A new French Tréboul spearhead found in The Netherlands

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A new French Tréboul spearhead found in The Netherlands: the case of the Goor find

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Keywords: Bronze Age, spearhead, dating, composition, supra-regional origin.

Introduction

In December 2020, the second author was out metal detecting in the vicinity of the town of Goor, Municipality 'Hof van Twente'. In a lower-lying area of the terrain – at the time very wet and soggy – at a depth of 25 cm a bronze spearhead was recovered. The shaft hole appeared plugged and fortunately was not cleaned at that point. The find was reported to PAN (the Portable Antiquities of the Netherlands website; PAN-84005) and immediately identified by the third author as an example of a small group of presumably imported spearheads of Western French origin. Contact was made with the finder, who was kind enough to lend the object to the Groningen Institute for Archaeology for further study. This means that we can report here on the analyses undertaken to study the spearhead (*e.g.* properties, affinities, composition) and its original depositional context.

Findspot: Landscape context

The spearhead was recovered from a landscape zone consisting of undulating cover-sand-ridges 9.9 to 11.5 m above D.O.D.) interspersed with lower-lying wetter areas. This area is situated between the Saalian Glacial ice-pushed hills of the Markelo-

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Metaaltijden 8. Bijdragen in de studie van de metaaltijden. Leiden: Sidestone Press, pp. 117-128.

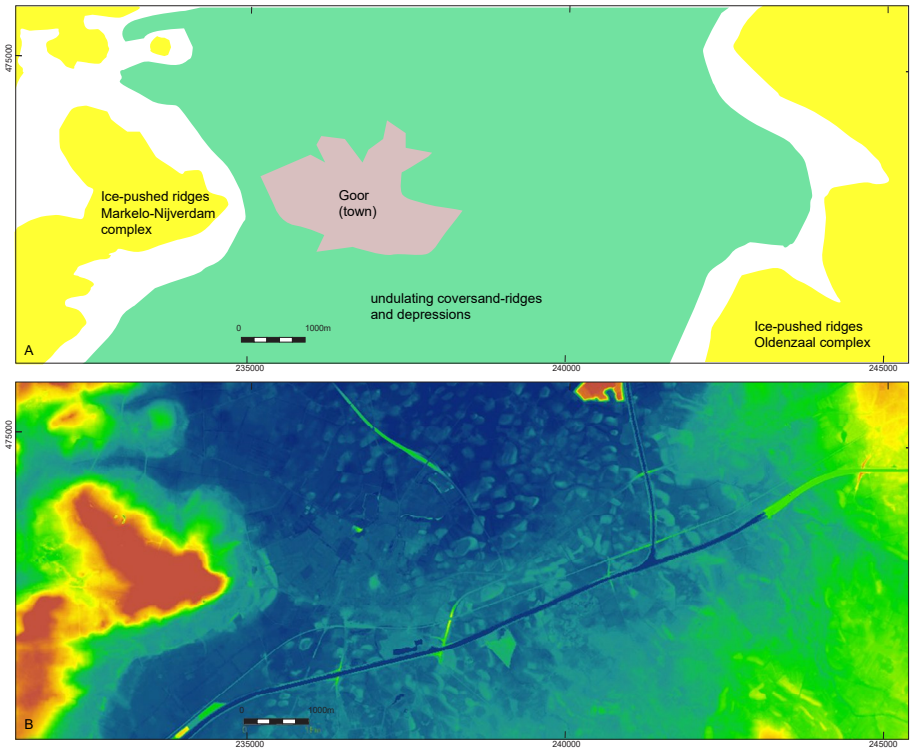


Figure 1. Landscape context of the Goor spearhead, showing the (A) major landscape features and (B) height above Dutch Ordnance Datum (D.O.D; dark blue 9.4 m abode D.O.D., dark red 45 m above D.O.D; (c) AHN3, Rijkswaterstaat).

Nijverdal complex in the west (Van Beek, Gouw-Bouman & Bos 2015, 231) rising locally to 45 m above D.O.D and those of the Oldenzaal-complex in the east (Fig. 1).

In terms of geomorphology, this zone is identified as an area of "partly washed-down coversand deposits" (geomorphology code 2M9; Ten Cate & Maarleveld 1977, 67) and pedologically as a patchwork of wetter Arenosols and dryer Plaggic Anthrosols (both under anthropogenic (plaggen soil) covers; Dutch: *beekeerdgrond* and *hoge zwarte Enkeerdgronden*; Stiboka 1971, 75-78). Locally, stream-valleys such as that of the Regge and Potlee provided drainage, but in other areas pockets of peat could develop in the later Holocene (Boshoven *et al.* 2009, 15). Based on the wet, loamy sediment still adhering to the spearhead upon recovery and the description by the finder, the Goor spearhead originated from a lower lying part of the landscape east of the town of Goor.

The object: a socketed bronze spearhead

The spearhead from Goor measures 13.4 cm in length and the maximum remaining width is 3.7 cm. Presumably, its original width was larger, but frequent resharpening may have reduced it some mm. The socket diameter measures 2.7 cm internally at its base, tapering out at c. 4 cm from the distal point. On the blade, and parallel to the central shaft hole, two ribs (*c.* 4 mm wide, 2 mm high) of convex shape are visible that meet and continue as an apex vertex towards the blade tip. The outer edges of the

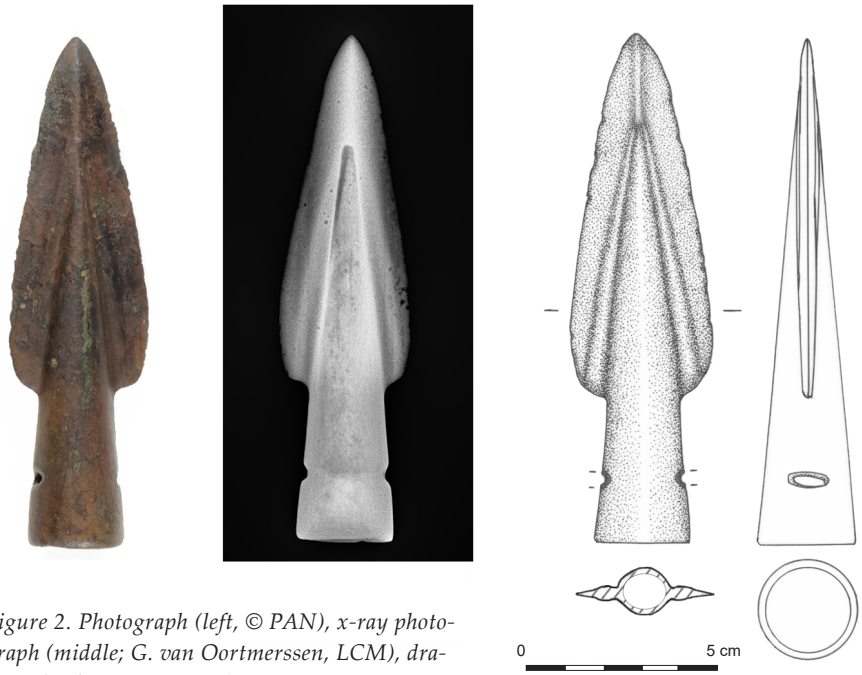


Figure 2. Photograph (left, © PAN), x-ray photograph (middle; G. van Oortmerssen, LCM), drawing (right; H. Steegstra).

blade are chipped and brittle. A brown-greenish (iron-rich?) patina covers most of the surface, but a more dark brown patina is visible in patches. Longitudinal scratch marks in those areas could indicate original use-wear or resharpening traces. The spearhead was originally fixed to a wooden shaft using two diametrically opposed pegholes (11 by 4 mm) of oblong oval shape. As the shaft hole was still plugged when the object was handed-over for study, an X-ray was taken[1] to determine (a) any possible contents of the shaft hole and (b) the presence and distribution of any casting flaws in the alloy (Fig. 2, middle).

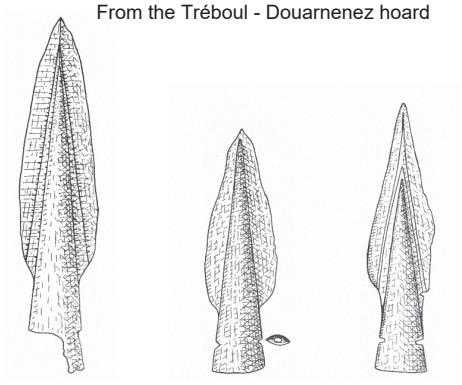
Based on the x-ray photograph, the quality of the casting is solid. Some gaseous pores are discernible near the extremity of the blade edges, but overall the structure is uniform. In the distal part of the shaft hole socket, a skewedly aligned matrix is visible, that was suspected to be the tip of the original wooden shaft (*infra*).

Typology: A French imported Tréboul spearhead?

Several observations of the Goor spearhead point towards an identification as a Type Tréboul spearhead. Spearheads of this group are named after the hoard found at Tréboul-Douarnenez in 1948 on a location known as *Sable Blanc* (Briard & Mohen 1983, 123). This hoard comprised 12 flanged axes (and 38 axe fragments), 58 sword and dagger fragments (a.o. Type Saint Brandan; *loc.cit*), several smaller objects and 17

1 We are grateful to mr. G. van Oortmerssen (Laboratory for Conservation & Material Studies, Groningen University) for his skilled (x-ray) photography, sample taking and conservation of the Goor spearhead.

From the Tréboul - Douarnenez hoard



No. 4
Briard 1965,
87 fig. 25

No. 2
Briard 1965,
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No. 3
Briard 1965,
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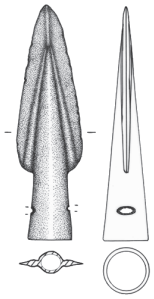
Goor spearhead



DB 2993
This publication

other Dutch Tréboul spearheads

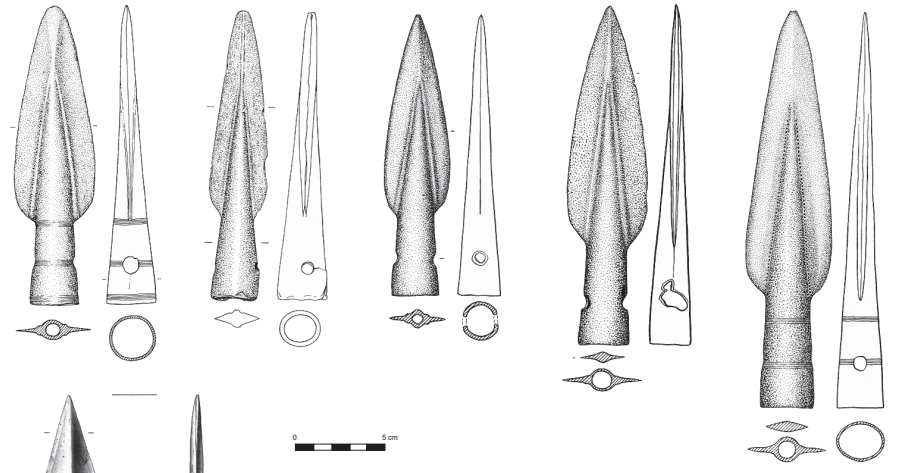
DB 1807
This publication

DB 1795
Butler 1987, 10 fig. 1

DB 1710
Butler 1987, 10 fig. 1

DB 525
Butler 1987, 10 fig. 1

DB 1037
Butler 1987, 10 fig. 1



DB 2936
Ruiters 2020, 136 fig. 65

DB 403
Butler 1987, 10 fig. 1

DB 1147
Butler 1987, 10 fig. 1

Figure 3 (previous page). Overview of Tréboul spearheads from the eponymous hoard (top-left inset; from Briard 1965, 87 fig. 25), from Goor (top middle inset) and Dutch comparanda, all to same scale (drawings Butler Archive, Groningen Institute of Archaeology (GIA; H. Steegstra (DB 2993) and R. Timmermans (DB 2936)).

spearheads (and seven spearhead fragments; Briard 1965, 308). Several of these spearheads show ribs on the blade next to the shaft hole (*nervures latérales*; Briard & Mohen 1983, 123), that meet well before the blade's tip – often continuing as a narrow midrib to the distal tip (Briard 1965, 86). Also, the pegholes are generally irregularly in shape and put-in after casting, resulting in irregularly shaped holes with often chamfered edges (Briard & Mohen 1983, 123). Geometric decoration of the shaft was also observed (*e.g.* Briard 1965, 87 fig. 25 no. 8).

These four characteristics (blade ribs, shaft hole termination below the blade tip, irregular pegholes, geometric decoration) have become typological markers for a Tréboul group of spearheads after the eponymous hoard (fig. 3; Briard 1965, 86; Briard & Mohen 1983, 123; LeClercq & Warmenbol 2018, 86). Briard (1965, 86) distinguished two subgroups based on the distance between the maximum extent of the shafthole and the blade tip (Type A: shaft hole terminates 3-5 cm (or 10-15 cm for larger blades; Briard & Mohen 1983, 123), Type B: shaft hole terminates at c. 1 cm from blade tip). Gabbilliot (2003, 56-57) later proposed individual subtypes/nos. for the four main characteristics (nos. 52-55; LeClercq & Warmenbol 2018, 86).

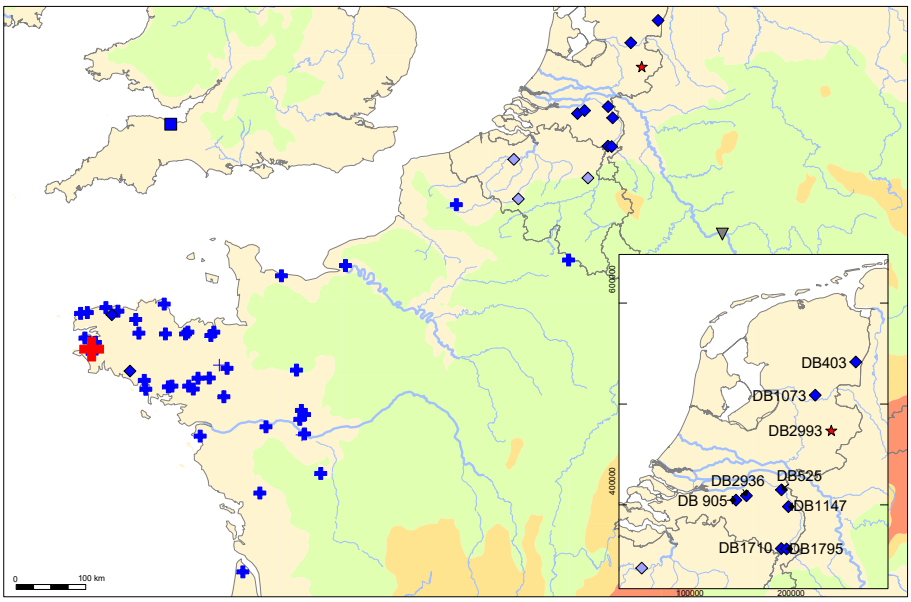


Figure 4. Distribution map of Type Tréboul spearheads (after Briard 1965, 86; O'Connor 1980, 63 list 18; 445, Map 11; Butler 1987; Hansen 1990; Maitay et al. 2013, 12; LeClercq & Warmenbol 2018, 88). The location of the eponymous hoard is indicated with a red cross. The location of the Goor spearhead is indicated with a red star. The inset shows the distribution of the presently known Dutch examples.

The distribution of Type Tréboul spearheads has an evident focus on Brittany (fig. 4; Briard 1965, 86; O'Connor 1980, 63 list 18; 445; Map 11; Maitay *et al.* 2013, 12; LeClercq & Warmenbol 2018, 88) and this presumably is their area of production. From this core-area, these spearheads were exchanged into the central-west of France (Maitay *et al.* 2013, 12 fig. 4), Normandy (LeClercq & Warmenbol 2018, 86) and possibly even to the British Isles (Davis 2012, 167 no. 1040, but see LeClercq & Warmenbol 2018, 86). Remarkable is their scarcity in *Hauts-de-France* (*cf.* Butler 1987, 9), as in both Belgium (O'Connor 1980, 63 list 18 nos. 3-4; LeClercq & Warmenbol 2018) and the eastern part of the Netherlands (Butler 1987, 11 fig. 2) more numerous examples are known.

As the Goor spearhead shows (a) irregular pegholes, (b) converging blade ribs, that (C) terminate below the blades' tip, we are confident in our identification as a Type Tréboul spearhead. It moreover fits well within the wider corpus of such spearheads already known from the Netherlands (Fig. 3). We assume that it represents an import – either along the coast and inland rivers, or along the Meuse – from the Armorican core region (*cf.* Butler 1987, 9) and may have formed part of warrior weapon sets like the contemporary Sögel-Wohlde sets of the Nordic interaction sphere (Butler 1987, 30; Fontijn 2003, 99; 103; 111; 228-229). That said, it seems improbable (and perhaps even irrelevant) whether communities in the Netherlands were aware of the Armorican ultimate origin (*cf.* Fontijn 2009, 124; 137-138) – in any case, their exotic ('southern'?) style must have stood out and mattered most (Fontijn 2003, 124, *cf.* Arnoldussen 2015, 25).

The wooden shaft

Based on the plugged shaft hole and x-ray photograph (Fig. 2, middle) the presence of wood was suspected. Upon further examination by drs. G. van Oortmerssen (Laboratory for Conservation & Material Studies, Groningen University), it was clear that the most proximal of the 'plug' consisted of a corrosion product no longer containing any wood. After its removal, it was clear that in a more distal part of the shaft hole, anaerobic conditions preserved ca. 3 cm of a tapered wooden tip of the shaft (Fig. 5, A). The original tight fit between shaft and shaft hole unfortunately resulted in a strong corrosive bond between the outermost cellulose and bronze surface of the shaft hole, and the wood fragment could not be extracted intact (Fig. 5, B).

A large fragment of the extracted wood was studied microscopically by Nicolien Bottema-Mac Gillavry. The outer surface was dry, brittle but still fibrous and showed precipitation of copper-oxides. The wood of the shaft was identified as ash (Fraxinus excelsior; cf. Schweingruber 1990), specifically based (among other miroscopically visible features) on the ring of large earlywood vessels at the growth ring border, the dense latewood with small, isolated vessels, and on the one- to three-seriate rays, visible as light lines in the cross section (Fig. 5, D).

Although only a limited number of wood-identifications are available, both ash and hazel appear to be common choices for Bronze Age spearheads (Drenth & Bouma 2015, 55 tab. 1; Arnoldussen *et al.* 2020, 475-476 fig. 6; Theunissen, van Os & Brinkkemper 2017, 17-18). Ash may have been preferred for its flexural and compression strength, but hazel was the next most popular option (and remained popular into the Early Medieval Period; Tegel, Muigg & Büntgen 2016, 150; 152; Haneca & Deforce 2020, 9).

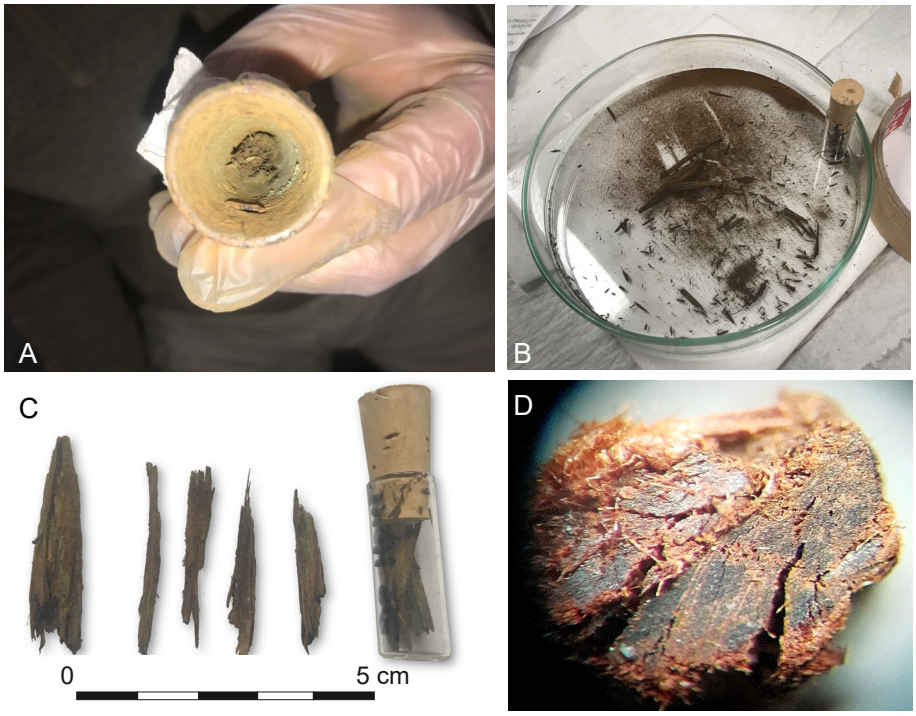


Figure 5. Original position (A), extracted fragments (B), detailed photograph (C; by G. van Oortmerssen) and microscope photograph (D; by N. Bottema-Mac Gillavry) of a cross section of a wood fragment from the Goor spearhead.

Dating: Tréboul in general and the Goor spearhead in specific

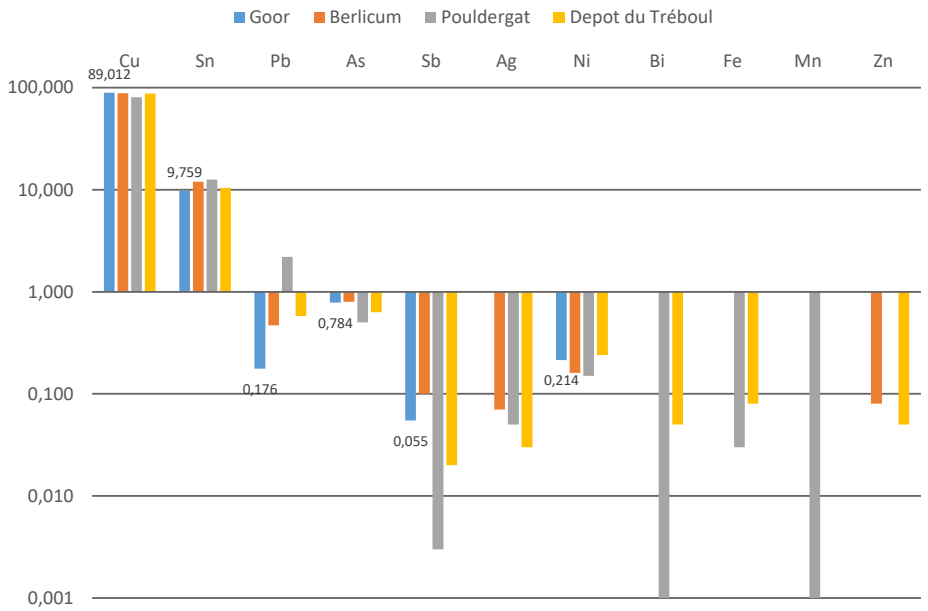
From the wood extracted, a tiny fragment (c. 200 mg) was sent off for AMS dating. This yielded a radiocarbon age of 3262 ± 21 BP (GrM-26057) or 1609-1456 BC. This tallies well with the assumed transitional MBA-A to MBA-B dating of Tréboul spearheads (c. 1575-1450/1425 BC; Fontijn 2003, 99). The eponymous hoard was however dated even slightly earlier, as the linen fabric in which the objects were deposited was radiocarbon dated to c. 1727-1476 BC (Lyon-196-Oxa : 3330 ± 55 BP; LeClercq & Warmenbol 2018, 88). The Tréboul daggers were in the eponymous hoard associated with swords of Type Saint Brandan, who are presently dated to c. (1600)1550-1500(1450) BC (Briard & Mohen 1983, 124; Fontijn 2003; 87 fig. 6.2; 103-104; Chopin & Gomez de Soto 2014, 531), suggesting that a 16th to 15th century BC date for the Goor spearhead was to be expected.

Composition: pXRF analysis

The composition of the alloy was studied using a portable X-ray fluorescence (pXRF) device (Thermo Scientific Niton XL3t, which measures up to 25 elements simultaneously in the elemental range from sulphur (atomic no. 16) to uranium (atomic no. 92), and can also detect light elements in the range of magnesium (atomic no. 12) to chlorine (atomic no. 17) under the supervision of Bertil van Os of the Cultural Heritage

Agency of the Netherlands (RCE). A total of 11 measurements spread across the patina of each 40 seconds long were taken in »Electronic metals mode« and corrected for oxides and lighter elements using reference standards. Using the same settings a sample of extracted (milled) fragments from the inside of the shaft were measured twice. As these represented the samples least affected by corrosion and soil-processes (for example, the average Fe content of the measurements on the patina was 15% – and Fe is not part of the alloy (insoluble), we report here solely on the milled bulk samples (Fig. 6).

The high and variable amount of iron precipitation in the outer corrosion tallies with the description of the find-spot as a (periodically) wet part of the landscape. The milled samples still contained c. 5 %wt Fe (suggesting that some of the outer corrosion had not been fully removed prior to sampling), but the values listed in Figure 6 are extrapolated to their original values (*i.e.* removal of iron).



Element	Pouldergat	Depot du Treboul (median, n=95)	Berlicum (DB 2936)	Goor (DB 2993)
Cu	80,5	87,42	88	89,012
Sn	12,6	10,43	12	9,759
Pb	2,2	0,58	0,47	0,176
As	0,5	0,63	0,8	0,784
Sb	0,003	0,02	0,1	0,055
Ag	0,05	0,03	0,07	<0,0
Ni	0,15	0,24	0,16	0,214
Bi	0,001	0,05	<0,0	<0,0
Fe	0,03	0,08	0 (c. 15%)	0 (c. 5%)
Mn	0,001	n.a.	<0,1	<0,0
Zn	n.a.	0,05	0,08	<0,0
Co		0,02		<0,0

Figure 6. Bar-chart (top, labels for the Goor spearhead added) and table (bottom) for the Tréboul alloys analysed (Pouldergat: Briard & Onnée 1971, 31, Tréboul hoard: Cecile le Carlier de Veslud, pers. comm. March 2021, Berlicum: Van Os in Ruijters 2020, appendix 7, Goor: this study).

The base alloy of the Goor spearhead was a tinbronze copper (9.76 % wt Sn), with minor amounts of arsenic (0.78 %wt), nickel (0.21 %wt) and lead (0.18 %wt). Antimony was present in even smaller amounts (0.055 %wt). The top part of Figure 6 shows that the composition of the Goor spearhead aligns well with those of the Tréboul spearheads of Berlicum and Pouldergat. The slightly higher value for lead and lower value for antimony in the Pouldergat analysis may relate to a different methodology (spectral analysis; Briard & Onnée 1971, 31) or different base ores. Cecile le Carlier de Veslud (University de Rennes) has measured a total of 95 fragments of objects from the Tréboul hoard (a.o. five spearheads, two axes, sword fragments and foundry waste), and was kind enough to supply us with median values for the elemental composition of those objects (Fig. 6). Again, the similarities of the Goor spearhead and median values is evident. Based on the notable amounts of nickel and antimony, an insular origin of the base ores may be suspected. For the Tréboul hoard, the Great Orme mine in Wales has been identified as most likely source based on composition (Williams & Le Carlier de Veslud 2019, 1184 fig. 4; 1185) and lead isotope (*op.cit*; 1186 fig. 5). Without lead isotope characterisation of the Goor spearhead, we can only postulate based on composition (*i.e.* notable arsenic and nickel, absence of silver) that the Goor spearhead was cast from alloys ultimately deriving from Wales too.

Conclusions: Bronze Age usage of the Goor environs

Based on its context of recovery, and presence of preserved wood, the Goor spearhead was presumably deposited in a lower – periodically waterlogged – part of the landscape. Its 'non-local' appearance may have been a factor in selecting it for deposition (Fontijn 2003, 99; 224). Whereas these spearheads figure prominently in hoards in their home-region of Brittany (Briard & Mohen 1983, 123-124), the Dutch examples all appear to be deposited in wet parts of the landscape (Fontijn 2003, 100). The blackish patina of the Witharen spearhead (DB1037) suggests that it too was originally deposited in a wetland context. For the Berlicum spearhead (DB 2936), it in any case was clear that it had been thrust point-first into a stream valley margin (Drenth 2020, 144). Such acts of deposition may have formed an element in the conversion of more bellicose (temporary) identities back to regular ones (*cf.* Fontijn 2003, 111). The traces of frequent resharpening are often documented (Fontijn 2003, 100; 348 Tab. 6.1) suggest that they have had long use-lives prior to deposition. The Goor spearhead too shows traces of resharpening (longitudinal fine grooves) in well-preserved sections of its blade.

It is difficult to pin-point the area of origin for the local community that once (acquired and) left behind the Goor spearhead. In any case, finds of Early Bronze Age sherds decorated with Barbed-Wire-stamp patterns to the southwest of Goor and at Ambt Montfort (Fig. 7) indicate that both west and eastern ice-pushed higher parts were settled (Boshoven *et al.* 2009, 32) around *c.* (2140)1950-1740(1680 BC (*cf.* Prummel *et al.* 2009, 146). A high-winged axe found in a peat-bog (but administratively placed at Elsen (DB 241; Butler 1996, 176)) may have been a contemporary deposition to the Tréboul spearhead, but its exact find location is not known.

The pegged socketed spearhead from Schooldijk (DB 1936) and Heriker Meene (DB 2076) were presumably also left in the wetter parts of the landscape, but at

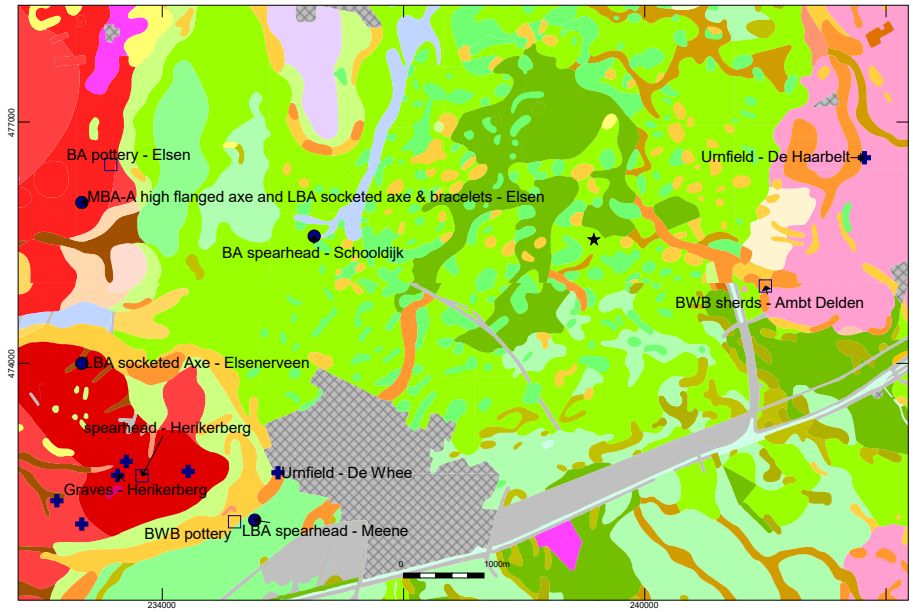


Figure 7. Bronze Age funerary sites (blue crosses), possible deposition (blue circles) and pottery finds (open blue squares) around Goor, on top of the geomorphological map (1:50.000; Koomen & Maas 2004).

Herikerberg (DB 851) another example was found in 1909 in a sandy location (also with various funerary sites nearby; Fig. 7). Both the presence of urnfield locations (Fig. 7; De Haarbelt, De Whee, Herikerberg) and various Late Bronze Age depositions and hoards (*e.g.* Verlinde 1980; Butler & Steegstra 2007/2008, 394-395; Boshoven *et al.* 2009, 28-32) suggest that into the Late Bronze Age, higher parts were used for (settlement and) interment and the wetter parts of the landscape for object deposition. In this sense, the deposition of the Goor spearhead signals the start of a local (and more widely shared; Fontijn 2003, 99; 2007; 2008) tradition that would continue for five centuries.

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METAALTIJDEN 8

BIJDRAGEN IN DE STUDIE VAN DE METAALTIJDEN

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