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Serial learners: interactions between Funnel Beaker West and Corded Ware communities in the Netherlands during the third millennium BCE from the perspective of ceramic technology

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Conclusion

The third millennium BCE is the scene of a migration into Europe from the Eurasian steppe (cf. Allentoft *et al.* 2015; Haak *et al.* 2015; Olalde *et al.* 2018 and further references). This migration set into motion historic changes in ancestry, connectivity, and probably language of which the effects are visible in Europe to this day (Kristiansen *et al.* 2017). Archaeologists long recognised this migration event as the appearance of specific cord-decorated ceramics across Europe. Hence the name attached to these migrating groups: Corded Ware.

Yet these drastic changes should not be taken for granted. These migrants did not arrive in an empty continent. Throughout Europe, they encountered indigenous communities, such as Funnel Beaker West (cf. Furholt 2014a, 2021). Therefore, the crucial question for this period is what interactions between migrating and indigenous communities drove the observed changes. Various answers to this question have been proposed, from slow coalescence of multiple communities under increased interactions (cf. Furholt 2021) to violent destruction of indigenous communities (cf. Heyd 2021; Kristiansen *et al.* 2017).

This pivotal question is approached here through a study of ceramic *chaînes opératoires* (cf. Roux 2019a). Ceramic technology consists of learned, embodied knowledge which potters acquire through working materials as well as direct and indirect interactions with other potters (cf. Gosselain 2018). Therefore, a detailed study of ceramic production processes adds a new dimension to our knowledge about the third millennium BCE: that of knowledge transmission and learning. As such, the following question is at the heart of this dissertation:

What can be inferred from developments in ceramic technology about the nature of the interaction between migrating and indigenous communities that shaped the Corded Ware transition?

This research question is applied to the interactions between indigenous Funnel Beaker West and migrating Corded Ware communities in the Netherlands. Before discussing the answer to this question, the next section sets the stage for these interactions by presenting a revised image of the Middle and Late Neolithic in the Netherlands, based on the findings from this study.

14.1 Setting the Stage

Developments in ceramic technology during the Early Neolithic are crucial for understanding Middle and Late Neolithic ceramic production. Knowledge about vessel production was introduced in Europe independently by farming communities and hunter-gatherers (Gronenborn 2003; Jordan *et al.* 2016; Piezonka 2015). These groups employed different (combinations of) roughing-out and preforming techniques (see Section 11.1, Tab. 11.1; cf. Gomart *et al.* 2017). The developments which followed are unclear, but by the Middle Neolithic, all potters in Northwest Europe learned, used, and taught the production process first seen among hunter-gatherers in Southern Scandinavia (see Ch. 11). As a result, all of the specific *chaînes opératoires* studied here follow a basic structure during roughing out, preforming, finishing, drying, and firing (see Ch. 10, 11). Most variation occurs during the application of decoration and surface treatment, but these operations do generally occur at the same places in the specific *chaîne opératoire* (see Ch. 9, 10), again hinting at a shared knowledge among potters during this period.

During the Middle Neolithic B (3400-2900 cal BCE), two communities co-existed in the Netherlands (see Fig. 14.1). On the one hand, Vlaardingen communities occupied the wetlands, and had roots going back to the Mesolithic. The subsistence economy of Vlaardingen communities combined hunting, gathering, fishing, farming, and fowling. They practiced a burial rite which left few archaeological traces (Amkreutz 2013; Fokkens *et al.* 2016). On the other hand, Funnel Beaker West communities likely migrated into the Netherlands from Southern Scandinavia, and are best known from the upland areas of the Netherlands. These communities practiced a burial rite involving inhumation in megalithic tombs and flat graves, and had a subsistence economy focused on agriculture (Louwe Kooijmans 2018).

It is not possible to substantiate typochronological distinctions within Funnel Beaker West (see Section 2.3). However, the radiocarbon evidence does point towards a chronological distinction between early flat graves which pre-date ca. 2925 BCE, and late flat graves which date between ca. 3000 and 2675 BCE. Materials associated with both early and late flat graves occur in megalith inventories, indicating the accumulation of these assemblages over longer periods of time (see Section 2.4).

There are two developments during the Middle Neolithic B which are crucial for the events during the third millennium BCE. The first development relates to the early and late flat graves which appear from the radiocarbon evidence (see Section 2.3; 2.4). Prior to and during the first century of the third millennium BCE, most flat graves contain inhumations (Bakker 1992 p. 93), but a small number yields traces of wooden structures in the burial pit which were set aflame during the burial (e.g. Bouma and Van der Velde 2022 pp. 50–2). Cremation of the deceased is rare (see Section 2.4). In addition, mourners increasingly selected amphora-like vessels and bowls as grave goods from the larger spectrum of vessel types found in Funnel Beaker West megalith inventories (see Section 2.4). This change in funerary practices is important for understanding later events in the third millennium BCE.

The second crucial development is knowledge exchange between Funnel Beaker West and Vlaardingen communities (see Section 12.2). Funnel Beaker West vessels from megalith inventories follow a production process which is distinct from that found in Vlaardingen vessels, and better resembles specific *chaînes opératoires* from Funnel Beaker North (see Fig. 10.2A, Tab. 10; Section 12.2). This pattern is due to the broad range of techniques applied during decoration and surface treatment of these vessels (see Ch. 9, 10). It points

at the existence of shared knowledge among potters in Southern Scandinavia and the Netherlands, and underlines the ties between Funnel Beaker West and North communities (see above). However, Funnel Beaker West vessels do appear on Vlaardingen sites, and vice versa (Amkreutz 2013 p. 342; Beckerman and Raemaekers 2009 p. 79; Drenth 2019).

Crucially, Funnel Beaker West vessels which post-date ca. 3000 BCE show a standardised production process with sparse decoration and intensive burnishing (see Ch. 9, 10). This same production process appears in Vlaardingen vessels (see Appendix F), but contrasts with Funnel Beaker North (see Fig. 10.2C; Tab. 10.3). The start of this standardisation in ceramic production processes already appears in early flat graves (see Ch. 10; Section 12.2), indicating that potters among Funnel Beaker West and Vlaardingen communities were in the process of exchanging knowledge and adopting a similar production process well before the third millennium BCE. This outcome might be part of the increasing regionalisation of Funnel Beaker groups during the fourth millennium BCE (cf. Furholt 2014b).

These two developments, in funerary rites and ceramic technology, bring us to the arrival of migrating communities with steppe ancestry in the Netherlands around 2975 BCE, and the start of the Late Neolithic A (2900-2500 cal BCE). The impact of this event on indigenous and migrating communities, respectively is discussed in the following two sections.

14.2 Business as Usual

Funnel Beaker West communities were unaffected by the arrival of migrating communities around 2975 BCE and co-existed with them for 150-500 years. Moreover, this development is not an exception but part of a broader pattern during the third millennium BCE.

The two defining elements of Funnel Beaker West are practices in funerary rituals and ceramic production (see Section 2.1). This study shows practices in both of these fields continued to be in use until ca. 2675 BCE, meaning people learned them, adhered to them, and passed them on. Changes did occur in these practices, but these changes are rooted in developments which took place prior to the third millennium BCE.

In terms of funerary practices, the archaeological record yields cremation burials dating to ca. 3000-2675 BCE. These cremation burials are a continuation of the practices seen in early flat graves, but cremation has become the norm, rather than the exception (see Section 2.4; 12.1; cf. Bakker 1992 p. 93). In addition, the selection of grave goods has further narrowed to only encompass large, complex bowls (see Section 2.4). These cremation burials also appear in funerary contexts which are associated with Funnel Beaker West burials prior to ca. 3000 BCE, including at flat grave cemeteries with earlier flat graves (e.g. Bouma and Van der Velde 2022 pp. 63-4), and in megaliths (cf. Bakker 1992 p. 93). Therefore, knowledge about Funnel Beaker West funerary rites was still in circulation and being practiced by communities during the first half of the third millennium BCE (see Section 12.1).

The same conclusion applies to the technical knowledge of Funnel Beaker West potters. The potters who made the vessels in late flat graves learned and applied the same paste recipes, techniques, tools, syntax, procedures, and modalities of techniques found in Funnel Beaker West vessels since before the third millennium BCE (see Ch. 9, 10, 12.1). Learning a production method at such a detailed level requires potters to be physically present and to be supervised by knowledgeable individuals (Gosselain 1992 p. 582, 2000 pp. 192-3, 2018; Roux 2019a p. 311; Thebe and Sadr 2017 pp. 85-6; Wallaert 2012 p. 29). Therefore, the similarities mentioned above indicate the potters who made the vessels

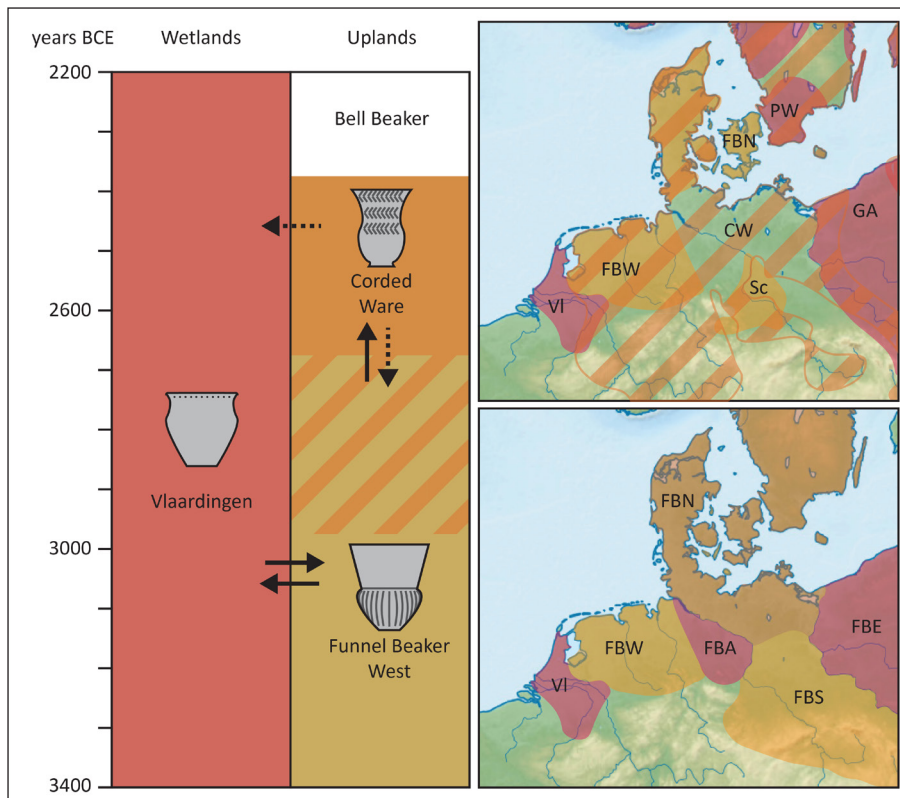


Figure 14.1: Co-existence of migrating and indigenous groups in Northwest Europe. Migrating communities co-existed with various indigenous communities after their arrival around 2975 BCE (top right; those confirmed by other studies), including older Funnel Beaker (-affiliated) groups (bottom right). Solid arrows indicate exchange of knowledge; dotted arrows of vessels alone. Abbreviations: CW = Corded Ware, GA = Globular Amphora, FBA = Funnel Beaker Altmark Group, FBE = Funnel Beaker East, FBN = Funnel Beaker North, FBS = Funnel Beaker South, FBW = Funnel Beaker West, PW = Pitted Ware, Sc = Schönfeld, and VI = Vlaardingen (after: Iversen 2020 Fig. 3; Midgley 2008 Fig. 1.1; Vanhanen *et al.* 2019 Fig. 1; Von Schnurbein and Hänsel 2009; Wetzel 1979). Not depicted: Bernburg and Salzmünde groups.

in late flat graves were taught by those who made the vessels in early flat graves and megalith inventories (see Section 12.1).

Similar to funerary practices, changes do occur in the specific *chaînes opératoires* of vessels in late flat graves relative to those in megalith inventories and early flat graves. The vessels in late flat graves were made according to a standardised production process which features fewer decorative techniques and intensive burnishing (see Ch. 9; 10; 12). However, these changes again are a continuation of processes visible in Funnel Beaker West vessels since before the third millennium BCE (see above, Section 10.2; 12.1).

Crucially, there is evidence that the same developments in funerary practices and ceramic production also took place among Funnel Beaker groups outside the Netherlands. The same funerary practice involving cremation of the deceased and use of large, complex bowls as grave goods appears in Northwest Germany (Kossian 2000), and Central Germany (Wetzel 1979). There is no data on specific *chaînes opératoires* from these areas, but potters

did follow the same, highly standardised paste recipe seen in all Funnel Beaker West vessels (cf. Struckmeyer 2017, 2018, 2019).

Such shared practices emerge out of interactions between mourners and potters across this area. These interactions contributed to their notions about how to conduct burials, or fashion vessels respectively. Potters and mourners then drew on this knowledge when conducting new funerals or fashioning new ceramics (cf. Bourgeois and Kroon 2017). In other words, this system of information exchange is what archaeologists recognise as Funnel Beaker West. The fact that the same system continues to shape burials and ceramic production throughout the first half of the third millennium BCE tells us the indigenous communities continued to thrive after the arrival of migrating groups at the start of the third millennium BCE (see Section 12.1).

Funnel Beaker West is not an exception in this regard. Similar observations have been made for indigenous groups in Denmark (Iversen 2014, 2015, 2020), Sweden (Holmqvist *et al.* 2018; Larsson 2009 pp. 260–1), Germany (Müller 2001), Poland (Włodarczak 2017 pp. 286; 300–1), and other areas of the Netherlands (Beckerman 2015; Kroon *et al.* 2019). Consequently, we mistakenly interpret Corded Ware as the only population during the first half of the third millennium BCE, creating an artificially sharp boundary between migrating and indigenous communities around 2800 BCE (see Section 2.2; 12.1). In fact, migrating communities were never alone in Europe (see Fig. 14.1): they lived side-by-side with indigenous communities who continued to practice the same funerary rites and ceramic production techniques as they had prior to the arrival of migrating communities (see Fig. 14.1). This co-existence of indigenous and migrating communities could explain the resurgence of hunter gatherer and early farmer ancestry in Bronze Age populations (cf. Haak *et al.* 2015; Mittnik *et al.* 2018).

14.3 Serial Learners

How did migrating groups interact with indigenous communities in the Netherlands, and elsewhere in Europe? The pattern evident from Corded Ware ceramic technology is that these migrating groups repeatedly learned from indigenous communities they encountered, and integrated this knowledge into their own technical repertoires without losing sight of their own practices (see Ch. 13).

Migrating potters arrived in the Netherlands with knowledge which was similar to, but also distinct from, that of contemporaneous potters in indigenous communities. Potters in both groups were familiar with the same spectrum of techniques and syntax but made distinct choices within that spectrum. In addition, subtle differences in paste recipes, modalities of techniques, tools, and procedures exist between Funnel Beaker West and Corded Ware vessels. These differences indicate migrating potters did not learn directly from indigenous potters in the Netherlands (see Ch. 13; Gosselain 1992 p. 582, 2000 pp. 192–3, 2018; Roux 2019a p. 311; Thebe and Sadr 2017 pp. 85–6; Wallaert 2012 p. 29), but from another community which shared knowledge with Funnel Beaker West.

This community was probably a Funnel Beaker-affiliated group in Central Europe (see Section 13.2). Funnel Beaker ceramics are more homogeneous during the fourth millennium BCE, but diversified over time (Furholt 2014b). For Funnel Beaker West, this diversification involves the adoption of a standardised production process mentioned above. Therefore, the strong similarities between Corded Ware and Funnel Beaker West ceramics in early flat graves and megaliths, but the weaker resemblance to ceramics from

late flat graves with standardised specific *chaînes opératoires* (see Fig. 10.2; Tab. 10.3), suggest a link to Funnel Beaker groups which did not undergo the same standardisation process. The dissimilarity between Corded Ware and Funnel Beaker North (see Fig. 10.2D; Tab. 10.3), and the knowledge exchange between Funnel Beaker communities across the North German plain which is visible in paste recipes (see above), further rule out these communities as potential sources of the technical knowledge in ceramic technology (see Section 13.2). This leaves the Funnel Beaker East and South East group, as well as the affiliated Globular Amphora communities. Studies of ceramics from these groups do show similarities with Corded Ware in paste recipes and tools used during decoration (cf. Midgley 1992 pp. 54–5; 58; Nowak 2017 p. 146; Rauba-Bukowska 2019; Rauba-Bukowska *et al.* 2020). However, further studies of the specific *chaînes opératoires* in these groups are needed to verify this conclusion (see Section 13.2).

After their arrival in the Netherlands, migrating potters again learned from indigenous potters. This is evident from a small number of Corded Ware vessels which follow the Funnel Beaker West paste recipe, as well as Corded Ware vessels which conform the standardised Funnel Beaker West specific *chaîne opératoire* (see Ch. 9; 10; 13.1). Picking up on these specific features of the ceramic production process requires the potters who made these Corded Ware vessels to have witnessed Funnel Beaker West potters in action, to have learned from them, and to have incorporated this knowledge into their production process (see above, Section 13.1). As such, the variability in Corded Ware ceramic technology hints at a process whereby migrating communities repeatedly arrive in an area, learn from the local indigenous groups, and travel on with this knowledge.

This interpretation of Corded Ware ceramic technology is consistent with observations on Corded Ware funerary practices (see Ch. 13). The origins of these distinctive funerary practices lie in the combination of Yamnaya and Central European funerary traditions (cf. Furholt 2021; Heyd 2021). In addition, there is evidence migrating communities in the Netherlands learned and adopted Funnel Beaker West funerary practices. Corded Ware and Funnel Beaker West practices are largely distinct (see above, Ch. 13; Bourgeois and Kroon 2017; Wentink 2020) with a few tell-tale exceptions. The deposition of Corded Ware vessels in megaliths follows Funnel Beaker West funerary practices (see Section 2.5). In addition, cremation burials, otherwise typical for late Funnel Beaker West, appear in Dutch Corded Ware (cf. Drenth and Hoogestijn 2014) and increase in frequency during the subsequent Bell Beaker period (cf. Bourgeois *et al.* in press.). These patterns in Corded Ware funerary practices again indicate the pattern of migrating groups arriving, interacting with and learning from indigenous communities, and then incorporating that knowledge into their own practices before moving on.

Thus, the image of interactions between migrating and indigenous communities which emerges from ceramic technology and funerary ritual is not that of rapacious, war-like bands which terminate indigenous communities (cf. Anthony and Brown 2017; Heyd 2021; Kristiansen *et al.* 2017). Rather, the emergence of Corded Ware appears as a history of migrant communities who interact with, adjust to, and learn from indigenous communities without either losing sight of their own practices. These migrants are not serial killers, but serial learners.

14.4 History of Knowledge: A New Synthesis

Ceramic technology is a powerful tool to explore the European Neolithic and beyond. This power derives from the ability to tap into one of the most fundamental aspects of human nature: our ability to learn. However, this power also comes with a prerequisite, namely an engagement with complexity.

Learning has a complex relation to the commonly used building blocks of Prehistory. It can cut across the historical, linguistic, economic, genetic, and social boundaries which form our culture-historical schemes (see Ch. 3). Moreover, learning may relate to the behaviour of agents, but a complete view of this behaviour is beyond the typical temporal and spatial resolution of archaeology, meaning an understanding based on learning cannot be predicated on agents alone (see Ch. 3). In other words, to fully harness learning and knowledge transmission in archaeology requires a new synthesis of the information at our disposal.

My hope is to have contributed to this new synthesis over the course of this dissertation. The contribution consists of developing and applying new analytical tools, such as the probabilistic comparison of ceramic technology (see Ch. 4). This contribution focuses on understanding the aggregate effects of individual learning trajectories from the available, fragmented, and disparate actualisations of these trajectories in the archaeological record.

Naturally, more work remains to be done. Both to understand developments in ceramic technology (see Ch. 11) and to further enhance the tools at our disposal. Such work will contribute both to understanding the specific events in the third millennium BCE, and to the history of knowledge as a whole.