Offa's Dyke Journal

A Journal for Linear Monuments, Frontiers & Borderlands Research

Volume 5

Edited by Howard Williams

Aims and Scope

Offa's Dyke Journal is a peer-reviewed venue for the publication of high-quality research on the archaeology, history and heritage of linear monuments, frontiers and borderlands. The editors invite submissions that explore dimensions of Offa's Dyke, Wat's Dyke and the 'short dykes' of western Britain, including their life-histories and landscape contexts. *ODJ* will also consider comparative studies on the material culture and monumentality of land divisions, boundaries, frontiers and borderlands from elsewhere in Britain, Europe and beyond from prehistory to the present day. We accept:

1. Notes and Reviews of up to 3,000 words
2. Interim reports on fieldwork of up to 5,000 words
3. Original discussions, syntheses and analyses of up to 10,000 words

ODJ is published by JAS Arqueología, and is supported by the University of Chester and the Offa's Dyke Association. The journal is open access, free to authors and readers: http://revistas.jasarqueologia.es/index.php/odjournal/. Print copies of the journal are available for purchase from Archaeopress with a discount available for members of the Offa's Dyke Association: https://www.archaeopress.com/

Submissions: howard.williams@chester.ac.uk

Front cover: Reconstruction of the Olger Dyke at Gårdeby Mark (Jørgen Andersen, Museum Sønderjylland, Arkæologi Haderslev). Cover and logo design by Howard Williams and Liam Delaney.

Offa's Dyke Journal

A Journal for Linear Monuments, Frontiers and Borderlands Research

Volume 5 for 2023

Edited by Howard Williams

Rhwydwaith Clawdd Offa's Dyke Collaboratory

University of Chester

Offa's Dyke Journal

A Journal for Linear Monuments, Frontiers and Borderlands Research

Volume 5 for 2023

The Olger Dyke: An Early Roman Iron Age Linear Earthwork in Denmark

Lisbeth Christensen

The Olger Dyke is a large-scale linear earthwork in southern Jutland in Denmark which consists of a combination of earthwork and (in part) well-preserved timber palisades that can be traced for at least 12 km. The article provides a synthesis of the history of fieldwork of this monument, including detailed overviews of recent excavations, which have enabled new dating work to be carried out. This linear earthwork is unusual in that it has exceptional preservation of timber uprights in several palisade trenches, and recent dendrochronological dates combined with the application of new dating methods has enabled the construction sequence to be refined and accurately pinpointed to the early first century AD, lasting for around 100 years. The article presents the location, construction and function of the Olger Dyke together with an outline of the new dating evidence.

Keywords: Linear earthwork, Early Roman Iron Age, Denmark, timber palisades, dendrochronology

Introduction

The Olger Dyke is one of the most important and fascinating prehistoric features in southern Jutland, and it is also the largest earthwork in the region (Figure 1). The linear earthwork consists of a varying number of palisades; over long stretches of the structure, the palisades were complemented by a ditch. The purpose of the structure has long been established as a means of forming a physical barrier in areas without natural obstacles such as meadows, bog or forest (Neumann 1982).

The Olger Dyke used to be called *Ollemersvold* or *Olmersdiget*. One interpretation of the name is that it is a distorted version of *Oldemors dige*, i.e. something very old. Another interpretation is that the name derives from the Old English word *ealgian*, meaning defend, protect, or screen (Jørgensen 1928: 134). It belongs to the group of linear earthworks called *langvolde* ('long dykes') which are found across Denmark but most frequently on the Jutlandic peninsula down to the Elbe area (Neumann 1982: 49 ff.). Many of the monuments cannot be dated precisely but they are traditionally supposed to date to the Iron Age (i.e. around the turn of the millennium to c. AD 200).

The article provides a synthesis and a review of the research history as well as presenting the results of new fieldwork on the Olger Dyke. Aspects relating to the location, construction, date, and function of the Olger Dyke are discussed in the light of four recent excavations carried out during the period 2003–2022. New dating methods and dendrochronological dates from three different Danish laboratories – the now-closed Wormianum Laboratory, the Laboratory of the National Museum and most recently

Offa's Dyke Journal volume 5 2023
Manuscript received: 28 November 2022
accepted: 16 January 2023

the dendrochronological department of Moesgård Museum – provide new dates for the construction and use of the Olger Dyke. The most recent dendrochronological dates come from the excavations at Ligård in 2003, at Olmersvej in 2020 and at Uge Mark in 2022. The new excavations and dendro-dating lead to a reconsideration of the chronological and physical development of the monument and its archaeological setting.

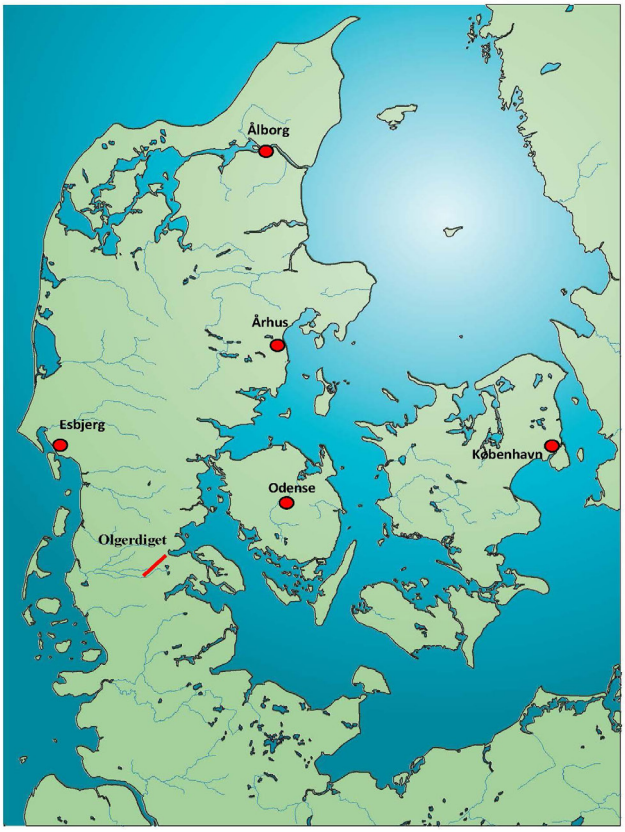

Figure 1: The location of the Olger Dyke (Olgerdiget). Jørgen Andersen, Museum Sønderjylland, Arkæologi Haderslev. The red dots represent the largest cities in Denmark by population

The article presents a reassessment on the traditional dating of the Olger Dyke which affects the interpretation of the structure and function of this boundary. The significance and function of the linear earthworks have been discussed frequently, focusing on its role as a defensive barrier between two 'tribes', or alternatively as a mechanism for controlling movement along the *Ox Road* routeway. These potential functions will be considered alongside considering the Olger Dyke as a possible expression of group identity and political authority.

The four recent excavation projects will be presented in detail in a separate article here, as they are intended to serve as a basic, primary data set for both Danish and foreign scholars in order to foster future analyses of linear earthworks.

Location and research history

The south-westernmost presence of the Olger Dyke has been demonstrated in a meadow near the Bjerndrup Mølleå stream east of Gårdeby. At Broderup, the Bjerndrup Mølleå joins the river Gejlå which is part of the larger Vidå river system, and which flows into the North Sea. The Olger Dyke runs from the Bjerndrup Mølleå east of Tinglev, and continues east of Uge until Urnehoved east of Bolderslev, *i.e.* 11.6 km (Figure 2).

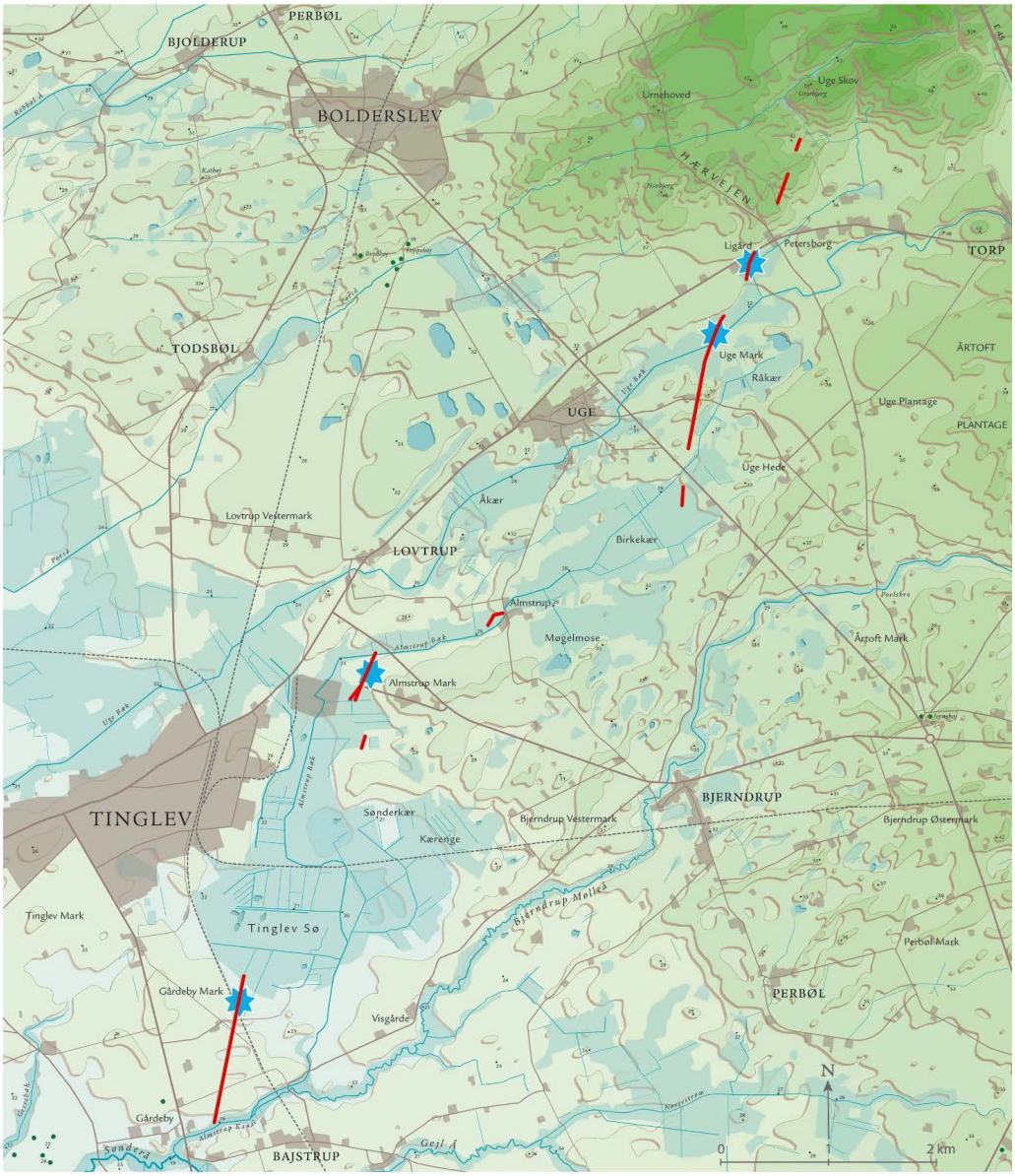

Figure 2: Map showing the *c.* 12km long extension of the Olger Dyke. The four sites (from south to north) of Gårdeby Mark, Olmersvej (Almstrup Mark), Uge Mark, and Ligård are marked with a blue star (Jørgen Andersen, Museum Sønderjylland, Arkæologi Haderslev)

Presumably, the Olger Dyke originally extended further north-east to end at Åbenrå Fjord and Lillebælt but this final stretch cannot be confirmed on present data.

The Olger Dyke is first mentioned in Pontoppidan's Danish atlas from 1768 (Jørgensen 1928: 134). In 1819, Rev N. Outzen in Breklum mentioned parts of an earthwork south of Tinglev in the field of Gårdeby (la Cour 1929: 50). According to J.N. Schmidt, remains

Figure 3 (above): Palisade on the meadow south of Olmersvej looking towards the Tinglev Lake (Photograph: Hugo Matthiesen from 1928)

Figure 4 (below): Aerial photography of the ditch at Gårdeby Mark, viewed from the south (Unknown photographer)

of the bank could be seen on the field of Gårdeby in 1846 (Schmidt 1846–1848: 275). The earthwork, which was associated with a ditch, was then estimated as c. 940m long, c. 4.7m wide and c. 1.25m high. In addition, the bank is registered on a German ordnance map from 1878 (la Cour 1929: 50). Near Uge Skov, remains of a mound called *Skansen* are known, where faint traces of it are preserved in the hedges. J N. Schmidt also saw a bank and ditch in the slope of a marl pit near Petersborg at the Hærvejen (*Ox Road*): the traditional north–south route along the Jutland peninsula. The earthwork is no longer visible in the landscape, except for these faint, possible traces in a few hedges.

The Olger Dyke was first described in its entirety from Urnehoved to Gårdeby by H.P. Jørgensen in 1928 (Jørgensen 1928). Jørgensen became aware of the structure when oak posts were found during peat cutting in the Bredsmose bog south of Olmersvej (Figure 3). As a consequence of Jørgensen's mapping of the Olger Dyke, Hugo Matthiesen from the National Museum of Copenhagen conducted the first archaeological excavation of the structure near Olmersvej in 1928. This section was placed under state protection in 1932 and remains the only part of the Olger Dyke officially protected by law.

It was also H.P. Jørgensen who pointed out the course of the structure to Hans Neumann, the head of the Museum in Haderslev. In turn, a series of archaeological excavations were carried out. Vilhelm la Cour from the National Museum of Copenhagen conducted an excavation of the entrenchment called *Skansen*. According to Hans Neumann, *Skansen* consists of a low bank, flanked by two small ditches. In the period 1963–1972, the National Museum and Haderslev Museum carried out a number of small, systematic excavations of sections of the Olger Dyke (Neumann 1982). The aim of these small, annual excavations was to establish the course of the monument, its date and function. Neumann divided the Olger Dyke into six sections, sections numbered 1–6 from north-east to south-west. The sections were separated by natural barriers such as streams, meadows, bogs, or forests which – together with the Olger Dyke – created a barrier across the Hærvej (*Ox Road*).

The archaeological excavations of recent decades

Recent excavations conducted for Museum Sønderjylland directed by the author have been crucial for the understanding of the structure and dating of the Olger Dyke. Neumann's excavations during the 1960s and 1970s primarily consisted of only small sites and trenches dug by hand. By way of contrast, three of the recent excavations allowed the exposure of large areas by an excavator, which led to a better overview and interpretation of the Olger Dyke. The four excavations in question were Ligård (in 2003), Gårdeby Mark (in 2013) (Christensen 2006b; Christensen 2014), Olmersvej (in 2020) and Uge Mark (in 2022). The results of the last two investigations are published here for the first time. None of the recent excavations produced any artefacts.

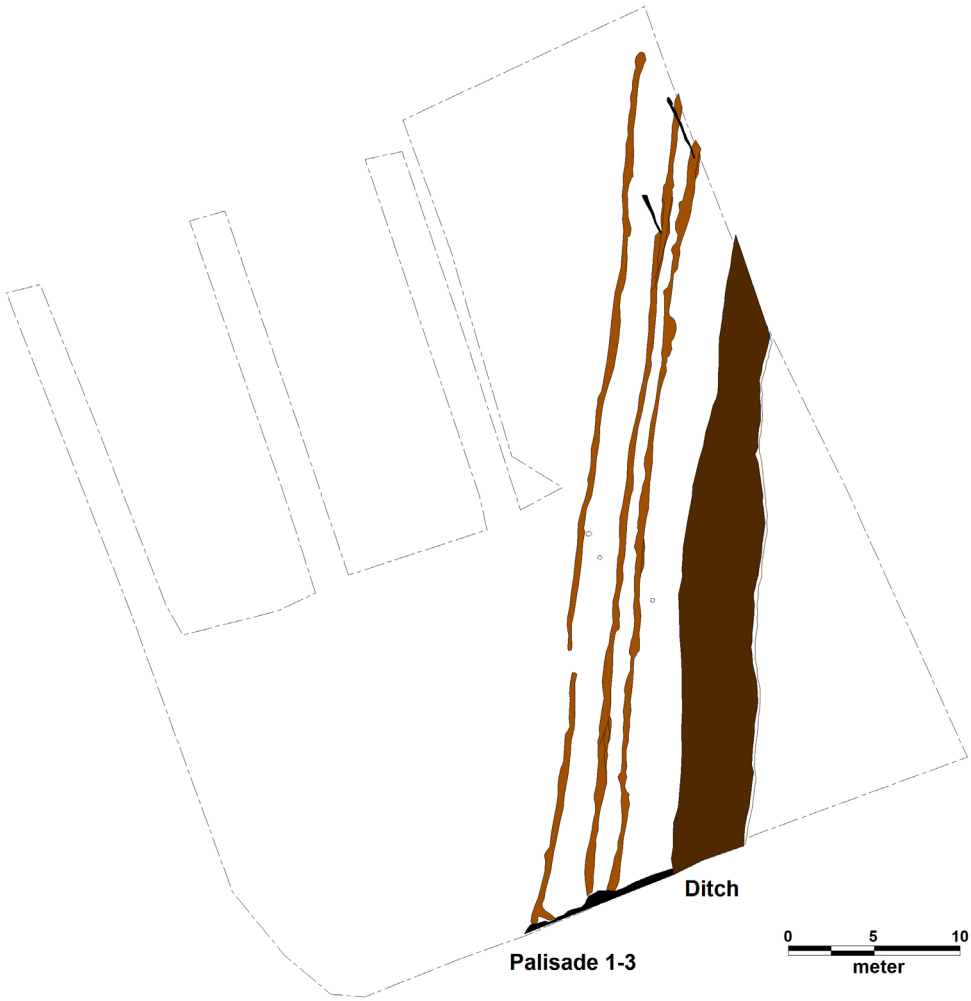

Figure 5: Excavation plan of the Olger Dyke at Gårdeby Mark, 2013. Ditch and three trenches

The excavation at Gårdeby Mark in 2013[1]

In 2013, an area of 1800m^2 was excavated in advance of the erection of a new byre (Christensen 2014). On this site, the Olger Dyke consisted of a ditch and three palisades (palisades 1–3), numbered from west to east. The ditch, which was 4–4.5m wide at the top and c. 1m deep and was visible as a cropmark on older aerial photographs (Figures 4–7), had slightly slanting sides and a flat base. The palisades ran west of and parallel to the ditch. The westernmost palisade had two openings: the largest was 1.25m wide, which was wide enough to allow access through the structure. The distance between Palisades 1 and 2 varied between 1.5m and 2.25m, whereas the distance between palisades

[1] Gårdeby Mark: Neumann 1982, sted 6, Tinglev, sb. 20. HAM 4252, sb. 122 (2013).

Figure 6 (above): Excavation photo of the Olger Dyke at Gårdeby Mark, 2013. Ditch and three trenches, viewed from the south (Photograph: Lisbeth Christensen)

Figure 7 (below): Section through the ditch of the Olger Dyke at Gårdeby Mark, 2013, viewed from the south (Photograph: Lisbeth Christensen)

2 and 3 varied between 0.5m and 1.25m. The distance between palisade 3 and the ditch measured c. 2.5m–3m. The width of the trenches in which the posts of the palisades had been placed varied between 0.35m and 0.75m. These trenches had been up to 0.5m deep. The palisade trenches were registered as three parallel features with varying distances between them. The palisades consisted of single rows of posts which apparently had a flat base. The post pipes showed that a combination of round, square, and cleft posts had been placed in the trenches. The posts themselves had not been preserved at Gårdeby Mark because this part of the structure was situated on agricultural land.

The excavation at Ligård in 2003[2]

In 2003, an area of 1800m^2 was excavated in advance of the erection of a new byre near the farm Ligård (Christensen 2006a–b) (Figures 8–9). The archaeological excavations showed that, as at Gårdeby Mark, the central part of the Olger Dyke consisted of a 1.1m deep flat-based ditch with a maximum width of 3.5m (Figure 10). Three palisades west of the ditch supplemented the structure.

The distance between palisade 3 and the ditch 4 measured only 1m, and the transition between these two features was not always clear. The distance between palisades 2 and 3 was only 0.75m, while there was 1.8m between palisades 1 and 2. The palisade trenches had a width of 0.5m and 1m, and a maximum depth of 0.4m. The westernmost palisade (palisade 1) consisted of a single row of posts, whereas palisades 2 and 3 consisted of double rows of posts. Palisade 3 was made primarily from round posts, whereas the posts of palisade 2 were predominantly square. The oak posts were generally poorly preserved. Distinct differences in terms of the diameter and the cross-section of the posts in the individual rows were observed.

Apart from the palisades 1–3, the presence of additional palisades east and west of the central part of the Olger Dyke were demonstrated at Ligård. Like the ditches to the west, these features are later than the central part of the Olger Dyke. The posts in the western, additional palisade trenches 6–7 appear to have been round, and were preserved up to 0.5m in height.

The palisade openings were placed at irregular intervals, creating somewhat of a labyrinth, but presumably allowed for passage through the Olger Dyke.

This large number of parallel trenches have only been documented at Ligård and the features to the east, the Ditches 5 and 9, probably represent the entrenchment known as *Skansen*. Neumann considered *Skansen* to be a younger, north-eastern extension of the Olger Dyke (Neumann 1982: 25ff). It was constructed as the course of the *Hærvej* moved further east. At Ligård, the *Skansen* monument consisted of the two easternmost trenches, though it was not possible to demonstrate the presence of an earthwork

[2] Ligård: Neumann 1982, sted 2, Uge sb. 37. HAM j.nr. 4230, sb. 87 (2003).

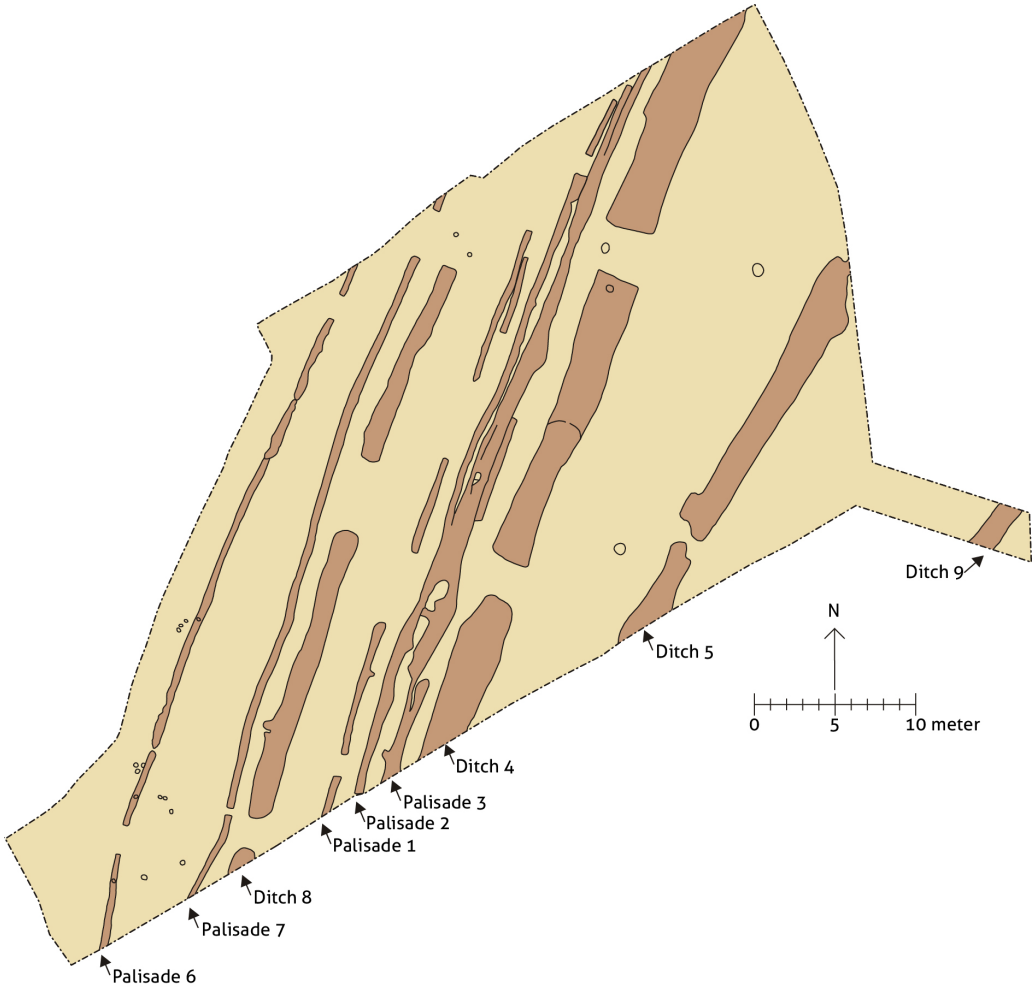

Figure 8: Excavation plan of the Olger Dyke at Ligård, 2003. The central part of the dyke consisting of palisades 1–3 and ditch 4 (Hans Peter Jørgensen, Museum Sønderjylland, Arkæologi Haderslev)

between the trenches here as it had been further north. The variation in profile and depth of the different trenches suggests that the palisades represent different phases of the structure, i.e., repairs or reinforcements.

No stratigraphic observations have been made which would allow for the establishment of a sequence for the construction of the palisades and ditches. It may simply be stated that there are at least three different main phases of construction of the Olger Dyke at Ligård; an observation which is provided by dendrochronological dates (see below).

Figure 9 (above): The excavated area at Ligård, 2003, viewed from the west (Photograph: Lisbeth Christensen)

Figure 10 (below): Section of the ditch at Ligård, viewed from the south (Photograph: Lisbeth Christensen)

The excavation at Olmersvej (Almstrup Mark) in 2020[3]

The excavation at Olmersvej in 2020 was carried out on behalf of Tinglev Forum, a voluntary umbrella organisation consisting of societies and institutions of the town of Tinglev (Figure 11). Tinglev Forum wanted to rebuild 10–12m of the original Olger Dyke across Olmersvej (former Bjerndrupvej) just east of Tinglev.

The purpose of the reconstruction and associated information was to inform tourists and local people interested in their heritage regarding this 2000-year-old prehistoric monument. The project was carried out in connection with the centenary of Schleswig's Reunification in 2020[4] on the exact place where the structure had originally been placed (Figure 12). On both sides of the old Bjerndrupvej was a 20m-wide protective zone which from 1932 on was covered by Danish heritage law to prevent further damage to the monument. The area of the road and its embankment, covering the Olger Dyke, was however not under protection and it was, therefore, possible to reconstruct parts of the Olger Dyke here. The excavated area was c. 350m^2. It lies only 50m east of the Almstrup stream and thus occasionally it floods. The Olger Dyke had been preserved by a 0.3m–0.35m-thick layer of peat and covered by the 1.5m-thick embankment of the modern road Bjerndrupvej.

At Olmersvej, the structure consisted of two parallel palisade trenches (2–3) running north-north-east/south-south-west and a ditch east of the trenches (Figure 13). The distance between palisades 2 and 3 varies between 0.6m and 1.2m. The distance between palisade 3 and the ditch varies 1.1–1.4 m. The palisade trenches had a width of 0.5–0.75m, and a depth of 0.7–0.75m and they contained preserved timber uprights in places. Both palisades consisted of a single row of closely placed posts. A wedge had been pushed underneath one of the posts to raise it slightly.

Another trench which was dug into and near the one side of the ditch may also belong to the structure. In section, the ditch, which was c. 0.9–1 m deep, was evenly shaped with slightly rounded or sloping sides and a flat base, and was 2.8–3.9 m wide, with the narrowest part at the southern end. The northern half comprised two phases, while only one phase was recorded in the southern half.

During a former excavation at Olmersvej (Almstrup Mark) in 1972, three wooden spades were found stuck into the palisade trench. The spades are 0.05–0.10m thick laths with a sharp edge in the one end and a step cut into one side. The spades were probably used to dig the palisade trenches and the ditch (Figure 14).

North of the Olmersvej, clear traces of a c. 150m-long ditch were clearly visible in the landscape. This is the only section of the Olger Dyke, where the ditch is still visible

[3] Olmersvej. Neumann 1982, sted 5, Uge sb. 46. HAM j.nr. 2959 (2020).

[4] Denmark's defeat by Prussia and Austria in the second Schleswig war in 1864 meant that the Danish State lost North Schleswig (Southern Jutland) to the Prussian State. The reunification of Southern Jutland with Denmark took place in 1920 following the German defeat of the First World War.

Figure 11 (above): Excavation photo of the Olger Dyke at Olmersvej, 2020 (Ditch and two trenches, viewed from the east) (Photograph: Lisbeth Christensen)

Figure 12 (below): Reconstruction of the Olger Dyke at Olmersvej 2021 (palisade, ditch and bank, viewed from the north). The photo was taken during the phase of reconstruction (Photograph: Lisbeth Christensen)

Figure 13 (above): Excavation plan of the Olger Dyke at Olmersvej, 2020

Figure 14 (left): Wooden spade from the 1972 excavation, south of Olmersvej (Almstrup Mark) (Photograph: Museum Sønderjylland)

(Figure 15). All that remains of the earthwork has disappeared. The fill of the ditch at Olmersvej as well as at Gårdeby Mark and Ligård indicates that the ditch had been water-bearing.

The posts which survived best from Olmersvej came from palisade 3, closest to the ditch; indeed they represent some of the best-preserved posts from the Olger Dyke found so far. The largest of the posts had a diameter of c. 0.36cm and the oak posts were generally preserved at a length of 0.10–0.43m. The longest post was found at the bottom of the ditch and measured 2.6m. For the first

Figure 15 (above): The ditch north of Olmersvej, 1928 (Photograph by Hugo Matthiesen, after Jørgensen 1951)

Figure 16 (below): Bevelled oak post from the excavation at Olmersvej (Photograph: Lisbeth Christensen)

time in the long research history of the Olger Dyke, it is now possible to document the original length of the posts.

Many of the posts had visible signs of having been trimmed, with carefully bevelled edges at c. 45° and typically a couple of centimetres wide (Figure 16). The homogeneity of the bevelling suggests that trimming was undertaken after cutting and dressing of the posts. The majority of the posts had a straight base, while three were slightly pointed.

Four of the posts had been cut at a fork, i.e. at the bifurcation of the trunk of a tree. Presumably, these posts were wider and heavier, which may have been an advantage in terms of stability.

Traces from cuts and bevelling must relate to the construction of the palisades. It is uncertain whether the even base had a specific function in relation to the construction. The same is true of the bevelling, but it is feasible that the posts were easier to transport and handle when the sharp edges had been trimmed.

The excavation at Uge Mark in 2022[5]

Excavation in 2022 of an area measuring 25m^2 took place near the Uge stream. The work was in advance of earthworks related to cable laying which involved the cutting of a 5.5m-wide trench. This allowed the Olger Dyke to be uncovered up to a width of 2.5m (Figures 17–18). The Olger Dyke was situated in a meadow bordering agricultural lands to the north and though there were no visible traces above ground, a palisade was found just below the surface of the meadow.

The palisade, of which 8m was recovered, survived to a maximum depth of 0.7m. It was situated only a few metres north of the present Uge stream and the area flooded regularly. The row of posts had, therefore, been covered and preserved by a 0.2m thick layer of peat and c. 0.35cm of plough soil. The structure nearest to the stream consisted of a slightly curved and irregular row of posts aligned northeast/southwest. The northern half of the structure consisted of a single row of posts. The southern half consisted of a 30cm–40cm wide trench in which up to two rows of posts (formed from replacements and renewals) had been slightly off-set from one another.

The posts were poorly preserved here since modern draining had dried out the matrix. Furthermore, cultivation had reduced the level of the ground surface so that the top of some of the posts now reached the surface.

Both round and square posts with an even base had been used. The piled posts had been trimmed to form a point, and had been rammed into the soft, boggy subsoil. The piled posts were exclusively round posts, and the tapered posts showed signs of cutting and trimming. These posts varied in length from 0.44m to 1.4m and had a maximum diameter of 0.16–0.22m, with the lower c. 0.4–0.6 m having been tapered (Figure 19). Two round posts, which had fallen over and continued beyond limits of the trench, measured 3.42–3.57m, of which the lower 0.5–0.6m had been tapered. This indicates that the original height of the palisade was originally c. 3 m. At this section, the Olger Dyke consisted of a single palisade without a ditch because the structure was placed in a once flooded meadow, representing a natural obstacle.

[5] Uge Mark. Neumann 1982, sted 3, Uge sb. 47. HAM j.nr. 6426 (2022).

Figure 17: Excavation photo of the Olger Dyke at Uge Mark, 2022, (palisade, viewed from the north (Photograph: Anders Hartvig)

Dendrochronology

Since the 1960s, samples of wood from different sections of the Olger Dyke have been submitted for dendrochronological analyses. It used to be believed that the Olger Dyke was erected in the beginning of the third century AD (see Neumann 1982: 136). However, this date has been revised thanks to the new excavations.

Until last year, there was only a single early dendrochronological date of AD 31 from the excavation of Olmersvej (Almstrup Mark) in 1972. Previous dendrochronological analyses have attempted to examine the development of the palisades (Christensen 2006b; Christensen 2014) but it was difficult to assign them to specific phases since

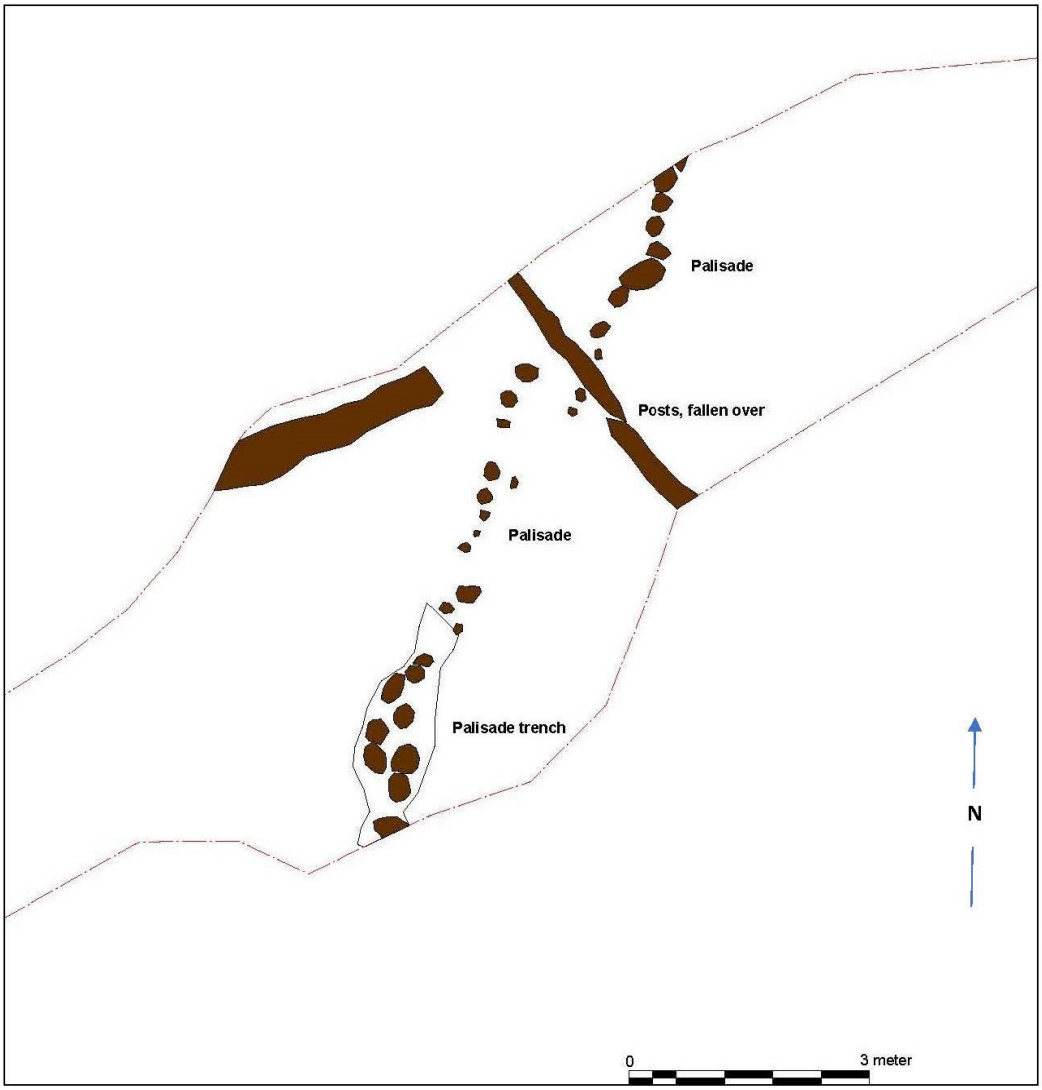

Figure 18: Excavation plan of the Olger Dyke at Uge Mark, 2022, (palisade, viewed from the south)

they apparently consisted of timber from different phases and palisades, probably reflecting that many posts were reuses in the construction of new palisades or in the repair of existing ones. The new dendrochronological dates from the Olger Dyke have added new and more detailed information about the dating and structure of this linear earthwork.

The dating of the posts is now based on a master sequence of tree ring data from oak trees in Denmark, which has been created and refined during the last 20 years by the dendrochronologists Niels Bonde from the National Museum of Denmark and Kjeld Christensen from the former Wormianum laboratory, giving the ability for more precise dendrochronological aging.

Figure 19: Tapered oak posts from the palisade at Uge Mark, 2022 (Photograph: Lisbeth Christensen)

Due to the fact that the dendrochronological dates from different Danish laboratories could be merged, together with new dating methods and recent dendrochronological samples from Ligård, Olmersvej and Uge Mark, it has been possible to obtain more refined chronological sequences and new dates for the Olger Dyke.

The dendrochronological samples were selected according to preservation, so that the best-preserved posts with most preserved annual growth rings were selected for dating. The degree of preservation of the remainder was either too poor to allow for a dendrochronological date, or the samples were severely damaged by the activities of the cockchafer beetle. The most recent dendrochronological dates come from Ligård in 2003, at Olmersvej in 2020 and at Uge Mark in 2022.

The 20 dated posts from the Ligård excavation in 2003 were dated by Bonde. None of the samples had preserved sapwood and the youngest growth rings were formed shortly before the turn of the millennium and until AD 53. The dendrochronological dates show two clusters, one around AD 60–70 and another around AD 80–90 (Figure 20).

A total of 25 samples were selected for dendrochronological dating from Olmersvej, of which fourteen were dated, while a total of ten samples were selected for dendrochronological dating from Uge Mark, of which five were dated (Ogdal 2021) (Figure 21).

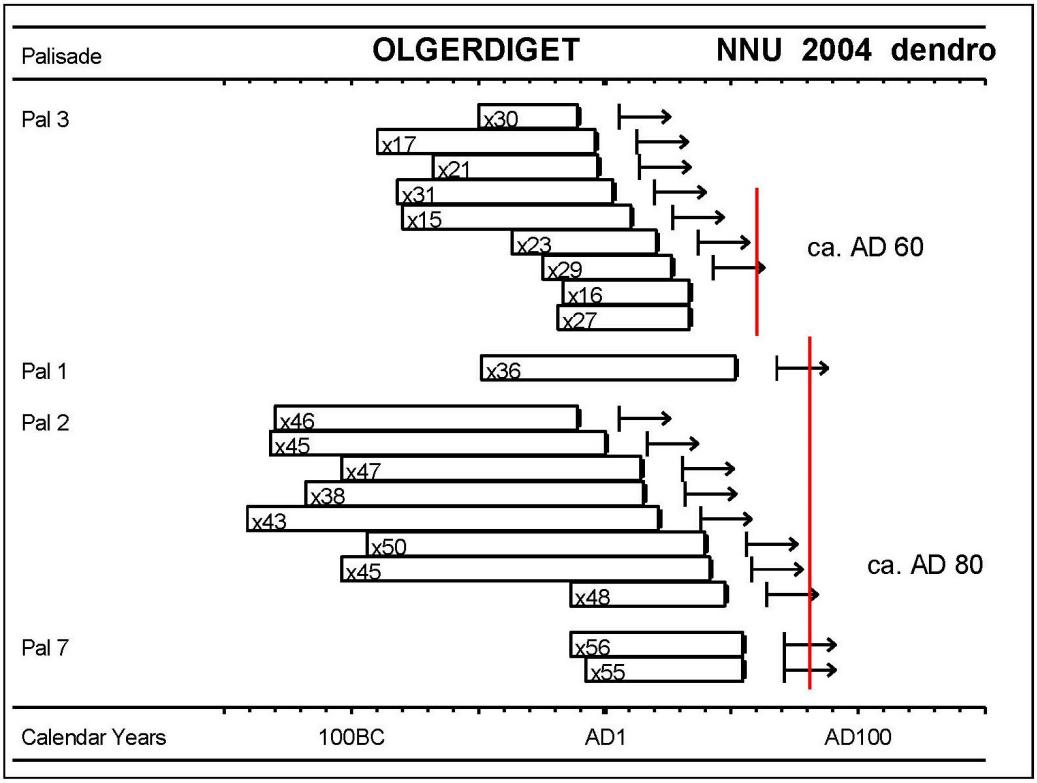

Figure 20: Results of the dendrochronological analyses of the sample from Ligård, 2003 (Photograph: Niels Bonde)

These dates from Uge Mark show that the Olger Dyke was erected around AD 25 (Ogdal 2022) (Figure 22). The results from 2020 indicate that there may have been a later phase, for example after AD 127. It is assumed, however, that the samples from trees felled after AD 89/90 represent repairs since there are only few dates from this phase.

The recognition of and calibration of cockchafer damaged samples is relatively novel. Within a period of four years the cockchafer goes through a cycle from egg to larvae and adult beetle. The larvae live for four years in the earth before they develop into adult beetles. They appear from April until June, lay eggs, and the cycle begins again. The larvae feed on roots, whereas the beetles prefer leaves from deciduous trees, preferably oak. In this way, the occurrence of the cockchafer influences the growth conditions of trees. Consequently, the cockchafer also has an impact on the dendrochronological method since the main curve is based on oak. The cockchafer-affected curves show minima every fourth year and so-called cockchafer years have been defined (K. Christensen 1983: 163ff.). These four-year minimums are causing disruption in the dendrochronological curves. Until now, these curves were considered undatable. However, it has now been possible to take into account the cockchafer years in the analysis of some of the samples from different sections of the Olger Dyke.

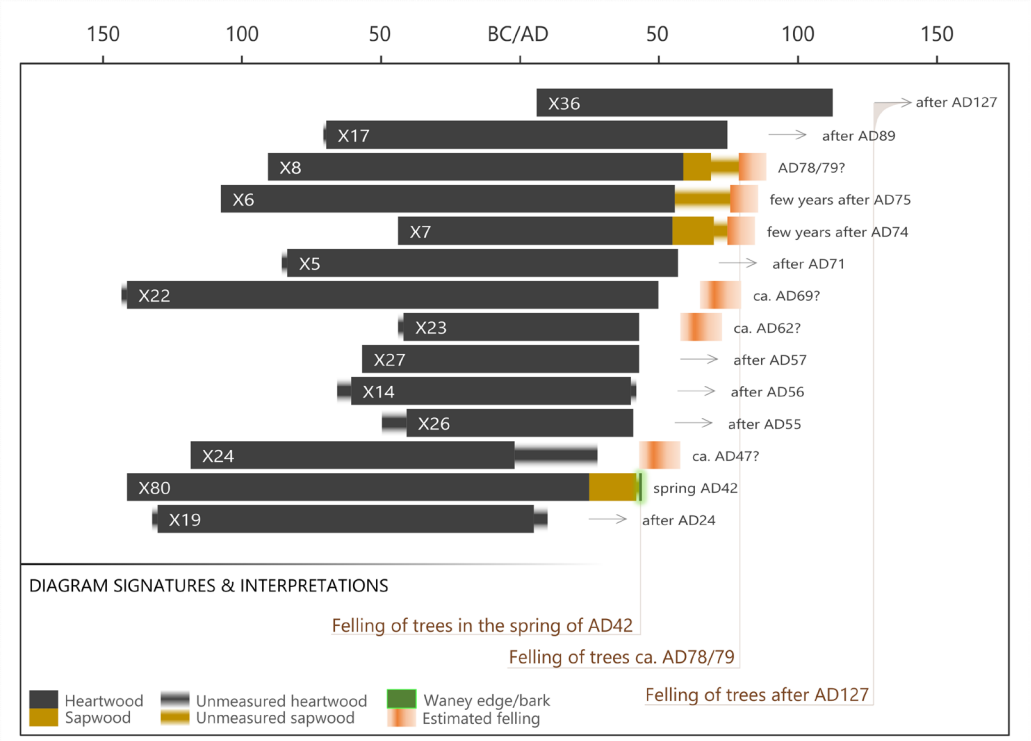

Figure 21: Results of the dendrochronological analyses of the samples from Olmersvej, 2021 (Photograph: Jonas Ogdal)

The method of identifying and calibrating for the effect of cockchafer beetles on dendrochronological samples was developed by Kjeld Christensen. Until today this dendrochronological method is only known by him and his colleague Inger Laigaard, while other dendrochronologists use other methods and so are unable to date the cockchafer-affected posts. It is not within the scope of this paper to explain the method of Christensen and how his method differs from the recent, dendrochronological methods of Jonas Ogdal from Moesgård Museum in Århus. However, when comparing the dating results of the same posts by Ogdal and Christensen, the results are found to be almost identical. Until 2019, a total of 57 posts from the Olger Dyke had been dated by Christensen, whereas it was only possible for Ogdal to date 34 of these posts by his method in 2020. The posts from Olmersvej 2020 and Uge Mark 2022 have until now only be dated by Ogdal, but Christensen is at present trying to date more of the posts from these two recent excavations using his method.

The new merged and revised dates of previously analysed samples from across the whole Olger Dyke system as well as the most recent dates from Olmersvej suggest that parts of the Olger Dyke were erected as early as the beginning of the first century AD (Ogdal 2021) and comprise at least three main phases of tree felling for construction:

Figure 22: Results of the dendrochronological analyses of the samples from Uge Mark, 2022 (Photograph: Jonas Ogdal)

Phase 1: Spring AD 42

Phase 2: c. AD 78/79

Phase 3: c. AD 89/90

The implication is that the Olger Dyke was in use until AD 125–130. After this date it is no longer maintained, and one must assume that it went out of use. It is the results of the various dendrochronology dates that form the focus of discussion later on in the article.

Construction – palisades and ditch

Excavations and dendrochronological analyses have shown that the several kilometre-long Olger Dyke comprises a unitary monument, constructed in the same way, and most likely erected at the same time (Figure 23). It is an impressive monument which was established c. AD 20–31 and remained in use for more than 100 years before it was abandoned.

The excavations at Ligård in 2003 showed that the Olger Dyke here was a complex structure with up to five rows of palisades (Christensen 2006 b: 3ff) and at least three phases of construction, with palisades 1–2 being partly coexistent and palisades 1–3 representing the oldest and central part of the structure.

As at Ligård, the excavations at Gårdeby Mark demonstrated openings in the palisades. Presumably, it was meant to allow a crossing of the defensive structure here and one may assume that it was also possible to cross the Olger Dyke at other points.

Figure 23: Reconstruction of the Olger Dyke at Gårdeby Mark (Jørgen Andersen, Museum Sønderjylland, Arkæologi Haderslev)

Palisades have only been recorded on 7.5km of the total extension and vary in depth up to 0.70m. The results of the recent excavations have confirmed that the central part of the Olger Dyke consisted of a ditch and three palisades (1–3) on arable land, with the palisades oriented towards the north. Near naturally wet areas, only a single palisade has been recorded, the posts being either placed in a trench or rammed into the ground. Indeed, at Olmersvej, while it appears that palisade 2 partly replaced palisade 3, palisade 1 seems to be missing. Further south near Tinglev Lake, Neumann found only a single palisade without a ditch near the lake, as at the site of Uge Mark.

Palisade 1 generally consisted of just one single row of oak posts, while the palisades 2 and 3 could consist of double rows. There are also examples of sections in which the posts in the double rows are placed in a staggered manner suggesting that this may be intentional. Both round as well as square posts have been used, possibly an indication of repairs or fortification of the palisade.

The oldest dendrochronological dates from the Olger Dyke derive from round posts from palisade 3 closest to the ditch. The westernmost of the three palisades, palisade 1, is the youngest. Refortification, with the addition of palisade 1, has only been carried out on parts of the structure and only at Ligård were further palisades added to the structure (Christensen 2006: 3ff.).

There were marked differences regarding the diameter and cross-section of the individual rows of posts. The varying cross-sections and depths of the trenches indicate that the palisades represent different phases of the structure, i.e., repairs and/or refortifications.

Most of the posts in the trenches had a flat base and the posts were preserved at a length of up to 0.50m, below the present surface. The posts which had been rammed into the ground outside the trenches were all round posts which had been tapered at one end.

The traces of the dyke itself have been ploughed out over the years. Meanwhile, the water-filled ditch, which was approximately 3–5m wide and up to 1.1m deep, with slanting sides and a flat base has only been found on the more elevated stretches of the structure. Running along only some 2km of its total length, it is visible today along a 150m stretch at Olmersvej, where it measures c. 4m wide and 1.70m deep (though it can be traced further in aerial photographs). Running east of and parallel to the palisades, it had approximately the same shape and depth in all recorded sections.

It appears that ditch, bank and palisade were established at the same time, with the oldest palisade (palisade 3) being contemporary with the ditch, as indicated by the post found lying in the ditch excavated at Olmersvej. The ditch and the palisades never cut each other, but the ditch is not always exactly parallel to the palisades, and we must assume that construction of the structure depended on the conditions of the ground and local routes of transportation.

The nature of other linear earthworks in Jutland

The Olger Dyke is related to the Jutlandic linear earthworks and to the so-called Danish hole or pit belts. Pit belts consist of 3–4m-wide belts of five to nine rows of closely spaced pits, which at the time of use were left open. The pit-holes had a width of 0.2–0.4m and the open pit-holes had depths of c. 0.3–0.4 m immediately after construction (Olesen 2002: 23 ff.). However, the pits do not appear to have held timber posts.

In his *Gallic Wars*, Caesar describes, at the siege of Alesia in northern France in AD 52, a defensive system with elements similar to the pit belts of western Jutland. Close to Alesia there are barriers like 'Caesar's Lilies'; ditches, wall, and a palisade which was supposed to prevent the inhabitants of leaving the town. This fortification is surrounded by a 21km-long outer line of defence oriented towards attacks from outside (Fischer 2014: 26).

Most of the forty-one known Danish pit belts occur in Mid and West Jutland. A few of these have been enclosing pit belts, found in connection with fortified settlements such as the sites of Grøntoft, Lystbækgåd, and Brændgårds Hede in Ringkøbing Amt. The majority of the pit belts are linear, e.g. Risum Østergård and Tvis Møllevej in Ringkøbing Amt (Steen 2005: 5 ff.; Steen 2009: 15 ff.), and at Risum Østergård, which runs c. 2.3km north-east/south-west and also has two narrow passages through it. There are, however, no indications of renewal or maintenance of the pit belts. There is only one known example of a pit belt in connection with linear earthworks, i.e. Rammediget (the Ramme Dyke) near Ramme also in Ringkøbing Amt, which has not been dated (Olesen

2003: 23 ff.). The bank and ditch are most likely contemporary with the pit belts and may therefore be dated to the first century AD (Eriksen 2018: 327 ff.).

The function of the pit belts is unclear, but it seems they represent a defensive structure that controlled access and defined territorial borders. However, other interpretations are possible, such as cattle grids. They may have even formed part of a ritual landscape or served as symbolic markers in the landscape (Eriksen 2018: 434–435). The pit belts should probably be understood as a predecessor of the dykes. The dated pit belts belong to the pre-Roman Iron Age, c. 500–200 BC (Eriksen 2018: 429) and so are of earlier origin than the Olger Dyke.

Most of the other Jutlandic linear earthworks are undated. Hardly any of them have been excavated and they only consist of either just a short linear bank or of a ditch and earthworks. The Olger Dyke can best be compared to two other Jutish dyke systems with palisade trenches called *Trældiget* and *Æ Vold*. Trældiget is a linear earthwork situated west of Kolding and about 85km north-west of the Olger Dyke. The structure runs north–south for 12km and consists of a series of discontinuous linear earthworks interrupted by boggy areas and meadows just like the Olger Dyke. Trældiget consists of two phases, an older phase with a single palisade trench and a ditch and a younger phase likewise with a single palisade trench, a ditch and traces of earthwork surviving in a present-day hedge. The two undated phases have differing courses and dimensions, but both palisade trenches are facing east during the two phases, with no apparent entrance gaps. The earthwork crosses the main road between Kolding and Ribe and runs alongside parish boundaries to the south (Hvass 1984; Knudsen and Rindel 1994). Trældiget is dated to the Early Roman Iron Age due to its similarities to the Olger Dyke, but they may not be contemporary (Hvass 1984: 100).

Æ Vold was at least 2km long, running east–west, facing north and was situated between two bog areas. Æ Vold is situated only 15km north of the Olger Dyke, where it crosses the *Ox Road* and is followed by a medieval parish boundary. The linear earthwork only consists of one phase with a ditch, an earthwork and a single palisade with no apparent entrance gaps (Andersen 1990). Here only a few fragments of the timber palisade were conserved of which a post has been dated by dendrochronology to AD 105.

Altogether, the structure of the Olger Dyke is quite unique when compared to other linear earthworks in Denmark, with its multiple, in part, well preserved timber palisades and entrance gaps and only Æ Vold is of a similar date as the Olger Dyke.

The Roman border along the Rhine, the *Limes*, used to be understood as a model for the construction of the Olger Dyke. However, the phase of the *Limes* resembling the Olger Dyke, that is the phase with palisade, ditch and earthwork, dating from about AD 200, is younger than the Olger Dyke. The Romans made use of constructional elements such as wall, ditch, and palisade in connection with their military structures dating to

periods before and after the turn of the millennium, such as that at the siege of Alesia. In addition, a Roman military camp/naval base with traces of a ditch and dating to just after the turn of the millennium may have been situated as far north as near Bentumersiel at the River Ems in north-western Germany (Brandt 1974: 73ff.; Stapel 2011: 293ff.). Such structures may have served as inspiration for the dyke in southern Jutland.

Interpretation

The group of linear earthwork monuments to which the Olger Dyke belongs is found all over Denmark but occurs most frequently in Jutland. The linear earthworks typically occur in combination with natural barriers such as bogs or streams which obstruct access to a given area. These monuments may have had some of the same functions as their predecessors: the hole belts.

Over the years, different theories have been put forward to explain the purpose of the earthworks and the roles they played in late prehistoric settlement patterns and societies. The Olger Dyke has been seen as a roadblock for the *Ox Road* and as a customs border as well as a border between the Jutes and the Angles, built by the Angles (Neumann 1982: 48ff). Most researchers have focused on the interpretation that the dykes functioned as a landscape boundary and were a frontier of a sort between territories and tribes (Hvass 1984: 103; Knudsen and Rindel 1994: 28; Ethelberg 2011).

The southern part of the Olger Dyke begins, as mentioned above, near the stream Bjerndrup Møllå, continues to the boggy areas south of Tinglev Lake, from where it runs further north and is interrupted by meadows forming natural barriers in the landscape and with specified crossings.

The recent excavations of sections of the Olger Dyke indicate that it had been repaired and reinforced in connection with the development of roads or fords in order to control these passageways. It served as an additional reinforcement or blocking of the *Ox Road* (*Hærvejen*), one of the most important Iron Age road systems in Jutland, since it connected northern Jutland with northern Germany.

A number of prehistoric and medieval roads are known from the area near Urnehoved, Ligård, and Uge. The medieval course of the *Hærvej* runs across the Urnehoved bank. The older course, also known as the *Ox Road*, went from Poulskro via Uge, Porsbøl and Porså to Bolderslev, and crossed the Olger Dyke near Ligård. Although the Roman Iron Age road system was different, old maps give an impression of the routes and areas which were passable in the Iron Age. According to the local topography, Ligård and Almstrup seem to have been located near ancient roads connecting the settlements of the area. There must have been a road at Almstrup and a ford at Almstrup Bæk. At Ligård, near the ancient road, the Olger Dyke consists of strongly built palisades, reinforced by additional ditches and palisades lines. Several interruptions of the ditches and rows

of palisades indicate the presence of a passage through the structure. So far, however, it has not been possible to demonstrate the presence of a roadway through the Olger Dyke, on which prehistoric wagons could pass.

The fact that some of the linear earthworks follow parish borders could indicate the demarcation of a territory. The Danish parish boundaries go back to the eleventh and twelfth centuries and the parishes represent a piece of land with a church, which acts as the religious centre of a parish. It seems as if some of these parish borders have an older origin dating back to the Iron Age and demarcate a territorial boundary between two territories or tribes. Otherwise it may be also the parish boundary that follows the ancient demaracations. Some of the parish boundaries have stood ever since, others have changed, which is probably the case concerning the Olger Dyke, when looking at the current parish borders.

The geographic position of the Olger Dyke seems to show the presence of a kind of buffer zone around the linear earthwork. Until now only two Iron Age settlements have been found in the vicinity of the dyke, the settlements of Skovsminde and Johannesminde (Andersen 2000; Ethelberg 2003: 186; Ethelberg 2017). The settlement at Skovsminde is situated about 250m west of *Skansen*, the younger north-eastern extension of the Olger Dyke. Skovsminde is a settlement with four settlement phases from the late pre-Roman to the Early Roman Iron Age, that is from around the turn of the millennium and the first century AD. Johannesminde is situated 1km west of Skovsminde and about 800m west of Ligård. This latter settlement has two settlement phases dated to second century AD (Ethelberg 2003: 186) (Figure 24).

Ethelberg interprets the Olger Dyke as a territorial boundary between two Germanic tribes primarily on the basis of the distribution of settlements defined by two different house types dated to the late pre- Roman and Early Roman period. According to the most recent interpretation, the Olger Dyke was established by the Angles in the south against the Varini to the north (Ethelberg 2020: 159 ff) (Figure 25). These Germanic tribal names are mentioned by the Roman historian Tacitus in his *Germania* from 98 (Tacitus 98: 40.1).

The author of this article, however, does not support this theory. The two house types appear side-by-side at the same settlements. The differences in house types are instead considered to be an expression of a chronological development of house types during the first and second centuries AD; from houses with only six sets of roof bearing timber posts (Ethelberg house type 1: Varinian) to larger houses with more sets of roof bearing posts (Ethelberg house type 2: Anglian). There is no archaeological evidence to suggest that the people on either side of the Olger Dyke were culturally separate from each other. One cannot detect any differences in types of household vessels, for example, which are supposed to be produced locally at the Iron Age settlements within the region. Nonetheless, the Olger Dyke may have functioned as a kind of boundary or territorial marker between two unnamed local tribes, and perhaps also is to be seen as part of a larger defensive structure.

Figure 24: Settlements, large urn cemeteries, 'princely graves', weapon sacrifices, linear earthworks and ring fortresses. Jutland from around the turn of the millennium until AD 200 (Jørgen Andersen, Museum Sønderjylland, Arkæologi Haderslev)

The palisades of the Olger Dyke consisted of at least 90,000 oak posts. The construction, maintenance and manning of the monument would have demanded significant efforts regarding material and people. Large defensive structures such as the Olger Dyke suggest the presence of some sort of chieftain who organised its construction and perhaps coordinated its maintenance. It is assumed that individual settlements along the Olger Dyke maintained smaller sections of the structure. Presumably, the Olger Dyke was not permanently manned, only certain sections and under certain circumstances such as border disputes or periods of unrest.

Specific events which could have led to the construction of the earthwork monuments are not known, but Roman and Greek authors refer to struggles of power and migrations in the countries of the north (Seneca 43). This work by Seneca was written around AD 40–45.

The Olger Dyke is contemporary with the earliest sacrifices of warrior equipment taking place in the bogs of Vimose (Vimose '0'), around the turn of the millennium, and Ejsbøl (Ejsbøl I) dated to the period 39–1 BC (Jensen 2008: 137 ff; Jørgensen and Andersen 2014: 192 ff.). The great sacrifices of war gear and weapon burials dating to the end of the pre-Roman Iron Age and Early Roman Iron Age indicate periods of unrest with risks of attacks from neighbouring tribes from the east and the south.

The Olger Dyke is also contemporary with the first sacrifices of objects in the bog of Thorsbjerg, and with the construction of the ring fortresses Trælbanken near Højer and Archsumburg on Sild in the Wadden Sea. The ring-fortresses controlled access to the Vidå river system, and with the Olger Dyke, may be understood as part of a larger defensive system which cut off the southern part of Jutland. The three structures were erected in the first century AD and were in use until the beginning of the second century AD (Harck 1989: 51 ff; Ethelberg 2011: 41).

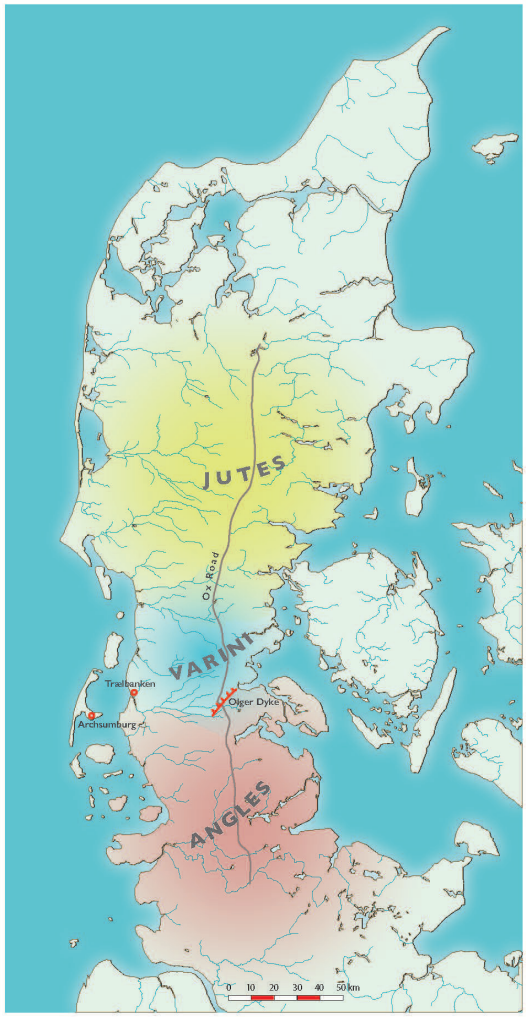

Figure 25: Archsumburg, Trælbanken, the Vidå river system, the Olger Dyke and the *Ox Road* shortly after the turn of the millennium (Jørgen Andersen, Museum Sønderjylland, Arkæologi Haderslev)

The Olger Dyke is succeeded by 'Æ Vold' which is located c. 15km to the north and has been dated by dendrochronology to AD 105 (Andersen 1990: 7ff.; Andersen 2023). According to Ethelberg, the defensive structures were constructed by the Angles and are oriented towards the north and, as such, moves c. 15 km further north towards Genner Bugt as the Angles expand their territory (Ethelberg 2011).

These old linear earthworks represent the predecessors to Dannevirke which formed a barrier across Jutland and marked a southern border (Tummuscheit and Witte 2019). A border separating Denmark with the rest of continental Europe. The Olger Dyke may also have marked the border between two tribal areas and controlled traffic moving between the north and the south through Jutland. In this way, it may have acted to control traffic, as a defensive structure, as a border or demarcation of a territory, or had several simultaneous, non-mutually exclusive functions at the same time.

Altogether, the Olger Dyke fits into a wider discussion of frontier archaeology and dyke studies, focusing on the history of prehistoric frontiers or borders inland as well as abroad. The results should be useful for future discussion and comparison of other similar linear earthworks, especially in respect to the purpose of these dykes and the role they played in delineating boundaries between different territories and different tribal societies during the Early Roman Iron Age.

Although the investigations of the impressive prehistoric monument were initiated almost one hundred years ago, it remains enigmatic. The recent excavations have certainly added valuable and exciting new information to the picture, but at the same time they have raised new questions which only future examinations will be able to answer. This results from the fact that during the last twenty years archaeologists have only had the chance to investigate the Olger Dyke in connection with rescue excavations: there was no flexibility to choose where to dig and on what scale. Hence, while these excavations have yielded new results, there is the potential for a research project to significantly enhance our knowledge about the monument.

One potential research project would be to instigate a series of east–west trial trenches across the Olger Dyke north and south of Ligård in order to: (i) detect where the many trenches at Ligård start and end to the north and south; (ii) locate the northern extension of the Olger Dyke; (iii) obtain more dendrochronological dates from the latest, westernmost trenches at Ligård.

More broadly, acquiring further dendrochronological dates from the latest phases of restoration (and thus use) of the Olger Dyke is required. These dates would help pinpoint exactly when the structure went out of use. I would also in general like to know more about the northern extension of the Olger Dyke called 'Skansen'.

In short, these new results set the stage for future work. Such investigations might explore the extent of the Olger Dyke to the north, when exactly it was repaired and went out of use, and also help to identify whether there were actual gateways through the Olger Dyke in connection with the *Ox Road*.

Acknowledgements

Translation by Pernille Kruse, Museum Sønderjylland, Arkæologi Haderslev.

Bibliography

Andersen, H.C.A. 2000. HAM 3505 Skovsminde, Uge Sogn, sb. 79, Lundtoft Herred, Åbenrå Amt, Excavation report.

Andersen, S.W. 1990. 'Æ vold' ved Øster Løgum – et gammelt fortidsminde i ny belysning: *Sønderjysk Månedsskrift* 1: 7–15.

Andersen, S.W. 1993: Æ vold. *Skalk* 1993 4: 9–13.

Andersen, S.W. 2023: Æ vold. Unpublished manuscript.

Brandt, K. 1974. Die Marschensiedlung Bentumersiel an der unteren Ems. Ein archäologischer Nachweis für die Anwesenheit römischen Militärs im frühen 1. Jh. n.Chr.Geburt. *Archäologisches Korrespondenzblatt 4*: 73–80.

Cour, V. la Cour 1929. Ollemersdiget.*Sønderjysk Månedsskrift* 1929: 49–54.

Christensen, K. 1983. Oldenborrer og årringe.*Nationalmuseets Arbejdsmark 1983*:163–174.

Christensen, K. 2012. *Analyse af årringsmålinger fra Olgerdiget med 4-årig periodicitet* (Unpublished report).

Christensen, L., 2006a. Olgerdiget, in.*J. Hoops Reallexikon der Germanischen Altertumskunde, Band 22*: 139–141.

Christensen, L., 2006b. Nye undersøgelser af Olgerdiget – en langvold fra jernalderen.*Sønderjysk Månedsskrift* 2006/I:3–10.

Christensen, L. 2014. Gensyn med Olgerdiget.*Arkæologi i Slesvig* 2014: 125–139.

Christensen, L. and Ethelberg, P. 2017. Unpublished posters about the Olger Dyke in the exhibition of Museum Sønderjylland, Arkæologi Haderslev.

Eriksen, P. og Rindel, P.O. (eds.). 2018: *Lange linjer i landskabet. Hulbælter fra jernalderen.*Jysk Arkæologisk Selskab 2018.

Ethelberg, P. 1992–1993. The Chieftans´ Farms of the Over Jerstal Group. *Journal of Danish Archaeology* 11: 111–135.

Ethelberg, P. et al. 2003. Gården og landsbyen i jernalder og vikingetid (500 f.Kr. – 1000 e.Kr.), in Ethelberg, P. N. Hardt, B. Poulsen & A.B. Sørensen. (eds). *Det Sønderjyske Landbrugs Historie. Jernalder, Vikingetid og Middelalder*. Haderslev Museum og Historisk Samfund for Sønderjylland 2003: 123–365.

Ethelberg, P. 2009. Frühe Königreiche. Machtkonzentrationen in Südskandinavien im 1.–4. Jahrhundert n.Chr., in S. Burmeister and H. Derks (eds). *2000 Jahre Varusschlacht– Konflikt:* Stuttgart: Konrad Theiss Verlag: 170–182.

Ethelberg, P. 2011. Grænselandets tidligste historie set i lyset af den første Rigsdannelse, in Furdal, K. Adriansen, I. Blond A. og Sørensen A.B. (eds). Årbog for Museum Sønderjylland 2011: 23–44.

Ethelberg, P und Kruse, P. 2012. Das Osterrönfeld-Haus: Status nach 10-jähriger Untersuchung. *Arkæologi I Slesvig*, 14: 103–130.

Ethelberg, P. 2020. Mellem angler og jyder i Kassø. *Arkæologi i Slesvig 18:* 159–177.

Fischer, T. 2014: *Die Armee der Caesaren. Archäologie und Geschichte*. Regensburg: Verlag Friedrich Pustet, GmbH.

Harck, O. 1979. Trælbanken ved Kærgård – et voldsted fra oldtiden. *Nordslesvigske Museer* 6: 29, ff.

Harck, O. 1989. Voldstederne på de nordfrisiske øer. *Sønderjyske Årbøger* 101 (1): 51–66.

Harck, O. 1990. *Archsum auf Sylt, Teil 3: Die Ausgrabungen in den römerzeitlichen Erdwerken Archsumburg, Tinnumburg und Trælbanken and der Westküste Schleswigs.*RGF 50, Mainz 1990.

Hvass, S. 1984. Trældiget. *Vejle Amts Årbog 1984*, 89–107.

Jensen, J.O. 2021. Dendrokronologisk undersøgelse af tømmer fra forsvarsværket Olgersdiget ved Bjerndrupvej nær Tinglev.*HAM 2959, Bjerndrupvej (FHM 4296/3367). Rapport nr. 42, 2021.*

Jensen, X.P. 2008. Vimose revisited- Perspektives and preliminary Results, in A. Abegg-Wigg und A. Rau (eds) *Aktuelle Forschungen zu Kriegsbeuteopfern und Fürstengräbern im Barbaricum. Schriften Des Archäologischen Landesmuseums Band 4*, Schleswig: 137–150.

Jørgensen, A.N. og Andersen, H.C. 2014: *Ejsbøl Mose. Die Kriegsbeuteopfer im Moor von Ejsbøl aus dem späten 1. Jh.v.Chr. bis zum frühen 5. Jh.n.Chr.* Aarhus: Aarhus Unviersitets Forlag.

Jørgensen, H. P. 1928: Olgerdiget. *Sønderjyske Årbøger* 1928: 132–151.

Jørgensen, H.P. 1951. *Uge sogn. Et grænsesogn igennem 1500 Aar*. Haderslev: A-S Modersmaalets Trykkeri.

Knudsen, S.A.A. and Rindel P.O. 1994. Trældiget – nye udgravninger. *Mark og Montre* 1994: 44–49.

Neumann, H. 1982. *Olgerdiget – et bidrag til Danmarks tidligste historie.* Skrifter fra Museumsrådet for Sønderjyllands Amt, 1. Haderslev: Haderslev Museum.

Ogdal, J. 2021. HAM 2959, Bjerndrupvej (FHM 4296/3367). Dendrokronologisk undersøgelse af træ fra forsvarsværket Olgerdiget ved Bjerndrupvej nær Tinglev. Afdeling for Konservering og Naturvidenskab, Moesgård Museum Nr. X, 2021.

Ogdal, J. 2022. HAM 6429, Olgerdiget (FHM 4296/3957). Dendrokronologisk undersøgelse af tømmer fra forsvarsværket Olgerdiget ved Uge Bæk. Afdeling for Konservering og Naturvidenskab, Moesgård Museum, Nr. 65, 2022.

Olesen, L.H. 2003. Rammedige – et forsvarværk fra jernalderen. *Holstebro Museums Årsskrift* 2003: 23–36.

Outzen, N. 1819. Geschichte des Herzogtums Schleswig Holstein oder Südjütland. Verlag von Kastrup, Flensburg 1819.

Pontoppidans Danske Atlas, 1768. bd. VII: 302.

Schmidt, J.N. 1846. Olgerdige og Frisergrænsen. *Antiquarisk Tidsskrift* 1846–49: 274–279. Geschichte des Herzogtums Schleswig Holstein oder Südjütland. Verlag von Kastrup, Flensburg 1819.

Schmidt, J.N. 1849. Urnehovedegnen. *Antiquarisk Tidsskrift* 1849–51: 47–57.

Seneca 43, L.A. Ad helviam matrem de consolatione, in*Philosophische Schriften 2. Dialoge VII-XII.* Lateinischer Text von A. Bourgery/R. Waltz. Translated into German by M. Rosenbach (Darmstadt 1971).

Stapel, E. 2011. Neue Forschungen zum germanischen 'Stapelplatz' von Bentumersiel an der unteren Ems. *Siedlungs und Küstenforschung im südlichen Nordseegebiet* 34: 293–306.

Steen, B. 2005. Stolpehulsbæltet ved Risum Østergård. *Holstebro Museum Årsskrift*: 15–27.

Steen, B. 2009. Forsvarsanlæg og bebyggelse ved Tvis Møllevej. *Holstebro Museums Årsskrift*: 5–16.

Tacitus 98. P.C. Tacitus, De origine et situ germannorum liber.Translated by N.W. Bruun/A.A. Lund, *Tacitus Germania I/II*, Wormianum (Århus 1974).

Tummuscheit, A. and Witte F. 2019: The Danevirke: preliminary results of new excavations (2010–2014) at the defensive system in the German-Danish borderland. *Offa's Dyke Journal* 1: 114–136.

Lisbeth Christensen, Museum Sønderjylland, Arkæologi Haderslev, Dalgade 7, 6100 Haderslev, Danmark

Email: lich@msj.dk