THE EVOLUTION AND MEDIEVAL RE-USE OF A PREHISTORIC BARROW AT WIELSBEKE
(WEST FLANDERS, BELGIUM)

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ABSTRACT
During archaeological research in the sandy loamy region of north-western Belgium in 2015, a prehistorical burial mound was uncovered. Based on detailed macro and meso soilscape analyses, the archaeological excavation data, and a soil micromorphological study, we were able to reconstruct the life cycle of this barrow. After its initial erection in the Bronze Age, the barrow was restored during the Iron Age. A cremation burial was added to the burial mound in the late Iron Age. Roman pottery finds from the ditch filling illustrate that the barrow was still present in the landscape at the time of founding of a late Iron Age to Roman Age settlement in the direct vicinity of the barrow. Finally, in the High Middle Ages, a new and larger mound was erected superimposing the original barrow.

KEYWORDS
Prehistory, Iron Age, Middle Ages, burial mound, soil micromorphology

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1. Introduction

In East- and West-Flanders, prehistoric barrows have all but disappeared in today's landscape. The circular ditch that surrounded these monuments is often the only relic left in the soil. Mainly due to intensive agriculture and erosion, the hill itself and often also the original burial has been topped off (Reu et al., 2013; Bourgeois et al., 1998). Even when all that is left is the infill of the surrounding ditch, very valuable information can still be deduced when archaeological research is combined with archaeopedological fieldwork and soil micromorphology (Ampe et al., 1996). In 2015, two excavations on the flanks of the river Lys revealed four circular barrows and a long-barrow (Figure 1). The structures where erected in the period ranging from the Early Bronze Age until the Iron Age (Beke et al., 2017; Vanhoutte et al., 2018; Mikkelsen et al., 2018).

Nowadays, not much is preserved of the historical natural landscape of Wielsbeke: concrete roads are flanked by residential areas and industrial complexes and the river Lys is channelled. Based on the research of one of these excavated barrows, we built up a chronological hypothesis to how this monument and its surrounding landscape evolved through time.

2. The soils of the site and the barrow

Within the study area, the soils are composed exclusively of light loamy sand (P) textures. In the immediate vicinity, soils are described as having a loamy sand (S) texture. The drainage class ranges from dry to moderately wet (b, c, d). To the east of the excavation, where today there is a canal and where a small stream has formed the soils, they are mapped as moderately wet. The soils are characterised by a degraded Bt horizon (www.DOV.be).

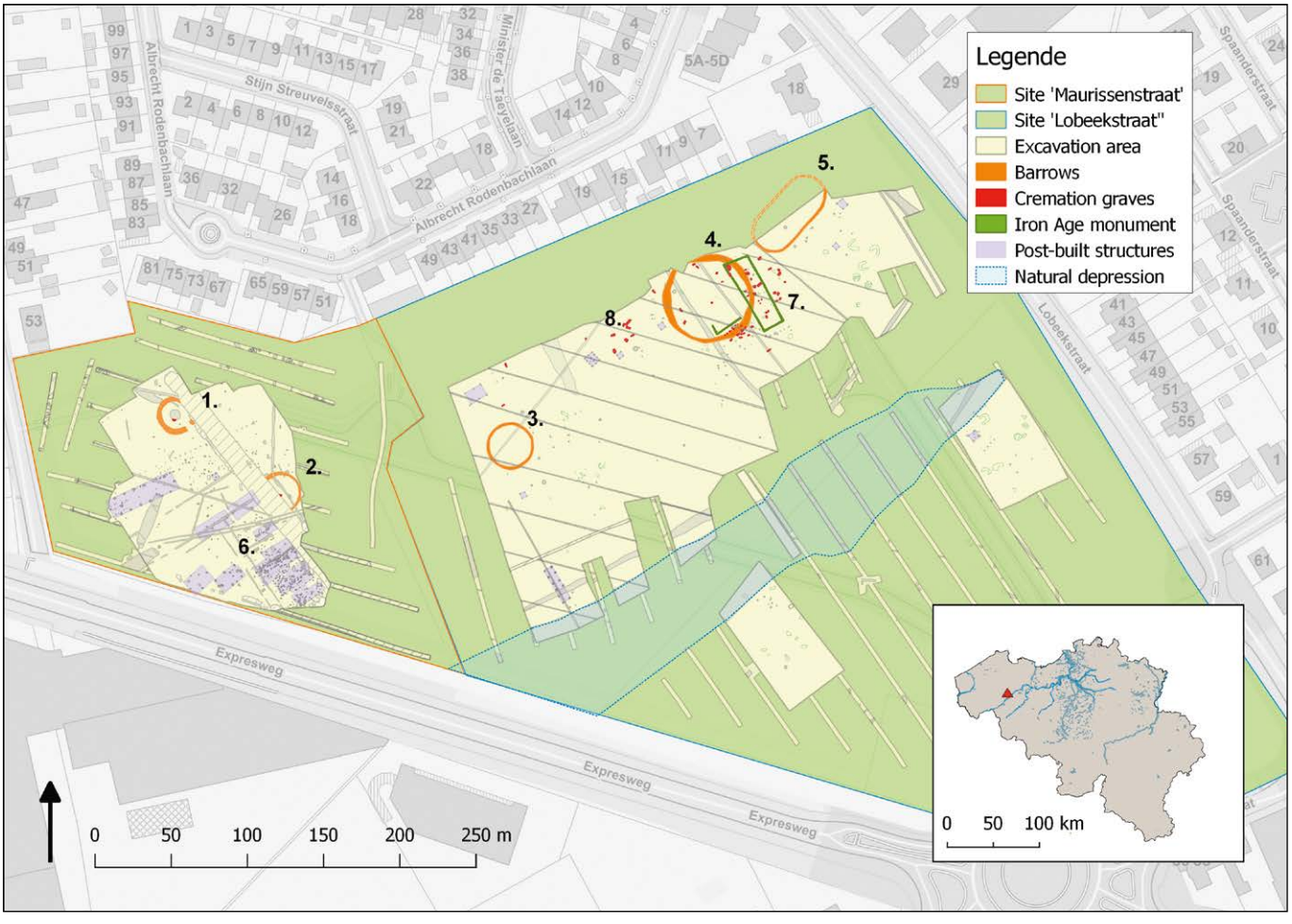

Figure 1. Excavation plan: prehistoric barrows at the site 'Maurissenstraat' (1&2); Bronze Age barrows at the site 'Lobeekstraat' (3-4); long-barrow (5); Late Iron Age and Roman settlement (6); Late Iron Age and Roman funeral structures (7-8).

2.1. THE REFERENCE PROFILE P1

The reference soil profile (P1) of the excavation can be divided into 6 horizons. H1 is the A-horizon that was created when a football field was laid out. This horizon therefore has a rather high humus content and a loose granular structure, probably related to intensive fertilising. H2 is the original Ap horizon, testifying that the soil has a history as arable land. Like H2, H3 is a homogeneous horizon with a slightly browner colour. This horizon is most likely a buried surface horizon that was also, at least partially, worked by man. H4 is a leaching horizon, almost entirely depleted from clay and humus and H5 is the illuvial horizon (Bt), in which the clay and humus have accumulated. H6 is the parent material, which consists of clayey and sandy, more or less, horizontal layers (Figure 2).

Initially, probably in the late glacial period, H6 was deposited in a fluvial environment. H3 to H5 were also deposited during this period and perhaps at least a part of H2. Possible part of the sediment is of eolian origin. In the Holocene period, soil development began with the leaching of clay and humus and the formation of an A-E-Bt soil (soil with a texture B-horizon). Later, the soil was cultivated and undoubtedly also fertilised. In a levelling phase, the soil at the location of P1 may have been raised slightly, and elsewhere the soils may have been eroded slightly. In the final phase, the football field was constructed, and the upper 7-8 cm of the soil developed further below the grass field to become a distinct humiferous A-horizon.

2.2. SOIL BARROW PROFILE A

On the circular ditch, interpreted as part of a Bronze Age structure, 3 soil profiles offering a cross section of the circular ditch were studied. Profile B is located in the northern-, A in the southern- and D in the western direction (Figure 3). The soils of profile A and B are discussed in more detail below.

Profile A is divided into 9 soil horizons of which the first 5 (H1 tot H5) are part of the circular ditch. The horizons H10-12 make up the natural in situ soil. The horizons H6 and H8-9 are only present in profile B. The horizons H10 to H12 are similar to horizons found in the reference soil profile. H10b is a pale horizon, strongly depleted of clay and iron. H10 is the illuvial horizon where the clay and iron from H10b has deposited. H11 and H12 are the deeper clayey and sandy soil horizons (Figure 4).

At first it is striking how little influence the ditch seems to have had on the in situ soil. On a meso scale,

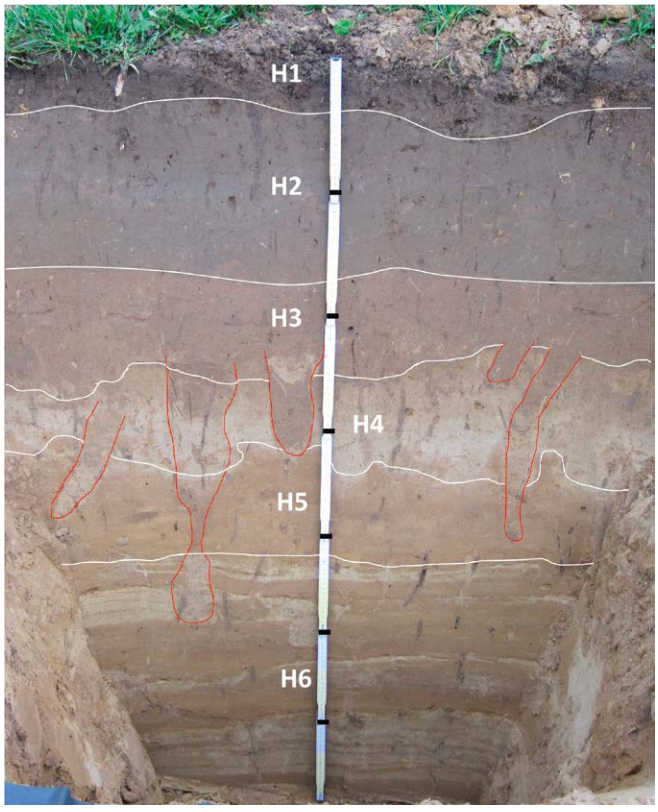

Figure 2. Photo of reference soil profile P1. Indicated are the soil horizons and the major bio galleries (red lines).

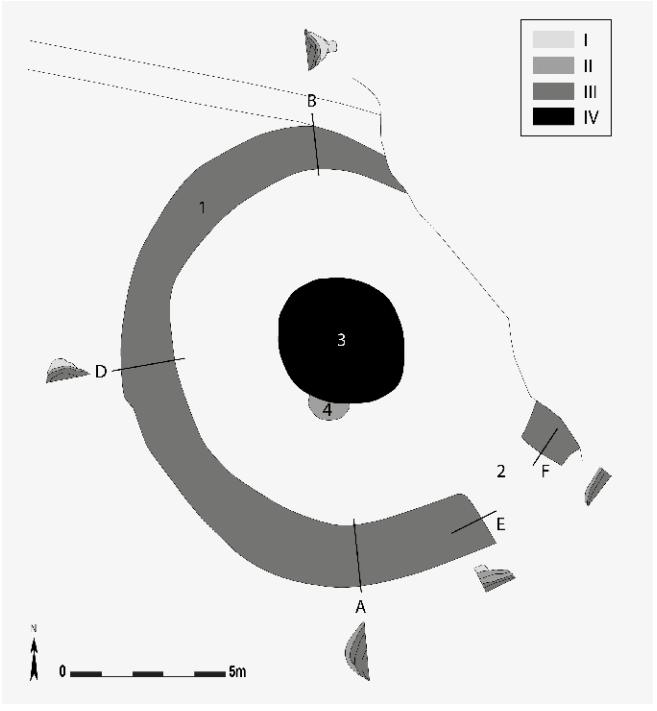

Figure 3. Barrow n°1 with the circular ditch (1); intentional interruption (2); Late Iron Age cremation (4); and the central pit dating to the medieval period (3). Legend, I: Foundation phase; II: Iron Age restauration phase; III: Anthropogenic filling; IV: High Middle Ages.

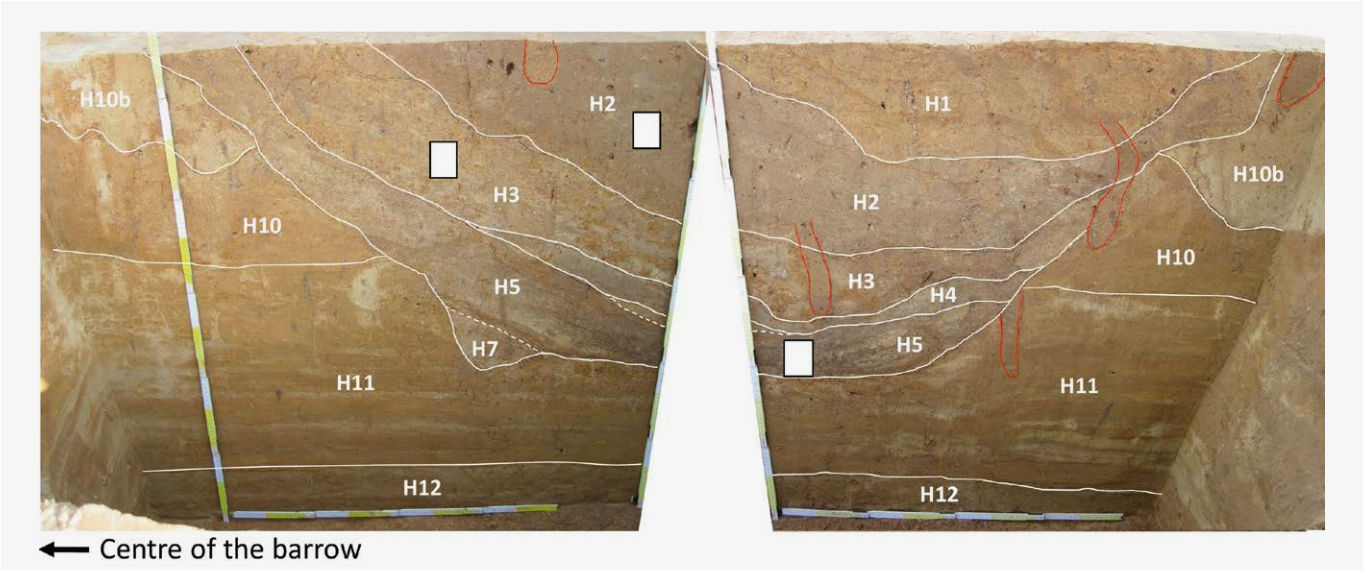

Figure 4. Cross-section A of the surrounding ditch: foundation phase (H7) Iron Age restoration phase (H5), anthropogenic filling of the ditch (H1-H4). The white boxes mark the samples for micromorphology.

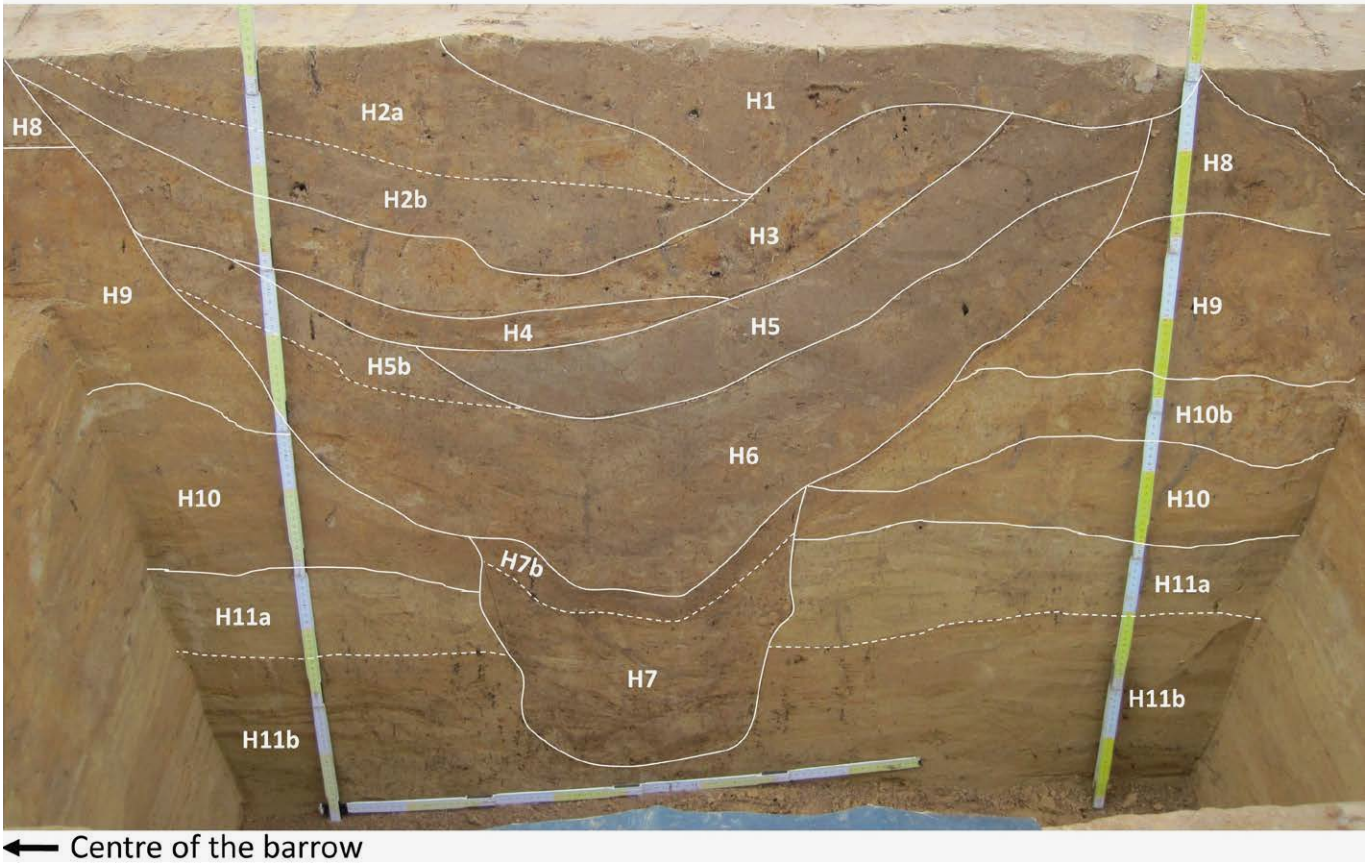

Figure 5. Profile B of the circular ditch: foundation phase and first use (H7); erosion phase (H6); Iron Age restoration phase (H5-H5b); anthropogenic filling of the ditch (H1-H4); intact soil (H8) and B-horizon (H9).

there are no visible traces of oxidoreduction reflecting stagnating water in the in situ soil or at the bottom of the ditch. Possible hypotheses are:

1) the soil is well drained with a relatively deep water table, which means that rainwater quickly seeps out of the ditch, leaving the ditch dry for the most part of the year,
2) the ditch is quickly filled with sediments, either intentionally or as a result of erosion of the surrounding soils and/or anthropogenic soil structures (e.g. the burial mound),
3) a combination of the above suggested explanations.

H2 could reflect a phase of erosion of an earthen hill or construction situated at the centre of the ditch. As the accumulated sediment of H2 is rich in humu s, it may indicate that the accumulated material originally was at or near the surface, or that the deposition rate happened rather slow, allowing vegetation to grow and accumulate organic debris in the ditch. The relatively uniform nature of the horizon suggests a good bioturbation of the soil material.

H3, a rather heterogeneous horizon, composed of clay rich brown areas, greyish brown humiferous areas, and paler humus and clay depleted areas. Traces of stratification are visible, possible reflecting more intensive periods of barrow erosion. The stratification is parallel to the bottom of the horizon. H3 is asymmetrical with more material accumulated on the inside of the ditch than on the outside. The heterogeneity of this horizon suggests that the horizon was formed quickly, and was maybe an anthropogenic infill.

2.3. SOIL B ARROW PROFILE B

Profile B, studied opposite to profile A, consists of 11 horizons. The horizons H1 to H7 outlines the area covered by the circular ditch, and the in situ soil is labelled from H8 to H11. The deeper soil horizons recognised in this profile are the pale light-beige horizon H11a, followed by the brown clay-rich horizon H11b. H9 resembles a brown B-horizon and H8 an old surface horizon, the upper part of which may have been eroded (Figure 5).

The circular ditch consists of a deep narrow part (H7 and H7b) and a wider upper part (H1-6). In lacking organic matter, the clay content in the soil is in general insufficient to keep the walls of the ditch stable, so the lower narrow part (H7) probably sealed of rather fast after the ditch was constructed. In H7 different stratification lines were observed, both horizontal and oblique. At the top of the horizon, there is a brown homogeneous zone without stratification (H7b). This horizon possibly reflects a period of stabilisation with accumulation of humus (leaves, etc. that fall into the ditch) in combination with bioturbation. Apart from manganese-oxide stains, there are no signs of oxido-reduction.

H6, with a more heterogeneous matrix and less humus accumulation, probably reflects a relative quick deposition phase of the ditch. H5, with a homogeneous matrix and a higher content of organic matter, may represent a period of vegetation growth and stability. It is noteworthy that H5 is only present on the outside of the ditch. Possibly, the inside was removed during maintenance works of the ditch and structure. After this suggested maintenance period, horizons H1-4 were deposited.

In this profile, it seems that most of the original in situ soil has been preserved, including the brown B-horizon (H9) and the original surface horizon (H8). If this hypothesis is correct, it implies that the soil has never experienced erosion, as the original soil appears well preserved.

The ditch of Profile A reaches approximately 70 cm below the level of the excavation and the ditch of profile B reaches about 90 cm deep. If we assume that the ditch originally was constructed to the same depth measured from the surface, it implies that the soils around profile A are missing about 20 cm of the original soilscape compared to the soils of profile B. Local erosion or levelling in the immediate surroundings of profile A and not around B could explain this difference.

2.4. THE SOIL MICROMORPHOLOGICAL STUDY OF PROFILE A

From profile A three thin sections from horizon H2, H3 and H5 were prepared (Figure 4). The soil micromorphological study was carried out by C. Nicosia (Nicosia, 2018). His observations and conclusions are synthesised below.

H5 revealed an alternating sequence of laminae composed of fine sand and silts grading to silty clay (Figure 6). This laminated aspect of the horizon indicates deposition in water, with various episodes of sedimentation with higher energy (most likely in-wash of sand during heavier rainfall events) and episodes with lower energy (standing waters with slow sediment settling). Wet conditions are also confirmed by the presence of iron and manganese nodules, indicating oxidation-reduction processes related to repeated cycles of water saturation and subsequent drying.

As a post-depositional process, we observe traces of clay illuviation. The latter indicates the action of soil-forming processes after the deposition of the sediments, in an undefined moment after the filling of the ditch. Anthropic materials are very scarce as only a few wood charcoal fragments have been observed. Phytoliths are frequent and are transported together with sediments from the surrounding area (Nicosia, 2018).

Horizon H3 differs greatly from the thin section of H5. H3 is composed of non-stratified silty fine sands with a

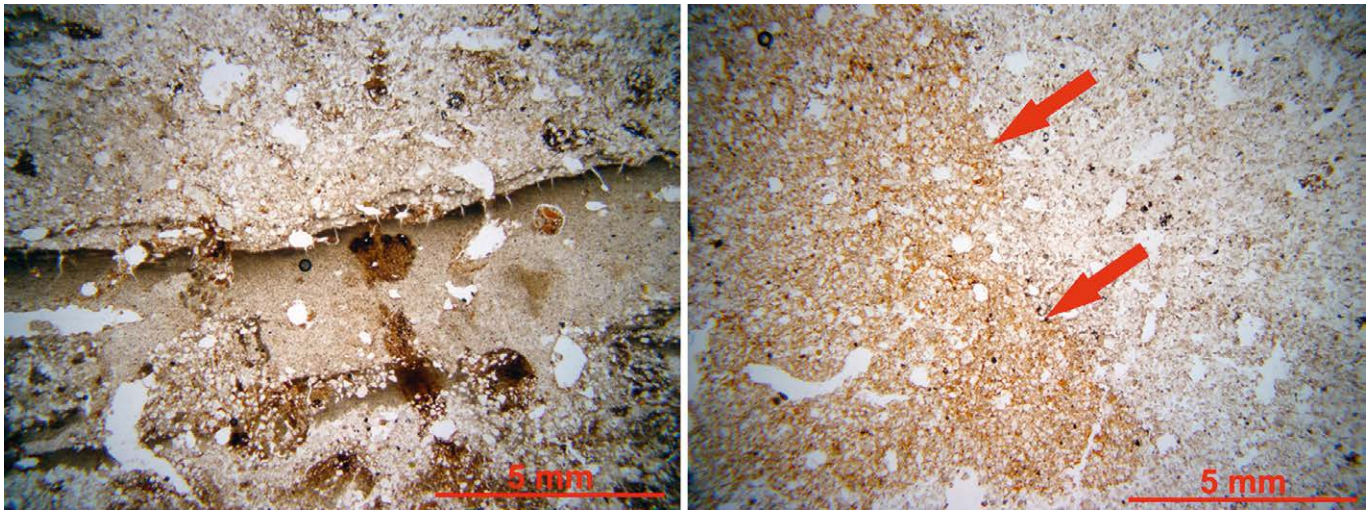

Figure 6. Left: Horizon H5 with alternating sequence of laminae, composed of fine sand and of silts grading to silty clay.
Right: horizon H3. Limit between a pedo-relic (arrows) and the surrounding sands (PPL). The pedo-relics are reworked soil fragments dug up from elsewhere and thrown in the ditch as backfill.

Figure 7. Barrow n°1: the surrounding ditch (1); intentional interruption (2); Late Iron Age cremation (4); the central pit dating in the medieval period (3); the more recent structures are delineated in black.

rather open arrangement, indicating a disaggregated and loose consistency. The lack of sedimentary structures (i.e. laminations, stratifications, grading) allows us to exclude that this layer of the ditch fill was deposited by water. Rather, the presence of pedorelics, such as fragments of soil dug up from elsewhere and redeposited here, suggests that H3 is in fact backfill. Sediments, and the soils formed on them, were therefore quarried from the surroundings and dumped back into the ditch.

The lack of indicators of oxidation-reduction processes, except for very scarce iron nodules in much lesser quantity than in H5, and of wet environmental conditions, such as the remains of algae, help confirm that H3 did not form in water. Anthropic inclusions are very scarce in H3 as well with only a few finely fragmented charcoal fragments observed.

From horizon H2 a third thin section was studied. This horizon is rather similar to H3, as it is composed of disaggregated silty fine sands devoid of any sedimentary structure. Therefore, it can be excluded that these sediments were deposited in or by water. It is interesting to observe that in this layer there are reworked iron nodules, meaning the nodules are in a secondary position. These appear to have been dug up from deeper horizons of the surrounding soils, similarly to the pedo-relics of H3. This characteristic suggests, once again, that this part of the ditch was sealed by backfill put in place by man. There are no indicators of colluvial processes which might indicate that H3 and H2 derive from the material from earthen structures inside the area surrounded by the ditch. Anthropic inclusions are very scarce and are limited to only a few fragments of wood charcoal.

3. Discussion

3.1. THE CONSTRUCTION OF THE PREHISTORIC BARROW

To create this Bronze Age barrow, a circular ditch with a diameter of 14,5 m was dug (Figure 7). At the southwestern side, an intentional interruption gave entrance to the centre of the circle. This mound was erected on a slightly sloping terrain (Figure 8). Most likely, the earth from the ditch was used to construct a hill at the centre of the circular ditch.

The five soil layers of the ditch (profile A and B: H1-H5) are continuous over its entire length. Only at the northern side, where the ditch is deeper, two older layers are preserved beneath (profile B: H7 and H7b) (Figure 5). These represent the soil present when the barrow was founded and the first use phase of the barrow and are absent at the southern side of the ditch (Figure 4). Furthermore, the horizons H8-9, associated with the soil that existed when the barrow was erected, are absent in the southern part and present on the northern side (Figure 5: H8, H9), which suggests that the site was levelled at a later stage.

The oldest layers did not contain any dateable material, therefore, it is not possible to date the foundation phase of this barrow. The four other barrows excavated in the direct vicinity of this burial mound (Figure 1) were dated using AMS ^{14}C and can be dated in the early (n°2) and middle Bronze Age (n°3-5). Therefore, it seems reasonable to assume a Bronze Age date for the fifth barrow as well.

The lower horizon H7 (Figure 5) was deposited relatively quickly. After the construction, the burial mound was largely overgrown, resulting in a strong reduction of the sedimentation rate. The organic rich composition of the upper ditch filling (H7b) confirms this hypothesis. H6 is witness to an active erosion phase. Agricultural activities, potentially preceded by deforestation, are often the direct cause of erosion. Presumably, the burial mound was constructed on a very gentle slope, where the top of the slope was levelled due to agricultural induced erosion-sedimentation also known as colluvium. This erosion phase had a larger effect on the southern side of the barrow, that initially was situated higher in the landscape than the northern part of the barrow.

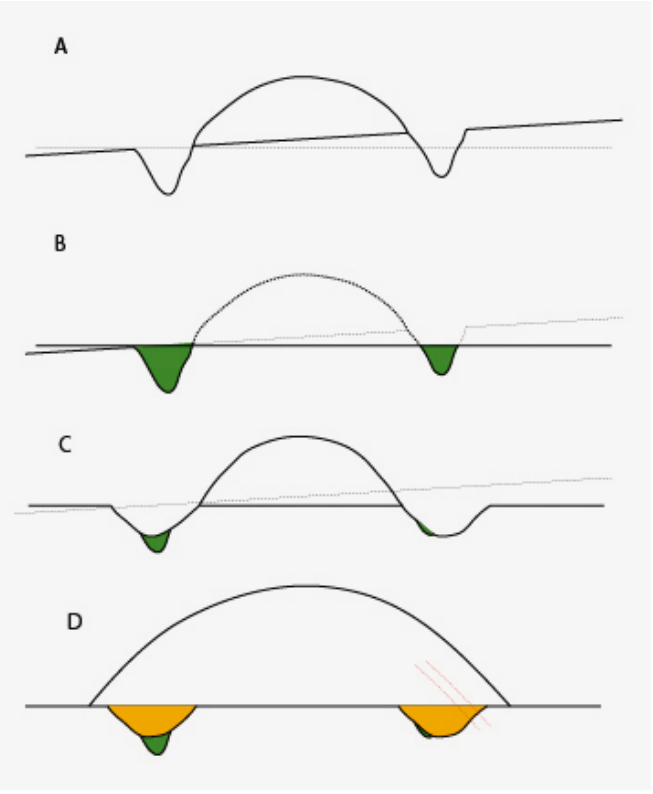

Figure 8. Schematic reconstruction of the barrow: Bronze Age foundation phase (A); erosion phase (B); Iron Age restoration phase (C); medieval re-built (D).

3.2. THE RESTORATION OF THE BARROW IN THE IRON AGE

In the Iron Age, the eroded barrow and circular ditch were restored. The new ditch was 1.4-2.0 m wide and had a depth ranging between 0.5 and 0.7 m over its entire length. This constant depth indicates that the originally sloping terrain was probably already levelled by this time. The entire ditch and its interruption were re-dug at the exact same location as the Bronze Age barrow, indicating that it was a restoration of the Bronze Age monument, rather than the creation of a new barrow. The pattern of soil sequences on the south side (Figure 4) indicates that the extracted soil was used to build the central mound.

To reconstruct the surrounding vegetation, soil samples from this restoration phase were analysed botanically. Unfortunately, neither pollen nor macro residues were found, but it was possible to select a sample for 14C dating (Van Beurden et al., 2017). AMS 14C dating of a charcoal fragment (cf. Prunus spinosa) from this restoration phase (RICH-23621, 2σ) yielded a date between c. 750-390 cal BC. This large age interval results from the so-called 'Hallstatt plateau' of the calibration curve.

In yet a later phase, during the late Iron Age, a cremation burial was added to the barrow. For this, a pit was dug, slightly asymmetrically, within the burial mound. Besides abundant charcoal, this pit only yielded some burnt pottery and a few grams of cremated bone, belonging to an individual older than 5 years. AMS 14C dating of a charcoal fragment (cf. Pomoideae) from this cremation grave (RICH-23622, 2σ) yielded a date between c. 380-190 cal BC.

3.3. ROMAN SETTLEMENT

The remains of a settlement consisting of at least 14 houses were found at less than 50 m from the barrow, dating from the late Iron Age to the Roman period. Pottery related to this occupation was found in horizon H5, indicating that the ditch was still functional, and the barrow was left untouched. A burial ground with at least 85 graves, contemporaneous with this settlement, was organised around the largest Bronze Age barrow (Figure 1, barrow n°4).

3.4. MEDIEVAL PERIOD

The youngest sediments of the barrow ditch (H3, H2 and H1) consist of a mixture of sediments (humus-rich greyish-, brown clayey-, and sandy pale sediments). The large heterogeneity of these upper 3 horizons suggests that the sediment was moved several times. Micromorphologically, they show inclusions in the soil matrix that indicate that the ditch was consciously filled with material that was dug elsewhere.

It is still not clear when the eventual infilling of the ditch took place. The Roman pottery in layer H5 indicates that this must have happened during or after this occupation phase. Sequences of thin migrated clay layers were noticed at the south side of the ditch (Figure 4 and 9). These are related to a larger structure that superimposed over the Iron Age burial mound. Based on the location of these layers at the outermost part of the ditch, this new mound must have been larger than its predecessors. Centrally in this new mound, a round pit of 2m diameter was

Figure 9. Photo of the clay migration bands (thin hollow arrows), which are younger than the sediments that covered and filled up the Iron Age burial mound and circular ditch. These gentle sloping migration bands suggest a soil body located above, having the same slope angle as the migration bands (black arrow: centre of the barrow).

dug, destroying a large part of the late Iron Age cremation. In this pit, pottery dating to the High Middle Ages was found together with strongly decomposed brownish organic matter. The latter could be from decomposed bone material.

The reason why this medieval mound was created remains unclear. The map of Ferraris (1770-1778) provides a first hypothesis. The hamlet where this site is located is marked as 'Grae Molenhoeck', which means mill corner. Historical data (Santy, 2008) confirms that in the Late Medieval /Early Modern Period at least three mills where located some 100 m in a northern direction. It is possible that a predecessor of these mills was situated on this site.

Another hypothesis is that the mount was re-used as a gallow hill. Several excavations in the Netherlands have shown that prehistorical barrows were re-used in medieval periods as execution sites or sites for displaying the bodies of executed individuals. The location of these gallows is important, because they are not only used as an execution area but also as deterrents (Meurkens, 2010). Therefore, visibility is (as in the Bronze and Iron Age) important. The round pit in the middle of this hill could be interpreted as a bone pit where the remains of the deceased were buried. Phosphate samples were taken and may confirm that the decomposed organic matter in the pit is the remnants of bone. These analyses still need to be performed.

3.5. THE CHRONOLOGY OF THE *BURIAL MOUND*

During the archaeopedological fieldwork, we realised that this prehistorical burial mound has a complex history. Detailed field observations in combination with a soil micromorphological study and a thorough archaeological excavation were combined in order to build up the chronological sequence of events that lead from the initial structure to the present-day situation. The following hypothesis are made as to how the prehistorical burial mound was founded and how the structure changed over time:

1) The structure was erected during the Bronze Age. The field evidences include a circular ditch of up to 100 cm depth below the excavation surface. The diameter of the circular ditch is 14.5 m and includes an opening towards the southeast
   a. we have no information what the structure looked like within the circular ditch, but it was not a pit or a depression. Most likely, the earth from the ditch was used to construct a barrow at the centre of the circular ditch;
   b. probably instantly after the ditch was constructed, sediments started to accumulate at the bottom of the ditch. The erosion phase would last until the barrow was covered with vegetation, as a vegetation cover will offer (some) protection from sheet and rill erosion;
   c. small scale maintenance during the Bronze Age period of the structure is not excluded, but this was not recorded in the ditch filling.
2) By the Iron Age, the ditch was probably almost filled with sediment. At this moment, the barrow was renovated, which included the re-opening of the ditch. The new ditch was wider and less deep (about 65 cm below the excavation surface) compared to the original ditch.
   a. after the ditch was re-opened sediments again started to accumulate at the bottom of the ditch forming H6; this indicates that erosion-sedimentation was possible in the immediate surroundings of the ditch:
      i. either because the vegetation cover was deliberately removed from the structure inside of the ditch or from the soils outside of the ditch, or
      ii. the earth excavated when the ditch was re-opened was used to restore the structure, allowing soil erosion to occur until the barrow was again protected by vegetation.
   b. H5 indicates a phase of relative stability with slow input of sediment into the ditch. The micromorphological study suggest that H5 was deposited by water and that oxido-reduction, at least for some periods, must have prevailed in the ditch, probably during the winter and early spring.
3) In the Late Iron Age a cremation burial was added to the structure, fragments of pottery and bone testify that a person of 5 years or older was cremated and buried.
4) Towards the end of the Iron Age period and during the beginning of the Roman period, a settlement was founded about 50 m from the barrow. Pottery fragments related to this settlement were excavated from H5. Evidently, we can conclude that the ditch and probably the entire structure was still visible in the landscape in this period.
5) Somewhere between the period of the Roman settlement and the High Middle Ages, the ditch was deliberately filled with material from elsewhere and a new larger hill was constructed.
   a. both the field studies of the horizons H1-3 and the micromorphological study suggest a fast filling of the ditch with heterogeneous material and containing pedofeatures that must have come from elsewhere. There are no traces of colluvium observed in the thin sections, so possibly the ditch was filled in a very short period (few days to few weeks?).
   b. clay migration bands superimpose the infilled ditch sediments, with a completely different

orientation than the sediments of the ditch. Based on the oblique orientation of these migration bands, it is suggested that the orientation to a certain extend reflects the form of the newly erected structure.

i. this implies that the new barrow or hill must have covered the entire prehistoric monument, including the ditch and beyond.

6) During the High Middle Ages, a round pit with a diameter of 2 m was dug out centrally in the new structure. The age of this pit was based on findings of pottery in the pit.
7) Somewhere between the High Middle Age and modern time, the entire structure was levelled, most probably to facilitate an optimal agricultural production of the field.

a. the historical map from the 18th century (Ferraris) shows no signs of a mound at or in the vicinity of this site. This indicate that the mound was probably gone by that time.

4. Conclusions

During the excavation of a Bronze Age barrow, the archaeological research and the ceramics testified to a more complex history than initially expected. By including detailed soil observations and soil micromorphology, more information was gained, which allowed the establishment of a comprehensive chronology of the structure and its immediate surroundings.

In today's landscape of Flanders, prehistoric barrows have almost disappeared. Yet, in this study we have been able to unravel a structure that was kept in place for centuries, maybe a half millennium, before it was transformed and possibly given a new function. Although the only remains of the initial barrow were the infill of its surrounding ditch, very valuable information could still be deduced, which gave numerous insights into the sedimentary history of the monument, both natural and anthropogenic.

The detailed study of the infill revealed a Bronze Age barrow which remained visible at least until the High Middle Ages. During its life cycle, the rather small barrow was restored and remodelled, but remained a distinct part of the landscape.

At a first glance, this appeared to be yet another routine archaeological excavation. But, this project and some other recent studies (Beke et al., 2018; Deconynck et al., 2018) show that an interdisciplinary approach of these burial mounds delivers a valuable addition. Adequate sampling for micromorphology is therefore strongly recommended for future excavations of these kinds of prehistoric structures.

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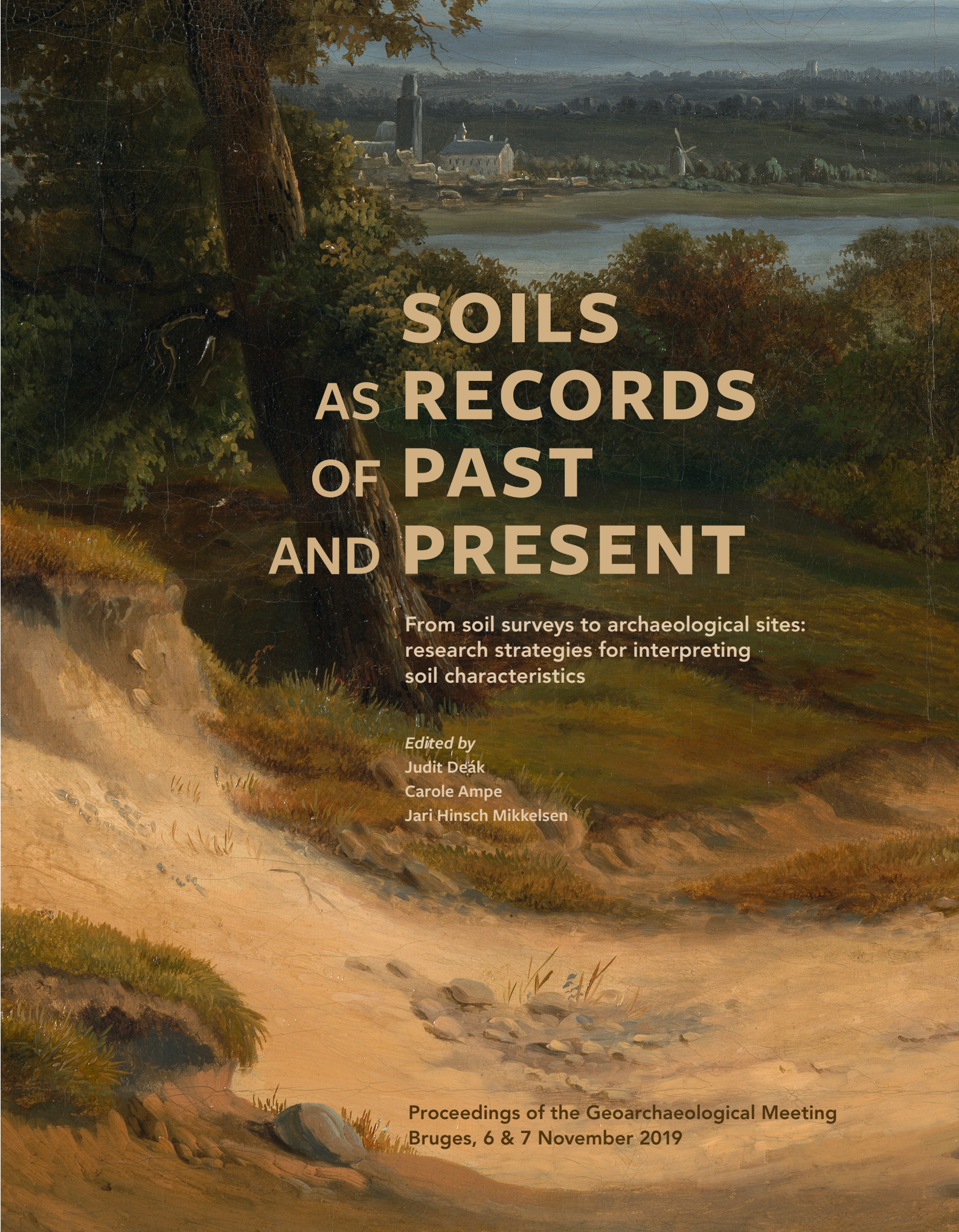

SOILS AS RECORDS OF PAST AND PRESENT

From soil surveys to archaeological sites: research strategies for interpreting soil characteristics

Edited by
Judit Deák
Carole Ampe
Jari Hinsch Mikkelsen

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