



Archaeological Excavation of a Lime Kiln at Nordy Bank Clee Liberty 2023



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Table of contents

Introduction	4
Part 1	5
Site Background	5
Geology	5
Location and topography	5
Site conditions	5
Aims	5
Method	5
Historic background	7
Results	7
Trench 2	9
Trench 3	11
Trench 4	13
Discussion	15
PART 2.....	16
Sources consulted	13



Table of figures

Figure 1 – Site location.....	4
Figure 2 – Trench locations	6
Figure 3 - Trench 1 section	9
Figure 4 - Trench 2 plan, ditch [202] not excavated.	11
Figure 5 - Trench 2 S facing section.....	11
Figure 6 - Trench 3 plan	13
Figure 7 - Trench 3 E facing section.....	13
Figure 8 - Trench 4 NW facing section.....	15

Table of plates

Plate 1 – Trench 1 excavated to buried topsoil (103) lkg SE. 2 x 1m scale.....	8
Plate 2 - Metal object from topsoil (107) Trench 1. Scale in cms.	9
Plate 3 - Trench 2 looking NE, general view	10
Plate 4 - Ditch [202] and stone bank (203). 1m scale	10
Plate 5 - Trench 2 fully excavated showing S facing section. 1m scale.	11
Plate 6 - Trench 3 general view looking NW. Stone layer (307) clearly visible on side of bank.	12
Plate 7 - Trench 3 looking S. Ditch [302] filled with dark silt (309) in foreground cutting stony natural geology (201). 2 x 1m scales.	12
Plate 8 - Trench 4 looking NW. 1m scale.	14
Plate 9 - Trench 4 SW end looking S showing redeposited white clay (407) overlying dark clay (403). 1m scale.....	15



Introduction

This report has been produced by Matt Williams of Fearn Heritage and Archaeology as part of the Our Upland Commons Project (OUC). It describes the results of an archaeological trench over part of a lime kiln adjacent to Nordy Bank, Clee Liberty (hereafter the 'Site') in the north west of Clee Liberty Common (Figure 1).

The fieldwork was carried out from the 5th to the 12th June 2023. All work was carried out in accordance with the Written Scheme of Investigation (WSI) prepared by Fearn Heritage and approved by the landowners, Clee St Margaret Parish Council.

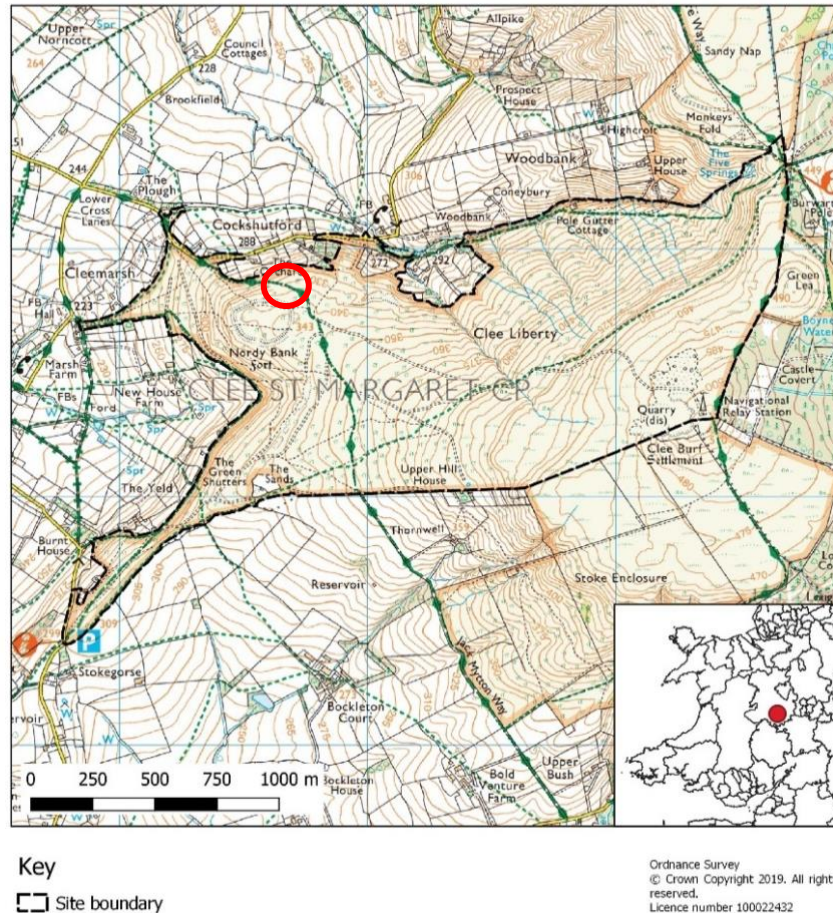


Figure 1 – Site location

Thanks are due to all the volunteers who participated in the excavation and recording: Polly Bolton, Guy Cholmeley, Clive Fisher, Nicky Fisher, Greg Forster, Ian Heighway, Mariel Lubman, Judi Major, David Maer, Chris Moore, Claire Nicholson, Bernard O'Connor, Gary Trim, Helen Paris, Chris Thom, Pamela Thom, Lucy Wells and Rob Woods.

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Site Background

Geology

Nordy Bank is located on lower Devonian 'Old Red Sandstone' deposits with some limestone at the east end; this is where several lime quarries and kilns are located. Upper Devonian Old Red Sandstone (Maughans Formation) deposits lie further to the east as the ground rises towards Clee Burf. Higher up the slopes, the sandstone is overlain by further Carboniferous Limestone (BGS, 2021), which was quarried extensively at the top of Clee Burf and Brown Clee.

Location and topography

The Site is located on the north side of the track which runs along the north side of Nordy Bank hillfort (Figure 1). The land slopes down to the north and west, and up towards Clee Burf to the east. To the southwest is the hillfort and there are further kilns and limestone quarries directly south.

Site conditions

The lime kiln is visible as a horseshoe shaped mound next to the track. It appears collapsed as the roof was broken out to get the lime when the final burning was complete. It is now covered in thin topsoil with low vegetation (grass and bracken) and there is some erosion on the south and west sides from sheep tracks.

Aims

One trench was excavated over the west interior half of the kiln feature.

The aims of the lime kiln excavations were:

1. to gain information on the construction method of the structure
2. to examine the form and type of the kiln
3. to recover artefacts that may aid the interpretation.

Method

Three kilns were identified as possible excavation Sites in the Written Scheme of Investigation (WSI). No clear evidence for a kiln could be seen in location 1; the kiln at location 2 appeared to have been truncated by the track and therefore the kiln at location 3 was chosen for excavation.

One trench was excavated by hand over the inner side of the west half of the kiln. Plans and sections were drawn a suitable scale and a photo register was maintained. A full description of the archaeological methodology is within the WSI (Fearn Heritage 2022).

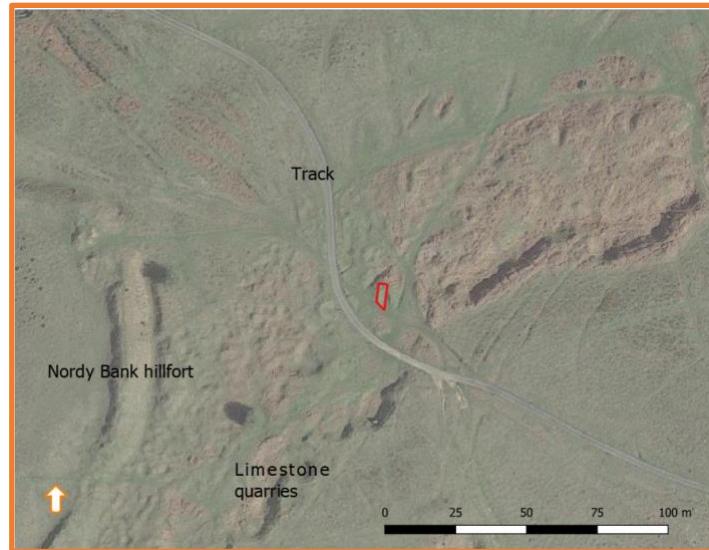


Figure 2 – Trench location



Figure 3 - Trench location detail showing kiln



Figure 4 - Kiln looking northwest prior to excavation



Historic background

Lime (calcium carbonate, sometimes known as 'quicklime'), is produced by burning limestone or chalk at temperatures above 900°C. From the Roman period until industrialisation in the 18th century, this process was carried out in lime kilns which were often located close to the lime source (HE 2018,3). There were three main types of early kiln: the most basic was a clamp kiln, which was essentially a mound of layers of limestone and fuel covered in clay or turf and left to burn before being dug out; a flare kiln consisted of a circular pit with stone or clay lined sides and a flue. Limestone was placed on a grate in the circular pit and covered over, and a fire was lit at the end of the flue. This type of kiln was only fired once before the lime was raked out; the final type was a draw kiln where limestone and fuel could be fed in to the top of the kiln and lime could be continually drawn out from the base (HE 2018, 5). The form of the features at Clee Liberty suggests they are flare kilns.

The dates of the lime kilns on Clee Liberty are not known but the lack of evidence for Roman activity in the area suggests they post-date the Roman period. The Foresters' accounts of the 13th century do not refer to coal or limestone quarrying (Rowley 1970, 59), this may be because the works were small scale and had no significant commercial value. However, in 1540 Leland wrote in his 'Itinerary' '*There is no great plenty of woods in Clee Hills yet there is sufficient wood. Plenty of Cole Yearth stone nether exceeding and good for lyme whereof they make much and serve the contre about*'. (Rowley 1970, 59). It infers that lime (*lyme*) was produced at the time by quarrying limestone and burned using coal (*Cole Yearth*) and used in the surrounding countryside as soil improver.

Results

The kiln consisted of a horseshoe shaped mound measuring 15.00m N-S, 9.70m E-W and 0.90m high, with the opening facing south (see Figure 3). One trench, aligned approximately NNW-SSE, was excavated over the west interior side, measuring 9.00m long (N-S) and 3.10m wide (E-W). The kiln appears to have been dug into a mound of soil and the high sides were on the north and east sides of the trench. At the base of the east end of the trench was the main kiln 'pit and running south from this was the flue.

The topsoil (101) was about 100mm thick. On the high sides of the kiln in the north of the trench it overlay a small area of mid grey stone grit and a substantial deposit of pale grey silt clay (102), up to 0.21m thick. Neither deposit showed evidence for burning/heating and are therefore interpreted as backfill. At the same level on the side next to the flue were thin deposits of mid orange grey clay with flecks of coal (104), mixed clay and coal fragments (105) and a mid brown red clay (106). Below (102) in the flue was a 0.20m thick deposit of hard brown silt with occasional coal flecks (108). It had been heat affected and was partly scorched to a mid orange yellow. These deposits are interpreted as remnants of clearing out the kiln.

The surviving kiln structure consists of a heated and hardened mid brown silt soil surface within the flue (112) and a wall of burnt and vitrified granite (113) around the main kiln pit. The wall (113) was one stone wide, approximately 0.20m. Six courses were exposed with a total height of 0.65m. The kiln base was not exposed although the break of the slope at the base of the exposed wall suggested that it was perhaps 200mm deeper.

The wall (113) was at the north end of a long cut [114] that comprised the kiln pit in the north and the long, narrow flue running south. The cut had steep, straight sides and was excavated to a maximum depth of 0.65m and a length of 4.91m. It was cut into pale brown clay silt (109) which had been scorched to a mid orange behind the stone structure (113). Within the cut and around the wall was a scorched orange silt (110). In the south of the trench was a flue clearance deposit of brown silt with coal flecks (107). This overlay a pale yellow grey silt (111) which was equivalent to (109). Along the edge of the cut [114] was stone rubble (115) which may have been part of the original structure, but had been disturbed and demolished. There was no demolition rubble in the north of the trench.



Figure 5 - Pre-excavation, looking north



Figure 6 - Post excavation, looking north



Figure 7 - Post excavation, north end of trench. Looking east



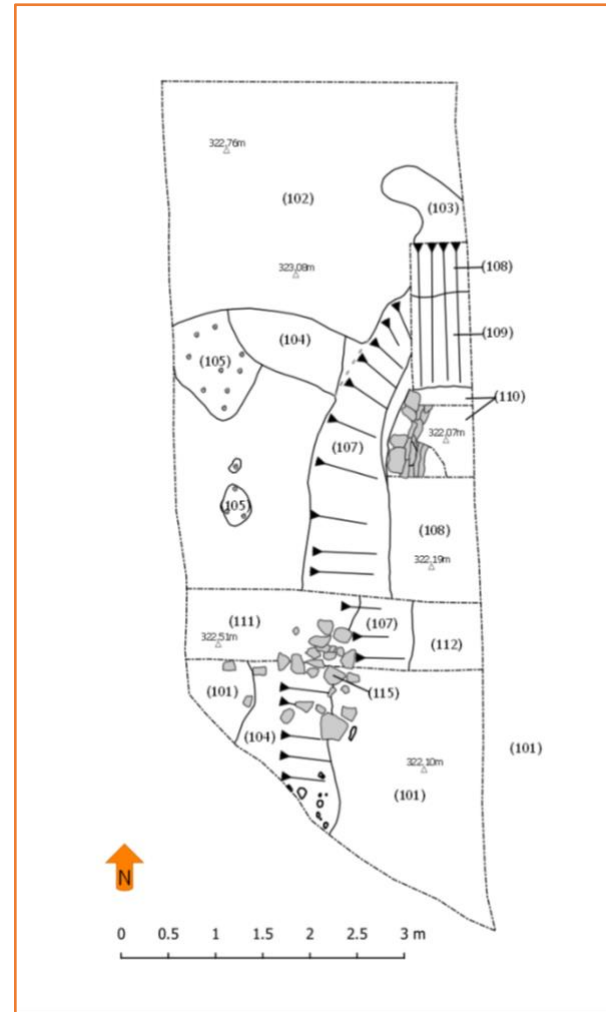
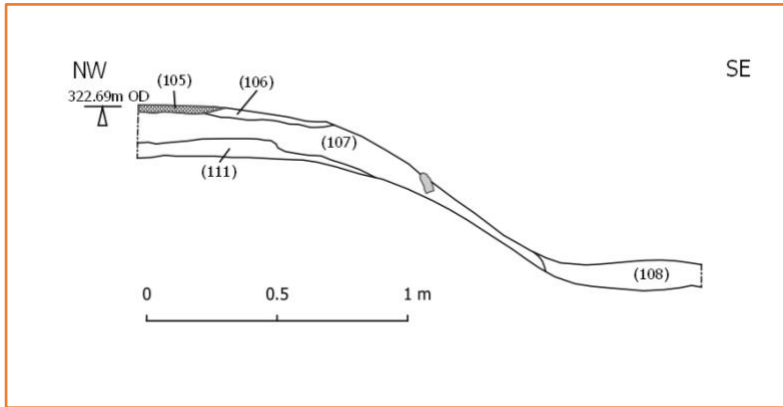
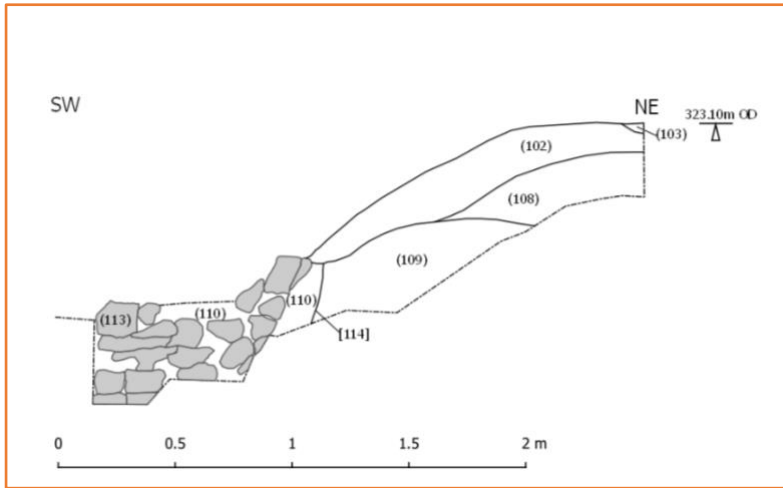
Figure 8 - Stone kiln structure (113), looking northeast



Figure 9 - Stone kiln structure (113) detail. 1m scale



Figure 10 - Stone rubble (115) in flue area, looking north. 1m scale.





Finds and environmental samples

No finds were recovered during the excavation.

Two bulk samples were taken. The aim of the samples was to recover charcoal from the flue deposits so that a C14 date could be obtained. Both samples were floated using a 1mm mesh.

Context/description	Volume	Result
(107) Mottled brown silt Kiln clearance	15l	Modern grass roots Coal fragments (4g)
(110) Orange red clay with coal flecks Fill around kiln wall.	12l	No artefacts or ecofacts

No charcoal was recovered from the samples; however, several fragments of coal were recovered from the kiln clearance (107) which indicates that coal, rather than wood or charcoal, was used as fuel for the kilns.

It is recommended that the coal fragments are discarded.



Figure 11 - Coal fragments from deposit (117). 1cm scale divisions.



Discussion

The feature consisted of a long, narrow cut with a rounded 'kiln pit' cut into an existing mound of soil. A granite face was constructed at the rounded end; this probably supported a grate onto which limestone and fuel was placed. This would have been lit and covered. When the limestone was burned and the kiln cooled the covering would have been removed and the lime, mixed with fuel ash, removed.

The flue ran approximately south from the kiln pit. There was evidence for a scorched surface just below ground level and stone rubble to the side suggested a fairly crude structure, although it had been demolished.

There was no dating evidence from the kiln. The environmental sample from the clearance deposit has demonstrated that coal was used to fire the kiln; this may have been mined from the deposits on Clee Liberty.

The trench has evaluated the location and condition of the kiln. There is some well preserved surviving structure but is it very deep within the mound. The full extent of the structure was not revealed and it is likely that there is a well preserved base running from the pit and into the flue. Further excavation on this feature could reveal the full extent of the structure.

Dating the kiln is very difficult as pre-industrial structures like these were used from the Medieval period onwards. A comparative structure was excavated in 2003 (concave stone walled kiln pit, crude stone flue) at Brodrick Castle, Arran – the form suggested a Medieval date but finds showed it to be 19th century (Alexander et al 2004). Further investigation into comparative sites in the West Midlands may shed light on the date of the Nordy Bank kilns.



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