques afin de pouvoir restituer en détail l'immigration à cette époque. Cette étude indique que plusieurs groupes ont pénétré dans notre contrée depuis différentes régions, probablement sur une période plus longue, pour s'installer sur un territoire avec une population résiduelle (probablement faible). Il faut considérer cette immigration forte et variée dans le contexte de la politique frontalière romaine et du recrutement (ethnique) de groupes de Germains par l'armée romaine.

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