

Investigation of a multi-period site at Chapel Fell, Malham Tarn, North Yorkshire, SD885 675



Ingleborough Archaeology Group

2016

**Investigation of a multi-period site at Chapel Fell,
Malham Tarn, North Yorkshire, SD885 675**

David Johnson

Yorkshire Dales National Park Authority Report SYD 14923
and Event EYD 15543

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Last, and by no means least, the committee gratefully acknowledges the financial support of the Robert Kiln Trust.

Abbreviation

IGML&A Ironbridge Gorge Museum Library and Archive

Summary

Various archaeological features on Chapel Fell, Malham Tarn, were investigated by Dr Arthur Raistrick in the mid 1940s and early 1960s and interpreted by him as a medieval chapel, three late prehistoric (Iron Age) 'huts', two 'earth circles' and a 'bank'. The current project aimed to reassess and build upon his findings by selectively excavating within the putative chapel – both where he had and had not excavated – and the three circular features. The project found that the supposed chapel was definitely not medieval and that detailed internal features he described were absent. Two of his 'huts' were confirmed as roundhouses, though no dating evidence was found, but the third was proven as a sow kiln – an early type of clamp lime kiln. This was radiocarbon dated to the early modern period. The most likely interpretation of the supposed medieval chapel is that it was a nonconformist chapel started but quickly abandoned in the run up to the Civil War in the 1640s.

1. Site Location and Historical Context

The Chapel Fell complex sits 150m to the north-west of the National Trust's offices and workshops at Waterhouses (Fig. 1), just north-west of the road from Langcliffe to Arncliffe, on Open Access land under the CRoW Act 2000. The valley lies within Malham Moor civil parish, in the Yorkshire Dales National Park.

The site is centred on NGR SD885 675.

Archaeological features here were first recorded by Dr Arthur Raistrick in a monograph of 1947 (Raistrick 1976, 113) and excavated by him in 1964 during one (or more?) of his Field Archaeology Courses at the Malham Tarn Field Centre. It was also recorded by the Ordnance Survey Archaeology Division (OS 1962, 1964, 1968 and 1977); and was again picked up by the Yorkshire Dales Project aerial mapping programme between 1989 and 1992 (Macleod 1991). It is currently noted on the Yorkshire Dales National Park Authority (henceforth YDNPA) Historic Environment Record (HER) as monument number MYD3758, as a 'Medieval chapel on the site of an Iron Age settlement, surviving as earthworks'; and MYD 1362 'Probable Iron Age settlement, comprising hut circles, seen as earthworks'.



*Fig. 1 Location of Chapel Fell.
The white star marks the excavation site (© Ordnance Survey)*

The site lies within Field number SD88682002 in the south-east corner of Chapel Fell.

Features already recorded on the YDNPA HER are shown on Fig. 2. Those sites recorded on the HER prior to this project, within the general vicinity of the site investigated, and as shown on Fig. 2, are summarised in Table 1.

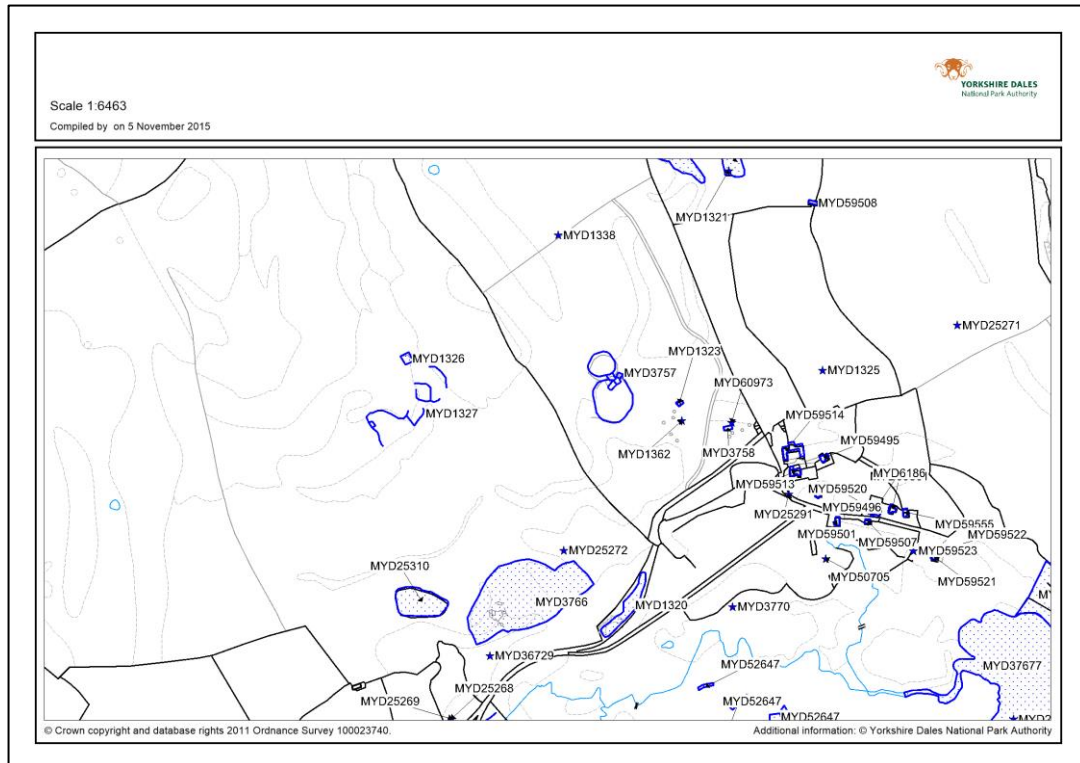


Fig. 2 Sites recorded on the YDNPA HER as at 5 November 2015

Table 1 Data entered on the YDNPA HER prior to the project

Monument no.	NGR	Description
MYD	SD	
1323	8840 6756	Demolished building, possible barn, unknown date
1326	8722 6764	Ruined sheepfold, possibly medieval
1327	8792 6755	Earthwork enclosures, prehistoric or Roman
1328	8821 6810	Former field boundaries, possibly medieval
1362	8841 6753	Probable Iron Age settlement
3757	8828 6759	Possible medieval farmstead
3758	8849 6751	Medieval chapel on site of IA settlement
3766	8814 6720	Iron Age/Romano-British settlement
25272	882 673	Neolithic/Bronze Age flint-working site
25310	8794 6720	Large ruinous walled enclosure
36729	8806 6711	Mesolithic tool assemblage, Chapel Cave
60973	8849 6753	Probable sow kiln

Thus, contained within the Chapel Fell walled field, apart from the monuments to be investigated, there are four recorded monuments: one of unknown date (1323), one assumed to be of Iron Age date (1362), and two assumed to be medieval (1328 and 3757). MYD 60973 was first noted by this writer in August 2015 and, on the basis of his previous surveys and excavations of similar features, it was entered in the HER as a putative sow kiln. MYD 3758 is the chapel site.

Various past archaeological events have been recorded on Chapel Fell:

1. Raistrick's excavations of the chapel site (EYD 4326) and assumed Iron Age site (EYD 4364) in 1964;
2. Aerial photography by the Cambridge University Committee for Aerial Photography (EYD 11073 in 1971 and EYD 11155 in 1973);
3. Field survey at a scale of 1:2500 by the Ordnance Survey Archaeology Division in 1964, 1968 and 1977 resulting in Field Investigators' Comments on each occasion (SYD 3).
4. Aerial photography by the YDNPA in 1995 (EYD 14964, 14966, 15070 and 15071).

Historical Background

Much of the land on Malham Moor was granted to Fountains Abbey by major landowners: the area called *Gnoup* (or Knipe) – possibly what is now Fountains Fell and Knowe Fell – along with *Dernbroc* (Darnbrook), *Suartecombe* (between Fountains Fell and Darnbrook), *Laghals* (probably Rainscar), *Ulfkil Cross* nearby, *Braidewides* lands to the boundary with Litton, *Eseldene* (Heselden) and as far west as the *Lonsdall* road (now Henside Road) – was gifted in 1251 by Matilda, Countess of Warwick and daughter of the magnate William de Percy. Elsewhere on *Malhgamora* (Malham Moor) Alice de Rumelli confirmed grants of her rights and claims to the Abbey. William de Percy granted Fountains *Malewater* and the ‘fishery thereof’ in pure and perpetual alms, valuable property previously confirmed to the Abbey in 1175 (Lancaster 1915, *passim*). Thus, much of Malham Moor was in the hands of Fountains from the late twelfth century to Dissolution in the 1530s including *Malewater* which later became known as (Malham) Waterhouses, so Chapel Fell must have been included within this particular possession.

Arthur Raistrick’s Investigations

It is, no doubt, for this reason that Arthur Raistrick wrote (1947, 113): ‘We have no documentation for the name of Chapel Fell beyond a very rare reference in the earlier charters [of Fountains Abbey] to the chapel of Malham Moor, and to “Chapell House” ... but on the fell shoulder not far above the road are the foundations of a very early building which are by tradition ascribed to this chapel (Fig. 3). *Examination of the site goes far to confirm this tradition*’ (this writer’s emphasis). Elsewhere Raistrick recorded his excavation, in 1964, of a rectangular building 45 feet (13.8m) by 23 feet (7m) with walls 2 feet 3 inches (0.68m) thick standing 2 feet 9 inches (0.84m) high, ‘well made of boulders laid in lime’ (Raistrick 1964, 327). He stated that it had been dismantled at Dissolution and that he had unearthed broken slate of the type from a ‘Fountains Abbey leased quarry at Austwick’. The building, he wrote, had a broad paved dais at the east end on which would have stood the altar with the rest floored with large cobbles. Oddly, though, a later edition of the same book described this structure as being 90 feet (27.6m) by 45 feet (13.8m), with a doorway at the south-west corner ‘very well framed with two steps’ (Raistrick 1976, 122).

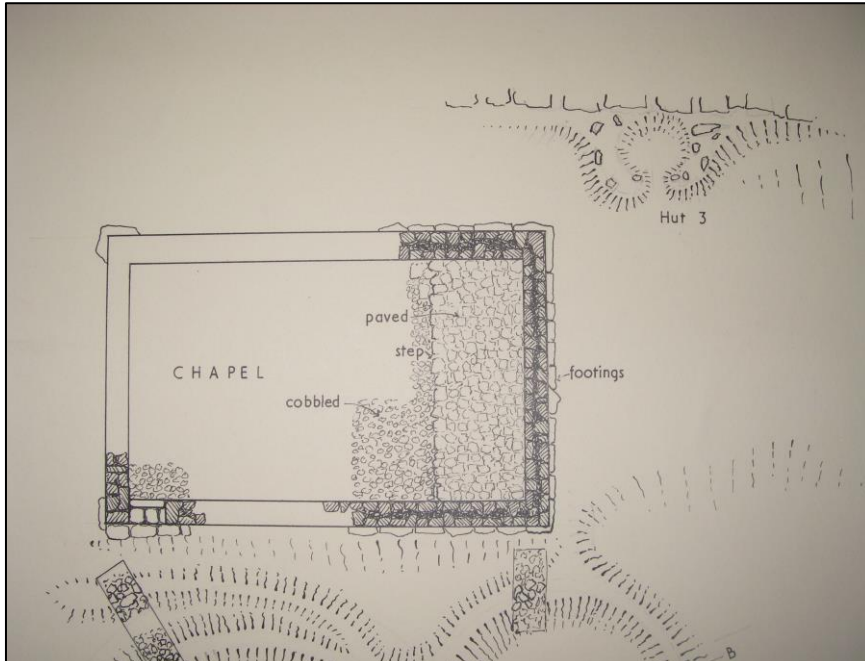


Fig. 3 Raistrick's excavation plan of the putative medieval chapel highlighting his two excavation trenches. Source IGML&A

The 'chapel' lay within an Iron Age settlement consisting of four 'huts' which revealed fragments of assumed Iron Age ceramics (Fig. 4).

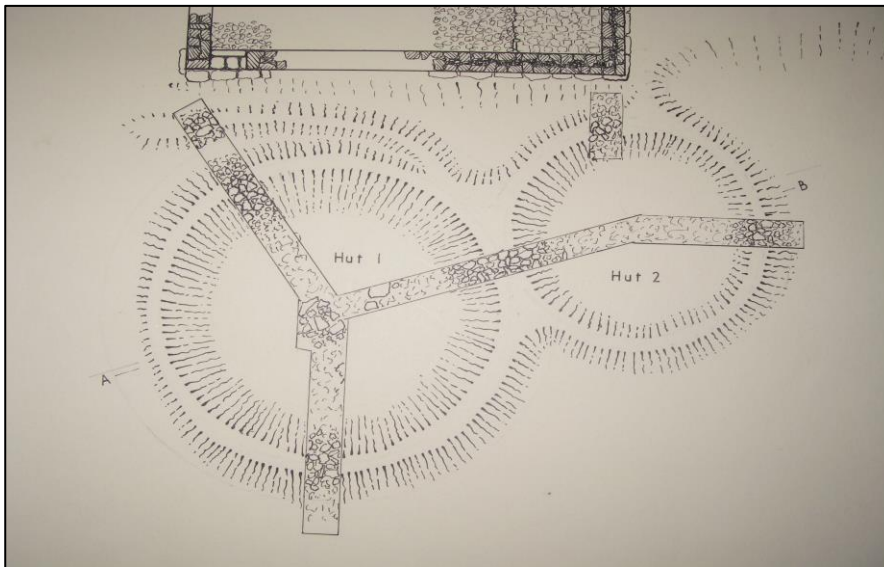


Fig. 4 Raistrick's excavation plan of two of the 'huts' with his excavation trench marked. Source IGML&A

In a later summary he reported a complex in the vicinity of the 'chapel' consisting of seven circular 'huts' which revealed charcoal, unidentified pot sherds, flint and pot-boilers. One hut that he excavated, with an external diameter of 26 feet (7.9m), had a hearth stone. (Raistrick 1968, 114) (Fig. 5).

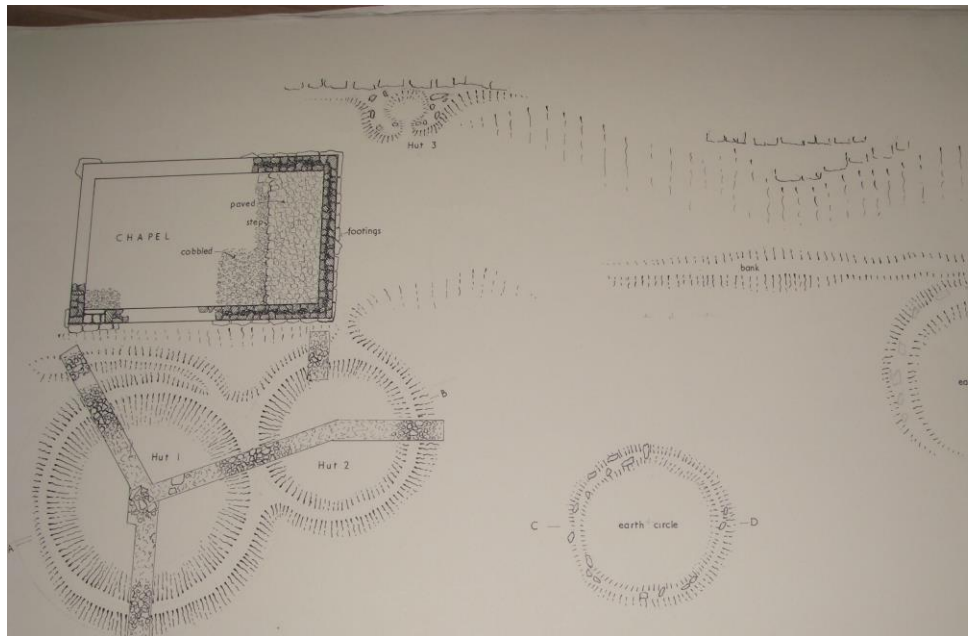
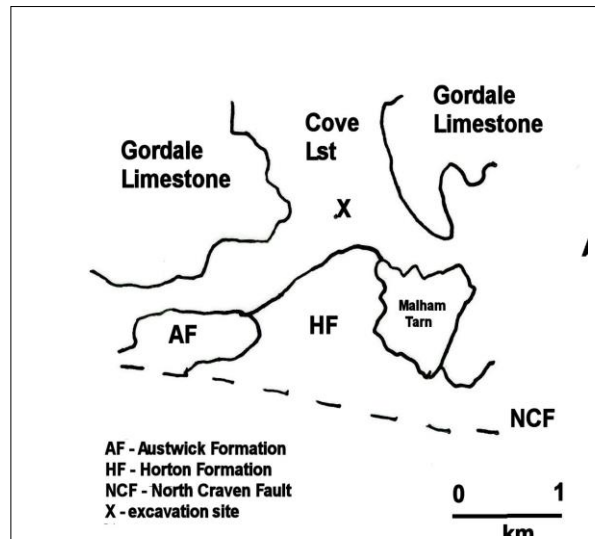


Fig. 5 Raistrick's excavation plan of the entire complex showing the 'chapel', three 'huts', two 'earth circles and a 'bank'. Source IGML&A

2. Geology and Topography

This part of Malham Moor is grounded on Carboniferous Great Scar (Cove) Limestone strata (Fig. 6), though to the south-east of the road Silurian Horton Formation rocks have been exposed by erosion northwards from the North Craven Fault. On parts of Chapel Fell (which itself is part of Knowe Fell) limestone outcrops at the surface forming discrete exposures with a prominent scar to the south-west that contains Chapel Cave.



*Fig. 6 Simplified solid geology
(based on British Geological Survey mapping)*

The site to be investigated lies at an altitude of 400m OD with the ground surface rising gently immediately WNW of the site to the top of Knowe Fell at the base of the foothills of Fountains Fell. The ground surface is broadly level from the excavation site towards the east and south-west, but beyond the road dips to Tarn Moss at c. 380m.

Apart from Waterhouses, the area northwards and westwards from the site is now very sparsely populated with a thin scatter of farms and former farmsteads at Stangill, Tennant Gill, Forna Gill, Trenhouse and Capon Hall, with three of these still-working farms.

Chapel Fell lies outside the Malham-Arncliffe Site of Special Scientific Interest (SSSI) and outside the Malham Tarn National Nature Reserve (NNR); it also lies outside the Craven Limestone Complex Special Area of Conservation (SAC); but is at the south-eastern corner of the Chapel Fell and Darnbrook Fell Limestone Pavement Order (LPO) area (Fig. 7).

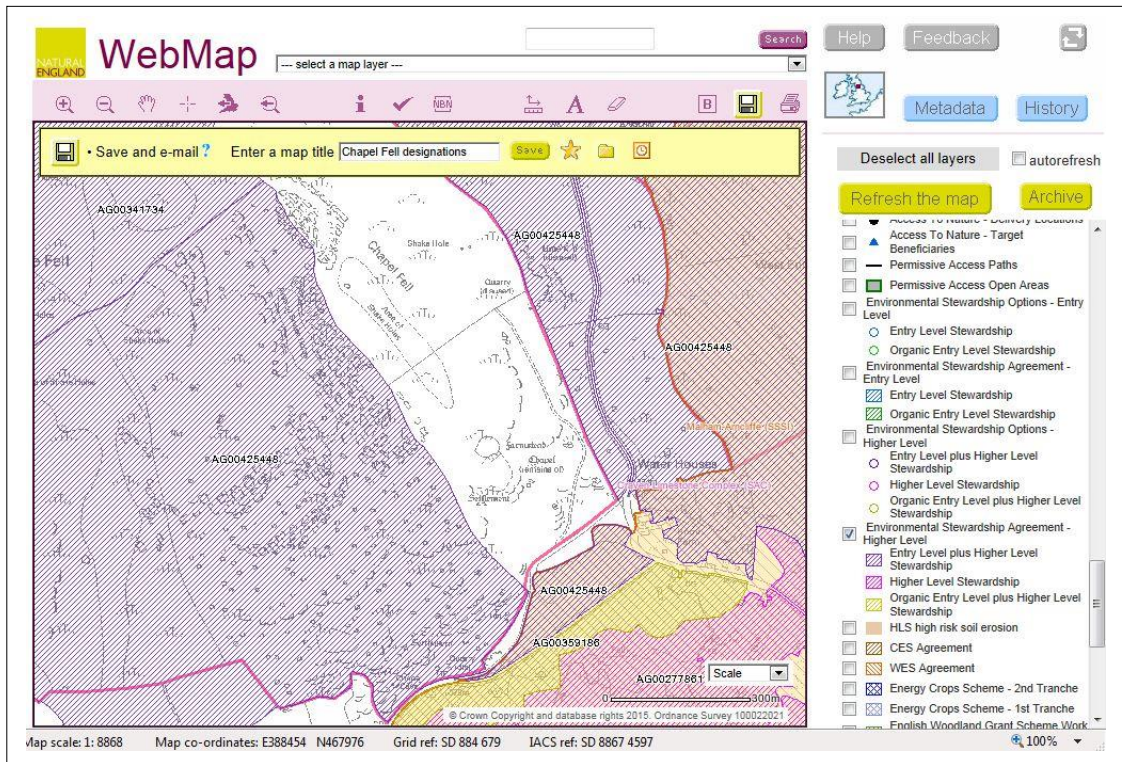


Fig. 7 Applicable statutory designations. The pink line marks the boundary of the LPO area.

© Natural England

Chapel Fell is privately owned, by Mr and Mrs F.R.A. Caton of Weston Hall Farm, Weston, Otley. The field is not subject to either an Entry Level or Higher Level Stewardship Scheme agreement.

3. Site Description

The most prominent features in the complex are visible on the ground as an obvious rectangular structure, two rounded banked structures, and a penannular sow kiln-type earthwork. The rectangular structure (Raistrick's medieval 'chapel'), Feature 1 (Figs. 8 and 9), is adjacent on its south side to two of the late prehistoric banked structures/enclosures noted by Raistrick (Feature 2 and Feature 3, Fig. 10), but it does not share a common wall and, having clear stone wall footings, is of very different constructional form; about 5m separates Features 2 and 3 from Feature 1. The potential sow kiln (Feature 4, Fig. 11) lies less than 10m to the NNE of the north-east corner of the Feature 1, and about the same distance SSW of a small quarried face. This kiln was marked on Raistrick's excavation plan as Hut 3 (see Figures 3 and 5).

A photograph taken in 1992 by this writer (see Figure 9) shows the wall footings of Feature 1 clear of turf. This is assumed to be an enduring result of Raistrick's excavations in 1964 and a failure to reinstate the vegetation, a reality paralleled by what the Group found during its 2013-14 work in Crummack Dale where he had also excavated. Here, too, vegetation had not yet re-colonised structures he had investigated.



*Fig. 8 Feature 1 (October 2015), looking south-east.
The walls are fully grass covered.*



*Fig. 9 Feature 1 (August 1992), looking east. The walls then had minimal turf cover.
The quarry working is visible towards the field wall, top left. (David Johnson)*

Externally, prior to excavation, Feature 1 measured 14m on its long E-W axis by 7m on the short N-S axis. Feature 2 lies just south of it and was externally measured c. 10m by 10m, and is contiguous with Feature 3 which was measured c. 7.5m east-west by 2.5m north-south.



*Fig. 10 Feature 2 (October 2015).
The 2m-ranging poles are sited on the southern bank.*



*Fig. 11 Feature 4, with part of the quarry working face
in the background (October 2015)*

4. Research Themes and Objectives

The project was conceived to investigate the following aims and objectives, as outlined in the Project Design (IAG 2015).

1. The **relationship** between the four structures. Was it possible to identify if the putative sow kiln was coeval in use with the rectangular 'chapel' structure? After all, lime mortar is evident in its foundation walling. Likewise, did the two banked structures prove to be of Iron Age date, as suggested by Raistrick, or coeval with the 'chapel', or entirely different?

2. The structures' ground plans and detailed **internal morphology**, including walls, with the aim of determining constructional methods and materials. For example, were the internal floors of Features 2 and 3 earthen, paved or set on bedrock; were their stone-cored banks built in one constructional phase; were the surviving banks the base for supporting walls and a roof or were they open structures; were roofing postholes discernible; were there entry points into the two structures, and could external thresholds be identified?

3. The detailed internal form of the 'chapel'. Raistrick reported that the floor was solid – part paved and part cobbled – and that there was a raised (altar?) dais at the eastern end, so excavation would have confirmed or refuted this.

4. The original **function** of the two banked structures. Were they buildings or stock enclosures?

5. The postulated sow kiln. Was evidence found by excavation to prove that it was a lime kiln; how did it fit into the **typology** of early lime kilns formulated and published in Johnson (2008); and what was its internal and external constructional form?

6. **Dating** evidence. Did geophysical surveying suggest the presence of internal hearths in Features 2 and 3 with charcoal deposits suitable for AMS radiocarbon dating (or any other suitable method of dating such as stratified ceramics), thereby enabling the site to be fitted into the assumed chronology of settlement in the southern Dales based on other known sites, and confirming if Raistrick's assumptions are valid? Was secure datable evidence found within the putative kiln?

7. It was hoped that **environmental** samples would be obtained from within the vicinity to enable examination of pollen and soil mineral composition, thereby helping in the reconstruction of past environments here. Dr Paul Humphreys, Reader in Applied Microbiology at The University of Huddersfield, and PhD student, Richard Wormald, undertook microbiological analysis of deposits in the kiln.

8. As with all IAG projects, beyond these practical and research issues, the project also aimed to further the practical **skill set** of participants, to extend their knowledge of sites such as this one, and to make available to the wider general public and researchers the results of this investigation.

9. As the site lies within the civil parish of Malham Moor, which has its own Local History Group in Malhamdale, invitations were extended to its membership at all practical stages of the project.

5. Methodology

Desk-based Assessment

Apart from what has been noted above, very little published or grey material has been located that is of direct relevance to Chapel Fell but an archival and grey material trawl was undertaken as part of the overall project. Detailed documentary and cartographic research in the Raistrick Archive at Ironbridge Gorge Museum Library and Archive also formed an integral part of the work undertaken. According to the combined Raistrick Archive catalogue, there are no relevant documents at either Craven Museum in Skipton or Special Collections at Bradford University Library, but a double check was undertaken prior to the fieldwork phase. His excavation plans were found and seen at Ironbridge, though no excavation or field notes materialised. Enquiries were also made to see if any surviving participants in Raistrick's field courses held at Malham Tarn Field Centre in the 1960s took part in his excavations: one such person (Leslie Bloom) was identified and he paid a visit to the site.

Total Station and Measured-plan Surveys

A tape-and-offset measured survey plan was drawn of the site and its four main structures as part of the project prior to the actual excavation, following English Heritage guidelines (English Heritage 2010, 6-7). IAG members undertook this element as well as a full Total Station site survey.

Geophysics

Geophysical surveying – magnetometry and resistivity – of a grid based round Features 1, 2, 3 and 4 was undertaken prior to excavation, with the aim of surveying the structures and the area between and around them. This was contracted out to Ann Wilkinson of Siddal Geophysical Services (see Appendix 3).

Excavation

Six trenches and two test pits were opened.

- a. Trench 1 was laid out within Feature 3 (Raistrick's Hut 2), designed to take in one section of the stone-cored wall bank, and to see if a floor surface could be determined. A strong, linear geophysical signal was registered and was incorporated within the trench.
- b. Trench 2 was laid out in Feature 4, the putative sow kiln (Raistrick's Hut 3), and took in the western half of the feature. Again, geophysics was the key locational determinant here.
- c. Trench 3 was laid out at the east end of Raistrick's assumed chapel (Feature 1), designed to test his findings that the floor was solid with a raised dais at the eastern end, as well as to examine the morphology of the east gable and eastern ends of the side walls.
- d. Trench 4 was set out in the north-western corner of the 'chapel', where Raistrick's plan suggested he had not excavated, aimed at identifying a floor surface and examining the details of the west gable and side walls, both inside and outside the building.
- e. Trench 5 was laid out to encompass what Raistrick described as a doorway into the 'chapel' at its south-west corner.

f. Trench 6 was laid out in the centre of Feature 2 (Raistrick's Hut 1) centred, as far as it was possible to determine, where he had located and excavated a hearth: the intention was to re-assess his findings.

g. Two 1m by 1m test pits were dug, both to investigate magnetic anomalies identified by geophysical surveying: one was cut within the 'chapel' towards its south-west corner but away from Trench 5; the other within Feature 3, half way between the southern arc of its perimeter wall and the central point.

h. Procedures on site adhered to the *General procedure for opening, excavating and closing trenches*, compiled by Mark Hewitt, Wildlife Conservation Officer for the YDNPA, in 2013; and ClfA's *Standard and guidance for archaeological excavation* 2014.

i. Turf and top soil were removed by hand and were stored on Visqueen sheeting. No wheelbarrows or machinery were used. Topsoil was stored separately from subsoil. Turves were stacked around the spoilheaps grass-to-grass and soil-to-soil to form a retaining wall for the soil. Each trench had its own discrete spoilheap.

j. Each trench was photo-cleaned, digitally photographed and planned using 1m x 1m planning frames at regular intervals as determined by excavation. A detailed digital photographic record was compiled at all stages of the project and has been archived in accordance with ClfA guidance.

k. Excavation was furthered using hand-trowels.

l. Proforma Context Recording Sheets were compiled and archived as per IAG's normal practice.

m. All artefacts were given a small finds number and logged and bagged according to best practice for post-excavation analysis.

n. Regarding any obviously modern items unearthed during excavation, the retention/discard policy adopted was to record them as objects in the site book but not to assign individual small finds numbers, and not to physically retain them in the Project Archive.

o. All trenches were backfilled and the turf relaid after completion of each trench. Undertaking the excavation in late spring gave time during the summer for the turves to knit and grow. Topsoil was replaced after subsoil and any other material such as stone. Monitoring over the ensuing summer ensured that stock disturbance and weed infestation were minimised.

p. A site book was maintained by the excavation supervisor and has been lodged in the Project Archive.

q. A full Project Archive has been compiled and is kept in IAG's facility in the Ingleborough Community Centre at Ingleton. It is accessible by arrangement with the Secretary through the Group's website. Copyright is retained by IAG.

6. Results

The large rectangular structure, Feature 1 (Raistrick's 'chapel'), was investigated by laying out Trench 3 at the south-east corner, Trench 4 at the north-west corner, and Trench 5 across the doorway in the south-western corner, in addition to Test pit 1 within the structure's interior.

The two circular structures – putative roundhouses – were subjected to investigation by excavation, with Trench 1 laid out along part of the southern edge of Feature 3 (Raistrick's 'Hut 2'); and Trench 6 centred within Feature 2 (Raistrick's 'Hut 1') where Raistrick's excavation plan suggests he found a hearth. Test pit 2 was cut within Feature 3.

The potential sow kiln, Feature 4 (Raistrick's 'Hut 3'), was investigated in Trench 2.

Trench 1

Four contexts were delimited within Trench 1: Fig. 12 shows the final contexts and Fig. 13 the trench on completion of excavation.

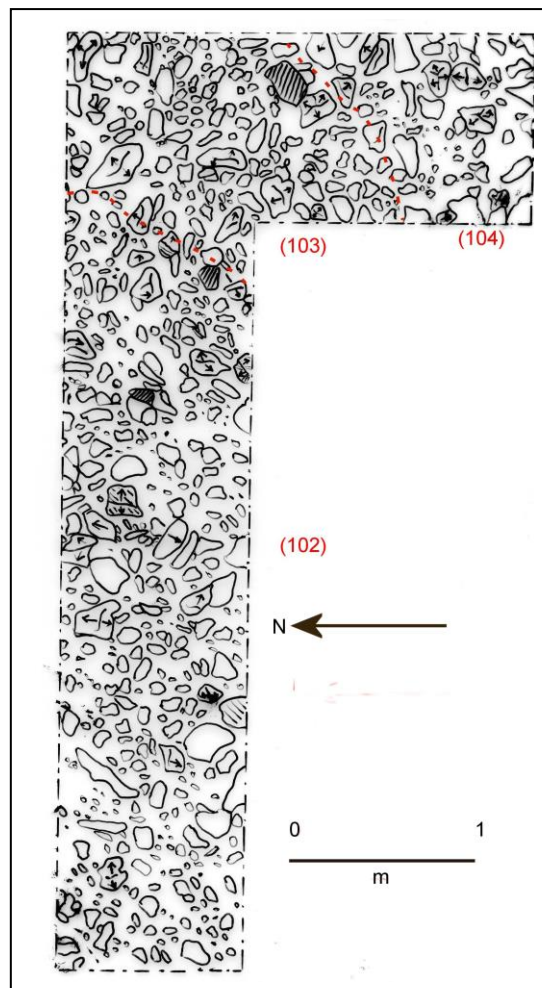


Fig. 12 Trench 1, final contexts. Sandstone is shaded



Fig. 13 Trench 1 on completion of excavation, looking west with the roundhouse wall running away from the camera

Context 101 was composed of unconsolidated, very dark brown clayey silt topsoil with only 15 per cent humic content, no more than 0.1m in thickness. It covered the whole trench, though with variable thickness. Finds logged within (101) were dominantly small pieces of fractured and heat-reddened sandstone (sf 125, 129-30, 132-42) interpreted as pot boilers; average sizes varied. Sf 126 was a small flint lithic.

Once (101) had been trowelled off, Context 102 was exposed as the top surviving surface of the perimeter wall bounding the southern arc of the roundhouse. Its total length within the trench was 2.7m on its inner face and 3.6m on the outer; width was a generally uniform 1m. It had been constructed using angular limestone cobbles with a few angular pieces of sandstone scattered among the limestone: four such pieces were of note during excavation as well as one flagstone piece 0.7x0.8m in size. Overall, stone covered between 60 and 80 per cent of the surface area of the wall, which can best be described as crudely built with no facing stones but with inner and outer stone-revetted banks. Two pot boilers (Sf 146-47) were logged within (102). The linear distribution of the pot boilers, as highlighted by excavation, was mirrored by the geophysical plot of magnetic anomalies.

Outside the wall top (102) was an area defined as the external, lower sloping bank of the roundhouse wall, coded Context 103, which was apparent in the south-east corner of the trench extending 1.75m north-south by 1.43m east-west. It, too, consisted mainly of limestone cobbles and angular pieces, with one sandstone piece 0.1x0.2m in size. No finds were logged within (103).

Beyond banking (103) was a spread of loose, very dark brown silty clay in an amalgam of yellowish degraded limestone fragments showing as a fine gravel layer which was interpreted as a deliberate deposit rather than a natural occurrence. No finds were logged from (104).

Trench 2

Thirteen contexts were recognised within Trench 2, laid across the western half of Feature 4.

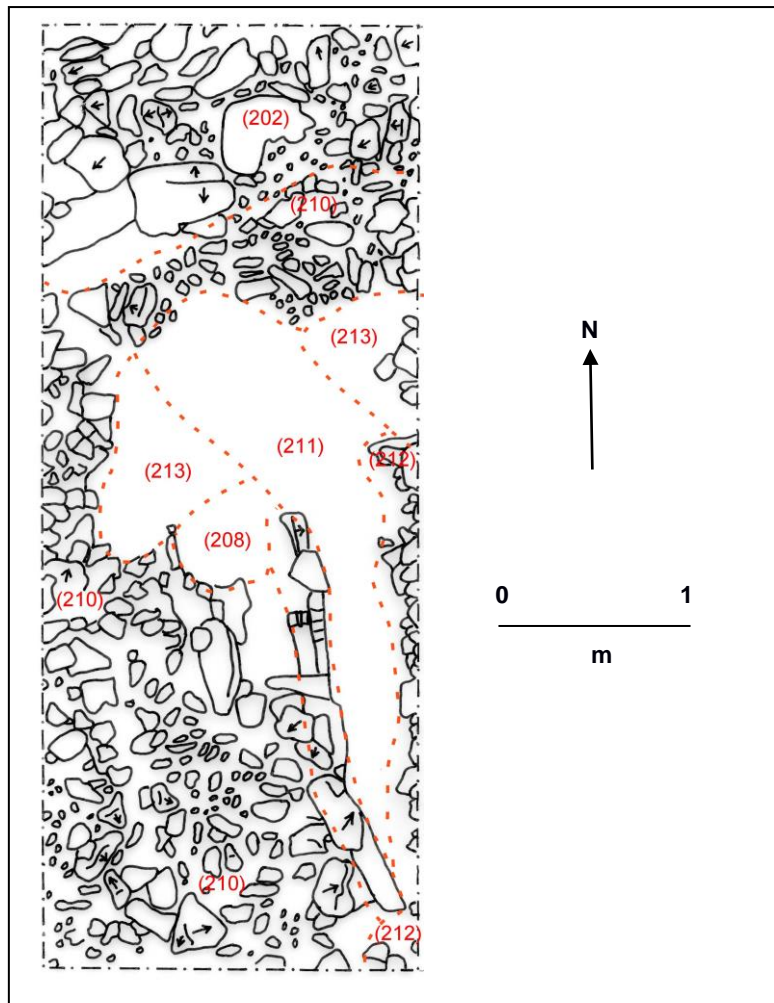


Fig. 14 Trench 2, final contexts



*Fig. 15 Trench 2 on completion of excavation, looking north.
The stokehole runs parallel to the side ranging pole.*

Context 201 was a topsoil layer whose thickness varied from 0.1 to 0.2m; it consisted of loose clayey silt, very dark brown in colour, the same as in Trench 1. Its humic level was assessed at 20 per cent. Context 201 extended across the full 2m-width of the trench and for 4m from its southern edge, in other words covering the whole of what further excavation would prove to be the kiln bowl. Two small finds were logged in (201) – Sf 123 was a fragment of charcoal and Sf 124 a small green glass bead with a diameter of 5mm. Three small fragments of coal along with cinders were found, but they were not logged as small finds.

The section of the trench not covered by topsoil (201) comprised natural limestone bedrock (Context 202), part of which had been incorporated into the kiln's overall structure. Prominent among the bedrock were four large limestone blocks standing proud of the bedrock and with angular limestone rubble packed between and around them: they measured 0.6x0.4m, 0.47x0.2m and 0.3x0.2m. No finds were logged in (202).

In the south-east corner of the trench was a small lens consisting of loose, yellowish brown gritty material (Context 203) largely made up of degraded and fractured limestone among a silty clay matrix, 0.1m thick and surfacing at a depth below the turf line of 0.14m. It extended 0.57m east-west by 0.2m north-south. The lens was interpreted as remnant deposits – limeash and other burnt material – raked out of the kiln bowl after its last firing event and lodged within the external flue passage. No finds were logged from this context.

As trowelling progressed other differences in colour and compaction of material became apparent, each being assigned a discrete context number. Context 204 was a lens (0.2x0.25m in extent) nestled against the lower part of the bowl wall exposed in the trench 0.3m below the turf line. It consisted almost entirely of burnt lime and limeash with small lumps of 'dead-burned' lime, meaning limestone that had not been fully calcined or reduced to quicklime. No finds were logged in (204).

The west side of the internal stokehole (Context 205) showed as a low stone wall surviving to 0.34m in height, 0.2m below the turf line, built of carefully-selected limestone blocks. Within the trench it was 1.2m in length and only one block wide. No finds were logged.

Within the exposed internal stokehole and external flue passage, for its full length of 2.3m and full width of 0.57m, was an amalgam of burnt and partially burnt lime, grit and heat-affected clay, designated Context 206; much of the burnt lime was mixed with charcoal or sooty deposits. Average thickness of this material varied but averaged 0.3m. One large piece of coal was recovered from (206) but was not logged as a small find; three charcoal samples (Sf 143-45) were logged.

Along the southern edge of the trench, immediately outside the external flue, was another small and isolated lens, this one designated Context 207; it was composed of loose, strikingly dark brown clayey silt containing burnt lime. It extended 0.3x0.3m and was visible 0.23m below the turf line. It was interpreted as material raked out from the kiln bowl/stokehole. No finds were logged.

Outside the stokehole Context 208 was a distinct layer beneath topsoil (201) which was not evident above the internal stokehole or external flue. Its content was 25 per cent highly degraded and fragmented small limestone pieces as well as limeash. It was interpreted as

post-abandonment backfill of the kiln bowl. Eleven charcoal samples were logged (Sf 148-54, 156-58, 160), plus one lump of coal (Sf 155).

Below the whole extent of (208) was a further layer of loose, very dark brown gritty material largely consisting of limeash, burnt material and charcoal smears, designated as Context 209, which appeared 0.4m below the turf line against the bowl wall and 0.6m next to the stokehole. Some of the material was distinctly reddish indicating burnt material fired at very high temperatures within the kiln. Three charcoal samples were logged in (209) – Sf 159, 161 and 162.

In turn, removal of (209) revealed the steep wall of the kiln bowl (Context 210) against the west side of the trench, almost entirely composed of angular limestone pieces of variable size (0.1-0.17m by 0.9-0.22m). The wall was emphatically not a coursed or even random-rubble structure built as a wall but with stone impressed into an outer clay lining, so it came across as a crudely put together structure. No finds were logged here.

Clearance of all loose material – deliberate backfill and slippage from the bowl wall – from within the internal stokehole revealed its floor (Context 211). The stokehole extended all the way to the base of the rear wall, a length of 3.6m, and its base was solid bedrock which was found to have burnt lime and limeash residue impressed into its natural cracks and surface pitting as well as evidence of its having been affected by high temperatures within the kiln. One sample of charcoal (Sf 167) was logged from (211).

Running in a strip along the full length of the bowl, set against the east side of the trench, was Context 212 which at the end of excavation was what remained within the trench/bowl of post-abandonment backfill of the bowl entirely composed of angular pieces of limestone of very variable size. Originally, the entire bowl would have filled with this material and still was in the half of the kiln not excavated. No small finds were logged here.

In order to determine the precise form of the bowl wall, and to distinguish between what may have been backfill or stone revetted into a clay-lined bowl, loose stone was taken out in a section of the west side of the bowl and at its rear above the point where the stokehole abutted against the rear wall. Neither of these explorations revealed any structure to the bowl: at the rear the kiln's makers had incorporated bedrock into the kiln structure by cutting into it; at the side a similar process had occurred except that here it was the natural slope that was cut into rather than bedrock. This exploration did conclude that the floor of the bowl, like that of the stokehole, was bedrock (Context 213). As with the stokehole floor, (213) had burnt material, fuel residue and limeash impressed into it. However, no small finds were logged.

Trench 3

Seven contexts were recognised within Trench 3.

Context 301 was a topsoil layer consisting of uncompacted, very dark brown and humus-poor clayey silt similar to topsoil seen in other trenches on the site. It extended across the entire trench. Thickness varied from only 30mm on the wall tops to 0.23m within the building. Three small pieces of coal (Sf 101-03) were logged from this horizon but were clearly residual deposits. Given that this trench was laid out where Raistrick had opened one of his

trenches it is likely that the topsoil was reintroduced during the process of backfilling his trench.

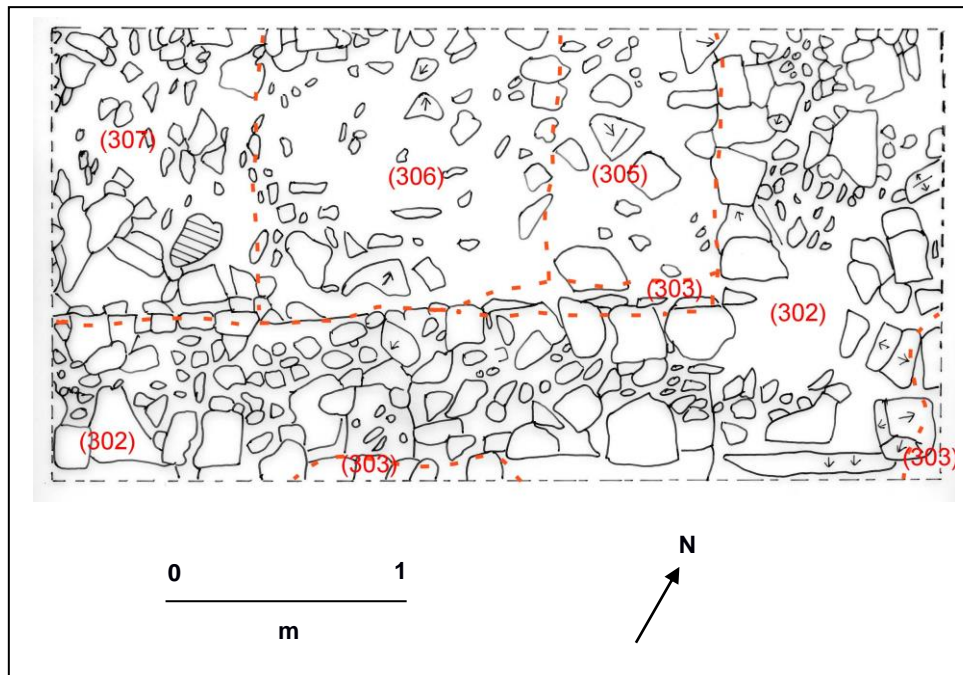


Fig. 16 Trench 3, final contexts

Trench 3 encompassed a 2m-section of the east gable wall and 4m of the south elevation wall (Context 302). Both lengths consisted of an inner and an outer face with carefully-selected squared blocks of limestone with limestone rubble infill. Apart from the outer face of the south-east corner of the building none of the blocks stood out as being noticeably large. The corner was supported on a very substantial foundation block, 0.68m on its east-west face by 0.46m along the gable wall. Given that limestone cannot successfully be dressed, no evidence of tooling was apparent. The corner was perfectly squared even though one of the geophysical plots hinted at an apsidal effect: in reality this was due to slippage of one top stone in the corner. The gable wall is 0.73m wide at the top and the side wall 0.67m. Along the inner face of both walls a distinct band of lime mortar, 40-60mm thick, was visible at a depth of 0.34m below the top of the gable wall and 0.33m below the top of the side wall. One lump of burnt shale and lime mortar concretion (Sf 105) was logged in this context. One aspect of both walls that was immediately obvious was the evenness of their height above the surrounding turf line. The walls stood 0.28m high outside the building; within the trench they were taken down to a depth of 0.45m.



Fig. 17 Trench 3 on completion of excavation, looking south, showing Contexts 302, 306 and 307

Sections of the narrow space between the outer edge of the walls and the edge of the trench – no more than 0.12m wide – were filled with unsorted limestone rubble (Context 303) which was either stone pushed off the walls or thrown in while the building was under construction. No finds were logged here.

Across the whole of the building's interior a large quantity of rubble – mainly limestone – was removed during excavation and was initially assumed to have been tumble or slippage from the walls but this hypothesis was later rejected as the evenness of the wall tops ruled out both natural slow decay of the walls and deliberate dismantling. It is more likely that this material (Context 304) was deposited within the building at some indeterminable point in its history. The rubble was contained within a matrix of dark brown clayey silt subsoil apparent 0.1m below the turf line. It contained quantities of lime mortar and degraded shale with two fragments of grey roofing slate (Sf 106) which are not thought to have been connected to the building itself. This context was interpreted as backfill of Raistrick's work.

Below Context 304 a yellowish brown substrate layer appeared largely composed of limestone grit and gravel with fragmented lime mortar and some burnt shale (Context 305). Its interpretation presented problems: initially it was suggested that it represented demolition debris but this was ruled out and it may have been deposited across the building's interior during construction in the tidying up process of keeping the internal surface level. It was certainly not a base layer. Within (305) three charcoal-with-mortar samples (Sf 107, 110 and 111) and a fragment of grey roofing slate (Sf 109) were logged.

As Context 305 was trowelled off a further horizon revealed itself as a layer of brown silty clay (Context 306), 0.25m below the turf line. Like (305) this soil matrix contained a large proportion of angular limestone rubble with many sub-rounded limestone pebbles at the western end of the trench (average long axis 0.1-0.2m) with one slab of flagstone (0.2x0.14m) laid flat exactly where the mortar band within (302) ended, and 0.2m from the inner wall face. However, it cannot be claimed that this slab had been carefully placed in that position.

As excavation thus far had located no evidence of any occupation layer, the decision was taken to cut a sondage (Context 307), 1x1.2m, at the western end of (306). It contained a matrix of brown silty clay and very small pieces of sub-rounded limestone. No trace of such a surface was found and this material can be interpreted as natural glacially-derived material. Sf 115 a small lithic, was logged from (307).

Trench 4

Trench 4 contained eight contexts.

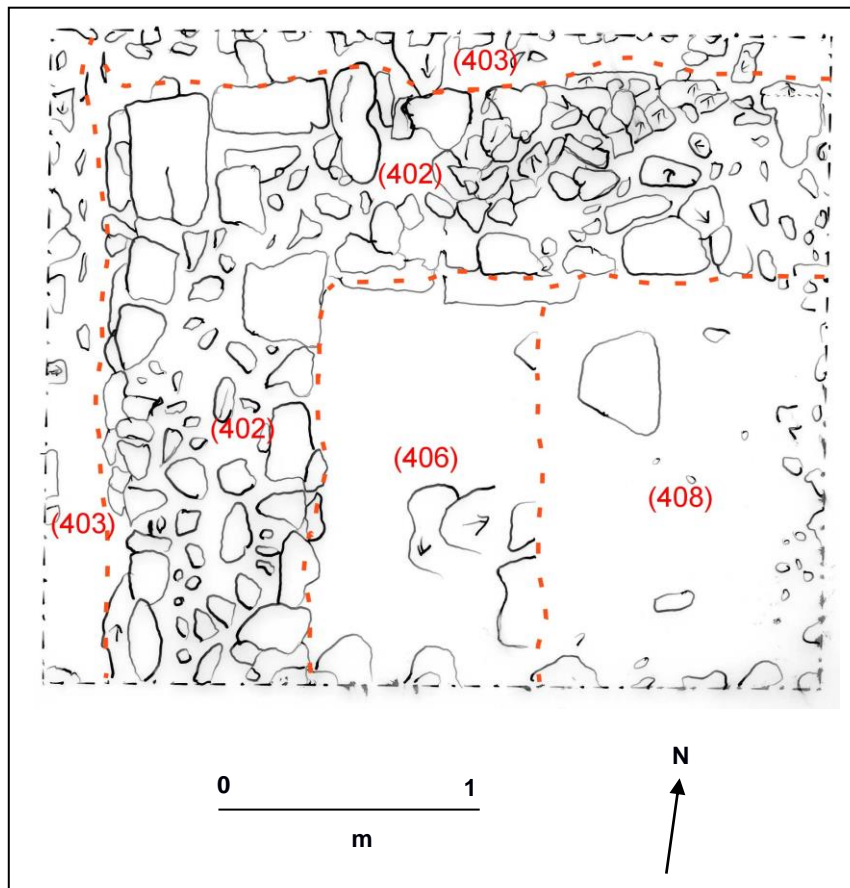


Fig. 18 Trench 4, final contexts

Context 401 was unconsolidated, humus-poor, very dark brown clayey silt, very similar to topsoil layers in the other trenches, containing small degraded limestone fragments. It covered the whole trench apart from on the wall tops, and was of variable thickness. No finds were logged.

The trench encompassed 2.5m of west gable wall and 3m of the north elevation wall (together Context 402). As with (302), both lengths were double faced with squared, but not dressed, limestone blocks. The north-west corner of the building, fully exposed in the trench, was right-angled on both sides. Lime mortar was visible in quantity in both walls. Again as with (302), the walls were absolutely the same height. Facing stones, especially on the outer face, typically measured 0.2x0.2m, 0.2x0.4m and 0.3x0.33m. Internal facing stones were slightly smaller in both dimensions. The wall's interior was rubble filled. The gable wall was uniformly 0.7m wide, the side wall 0.67m; at its full extent the outer face measured 0.89m

from top to bottom in the north side wall and 0.79m in the gable wall, with seven stone courses visible in both. The inner face of the gable wall reached a height/depth of 1m. The topmost outer facing block in the corner of the building can only be described as massive, measuring 0.53x0.3x0.21m, laid with its long axis along the gable wall. The outer corner stone in the fourth course down was also massive, being 0.51m along the gable wall, 0.33m along the north wall with a thickness of 0.28m. The largest outer base stones measured 0.26m thick in the north wall and 0.36m in the gable wall. No finds were logged.



Fig. 19 Trench 4 on completion of excavation, looking east

Context 403 extended across the whole trench within the building and consisted of angular limestone rubble in a buff-coloured matrix. It did not show as a horizontal deposit but looked as if it had been carelessly thrown in as backfill after the building was abandoned. It did not closely relate to any other context in the trench. As Raistrick did not open this section of the building it cannot be linked in any way to his work. Context 403 was very similar in composition to (303). No finds were logged in (403).

Trowelling through (403) revealed another horizon made up of loose, brown subsoil with a high proportion of limestone grit (Context 404). As it sits within the building, it has to be seen as a deliberate post-abandonment backfill deposit rather than a layer that formed naturally through time. No finds were logged here.

It had been expected that a floor surface would have been found rather than the unconsolidated mass of (404) so, as in Trench 3, excavation continued to try and locate an occupation layer. Beneath (404) another layer was revealed (Context 405), this one distinctly yellowish brown and very gritty with mortar evident throughout. Not all of (404) was removed and the area exposed as (405) measured 0.6x0.75m. Two fragments of grey roofing slate – residual items – were logged (Sf 108): it is assumed they were thrown in when post-abandonment backfilling took place.

This was not the base layer as Context 406 underlay (405), showing as a dark brown layer of unconsolidated silty clay with small and fragmented limestone pieces throughout. It was also interpreted as backfill. One charcoal sample set in lime mortar (Sf 113) was logged in this context proving it was not a natural horizon.

Set against the south-west corner of the trench, nestling against the gable wall, was a cone-like lens (Context 407) of olive-coloured gritty lime mortar, in plan 0.6x0.7m, and reaching almost to the top of the wall. Its colour and texture were unlike anything else seen in this trench or in Trench 3. It, too, has to be interpreted as backfill of redundant or poor-quality lime mortar.

Again as with Trench 3, the matter of no occupation surface being located necessitated the cutting of a sondage (Context 408) the full width of the trench, 1.55m in from the gable wall and 0.75m wide, reaching a depth of 0.2m below the base level of (406). No trace whatsoever of a floor surface was seen. The material within the sondage was creamy brown to yellow in colour and contained a high proportion of small stone and grit: it has to be interpreted as natural glacially-derived deposits.

Trench 5

Six contexts were recognised in Trench 5. No finds were logged from any context.

Context 501 was unconsolidated very dark brown clayey silt, as seen in the other trenches within the building, though as much of the trench was wall lines the soil was very thin – barely 20mm thick – apart from in the narrow strip outside the wall.

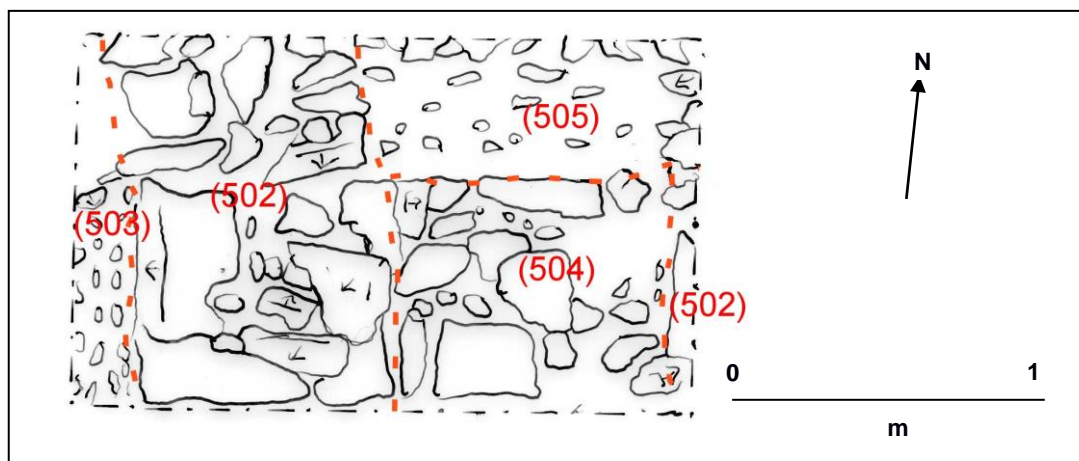


Fig. 20 Trench 5, final contexts

The western part of the trench was the southern end of the west gable wall (Context 502), with details exactly as seen in Trench 4. On the outer side there was one substantial squared limestone facing block 0.51m in length by 0.29m in width, set on a stone footing 0.65m long by 0.45m wide by 0.33m thick.

Context 503 was a narrow (0.1m) band of limestone rubble, either stone from the wall or discard during its construction, lying on the inside of the gable wall within the doorway.

The doorway/threshold (Context 504) was 0.9m wide by 0.72m deep and had very clear edges on its inner and outer sides. The east side of the threshold, where the south elevation wall ends, was marked by a large, squared limestone block 0.32m high on its northern face and 0.63m on its southern face. This block, which served as the basal stone for the door

jamb was 0.44m in length (ie through the wall) by 0.53m wide (ie along the wall): it extended two-thirds of the way through the threshold and was flush with the wall's outer face. The western side of the threshold was composed of two squared limestone blocks. The threshold floor was made up of limestone slabs laid flat, of very variable size and set more as crazy paving than a formal solid all-over surface except along the inner edge where five such slabs did form a continuous hard surface.



Fig. 21 Trench 5 on completion of excavation, looking north through the doorway

Context 505 lay within the building, beyond the threshold and was composed of dark brown gritty silt mixed with lime mortar and degraded limestone fragments. It *may* have been a deposit laid down to form a substrate for a floor surface that was never laid.

In order to test this hypothesis (505) was lifted to reveal a further layer (Context 506) which was unconsolidated brown clayey silt containing fragmented limestone chippings. It was not determined if this was glacially-derived natural material or a base layer within the building.

Trench 6

Three contexts were delimited in Trench 6.

Context 601 was unconsolidated very dark grey clayey silt 0.1m thick extending across the whole trench. No finds were logged.

Below the topsoil was a further layer 0.2m thick, also extending over the whole trench, (Context 602) almost half of which was composed of degraded limestone and some larger sub-rounded limestone cobbles. This context also contained eight pieces of angular, coarse sandstone and two of flagstone, one of which was clearly heat-reddened. Five lithics were logged in this context, associated with the sandstone/flagstone: Sf 163 is a chert flake, 165 is one chert and one flint flake, and 166 also a chert flake, while 164 is an indeterminate chert fragment.

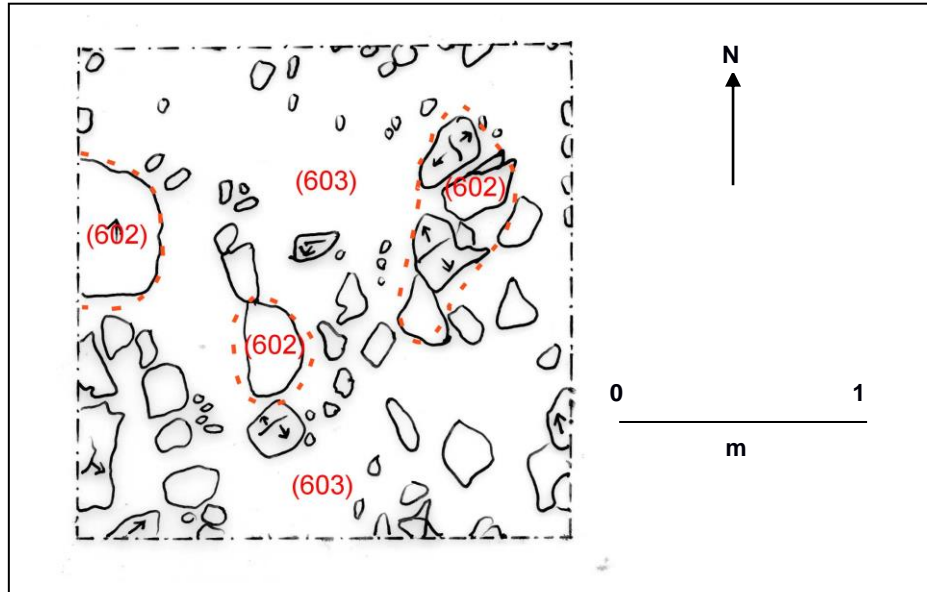


Fig. 22 Trench 6, final contexts



Fig. 23 Trench 6 on completion of excavation, looking west

Removal of (602) revealed a further layer (Context 603) across the whole trench which was brown and very gritty with a large number of degraded limestone pieces or sub-rounded earthfast limestone cobbles. The trench was bottomed at a depth of 0.3m and (603) was not trowelled off as it may well be natural though this is a tentative conclusion. No finds were logged here suggesting it was beneath the occupation level of the roundhouse within which this trench was located.

Test pit 1

This was centred on a magnetic anomaly in the south-west quadrant of the rectangular building (Feature 1). Within the topsoil layer, just 40mm below the turf line, an unidentifiable

curved modern iron object was unearthed (Sf 104) which was clearly the source of the signal. Excavation continued in search of a floor surface in the building but work was halted at a depth of c. 0.4m as no trace was seen.

Test pit 2

This pit was centred over another strong magnetic anomaly nestling against the southern section of the wall of Raistrick's Hut 2 (Feature 3). The anomaly proved to be a length of cast-iron rainwater goods (Sf 117) but one lithic flake (Sf 118) was also logged along with three angular, heat-affected sandstone lumps (Sf 119 and 120), all interpreted as pot boilers. The pit was taken down through (TP202), a subsoil layer with a high proportion of fractured limestone pieces; (TP203), a patchy layer full of fine grit; (TP204), a lens of silty clay; and (TP205), a base layer of limestone-derived gravel 0.45m below the turf line: this was not bottomed and may represent natural glacially-derived material. No finds were logged below (TP201). No trace of an occupation level was found in the test pit.

Molehill survey

To add to the total quantity of archaeological data recovered during the excavation phase of the project, and as time and manpower resources permitted, all molehills in and around the excavation site were investigated by hand-sieving of the soil to recover any artefacts brought up by moles. Six molehills proved to be productive each one providing a lithic (Sf 112, 114, 116, 121, 127 and 128), including both flint and chert.

Total Station plotting

During the excavation phase of the project the Total Station team plotted all ancillary archaeological features, largely showing as earthworks, across the southern half of Chapel Fell with a view to comparing these data with HER records and potentially updating the HER. Four days' work was involved and the overall result was that all features already on the HER need to be updated in the light of this survey (see Figure 2).

7. Finds Report – Charcoal

Based on laboratory examination by Dr Denise Druce, Oxford Archaeology North

Altogether, twenty-three samples of charcoal were logged and submitted for post-excavation examination and species identification: nineteen from Trench 2, three from Trench 3, and one from Trench 4. Nine were found to be so clinkered that species identification was impossible and a further six could not satisfactorily be identified, so all were discounted from the useful data set (Table 2).

Table 2 Indeterminate charcoal samples

Sf	Context
Clinkered	
107	305
113	406
123	201
143	206
145	206
149	208
159	209
160	208
161	209
Indeterminate	
110	305
111	305
150	208
154	208
157	208
162	209

Of the remaining eight samples all but one were either oak or ash, both being long-lived species which are not suitable for radiocarbon dating, so these too were discounted (Table 3).

Table 3 Discounted charcoal samples from long-lived species

Sf	Context	Species
144	206	Oak (<i>Quercus</i> sp)
151	208	Ash (<i>Fraxinus excelsior</i>)
152	208	Ash
153	208	Oak
156	208	Ash
158	208	Ash
167	211	Ash

Thus, only one sample – Sf 148 from Context 208 – proved suitable for radiocarbon dating being hazel (*Corylus avellana*) roundwood with six tree rings and bark present on the sample.

8. Finds Report – Metal Artefacts

No metal objects were recovered from any of the trenches or test pits but surveying of ancillary archaeological features on Chapel Fell did log fragments of rainwater goods (Sf 131) from a small collapsed post-medieval agricultural building (HER MYD 1323) and from Test pit 2 (Sf 117). An unidentified curved iron object (Sf 104) was logged from Test pit 1.

9. Finds Report – Stone

a. Sandstone

Nineteen small finds numbers were allocated to a total of twenty-three individual sandstone pieces – all but two were logged from Trench 1, the other two from Test pit 2. Though they were variable in size, with diameters ranging from c.30-60mm, all had common characteristics. They were sub-rounded in generality but with a number of individual flat faces giving their roundedness an angular effect; they were reddened suggesting they had been exposed to very high temperatures, and most showed signs of heat fracturing. Given that the vast majority were recovered from the southern wall of the smaller roundhouse in Trench 1 or from Test pit 2 in the southern half of the same feature, the balance of probability is that they were pot boilers – fire-resistant and heat-retaining stones used for boiling water and for keeping it hot that had been heated on the hearth within the roundhouse. Examination of the stones by several individuals asserted that one (Sf 125) is a definite pot boiler, two (Sf 138 and 146) were possible candidates, while the rest were deemed to be probable pot boilers.

b. Lithic Assessment

Antony Dickson, Oxford Archaeology North

Introduction

The assemblage comprises a total of eleven lithic artefacts (Table 4). This report is a preliminary quantification of the assemblage, assessing its technological traits and chronological indicators. Based on these initial findings, the report offers recommendations for any further work needed to provide an in-depth technological and chronological understanding of the assemblage, and its wider contextual significance.

Methodology

The artefacts were macroscopically scanned and assigned to a category within a simple lithic classification system (Table 4). Cores are characterised by reference to the number and type of platforms and the reduction strategy exhibited on their flaking fronts. Evidence for the maintenance and upkeep of cores during reduction is also recorded. Unmodified blade and flake debitage, when complete, has been assigned to a generalised reduction sequence. This has been undertaken in order to define and characterise reduction processes within the assemblage. Furthermore, the unmodified blade debitage is sub-divided by width, to further clarify their role within reduction strategies. Indeterminate pieces are also sub-divided into arbitrary size classifications: chunks representing thicker, angular pieces and fragments representing blade and flake shatter. The presence of this material is a good indicator of the on-site reduction of raw materials. When present, formal tools and utilised pieces are also characterised by type and classification. Beyond this no detailed metrical or technological recording was undertaken. The results of this report are based on a rapid assessment of the assemblage and could, therefore, change if further work is undertaken.

Table 4 Quantification of the Chapel Fell lithic assemblage by lithic type and context

Lithic type	Context						Total	% of total
	201	307	602	MH1	MH2	MH3		
Broad blade				1			1	9%
Core			1			1	2	19%
Indeterminate Frag	1	1	1		1		4	36%
Narrow blade			1				1	9%
Regular flake			2			1	3	27%
Total	1	1	5	1	1	2	11	
% of total	9%	9%	45%	9%	9%	18%		

Quantification

Four of the flaked lithics were recovered from topsoil deposits associated with the sieving of molehills within the site area and are, therefore, unstratified (Sf 112, 114, 116 and 121 from MH1-3; Table 4). In addition, a piece was recovered from topsoil deposits in a test pit (Sf 118 from Context 201; Table 4), whilst five items were recovered from sub-soil deposits (Sf 163-6 from Context 602; Table 4) from a trench placed over Feature 2. Therefore, the flaked lithic from the topsoil is also unstratified, whilst those from subsoil deposits are likely to be too. A single flaked lithic from a sondage in the rectangular structure was recovered from the base of the trench (Sf 115 from Context 307; Table 4); however, given the assumed date of the rectangular structure (IAG 2015) it is likely to be residual.

The assemblage consists of mainly blade, flake and indeterminate debitage (Table 4) forming 81 per cent of the assemblage, along with two items of core technology. No diagnostic tools or edge utilised pieces were identified, and the assemblage comprises the use of flint and chert raw materials.

Assessment

The flint indeterminate fragment recovered from (201) is a burnt blade/flake fragment (Table 4), which could have a small patch of semi-abrupt retouch on a lateral edge; however, the edge alteration could also be damage from heat. Given the non-diagnostic nature of the piece and the fact that it was recovered from topsoil deposits it warrants no further analysis. A similar item was recovered from (307) (Table 4). Whilst this piece was apparently recovered from a secure context it is non-diagnostic, probably residual, and also requires no further analysis.

The largest group of material was recovered from (602) (Table 4). This collection consists of a probable core fragment; a complete narrow blade; two broken flakes (both proximal sections); and a blade/flake fragment. One of the broken flakes, the only piece made from flint, could be a fragment associated with the rejuvenation of a core striking platform. Interestingly, one of the broken flakes, the core fragment, the blade and the indeterminate fragment are all made from chert, the four occurrences of such within the assemblage as a whole. Notwithstanding this, the chert items do not represent the reduction of the same nodule as the colour, lustre, grain size and inclusion content of the material vary considerably. The probable core fragment, although non-diagnostic to a specific reduction strategy, is small in dimensions, indicating that it was derived from a small core, and it could represent a late Mesolithic/early Neolithic technology. Given the dimensions and technological characteristics of the narrow blade it could also be of a similar technology; however, it could also be a split flake (siret fracture) as its left side has an abrupt edge. Owing to the small size of this collection of flaked lithics, their apparent recovery from subsoil deposits, and the lack of diagnostic material, it requires no further analysis.

Four flaked lithics were recovered from molehill deposits (Table 4: MH1-3), and all are made from flint. The collection consists of the proximal section of a burnt broad blade; an indeterminate blade/flake fragment; a complete tertiary flake; and a multi-platform core. The latter probably represents a core made on a flake and has been mainly worked from two opposed ridges. In addition, it was also worked in four other directions evidenced by several negative flake scars emanating from the opposite sides of the ridges noted above, and from random directions from the edges of the core. At least fifteen negative flake scars can be identified and given that the piece reflects a flake-based reduction strategy it is possibly of a Neolithic or later technology. Given the unstratified nature of the material from the molehills, and the lack of diagnostic pieces, no further analysis of the material is warranted.

The majority of the flaked lithics reflect the working of flint, and all of this material, apart from the four chert items from (602), is patinated. In two cases the patination is from the result of the effects of heat. The patination is chiefly a thin sheen which ranges from white to pale brown in colour. It is possible that some of the material with a white patination is white flint, as such has been identified on sites from the general region (Preston 2012, 722-28). It is suggested that this type of flint could be derived from till deposits to the east of the Dales (*ibid*). The chert is likely to have been procured from more local sources, on the limestone plateau, within the region.

Potential

The flaked lithic assemblage from the Chapel Fell excavation is of small size, is mainly non-diagnostic to any specific reduction strategies, and is mainly unstratified. Therefore very little can be said of the assemblage's technological character and context. The core fragment and the core are possibly related to late Mesolithic/early Neolithic and Neolithic stone-working traditions respectively. In that respect they can be seen alongside evidence for activity in those periods from the immediate landscape (Donahue and Lovis 2006; IAG 2015, 9-10). It is therefore recommended that no further analysis is undertaken, and that this assessment, with the associated catalogue, describes in sufficient detail the technological character of the assemblage.

10. Dating

Though twenty-three charcoal samples were logged – nineteen from the kiln and four from the supposed medieval chapel – only one of the samples proved suitable for radiocarbon dating, namely Sf 148 from Context 208 within the sow kiln. Thus, it proved impossible to directly relate the date obtained from the kiln with charcoal associated with mortar found in the adjacent building. Having said this, the date range returned for Sf 148 does provide a secure date for the last (or, at least, one of the latest) firing event of the kiln. Fig. 24 summarises the date range for this context, and thus for the kiln.

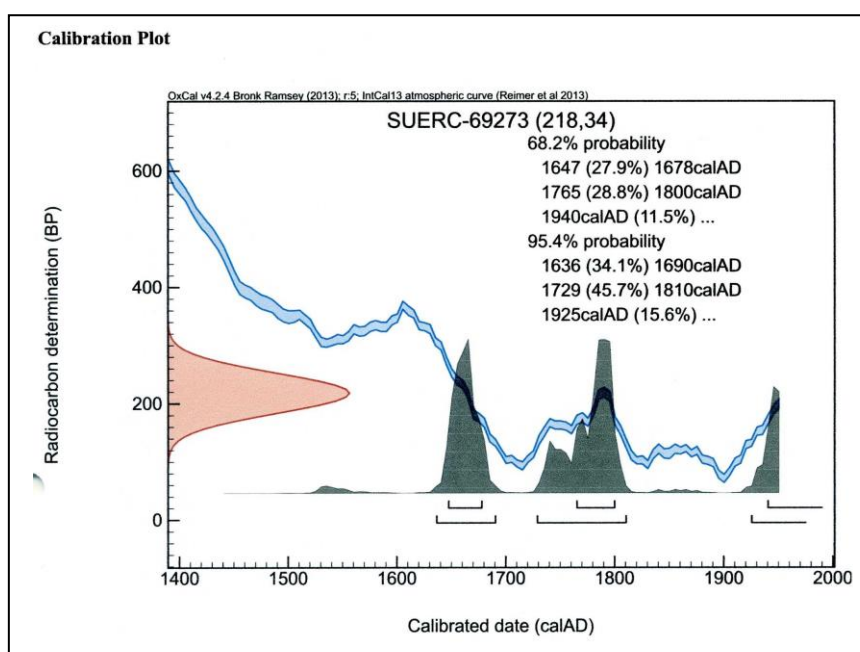


Fig. 24 Sf 148, calibration plot

Sample location	Lab code	Material	Radiocarbon age	$\delta^{13}\text{C}$	Calibrated date
Bowl floor	SUERC-69273	<i>Corylus</i>	218±34 BP	-26.5 ‰	1636-1925 (95.4%)

The Radiocarbon Age is given as 218±34 years BP, thus 184-252 years BP, giving a date range of AD 1698-1766. However, when calibrated the picture is less straightforward: as the calibration plot shows there are three discrete spikes with differing levels of probability at both 1 σ and 2 σ levels of confidence. Those falling between cal AD 1729 and 1810, between cal AD 1765 and 1800, and after cal AD 1925 can be discounted as this type of clamp kiln had been replaced by masonry-fronted field kilns by the closing years of the seventeenth century, and the remains of one such kiln lie over the wall just north of this site. This leaves the two ranges cal AD 1647-1678 (at 27.9 per cent) and cal AD 1636-1690 (at 34.1 per cent) as the most likely periods when the kiln was in use, though the nuanced approach taken here is stressed.

No other conclusive dating evidence was found, though the lithics suggest Mesolithic/Neolithic and the pot boilers late prehistoric provenance.

11. Interpretation and Discussion

Local Archaeological Context

Before this project the Yorkshire Dales HER listed twelve archaeological features on Chapel Fell (see Figure 2 and Table 1 for details).



*Fig. 25 Aerial overview of Chapel Fell showing archaeological features.
For the key, see the ensuing text. (YDNPA.YDP 176/31)*

Fig. 25 marks features that are apparent on the ground, as earthworks, and that were (mostly) already entered on the HER prior to this project:

Feature 1 is the rectangular structure (MYD 3758) subjected to investigation during this project. The HER notes it as a medieval chapel (see below).

Features 2 and 3 are two contiguous roundhouses (also MYD 3758) recorded on the HER as 'Two additional hut circles adjoining the chapel' of Iron Age date (see below).

Feature 4a is the excavated sow kiln (MYD 60973), noted by Raistrick as a 'hut' (see below).

Feature 4b is the quarry workings associated with the kiln.

Feature 5 is a rather indistinct ovoid banked enclosure that Raistrick identified as an 'earth circle', at SD88518 67510.

Feature 6 consists of four small rounded or sub-rounded banked enclosures recorded on the HER (MYD 1362) as 'Probable Iron Age Settlement'. Their dimensions are summarised in Table 5.

Table 5 MYD 1362: dimensions

NGR SD	Length (m)	Width (m)	Description
88398 67548	13	9	Ovoid enclosure with detached semi-circular bank on east side
88400 67533	12	10	Circular enclosure – possible roundhouse. Possible doorway on south side
88400 67505	8	6	Small circular enclosure, possibly roofed
88420 67496	7.5	7	Small rounded enclosure, possibly a roofed structure

Feature 7 incorporates the following elements:

A linear stone-cored bank runs from the modern field boundary, at SD88520 67563, just north of the modern sheepfolds, to near the ruined building at SD88410 67567 (Feature 8). The bank is 110m in length.

Another short, and truncated, stone-cored bank lies east of the excavation site, also marked 7, 12m long.

A similar linear stone-cored bank runs for a length of 35m in a south-westerly direction from above the northernmost enclosure within Feature 6, from SD8837 6754 at the north-east end to SD8834 6751 at the south-west end.

Feature 8 (Fig. 26) is the ruined building entered on the HER as a ‘demolished building’ (MYD 1323), ‘probably the foundations of a medieval or later barn’, at SD88405 67565. Close examination of its plan form shows that it is an early modern construction consisting of a small squared building, formerly roofed, and with rainwater goods still visible in the rubble, with a small walled fold yard on its western and southern sides. The north wall stands to more or less its original full height. It is too small to be described as a barn but could have been a field dairy of the type common across Craven. The building stands at the head of a narrowing dry valley (**Feature 9**) and it is probable that the valley was used for accessing the structure.

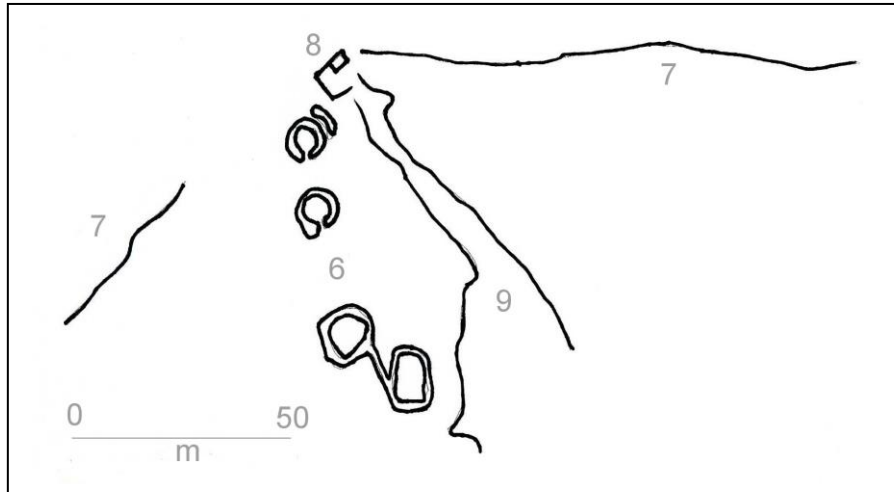


Fig. 26 Detailed plot of Features 6 – 9.

On-site Total Station recording was undertaken by a team led by John Cuthbert who also undertook post-processing of data downloaded from the instrument.

Feature 10 was entered on the HER as 'Possible Medieval Farmstead (MYD 3757). Inspection of the aerial photograph (Fig. 27) shows two large but unequal sub-rounded enclosures with smaller enclosures sandwiched in between. The smaller, northern, enclosure (centred on SD88270 67627) measures 44m north-south by 51m east-west and on its south-western face the bank appears from the earthwork to split into two curving but parallel banks (Fig. 28).

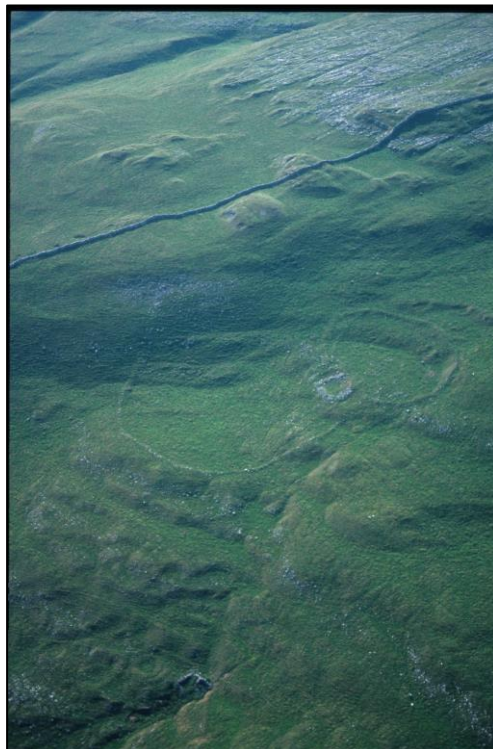


Fig. 27 Aerial view: large double-banked enclosure, Feature 10, looking north-west (YDNPA. YDP 176/30)

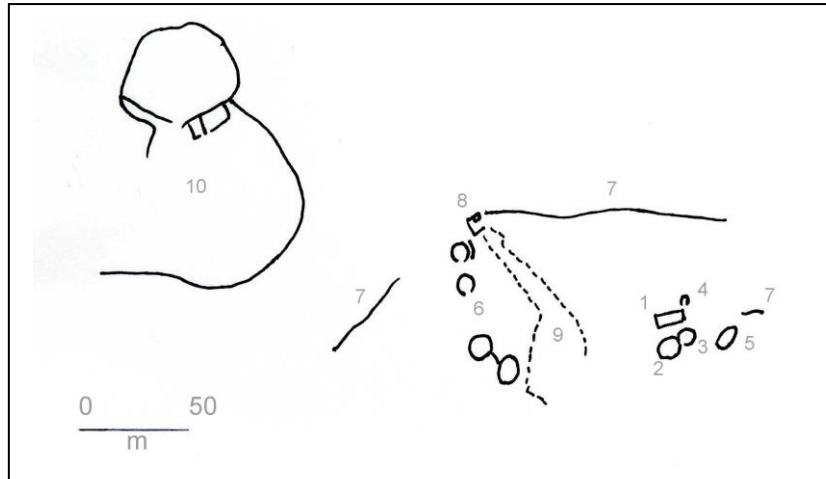


Fig. 28 Total Station plot, showing Feature 10 in relation to other recorded features

The southern, larger, enclosure (centred on SD88284 67568) measures 88m north-south by 71m east-west, and the bank terminates rather more than half way up the natural hill slope to leave the enclosure open on its western side. In between the two is a complex of two (possibly three) small rectangular enclosures defined by low and tumbled dry stone walls; together this complex extends 12m by 12m. Though the HER associated it with the medieval era there is no ground evidence to confirm this: it could relate to monastic stock management on Chapel Fell or to the late prehistoric sites lower down the fell. However, the small squared enclosure does not have the appearance of a roofed building.

The Excavation Site

Four discrete features were subject to partial excavation during the Project – the rectangular building (the supposed medieval chapel), two late prehistoric roundhouses, and a sow kiln.

The Rectangular Building

Measured internally, the building (which it beyond doubt was) is 12m (39ft 5 in) long by 5.5m (18ft 2in) wide; externally it is 13.7m (45ft) long by 7m (23ft) wide. These external measurements tie in exactly with what Raistrick recorded in his earlier monograph (Raistrick 1947, 113) but are very different from what is in the later edition of the same work (Raistrick 1976, 122) where dimensions of 90 ft and 45ft were mentioned. To test, and reassess, these conclusions this project opened up four trenches (Fig. 29): Trench 3 at the south-east corner was aimed at examining the south elevation and east gable walls, the cobbled floor surface noted by him and the paved raised dais at the east end. In short, this trench was laid out on Raistrick's trench (see Figure 3). Trench 4 was set out at the diagonally opposite corner, where he had not worked, to determine whether or not the cobbled floor extended the full length of the building. Trench 5, at the south-west corner, was also laid out on a Raistrick trench to examine the paved and stepped threshold that he noted. Test pit 1 was cut partly to test a magnetic anomaly but also to look for the cobbled floor surface.

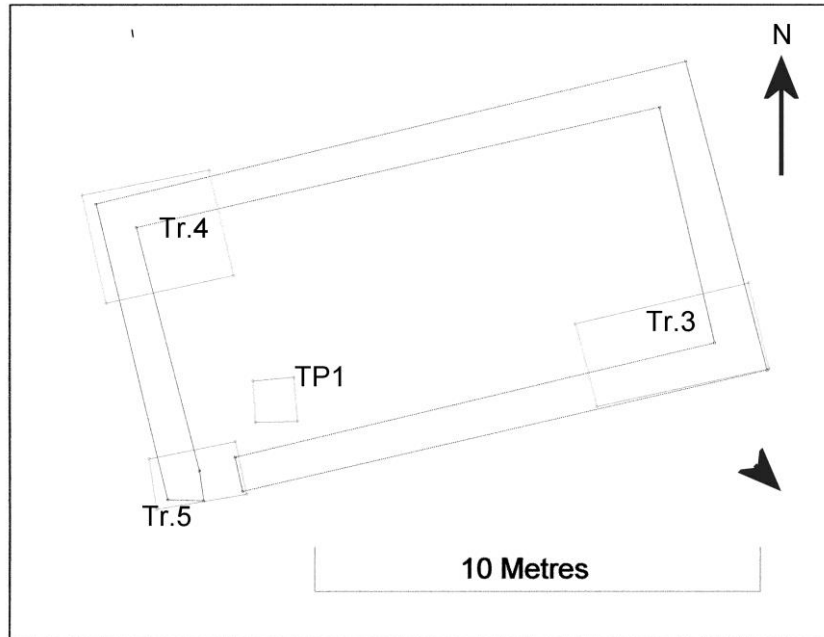


Fig. 29 The putative chapel with trenches outlined

All four **wall** lengths were identical in form and construction consisting of inner and outer faces with squared limestone blocks and rubble infill. All four (right-angled) corners had more substantial blocks than the intervening wall lengths, with particularly massive footings: that at the south-east corner, for example, measured 0.68m east-west by 0.46m north-south. All walls were well mortared. Whereas Raistrick recorded wall thickness as 0.68m (2ft 3in), both gable walls are in fact 0.73m wide and both side walls uniformly 0.67m.

Trowelling along both faces of the walls in Trench 4 revealed their full sub-surface depth: the north elevation reached a maximum depth from its top level of 0.89m while the west gable was 0.79m deep. Both walls had only five courses which emphasises the size of blocks used in their construction. The maximum inner face of this gable wall is 0.56m deep. Final work at the south-west corner revealed a full wall depth in Trench 4 of 1.02m, with basal plinth blocks in the west gable and west end of the north wall 0.26m and 0.36m thick respectively.

What was especially striking across the building was the almost absolute level of all four walls (see Figures 9, 17 and 19), though fluctuations in the external ground surface gave the initial impression that they were not level: for instance, the west gable wall rose 0.3m above the turf line whereas the north wall only 0.1m. To establish accurate levels across the whole structure – walls and internal surface – a series of Total Station readings was taken (Table 6).

Table 6 Total Station levels recorded in the putative chapel

Level no.	Location	Height (m AOD)
1	West end of interior, centrally placed	294.27
2	Against inside of north wall, centrally placed	294.17
3	Against inside of north wall, close to east end	293.82
4	East end of interior, centrally placed	293.62
5	Opposite no. 3, against south wall	293.49
6	Opposite no. 2, against south wall	293.80
7	In centre of building, between nos. 2 and 6	293.85
8	In centre of building, between nos. 3 and 5	293.59
9	On north wall top, west end	294.56
10	On north wall top, centrally placed	294.34
11	On north wall top, east end	294.06
12	On east gable top, north-central	293.91
13	On east gable top, south-central	293.72

Thus, there is a very slight change in height from one end to the other, and from north side to south side, but that reflects the almost imperceptible drop in height of the ground surface on which the building was erected. That apart, the differences have no statistical significance. To all intents and purposes the walls are level throughout.

According to Raistrick (1976, 122) the **doorway** was 'very well framed with two steps' and his excavation plan shows four stone slabs forming the doorway floor – three set at right-angles to the south wall and one running full width east-west in the inner side of the doorway. Digging of this project's Trench 5 found no evidence of any steps down into the interior of the building. Furthermore, the configuration of blocks forming the two sides of the doorway does not conform to what he described nor does the nature of the floor within the doorway (*cf* Figure 3 with Figure 21). The latter at the end of the excavation was seen more as a crazy paving effect than four squared slabs laid together.

Evidence of a cobbled **floor** surface was sought in Trenches 3, 4 and 5 and Test pit 1. Similarly, evidence of Raistrick's paved dais at the eastern end was sought in Trench 3. His excavation notes recorded the height of the walls at 0.84m (2ft 9in) so excavation of all four cuts in this project were taken well below that level. Excavation of Trench 3 found no sign at all of any laid floor surface, either within or without Raistrick's area of work; the same findings apply to Trench 4 and Test pit 1. There simply is no floor (see Figures 17 and 19). In all three cuts the lowest non-natural layer was composed of irregularly-sized angular (cobble

sized) pieces of limestone with no stratification or ordering whatsoever. All showed unordered limestone rubble, though a sondage in Trench 3 also contained a discrete area of sub-rounded pebbles (average long axis 0.1-0.2m) and one flagstone slab. In the test pit work was stopped at a depth of 0.36m below the turf line, well below Raistrick's wall height above the turf line, and only unsorted limestone rubble was found at lower levels. Trench 4 was taken even deeper than in the test pit, with identical results. The conclusion has to be that there never had been a laid floor surface within the building.

Equally perplexing was the total absence of evidence in Trench 3 of a **paved dais** at the eastern end: this whole area showed the same amalgam of limestone rubble and soil. Initially during excavation a discrete thin layer (40-60mm thick) of lime mortar clearly visible in the south elevation and east gable walls was interpreted as a layer (0.34m below the wall top) into which the paving had been set. Careful consideration caused this theory to be rejected as the length and width dimensions of the mortar layer do not match measurements shown on Raistrick's plan.

The Roundhouses

Raistrick's excavation plans show two adjacent 'huts' or roundhouses and he investigated both with one long and narrow Y-shaped trench, centred on a hearth in the larger structure (see Figure 4). This project found the larger structure to have a diameter of c. 10m and the smaller of c. 8m, both measured externally. Little of whatever notes he left on the nature of the two roundhouses is available now so work during this project was concentrated on examining parts where he had not excavated, apart from the position of the hearth in the larger structure (Fig. 30).

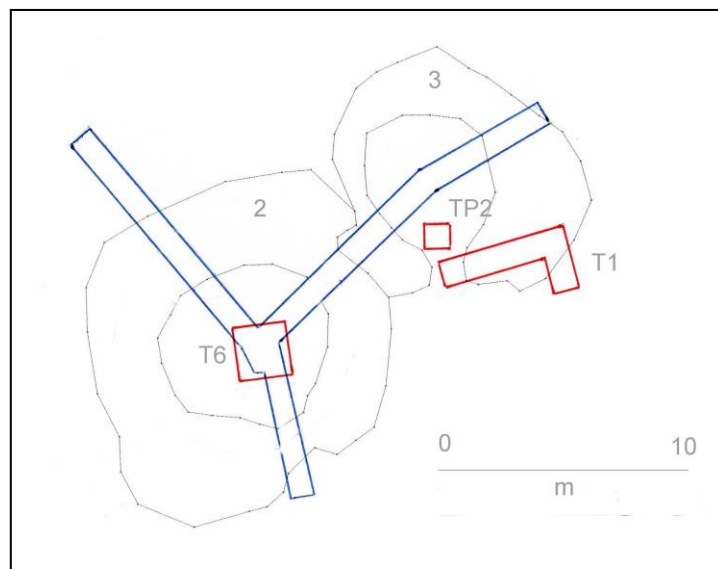


Fig.30 The roundhouses with Raistrick's trenches outlined in blue and this project's in red

Though Test pit 2's precise location was determined by a strong positive geophysical anomaly, it also sought evidence of an **occupation layer**, specifically what his drawing (see Figure 4) appears to depict as being covered in small stone, possibly a cobble effect. Indeed there was a layer of small sub-rounded limestone cobbles though not organised in a manner that suggested an occupation surface. Associated with this layer (202) was an area of gritty material (203), both of which overlay a lens of sticky clay (204) which in turn overlays a layer of fine limestone gravel (205) – none could be described with any confidence as a floor surface.

Trench 1 was designed to understand the nature and composition of the smaller roundhouse's **wall** and it was revealed as a clear earthen bank with pieces of (mainly lime)stone of varying size and shape impressed into it to give strength to the structure (see Figure 13). The angle of repose of the external banking, allowing for settlement over the ensuing centuries, was very shallow, and it gave way on its outer face to a layer of gritty material similar to that seen in the test pit.

Trench 1 was laid out where the geophysical survey had highlighted strong magnetic responses seen in two gentle arcs on and outside the roundhouse's bank. Excavation unearthed twenty-three angular pieces of sandstone (Fig. 31). As discussed earlier, these had all been heat-affected and their overall characteristics strongly suggest that they were **pot boilers** discarded from a hearth somewhere within this roundhouse.

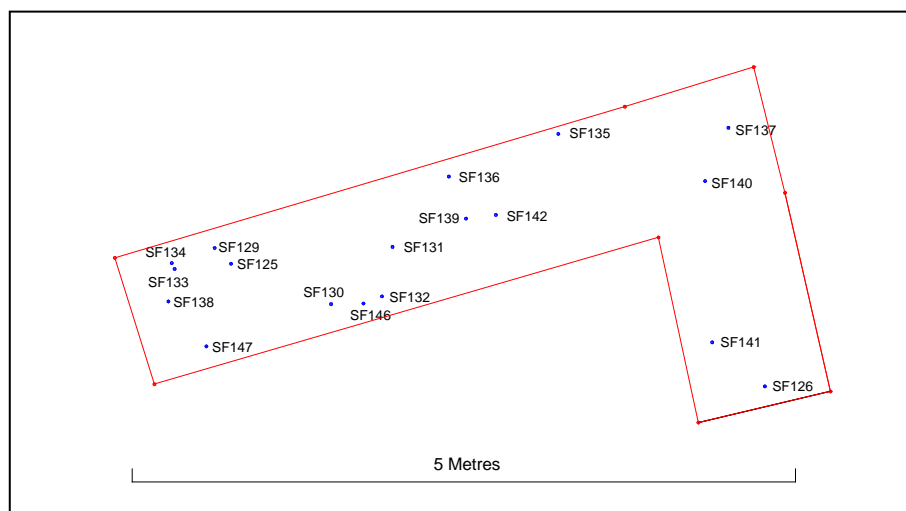


Fig. 31 Spatial distribution of pot boilers in Trench 1

Trench 6 did not find any signs of a **hearth**, though it is possible that Raistrick's excavations here removed it. What was found was a large number of rounded limestone pieces of variable size (pebble to cobble) and an area of gravel (see Figure 23), which conceivably could have formed the substrate for an occupation layer. In addition, eight pieces of coarse sandstone and two of heat-reddened flagstone were found within the trench along with three lithic flakes: taken together these items would suggest the presence of a hearth.

The Sow Kiln

Geophysics had suggested that what Raistrick had assumed was a 'hut' was some kind of kiln and excavation confirmed that it was indeed a sow (clamp) lime kiln. Measured at the rim, the bowl was found to be 3.9m east-west by 3.3m north-south with a full depth below the turf of 0.73-0.8m and a basal diameter of 2.4m. The internal stokehole was measured as 2.4m in length within the bowl plus 1.2m where it cut through the front bowl wall. The stokehole within the kiln was 0.57m in width. All these dimensions put this kiln well towards the top end of parameters of excavated sow kilns (Johnson 2008).

Even within the topsoil layer (201) fragments of coal, charcoal and cinders were noted and it soon became apparent that the emerging shape was a kiln bowl surrounded by a penannular rim formed of upcast material from the bowl, though it had been comprehensively backfilled with limestone rubble at some point after abandonment. As work progressed within the trench more and more burnt material surfaced indicating very high temperatures had been reached within the bowl, and the presence of burnt lime and limeash left no doubt that it was a lime kiln, with an external flue passage and an internal stokehole arrangement both of which had been partially dismantled. Both of these elements of the kiln had large quantities of burnt lime and deeply heat-affected silty material on their floors as well as eleven samples of charcoal and two relatively large lumps of coal. It is thus most likely that the charcoal represented kindling to get the fire going and the coal the main fuel to maintain the burn. Significant amounts of burnt carbonaceous shale were also noted, suggesting that the shale was used as kiln fuel: it is possible that it was sourced on Fountains Fell where mining of coal and coal shale endured for centuries.

By the end of work in Trench 2 the kiln's full form was clear. Unless it had been stripped out after abandonment the bowl wall was not made up of coursed stone walling but partly of limestone rubble impressed into the earth bank and partly of solid bedrock. In clamp kilns the highest temperatures are achieved in the centre of the bowl and it is in no way unusual to find such kilns with a limestone lining. To test whether or not the bowl had been fully lined, a 1.3m-long strip of turf was peeled back from the rim of the opposite side of the bowl – this was found to consist of coursed angular limestone set at an angle of 30 degrees to the horizontal so this suggests that the majority of the original lining had indeed been stripped out for reuse elsewhere.

Based on a series of excavated sow kilns this writer formulated a typology of clamp lime kilns based on structural form (Johnson 2008). The earliest dated examples had a clay-lined bowl with no masonry at all and no stokehole; these were followed by clay-lined bowls or clay-lined bowls with limestone impressed into the lining and with a stokehole; and finally by carefully stone-lined bowls with a stokehole. Kilns dated either by archaeomagnetic techniques or by radiocarbon dating of charcoal show that this sequence is seen in kilns from the eleventh through to the eighteenth century, with stokeholes seemingly appearing in the seventeenth century.

Stone for the kiln was sourced from the small double-level workings cut into the natural hill slope 10m to the north of the kiln (Fig. 32). Detailed surveying of the workings has calculated that c. 50m³ of stone has been removed. A method of calculating (or estimating perhaps) the volume of a kiln bowl uses the formula

$$V = 0.75\pi(d^2h \div 4)$$

where V = volume, d = rim diameter and h = overall bowl height (Bick 1984, 91). This would give a volume of 7.63m^3 for the Chapel Fell kiln. However, the lime and fuel would have been domed up above ground level before being sealed so, without knowing what height the dome would have reached, this result has to be seen as speculative and tentative. It merely indicates that the kiln had a limited life and a limited number of firings.

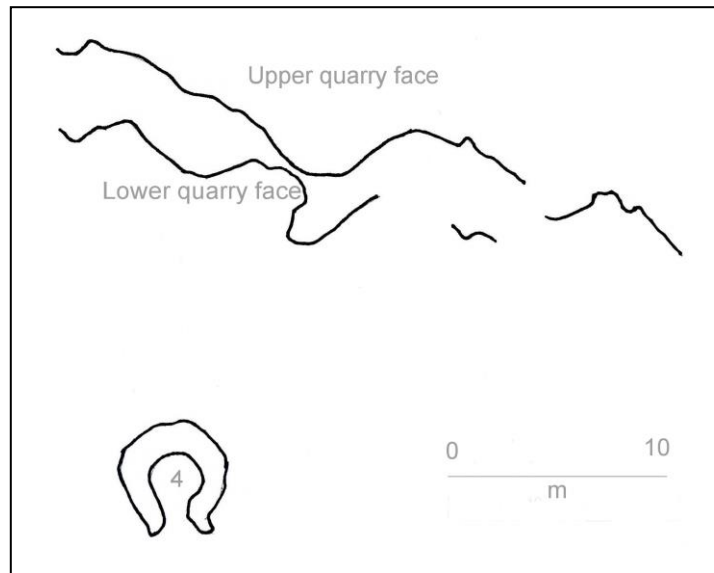


Fig. 32 The sow kiln (4) and associated quarried faces

Comparative Sites in the Dales

The chapel

An archaeological structure vaguely comparable to the chapel site (Feature 1) within North Craven is the monastic St Helen's Chapel site within Malham village, partially excavated in 2015 and 2016 by the Institute of Archaeology, University College London, and researched from a documentary perspective by Dr Victoria Spence (Spence 2015), a local resident. On a brief site visit to the Chapel Fell site, UCL's project lead noted that the two chapels seem to be more or less the same size (pers. comm. Mark Roberts).

Raistrick's *Malham and Malham Moor* (1947, 113) has a short description of the Chapel Fell site:

We have no documentation for the name of Chapel Fell beyond a very rare reference in the earlier charters to the chapel of Malham Moor, ... but on the fell shoulder not far above the road there are the foundations of a very early building which are by tradition ascribed to this period. Examination of the site goes far to confirm this tradition.

The Roundhouses

There are a number of sites on Malham Moor that have been ascribed to the IA/R-B era but mostly by Raistrick and dominantly based on small assemblages of ceramic artefacts. The valid point has been made that dating a structure, or site, from unstratified objects may be misleading (White 2002, 28). Various brief references relate to Chapel Fell:

1. *Yorkshire Archaeological Journal* Yorkshire Archaeological Register, 1964, vol. 41, 327, 'Malham, West Riding' contains a brief summary with basic dimensions of the chapel and very brief mentions of features noted, such as a broad paved dais at the eastern end and a cobbled floor surface. Of direct relevance here is that Raistrick also noted that the chapel was contained 'within' a large Iron Age settlement consisting of four hut circles, with fragments of Iron Age pottery.
2. YAJ YAR, 1965, vol. 42, 561, noted a Romano-British enclosure and small rectangular building with two R-B querns close by, at SD881 672.
3. YAJ YAR, 1968, vol. 42, 114, 'Malham Moor, West Riding' noted a Romano-British settlement also at SD881 672, with second-century pot sherds and two querns; as well as seven circular huts at SD884 675 with charcoal, unidentified flints, pot boilers and a hearth stone.

It is well known that there is a dearth of convincingly dated sites from the Iron Age/Romano-British periods in this part of the Dales, despite extensive survey work by Raistrick and, later, by Alan King (1985; 2011). This project's detailed examination of some of the features in question may add to the understanding and chronology of such settlements, and to the detailed morphology of the structures investigated. Features 2 and 3 are clearly roundhouses, though no direct dating evidence from this work ties them in to those periods. Similarly, their morphology can be compared with, for example, a similar structure excavated at Gordale by Bradford University in 1997 and 1998¹, or with sites excavated in 1991-92 in Littondale by Manchester University, dated to the third or fourth centuries AD (Maude 1998).

Raistrick ascribed a number of sites on Malham Moor to these periods (Raistrick and Holmes 1962): three near Trougate, two near Sherriff Hill, two below Stridebut Edge, Middle House Pasture, and possibly Dewbottoms. As far as can be determined now, none of these was dated by stratigraphically-secure artefacts, and certainly not by radiocarbon dating, a technique not then widely available. As a prominent Yorkshire archaeologist has said recently, it is time to look again at Raistrick's 'guesses'.

The Sow Kiln

This writer has well over a hundred sow kiln sites (proven or putative) on his database and he has been involved over the years in the excavation of over a dozen sow kilns (Johnson 2004, 2006, 2007, 2008a, 2015), and has published a typology in a peer-reviewed journal (Johnson 2008). Thus far, only one other sow kiln earthwork has been located in Malhamdale or Malham Moor, namely HER MYD 49792 in New Pasture on Malham Moor (NGR SD88073 69124).

¹ The Gordale site was surveyed in 1996, one round house (SD9098 6355) was excavated in 1997 and a second in 1998 (SD9098 6353) (EYD 7635). No report was submitted to the YDNPA.

12. Conclusion

The Chapel Fell Project framed a set of aims and objectives, as outlined in Section 4 (above). In summary the Project aimed to examine and understand:

1. the **relationship** between the four structures, particularly to identify if the putative sow kiln was coeval with the 'chapel'.
2. the various structures' ground plans and detailed **morphology**.
3. the detailed internal form of the '**chapel**' and to confirm Raistrick's findings.
4. the original **function** of the two round banked structures.
5. if the postulated **sow kiln** was indeed a lime kiln and, if so, to see how it fits into the typology of early lime kilns.
6. as well as to obtain **dating** evidence for the various structures.
7. and to obtain **environmental** samples.

As Fig. 33 shows, there is a very clear and close physical relationship between the various structures: the two roundhouses are contiguous, both are separated by a very small distance from the south side of the 'chapel', and the sow kiln is equally close to its opposite side. The earth-banked oval feature is only a short distance from the smaller roundhouse.

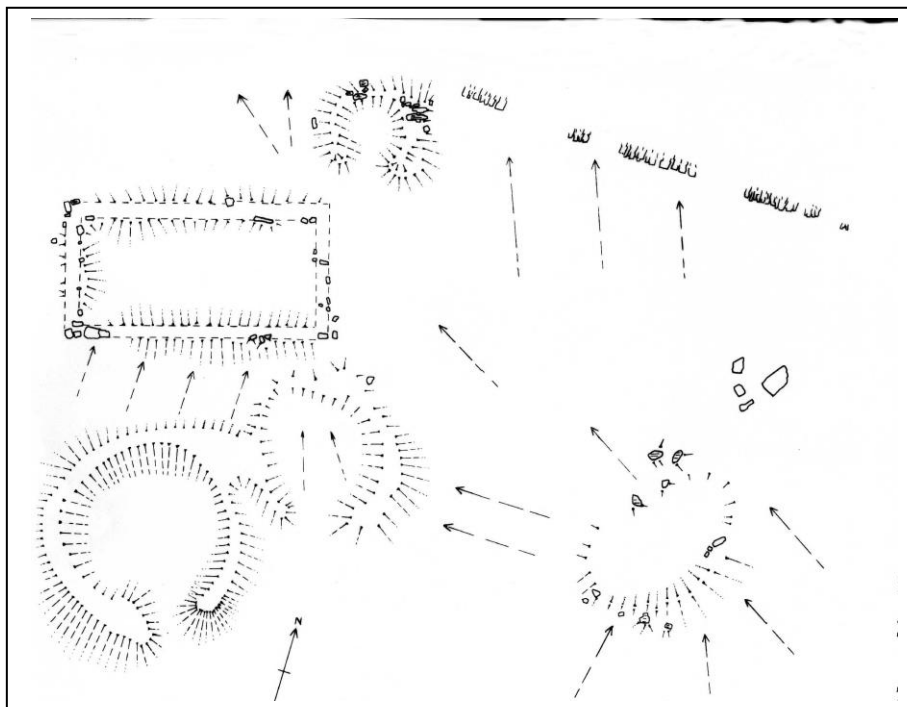


Fig. 33 Measured drawing of archaeological features in the core site

Not all, however, is as clear as may at first sight appear from the earthworks. As Raistrick correctly observed, it is a multi-period site with late prehistoric features in close physical proximity to two much more recent structures – the 'chapel' and the kiln, though his identification of the kiln as a 'hut' has been disproved.

The rectangular building's stated function, according to Raistrick, was as a chapel for the Fountains Abbey community on Malham Moor, dismantled at Dissolution in the 1530s, with its foundation supported by early monastic charters. It can now be stated with a high level of certainty that the building was neither monastic in origin nor demolished at Dissolution; furthermore, the findings of this project's excavations within the supposed chapel necessitated further consideration of how it came to take on its present 3-D form.

Raistrick may have taken his comment about the foundation of a monastic chapel on Malham Moor from an earlier work (Morkill 1933, 257) which alluded to

Tradition tell[ing] of a chapel at Water Houses on Malham Moor and foundations of a building at the foot of Chapel Fell ... The name Chapel Fell gives weight to the tradition which, despite the lack of written confirmation, is probably founded on fact.

This traditional view was supported during this project's excavation phase by a visit to the site by a long-term resident of Malham whose grandfather had farmed at Capon Hall, on Malham Moor, and had rented Chapel Fell from the 1880s. The visitor spoke of how she had accompanied her grandfather to the Fell and how he had shown her the structure impressing on her that this was a long-lost chapel. On the other hand, the mention of a chapel in early Fountains Abbey charters refers not to Malham Moor but to Malham village, to the site investigated archaeologically in 2015-16 (pers. comm. Victoria Spence). This latter chapel is known to have been systematically (and illegally) dismantled during the short reign of Edward VI (1547-53), that is, within a decade or so of Dissolution (Spence 2015, 52).

Of arguably far greater importance and relevance are the writings of Nathaniel Johnson who visited parishes in the area, interviewed local inhabitants and kept a hand-written journal of his observations (Bodleian MS Top Yorks).² On page 127, on 3 August 1669, he wrote:

On this more the Inhabitants did intend to build a Chapele, w^{ch} they began in 1642, but/ of in (sic) 1647 but then the wars coming on they never finished it. Also Tarne houses, adjoining to the Tarne, 3 houses, Stan gill, 3 houses, 3 houses near Fountaines fell. Thor gill beck 2 Houses Darnbrooke North east/ 5 houses.

It is clear from the way he ordered the various tenements in this section that he had journeyed systematically from west to east: each of the place-names he noted still exists, though Stangill and Thoragill (as they are now) have been reduced to single field barns. The three houses near Fountains Fell can only refer to what is now Tennant Gill midway between Stangill Barn and Thoragill Beck House. His description starts in the west so the intended chapel lay just before 'Tarne houses' which is now Water Houses. The chapel therefore lay on Chapel Fell.

Thus, the rectangular building was indeed a chapel, or an intended but aborted chapel, but not from the medieval period and not demolished at Dissolution. Archaeological evidence from this project supports this contention.

Firstly, the walls do not fit the norm for medieval structures. With widths of 0.6m on the side walls and 0.7m on the gable walls they are too narrow: these widths fit the parameters of early modern or even nineteenth-century buildings but certainly not supposed monastic

² The writer is indebted to Dr V. Spence for drawing this item to his attention.

buildings. The style of construction is also out of keeping with medieval techniques which employed more massive and 'blocky' facing stone. Apart from the corner stones in this building the facing stone used is smaller and, in general, not squared though it should be said that limestone, as used here, is much harder to shape than sandstone.

Secondly, the inescapable reality that the wall tops are so uniformly level excludes the possibility that the building had been abandoned and left to slowly disintegrate, and in all probability it also rules out deliberate demolition. If it had been systematically dismantled, why would this process have stopped at the height now apparent given that what stands contains mostly useful building stone? It seems untenable to suggest that it could have been taken down to such a uniform level.

Further, if the building had slowly decayed and collapsed one would expect to have found much more stone lying within the building, and no doubt outside as well, with the greatest volume along the walls where the majority would have fallen. It is also impossible to imagine collapsing walls ending up so level. What stone was found within the building during excavation was almost without exception what a waller would regard as rubble – irregularly-shaped limestone used as infill between facing blocks.

It was also striking that none of the interior walls exposed in the trenches showed any evidence of having been coated with lime mortar or plaster. Had this been a medieval chapel, some (even faint) trace would have survived. Similarly, the total lack of evidence for a floor, or even the substrate for a floor surface, militates against it having been a building completed and used as a chapel – or, arguably, used for anything.

Other possible uses can also be ruled out by the archaeological evidence. A building in such a location as this could conceivably have been intended for housing stock. Were this the case, though, one would expect to find signs that disposal of liquid and solid waste had been taken into account. Given that there is a slight decrease in height from west to east there would have to have been an opening in the east gable, specifically in the south-east corner, for swilling it all out: there is no such aperture. The building has only one point of entry, in the extreme south-west corner. It is only 0.9m wide thus perhaps rather narrow for cattle but more tellingly a stock building would not just have one relatively narrow doorway tucked into one corner. It would not make sense logistically.

Could it have been used, or intended to be used, as a domestic house perhaps? Here again the positioning of its single door would pose a problem. The existence of one door, set at or close to the south-west corner, is attested in chapels elsewhere but not in houses.

Its almost perfect east-west long-axis alignment suggests that it was intended as a religious building.

All this evidence of function is, of course, speculative and tentative. So, too, would be any conclusion concerning its date of construction, though medieval provenance has been ruled out above. It had been hoped that charcoal samples from within the building would prove suitable for radiocarbon dating, and that these dates would correspond to ones obtained from the sow kiln, but this was not to be. As seen earlier, no samples from the chapel proved suitable and only one date was possible from the kiln but this single date does have value regarding the chapel's origin. As discussed earlier, the calibration plot was not clear cut, having three spikes, but the later ones can be ruled out and the date ranges that fit this style

of sow kiln, assuming that the typology is tenable, take in the seventeenth century. Within the 1σ (68.2%) range there is a 27.4 per cent probability that the dated firing event fell between 1647 and 1678, and at 2σ (95.4%) 34.1 per cent probability of 1636-90. Nathaniel Johnson's account tallies with these ranges.

In summary, therefore, we are not dealing here with certainties or absolute facts but with balance of probability. Evidence and analytical reasoning point to the building not having had medieval origins or an immediate post-Dissolution termination but an intended life as a nonconformist – Puritan? – chapel, abandoned as a direct result of the deteriorating political and economic situation in the 1640s. Archaeological evidence strongly suggests that the kiln had a limited life, it was built close to the chapel, as was so common with pre-modern building projects (the equivalent of today's mechanised cement silos on construction sites), and the dating results for the kiln do potentially tie it in to the mid-seventeenth century, so there is more than just a tenuous link evident here.

On the two circular banked structures, though this project found no secure dating evidence, there can be little doubt that they, along with the other four features just west of the dry valley, were indeed late prehistoric roundhouses. Whether the two were coeval with the four remains an unresolved matter; whether the banks, noted as Feature 7 in this project, were associated with the roundhouses is also unresolved. Equally uncertain is the age of the large double enclosure (Feature 10) – it could either be of late prehistoric or monastic age.

Finally, we can address the extent to which this project's aims were achieved.

It will come as no surprise that Chapel Fell's visible archaeology represents a multi-period landscape with the lithic assemblage confirming a late Mesolithic-Neolithic presence around the north side of Malham Tarn, the roundhouses late prehistoric settlement, and the chapel and sow kiln most probably seventeenth-century activity. Whereas Arthur Raistrick had assumed the sow kiln was another prehistoric 'hut', this project has proved it to be a lime kiln. In terms of internal morphology, especially with regard to the chapel, there are significant differences between Raistrick's assertions and this project's findings. There simply is no cobbled floor or paved dais in the chapel and no convincing occupation surface was found within the roundhouses. Dating evidence fell short of initial aspirations: nothing in the nature of absolute dating was found within the roundhouses; dating of the chapel can only be based on associations with the sow kiln and Nathaniel Johnson's records though medieval provenance can effectively be ruled out; and only one reliable date was secured for the kiln itself though the sample's position on the floor of the bowl does give the result stratigraphical integrity. Attempts to obtain environmental samples failed.

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14. Appendices

1. Personnel
2. Harris Matrices
3. Geophysical Report *Ann Wilkinson*
4. Finds Database
5. Charcoal Database *Dr Denise Druce*
6. Photographic Archive Database
7. Botanical Assessment

Appendix 1. Personnel

Project managers	Chris Bonsall, Carol Howard
Excavation supervisor	Dr David Johnson
Geophysics specialists	Ann and Stuart Wilkinson
Geophysics team	Chris Bonsall, Sandra Bonsall, John Cuthbert, Carol Howard, Bob Moore, Sarah Moorhouse, Carol Ogden, Phil Robinson, Helen Sergeant, Frank Walker
EDM manager	John Cuthbert
EDM team	David Gibson, Sarah Hunter, Bob Moore, Jeff Price, Helen Sergeant
Tape and offset surveying	Chris Bonsall, Peter Gallagher, David Gibson, Sheila Gordon, Carol Howard, David Johnson, Bob Moore, Carol Ogden, Phil Robinson, Philip Sugden
Excavation	Alison Armstrong, Chris Bonsall, Sandra Bonsall, Peter Gallagher, David Gibson, Sheila Gordon, Carol Howard, Sarah Hunter, Lynda Hutchins, Gordon Jackson, Chris Judge, Mike Kingsbury, Mike Kneill, Frank Laver, Muriel Laver, Wanda Lewcun, Bob Moore, Sarah Moorhouse, Carol Ogden, Laura Parker, Phil Robinson, Helen Sergeant, Philip Sugden, Frank Walker, Dianne Wall, Justin Wood, Martyn Winrow

Appendix 2. Harris Matrices

Trench 1

101	topsoil
↑	
102	wall top
↑	
103	external wall banking
↑	
104	gravel layer

Trench 2

	201		topsoil
	↑		
208		212	bowl backfill
	↑		
	209		mix of limestone & burnt lime
	↑		
	204		lens of burnt lime
	↑		
	203		grit layer
	↑		
	207		lens of burnt lime
	↑		
	206		lime deposits within stokehole
	↑		
	205		west wall of stokehole
	↑		
	210		west wall of kiln bowl
	↑		
211		213	floor of kiln bowl & stokehole
	↑		
	202		bedrock

Trench 3

301	topsoil
↑	
303	wall tumble
↑	
304	backfill
↑	
305	laid gravel layer
↑	
302	walls
↑	
306	clay subsoil
↑	
307	silty clay layer – natural?

Trench 4

401	topsoil
↑	
403	wall tumble/backfill
↑	
407	lens of tumbled material/backfill
↑	
402	walls
↑	
404	gravel layer
↑	
405	upper subsoil horizon
↑	
406	lower subsoil horizon
↑	
408	natural

Trench 5

501	topsoil
↑	
503	wall tumble
↑	
504	threshold to building
↑	
505	layer – floor substrate?
↑	
506	layer – natural?
↑	
502	walls

Trench 6

601	topsoil
↑	
602	layer of soil & degraded limestone
↑	
603	gravel layer

Appendix 3. Geophysical Report

Ann Wilkinson

Summary

A geophysical survey was conducted as part of the Ingleborough Archaeology Group's proposed archaeological investigation and reassessment of earlier work of a multi-period site on the lower reaches of Chapel Fell near Malham Tarn, North Yorkshire. The site includes the visible remains of a rectangular building structure adjacent to two banked circular features and that of another feature which may be a potential sow lime kiln. The earth resistance survey provided little additional detail concerning existing archaeological features whilst the magnetometer survey confirmed a significant magnetic response in the locality of the potential sow lime kiln.

Contributors

The fieldwork supervised by Stuart and Ann Wilkinson was conducted with the help of David Johnson and members of the Ingleborough Archaeology Group. Background to the Chapel Fell Project was supplied by David Johnson, and members of the Ingleborough Archaeology Group undertook measurement of the survey area co-ordinates with a Total Station.

Acknowledgements

The author wishes to thank Stuart Wilkinson, David Johnson and members of Ingleborough Archaeology Group for their help with undertaking the fieldwork.

Archive Location

Halifax, West Yorkshire.

The survey archive can be supplied on CD for the purpose of deposition with the project archive in due course.

Date of Fieldwork and Report

The fieldwork was conducted over the weekend of 19 and 20 March 2016 and the report was completed on 12 May 2016.

Contact Details

Ann Wilkinson, 129 Siddal Lane, Siddal, Halifax, HX3 9JS.

Email: ann.wilkinson0@talk21.com

Introduction

A geophysical survey was conducted over a site at Chapel Fell near Malham Tarn, North Yorkshire. The survey was undertaken as part of Ingleborough Archaeology Group's proposed archaeological investigation and reassessment of earlier work of a multi-period site on Chapel Fell (Johnson 2015). It was hoped the results, in particular the magnetometer survey would shed some light on the purpose of features visible on the ground and to help inform the placement of trenches in subsequent excavation.

The site (centred on NGR SD885 675) is situated near to the road from Langcliffe to Arncliffe on the lower reaches of Chapel Fell which lies north-west of Malham Tarn (see Figure 1). Obvious features visible on the ground include a rectangular structure consisting of the turf-covered lower courses of a stone building orientated east-west with dimensions of 14m east-west x 7m north-south. Adjacent to the south are two sub-rounded banked structures measuring 10m x 10m and 7.5m east-west x 2.5m north-south respectively (Johnson 2015). This complex of features is recorded in the Yorkshire Dales National Park Authority (YDNPA) Historic Environment Record as monument number MYD3758 identified as a probable Medieval chapel on the site of an Iron Age settlement. Less than 10m to the north-east of the north-east corner of the rectangular structure, the earthworks of another feature have been identified by David Johnson as that of a potential lime kiln of the sow kiln type (Johnson 2015). Various archaeological events have been recorded on Chapel Fell including archaeological excavations of the chapel/Iron Age settlement by Arthur Raistrick in 1964 (Johnson 2015).

The Chapel Fell site lies over Carboniferous Great Scar (Cove) Limestone which outcrops at the surface (Johnson 2015). It lies at an altitude of circa 400 OD where the ground level inclines gently upwards across the survey area from south to north. At the time the survey was carried out the weather conditions were generally cold but dry.

Method

A grid consisting of three 20m x 20m squares was established (Figure 2) and tied into known, mapped Ordnance Survey (OS) points using a Total Station.

Magnetometer survey

The Magnetometer survey was carried out using Bartington Grad601-2 dual sensor fluxgate gradiometers. Using the 100 nanotesla (nT) range setting (resolution 0.03nT) of the instrument, readings were collected at a sampling interval of 0.25m along successive north-south traverses spaced 1m apart and walked in the so called zig-zag traverse pattern. Thus, providing 1600 sample measurements for each 20m x 20m grid. At the end of the survey, the magnetometer data was downloaded from the instrument's data logger into Grad601 Datalog v.3.16 software prior to importing into Geoplot v.3 software for processing.

Earth resistance survey

Earth resistance data was recorded using a Geoscan RM85 resistance meter with integral multiplexer and a PA20 electrode frame in the twin electrode configuration with mobile probe spacing of 0.5m and 1.0m allowing mapping of earth resistance data at differing depths. Readings were collected at 1.0m intervals along traverses spaced 1.0m apart walked in the

zig-zag traverse pattern. Thus, providing 400 sample measurements for both the 0.5m and 1.0m mobile probe settings per 20m x 20m grid. At the end of the survey, the earth resistance data was downloaded from the instrument's data logger directly into Geoplot v.3 software for processing.

Data processing

Subsequent processing of the magnetometer data included the setting of each traverse within a grid to zero mean for removal of striping effects in the traverse direction and clipping data to specified maximum and minimum values to limit the impact of large noise spikes. Processing of the earth resistance data included clipping to specified values and application of a high pass filter to remove larger variations in the data often associated with underlying geology so as to better resolve significant archaeological/man-made anomalies.

The processed magnetometer and earth resistance data are presented as linear greyscale images superimposed over the OS base map in Figures 3 to 5.

Results

Magnetometer survey

A graphical summary of the significant magnetic anomalies identified with the prefix [m] are superimposed on the OS map data in Figure 6.

In the northern limits of the survey area, the bipolar combination of strong positive magnetic and associated negative magnetic responses making up anomaly [m1] coincides with the location of the feature identified as that of a potential sow lime kiln. The magnetic responses of anomaly [m1] could suggest a burning event which would lend support for this feature being the remains of a lime kiln.

Immediately to the south-west of [m1] there is what is largely a positive magnetic rectilinear anomaly [m2] which runs east-west, turns south and then back on itself, running west-east. In part, the location of [m2] corresponds with the remains of the rectangular stone building structure referred to as a chapel. The intensity of the positive magnetic response is stronger along the northern extent of anomaly [m2] fading in intensity along the southern extent and is accompanied in places by a weak negative magnetic response. It is unclear why this magnetic anomaly should be observed, as the stonework of this structure is that of limestone and would expect to have a lower or non-magnetic polarity compared to the background. This structure was investigated by Arthur Raistrick in 1964 (Johnson 2015) and it is possible anomaly [m2] may relate to his excavation work.

Discrete positive magnetic anomalies [m3–m5] may relate to features of possible archaeological origin such as the magnetically enhanced infill of a pit. Anomaly [m3] is located near the south-east corner of the rectangular stone building structure and could be associated with the responses noted with anomaly [m2]. Anomaly [m5] lies near the inside edge of the western limit of the smaller of the two circular anomalies ([r3], Figure 7) noted on the earth resistance survey.

Discrete anomalies [m6] and [m7] consisting of a positive magnetic with associated negative response are likely to be caused by ferrous metal objects within the survey area. Anomaly [m6] lies on the southern limits of the smaller of the two circular anomalies ([r3], Figure 7)

noted on the earth resistance survey. At the time of the survey, a sweep across the visible features with an XP ADX150 metal detector identified three ferrous responses. One located at SD88489 67515 which is inside the rectangular structure towards the south-west corner, one at SD88498 67509 slightly to the south of anomaly [m5] and one at SD88500 67508 at the top end of anomaly [m6].

The scatter of positive magnetic responses [m8-10] and the weakly positive magnetic curvilinear responses making up anomaly [m11] may have archaeological significance but are probably natural in origin.

Earth resistance survey

A graphical summary of the significant earth resistance anomalies noted for the 0.5m probe survey are identified with the prefix [r] on the OS map data in Figure 7.

The distinct very high resistance rectilinear anomaly [r1] corresponds to the location of the rectangular building structure visible on the ground. Likewise, to the south of [r1], two weaker high resistance circular anomalies [r2] and [r3] in close proximity to each other coincide with the location of the two sub-rounded banked structures visible as earthworks.

Other very high resistance anomalies [r4-r7] are probably related to near surface or outcropping of underlying limestone bedrock.

In addition to the earth resistance data collected for 0.5m mobile probe spacing; data was also collected for 1.0m mobile probe spacing. Whilst some of the anomalies identified from the former are discernible on the greyscale image of the 1.0m probe spacing in Figure 5; there is very little additional detail to be gleaned from this dataset.

Conclusion

The earth resistance survey confirmed the presence of the rectangular building structure and the two sub-rounded banked structures but gave little additional information on these features nor indicated the presence of any other significant features in the area in between and around them. In contrast the magnetometer survey indicated a significant magnetic anomaly coinciding with the location of another feature identified as a potential sow lime kiln. Magnetic anomalies noted in the locality of the smaller of the two sub-rounded banked structures would warrant further investigation to clarify the nature of these responses.

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References

David Johnson, Ingleborough Archaeology Group (IAG) 2015, Chapel Fell Project Design (Project Code CHF 16), *Investigation of a multi-period site at Chapel Fell, Malham Tarn*

Yorkshire Dales National Park Authority, monument record MYD3758 accessed through the Archaeology Data Service (ADS) website

<http://archaeologydataservice.ac.uk/archsearch/browser.jsf> (May 2016)

Location of Chapel Fell, Malham Tarn

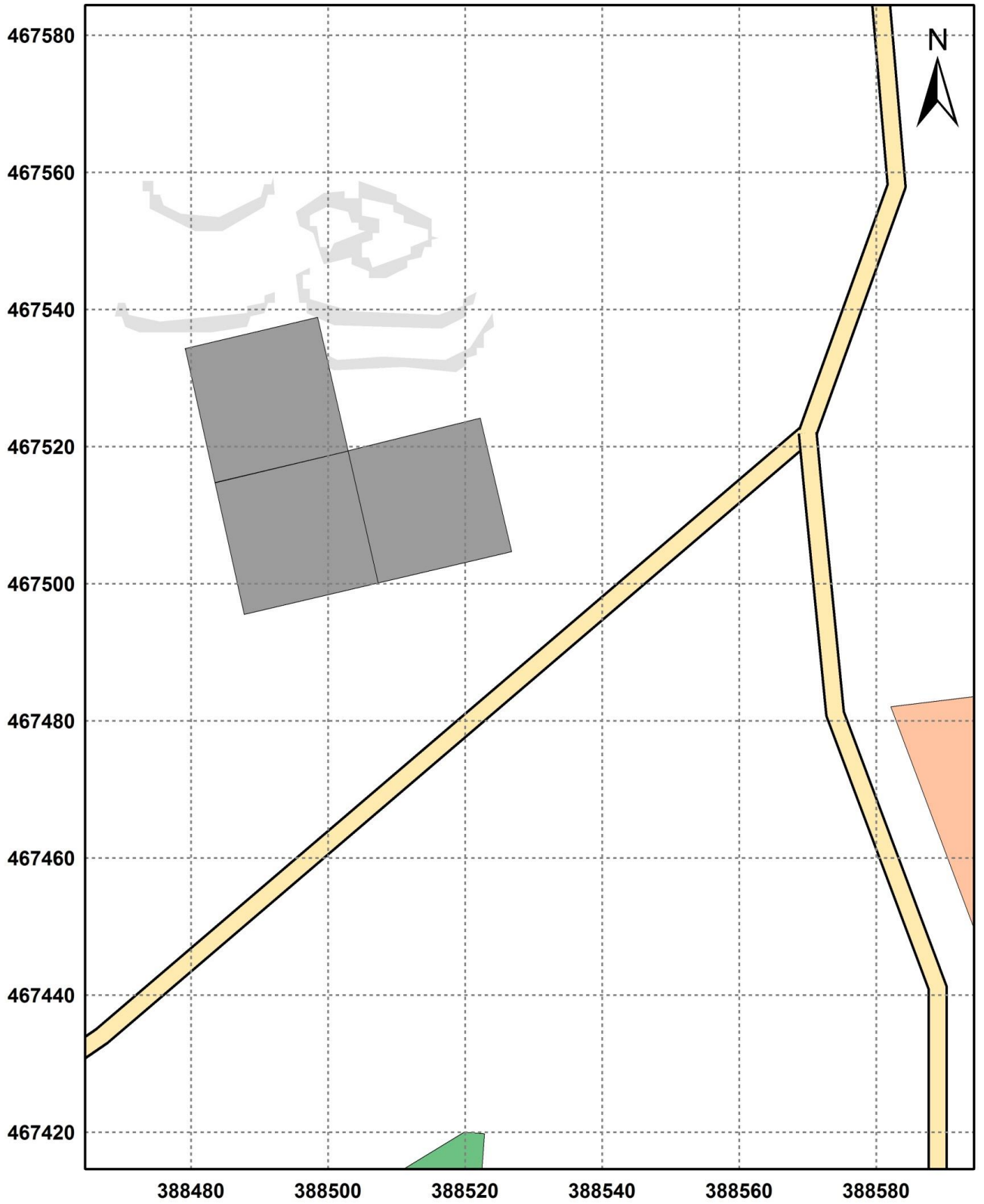
Figure 1



Contains OS data © Crown copyright and database right 2016

Chapel Fell, Malham Tarn
Location of geophysical surveys, March 2016

Figure 2

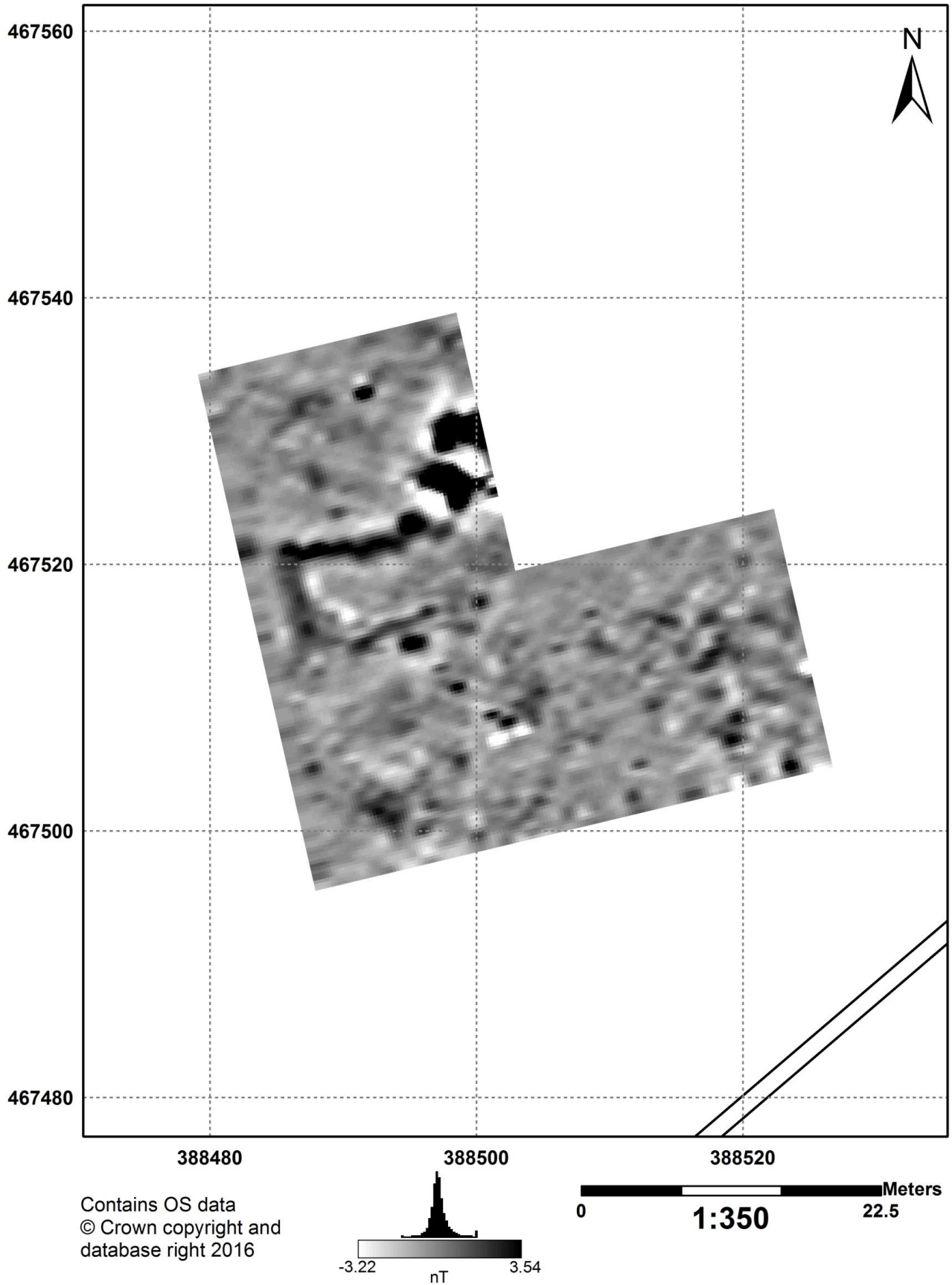


Contains OS data
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0 1:700 30 Meters

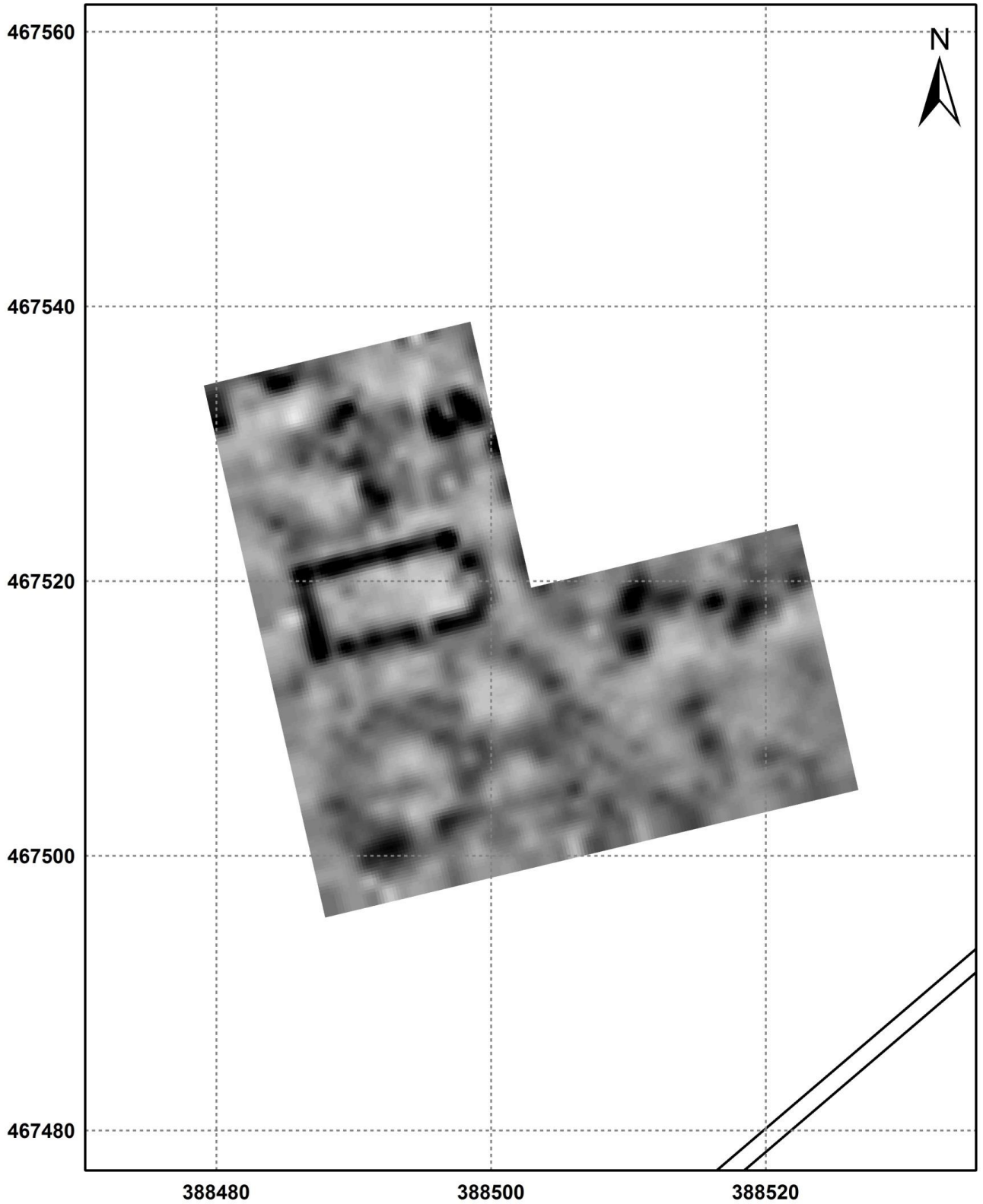
Chapel Fell, Malham Tarn
Location of fluxgate gradiometer survey, March 2016

Figure 3

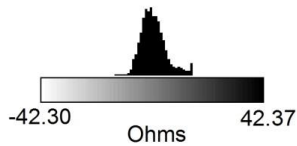


Chapel Fell, Malham Tarn
Location of earth resistance survey (0.5m probe), March 2016

Figure 4

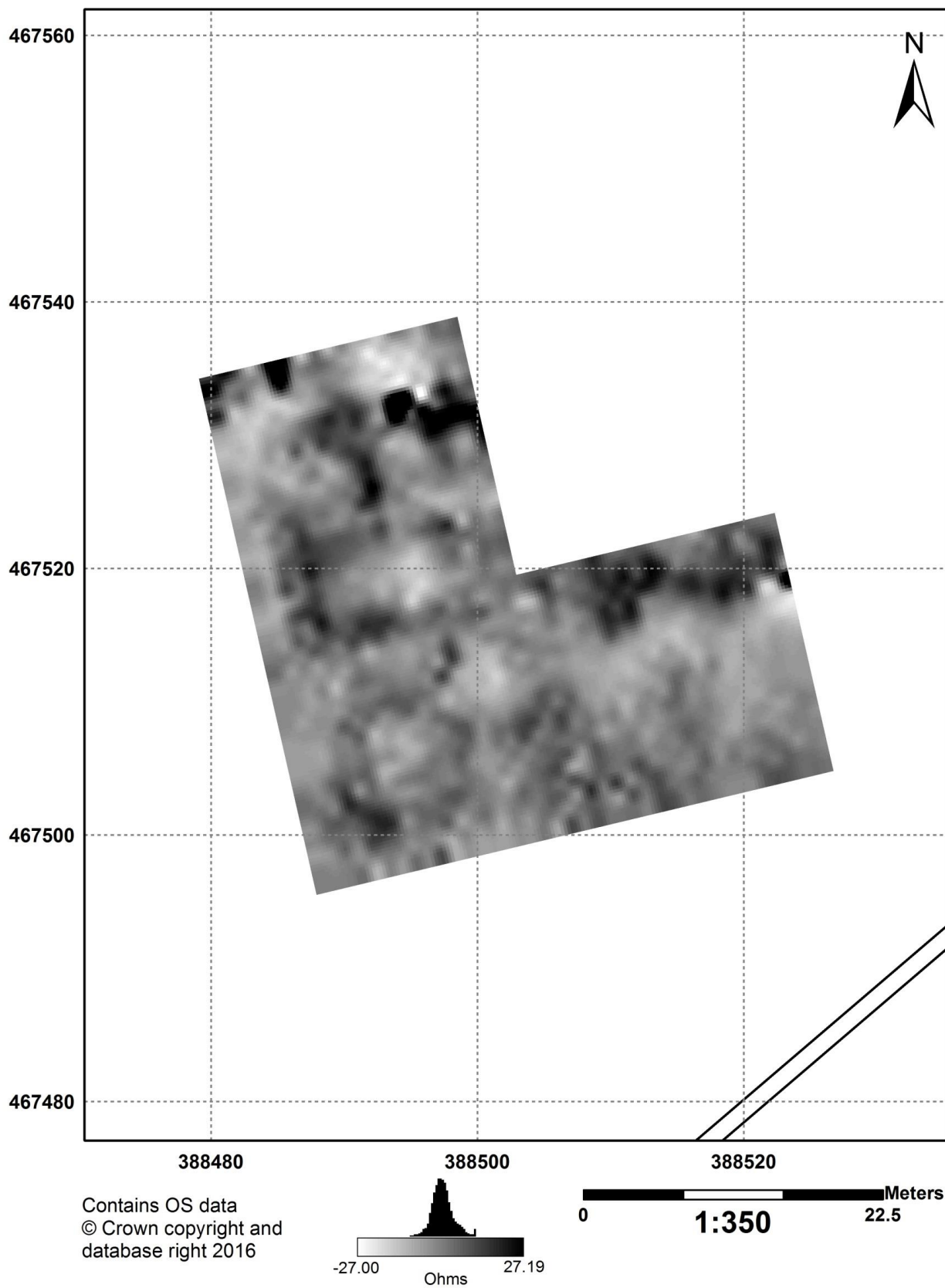


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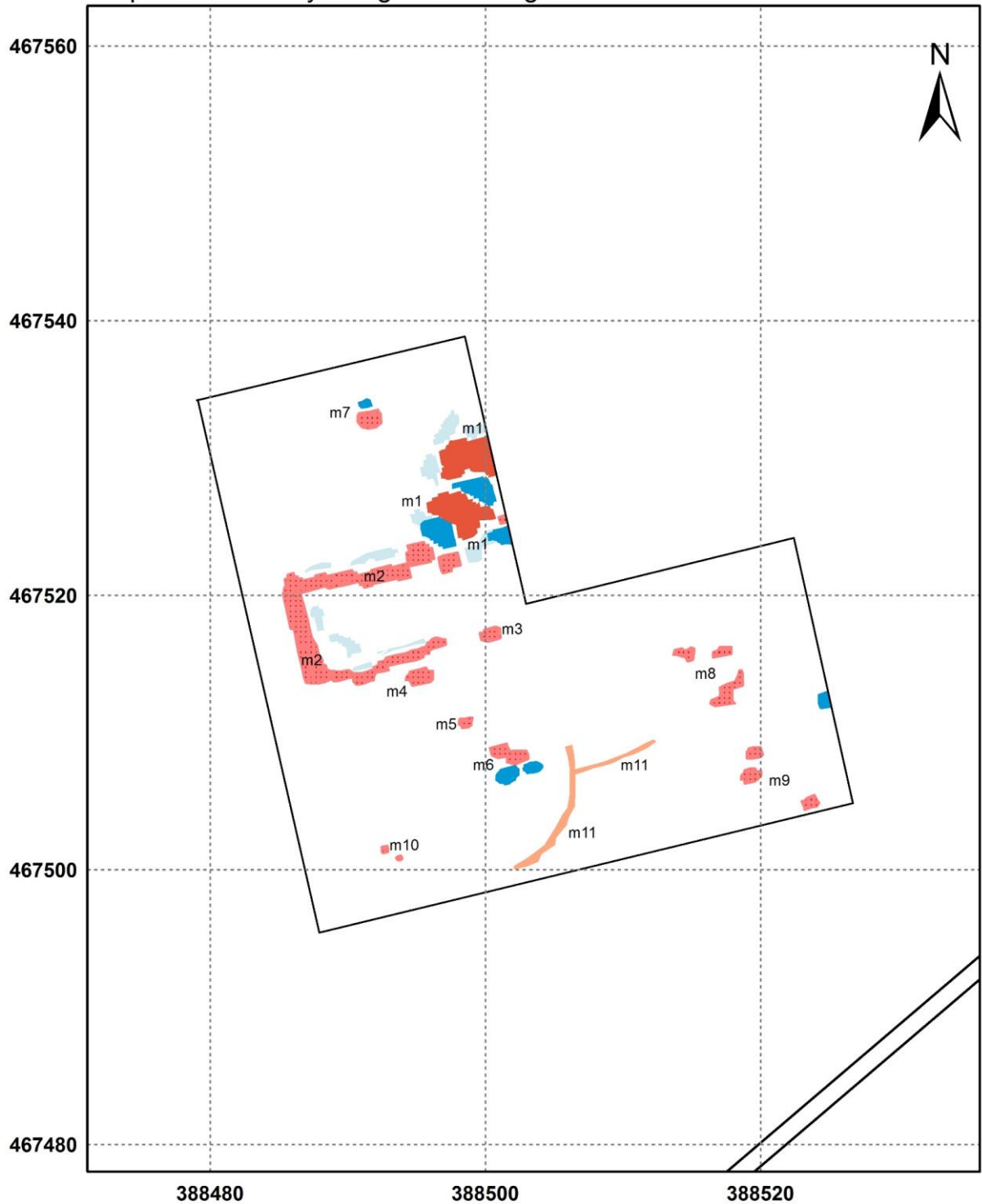
Chapel Fell, Malham Tarn
Location of earth resistance survey (1.0m probe), March 2016

Figure 5



Chapel Fell, Malham Tarn
 Graphical summary of significant magnetic anomalies

Figure 6



0 **1:350** 22.5 Meters

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- Strong Positive Magnetic
- Positive Magnetic
- Weak Positive Magnetic
- Weak Negative Magnetic
- Negative Magnetic

Appendix 4. Finds Database

Sf no.	Context	n	Material	Description
101	301	1	coal	small piece
102	301	1	coal	small piece
103	301	1	coal	small piece
104	TP101	1	iron	modern, unidentified curved bar
105	302	1	shale	burnt shale/lime mortar concretion
106	304	2	slate	broken roofing slate pieces
107	305	-	charcoal	clinkered
108	405	2	slate	probable roofing slate piece
109	305	1	slate	probable roofing slate piece
110	305	-	charcoal/mortar	indeterminate sp.
111	305	-	charcoal	indeterminate sp.
112	MH1	1	flint	broad blade
113	406	-	charcoal/mortar	clinkered
114	MH2	1	flint	indeterminate fragment
115	307	1	flint	indeterminate fragment
116	MH3	1	flint	regular flake
117	TP2	1	metal	iron rainwater goods
118	TP2	1	flint	indeterminate fragment
119	TP2	1	stone	sandstone pot boiler
120	TP2	1	stone	sandstone poss. Pot boiler
121	MH4	1	flint	core
122	TP2	2	stone	sandstone pot boilers
123	201	-	charcoal	clinkered
124	201	1	glass	green bead
125	101	1	stone	sandstone pot boiler
126	101	1	flint	flake/blade fragment
127	MH5	1	lithic	

Sf no.	Context	n	Material	Description
128	MH6	1	lithic	
129	101	1	stone	sandstone pot boiler
130	101	1	stone	sandstone pot boiler
131	DB	1	iron	rainwater goods
132	101	1	stone	sandstone pot boiler
133	101	1	stone	Sandstone pot boiler
134	101	1	stone	sandstone pot boiler
135	101	1	stone	sandstone pot boiler
136	101	2	stone	sandstone pot boilers
137	101	2	stone	sandstone pot boiler
138	101	1	stone	sandstone pot boiler
139	101	1	stone	sandstone pot boiler
140	101	2	stone	sandstone pot boilers
141	101	1	stone	sandstone pot boiler
142	101	1	stone	sandstone pot boiler
143	206	-	charcoal	clinkered
144	206	-	charcoal	oak
145	206	-	charcoal	clinkered
146	102	1	stone	sandstone pot boiler
147	102	1	stone	sandstone pot boiler
148	208	-	charcoal	hazel
149	208	-	charcoal	clinkered
150	208	-	charcoal	indeterminate sp.
151	208	-	charcoal	ash
152	208	-	charcoal	ash
153	208	-	charcoal	oak
154	208	-	charcoal	indeterminate sp.
155	208	1	coal	small piece

Sf no.	Context	n	Material	Description
156	208	-	charcoal	ash
157	208	-	charcoal	indeterminate sp.
158	208	-	charcoal	ash
159	209	-	charcoal	clinkered
160	208	-	charcoal	clinkered
161	209		charcoal	clinkered
162	209	-	charcoal	indeterminate sp.
163	602	1	chert	regular flake
164	602	1	chert	indeterminate fragment
165	602	2	flint	narrow blade
			chert	regular flake
166	602	1	chert	core
167	211	-	charcoal	ash

DB – demolished building; MH – molehill; TP – test pit

Appendix 5. Charcoal Database

Dr Denise Druce

Sf no.	Context	Species	Comments
107	305	unknown	clinkered
110	305	unknown	indeterminate
111	305	unknown	indeterminate
113	406	unknown	clinkered
123	201	unknown	clinkered
143	206	unknown	clinkered
144	206	oak	old wood effect
145	206	unknown	clinkered
148	208	hazel	roundwood
149	208	unknown	clinkered
150	208	unknown	indeterminate sp.
151	208	ash	old wood effect
152	208	ash	poss. old wood effect but roundwood/sapwood?
153	208	oak	old wood effect
154	208	unknown	indeterminate sp.
156	208	ash	old wood effect
157	208	unknown	indeterminate sp.
158	208	ash	old wood effect
159	209	unknown	clinkered
160	208	unknown	clinkered
161	209	unknown	clinkered
162	209	unknown	indeterminate sp.
167	211	ash	old wood effect

Appendix 6. Photographic Archive Database

File Ref.	Date	Time	Trench	Description	Contexts / Find No.	Direc'n	Conditions	Photo - grapher
CHF001	16/5/16	11.00		Pre-excavation	Feature 1	N	Sunny	CJB
CHF002	16/5/16	11.00		Pre-excavation	Feature 1	E	Sunny	CJB
CHF003	16/5/16	11.00		Pre-excavation	Feature 1	S	Sunny	CJB
CHF004	16/5/16	11.00		Pre-excavation	Feature 1	W	Sunny	CJB
CHF005	16/5/16	11.45	4	Marked Out		S	Sunny	CJB
CHF006	16/5/16	11.45	4	Marked Out		S	Sunny	CJB
CHF007	16/5/16	12.10	3	Marked Out		S	Sunny	CJB
CHF008	16/5/16	14.30	3	De-turfed	301 302 303	N	Sunny	CJB
CHF009	16/5/16	14.30	3	De-turfed	301 302 303	E	Sunny	CJB
CHF010	16/5/16	14.30	3	De-turfed	301 302 303	S	Sunny	CJB
CHF011	16/5/16	14.30	3	De-turfed	301 302 303	W	Sunny	CJB
CHF012	16/5/16	14.45	4	De-turfed	401 402 403	N	Sunny	CJB
CHF013	16/5/16	14.45	4	De-turfed	401 402 403	E	Sunny	CJB
CHF014	16/5/16	14.45	4	De-turfed	401 402 403	S	Sunny	CJB
CHF015	16/5/16	14.45	4	De-turfed	401 402 403	W	Sunny	CJB
CHF016	16/5/16	16.00	3	Detail: SE corner feature 1 (external)	302 303	NE	Sunny	CJB
CHF017	17/5/16	10.00	3	Detail: SE corner feature 1 (external)	302 303	N	Cloudy	CJB
CHF018	17/5/16	10.20	3	Detail: SE corner feature 1 (external)	302 303	NW	Cloudy	CJB
CHF019	17/5/16	10.05	TP1	Marked Out		N	Cloudy	CJB
CHF020	17/5/16	10.30	TP1	De-turfed	TP101	N	Cloudy	CJB
CHF021	17/5/16	12.20	3	Detail: SE corner feature 1 (external)	302 303	W	Cloudy	CJB
CHF022	17/5/16	12.20	3	Detail: SE corner feature 1 (external)	302 303	N	Cloudy	CJB
CHF023	17/5/16	14.30	3	Detail: SE corner feature 1 (external) stones removed	302 303	N	Cloudy	CJB
CHF024	17/5/16	14.30	3	Detail: SE corner feature 1 (external) stones removed	302 303	W	Cloudy	CJB
CHF025	17/5/16	12.30	4	Detail: W wall (External) / SE corner trench 4	402 403	E	Cloudy	CJB
CHF026	17/5/16	12.30	4	Detail: W wall (External) / SE corner trench 4	402 403	E	Cloudy	CJB
CHF027	17/5/16	12.30	4	Detail: W wall (External) / SE corner trench 4	402 403	E	Sunny	CJB
CHF028	17/5/16	12.30	4	Detail: W wall (External) / SE corner trench 4	402 403	E	Cloudy	CJB
CHF029	17/5/16	12.30	4	Detail: W wall (External) / SE corner trench 4	402 403	E	Cloudy	CJB
CHF030	17/5/16	16.30	5	De-turfed	501 502 503	N	Cloudy	CJB
CHF031	17/5/16	16.30	5	De-turfed	501 502 503	E	Cloudy	CJB

File Ref.	Date	Time	Trench	Description	Contexts / Find No.	Direc'n	Conditions	Photo-grapher
CHF032	17/5/16	16.30	5	De-turfed	501 502 503	S	Cloudy	CJB
CHF033	17/5/16	16.30	5	De-turfed	501 502 503	W	Cloudy	CJB
CHF034	18/5/16	14.30	5	Final Clean	502 503 504 506	N	Cloudy	CJB
CHF035	18/5/16	14.30	5	Final Clean	502 503 504 506	E	Cloudy	CJB
CHF036	18/5/16	14.30	5	Final Clean	502 503 504 506	S	Cloudy	CJB
CHF037	18/5/16	14.30	5	Final Clean	502 503 504 506	W	Cloudy	CJB
CHF038	18/5/16	14.35	TP1	Final Clean	TP102 TP103	N	Cloudy	CJB
CHF039	18/5/16	14.35	TP1	Final Clean	TP102 TP103	E	Cloudy	CJB
CHF040	18/5/16	14.35	TP1	Final Clean	TP102 TP103	S	Cloudy	CJB
CHF041	18/5/16	14.35	TP1	Final Clean	TP102 TP103	W	Cloudy	CJB
CHF042	19/5/16	10.30	4	Before removal of large stones	402 403 406 407	N	Cloudy	CJB
CHF043	19/5/16	10.30	4	Before removal of large stones	402 403 406 407	E	Cloudy	CJB
CHF044	19/5/16	10.30	4	Before removal of large stones	402 403 406 407	S	Cloudy	CJB
CHF045	19/5/16	10.30	4	Before removal of large stones	402 403 406 407	W	Cloudy	CJB
CHF046	19/5/16	12.20	3	Sondage marked out before excavation	301 302 303 306	S	Cloudy	CJB
CHF047	19/5/16	12.20	3	Sondage marked out before excavation	301 302 303 306	N	Cloudy	CJB
CHF048	20/5/16	13.40	4	Final Clean	402 406 408	N	Cloudy	CJB
CHF049	19/5/16	14.30	4	Final Clean	402 406 408	E	Wet	CJB
CHF050	19/5/16	14.30	4	Final Clean	402 406 408	S	Wet	CJB
CHF051	20/5/16	13.40	4	Final Clean	402 406 408	W	Bright	CJB
CHF052	19/5/16	14.35	4	Final Clean N & W walls - internal	402 408	NW	Wet	CJB
CHF053	20/5/16	13.40	4	Final Clean W wall -internal	402 408	W	Bright	CJB
CHF054	19/5/16	14.35	4	Final Clean N wall -internal	402 406 408	N	Wet	CJB
CHF055	20/5/16	13.40	4	Final Clean W wall -internal	402 408	W	Bright	CJB
CHF056	19/5/16	14.40	4	Final Clean W wall -external	402	N	Wet	CJB
CHF057	19/5/16	14.40	4	Final Clean W wall -external	402	S	Wet	CJB
CHF058	19/5/16	14.40	4	Final Clean N wall -external	402	E	Wet	CJB
CHF059	19/5/16	14.40	4	Final Clean N wall -external	402	W	Wet	CJB
CHF060	20/5/16	10.30	5	Final Clean - Threshold	502 503 505	N	Wet	CJB
CHF061	20/5/16	10.30	5	Final Clean - SW corner feature 1	501 502	NE	Wet	CJB
CHF062	20/5/16	10.35	4	Final Clean - NW corner feature 1	402	SE	Wet	CJB
CHF063	20/5/16	11.45	TP1	Backfilled		N	Cloudy	CJB
CHF064	20/5/16	11.50	TP2	Marked Out		N	Cloudy	CJB

File Ref.	Date	Time	Trench	Description	Contexts / Find No.	Direc'n	Conditions	Photo-grapher
CHF065	20/5/16	12.20	TP2	De-turfed	TP201	N	Cloudy	CJB
CHF066	20/5/16	13.15	TP2	SF in Situ	SF117 TP201	NE	Cloudy	CJB
CHF067	20/5/16	13.15	TP2	SF in Situ	SF117 TP201	NE	Cloudy	CJB
CHF068	20/5/16	14.10	3	Final Clean	302 306 307	N	Bright	CJB
CHF069	20/5/16	14.10	3	Final Clean	302 306 307	E	Bright	CJB
CHF070	20/5/16	14.10	3	Final Clean	302 306 307	S	Bright	CJB
CHF071	20/5/16	14.10	3	Final Clean	302 306 307	W	Sunny	CJB
CHF072	20/5/16	14.30	3	Final Clean SE corner feature1 - internal	302 306	SE	Bright	CJB
CHF073	20/5/16	14.35	3	Final Clean SE corner feature1 - internal	302 306 307	SE	Bright	CJB
CHF074	20/5/16	14.40	3	Final Clean E wall feature1 - internal	302 306	E	Bright	CJB
CHF075	20/5/16	14.40	3	Final Clean W Section	302 307	W	Bright	CJB
CHF076	20/5/16	14.45	3	Final Clean N Section	302 306 307	NE	Bright	CJB
CHF077	23/5/16	9.50		Pre-excavation	Feature 4	N	Sunny	CJB
CHF078	23/5/16	9.50		Pre-excavation	Feature 4	E	Sunny	CJB
CHF079	23/5/16	9.50		Pre-excavation	Feature 4	S	Sunny	CJB
CHF080	23/5/16	9.50		Pre-excavation	Feature 4	W	Cloudy	CJB
CHF081	23/5/16	10.00	TP2	1st Clean	TP201	N	Sunny	CJB
CHF082	23/5/16	10.00	TP2	1st Clean	TP201	E	Sunny	CJB
CHF083	23/5/16	10.00	TP2	1st Clean	TP201	S	Sunny	CJB
CHF084	23/5/16	10.00	TP2	1st Clean	TP201	W	Sunny	CJB
CHF085	23/5/16	10.35	2	Marked Out		N	Cloudy	CJB
CHF086	23/5/16	10.35	2	Marked Out		E	Cloudy	CJB
CHF087	23/5/16	10.40	2	Marked Out		S	Cloudy	CJB
CHF088	23/5/16	10.40	2	Marked Out		W	Cloudy	CJB
CHF089	23/5/16	12.50	2	De-turfed	201 202	N	Cloudy	CJB
CHF090	23/5/16	12.50	2	De-turfed	201 202	E	Cloudy	CJB
CHF091	23/5/16	12.50	2	De-turfed	201 202	S	Cloudy	CJB
CHF092	23/5/16	12.50	2	De-turfed	201 202	W	Cloudy	CJB
CHF093	23/5/16	14.00	TP2	Final Clean	TP205	N	Cloudy	CJB
CHF094	23/5/16	14.00	TP2	Final Clean	TP205	E	Cloudy	CJB
CHF095	23/5/16	14.00	TP2	Final Clean	TP205	S	Cloudy	CJB
CHF096	23/5/16	14.00	TP2	Final Clean	TP205	W	Cloudy	CJB
CHF097	24/5/16	10.10	TP2	Backfilled		N	Sunny	CJB

File Ref.	Date	Time	Trench	Description	Contexts / Find No.	Dirac'n	Conditions	Photo-grapher
CHF098	24/5/16	10.45		Pre-excavation	Feature 3	N	Sunny	CJB
CHF099	24/5/16	10.45		Pre-excavation	Feature 3	E	Sunny	CJB
CHF100	24/5/16	10.50		Pre-excavation	Feature 3	S	Sunny	CJB
CHF101	24/5/16	10.50		Pre-excavation	Feature 3	W	Sunny	CJB
CHF102	24/5/16	10.55	1	Marked out		N	Sunny	CJB
CHF103	24/5/16	10.55	1	Marked out		E	Sunny	CJB
CHF104	24/5/16	10.55	1	Marked out		S	Sunny	CJB
CHF105	24/5/16	10.55	1	Marked out		W	Sunny	CJB
CHF106	24/5/16	11.40		Raistricks trench marked out	Feature 2	N	Sunny	CJB
CHF107	24/5/16	11.40		Raistricks trench marked out	Feature 2	E	Sunny	CJB
CHF108	24/5/16	11.40		Raistricks trench marked out	Feature 2	S	Sunny	CJB
CHF109	24/5/16	11.40		Raistricks trench marked out	Feature 2	W	Sunny	CJB
CHF110	24/5/16	12.20	1	De-turfed	101	N	Sunny	CJB
CHF111	24/5/16	12.20	1	De-turfed	101	E	Sunny	CJB
CHF112	24/5/16	12.20	1	De-turfed	101	S	Sunny	CJB
CHF113	24/5/16	12.20	1	De-turfed	101	W	Sunny	CJB
CHF114	24/5/16	14.10	2	1st Clean	202 208 210	N	Cloudy	CJB
CHF115	24/5/16	14.10	2	1st Clean	202 208 210	E	Cloudy	CJB
CHF116	24/5/16	14.10	2	1st Clean	202 208 210	S	Cloudy	CJB
CHF117	24/5/16	14.10	2	1st Clean	202 208 210	W	Cloudy	CJB
CHF118	24/5/16	14.55	2	Detail: Burnt limestone SE corner (Stokehole)	203	W	Cloudy	CJB
CHF119	24/5/16	15.35	2	Detail: Burnt limestone	204	N	Sunny	CJB
CHF120	25/5/16	10.15	1	1st Clean	102 103 104	N	Cloudy	CJB
CHF121	25/5/16	10.15	1	1st Clean	102 103 104	E	Cloudy	CJB
CHF122	25/5/16	10.15	1	1st Clean	102 103 104	S	Cloudy	CJB
CHF123	25/5/16	10.15	1	1st Clean	102 103 104	W	Cloudy	CJB
CHF124	25/5/16	12.30	1	Final Clean	102 103 104	N	Cloudy	CJB
CHF125	25/5/16	12.30	1	Final Clean	102 103 104	E	Cloudy	CJB
CHF126	25/5/16	12.30	1	Final Clean	102 103 104	S	Cloudy	CJB
CHF127	25/5/16	12.30	1	Final Clean	102 103 104	W	Cloudy	CJB
CHF128	25/5/16	13.45	3	Backfilled		N	Cloudy	CJB
CHF129	25/5/16	13.45	3	Backfilled		S	Cloudy	CJB
CHF130	25/5/16	13.50	2	Burnt limestone and charcoal in situ	208	W	Cloudy	CJB

File Ref.	Date	Time	Trench	Description	Contexts / Find No.	Direc'n	Conditions	Photo-grapher
CHF131	25/5/16	13.50	5	Backfilled		N	Cloudy	CJB
CHF132	26/5/16	10.10	6	Marked Out			Cloudy	CJB
CHF133	26/5/16	11.20	6	De-turfed	601	N	Cloudy	CJB
CHF134	26/5/16	11.20	6	De-turfed	601	E	Cloudy	CJB
CHF135	26/5/16	11.20	6	De-turfed	601	S	Cloudy	CJB
CHF136	26/5/16	11.20	6	De-turfed	601	W	Cloudy	CJB
CHF137	26/5/16	13.25	2	Trench Rim		NE	Cloudy	CJB
CHF138	26/5/16	13.25	2	Trench Rim		SE	Cloudy	CJB
CHF139	26/5/16	13.25	2	Trench Rim		S	Cloudy	CJB
CHF140	26/5/16	13.25	2	Trench Rim & Trench	202 203 205 208 209 210 211 212 213	N	Cloudy	CJB
CHF141	26/5/16	13.25	2	Trench Rim & Trench	202 203 205 208 209 210 211 212 213	E	Cloudy	CJB
CHF142	27/5/16	9.40	6	1st Clean	602 603		Cloudy	CJB
CHF143	27/5/16	9.40	6	1st Clean	602 603		Cloudy	CJB
CHF144	27/5/16	9.40	6	1st Clean	602 603		Cloudy	CJB
CHF145	27/5/16	9.40	6	1st Clean	602 603		Cloudy	CJB
CHF146	27/5/16	13.05	6	Final Clean	603		Cloudy	CJB
CHF147	27/5/16	13.05	6	Final Clean	603		Cloudy	CJB
CHF148	27/5/16	13.05	6	Final Clean	603		Sunny	CJB
CHF149	27/5/16	13.05	6	Final Clean	603		Sunny	CJB
CHF150	27/5/16	13.15	1	Backfilled			Cloudy	CJB
CHF151	27/5/16	14.00	2	Final Clean	202 203 205 208 209 210 211 212 213		Cloudy	CJB
CHF152	27/5/16	14.00	2	Final Clean	202 203 205 208 209 210 211 212 213		Cloudy	CJB
CHF153	27/5/16	14.00	2	Final Clean	202 203 205 208 209 210 211 212 213		Cloudy	CJB
CHF154	27/5/16	14.00	2	Final Clean	202 203 205 208 209 210 211 212 213		Cloudy	CJB
CHF155	27/5/16	14.05	2	Detail - stokehole	203 205 211 212		Cloudy	CJB
CHF156	27/5/16	14.05	2	Detail - burnt limestone	209		Cloudy	CJB
CHF157	27/5/16	14.05	2	Detail - back wall	202 210 212 213		Cloudy	CJB
CHF158	27/5/16	15.20	6	Backfilled			Sunny	CJB
CHF159	27/5/16	15.20	4	Backfilled			Sunny	CJB
CHF160	27/5/16	15.20	4	Backfilled			Sunny	CJB
CHF161	27/5/16	16.10	2	Backfilled			Sunny	CJB
CHF162	27/5/16	16.10	2	Backfilled			Sunny	CJB

Appendix 7. Botanical Assessment

Statement of Ecological Significance

Dr Peter Welsh, Ecologist and Wildlife Engagement Officer, National Trust, Yorkshire Dales, Malham Tarn Estate. 8 December 2015

Thank you for showing me the location of the proposed investigations (c. SD885675). I have had a good look at the grassland that lies over and around the archaeological features (that are the subject of this application) and it is clear that it is not of nature conservation importance. The grassland is characteristic of more 'neutral' types of grassland on deeper soils and semi-improved locations in limestone areas. It is dominated by coarse and 'mesotrophic' grasses including much tufted hair-grass (*Deschampsia cespitosa*). There are no specially protected or biodiversity priority species and there is no limestone pavement within the area. The wider Chapel Fell enclosure includes some areas of limestone pavement and unimproved limestone grassland habitat that are biodiversity features of importance but these lie well outside the area of this application.

