Estonian Journal of Archaeology, 2025, 29, 1, 72–105 https://doi.org/10.3176/arch.2025.1.03

Comb Ware cultures in the eastern Baltic

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Received 14 February 2025, accepted 14 April 2025, available online 12 May 2025

ABSTRACT

At first glance, the Comb Ware culture – or rather, cultures – appears to be one of the best-studied Stone Age cultures in the eastern Baltic region; however, this is far from the truth. A number of questions remain regarding its eastern and southern borders, chronology, and internal divisions. One of the main difficulties significantly complicating the understanding of this cultural phenomenon is the diversity of terminology, which has developed and transformed differently across the regions of its distribution over the more than a century of research. While the Typical stage is understood more or less similarly, opinions vary regarding its later phases. In this paper, we outline the distribution area of the main inventory set related to the Comb Ware cultures, analyse the most reliable dates from sites in Estonia, Latvia, and Lithuania, describe the main hypotheses on the origins of this cultural complex, and reveal gaps in the research. Our objective is to initiate a discussion on the criteria for distinguishing Comb Ware cultures across the entire geographical and chronological range of this phenomenon, and to set a starting point for further broader study.

KEYWORDS

Comb Ware cultures, Stone Age, 4th and 3rd millennia BC, eastern Baltic.

Introduction

At the beginning of the 4th millennium BC, the western part of the forest zone of eastern Europe underwent processes that changed the life of the population inhabiting this territory. East of the Baltic Sea, a new horizon of material culture was formed in a territory previously partially occupied by inhabitants of the

Narva culture. This cultural phenomenon is usually described as the Comb Ware culture – or cultures –, based on the characteristic element of ornamentation on pottery, i.e. impressions made with a comb-like (toothed) stamp.

In the north, the phenomenon covered most of Finland and a small part of northern Sweden; in the south, Latvia, parts of Lithuania and Belarus; and in the northeast and east, Karelia, as well as the Leningrad, Pskov and Novgorod regions of Russia (Fig. 1). However, the eastern and southern parts of the distribution of these cultures are still poorly studied, and their boundaries are difficult to establish. The chronology of the Comb Ware cultures is generally defined within the framework of 3900–1750 cal BC (Nordqvist 2018, 54–61; Kriiska et al. 2020, fig. 1), though reliable dates are only sporadically available across their area of distribution. While the beginning is relatively clear and discussions only concern whether it occurred in the 3900s or 3800s cal BC (Pesonen & Oinonen 2019, 257), the end of the Comb Ware cultures is rather confusing and based on dates that are not always clear (Kriiska et al. 2020, 107). At first glance, Comb Ware cultures seem to be among the more thoroughly studied Stone Age topics in the eastern Baltic region, but in fact this is far from the case. In addition to the

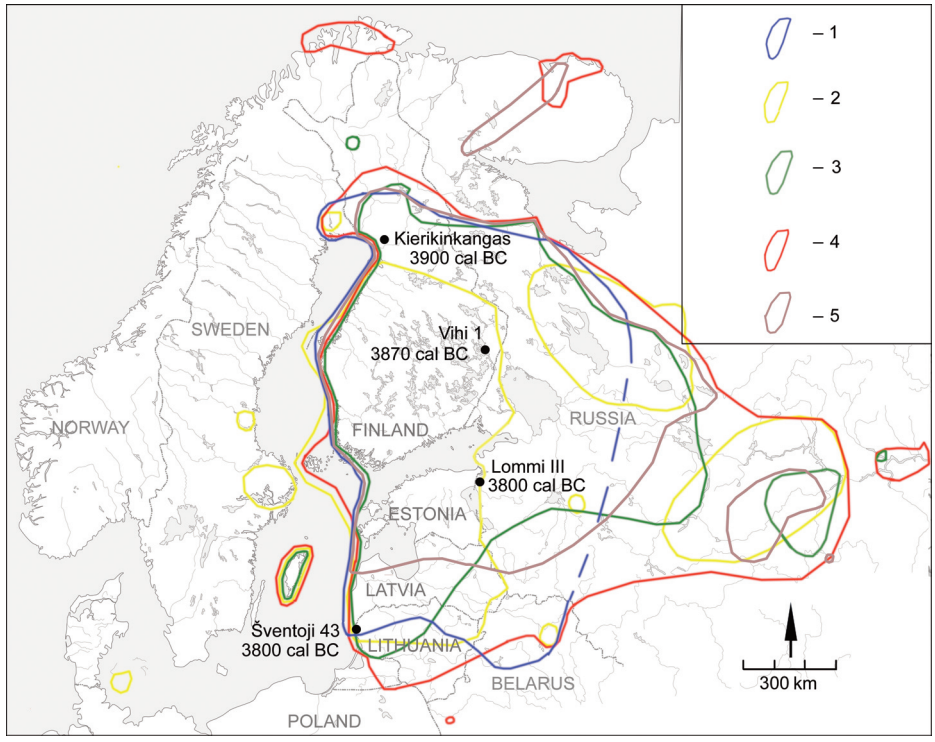

FIG. 1. Area of distribution of Comb Ware cultures and materials related to this phenomenon: 1 – Comb Ware pottery (typologically defined by different researchers); 2 – miniature clay figurines; 3 – metatuff axes of Russian-Karelian type; 4 – amber; 5 – metatuff and slate rings (after Charniauski 2001, fig. 1; Zhulnikov 2012, fig. 1; Khrustaleva & Kriiska 2020, fig. 1; Ahola et al. 2022, fig. 7; Nordqvist 2023, fig. 4). Settlement sites with the earliest radiocarbon dates for Comb Ware cultures are marked by black dots.

vague general chronological and territorial boundaries, there is no clear understanding of the internal division of these cultures into groups or their spatial extent and chronology; neither is it possible to correlate data across different countries and regions due to varying definitions of the same or similar phenomena.

In Estonia and Latvia, the Comb Ware culture began to be identified in the first quarter of the 20th century by Finnish archaeologists (Ailio 1909, 87; Tallgren 1922, 68–69), with further study continuing according to the parameters they proposed (e.g. Spreckelsen 1925). Lithuania was also considered to belong to this culture zone, though without clear argumentation (e.g. Moora 1932, 15; Richthofen 1935). More systematic studies in Estonia and Latvia began in the 1930s with a few small excavations at settlement sites (Šturms 1931; Indreko 1948). In the 1950s, after large-scale excavations at Akali and Kullamägi settlement sites in eastern Estonia and a re-examination of finds previously collected in Estonia, the division of Comb Ware into two types – Typical and Late – was developed (Yanits 1959). Jaanits demonstrated the sequence of these types through the horizontal and vertical stratigraphy of settlement sites. Essentially, this classification was largely similar to the one developed in Finland (Europaeus-Äyräpää 1930), but was grounded in a thorough analysis of Estonian pottery and did not take into account the stylistic basis of the Finnish Late Comb Ware, specifically the absence of comb impressions. Subsequent studies explored regional differences (e.g. Jaanits 1970; Jaanits et al. 1982, 77–78) and other characteristics (e.g. Kriiska 1995; Kriiska et al. 1998; Kriiska & Rappu 2008; Kriiska & Nordqvist 2012).

In Latvia and Lithuania, the study of the Pottery Stone Age intensified in the 1960s (Loze 1984, 28; Rimantene 1985, 99). In Lithuania, the Comb Ware culture was no longer distinguished, and certain characteristic objects, materials, and ornamental motifs on pottery were regarded as signs of trade and contact with northern regions (e.g. Rimantene 1985). In Latvia, as in Estonia, there was initially a twofold division into Typical and Late Comb Ware (Zagorskis 1963, 34), but soon several pottery types began to be distinguished. Only Typical Comb Ware pottery continued to be discussed as Comb Ware culture, while other types of Comb Ware were usually described as local or hybrid variants (formed under the influence of Typical Comb Ware) or as separate cultures (e.g. Zagorskis 1965; Loze 1979, 130). In Belarus, materials of the (Typical) Comb Ware culture were first identified in 1964 (Charniauski 1966; 1997).

The strict typological division between Typical and Late Comb Wares is now being questioned in Estonia, as the features (especially organic and shell admixtures in the clay) previously considered characteristic of the latter are found at the very beginning of the Typical Comb Ware period. Thus, the cultural changes appear to have been continuous, with no sharp temporal division (Kriiska et al. 2020, 107; Khrustaleva & Kriiska 2021, 91), and for the later stage of the culture, various local variants are also distinguished (Kriiska et al. 2020, 131). In Latvia,

the division into Typical Comb Ware and pottery of the Piestiņa and Abora types, which are considered to have developed from Narva culture pottery under the influence of Comb Ware, remains in use. Sometimes the later stage is described using the terms *porous pottery*, *Post-Narva pottery*, or *Eastern Baltic culture* (Dumpe 2021, 495; Zagorska 2021, 128). At the same time, surprisingly, *Late Comb Ware* is also used as a unifying term for a hybrid variant of Narva and Comb Ware pottery (Dumpe 2021, 495–497). In Lithuania, at least in the western part, the (Typical) Comb Ware culture has begun to be distinguished not only as an influence or the result of minor migration, but also as a separate cultural stage (Piličiauskas et al. 2019, 94). In Belarus, the Comb Ware culture is not studied as such.

Thus, the subject of Comb Ware cultures already contains complexities rooted in the history of research, along with considerable confusion and disagreement. This publication does not offer solutions to this issue. The purpose of our paper is to present an initial overview of the data concerning Comb Ware culture settlement sites in the eastern Baltic region and Belarus, and to discuss some of the more reliable radiocarbon dates currently available. The main body of published literature on the topic is referenced in the text, although the number of publications on this subject is very large. The paper is intended to initiate a discussion on the criteria for distinguishing Comb Ware cultures in the eastern Baltic and Belarus, and to serve as a starting point for their further, broader study.

Terminological diversity and cultural attribution

Terminological diversity has accompanied the study of the Comb Ware cultures in the eastern Baltic from the very beginning. The pottery was distinguished either as ceramics with combed ornamentation or as Typical Comb Ware (Tallgren 1922, 68–69; 1924, XIII). After the division of Comb Ware in Finland into three styles – I = Early Comb Ware,[1] II = Typical Comb Ware,[2] and III = degenerate/Late Comb Ware[3] (Europaeus-Äyräpää 1930; although such a div-

1 Early Comb Ware is divided in Finland into two chronological styles: I:1 = older and I:2 = younger Early Comb Ware, with the parallel designation Sperrings also in use – accordingly, Sperrings 1 and Sperrings 2 (see Nordqvist 2018, fig. 10 and references therein; Pesonen 2021, 21–24 and references therein).

2 Typical Comb Ware was previously divided in Finland into two chronological styles: II:1 = older and II:2 = younger Typical Comb Ware; today, such a classification is rarely used (see Nordqvist 2018, fig. 10 and references therein; Pesonen 2021, 28–29 and references therein).

3 Late Comb Ware was previously divided in Finland into two styles: III:1 = Uskela-type and III:2 = Sipilänhaka-type pottery; while this classification is now rarely used, the distinction of Uskela-type pottery has not completely disappeared (see Vikkula 1981, 1 and references therein; Nordqvist 2018, figs 10, 15, table 1 and references therein; Pesonen 2021, fig. 1.2, 30–33 and references therein).

ision, in one form or another, had already existed almost a decade earlier, for example Ailio 1922, 36–41; cf. Nordqvist & Mökkönen 2015) –, the names Europaeus style II and Europaeus style III began to be used in the eastern Baltic to designate variants of Typical and Late Comb Wares, respectively (Šturms 1931, 414–415).

The names of archaeological cultures or periods have also changed. In Estonia and Latvia, Comb Ware was first associated with the so-called Burtnieki period of the Stone Age (Tallgren 1922, 48). After that, the term *Comb Ware culture* (Moora 1936, 21) came into use, or *Typical Comb Ware culture* (Jaanits et al. 1982, 67), which was later divided in Estonia into Typical Comb Ware culture and Late Comb Ware culture (Kriiska & Tvauri 2002, 54–55). In the 2020s, the term *Comb Ware stage* has been used in Estonia as a common designation covering both Typical and Late Comb Ware cultures (Sikk et al. 2020; Sander & Kriiska 2021; 2022).

Since the middle of the 20th century, different names have been used for the Comb Ware phenomenon in the eastern Baltic and neighbouring territories (Russia and Belarus). Sometimes these terms transformed or changed chaotically (see e.g. Bērziņš 2008, 40–41; Kriiska 2009, 167). Different researchers at different times have used terms such as Comb-Pit Ware culture (Yanits 1959; Tretyakov 1968; Vankina 1970), Pit-Comb Ware or Baltic culture (Gurina 1967; 1996a; Loze 1984; Zhulnikov 2003), Typical Comb-Pit Ware culture (Charniauski 1997, referring to Yanits 1959), pit-toothed pottery (Bryusov 1951, 49; Pankrushev 1959), pottery of the Baltic-Novgorod and Baltic-Finnish types (Pankrushev 1959, 57), pottery of the best style (Tretyakov 1961, 92), and others (see Vitenkova 2004, 4; Nordqvist & Mökkönen 2015, 208).

The most significant change was the identification of Post Narva-type sites, first in Latvia (Zagorskis 1965; Gurina 1996b) and then in Lithuania (Girininkas 1988). Comb Ware with organic admixture in the clay mass was included, highlighting its similarity to the pottery of the previous Narva culture and demonstrating 'the process of interbreeding between two cultures' ('hybrid pottery', Gurina 1996a, 149). Earlier materials of this type from eastern Latvia were called Piestiņa or Piestiņa-Zvidze pottery, according to eponymous sites (Zagorskis 1973, 65; Apals et al. 1974, 38). The names Late Narva culture (Girininkas 1988), the culture of Porous Ware of the Abora-type, or the East Baltic culture / East Baltic Comb Ware culture (Loze 1978, 10; 1988, 28, 106) have been used for the late stage.

This was followed by a partial reattribution of materials described earlier as Comb Ware culture sites. As a result, the cultural affiliation of the same materials can differ from publication to publication, with studies sometimes contradicting each other. For instance, materials from the Kreiči settlement site (eastern Latvia), initially attributed to Late Comb Ware, were later described as pottery of a 'transitional type' (Zagorskis 1963, 34; Gurina 1996b, 152). Piestiņa-Zvidze-

type pottery was even distinguished among materials from settlements in eastern Estonia (Girininkas 1988, 47, referring to Yanits 1959, 132–134), which in the Estonian research tradition were considered Late Comb Ware and Early Textile pottery (Yanits 1959, 132–134; Kriiska et al. 2005). Materials from the Tamula I (southeastern Estonia) and Undva (Saaremaa island) settlement sites, also associated with Comb Ware, have been included in the Post-Narva culture, although the same publication specifies that the Tamula I settlement site belongs to 'the final stage' of the Comb-Pit (Typical Comb) Ware culture (Gurina 1996b, 154). The only thing that remained unchanged was the idea that all these new types and cultures were formed under the influence of Typical Comb Ware (Zagorskis 1973, 65; Apals et al. 1974, 38; Girininkas 1994, 94–95; 2009, 249; Rimantienė 1996, 152–153; Gurina 1996b; Loze 2000b, 120; Dumpe 2021).

The descriptive term *porous pottery*, which started to be used in Latvia, emphasised the presence of organic admixture in the clay (Loze 1978; Gurina 1996a, 149). At the same time, this term encompassed different types of pottery (e.g. Dumpe 2021, 495, 497). In Estonia, by contrast, Comb Ware with organic admixture was called Late Comb Ware (Yanits 1959; Kriiska 1995, 115), including similar ware found at Latvian settlement sites (Jaanits et al. 1982, 77).

No less problematic is the question of the territorial extent of the Comb Ware cultures. On the earliest maps, researchers showed it as spanning a vast area from northeastern Poland to the Ural Mountains (Tallgren 1922, 68; Moora 1936, fig. 9), being significantly reduced to the west, i.e. Finland, the Baltic States, the Kaliningrad region, and western Karelia (Foss 1952, 64–65; Jaanits 1974, fig. 2; Gurina 1996a, map 8; Vitenkova 2002, fig. 1; 2004, 4). Today, due to the discovery of new sites, as well as the modern revision of older materials, there is reason to believe that the western boundary of the Comb Ware cultures along the Baltic Sea coast (including the islands of Saaremaa and Hiiumaa, as well as the Åland Islands) and the northern boundary in Finland are undisputed, while the eastern and southern boundaries are still very poorly studied and are represented only by sporadically located sites (Kriiska et al. 2020, fig. 25).

In addition, the territorial and chronological boundaries between different variants and cultures of Comb Wares are often unclear or not defined at all. Therefore, it is rather difficult – and in some cases even impossible – to correlate these materials with each other or with data from neighbouring territories. This makes it necessary to define clearer criteria for attributing materials and to bring terminology to some common denominators. It is time to start a modern, in-depth, and purposeful study of the Comb Ware cultures.

Characteristic inventory of Comb Ware cultures

Despite the presence of regional and chronological features of the Comb Ware cultures, with diverse assemblages of finds, in which pottery with different

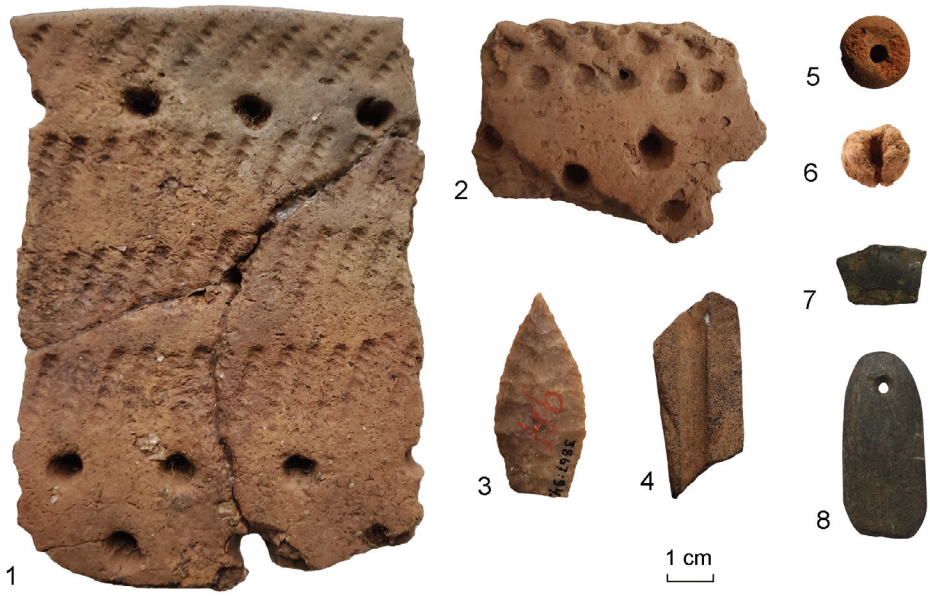

FIG. 2. Lommi III settlement site, Ingria (Russia), ca 3800 cal BC. The inventory characteristic of the Typical stage of a Comb Ware culture site includes: 1 – Comb Ware fragment with mineral admixture (AI 3867:28); 2 – Comb Ware fragment with organic admixture (AI 3867:140); 3 – bifacial Carboniferous flint arrowhead (AI 3867:94); 4 – grinding stone with oval trace of use (AI 3867:148); 5 – amber bead (AI 3867:242); 6 – clay 'figurine' (AI 3867:51); 7 – fragment of metatuff polished tool (AI 3867:115); 8 – slate pendant (AI 3867:43). Photos by I. Khrustaleva.

admixtures may occur or some variants of local raw materials, such as quartz or Silurian flint, predominate (Jaanits et al. 1982, 86; Khrustaleva & Kriiska 2022, 102 and references therein) or occur abundantly, such as Baltic red quartz porphyry (rhyolite), this stratum of material culture is in some manifestations quite homogeneous over almost the entire territory of its distribution.[4] It includes a characteristic set of materials, processing techniques, and inventory, which are usually present in one or another composition and quantity at virtually all (sometimes with the exception of small, short-term sites, for more details, see Sander 2023, 23–54) Comb Ware culture sites in the eastern Baltic region (Tallgren 1922, 69; Yanits 1959, 333–335; 1973; Loze 1984; Gurina 1996a, 147–149; Kriiska 2015; Piličiauskas et al. 2019). The inventory includes pottery with combed ornamentation, bifacial flint arrowheads, scrapers, knives and points, stone and bone chisels, metatuff chopping tools (including those of the so-called Russian-Karelian type), bone arrowheads of conical or willow-shaped forms, grinding stones with oval traces of use, jewellery made of amber and metatuff/slate, and miniature clay figurines (Figs 1–2). Carboniferous and Cretaceous

4 The number of publications on this subject is very large; only some are mentioned here, mainly those concerning the eastern Baltic.

flint, metatuff, and amber are characteristic materials common throughout Comb Ware cultures, even in territories located far from natural sources of raw materials (e.g. Loze 1985; Zhulnikov 2008a; 2008b; Tarasov et al. 2010; Núñez & Franzén 2011; Kriiska 2015; Tarasov & Nordqvist 2022).

Pottery constitutes the main, or at least one of the most abundant, category of finds from Comb Ware culture settlement sites, except for the previously mentioned small, short-term sites in western Estonia (Sander 2023, 23–54). The core problem is its diversity. In this paper, we do not discuss typology, but only describe those elements – emphasising the importance of their coexistence – according to which different researchers at different times have distinguished Comb Ware (Yanits 1959, 127–143; 1973, 205–207; Loze 1984, 30–32; Kriiska 1995, 75–95; Gurina 1996a, 149; Piličiauskas et al. 2019, 79; Kriiska et al. 2020, 130–131; Dumpe 2021, 495–497). Vessels are moulded from clay containing rock debris, sand, grog, crushed shells, and crushed plant admixture. Predominantly, large egg-shaped pots were constructed using relatively wide clay coils joined in a diagonal, or N-type, pattern. Smaller vessels – sometimes even miniature ones only a few centimetres high – are less common. The outer and inner surfaces of the vessels are smoothed or striated. At the Typical stage, the deep and clearly defined ornamentation consists of toothed (comb) stamp imprints, pits, and more rarely, various grooves, notches, and cord-wrapped stick impressions. The ornament, arranged in horizontal rows, covers the entire surface of the vessel, from the bottom to the rim, and sometimes even extends onto the top of the inner surface of the pot. A frequently encountered motif is the alternation of comb imprints and rows of pits. The comb imprints may form various geometric figures: zigzags, rhombs, crosses, and, in some cases, images of waterfowl. During the later stage of the Comb Ware cultures, the ornamentation became more varied, and partially or completely undecorated vessels can be found as well. Ornaments are still often arranged in rows, as in the Typical stage; rows of comb imprints alternate with rows of pits, although these elements are generally found separately. There are also long, often more complex geometric figures (including meanders) formed by comb stamp impressions. In some territories, pits and notches predominate.

Flint is another type of mass, or at least representative, material found at Comb Ware culture settlement sites. In different proportions and quantities, the sites contain flint items made from both imported Cretaceous and Carboniferous flint, as well as local Silurian flint (which, however, in some places was also imported, as it does not occur naturally throughout the eastern Baltic). Cretaceous flint was imported from southern Lithuania and Belarus (Baltrūnas et al. 2006; Johanson et al. 2021). The main outcrops of Carboniferous flint are located on the Valdai Upland in the Tver and Novgorod regions of Russia (Galibin & Timofeev 1993; Kriiska et al. 2018; Johanson et al. 2021), from where it was brought to the entire territory of the Comb Ware cultures both as raw material and finished

products. In some regions, the amount of flint inventory increased compared to previous periods. This is especially noticeable in areas where natural flint is absent (e.g. northern Estonia, see Fig. 4), or present only in small quantities (such as the islands of western Estonia), and where quartz had previously been the main rock raw material for millennia (Gurina 1967, 175; Jaanits et al. 1982, 86; Timofeev 1993, 27; Khrustaleva et al. 2019, 258; Kriiska et al. 2020, 124). In general, flint artefacts of the Comb Ware cultures are quite diverse, yet share a number of common features. Important changes occurred in raw material processing technologies, with the addition of bifacial techniques, primarily for the production of arrowheads and spearheads (Kriiska et al. 2020, 125).

The Comb Ware culture sites are characterised by finds of **miniature clay figurines**, not exceeding a few centimetres in size (Edgren 1966; Loze 1984, 30; Núñez 1986; Khrustaleva & Kriiska 2020 and references therein). These are represented by various types of primarily anthropomorphic forms – so-called embryonic (bent) or standing – without any sexual or other physical details, as well as zoomorphic sculptures depicting four-legged creatures, waterfowl, snakes, and the like (Miettinen 1964; Butrimas 2000; Pesonen 2000; Kashina 2007; Khrustaleva & Kriiska 2020). Some figurines are ornamented with comb stamp or pit impressions, and some are coloured with ochre (Miettinen 1964, 35; Studzitskaya 1985, 102; Butrimas 2000).

Amber items are made of Baltic amber, the main source of which lies along the southeastern shore of the Baltic Sea (Zagorska 2003, 108). The most characteristic artefacts of the Comb Ware culture are round buttons with a V-shaped hole and trapezoidal pendants, but there are also various beads, discs, rings, zoomorphic figures, and others (Timofeev 1993, 28; Loze 2000a; Ots 2003; Zhulnikov 2008a; 2008b; Nordqvist 2023, 4).

Items made of **metatuff and slate** are also found at Comb Ware culture sites. These materials, occurring naturally mainly in Karelia, were used to produce jewellery such as slate rings and pendants, as well as wood-chopping tools (including those of the so-called Russian-Karelian type) (Tarasov et al. 2010; Kriiska & Tarasov 2011; Zhulnikov 2012; Kriiska et al. 2013; Ahola et al. 2022; Tarasov & Nordqvist 2022).

In order to distinguish the Comb Ware cultures, it is important to consider all the materials described above as a whole, because individually, some elements of this set (such as comb stamp impressions on pottery, single finds of amber, imported flint, etc.) are sometimes found at eastern Baltic settlement sites dating to before the formation of the Comb Ware cultures in the early 4th millennium BC (Kriiska 1995, 72–73; Kriiska et al. 2021, 49). In addition, at several Comb Ware culture settlement sites in Estonia, flint material constitutes only a minor part of the stone inventory, with quartz being the main material used; at other sites, local Silurian flint predominates, or imported Carboniferous flint (Kriiska et al. 2020, 124; Khrustaleva & Kriiska 2022, 102). Bone artefacts were not preserved at all

sites, so they cannot serve as a clear cultural marker. As for grinding stones with oval traces of use, their distribution has not been specifically analysed, although they are clearly identified in the collections of Comb Ware culture settlement sites. Thus, a more important role in defining the Comb Ware cultures as a whole is played by the presence of a specific set of objects and materials, such as amber, metatuff, flint and clay figurines, as well as the combination of modelling techniques and ornamental motifs on pottery, processing technology, and the shape of finished flint objects. The widespread distribution and, most importantly, the co-occurrence of these elements give a general characterisation of this cultural phenomenon.

Chronology

The chronology of the Comb Ware cultures has historically undergone several changes, ranging from the foundation of a typo-chronological connection with finds in Finland (e.g. Yanits 1959, 296–297) to the consideration of individual existing radiocarbon dates (e.g. Jaanits & Liiva 1973, 191; Loze 1984, 32–33). However, the creation of an adequate chronology according to modern standards can only be possible if a representative number of reliable radiocarbon dates are available. This article does not present all the known dates for the Comb Ware culture sites in the eastern Baltic. Only data from settlement sites is considered, while dates from burial sites, which constitute a rather large part of the known dates of these cultures (e.g. Zagorska 2006; Tõrv 2016), are excluded from the review. This is because, as far as is known, they all exhibit a freshwater or marine reservoir effect and require separate adjustment to adequately reflect the time of death of the buried individuals. At the same time, the burials provide little data for systematising the basic criteria of archaeological cultures.

Unfortunately, dates from settlement sites also present a number of problems. Often, they come from mixed contexts of multicultural sites, which makes their association with Comb Ware impossible. Some of the dates also exhibit a reservoir effect that cannot yet be corrected, causing the obtained radiocarbon age of artefacts to be several centuries older than their actual production or use. Table 1 presents only 32 dates that are more or less reliably associated with the Comb Ware cultural context (all dates in the article have been calibrated using the OxCal 4.4.4 programme with the IntCal 20 atmospheric curve and are given with a 95.4% probability; Reimer et al. 2020; Bronk Ramsey 2021). Most dates are obtained from Estonian settlements (24), with single dates available from Latvia (3) and Lithuania (4), while materials from Belarus have not yet been dated. The dates were obtained from various organic materials: wood, charcoal, hazelnut shells, burnt and unburnt bones of large terrestrial mammals; none exhibit a reservoir effect. In addition, for the Lommi III settlement site (Ingria, Russia), dates from organic crust from pottery were used, which, according to lipid

TABLE 1. Radiocarbon dates for settlement sites of the Comb Ware cultures in the eastern Baltic

No.	Country	Site	Radiocarbon date, years BP	Calibrated age (94.5% probability), cal years BC	Lab code	Dated material (*reservoir effect)	Radiocarbon age with the reservoir effect correction, years BP	Calibrated age (94.5% probability), cal years BC	Reference
1	**Estonia**	Jägala Jõesuu V	4460 ± 35	3342–3013	Poz-115983	Hazelnut shell			Khrustaleva & Kriiska 2022
2	**Estonia**	Jägala Jõesuu V	4438 ± 29	3331–2929	UBA-29062	Burnt animal bone			Khrustaleva & Kriiska 2022
3	**Estonia**	Jägala Jõesuu V	4400 ± 35	3315–2911	Poz-115982	Hazelnut shell			Khrustaleva & Kriiska 2022
4	**Estonia**	Kaseküla	4280 ± 30	3008–2783	Poz-59066	Seal bone*	3933 ± 103	2857–2068	This study
5	**Estonia**	Kääpa	4480 ± 255	3777–2488	TA-6	Unburnt animal bone			Liiva 1963
6	**Estonia**	Kääpa	4350 ± 220	3629–2465	TA-4	Charcoal			Liiva 1963
7	**Estonia**	Kudruküla	4835 ± 100	3911–3370	Ua-4827	Greenland seal bone*	4488 ± 173	3638–2701	Lõugas et al. 1996
8	**Estonia**	Kudruküla	4750 ± 100	3769–3196	Ua-4826	Seal bone*	4403 ± 173	3525–2581	Lõugas et al. 1996
9	**Estonia**	Lemmetsa I	4155 ± 35	2881–2623	Poz-58929	Seal bone*	3808 ± 108	2567–1950	This study
10	**Estonia**	Loona	4270 ± 75	3096–2624	Ua-4824	Seal bone*	3923 ± 148	2874–2031	Lõugas et al. 1996
11	**Estonia**	Loona	4050 ± 80	2879–2351	Ua-4825	Unburnt animal bone			Lõugas et al. 1996
12	**Estonia**	Naakamäe	4526 ± 28	3362–3102	KIA-54028	Unburnt animal bone			Khrustaleva & Kriiska 2020

Continued on the next page

TABLE 1. *Continued*

No.	Country	Site	Radiocarbon date, years BP	Calibrated age (94.5% probability), cal years BC	Lab code	Dated material (*reservoir effect)	Radiocarbon age with the reservoir effect correction, years BP	Calibrated age (94.5% probability), cal years BC	Reference
13	**Estonia**	Naakamäe	4483 ± 28	3341–3035	KIA-54032	Unburnt animal bone			Khrustaleva & Kriiska 2020
14	**Estonia**	Naakamäe	4477 ± 27	3340–3031	KIA-54026	Unburnt animal bone			Khrustaleva & Kriiska 2020
15	**Estonia**	Narva-Jõesuu IIB	4650 ± 40	3523–3360	Poz-87712	Hazelnut shell			Vanhanen et al. 2023
16	**Estonia**	Narva-Jõesuu IIA	4557 ± 34	3488–3102	Hela-2741	Burnt animal bone			Kriiska & Nordqvist 2012
17	**Estonia**	Narva-Jõesuu IIB	4500 ± 35	3357–3041	Poz-5891	Burnt animal bone			Kriiska et al. 2015
18	**Estonia**	Riigiküla II	4872 ± 38	3765–3532	Hela-3256	Charcoal			Kriiska et al. 2017
19	**Estonia**	Tallinn Vabaduse Väljak	4750 ± 40	3637–3378	Hela-1923	Greenland seal bone*	4403 ± 113	3490–2704	Kadakas et al. 2010
20	**Estonia**	Tallinn Vabaduse Väljak	4630 ± 40	3521–3346	Hela-1922	Greenland seal bone*	4283 ± 113	3333–2577	Kadakas et al. 2010
21	**Estonia**	Tallinn Vabaduse Väljak	4450 ± 40	3339–2932	Poz-35401	Unburnt animal bone			Lõugas & Tomek 2013
22	**Estonia**	Tallinn Vabaduse Väljak	4340 ± 30	3072–2895	Beta-409162	Unburnt animal bone			Muru et al. 2017
23	**Estonia**	Tallinn Vabaduse Väljak	4240 ± 30	2912–2702	Beta-409161	Unburnt animal bone			Muru et al. 2017

Continued on the next page

TABLE 1. *Continued*

No.	Country	Site	Radiocarbon date, years BP	Calibrated age (94.5% probability), cal years BC	Lab code	Dated material (*reservoir effect)	Radiocarbon age with the reservoir effect correction, years BP	Calibrated age (94.5% probability), cal years BC	Reference
24	**Estonia**	Viljapea	4315 ± 30	3012–2887	Poz-59063	Bone artefact			Kriiska et al. 2016
25	**Russia (Ingria)**	Lommi III	5020 ± 40	3948–3661	Poz-133186	Organic crust from potsherd surface			Khrustaleva & Kriiska 2021
26	**Russia (Ingria)**	Lommi III	4970 ± 70	3946–3642	Poz-133669	Organic crust from potsherd surface			Khrustaleva & Kriiska 2021
27	**Latvia**	Priedaine	4885 ± 30	3761–3542	KIA-40960	Hazelnut shell			Bērziņš et al. 2016
28	**Latvia**	Priedaine	4765 ± 30	3638–3384	KIA-40961	Hazelnut shell			Bērziņš et al. 2016
29	**Latvia**	Priedaine	4850 ± 40	3708–3527	KIA-40962	Hazelnut shell			Bērziņš et al. 2016
30	**Lithuania**	Šventoji 43	5045 ± 30	3954–3715	Poz-64690	Hazelnut shell			Piličiauskas et al. 2019
31	**Lithuania**	Šventoji 43	5025 ± 35	3946–3711	Poz-66912	Hazelnut shell			Piličiauskas et al. 2019
32	**Lithuania**	Šventoji 43	4945 ± 30	3782–3648	Poz-64688	Hazelnut shell			Piličiauskas et al. 2019
33	**Lithuania**	Šventoji 43	4905 ± 30	3766–3637	Poz-64687	Hazelnut shell			Piličiauskas et al. 2019

studies, did not contain fish markers (Khrustaleva & Kriiska 2021). Therefore, the age should not be affected by the reservoir effect. For the Kudruküla, Loona, Kaseküla, Lemmetsa I, and Tallinn Vabaduse Väljak settlement sites (Estonia), dates from seal bones, whose radiocarbon ages were calibrated to calendar years after subtracting the calculated reservoir effect of 347 ± 73 radiocarbon (^{14}C) years, are used (for a more detailed explanation, see Muru et al. 2017).

Existing dates for the Comb Ware culture sites in the eastern Baltic region are sufficient to discuss the questions of the beginning and end of this cultural phenomenon. However, this issue is further complicated by prevailing scientific and historical views, according to which the spread of Comb Ware cultures to the territory of the eastern Baltic and Belarus is regarded either as a rapid (Jaanits et al. 1982, 77; Kriiska & Tvauri 2002, 54) or, on the contrary, a slow (Charniauski 1997, 210) process.

The radiocarbon dates obtained in the last decade help clarify this question (Fig. 3). The earliest dates currently known for Finnish settlement sites give an average age of 3900–3850 cal BC (dates obtained from birch bark tar, Yli-Ii Kierikinkangas: 5085 ± 125 (Hela-409); Rääkkylä Vihi 1: 5070 ± 40 (Poz-5978); Pesonen & Oinonen 2019, appendix 2). The Lommi III settlement site on the River Narva has the two earliest reliable dates for Comb Ware culture sites located south of the Gulf of Finland, with an average age of 3800 cal BC. The two earliest dates obtained for the settlement of Šventoji 43 (northwestern Lithuania) also give an average age of 3800 cal BC (Piličiauskas et al. 2019). These data indicate a relatively rapid formation of Comb Ware cultures over a wide area.

In general, the bulk of the currently known dates fall between 3500 and 3000 cal BC (Table 1, Fig. 3), which corresponds to the period after the Typical stage of the Comb Ware culture, regardless of how these cultural groups or regional variations are called. The latest dates obtained so far are from the Lemmetsa I (southwestern Estonia) and Kaseküla (western Estonia) settlement sites, providing average ages of 2250 and 2450 cal BC, respectively (Table 1). There are also younger dates, up to 1750 cal BC, from several Estonian settlement sites where Comb Ware has been found (Kriiska et al. 2020, 107). However, the connection between these age determinations and the Comb Ware cultures remains uncertain.

Origins of Comb Ware cultures

The appearance of new types of pottery, stone tools, and materials used for their production during the 4th millennium BC in the eastern Baltic region is considered to be the result of human migration (e.g. Tallgren 1922, 68–69; Foss 1952, 153; Moora 1956, 56; Yanits 1959; 1975, 417; Tretyakov 1961; Gurina 1973, 19; Jaanits 1981, 17; Loze 1984). Various opinions have been expressed about the location of the Comb Ware cultures' formation, with some scholars suggesting

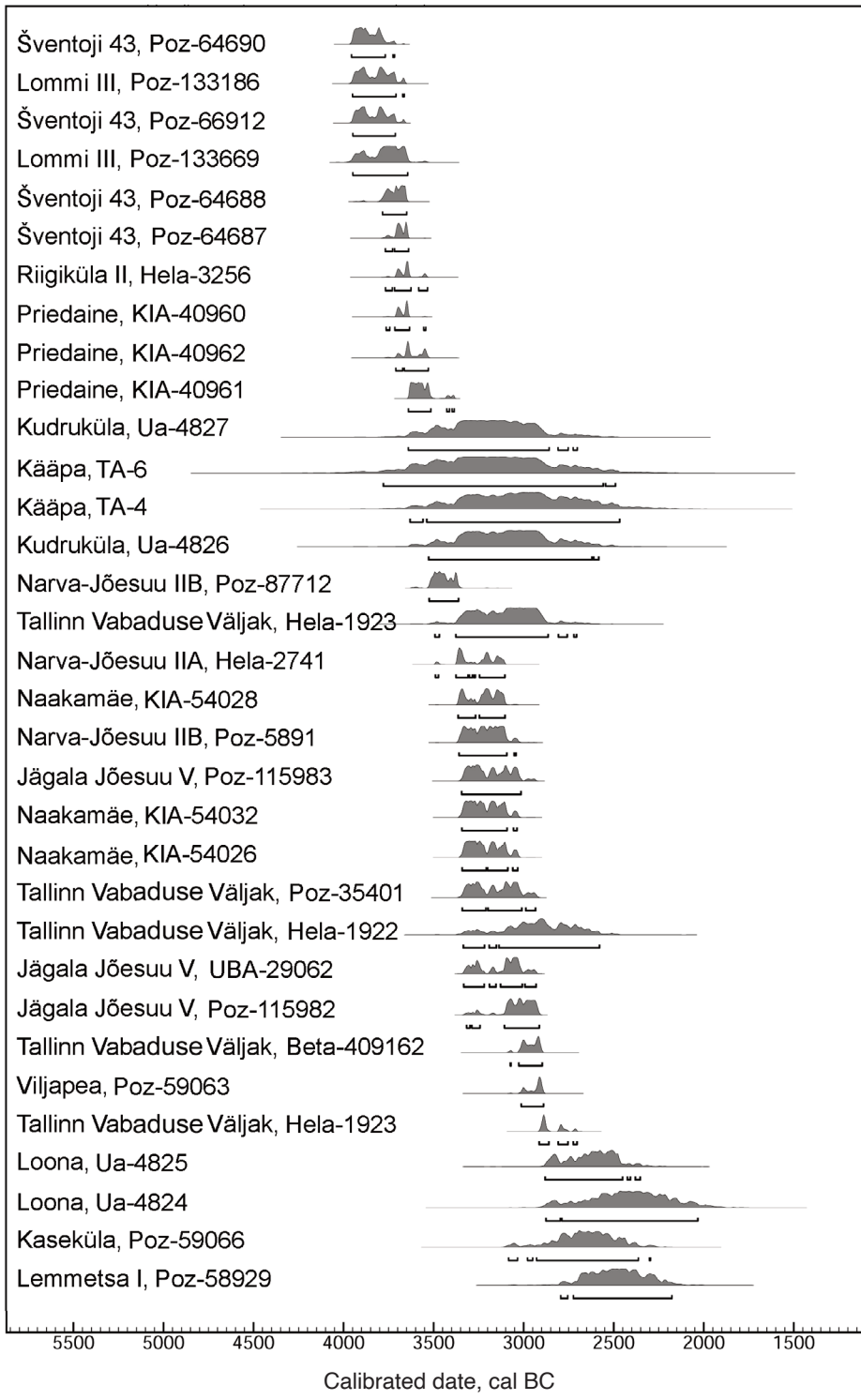

FIG. 3. Chronology of eastern Baltic Comb Ware settlement sites (for the raw data, see Table 1).

the Lake Ladoga or Lake Onega region and the Karelian Isthmus as the home area (Tretyakov 1961, 92; Oshibkina 1996, 220; German et al. 2004, 43; Nordqvist 2018, 98–100 and references therein). Based on pottery ornamentation, the prevailing hypothesis is that a segment of the population formed in the Upper Volga region at the end of the 6th millennium BC migrated to the Lake Ladoga area in Karelia and/or the Novgorod region of Russia (e.g. Yanits 1956, 156; 1975, 417; Pankrushev 1959, 57; Huurre 1998, 52). There, through interaction and mixing with local inhabitants, they laid the foundation for the Comb Ware cultures, which then spread rapidly across the eastern Baltic region through migratory population flows. The groups who settled there maintained close relations with each other. Although the influence of the Upper Volga region on the formation of Comb Ware cultures is undoubted (e.g. Foss 1952, 153; Carpelan 1999, 256–258; Herva et al. 2014, 144), the exact course of this process remains unclear. The role of the local population of the eastern Baltic region in the formation of this new cultural reality also remains uncertain.

Population migration from the east is also confirmed by the results of ancient DNA studies conducted on human bones from burials found in Estonia and Latvia (Saag et al. 2017; Mittnik et al. 2018). In Latvia, research on samples from the Zvejnieki burial site revealed the near-simultaneous presence of populations of different origins – those associated with the local Narva culture and newcomers linked to the Comb Ware culture – at the same location (Jones et al. 2017). However, the extent of their interaction remains unclear. Particularly intriguing is the role of the local population in the emergence of the new cultural phenomenon of the Comb Ware culture, a process also suggested by archaeological evidence from Estonia and Finland (Mökkönen et al. 2017; Kriiska et al. 2020, 106).

It would be difficult to assume that representatives of the Comb Ware cultures switched so quickly to the use of local raw materials or started to apply stone processing techniques characteristic of previous periods without the participation of the local population. This might also explain the rapid settlement of the Baltic Sea islands. Apparently, the relatively fast changes in the Comb Ware culture, which was initially more or less homogeneous for a comparatively short period of time (the so-called Typical Comb Ware culture), later split into several cultural regions with specific characteristics. This evolution likely also testifies to the participation and influence of people from preceding local cultures (e.g. Yanits 1975, 418). Several centuries after the emergence of the culture, distinct pottery groups developed across its entire territory. In Estonia, as well as in Latvia and northwestern Belarus, it has been suggested that these groups largely overlapped geographically with the local groups of the Narva culture (Jaanits 1981, 17–18; Yanits 1984, 20). However, these overlaps occurred several centuries apart in time. Moreover, recent discoveries and research on Narva culture settlement sites in Estonia suggest that the extent of this overlap is significantly

smaller than previously assumed. In Estonia, a more confident assertion of such an overlap can be made primarily in the case of Saaremaa.

Discussion and conclusion

The emergence of Comb Ware is clearly distinguishable in the archaeological material across its entire distribution area. At the beginning of the 4th millennium BC, alongside the continuation of traditional subsistence practices based on hunting, fishing, and gathering, more extensive and complex social networks began to emerge. Evidence of broad contact networks among the people of that time is provided by various materials and artefacts that were distributed hundreds of kilometres, and sometimes over a thousand kilometres, from their natural sources or places of production (e.g. Loze 1985; Tarasov et al. 2010; Kriiska 2015). Compared to the preceding period, material culture became significantly more diverse both qualitatively and quantitatively. Changes are also evident in lifestyle, including an increase in the number of inhumation cemeteries, the presence of objects and sites associated with art and religion (including rock art in Finland and Karelia), the development of permanent or semi-permanent settlements, and a rise in the number of known pit-houses (Zhulnikov 2003; Mökkönen 2011, 25; Herva et al. 2014, 144; Khrustaleva 2025).

The spread of Comb Ware cultures into Karelia, Finland, the eastern Baltic Sea area, and Belarus led to the unification of material culture across a region previously occupied by diverse cultural groups (such as the Narva, Sperrings, Säräisniemi cultures, etc.). The initial stage of Comb Ware cultures is quite distinctly defined across their entire distribution area due to the emergence of a completely different material culture, which bears no connection to the preceding cultural groups. The presence of a characteristic assemblage of finds at the earliest known settlement sites of Comb Ware cultures in the eastern Baltic suggests that this distinct material culture was established from the very beginning of the cultures' appearance in the region. At the Lommi III site, dating to approximately 3800 cal BC, in addition to Comb Ware pottery, bifacial points made of Carboniferous flint, grinding stones with oval wear traces, fragments of polished tools made from metatuff, a clay 'figurine' (a sphere with a pit impression), an amber bead, and a slate pendant were found (Fig. 2; Khrustaleva & Kriiska 2021). Similarly, at the Šventoji 43 site, also dating to approximately 3800 cal BC, Comb Ware pottery, a large quantity of amber, and tools made from metatuff were discovered (Piličiauskas et al. 2019). The reasons for such an extensive and rapid process of unification and its course remain unclear, but it is worth emphasising that an important role in this was played by the migration of new populations.

Despite the existing uncertainties regarding the origin of Comb Ware cultures, the influence of populations from the Volga region is undeniable. This is

quite unequivocally indicated by the dominance of Carboniferous flint from western Russia among imported flint in the eastern Baltic (and Finland, where natural flint is absent) during that time. The appearance of certain stone processing technologies could also serve as evidence of this influence. Mapping the earliest evidence of flint bifaces across the European forest zone clearly indicates the spread of bifacial knapping techniques for making arrow and spear points into the territory of the eastern Baltic from the east at the beginning of the 4th millennium BC (Khrustaleva 2021, fig. 10). The distribution of various material culture elements characteristic of the Comb Ware cultures shows a surprisingly high degree of overlap (Fig. 1). This overlap is not only in the objects, the materials, and techniques used to make them, but also in objects with sacred significance (which certainly applied at least to miniature clay figurines), and through the ornamentation of clay vessels, in the recurrence of symbols, pointing to the spiritual connection between the people of these regions.

Another observation on the same distribution map (Fig. 1) is that the area of material elements characteristic of the Comb Ware cultures clearly slopes to the east. On one hand, the boundary of the distribution of the Comb Ware pottery is unclear, which significantly hinders the study of the development of the Typical Comb Ware culture. On the other hand, this confirms, in our opinion, once again that the populations of the Upper Volga played an important role in the formation of this phenomenon.

The spread of new populations clearly did not result, at least immediately, in the complete absorption or destruction of the local inhabitants but instead led to varying degrees of assimilation across different regions. This can be observed through archaeological data. In addition to the influx of imported raw materials, a rapid adaptation to certain types of local resources is evident in several areas. For example, quartz was widely used in flint-scarce regions of Estonia (Fig. 4). In more eastern settlements, located closer to sources of Carboniferous flint, the flint industry dominated over quartz usage, unlike in the western part of the country (Fig. 4: A). This might suggest varying degrees of influence from imported materials or difficulties in transporting large quantities of raw materials to the west. A sharp decline in the use of flint in favour of quartz can be observed at Estonian settlements between 3700 and 3200 BC (Fig. 4: B). This could indicate, first, a reduction in the import of flint raw materials and, second, that after the initial large wave of migrants, local stone-processing technologies were restored.

In the Lake Saimaa area in Finland, varying quantities of imported flint were observed at northern and southern sites, which have been interpreted as indicating differences in the speed and scale of population movements (Mökkönen & Nordqvist 2016; Mökkönen et al. 2017). The participation of the local population in the formation of a new cultural phenomenon can probably explain the rapid settlement of the Baltic Sea islands as well (Kriiska et al. 2020, 106). This sug-

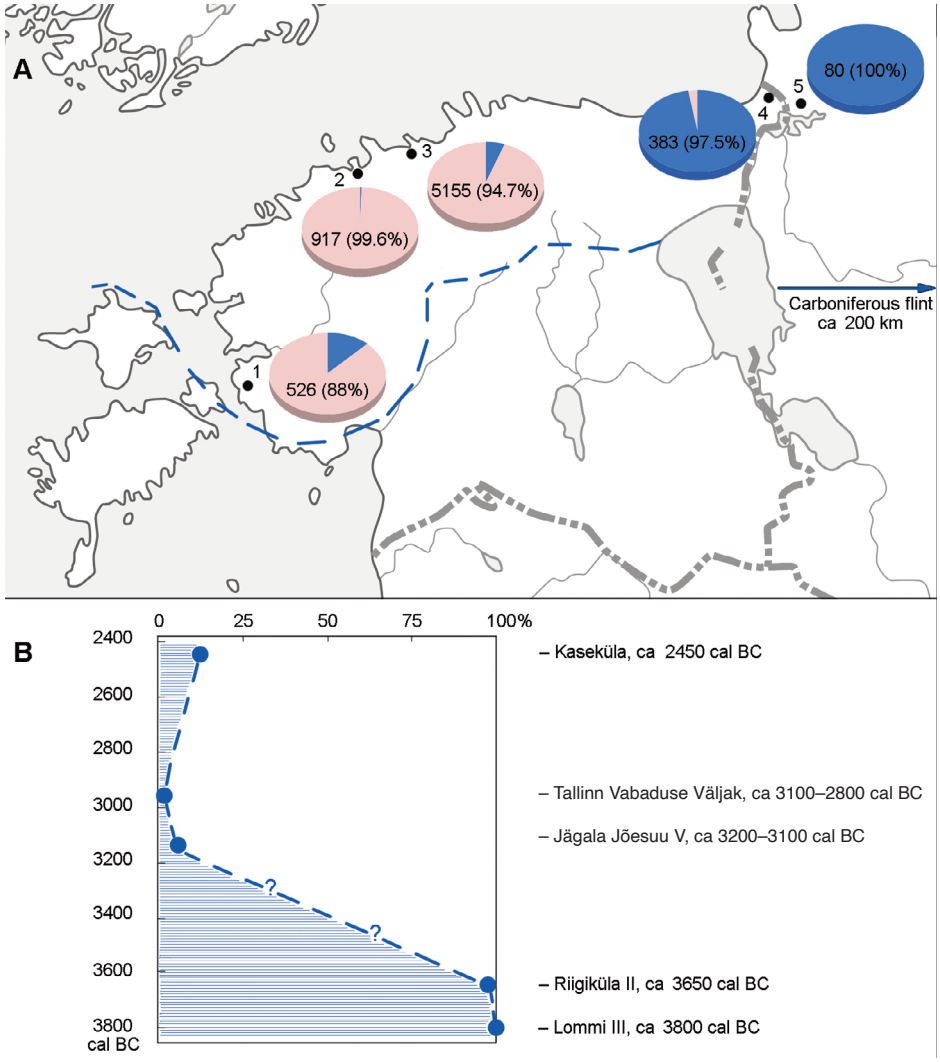

FIG. 4. Lithic materials at the Comb Ware settlement sites. A – map showing settlement sites and diagrams indicating the flint-to-quartz ratio (pink – quartz; blue – flint) at each site: 1 – Kaseküla; 2 – Tallinn Vabaduse Väljak; 3 – Jägala Jõesuu V; 4 – Riigiküla II; 5 – Lommi III. The blue dashed line represents the northern border of Silurian flint raw material distribution; the blue arrowhead shows the direction to the Carboniferous raw material border. B – chronological dynamics of flint in relation to quartz at Comb Ware settlement sites. Dots indicate the percentage at specific sites where counts were made.

gests adaptation to a new type of economy – seal hunting – which was not known to the Comb Ware population in the forest zone. However, there are not enough radiocarbon dates for these sites to establish the real speed of settlement of the islands.

While ancient DNA studies conducted on human bones from burials found in Estonia and Latvia confirm population migration from the east (Saag et al. 2017;

Mittnik et al. 2018), the scale of this process remains uncertain. Further studies are needed to better understand the interactions between the local populations and newcomers across different regions.

The regional and temporal variations observed after the Typical stage of Comb Ware represent the greatest challenge for its study, and have been repeatedly highlighted as an area requiring further research (e.g. in Finland; Nordqvist & Mökkönen 2015). It is possible that an even greater tangle of issues, which requires correction and thorough investigation, lies in the southern area of the Comb Ware cultures' distribution. Above all, there is ambiguity regarding Latvia and Lithuania, as both have been alternately included within or distinguished from the Comb Ware cultures. Nevertheless, there is broad agreement that the Typical Comb Ware culture influenced the local populations, either directly through small-scale migration or indirectly through trade and other interactions.

It appears that the understanding of the Comb Ware cultures has often been shaped less by the actual Stone Age material and more by ethnic interpretations – particularly the perceived prehistoric boundary between the ancestors of the Finnic and Baltic peoples. Therefore, we will briefly explore this topic, highlighting a persistent conceptual obstacle that, despite its outdated and now largely irrelevant nature, continues to influence scholarly traditions. Although the original reasons behind this debate have long been forgotten and the issue has shifted to much later prehistoric periods, future research must find a way to move beyond these outdated constraints.

Leaving aside earlier ethnic interpretations of the Stone Age population, Aarne Mikaël Tallgren played a key role in shaping the ethnic interpretation of the Comb Ware culture during the 1920s as part of the search for the original homeland of the Finnic people (Tallgren 1922, 124–126; 1926). His approach was based on a retrospective method and the hypothesis of Finnish linguist Eemil Setälä (1926), who proposed that the ancestors of Finnic-speaking peoples migrated to the eastern Baltic only in the 1st millennium BC, a view widely criticised by most archaeologists. In response, scholars began searching for a unified material culture that could have served as the foundation for the formation of the Finnic languages (see e.g. Sedov 1987, 12–13 and references therein). As a result, the Comb Ware culture was identified as this cultural foundation (Moora 1936, 23; 1956, 63–64; Yanits 1956, 159; 1975; Tretyakov 1961). It was viewed as a relatively homogeneous ethno-cultural entity spanning from the Trans-Urals in the east to the Baltic Sea in the west – a territory that would later become the historical homeland of the Finno-Ugric peoples (e.g. Tretyakov 1961, 76). In general, archaeological cultures – and even just pottery ornamentation – were often equated with ethnic groups (Foss 1952, 64–77; Bryusov 1956; Moora 1956, 60; Yanits 1956; Tretyakov 1962, 6). The association of the Comb Ware cultures with Finno-Ugric populations was, according to several researchers, supported by the

geographical overlap between the distribution of Comb Ware cultures and Finno-Ugric toponyms, particularly hydronyms (e.g. Ariste 1956, 10; Moora 1956, 58–59 and references therein). In Lithuania, even isolated Comb Ware artefacts or comb impressions on pottery were considered sufficient evidence to link these materials with a Finno-Ugric origin (Rimantene 1985, 103–104; Girininkas 2009, 161, fig. 122).

A number of researchers have focused on identifying the original Proto-Finno-Ugric homeland, proposing various locations around the Urals as potential starting points (Khalikov 1967; Bader 1972; Laslo 1972; Loze 1984, 33–34; for further details, see Tretyakov 1961). Within this extensive body of research, the opinion emerged that the Volga–Oka region played a key role in forming the eastern Baltic population through migration to the sparsely populated western territories, associated with the spread of the Comb Ware culture (Tallgren 1922, 68–70; Moora 1936, 27; Foss 1952, 153; Bryusov 1956, 9–10; Yanits 1956, 163). In principle, this view suggested that the widespread presence of Comb Ware throughout the eastern Baltic indicated that the ancestors of the later Finnic peoples lived in this region.

This was complemented by studies on the formation of Baltic tribes, where the search for their Stone Age ancestors in the eastern Baltic led to the Corded Ware culture at the end of the Stone Age (e.g. Moora 1936, 20; 1956, 64–75; Yanits 1956, 170) or even further back to the Narva culture, which was simultaneously emphasised as having continuity with preceding settlements (Gurina 1955; 1967, 198; Rimantene 1980, 23–24; Loze 1984, 33–34; Girininkas 1994, 241–250, 259; 2009, 251). The almost nonexistent evidence for the spread of the Comb Ware culture into Lithuanian territory provided a well-founded reason for removing this ethnically charged culture from consideration, viewing it merely as a trade and/or cultural influence (e.g. Rimantene 1985). In our view, the idea of the Post-Narva culture in Latvia and Lithuania is largely rooted in the same reasoning. By focusing primarily on clay vessels with organic admixtures and largely ignoring other archaeological material, this approach saw continuity from the Narva culture as the ancestral culture of the Baltic tribes, which was only influenced by the Comb Ware culture as the ancestral culture of the Finnic tribes.

This led to differing interpretations of the role of the Comb Ware culture population in ancient history across various areas of the eastern Baltic region, ranging from population replacement, mixing, and assimilation of the local population to the opposite scenario, where the previous population assimilated the people of the Comb Ware culture, with individual artefacts and pottery ornamentation motifs spreading through trade and other forms of contact. As a result, the phenomenon remains undefined, hindering a comprehensive study of its impact. Thus, studies of the Comb Ware cultures were heavily influenced by ethnic determinism and, surprisingly, this influence persisted until quite recently,

when Finno-Ugric hydronyms in Lithuania and Latvia were still linked to the Comb Ware and/or Porous Ware culture peoples (Piličiauskas et al. 2019).[5]

We certainly do not wish to downplay the role of the people who lived in the eastern Baltic (Narva culture) during the formation or transformation of the Comb Ware culture. Overall, we do not rule out any possible scenarios. Moreover, the dynamics of these processes could have varied across different regions. The issue lies primarily in the type of argumentation used and how well it is supported by empirical knowledge.

Undoubtedly, there is an evident connection – and likely continuity – with the earlier stage of the Comb Ware cultures. However, the details, which are ultimately of crucial importance, remain unclear and contain numerous gaps, ranging from the lack of precise and thorough studies of pottery and other materials to the limited number, or even complete absence, of dates. In most cases, regional and temporal differences are so significant that it is impossible to distinguish specific types of pottery. Nevertheless, it is important to note that despite this diversity, these sites share a distinct set of specific artefacts that remain fully preserved at least until the end of the 3rd millennium BC (Fig. 5). This suggests that these local variants represent a continuation of the development of the Comb Ware cultures.

In this article, we have outlined the current state of research on the Comb Ware cultures in the eastern Baltic region and Belarus. Despite the long history of research, many questions regarding their eastern and southern boundaries, chronology, and internal divisions still require further clarification. A key objective moving forward is to adopt a comprehensive approach to studying this phenomenon, involving a broad range of specialists from different countries, who would unify existing knowledge and make a qualitative leap toward new insights. To achieve this, it is essential to abandon outdated preconceptions and reassess the material from a fresh perspective. A much more detailed ancient DNA dataset is needed to better understand the populations in the eastern Baltic region of the time and their territorial similarities and differences. Equally crucial is a comprehensive reanalysis of the entire archaeological record from the 4th and 3rd

5 The idea of eastward migration persists in some rather curious interpretations. For example, the discovery of clay figurines, including the so-called embryonic ones, at several Comb-Pit Ware sites in western Siberia has led some researchers to suggest that the concept of such figurines originated in the forest-steppe and southern taiga region of the Ishim–Irtysh interfluve, and then spread northwest and northeast as far as Karelia and the eastern Baltic region (Zakh & Skochina 2004, 120). This hypothesis persists despite the fact that the Baltic figurines are chronologically older than those from Siberia, that a large number of such figurines have been found in the eastern Baltic region and Finland, while they remain extremely rare in Siberia, and that no similar figurines have been discovered across the vast territory separating these two regions. Clearly, the study of Comb Ware remains influenced by preconceptions, even when contradicted by evidence.

FIG. 5. Jägala Jõesuu V settlement site, Estonia, ca 3200 cal BC. The inventory characteristic of the post-Typical stage of a Comb Ware culture site includes: 1 – Comb Ware fragment with mineral admixture (TÜ 1972: 2508); 2 – Comb Ware fragment with organic admixture (TÜ 1972: 2333); 3 – fragment of a polished metatuff tool (TÜ 1972: 2465); 4 – grinding stone (TÜ 1972: 2565); 5 – clay figurine (TÜ 1972: 1000); 6 – Cretaceous flint arrowhead (TÜ 1972: 1927); 7 – flint (Silurian) blade (TÜ 1972: 1810); 8 – fragment of a slate arrowhead (TÜ 1972: 52); 9 – quartz blade (TÜ 1972: 2465); 10 – fragmented amber pendant (TÜ 1972: 775). Photos by J. Ratas and K. Roog.

millennia BC. This should focus on short-lived or stratified and minimally mixed settlement sites, while distinguishing, dating, and comparing contemporaneous complexes.

DATA AVAILABILITY STATEMENT

All data are included within the article.

ACKNOWLEDGEMENTS

This research was supported by a Lili Kaelas Foundation research grant, the Estonian Research Council grants PRG1899 and PRG2762, the Estonian Ministry of Education and Research (TK215), the Collegium for Transdisciplinary Studies in Archaeology, Genetics and Linguistics, University of Tartu, and Arheograator OÜ. We are thankful to both reviewers for their valuable comments. The publication costs of this article were partially covered by the Estonian Academy of Sciences.

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Kammkeraamika kultuurid Läänemere idarannikul

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RESÜMEE

Neljanda aastatuhande alguses eKr kujunes Läänemere idarannikul uus materiaalse kultuuri horisont, mida kammilaadse (hambulise) templiga tehtud ornamendi järgi savinõudel kirjeldatakse tavaliselt kammkeraamika kultuuri või kultuuridena. Põhjas hõlmas see nähtus suurema osa Soomest ja väikese osa Põhja-Rootsist, lõunas Lätit, osaliselt Leedut ja Valgevenet, kirdes ja idas Karjalat ning Leningradi, Pihkva ja Novgorodi oblastit Venemaal. Kammkeraamika kultuuride ida- ja lõunapoolset levikuala on aga endiselt vähe uuritud ning nende piirid on ebamäärased.

Kammkeraamika kultuurid dateeritakse ajavahemikku 3900–1750 eKr, kuid usaldusväärseid dateeringuid on Eestis, Lätis ja Leedus seni suhteliselt vähe ning kultuuride lõpp jääb pigem prognoositavaks kui põhistatud vanusega. Kultuurisiseste rühmade territoriaalne ulatus ja kronoloogia ei ole kaugeltki selged. Eri riikide ja piirkondade andmete võrdlemine on raskendatud, kuna samu või sarnaseid nähtusi määratletakse erinevalt.

Kammkeraamika kultuuri hakati Läänemere idarannikul eristama 20. sajandi esimesel veerandil, algusest peale terminoloogilise mitmekesisusega. Seda on nimetatud kammkeraamika, tüüpilise kammkeraamika, kammlohkkeraamika ja lohkkammkeraamika kultuuriks, Balti kultuuriks jne. Lisaks hakati Lätis ja seejärel Leedus kasutama nn post-Narva kultuuri nimetust, mille alla arvati ka varem kammkeraamikana identifitseeritud orgaanilise lisandiga savinõud. Rõhutades nende sarnasust varasema Narva tüüpi keraamikaga, nähakse selle kujunemist

Narva ja kammkeraamika kultuuride (inimeste) segunemisena. Seetõttu on ilmne vajadus määratleda selgemini kammkeraamika kultuuride atributeerimise kriteeriumid ning ühtsustada terminoloogia.

Vaatamata piirkondlikele ja kronoloogilistele eripäradele sisaldavad kammkeraamika kultuurid iseloomulikke materjale, töötlustehnikaid ja esemekomplekte, mis esinevad – erinevas koosseisus ja koguses – kõigis (v.a mõned lühiajalised asulakohad) Läänemere idaranniku kammkeraamika kultuuride asulakohtades. Tüüpilisse inventari kuuluvad kammornamendiga savinõud, labatehnikas tulekivist nooleotsad, tulekivist kõõvitsad, noad ja teravikud, kivist ja luust talvad, metatufist, sh Vene-Karjala tüüpi raieriistad, koonilised ja pajulehekujulised luust nooleotsad, ovaalsete kulumisjälgedega lihvimiskivid, merevaigust ja metatufist/kiltkivist ehted ning savist pisiplastilised kujukesed. Karboni ja Kriidi tulekivi, metatuff ja merevaik on iseloomulikud kogu kammkeraamika kultuuride levialale, esinedes ka looduslikest tooraineallikatest kaugel asuvates piirkondades. Niisuguse inventarikompleti laialdane levik ja, mis kõige olulisem, nende samaaegne esinemine iseloomustavad seda kultuurifenomeni üldiselt.

Kammkeraamika kultuuride tänapäevastele standarditele vastava kronoloogia loomine on võimalik ainult esindusliku arvu usaldusväärsete radiosüsinikdateeringute kaudu. Paraku on siin võimalused piiratud. Matmispaikades on probleemiks nii mage- kui ka merevee reservuaariefekt inimluudest tehtud dateeringutes ja puudulik teave nende korrigeerimiseks. Asulakohtadest on dateeringuid vähe ja paljud neist pärinevad mitmekultuurilistest paikadest või segatud kontekstidest, mistõttu ei ole neid võimalik kammkeraamika kultuuridega kindlalt seostada; osa vanusemääranguid on ka reservuaariefektiga. Seetõttu käsitleme artiklis 32 Eesti, Läti ja Leedu asulakohast saadud dateeringut, mis on enam-vähem usaldusväärselt seostatavad kammkeraamika kultuuride kontekstiga. Varaseimad dateeringud, u 3800 eKr, osutavad kammkeraamika kultuuri suhteliselt kiirele kujunemisele. Enamik dateeringuid Läänemere idarannikul jäävad vahemikku 3500–3000 eKr, seni hiliseimad usaldusväärsed dateeringud Eestis on ajavahemikust 2450–2250 eKr.

Kuigi kammkeraamika kultuuride kujunemist on seletatud mitmel viisil ja lokaliseeritud erinevatesse kohtadesse, domineerib seisukoht, et selle aluseks oli osaline rahvastiku väljaränne Ülem-Volga piirkonnast 6. aastatuhande lõpul eKr Laadoga järve ja Novgorodi piirkonda, kus nad segunesid kohalike elanikega ning kultuur transformeerus. Idapoolset rännet kinnitavad ka Eesti ja Läti matmispaikade inimluude vana DNA uuringud. Samas on võimalik, et kultuuride kujunemises mängis mingil määral rolli ka kohalik elanikkond. Uue rahvastiku levik ei pruukinud vähemalt esialgu tuua kaasa kohalike täielikku assimileerumist või kadumist – sulandumine võis paikkonniti erineda. Sellele näikse osutavat ka sisserändajate kiire kohanemine Läänemere idaranniku ressurssidega. Kas see aga ka tegelikult nii oli ja millisel määral, jääb ebaselgeks.

Seetõttu ongi piirkondlikud ja ajaliselt varieeruvad erijooned pärast tüüpilist etappi kammkeraamika kultuuride uurimisel praegu suurim teaduslik katsumus.

Seda enam, et nende muutuste mõistmist on 20. sajandil meie meelest mõjutanud rohkem kultuurifenomeni etnilised tõlgendused (läänemeresoome ja balti rahvaste esiajaloolise asuala otsingud) kui tegelik kiviaegne materjal. Kuigi Narva kultuuri elanikkond võis kammkeraamika kultuuride kujunemises või muutumises rolli mängida, näeme kogu levialal selget seost ja järjepidevust kammkeraamika kultuuride tüüpilise etapiga. Hoolimata piirkondlikest ja ajalistest erinevustest säilis iseloomulik materjalide ja esemete komplekt vähemalt 3. aastatuhande lõpusajanditeni eKr.

Eesti, Läti, Leedu ja Valgevene kammkeraamika kultuuride uurimise praegune seis osutab reale probleemidele, mis vajavad lahendamist. Need puudutavad kultuuride ida- ja lõunapiire, kronoloogiat ja sisemist jaotust. Kvalitatiivseks arenguhüppeks on oluline kaasata erinevate riikide uurijaid, rakendada terviklikku lähenemist ja ühtlustada olemasolevaid teadmisi ja termineid. Selle saavutamiseks on vaja loobuda vananenud eelarvamustest ning leida uusi vaatenurki. Et paremini mõista ajalis-ruumilisi sarnasusi ja erinevusi Läänemere idarannikul, on tarvis märksa detailsemat vana DNA andmestikku, kuid mitte ainult – sama tähtis on kogu 4. ja 3. aastatuhande eKr arheoloogilise materjali terviklik analüüs ja dateerimine. See peaks keskenduma lühiajalistele või stratigraafiliselt selgetele ja minimaalselt segatud asulakohtadele, eristades ja võrreldes samal ajal eksisteerinud arheoloogilisi komplekse.