

# New AMS radiocarbon dates for the late Neolithic site of Haamstede-Brabers (prov. of Zeeland, NL)

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## 1. Introduction

The site of Haamstede is uncovered on a ca. 500 m long sand ridge called “Brabers” on the former island of Schouwen (Zeeland, the Netherlands). Excavations on the northern part of this ridge in 1957 by the State Service for Archaeological Excavations (ROB), under the supervision of J. A. Trimpe Burger, led to the discovery of at least three late Neolithic house plans as well as pottery and lithic artefacts from the same period. At the time of occupation, the settlement was located on a coastal barrier at the exact spot where the river Scheldt flowed into the North Sea (Verhart, 1992; Fig. 1). The late Neolithic soil traces and artefacts were found in a 10 to 30 cm thick humic layer on top

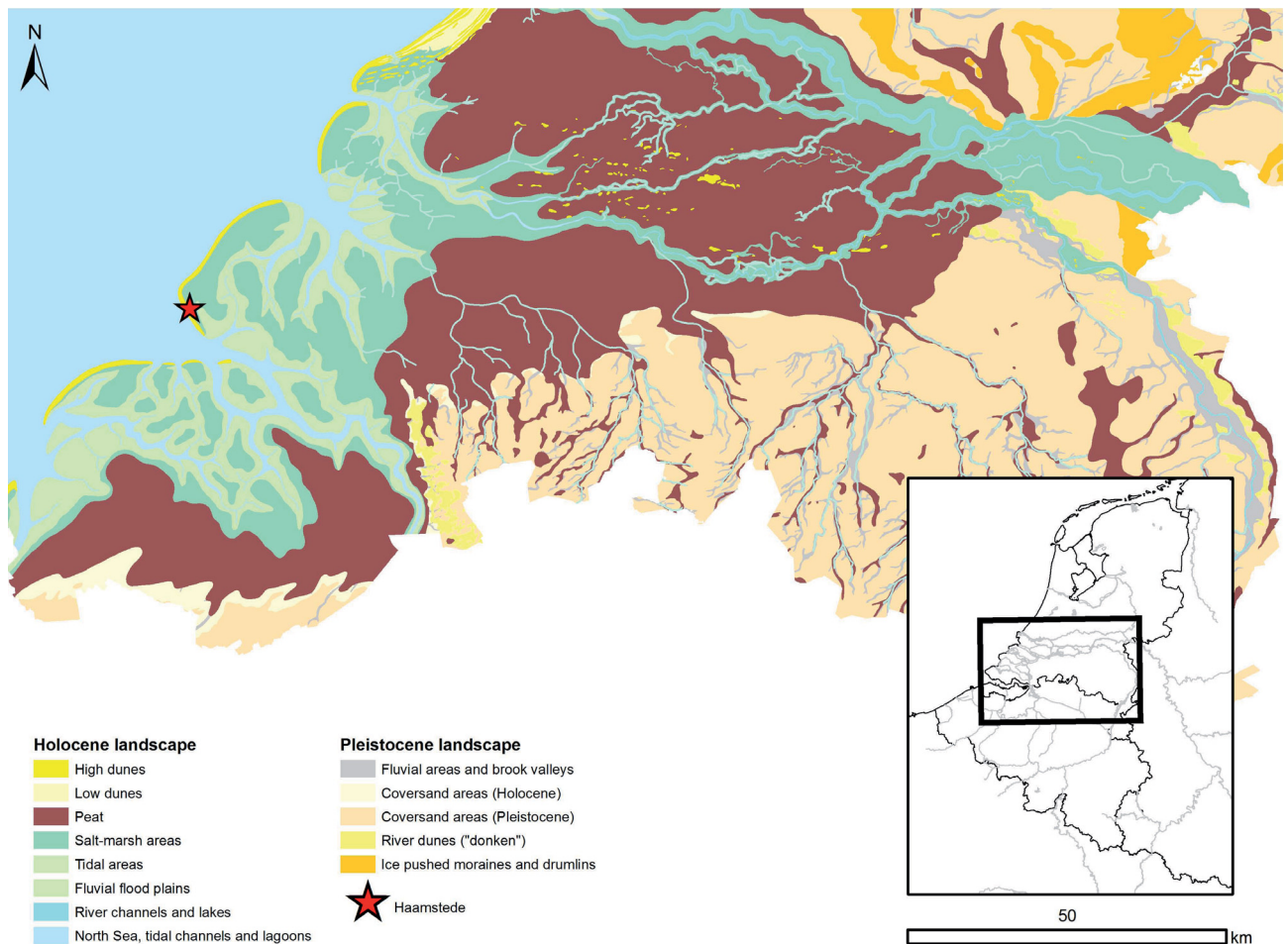


Fig. 1 – Detail of a palaeogeographical map of the Netherlands around 2750 BC (modified after Vos & de Vries 2013), indicating the approximate location of the late Neolithic settlement of Haamstede-Brabers.

of the wind-blown beach or sea sand. Only part of the settlement could be investigated and due to a lack of time most artefacts from the Neolithic cultural layer were collected without recording their spatial distribution.

Preliminary notes on the results of the excavations at Haamstede were published by Trimpe Burger (1958). Lanting and Mook (1977) published the only available radiocarbon date for this site, obtained on a charcoal sample from the cultural layer (GrN-1577:  $4410 \pm 60$  BP). In a full publication of the results by Verhart (1992) the house plans and material found on this site are discussed in detail. At present the find material from Haamstede-Brabers is stored in the ‘Zeeuws Archeologisch Depot’ at Middelburg (Stichting Cultureel Erfgoed Zeeland, Middelburg, NL). During a recent visit to this depot by members from Ghent University food crusts were noticed on some of the pottery fragments from this site. The fragments were sent to the Royal Institute for Cultural Heritage in Brussels for AMS radiocarbon dating.

## 2. Radiocarbon dates

Four wall fragments with food residue encrusted on the internal surfaces were analysed. As a result of the excavation circumstances and methodology no contextual information is available for these pottery fragments, other than that they originate from the Neolithic cultural layer. The results of the AMS  $^{14}\text{C}$  and bulk stable isotope analyses are presented in Table 1. The  $^{14}\text{C}$  dates on all four samples cluster well in the late 4<sup>th</sup> to early 3<sup>rd</sup> millennium cal BC. They are also in line with the radiocarbon date on a charcoal sample published by Lanting and Mook (1977; Fig. 2), for which the contextual information is again limited to the Neolithic cultural layer.

Reference nr.	AMS lab code	BP date	cal BC ( $\pm 2 \sigma$ )	$\delta^{13}\text{C}$ (‰)	$\delta^{15}\text{N}$ (‰)	C:N
Object 1461-9	RICH-23961.1.1	$4338 \pm 33$	3080-2893	-28.0	8.8	9.6
Object 1461-32	RICH-23962.1.1	$4352 \pm 32$	3084-2901	-26.4	9.7	17.0
Object 1461-37	RICH-23963.1.1	$4304 \pm 31$	3011-2882	-24.2	10.5	13.7
Object 1461-30	RICH-23964.1.1	$4377 \pm 33$	3090-2911	-25.5	9.7	13.1

Tab. 1 – AMS  $^{14}\text{C}$  determinations and bulk isotopic values of food crusts preserved on the Vlaardingen pottery of Haamstede-Brabers.  $^{14}\text{C}$  calibrations were performed using OxCal v.4.2 (Bronk Ramsey, 2009) and the IntCal13 atmospheric curve (Reimer et al., 2013).

According to Lanting and van der Plicht (1999/2000) the radiocarbon date on charcoal from Haamstede might have a considerable old-wood effect. This assumption is probably based upon the fact that this date is considerably older than  $^{14}\text{C}$  dates on charcoal samples associated with Vlaardingen pottery from other sites (Hekelingen III/fase 3 and Voorschoten-Boschgeest) that was typo-chronologically attributed to the VL2a phase (see below).

In this respect it is important to emphasize that the food crust dates might be subject to a reservoir effect. The settlement was located on an ancient coastal barrier<sup>1</sup>, at the intersection of marine (North Sea) and freshwater (Scheldt) environments. Although no fish remains were found during the excavation – but this might be related to the

<sup>1</sup> Van der Valk and Beekman (2011, 2013) hypothesize that the “Brabers” sand ridge is formed as the result of a wash-over and has to be located to the east of or inland to the Older Dune area.

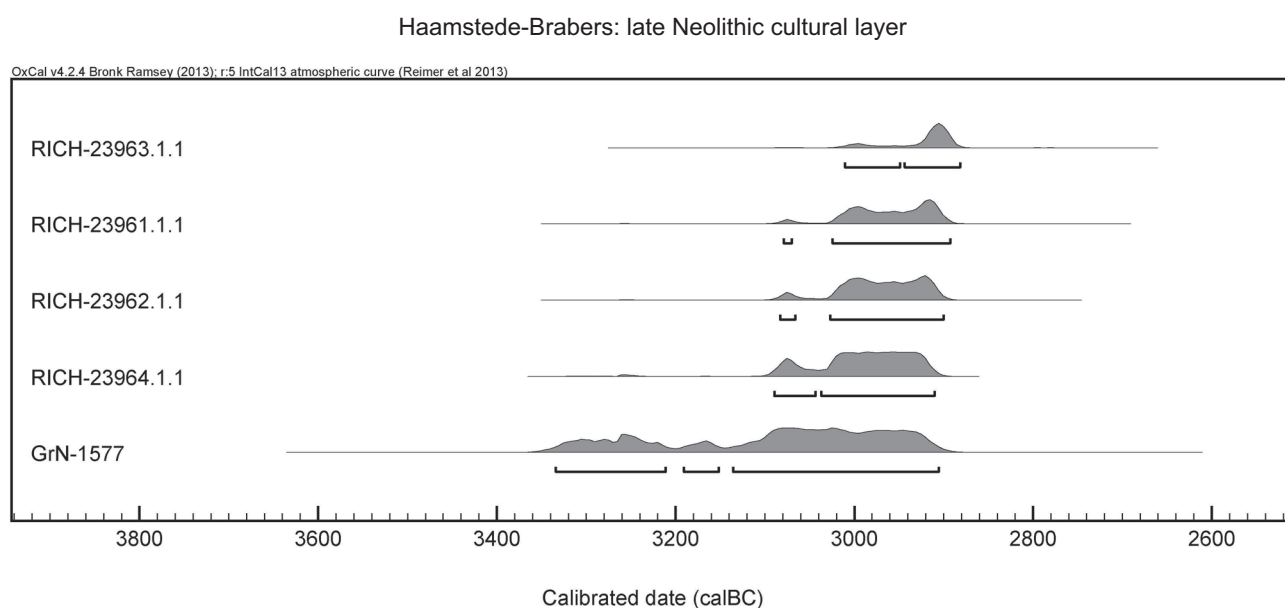


Fig. 2 – Multiple plot of the available radiocarbon dates (95.4 % range) on charcoal (GrN-1577) and on pottery food crusts originating from the late Neolithic cultural layer at Haamstede-Brabers.

excavation method without sieving and/or the bad preservation of bone material – it is likely that aquatic resources were part of the economy or diet at this site (Verhart, 1992). The high  $^{15}\text{N}$  values (Tab. 1) for the residues might even point in this direction (Craig *et al.*, 2007; but see Boudin *et al.*, 2010). There are however no direct indications for fish consumption. A possible use of aquatic resources at this settlement also does not necessarily imply the processing of such resources inside these particular vessels. In the case of a reservoir effect we might expect more scatter in the food crust dates. In our opinion, the strong clustering of all four dates on food crusts, in agreement with the charcoal date, indicates that these radiocarbon dates are reliable.

### 3. Haamstede-Brabers and the chronology of the Vlaardingen Culture

The chronology of the Vlaardingen Culture is largely based upon changes in the pottery morphology and type of temper. Glasbergen, Groenman-van Waateringe and Hardenberg-Mulder (1967a-b) suggested a division between VL1 (*classical phase*) and VL2 (*developed phase*) based upon the pottery found at Voorschoten. Apart from differences in vessel shape and decoration, the latter being absent for VL2 pottery, the transition between both phases is characterised by the change from quartz to grog as a predominant temper (Beckerman & Raemaekers, 2009). The developed phase was further subdivided in a phase with only developed Vlaardingen pottery (VL2a) and a phase where developed Vlaardingen pottery occurs together with *Single Grave Culture* and *All-Over-Ornamented* beakers (VL2b). As a result of later adjustments by Louwe Kooijmans (1976) and Lanting and van der Plicht (1999/2000) the first Vlaardingen phase was subdivided into VL1a, 1b and 1c.

The pottery of Haamstede-Brabers is discussed by Verhart (1992) as pottery with barely pronounced belly-shaped S-profiles, tempered with grog, rarely (4 %) combined with a small amount of fine broken quartz. Variation in pottery types is small and “beaker-like” pots or large storage vessels do not occur. Based on the morphological and technological characteristics this pottery was attributed by Verhart to the VL2a phase. Other sites with VL2a pottery (Hekelingen III/fase 3 and Voorschoten) yielded  $^{14}\text{C}$  dates on associated

charcoal remains between ca. 4150 and 4000 BP, which is probably the reason why Lanting & van der Plicht (1999/2000) suggested a considerable old-wood effect for the charcoal date of Haamstede (GrN-1577: 4410 ± 60 BP).

The typo-chronological division of the Vlaardingen pottery into 5 (sub)phases is called into question by Raemaekers (2005). Beckerman and Raemaekers (2009) proposed a new division into an early, middle and late phase. Based on morphological developments in the Vlaardingen pottery they distinguished five groups (A-E) and tried to position these groups chronologically by means of stratigraphy and the available radiocarbon dates. The pottery of Haamstede-Brabers was assigned to the middle phase but this could not be verified due to a lack of reliable <sup>14</sup>C dates. The new dates on food crusts and the old date on charcoal in any case fit in with the other available radiocarbon dates for the middle phase of the Vlaardingen pottery according to Beckerman and Raemaekers (2009: Tab. 5).

#### *4. Conclusion*

The results of AMS <sup>14</sup>C analyses on food crusts preserved on the Vlaardingen pottery of Haamstede-Brabers are in line with a previously obtained date on charcoal from the Neolithic cultural layer, confirming an occupation for this site at the transition from the 4<sup>th</sup> to 3<sup>rd</sup> millennium cal BC. Given the location of this site on an old coastal barrier, at the exact spot where the Scheldt river at that time flowed into the North Sea, a (marine or freshwater) reservoir effect on the food crust dates cannot be excluded. However, the strong clustering of all five dates indicates that they are reliable and that they can be included in discussions on the chronology of the Vlaardingen Culture.

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### *Abstract*

The chronology of the Vlaardingen Culture is largely based upon changes in the pottery morphology and types of temper. On account of varying characteristics between the pottery from different sites as well as stratigraphic layers, several (sub)phases are recognized. For many of these sites radiocarbon dates are limited or lacking, making it difficult to validate this much debated chronological framework. We present the results of AMS <sup>14</sup>C analyses on food crusts preserved on the Vlaardingen pottery of Haamstede-Brabers, excavated in 1958. The dates on four samples are in line with a previously obtained radiocarbon date on charcoal from the late Neolithic cultural layer, confirming an occupation for this site at the transition from the 4<sup>th</sup> to 3<sup>rd</sup> millennium cal BC.

*Keywords:* Haamstede-Brabers, Prov. of Zeeland (NL), Vlaardingen Culture, pottery, food crusts, radiocarbon dating.

### *Samenvatting*

De chronologie van de Vlaardingen-cultuur is grotendeels gebaseerd op veranderingen in de morfologie en magering van het aardewerk. Op basis van variaties in de kenmerken van het aardewerk van verschillende sites en stratigrafische lagen worden enkele (sub)fasen onderscheiden. Voor veel sites ontbreken voldoende <sup>14</sup>C-dateringen om dit chronologisch kader te toetsen. Dit artikel geeft de resultaten weer van AMS <sup>14</sup>C-analyses op voedselresidu bewaard op het Vlaardingen-aardewerk van de site Haamstede-Brabers, opgegraven in 1958. De dateringen op vier stalen sluiten aan bij een vroegere datering op houtskool uit de laatneolithische cultuurlaag en bevestigen dat de bewoning op deze locatie gedateerd kan worden rond de overgang van het 4<sup>de</sup> naar het 3<sup>de</sup> millennium cal BC.

*Trefwoorden:* Haamstede “Brabers”, Zeeland (NL), Vlaardingen-cultuur, aardewerk, voedselresidu, radiokoolstofdatering.

### *Résumé*

La chronologie de la culture de Vlaardingen est principalement fondée sur les variations morphologiques et les choix de dégraissants de la céramique. Ces différences observées entre sites ou entre couches stratigraphiques d'un même site ont permis de reconnaître plusieurs (sous-) phases. Cependant, les données des datations radiocarbones sont au mieux limitées, ce qui rend difficile de valider ce cadre chronologique, qui a été sujet à discussion. Dans cette contribution, on présente des résultats de datations radiocarbones par AMS sur des résidus alimentaires carbonisés conservé sur de la céramique Vlaardingen du site de Haamstede-Brabers, fouillé en 1958. Les quatre datations sont en conformité à une ancienne datation faite sur charbon de bois provenant de la couche du néolithique récent et confirment que l'occupation du site a eu lieu à la transition du 4<sup>ème</sup> au 3<sup>ème</sup> millénaire cal BC.

*Mots-clés :* Haamstede «Brabers», Prov. de Zélande (NL), Culture de Vlaardingen, céramique, résidus alimentaires, datation radiocarbone.

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