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Reconstructing palaeolandscapes in the eastern Rhine-Meuse delta (The Netherlands). Finding the starting point of the Linge channel?

Verhagen, J.G.M.; van Hemmen, F.; Mulder, J.R. ; Kluiving, Sjoerd

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A Festschrift in Honour of Prof. Dr. Henk Kars

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Sjoerd Kluiving, Lisette Kootker
& Rita Hermans

CLUES

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Reconstructing palaeolandscapes in the eastern Rhine-Meuse delta (The Netherlands)

Finding the starting point of the Linge channel?

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Abstract

The Linge is a water body in the central Netherlands, comprising a western part which is a natural branch of the Rhine delta, and an eastern part which is largely artificial. This latter part consists of a series of drainage channels dug to drain excess water from the Betuwe, the area between the Lower-Rhine and Waal river branches. These drainage channels have been constructed within the framework of medieval land reclamation. In some places residual gullies have been used to create these channels. The contemporary Linge starts near Doornenburg with an inlet sluice in the dike along the Pannerden Canal. However, this situation is not original, because the Pannerden Canal was dug in AD 1707, leading to the isolation of a piece of the Betuwe, which is also known as the Isle of Gelderland.

At the eastern side of the Isle of Gelderland the village of Herwen is located, originating in Roman times as a fortification and probably known as Carvium. Oral history suggests that during the mid-20th century the main local watercourse was called “Lingse Graaf”. This may correspond to a text from AD 1552, which states that the Linge started at Lobith, near the 16th century bifurcation of the Lower-Rhine and Waal. This paper illustrates how the natural water course and

drainage channels developed in the area from late medieval times until the present. This allows us to assess whether the Linge channel originated near Lobith or that we should reject this possibility.

Introduction

The Linge, situated in the central Netherlands, is a water body that has formed and evolved through two different mechanisms (Cohen *et al.*, 2012). The western part, from Tiel to Gorinchem, originated as a natural branch of the Rhine delta, and was used for transport since at least Roman times, evidenced by the discovery of a Roman vessel near Kapel-Avezaath, 5 km west of Tiel (Louwe Kooijmans, 1968; Berendsen, 1990; Brouwers *et al.*, 2013, 26). In contrast, the eastern part, from Doornenburg to Tiel, is largely artificial, consisting of channels constructed within the framework of medieval land reclamation, to drain the low-lying basins of the Betuwe, between the Lower-Rhine (Nederrijn) and Waal river branches (Figure 1).

Today the Linge begins east of Doornenburg, at an inlet sluice constructed in the 1950's in the dike along the Pannerden Canal ("Pannerdensch Kanaal") (Figure 2). This canal was dug in AD 1707 in order to improve the navigability of the Lower-Rhine river branch (Van de Ven, 2007, 59-66; 143-146). The new artificial channel replaced part of the natural river branch which has since been called Old Rhine. This river segment ceased to be used for transports and this area became a polder in the 20th century by the construction of new dikes at the upstream and downstream end.

It is conceivable that the construction of the Pannerden Canal has intersected with the earlier drainage system of this area and that the Linge could have started further eastward prior to canal building. The cut off part of the Betuwe east of the canal is since known as the Isle of Gelderland ("Gelders Eiland") also as the Three Village Polder ("Driedorpenpolder", named after the settlements of Pannerden, Herwen and Aerdt) and now drains northwards into the Old Rhine via a pumping station in its dike (Figure 2).

The course of the Linge is referred to in a historical petition of AD 1552 by inhabitants of the Lower Betuwe, which indicates that it had its starting point at Lobith, near the tollbooth, situated in the current center (Van Veen, 1916, 178). If correct, this suggests that the Linge originated near the medieval bifurcation of Lower-Rhine and Waal. However, it must be stressed that no other known historical documents mention the presence of the Linge east of Doornenburg / Pannerden.

A possible new insight into the historical development of the Linge is provided by an oral history report of Mr. Herman Peters, an inhabitant of the present village Herwen; his account suggests that around 1940 the watercourse south of Herwen was called the "Lingse Graaf". The term "graaf" is common in this region and refers to a dug waterway.

This new account by a living resident provided an opportunity to review the available evidence with respect to the the Lingse Graaf, its relationship to the Linge and to consult different sources of information in order to examine whether this possibility could be confirmed by additional analysis of historical and geomorphological data. In order to address these questions, the whole drainage system of the Three Village Polder has been scrutinized.

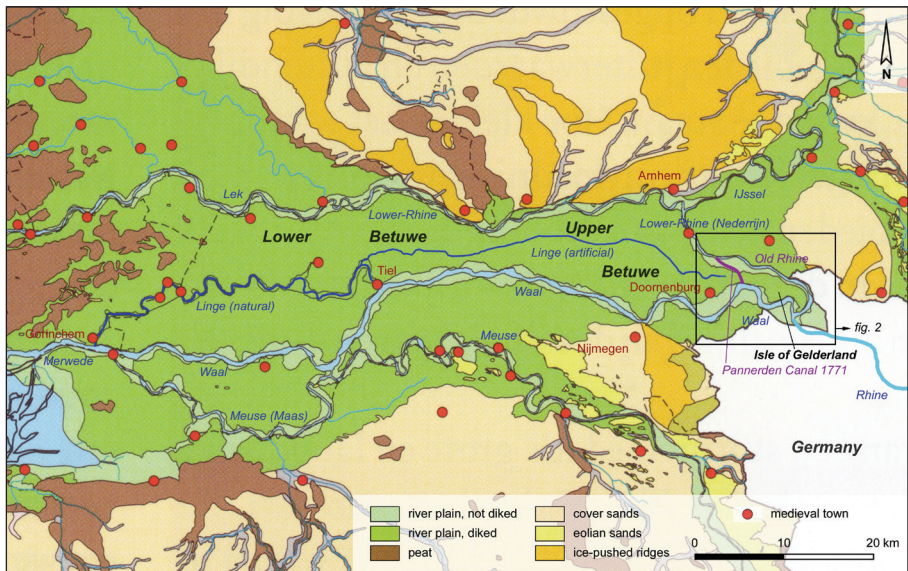


Figure 1. Course of the natural and artificial Linge within the Rhine-Meuse delta with the Pannerden Canal and the cut off part of the Betuwe. Map background represents the situation about 1500 AD (Vos et al., 2011).

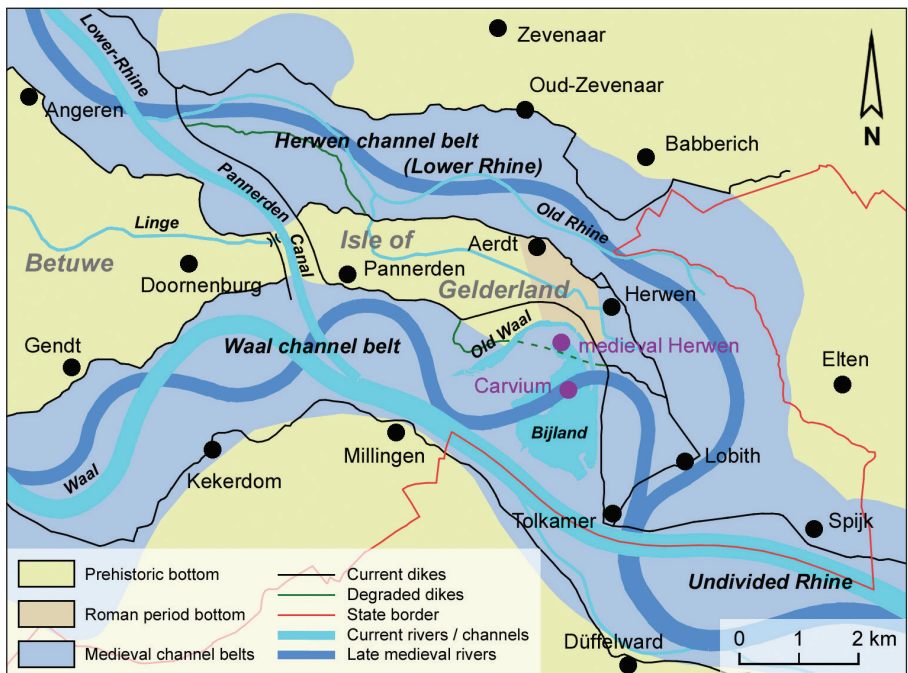


Figure 2. Situation of the Isle of Gelderland, the part of the Betuwe cut off by the construction of the Pannerden Canal. The late medieval bifurcation of the Rhine is situated southwest of Lobith. The current starting point of the artificial Linge at the inlet sluice built around 1950 from the Pannerden Canal, is situated east of Doornenburg. (Map after Verhagen et al., 2017, fig. 9).

Herwen probably developed as a Roman fortification (*castellum*) called Carvium (Verhagen, 2014). Remains of it were found in part of the Bijland (Figure 2) during the sand and gravel extractions in the 1930's to the 1950's. During the northward encroachment of the big Waal meander of the Bijland (Old Waal) in the 18th century the medieval village of Herwen was swallowed (Van Petersen, 1974, map 1; see fig. 2). After that a new village Herwen was founded in its current location and at some distance from the area eroded by the Waal a replacement river dike was constructed in AD 1771-1772 (Van de Ven, 2007, 100-101). As a result, a large area originally situated inside of the dike was now located outside of it.

Previously collected evidence

The western part of the Linge is a river branch of the Rhine-Meuse delta (Cohen *et al.*, 2012, channel belt no. 97), which splits from the Waal (channel belt no. 175) at Tiel and flows into the Upper-Merwede (channel belt no. 109) at Gorinchem (Figure 1). The sedimentation of the Linge channel started about 200 BC, while the channel was dammed at its upstream end at Tiel in AD 1307, just one or two centuries after its embankment.

The eastern part of the Linge, between Doornenburg and Tiel, is largely artificial, consisting of channels that have been constructed within the framework of medieval land reclamation, to drain the low-lying basin areas of the Betuwe. The flow of drainage water was facilitated by the partial use of ancient residual gullies as well as the digging of ditches through low basins and sometimes through stream ridges (Gouw & Erkens, 2007; Mentink & Van Os, 1985, 111-112; Vink, 1954).

The development of the system of river dikes in the eastern delta of the Rhine started separately in each village with the construction of “zijdewendes”, “achterwendes” and thereafter the “voorwendes” in a period of partial embankments (10th-13th century). This allowed every village to discharge its water into suitable areas near the river such as depressions and channels in the flood plain and the adjacent border areas between villages (De Koning *et al.*, 2009, 18-20).

From the 13th century onwards, there is a phase of ring dike construction, whereby the partial embankments of the villages were connected to each other. For example, the ring dike of the “Ambt Over-Betuwe”, including the village polders Pannerden, Herwen and Aerdt. During this phase, each village was drained via a sluice at the lower part of its polder on the adjacent river.

For the Three Village Polder the digging of the Pannerden Canal in AD 1707 had a big impact on water management (Van de Ven, 2007, 59-66). It was preceded in AD 1701 by the construction of a retrenchment (wall with moat) between the Waal and Lower-Rhine to protect Holland against the French Army during the Spanish War of Succession. At this time the moat was not connected with the river Waal in order to maintain the embankment of the river. However, in AD 1707 the moat was widened and connected with the rivers allowing the first ships through the canal. Along the east side of the canal a new dike was built (Van de Ven, 2007, 60-62).

One might assume that the present drainage channel to the north into the Old Rhine (Figure 2) would have been constructed after the building of the Pannerden Canal, but historical records indicate that drainage into the Rhine already existed

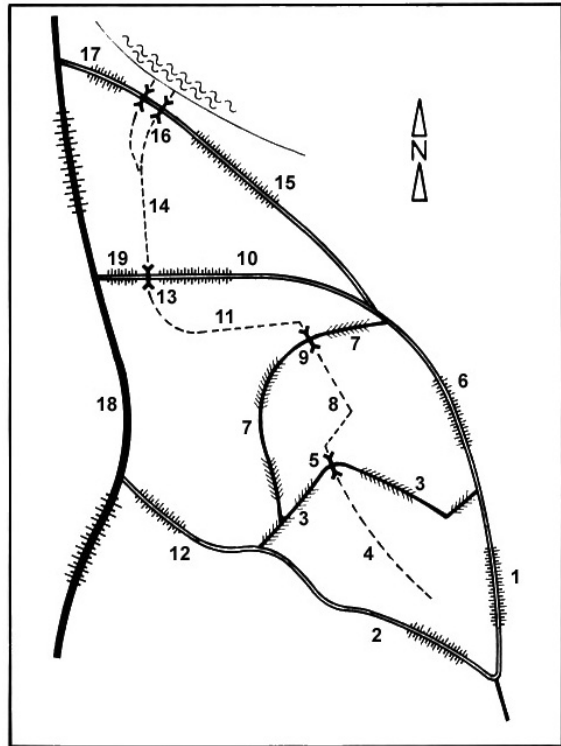


Figure 3. Schematic map of the situation of water management in the Polder area of Pannerden, Herwen and Aerdt in 1659. Doornenburg and the Betuwe are situated at the westside (left of nr. 18). Source: Van Petersen 1978.

by AD 1659 (Figure 3, Van Petersen, 1978, 25). Fig. 3 illustrates that the water of the Three Village Polder was discharged by a sluice (13) in the Deukerdijk (19) into the Pannerdense Waard. The water was then discharged through two sluices (16) on the Lower-Rhine (now known as Old Rhine).

Although in more recent times it has been stated that the starting point of the Linge channel is to be found directly east of Doornenburg in the fields of “Honderd Morgen” (Mentink & Van Os, 1985, 110-114; Mulder, 2002, 23-25), the question remains as to what was the impact of the digging of the Pannerden Canal on the water management in this area. Was there before AD 1707 a continuous drainage system for both the Three Village Polder and (the rest of) the Betuwe and what was its planform morphology?

Results of new evidence

In order to investigate the ancient drainage system near Doornenburg and in the Three Village Polder we analysed data from historical maps and other documentary sources and created a Digital Elevation Model (DEM) by LIDAR of the region.

Local depressions and old river channels

The DEM map of the area of Pannerden and Doornenburg indicates that the Linge could have been truncated by the construction of the Pannerden Canal (Figure. 4, red arrows). North of Doornenburg the drainage channel of the Linge is situated

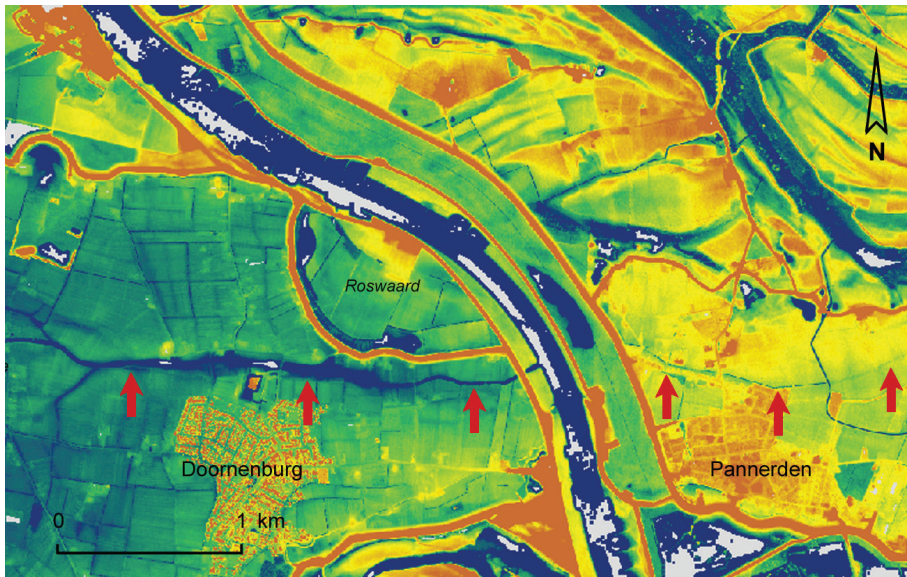


Figure 4. Digital Elevation Model image by LIDAR of the area around the Pannerden Canal. Source: www.ahn.geodan.nl/ahn, AHN1 (1998), accessed: June 2014, viewer set between 10.0 and 13.0 m above sea-level.

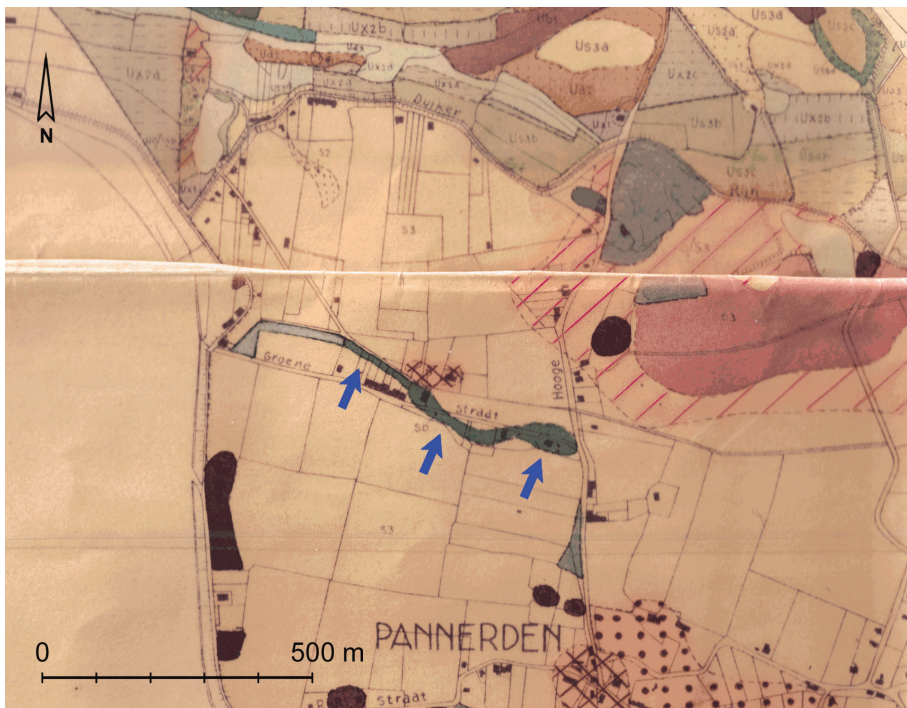


Figure 5. Residual gully northwest of Pannerden, detected by Stiboka. Source: Pons, 1952.

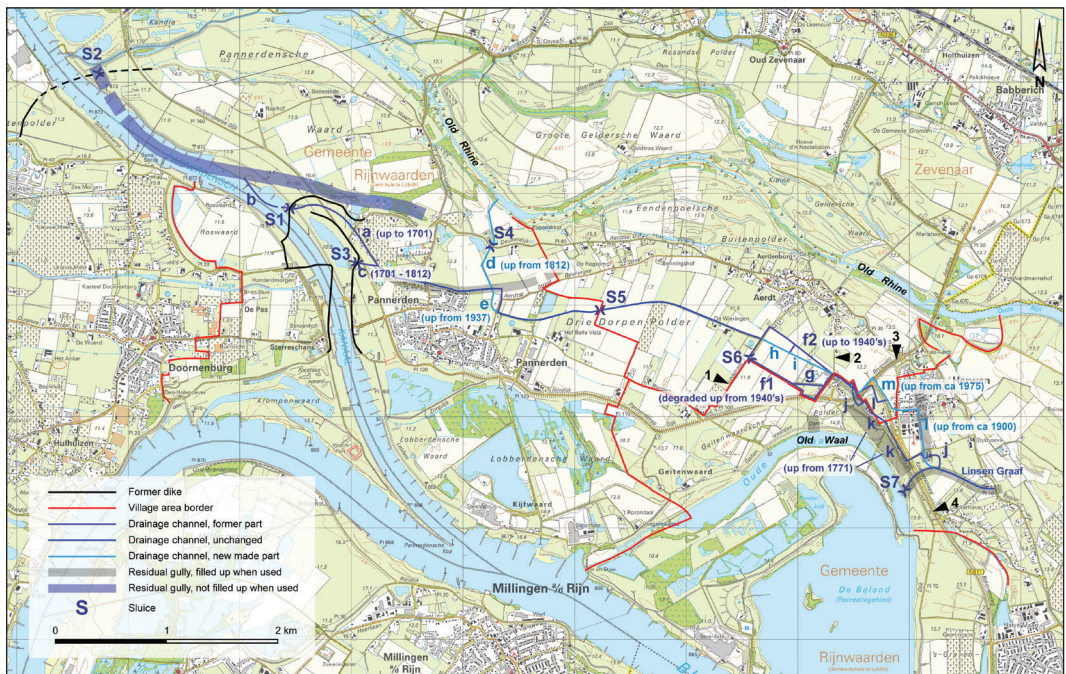


Figure 6. Current and former drainage channels in the Three Village Polder as derived from historical maps. Streets that are referred to in the text: 1 = Loostraat, 2 = Heuvelakkersestraat, 3 = Brugweg, 4 = Batavenweg. Other phenomena are referred to in the text. Map background: Topographical map 2009, scale 1:25,000, by the Dutch Topografische Dienst, map nr. 117.

in a 100 m wide residual gully. Further to the east the low area is still recognizable but is narrower, although it is still wider than the current watercourse and has been mapped as a residual gully (Figure 5, Pons, 1952).

North-east of Pannerden the current drainage channel crosses the low area listed on the DEM. Here the potential residual gully on the DEM seems to emanate from the east-north-east (Figure 4), but because it is quite narrow we cannot exclude that it concerns the subsided remains of a disused drainage channel. It is difficult to determine on the DEM whether the low areas on either side of the Pannerden Canal belong to a single gully system.

Old drainage channels in the Three Village Polder

On a map from AD 1705, the Linge is shown as starting near Doornenburg, while the area of Herwen, Aerdt and Pannerden is drained separately by a waterway to the north-west into the Lower-Rhine (map nr. 1). However, on a map from AD 1573 the drainage from the area of Herwen, Aerdt and Pannerden along Doornenburg continues via the Linge (map nr. 2). On the other hand, a map from AD 1633 shows the Linge channel starting in the area “Honderd Morgen” near Doornenburg (map nr. 3).

In order to reconstruct the drainage configuration before and after the digging of the Pannerden Canal, several historical maps of the region were analysed. This investigation allowed us to identify the known positions of former drainage channels, which are presented together with the contemporary water network in

fig. 6. Age estimates for individual features are drawn from these historical maps and other documentary sources. The maps used for this analysis are summarized in the table of appendix 1.

In order to be able to reconstruct former trajectories of drainage channels accurately map nr. 4 (“Verpondingskaart”, AD 1771-1800, part is represented in fig. 8) provides us with good baseline knowledge. First, palaeo-drainage channels located on this historical map are drawn on the current topographic map. Based on these historic channel positions, watercourses from even older maps could be correlated more easily, by comparing and identifying boundary positions that have changed little. In the following section, the ancient watercourses will be summarized per sub-area, but described only when directly relevant to this study.

Former drainage network near the Pannerden Canal

The channel from the area as presented on map nr. 5 (AD 1694, fig. 7) flows through a sluice in the Deukerdijk (Figure 6, S1 and d2), with (breakthrough) ponds at either side of the dike (Figure 6, a) and then within a fairly short distance (Figure 6, b) drains into an old Rhine gully. This river gully subsequently flows through a sluice (Figure 6, S2 and d1) into the former Lower-Rhine (now Old Rhine). Also notable is that the main Lower-Rhine dike of the Betuwe, named Luijendijk, is situated along the old Rhine meander of the Roswaard and with a sharp turn southward it is connected as a transversal dike (“Dwardsdijk”) with the dike along the river Waal (Figure 6, d3; fig. 7 and 8).

A map from AD 1703 shows the situation after the construction of the retrenchment which began in AD 1701 (map nr. 6). The transversal dike has been used as a barrier and was extended with a newly raised earthen wall along the old gully to the Lower-Rhine. In front of this retrenchment wall a moat was built, partly formed from the old river gully. The moat was not connected to the Waal (Figure 6, d5). The drainage channel then flowed into the moat via the southern (short) conduit (Figure 6, c, cf. Figure 8) with no sluice at that point (because there is no embankment along the canal).

The map of AD 1707 shows the completed Pannerden Canal (map nr. 7). At some distance to the east side of the canal a new dike has been built (Figure 6, d4). The mouth of the drainage channel is now equipped with a sluice in the new dike (Figure 6, S3). On a map from AD 1756, the canal appears to have been widened as far as the new dike (map nr. 8). The sluice of the drainage channel is now called the Great Sluice (“Groote Sluijs”).

Situation in the area between Pannerden and Aerdt / Herwen

From a point 1 km north-west of Pannerden a new drainage channel (Figure 6, d) with a sluice (S4) carries the water from the Three Village Polder into the Old Rhine up since 1812 (Van Petersen, 1978, 34). At the point where this channel was connected to the existing drainage system the kinks in the system were adapted in 1937 to improve water flow (map nr. 9). A new bend (Figure 6, e) was connected in the extension of the northern drainage channel. One kilometer east of this location a sluice is indicated at the point where the old border Aerdt-Pannerden crosses the

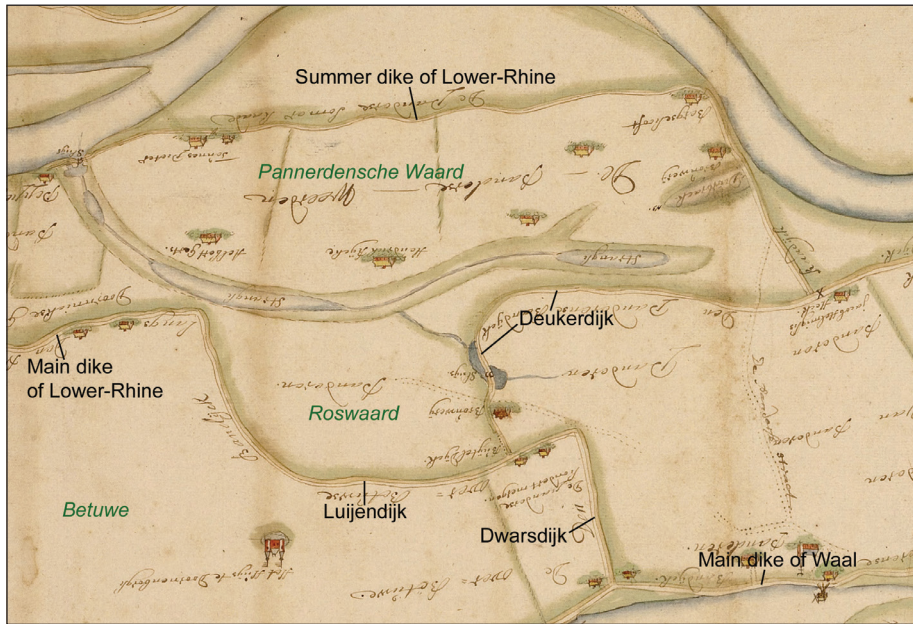


Figure 7. Part of the map from 1694 with the situation before the construction of the Pannerden Canal. Source: see appendix 1, map nr. 5.



Figure 8. Part of the Verpondingskaart (of 1771-1800) with nearly the same area as shown in Figure 7. Source: see appendix 1, map nr. 4.

watercourse (Figure 6, S5). In AD 1866 this sluice is recorded as “Aerdse Sluisje” (map nr. 10). Further east another sluice is indicated at the Loostraat (Figure 6, S6), though continuing in this direction no other sluices are shown on this map.

Old drainage channels near Herwen

In the 18th century the drainage channel south of Aerdt divided and flowed along the two long sides (Figure 6, f1 and f2) of a rectangle (map nrs. 4 and 11). The new dike north of the Old Waal was in AD 1771-1772 laid over the southern corner of this rectangle, after which it has been shortened with a new channel segment (Figure 6, g). The other adaptations of the watercourse within the rectangle (Figure 6, h and i) are recorded on the maps of 1937 and later. On a map from 1943 (map nr. 12) the upstream part of the watercourse south of Herwen bears the name “Linsen Graaf” (Figure 6). In AD 1770 there was an outlet with a sluice into the (Old) Waal (map nr. 14; fig. 6, S7).

The watercourse downstream from the Linsen Graaf is indicated on map nr. 4 and flows to the north-west directly along the new dike of AD 1771 and then moves along the former border between Herwen and Aerdt to the current Heuvelakkersestraat (Figure 6, j). Two channel segments are situated parallel to the inner foot line of the dike (Figure 6, k), which can be considered as new trajectories (shifted eastward) after the building of this dike, just like the new segment g. Before 1903, the route of flow has been moved further eastward from the dike of 1771 (map nr. 13, fig. 6, l). During the construction of the Brugweg and the Batavenweg in about 1975 the course was partly shifted again (Figure 6, m), without significant changes in the trajectory.

Discussion and conclusions

The Isle of Gelderland, the truncated part of the Betuwe, created by the digging of the Pannerden Canal, was and is drained by a system of artificial channels, partly made utilising residual gullies and partly new features dug through low-lying basins. The trajectory north of Pannerden is located in a residual gully of an unknown age (Figure 4). However, whether this residual gully is connected with the one near Doornenburg in which the Linge channel is situated, is unclear. This latter residual gully might be of prehistorical age, like many such features in the eastern part of the Betuwe (Mulder, Salverda en Van den Hurk 1979, 31-32).

Recent coring undertaken near Herwen has revealed four hitherto unknown residual gullies (Figure 9, Verhagen *et al.*, 2017). The sediments of three of these have been dated by AMS radiocarbon methods. The largest gully (Figure 9, B) was dated to between 90 BC and 55 AD, while gullies A and C are dated around the 5th century AD.

By combining this data with the course of the drainage channel near Herwen, we can conclude that the Linsen Graaf was constructed in residual gully D. The further route to the north-west was positioned along the eastern border of residual gully B. However, because the new dike of 1771 was also built upon or near the eastern border of gully B, it is difficult to identify this route in the field. On the other hand, the western border of this large gully can still be identified in the local relief of several plots (meadows) between the dike and the Old Waal. The large gully would have been a very prominent and recognizable feature in the landscape prior to the building of the new dike and would have formed an attractive option for determining the position of the drainage channel during the Middle Ages. This pre-existing feature also explains why the Heuvelakkersestraat at the junction with the



Figure 9. Position of 4 recently discovered residual gullies near Herwen. Black dots are the positions of the cores. Source: Verhagen et al., 2017.

watercourse has some kinks. This may be interpreted as the ancient crossing over the major residual gully in the old road of Aerdt to the medieval settlement of Herwen.

Also part of the deflected drainage channel made around 1900, namely the south-north segment south of the current village of Herwen, was positioned in a residual gully (C). It is possible that this gully already contained a local ditch, which was enlarged at the time of the drainage configuration. From the Heuvelakkersestraat westward the watercourse consists of relatively long straight sections that are supposedly dug in the low-lying basin in the period of the land reclamations (late Middle Ages).

Through our analysis of old maps, it is clear that prior to the construction of the Pannerden Canal the Three Village Polder had its own drainage system, allowing waters to flow north-west into the Lower-Rhine (Figure 6, a/b). This conclusion is supported by the presence of the transversal dike between the Roswaard and the Waal on maps prior to AD 1701; this dike separated the drainage systems of the Three Village Polder and the rest of Betuwe and was transformed into part of the retrenchment in 1701 (Van de Ven, 2007, 36).

The construction of transverse dikes is associated with the dramatic increase in the activity of the river Waal following the Elisabeth flood (“St. Elisabeths Vloed”) of AD 1421 in the western part of the delta. Along the Waal, water seepage and the associated risk of dike breaches increased following this event (Van de Ven 2007, 11-19; Van Hemmen & Heunks, 2015). From the 15th century a number of cross dikes were constructed, for example the Aalsdijk at Buren and at a later stage the Spaniard dike between Upper and Lower Betuwe. Even before AD 1490

regional authorities must have planned to build the Over-Betuwsse Dwarsdijk, east of Doornenburg between the point where the Deukerdijk joins the Luijendijk and the Waaldike directly west of Pannerden (Van Schilfgaarde, 1932).

The separate drainage system of the Three Village Polder before AD 1701 draining into the Lower-Rhine seems contrary to the statement of AD 1552 that the Linge starts at Lobith and the oral tradition of “Lingse Graaf”, also mentioned on the map of 1937 as “Linsen Graaf”. Etymology has to provide an explanation here: both the name Linge and Linsen may be corruptions of the Medieval Dutch “Lingene”: filth (“drek”), mud (“modder”) (Schönfeld, 1955, 262-263).

The name “Linsen Graaf” is only known for the most upstream part of the watercourse. As the watercourse of the Three Village Polder would have been a cut off part of the Linge, why don't we observe the name “Linsen Graaf” along other parts of the watercourse? Furthermore, the statement of AD 1552 that the Linge had its origin near Lobith has not been confirmed. No other historical sources mention the presence of the Linge east of Doornenburg / Pannerden.

Therefore we assume that the flow of water from the Three Village Polder has always been separated from the waters draining the rest of the Betuwe. However, it cannot be proved that the movement of the meander of the Roswaard has not disrupted the medieval course of a combined drainage system, but evidence for this is not forthcoming at the present time.

Another question is whether the northward encroachment of the big Waal Meander has had an impact on the course of the drainage system in the area. From the results presented in this study it is conceivable that only small parts of the watercourse had to be shifted to the north / east, becoming necessary by the building of the new dike. It is likely that the shift further eastward at a later date was motivated by increased water seepage at the foot of the dike, due to the gradually increasing elevation of the dikes at that time.

Summarizing we conclude that the main drainage system in the Three Village Polder consists of some parts which have utilised ancient residual gullies and other parts which have been dug freshly in the low-lying flood basin area. This provides a parallel with the situation of the Linge in the Betuwe. There are no reasons to assume that the Linge channel originally started in the Three Village Polder in the vicinity of Herwen or Lobith. The main arguments supporting this conclusion are the existence of the transversal dike east of Doornenburg and the north-western drainage of the Three Village Polder before the construction of the retrenchment in AD 1701 and the Pannerden Canal in AD 1707.

The mention in AD 1552 in a petition of inhabitants of the Lower Betuwe that the Linge started at Lobith can be seen as a mistake and was probably made because of the distance, meaning that one was not properly informed about the actual situation near Herwen and Lobith. Furthermore, Lobith is situated outside of the Three Village Polder, so the drainage system could not have started easily there. In addition no other historical sources mention the presence of the Linge east of Doornenburg / Pannerden, although one cannot completely exclude the possibility that the situation during the Middle Ages (i.e. before the construction of the transversal dike) was different from that of the 17th century.

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Appendix 1

Table of consulted maps:

nr	date	map name
1	1705	N. de Fer, Le Cours du Rhein depuis Rheinberg jusque a Arnhem
2	1573	Christiaan 'sGrooten, Atlas of the Spanish Netherlands, Royal Library Brussels, inv. nr. 21569, sheet XVII
3	1633	N.N., De waterleiding van het Huis te Doornenburg tot de Grift. RAG 0124 Hof van Gelre en Zutphen, Alg. Kaartenverzameling no. 431, inv.nr. 5133
4	1771-1800	Kaart van de kerspelen Herwen en Aerdt, mitsgaders de Hooge en Vrije Heerlijkheid Pannerden, 1700-1800, Gelders Archief, 0873 Verpondingskaarten, nr. 84
5	1694	Gerard Passavant, Caarte van de bandijken der Waal en Nederrijnstroom bij Panderen... RAG 0124 Hof Van Gelre en Zutphen, Alg. Kaartenverzameling no. 319, inv.nr. 5669
6	1703	Gerard Passavant, Caart van het retranchement tot Pannerden, 1703, RAG 0003 Archief gedeputeerden van Nijmegen, inv.nr. 1009
7	1707	Gerard Passavant, Caerten van 't retranchement tot Panderen (18 juli 1707), RAG 0011 College tot Beneficiëring van Nederrijn en IJssel, inv.nr. 262
8	1756	W. Leenen, Caart figuratif van den Rhijnstroom, RAG 0012 Gelderse Rekenkamer, inv.nr. 652
9	1937	Kaart Verruiming Hoofdwaterleidingen, Oud Archief Polderdistrict Oude Rijn, sheet 1
10	1866	Bonneblad 1866, Kadaster, map number 513
11	1810	Kaart van de landen gelegen in de gemeente van Aart, 1810. Gelders Archief, 0873 Verpondingskaarten, nr. 85
12	1943	Kaart aanleg kwelkaden, Oud Archief Polderdistrict Oude Rijn, inv. nr. 123
13	1903	Bonneblad 1903, Kadaster, map number 535
14	1770	Kaart vertoonende de waare gedaante van de Bylandsche Waard. Gelders Archief, 0509 Kaartenverzameling 1192

INTERDISCIPLINARITY BETWEEN HUMANITIES AND SCIENCE

Henk Kars was appointed as first Chair of Archaeometry in The Netherlands in 1994. From 2002 he was full time professor at the Vrije Universiteit Amsterdam, interim Director of CLUE, and founder and Managing Director of the Institute for Geo- and Bioarchaeology. This festschrift volume incorporates original publications in the field straddling the Sciences and Humanities produced by various former PhD-students, post-docs and colleagues.

Landscape archaeology is described in the first cultural landscapes of Europe as a mysterious outcome, while the historical record of surface water flow of the central Netherlands is reviewed. The south-western Netherlands are historically analysed since military inundations during the Eighty Year's War. The palaeolandscapes of the eastern Netherlands are reconstructed to locate the origins of the river Linge. The long time scale is considered in a 220.000 year overview of landscape development and habitation history in Flevoland.

Bioarchaeology is represented in a review of the current state of isotope research in The Netherlands and a correlation between bio- and geochemistry meets an analysis of organic residues in copper corrosion products. Archaeometry reveals the colour of Dutch archaeological textures. The relevance of a quartzite Neolithic axe found near to Huizen, The Netherlands is described.

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