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# Time to revise. Dating the emergence of Typical Comb Ware in Latvia

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**ABSTRACT**

The emergence of Typical Comb Ware pottery, marking the beginning of the Middle Neolithic, is currently dated in Latvia to approximately 4100 BCE. This is several centuries earlier than the onset of this phenomenon in other regions, including those believed to be the origin of Typical Comb Ware influence. This discrepancy is implausible, and this paper explores the reasons behind it. The article compiles all published dates associated with the beginning of the Middle Neolithic and Typical Comb Ware in Latvia. The evaluation of the data shows that most dates previously connected with this phase cannot be definitively associated with Typical Comb Ware material culture, or are affected by other issues, such as dietary offsets. It is proposed that the boundary for the beginning of Typical Comb Ware in Latvia should be more closely aligned with current understandings of the dating of this phase elsewhere in northeastern Europe and should be set at 3900–3800 BCE at the earliest.

**KEYWORDS**

Typical Comb Ware, Middle Neolithic, radiocarbon dating, chronology, Latvia.

## Introduction

The appearance of Typical Comb Ware pottery (or culture) is considered to mark the boundary between the Early and Middle Neolithic periods in Latvia (Bīrons et al. 1974, 41; Loze 1988, 102; Bērziņš 2008, 41; Meadows et al. 2016, 679).[1] The most recent works place its beginning, in absolute chronological terms, at

1 In Latvian periodisation, the onset of the Neolithic is marked by the emergence of pottery, and most of the Neolithic period is the prehistory of hunter-fisher-gatherer societies.

approximately 4100 BCE (Bērziņš 2021, 43; Dumpe 2024, 304). However, this contradicts the dating of the onset of the phenomenon in other regions, which is between 3900–3800 BCE (see Pesonen 2021 and the next section). In other words, in Latvia, the beginning is dated centuries earlier than elsewhere, including the areas where the Typical Comb Ware influence is believed to have originated. This scenario is not plausible, and the resulting contradiction is the primary trigger for writing this contribution. Additionally, the paper is motivated by the need to pay more attention to the overall robustness of Latvian Stone Age chronologies and the general use of legacy radiocarbon dates.

The inconsistencies between the material culture and the absolute dates assigned to it have been noted for some time (Nordqvist & Herva 2013, 418; Meadows et al. 2016, 688; Ahola et al. 2025, 11), but an analytical discussion in the context of the broader Typical Comb Ware chronology is lacking. This article presents the published dates that have been associated with the beginning of the Middle Neolithic and Typical Comb Ware in Latvia, traditionally, first and foremost, the sites in the Lake Lubāns area and the Zvejnieki cemetery (Fig. 1: 1–2; Supplementary material). The discussion broadly subscribes to the idea of radiocarbon or chronometric hygiene (Waterbolk 1971; Pettitt et al. 2003): radiocarbon dates should not be accepted uncritically, but their suitability for establishing a radiocarbon chronology must be assessed on a case-by-case basis. The evaluation of data is followed by a brief discussion and concluding remarks. The paper begins, however, with an introduction to the Typical Comb Ware.

## Typical Comb Ware and its dating in northeastern Europe

Typical Comb Ware was provisionally described already at the beginning of the 20th century (Ailio 1909; Pälsi 1915; see Šturms 1926 for Latvia). However, due to its long research history and the large geographical area, ‘Comb Ware’ has developed into an ambiguous term that may carry several different meanings. In extremely broad terms, it may refer to a pottery tradition rooted in the earliest introduction and development of ceramic vessel production among hunter-fisher-gatherers in the boreal zone during the 6th–5th millennium BCE (Piezonka 2015). More locally, it may describe, individually or collectively, regional pottery types or variants that are part of, or assumed to derive from, this tradition (e.g. Khrustaleva & Kriiska 2025). Finally, it is also often used as a simple shorthand or synonym for ‘Typical Comb Ware’ itself.

Typical Comb Ware denotes the pottery style or craft tradition that spread in northeastern Europe in the early 4th millennium BCE. The term finds its origins in the typo-chronological system coined by Aarne Äyräpää (Europaeus) a century ago, based on Finnish coastal materials (Europaeus 1927;

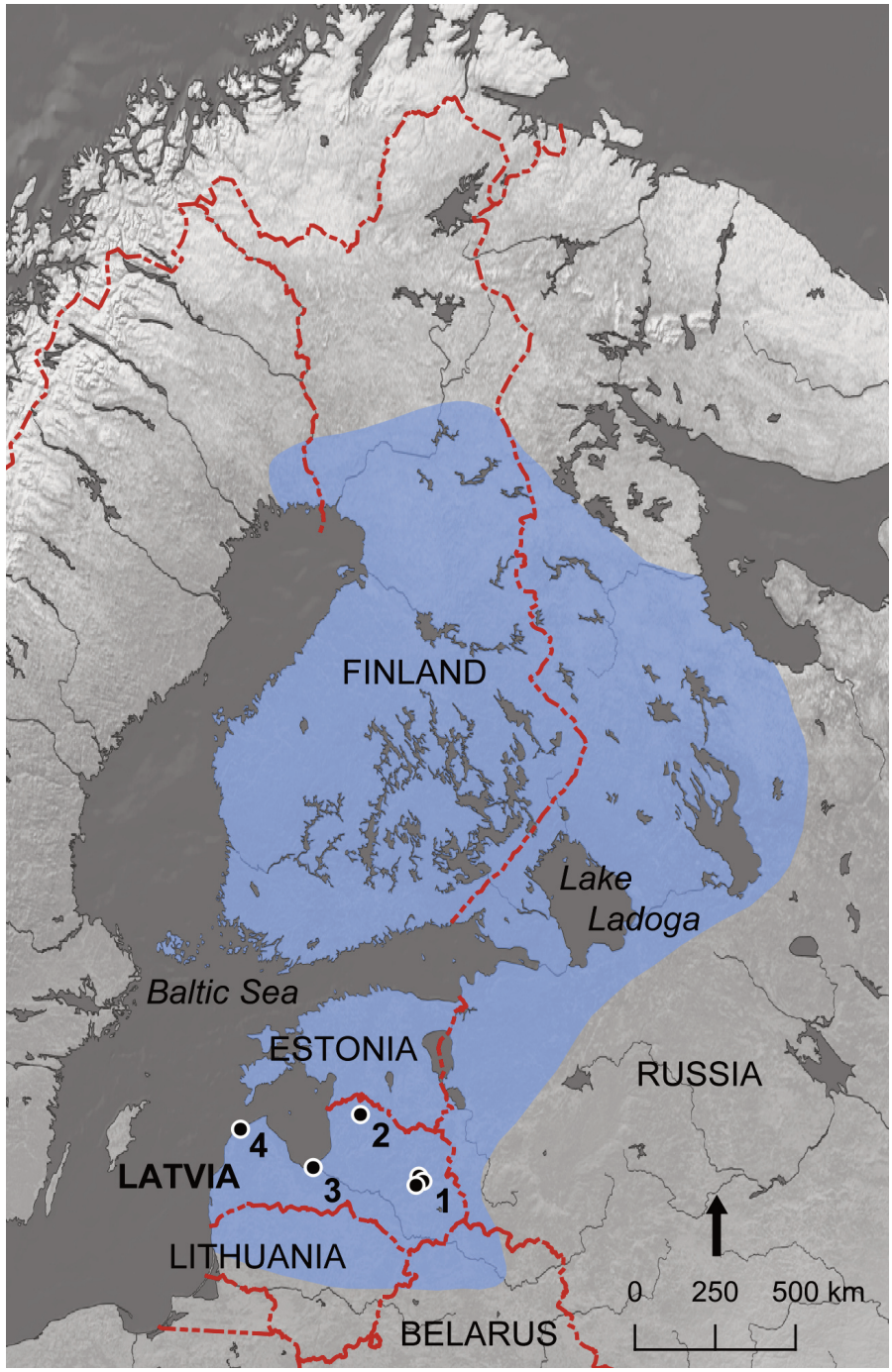


**FIG. 1.** Distribution of Typical Comb Ware (after Nordqvist 2018) and the sites discussed in the text with Typical Comb Ware-related radiocarbon dates: 1 – sites in the Lake Lubāns area (Kvāpāni II, Suļka, Zvidze), 2 – Zvejnieki, 3 – Priedaine, 4 – Piedāgi. Map by K. Nordqvist.

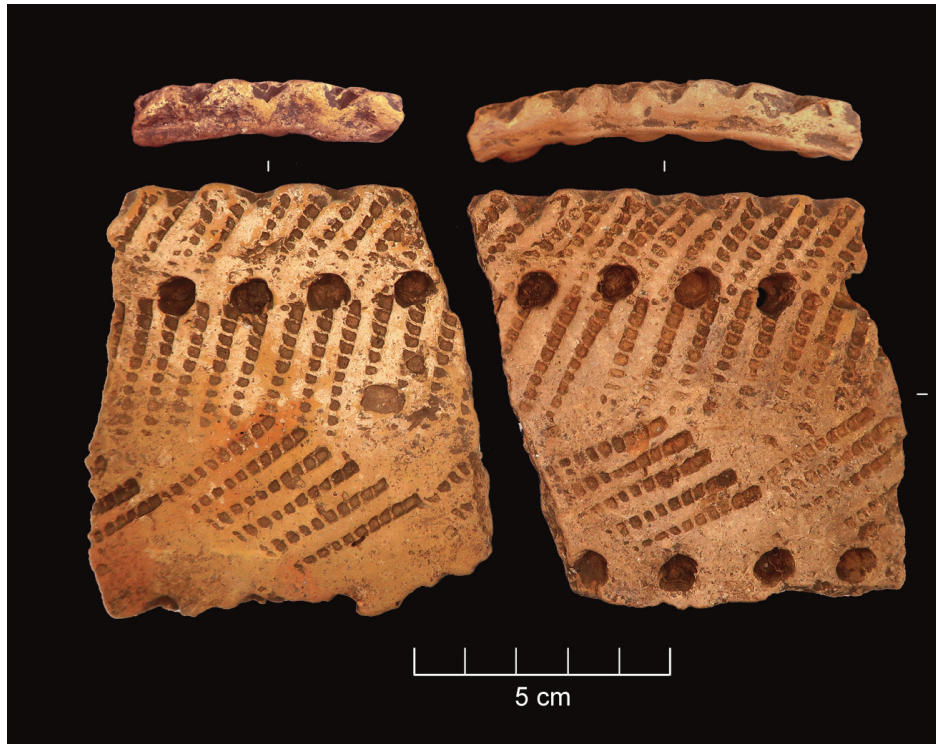


**FIG. 2.** Typical Comb Ware pottery from the Kaulēnkalns settlement, located near the Zvejnieki site by Lake Burtnieks (A11306: 86, Latvian National Museum of History). Photo by K. Nordqvist.

Europaeus-Äyräpää 1930).[2] Briefly described, Typical Comb Ware, also known in older literature as Äyräpää's style II or Ka 2, is pottery often tempered with sand or crushed rock; however, other tempers may also exist (see Nordqvist & Mökkönen 2015, 154–155; Spataro et al. 2021, 1458). The vessels are usually quite large and unprofiled, with round or pointed bottoms and inwards thickened or wavy rims. Decoration is a characteristic feature: it covers the entire outer surface, is often arranged in horizontal zones or geometric patterns, and consists of comb stamps and pits as well as other elements (Europaeus-Äyräpää 1930, 179–182; see Zagorskis 1965, 35–50; Loze 1988, 52–59; 1993, 11–20; Dumpe 2024, 305–308 for Latvian materials) (Fig. 2).

2 In Latvian literature, this is called, with variable spellings, *(tipiskā) ķemmes keramika*, or *(tipiskā) ķemmes un bedrīšu / ķemmes-bedrīšu keramika* ((Typical) Comb Ware; (Typical) Comb and Pit / Comb-Pit Ware). Occasionally, other terms are used for the phase, such as Comb-and-Pit-Marked Pottery culture (Liiva & Loze 1993), Pit and Comb Ware pottery (Loze & Liiva 2004), East Baltic Comb-Pit Ware culture (*восточно прибалтийский культуры гребенчато-ямочной керамики*; Loze 1984), or East Baltic-Karelian Comb-Pit distribution area (*Austrumbaltijas-Karēlijas ķemmes-bedrīšu izplatības zona*; Loze 1993).

The origins of Typical Comb Ware are often traced to the Pit-Comb Ware or Lyalovo complex of central European Russia, possibly supplemented by more western, local pottery traditions (Europaeus-Äyräpää 1930, 211; Tretyakov 1952, 50; Jaanits 1959, 333–335; Carpelan 1999, 257–258), but the precise development is not yet satisfactorily explained in detail. Be this as it may, archaeological evidence shows that the phenomenon spread widely and apparently relatively rapidly in the early 4th millennium BCE, from the Lake Ladoga area through southern Finland and as far north as the Arctic Circle. To the south, its distribution area includes Estonia, Latvia, northern Lithuania, and northern Belarus (Fig. 1). Individual finds have been reported even from southeastern Baltic area (Ozols 1965).

In the Baltic States, Typical Comb Ware represents a distinct ceramic tradition from the earliest pottery craft in the region, the Narva(-Osa) Ware (Jaanits 1959; Zagorskis 1965; Kriiska et al. 2017). Its emergence is associated with a broader change in the socio-cultural and material framework, and this stark difference has usually been explained by the migration of new people (see Loze 1984, 34; Zagorska 2006, 100; Bērziņš 2021, 43 for Latvia). Population movement is currently confirmed by aDNA studies, documenting the appearance of eastern genetic influx in Estonia and Latvia around this time (Jones et al. 2017, 577–578; Saag et al. 2017, 2189; Mathieson et al. 2018, 199; Mittnik et al. 2018, 8). In Finland, where aDNA studies are not possible due to the lack of bone material, changes in material culture suggest migration, but also cultural diffusion and hybridisation (Mökkönen et al. 2017; Nordqvist 2018, 101–102). This suggests that the arrival of new people and cultural influences had varying impacts in different regions. Likewise, the period following the Typical Comb Ware phase in the 4th millennium BCE is characterised by different regional 'types', 'cultures' or 'groups' that are variably dated and perceived as descendants or hybrids of either the Typical Comb Ware tradition or the preceding ones. In the Latvian context, for example, these include Piestiņa and Sārnate Wares. However, these are not pertinent to the current study, which focuses on the emergence of Typical Comb Ware.

The chronology of Typical Comb Ware has been studied most thoroughly in Finland, starting with the typological and shore-displacement research by Äyräpää (Europaeus 1927; Europaeus-Äyräpää 1930; also Siiriäinen 1974). These studies were also influential in establishing relative chronologies in neighbouring areas (Jaanits 1959, 296–299; Gurina 1961, 54; Šturms 1970, 85–87). Since the introduction of the radiocarbon method – and in particular accelerator mass spectrometry (AMS) dating, which enables the use of small samples with short own age and clear association with corresponding material culture – the dating of Typical Comb Ware has been refined. Owing to targeted research, it is currently the best-dated phenomenon of the Finnish Stone Age, with about 200 direct food-crust (charred residue) or birch-tar dates, in addition to several dozen

context dates (burnt bone, charcoal; see Pesonen 2021, with appendices and cited literature). Visual inspection of the dates places its onset between 3900–3800 cal BCE, while Bayesian modelling sets the start at approximately 3800 cal BCE or several decades earlier (Pesonen 2021, 71).[3] In other areas, there are significantly fewer dates, but these reflect a similar picture: in northwestern Russia, Estonia, and Lithuania, corresponding pottery appears around 3900 BCE and shortly thereafter (Tarasov et al. 2017, 105; Piličiauskas et al. 2019, 88; Kriiska 2020, 104); no dates are available from Belarus. Since the Finnish data represent the only statistically solid and sufficiently scrutinized sequence, they are used below as the primary baseline for the duration of Typical Comb Ware.

## Evaluation of Typical Comb Ware chronology in Latvia

Typical Comb Ware is known in Latvia from a few dozen sites (see Loze 1986; Dumpe 2024). However, for many of these, radiocarbon dates are not available, or the existing determinations are associated with materials and contexts other than Typical Comb Ware and the early Middle Neolithic. Consequently, the absolute chronology has relied primarily on two main sources: settlement sites in the Lake Lubāns area in the eastern part of the country, and the Zvejnieki cemetery in the north (Fig. 1: 1–2; Supplementary material). Since the dates obtained from these sources differ in methodology, materials used, and possible caveats, they are discussed separately in the following two subsections, followed by the presentation of the few dates so far obtained from other locations.

The assessment of the reliability of radiocarbon dates should ideally be systematic and criterion-based (see Waterbolk 1971; Pettitt et al. 2003). Indeed, a set of such criteria has been developed for northeastern European Stone Age materials, 'with focus on three major themes: the association of the sample and the dated hominin-influenced event; the compatibility of the date with other data from the site; and the quality of the sample and date itself' (Seitsonen et al. 2012, 103, with cited references). However, due to often unclear contexts and sample–context associations, the lack of sample-specific data, and the asynchrony of the dates, it was not possible to apply these criteria effectively to the present material: most samples, particularly those from the Lake Lubāns series, simply rank poorly. Furthermore, the criteria in question were tuned 15 years ago for materials other than unburnt (human) bone and are not sensitive enough to handle reservoir effect-riddled samples, such as those from the Zvejnieki series. Thus, there is no

3 All dates in this paper follow a calibrated chronology: cal BCE is used when discussing specific calibrated radiocarbon or modelled dates, and BCE when referring to other dates cited in the literature. The dates (Supplementary material) are calibrated using OxCal 4.4 software (Bronk Ramsey 2009) and the IntCal20 atmospheric curve (Reimer et al. 2020).

purpose in replicating here the preliminary analysis conducted by the author.[4] Instead, the main themes of 'association', 'compatibility', and 'quality' are discussed in general terms in the following.

## LAKE LUBĀNS AREA

From the 1960s to the 1980s, sampling studies were undertaken alongside excavations at various settlement sites in the Lake Lubāns area, with the aim of establishing a robust local chronology (Loze 1971; 1979; 1982; 1988; 1993; Semyontsov et al. 1972; Liiva & Loze 1993; 1994; Loze & Liiva 2004). In addition to radiocarbon dating, the studies drew on typology and stratigraphy, as well as palynology and the geological and hydrological history of the area. Most of the collected data, however, pertain to other periods, and fewer than 30 dates are connected to the Middle Neolithic, some with reservations (Loze 1988; 2015; Liiva & Loze 1993; 1994). Unfortunately, the entire Lake Lubāns dataset is plagued by several unresolved issues, including ambiguous cultural affiliations and sample contexts. All things considered, only seven dates can be identified in the literature as Typical Comb Ware or as belonging to the early or first phase of the Middle Neolithic. These dates provide a broad timeframe between the mid-5th and late 4th millennium cal BCE (Fig. 3).

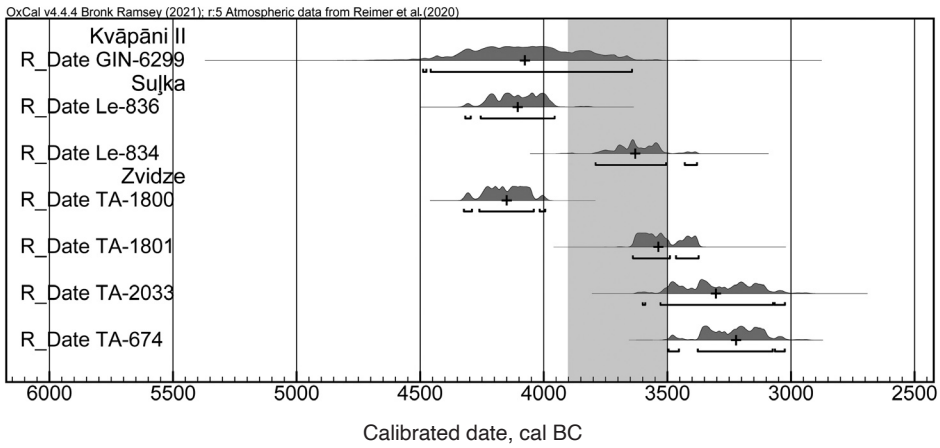


**FIG. 3.** Radiocarbon dates from the Lake Lubāns area associated with Typical Comb Ware. The shaded area indicates the approximate period proposed for Typical Comb Ware in neighbouring regions.

4 The evaluation criteria used for the preliminary screening of the dates were as follows: 1) Certainty of association of the dated sample with human activity; 2) Relevance of the dated sample to the specific archaeological entity of concern; 3) Quantity and nature of dates for the archaeological horizon; 4) Stratigraphic issues; 5) Sample type choice and the own age of the material; 6) Standard deviation; 7) Agreement with the archaeological finds and stratigraphy (for more details, see Seitsonen et al. 2012, table 1).

*The association of the sample and the dated hominin-influenced event.* The associations between the dated samples and past human activities, and their typologically diagnostic products – in this case, Typical Comb Ware – are problematic. The site of Zvidze is a settlement with several habitation phases (Loze 1988, 18–74). Such palimpsest sites are frequently complex and stratigraphically mixed, both vertically and horizontally. Therefore, the information given for the Lubāns samples – a layer and/or a depth – is often insufficient to confirm a direct connection between the dated samples and particular material cultures in multicomponent cultural layers that may contain residual or intrusive material. This is further emphasised at Zvidze, where three out of four samples come from palynological columns, potentially with an even less obvious relation to the assumed anthropogenic action; at best, they provide *ante* and *post quem* dates with wide margins of error.

The same applies to the Suļka site. Although the finds largely consist of Typical Comb Ware (Loze 1988, 85–90; 2015, 156–160), the dated samples were obtained as part of palaeoecological investigations beneath the settlement deposits. The dates were initially deemed unrelated to archaeology (Loze 1971, 67; 1988, 91) but were later considered by the same author to date the Typical Comb Ware presence at the site (Loze 2015, 238). The date from Kvāpāni II derives from a burial that was initially linked to the Late Neolithic, or even the Corded Ware culture (Loze 1979, 53–54; 1987, 35). Due to the radiocarbon date, it has since been associated with Typical Comb Ware present at the adjacent settlement (Loze 2008, 21; 2015, 71), while the burial itself shows no chronologically or culturally diagnostic features or material culture.

*The quality of the sample and date itself.* The coarse excavation techniques employed at the Lake Lubāns sites (large recovery units, thick excavation spits, lack of screening) further compromise the integrity between the find materials and the dated samples. Since most Typical Comb Ware-associated samples are of sediment (peat/peaty cultural layer), the sample quality is undoubtedly a major impediment.[5] The dates were obtained using liquid scintillation counting (Semyontsov et al. 1972, 336; Liiva & Loze 1994, 153), which required a large sample size; this may have meant that the samples contained material of different ages. Due to the limitations of the technology used, some dates have fairly large standard deviations.

*The compatibility of the date with other data from the site.* Considering the chronological framework proposed for Typical Comb Ware in neighbouring regions (broadly 3900–3500 BCE), the date from Kvāpāni II (GIN-6299) partially overlaps with it (Fig. 3). However, it is the only date from this site, shows

5 With regard to the Lake Lubāns area in general, Loze (2008, 45), when discussing the dates of the late Middle Neolithic Nainiekste settlement, notes that charcoal samples usually give ‘better dating results’ compared to peat, but the question of sample quality is not explored in detail.

no obvious connection to Typical Comb Ware and, due to its large deviation (±200 yr), covers nearly a millennium when calibrated; additionally, it may suffer from dietary reservoir offset (see the next subsection). The younger date from Suļka (Le-834) agrees with the proposed time, while the other (Le-836) is earlier. As noted, both – like the three other diachronic dates from the site – come from geological contexts. The Zvidze dates are either older (TA-1800), partially overlapping (TA-1801), or younger (TA-2033, TA-674) than the suggested time. The remaining ca 40 dates from the site are mainly associated with Mesolithic and Early Neolithic contexts, except for three dates linked with the later Middle Neolithic period. All dates are similarly disconnected from the Typical Comb Ware material culture.[6]

The use of the Lubāns dates can be characterised as uncritical: dates could be integrated into the chronological framework despite potential contextual or even temporal inconsistencies. Although data from surrounding territories – primarily from the area of the former Soviet Union (Loze 1993, 24), and secondarily Finland (Loze 2015, 239–240) – were consulted, the noted similarities or differences were never scrutinised to test the radiocarbon data (Loze 1988, 104–105). The interpretations and the selection of dates used for the argument can therefore even be described as opportunistic. From today's perspective, the recurrent incoherence of both archival and published data makes the assessment and use of the Lake Lubāns material complicated, if not often impossible.

Under these circumstances, none of the dates from the Lake Lubāns area can be confidently associated with the Typical Comb Ware material culture, nor can they be used to establish a chronology for it; their internal incoherence can be seen as further evidence of this (Fig. 3). The issues raised here highlight the need to reassess the entire Lubāns radiocarbon data and their applicability to other periods as well. This must include not only the legacy data but also the analysis of a substantial number of new AMS dates from systematically selected samples.

## ZVEJNIEKI CEMETERY

The first radiocarbon dates from the Zvejnieki cemetery were obtained in the 1990s, and about 60 individuals are currently dated and published (Zagorska & Larsson 1994; Zagorska 1997; 2006; Eriksson et al. 2003; Mannermaa et al. 2007; Larsson 2010; Zagorska et al. 2018). Of these, 21 individuals have been assigned to the Middle Neolithic (Zagorskis 1987; Zagorska 2006; Zagorska et al. 2018) and date to between approximately 4400 cal BCE and 3600 cal BCE (uncorrected medians). The dates from Zvejnieki played a significant role in extending the dating of Typical Comb Ware well into the 5th millennium BCE in

6 This presentation excludes a date from the Zvejsalas settlement (4905 ± 70 BP, TA-395, wood charcoal) that has been explicitly linked to the preceding Narva phase (Loze 1982, 94; 1988, 80; 2015, 129) but rather overlaps temporally with Typical Comb Ware, also present at the site (see also Loze 2015, 242).

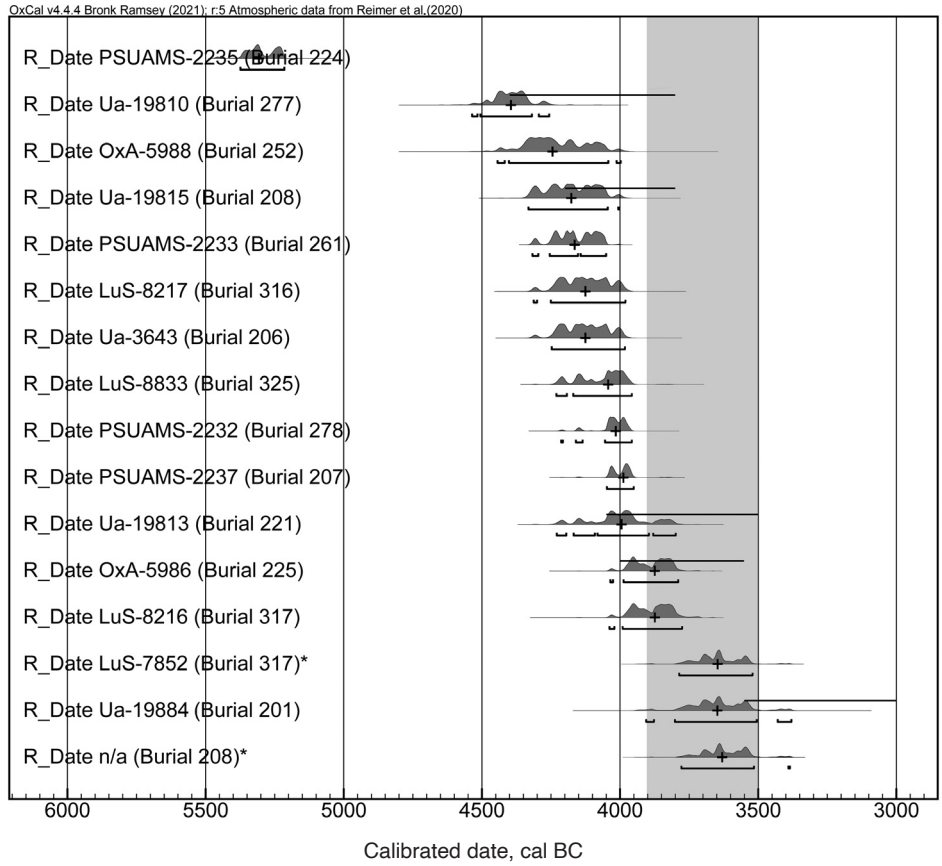


**FIG. 4.** Radiocarbon dates from the Zvejnieki cemetery associated with individuals buried according to the Typical Comb Ware grave ritual (after Ahola et al. 2025). * – dates obtained from terrestrial fauna; the black bars indicate the span suggested for the reservoir effect-corrected dates (see Supplementary material for data); the shaded area indicates the approximate period proposed for Typical Comb Ware in neighbouring regions.

the early 2000s (Zagorska 2006, 101–102; Bērziņš 2008, 107; Bērziņš et al. 2014, 722; Loze 2015, 47, 237).

*The association of the sample and the dated hominin-influenced event.* In the case of the Zvejnieki series, the questions of context integrity and the anthropogenic origin of the samples are less pronounced than for the Lubāns settlement finds. Regarding Typical Comb Ware, a distinctive burial type has been connected to it: the so-called ‘amber’ or ‘ochre’ graves (Zagorska 2001), or ‘symbolically overloaded burials’ (Ahola et al. 2025). Of the dated Middle Neolithic individuals, fourteen are identified with this burial tradition (individuals 201, 206, 207, 208, 221, 224, 225, 252, 261, 277, 278, 316, 317, 325), while eleven are not. Most of the latter (individuals 124, 164, 165, 185, 226, 271, 282, 310) follow a different burial rite, with different or no grave goods (Zagorskis 1987, *passim*; Larsson et al. 2017, 67; Ahola et al. 2025). They may represent slightly earlier,

broadly contemporary, or slightly later practices (see also Zagorska 2006, 99–102), but cannot be assigned a precise cultural affiliation. Only in the case of individuals 199, 228, and 256 does the associated material culture indicate a slightly later date.[7]

*The quality of the sample and date itself.* The potential problems associated with the radiocarbon dating of the individuals buried at Zvejnieki have been discussed systematically and methodologically in several papers (Meadows et al. 2014; 2016; 2018; also Eriksson et al. 2003, 16), and there is no need to repeat them here. It suffices to say that, over the 2010s, it became obvious that radiocarbon dates obtained from human remains in the area are affected by dietary reservoir offsets. In the local waterbodies near Zvejnieki, the reservoir age may reach close to a millennium (Meadows et al. 2014, 829; 2016, 684), resulting in uncertainties of over 100 radiocarbon years in the human freshwater reservoir effect (Meadows et al. 2018, 1005). Corrections based on dietary reconstructions have been published for some individuals associated with Typical Comb Ware, but these ages, as well as the proposed timespan for Typical Comb Ware (4200–3740 cal BCE; Meadows et al. 2018, 1004), are still partially older and inconsistent with the typological age (see also Ahola et al. 2025, 11) (Figs 4 and 5). This underlines the need for further attention to the chronology, dietary models, and cultural attribution of the burials.

*The compatibility of the date with other data from the site.* There are only two paired dates of human bones and terrestrial fauna: cervid bones from burials 208 (unknown lab-ID) and 317 (LuS-7852). Acknowledging that no data have been published that would allow an assessment of the technical quality of these dates, they suggest that Typical Comb Ware style burials were made at Zvejnieki at least around 3650–3600 cal BCE (medians, or 3800–3400 cal BCE, 2σ). The dates of human bone samples are generally too old compared with the typo-chronological age of the graves, with only individual 201 appearing as an exception.[8] No dates are available from adjacent Typical Comb Ware settlement contexts.

## OTHER SITES

Only a handful of dates from other sites are connected with Typical Comb Ware. One such date originates from the settlement site of Piedāgi in western Latvia

7 The potentially varied backgrounds of these individuals are indicated by two genetically studied cases: individual 124 points towards western European hunter-gatherer ancestry and indigenous or pre-Typical Comb Ware populations, in contrast to the stronger eastern European hunter-gatherer influence visible in individual 226 (Jones et al. 2017; Mathieson et al. 2018). Nevertheless, research into the timing, phases, and overlaps of demographic and cultural processes is similarly affected by the problems inherent in the Zvejnieki dates.

8 The reason for this cannot be determined here. Possible explanations include, for example, technical errors or the continuation of Typical Comb Ware burial tradition for a longer period than previously expected.

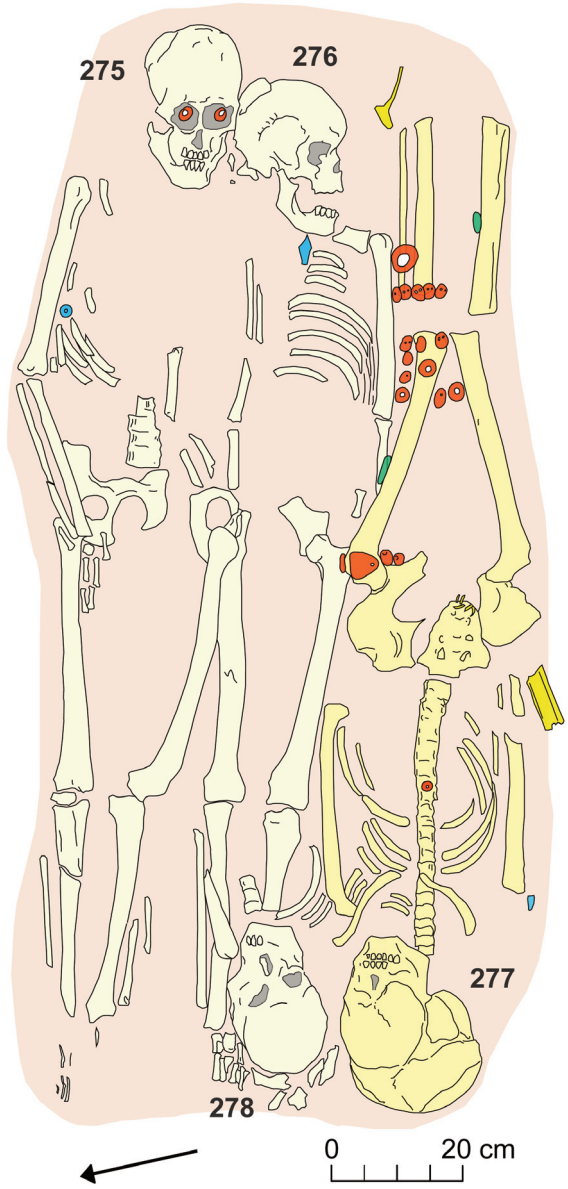


**FIG. 5.** Individual 277 at Zvejnieki is often referred to as the oldest indicator of the Typical Comb Ware influence in Latvia. However, the date is affected by the freshwater reservoir effect, while the material culture (red – amber, blue – flint/stone, dark yellow – bone/antler, green – native copper) and burial customs (including a combination of a multiple burial, a skull plastered with clay and red ochre) place it in the early 4th millennium BCE. Illustration by K. Nordqvist after an original drawing by B. Vaska, the Institute of Latvian History, University of Latvia.

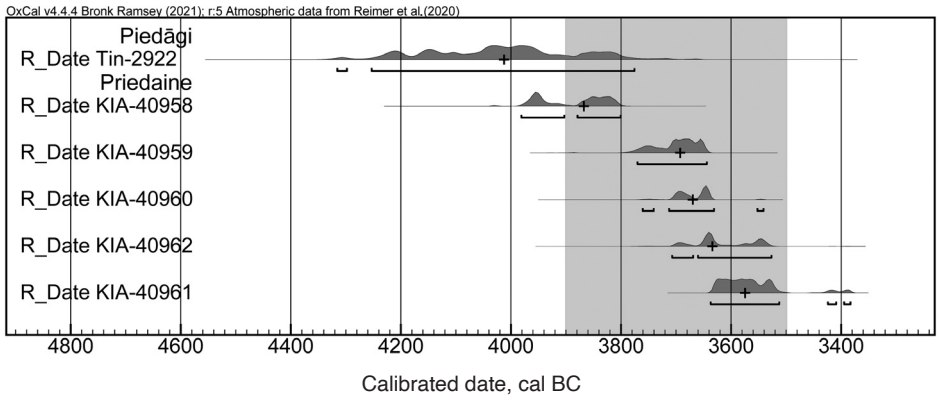


**FIG. 6.** Other radiocarbon dates associated with Typical Comb Ware in Latvia. The shaded area indicates the approximate period proposed for Typical Comb Ware in neighbouring regions.

(Bērziņš et al. 2009; also Bērziņš 2008, 107) (Fig. 1: 4). In the present framework, however, this date (Tin-2922) appears slightly old (Fig. 6). This may be due to it being a conventional date with a large error (±95 yr), a combination date of two charcoal samples that may be inconsistent, or simply contain own age.

The most consistent dates come from the Priedaine settlement near Riga (Fig. 1: 3). The two oldest dates (particularly KIA-40958, and also KIA-40959), obtained from charred residues on pottery sherds, may contain some reservoir offsets based on their isotopic signatures (Bērziņš et al. 2016, 17–18), even if they are generally compatible with the dating of Typical Comb Ware. The three other dates were obtained from plant-based materials with apparently short own age. Although the stratigraphic position of the youngest date (KIA-40961) may indicate some redeposition within the dune stratigraphy, the agreement of the two remaining dates (KIA-40960, KIA-40962) currently represents the best verifiable age for a Typical Comb Ware settlement context in Latvia, dating to 3670–3630 cal BCE (medians, 3750–3500 cal BCE, 2σ).

## Discussion and conclusions

During the first decades of the 21st century, the absolute chronology of Typical Comb Ware pottery and other material culture in northeastern Europe underwent revisions. For example, the first dates directly associated with it were obtained in Estonia and Lithuania (see Piličiauskas et al. 2019, 95; Kriiska 2020, 107). Finland represents the most comprehensively studied area in this regard. There, too, Typical Comb Ware had previously been dated older on the basis of context charcoal samples and shore-displacement chronology (Meinander 1971; Siiriäinen 1974), and only the application of the AMS method and smaller samples in the early 2000s shifted the chronology to nearly half a millennium younger (Pesonen

1999; 2004; 2021, 42, 67; for Estonia, cf. Lang & Kriiska 2001, 92 and Kriiska 2020, 104).

In Latvia, the development differed: data from Lake Lubāns formed the basis, and the newly acquired dates from Zvejnieki appeared to confirm the older age of Typical Comb Ware. The revised broader chronological context has not been properly accommodated in Latvian literature (cf. Bērziņš 2008, 107; Loze 2015, 239–240), although some recent internationally co-authored papers have set the onset closer to 4000 BCE (see Berg-Hansen et al. 2019, 20; Spataro et al. 2021, 1448; Lõugas & Bērziņš 2023, 7).

On closer inspection, there is little material that can be used to date Typical Comb Ware in Latvia: most of the Zvejnieki dates remain inaccurate due to unresolved dietary reservoir offsets, and the Lake Lubāns series consists of legacy data with serious quality issues. The few available dates from Zvejnieki and Priedaine provide a snapshot confirming the presence of Typical Comb Ware during the first half of the 4th millennium BCE, but do not necessarily reflect the beginning or end of its use. Individual dates and their simple calibrations have their limitations: just as 'one date is no date' from a single site because its reliability cannot be assessed (Pettitt et al. 2003, 1690), one or two sites or dates cannot be presumed representative of the entire phenomenon across a larger area. In the current situation, the absolute temporal boundaries for Typical Comb Ware in Latvia must largely be extrapolated from data from neighbouring areas. Future studies will have to clarify how synchronous the events ultimately were.

Much of the above discussion applies to Latvian Stone Age chronologies in general, and to Neolithic chronologies in particular: they are based on largely similar data, are affected by similar problems and concerns, and are restricted by similarly limited geographical coverage. Establishing reliable chronological boundaries and uncovering regional sequences remains one of the foremost challenges facing Latvian Stone Age studies. Addressing this challenge calls for a targeted dating programme that combines legacy data with systematic AMS dating, typological sequences, and other archaeological information within a controlled framework (e.g. Whittle et al. 2016).

In previous decades, radiocarbon dating was scarce, often regarded as objective, and applied indiscriminately. Today, however, the numerous problems associated with these data are well recognised: not all dates obtained are usable in the raw – or usable at all. The case of Typical Comb Ware underlines that this awareness must be made visible through a reassessment of the chronologies used and the underlying data. Another example from Latvia provides a fitting conclusion to this article. The beginning of the Corded Ware culture (and hence the Late Neolithic) was previously dated to approximately 3200 BCE (Loze 1992, 319; Bērziņš 2008, 41; Meadows et al. 2018, 1005). In recent contributions (Bērziņš 2021, 43; Dumpe 2024, 313; but see already Larsson & Zagorska 2006, 4), this boundary has shifted to around 2900 BCE. This age aligns better with the current understandings of this phenomenon in Europe and other Baltic countries,

where corresponding changes in chronologies were made in the 2010s. A similar revision is now warranted for the chronology of Typical Comb Ware and related phenomena in Latvia: its onset should be set at 3900–3800 cal BCE at the earliest.

**DATA AVAILABILITY STATEMENT**
All data are included within the article.

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**SUPPLEMENTARY ONLINE DATA**
Supplementary online data to this article include Table 1 detailing the radiocarbon dates associated with Typical Comb Ware in Latvia in the research literature and can be found at https://doi.org/10.3176/arch.2025.2.S02.

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# *Aeg revideerida. Tüüpilise kammkeraamika kujunemine Lätis*

Kerkko Nordqvist

**RESÜMEE**

Tüüpilise kammkeraamika kultuuri esiletõus, mis tähistab keskneoliitikumi algust, on Lätis praegu dateeritud umbes aastasse 4100 e.m.a. See on mitu sajandit varasem kui sarnase nähtuse algus teistes piirkondades, sealhulgas neis, mida peetakse tüüpilise kammkeraamika mõju võimalikeks lähtekohtadeks. Niisugune

erinevus on ebatõenäoline ning käesolev artikkel uurib selle põhjuseid. Koondatud on kõik avaldatud asjakohased Läti dateeringud ja hinnatud nende kasutuskõlblikkust keskneoliitikumi ja tüüpilise kammkeraamika alguse kronoloogia koostamisel. Artiklit on ajendanud ka vajadus pöörata senisest enam tähelepanu Läti kiviaja kronoloogiate usaldusväärsusele ning varasemate radiosüsinikdateeringute kasutamisele üldisemalt.

Tüüpiline kammkeraamika tähistab keraamikastiili või -käsitöö traditsiooni, mis levis Kirde-Euroopas 4. aastatuhande algul e.m.a., ulatudes Laadoga järve piirkonnast läbi Lõuna-Soome kuni polaarjooneni põhjas ning hõlmates lõunas Eestit, Lätit ning Leedu ja Valgevene põhjaosa. Tüüpilise kammkeraamika kronoloogiat on kõige põhjalikumalt uuritud Soomes, kus ligikaudu 200 otsest keraamika pinnal paiknevate toidu kõrbekihtide (söestunud jääkide) või kasetõkati dateeringut ning mitukümmend konteksti (põletatud luu ja puusüsi) dateeringut paigutavad selle alguse vahemikku 3900–3800 aastat e.m.a. Teistes piirkondades on dateeringuid märgatavalt vähem, kuid need annavad laias laastus sarnase pildi nii Loode-Venemaal, Eestis kui ka Leedus.

Lätis on tüüpilist kammkeraamikat leitud mõnekümnest kohast. Selle absoluutne kronoloogia tugineb aga peamiselt kahele allikale: Lubāna järve piirkonna asulakohtadele Läti idaosas ja Zvejnieki kalmistule riigi põhjaosas. Kahjuks raskendab Lubāna järve piirkonna andmestiku kasutamist mitu lahendamatut probleemi, sealhulgas dateeritud proovide ebakindel seos mineviku inimtegevusega, proovide halb kvaliteet ning andmete asünkroonsus. Lisaks on teave proovide kohta vastuoluline, mistõttu ei saa ühtki dateeringut usaldusväärselt siduda tüüpilise kammkeraamika kultuuriga ega kasutada selle kronoloogia määramiseks.

Zvejnieki dateeringute sari mängis 2000. aastate alguses olulist rolli tüüpilise kammkeraamika dateerimisel Lätis 5. aastatuhandesse e.m.a. 2010. aastatel sai aga selgeks, et sealsete inimsäilmete radiosüsinikdateeringuid on mõjutanud toiduga seotud reservuaariefekt. Toidurekonstruktsioonidel põhinevad dateeringute parandused on endiselt osaliselt vanemad tüpoloogilisest vanusest ning praegu on olemas ainult kaks maismaaloomade ja inimluude paarisdateeringut. Lisaks neile on tüüpilise kammkeraamikaga seotud vaid üksikud dateeringud teistest leiukohtadest. Riia lähedal paikneva Priedaine asulakoha dateeringud pakuvad praegu kõige usaldusväärsemat kontrollpunkti tüüpilise kammkeraamika asulakonteksti vanuse määramisel Lätis.

21. sajandi esimestel aastakümnetel hinnati Kirde-Euroopas ümber tüüpilise kammkeraamika ja muu materiaalse kultuuri kronoloogia, mille tulemusel nihkusid dateeringud üldiselt ligi poole aastatuhande võrra varasemaks. Lätis kulges areng teisiti: seal toetuti peamiselt Lubānsi järve andmetele ning Zvejnieki uued dateeringud näisid kinnitavat varasemat vanust. Laiemat ja uuendatud kronoloogilist konteksti ei arvestatud. Lähemal uurimisel selgub aga, et andmed ei toeta kammkeraamika varasemat algust. Seetõttu tuleks tüüpilise kammkeraamika alguspiir Lätis viia kooskõlla ülejäänud Kirde-Euroopas omaks võetud arusaamadega ja määrata see kõige varem ajajärku 3900–3800 aastat e.m.a.