

Lanton Quarry, Northumberland
Report on an Archaeological Excavation



ARS Ltd Report No. 2009/27
April 2009

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Executive Summary

A second phase of archaeological excavation was conducted by Archaeological Research Services Ltd (ARS Ltd) on an area totaling 1.5ha at Lanton Quarry, Milfield, Northumberland on behalf of Tarmac Northern Ltd. The investigation took the form of a strip, map and sample approach, in which the topsoil was mechanically removed under archaeological supervision before a complete plan of archaeological features was made. A sampling strategy was then agreed and excavations were undertaken.

Archaeological remains were excavated dating from a number of different prehistoric periods including:

- *Early Neolithic 'midden pits' that contained Carinated Bowl ceramics.*
- *A probable Bronze Age circular post-built house similar in form to others found during a previous phase of work at this site and on the nearby Cheviot Quarry site.*
- *Three probable Bronze Age rectangular and triangular post-built structures similar in form to others found during a previous phase of work at this site.*
- *Three irregular post-built structures of uncertain date, similar in form to probable Early Neolithic structures found during previous work on this site.*
- *A late Iron Age burial within a corbelled stone cist. A second nearby feature was probably also an Iron Age burial cist but this had been more deeply truncated by ploughing and so no remains were found in the base of this feature.*

Analysis of the botanical macrofossils obtained through flotation has shown the presence of emmer wheat, barley and hazelnut shells in the Neolithic contexts, indicating a potential mix of agriculture and exploitation of natural resources. The picture of the Neolithic environment described by the botanical macrofossils is of cleared areas within a mixed deciduous woodland containing a variety of tree species. The macrofossil analysis indicates a similar environment and mixed economy for the Bronze Age.

Charred wood samples from short-lived tree species have been obtained from most structures and the midden pits that are suitable for radiocarbon dating. This will allow the dates of the various structures on the site to be established.

Analysis of the human remains from Cist 1 showed that the burial belonged to an adult woman, probably an older woman in her 60s or 70s, as shown by the decayed nature of her joints. A single radiocarbon determination from her femur bone showed that the woman died in the period 170 cal BC – cal AD 30 (95% confidence) or probably 110 BC – 10 AD (68.2% confidence) in what is conventionally termed the late pre-Roman Iron Age.

The archaeological features and ceramic finds from the site add important new information to the wider story of prehistory in the Milfield Basin and also the wider region. A full discussion of their wider significance will be produced as part of the final site narrative.

1 Introduction

- 1.1 This report describes an archaeological strip, map and sample investigation undertaken at Lanton Quarry, Northumberland in 2008 and 2009 by Archaeological Research Services Ltd on behalf of Tarmac Northern Ltd. In December 2008 an area totaling 1.5 hectares was stripped of topsoil which revealed significant multi-period archaeological deposits. Excavation was undertaken between December 2008 and February 2009.

2 Location, Land Use and Geology

- 2.1 The Lanton Quarry site lies in the Milfield Basin north-east of the Cheviot Hills and approximately three km north of Wooler (see Fig 1).



Figure 1: Site location

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- 2.2 The Milfield plain is an area of low-lying ground which contains a complex sedimentary sequence, with glaciodeltaic and glaciofluvial sand and gravel deposits fanning out from the valley of the River Glen to form a series of terraces (Passmore *et al.* 2002). Inset below the gravel terraces is the in-filled glacial lake,

Lake Ewart, which forms an extensive alluvial floodplain. Eight hundred metres to the north-east of the site lies the present channel of the River Till, and beyond that the land rises to the Fell Sandstone escarpment that borders the basin on its eastern side. Three kilometres to the south, the igneous rocks of the Cheviot Hills rise abruptly from the plain above the River Glen, where the summits of Humbleton Hill, Harehope Hill and the double peak of Yeavinger Bell form prominent landmarks. To the west, the northern foothills of the Cheviots run parallel to the Fell Sandstone ridge, leaving only a 2 km wide corridor at the northern end of the plain through which the River Till meanders. The archaeology of Lanton Quarry was situated on a terrace of glaciofluvial sand and gravel deposits, situated for the most part at ≈ 45 m OD and covered by a ploughsoil of argillic brown earth origin (Payton 1992). Immediately to the south the terrace edge falls steeply away into the Galewood Depression, a large, Late Glacial palaeochannel, formerly the course of the River Glen, that contains an area of organic sediments dating to the immediate Post Glacial period.

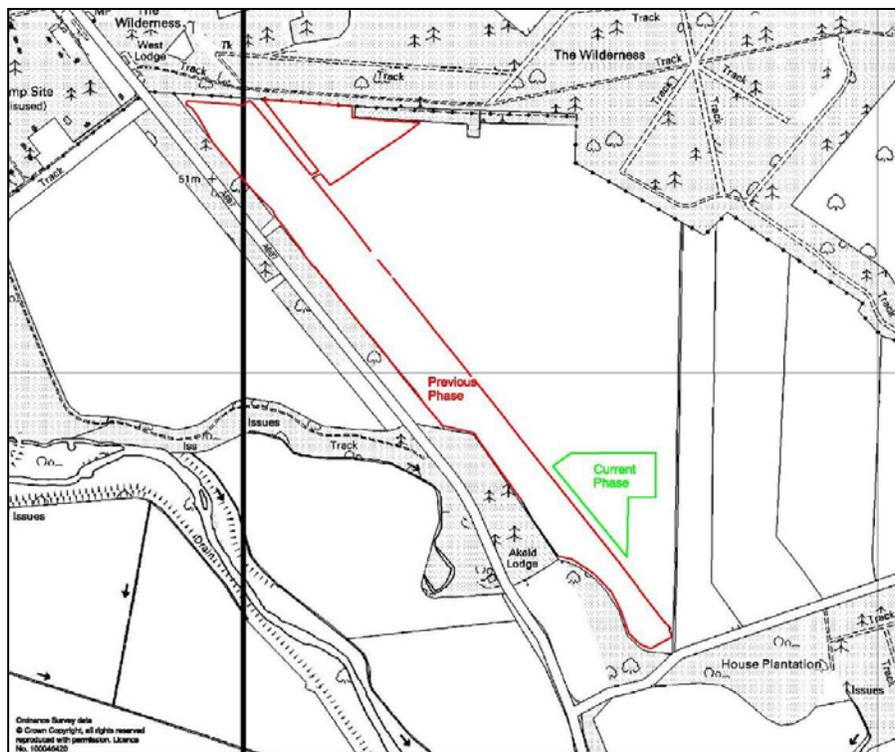


Fig. 2: Site plan showing locations of Phase 1 and Phase 2 excavation areas.

3 Archaeological and Historical Background

- 3.1 Numerous and extensive archaeological remains are known from the vicinity of the quarry site, dating from all periods with important remains from the Mesolithic, Neolithic, Bronze Age and Anglo-Saxon periods.
- 3.2 There is widespread evidence of Mesolithic activity within the area, perhaps best illustrated by the substantial volumes of worked stone tools recovered during large-scale field walking programmes across the Milfield Basin (Waddington 1999) and the surrounding Till-Tweed catchment (Passmore and Waddington in press; Passmore and Waddington forthcoming). The glaciofluvial terraces, with

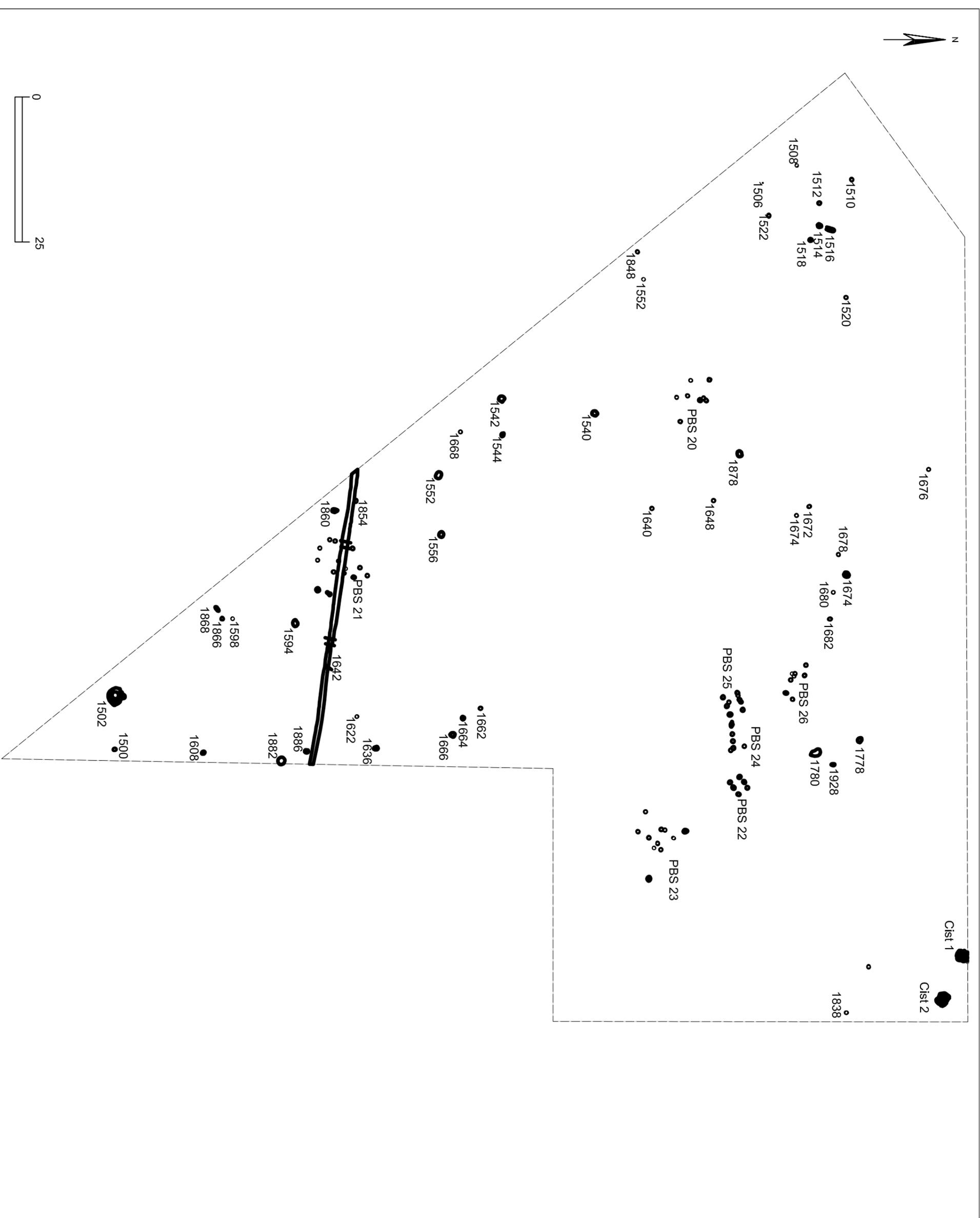
the flood plain of the river Glen immediately to the south and west of the quarry, would have been extremely favourable for exploitation by Mesolithic groups.

- 3.3 The Milfield Basin would have remained an attractive focus for settlement into the Neolithic, as is attested by the concentration of archaeological sites dating to this period in the area around Lanton Quarry. These include the extensive 'ritual landscape' comprising mortuary enclosures, henges, burial monuments and associated features, together with settlement sites and possible Neolithic pit alignments. There are eight henges or henge-type monuments in the Milfield Basin of which three - Milfield South, Coupland and Marleyknowe - appear to be linked by a bounded avenue or 'droveway' (Harding 1981; Passmore and Waddington in press). Previous excavations in the area around the site, have produced Early and Late Neolithic ceramic assemblages (e.g. Coupland Passmore and Waddington in press), Thirlings (O'Brien and Miket 1991), Cheviot Quarry (Johnson and Waddington in press) and Yeavinger (Hope-Taylor 1977). Fieldwalking within the proposed site of Lanton quarry also produced Mesolithic and Neolithic/Early Bronze Age lithics as well as Carinated Bowl ceramics (Waddington 1999).
- 3.4 Bronze Age activity from the vicinity of the quarry is evidenced by the numerous ring ditches and burial mounds, which include a barrow cemetery at Whitton Hill (Miket 1985) and the recent discovery of two Bronze Age roundhouses at Cheviot Quarry (Johnson and Waddington in press) and a further example during the previous phase of work on this site.
- 3.5 There is good evidence for Iron Age settlement in the lowlands in the form of crop-marks of substantial, and often complex, fort sites, together with potential field systems and stock control boundaries. Recognition of roundhouses and enclosed settlements is hindered by their invisibility on aerial photographs and now only coming to be recognised as a result of large-scale open area excavation. Romano-British settlement sites are also known from the surrounding vicinity in the form of both upstanding and crop-mark remains of enclosed rectangular farmsteads.
- 3.6 Anglo-Saxon activity is well attested across the landscape, with the royal palace site of Yeavinger (Hope-Taylor 1977) to the west and the replacement palace site at Maelmin (Gates and O'Brien 1988) to the north of the quarry. Excavations at Thirlings, to the north-east, produced evidence for extensive early medieval settlement (O'Brien and Miket 1991) and two burials were found at nearby Galewood Farm in 1852. Excavations at New Bewick demonstrated the presence of a sunken-featured building amongst a crop-mark complex of many other such buildings (Gates and O'Brien 1988) and excavations at Cheviot Quarry found three Early Medieval post-built buildings that date from the later 5th - early 6th centuries A.D. (Johnson and Waddington in press). A substantial Early Medieval settlement was uncovered as part of the previous phase of work on this site (see below 3.7).
- 3.7 The Phase 1 excavations at Lanton quarry, which took place between August and December 2006 uncovered multi-period remains. These remains included evidence for Neolithic settlement including four trapezoidal structures, three triangular structures and associated hearths and pits; one Bronze Age roundhouse probably in association with two rectangular structures; one possible Iron Age

roundhouse with large associated pits, and a concentration of Early Medieval settlement evidence along the southern half of the excavated area including two rectangular and two square post-built buildings, six sunken feature buildings and associated pits and postholes.

4 Method Statement

- 4.1 The excavation was carried out between December 2008 and February 2009 by stripping back the topsoil in spits with a 360° tracked excavator equipped with a toothless ditching bucket, exposing the underlying sand and gravel deposits into which archaeological features were cut. The entire process was monitored by suitably experienced archaeologists. As the machine stripped the ground, features were cleaned with a hoe and trowel, recorded in plan and photographed before being marked with wooden pegs and ascribed context and feature numbers.
- 4.2 Each of the features identified during the stripping process was subject to excavation and recording. This involved the sectioning of deposits to determine their form and dimensions, and the collection of artefacts and samples suitable for radiocarbon dating and environmental analysis. All excavation was undertaken with trowels and small tools. The content of all deposits were sieved through a 10mm mesh and deposits containing artefacts, or with potential for containing organic material, were subject to flotation through a 500µm sieve. All features were photographed using colour slide and black and white print film, and selective digital photographs were taken. All sections were drawn at 1:10 and features planned at 1:20. The section lines were surveyed to provide an Ordnance Survey datum for each feature.
- 4.3 All the deposits and cuts were described in the field on pro-forma context sheets. The sheets contain prompts for the recording of sediment composition, compaction and colour, the dimensions of the deposit, its relationship to other deposits and features, artefact content, environmental samples, drawing and photographic records and an interpretative discussion to ensure consistency across all records. All features were described in accordance with MoLAS conventions. Drawings were produced on drawing film and on graph paper on the reverse side of the context sheets. Registers of all contexts, samples, finds, levels, and drawings were also made. Artefacts were bagged individually and assigned an individual finds number, with the site code and the deposit from which they were recovered clearly indicated. Ceramic finds were bubble-wrap before being placed in labelled bags or boxes as appropriate. Any single entity charred material samples suitable for radiocarbon dating were wrapped in aluminium foil before being placed in labelled bags.
- 4.4 Flotation of sediments to recover organic materials was undertaken on site. The fill of every feature associated with a building, or which contained material culture or was organic-rich were dry-sieved through a 10mm mesh, and then passed through flotation to maximise recovery of small finds and organic material. The sediments were passed through four mesh sieves from 5mm down to the smallest which measured 500µm. Material from the sieve was air dried and then placed in a sealed bag marked with its context and environmental sample number. All the dating and environmental samples were recorded in a separate register.



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Site Code: Lan08
Drawing Ref: N/A
Date: 04/09
Drawn: JB
Scale: 1:625@A3

Figure 3: Site plan showing detail of Phase 2 excavation area

Key:

Notes:

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5 Results

5.1 This section describes the results of the excavation. The post-built structures are discussed separately and then the remaining features are discussed according to their type. In summary the features discovered on site were:

- Seven post-built structures including one circular structure and two rectangular structures.
- Twenty-two pits of varying sizes, some of which indicated burning activity and some of which produced pottery.
- Nineteen isolated postholes and stakeholes not thought to be related to any of the seven identified post-built structures on site.
- One linear feature, thought to be a post-Medieval field boundary.
- Two stone built cists, one of which was of corbel construction, thought to date from the Bronze Age period. One cist contained human remains.
- Two tree throws/natural root features.

5.2 All features on the site were truncated as a result of past agricultural practices. No archaeological features survived within the topsoil, only those features that were cut into the natural glaciofluvial gravel deposits remained. However, as the previous fieldwalking exercise demonstrated, the topsoil is also a valuable archaeological resource in itself on account of the artefactual evidence that it contains for primarily Stone Age activity in the form of lithic scatters - and to a lesser extent pottery scatters. The features and deposits are discussed individually, but arranged under headings according to their period, association with other features and their type.

5.3 *Topsoil.* The topsoil (001) at Lanton Quarry consisted of a dark-brown sandy soil containing coarse to medium gravel inclusions and was loosely compacted.

5.4 *Glaciofluvial Deposits.* The soils of the Milfield Basin are underlain by thick glaciofluvial deposits from the Devensian glacial episode (Payton). A mixed deposit of gravel and coarse sand (002) was evident across the area, interspersed by bands of finer fluvially deposited sand.

6. Stratigraphic Report

6.1 Truncation of features across much of the site was very severe and was particularly noticeable in the west. Due to this many features had a very shallow depth and may have originally been considerably deeper.

6.2 *Post-built Structures*

6.2.1 A total of seven post-built structures (PBS20-PBS26) were encountered during the Phase 2 excavations at Lanton Quarry. Each structure comprised between five and thirteen possible postholes as well as other possible associated features such as pits and burning pits. Some of the postholes also produced pottery.

6.2.2 *Post-built Structure 20 (PBS20)*

Feature No.	Context Numbers	Description	Max. dimensions (mm)	Max. Depth (mm)	Colour of Fill	Composition
PBS20						
Postholes						
F1526	1526, 1527	Small circular posthole	240 x 200	140	Black 7.5yr 2.5/1	Silty sand
F1528	1528, 1529	Small circular posthole	260 x 280	130	Mid grey/brown 7.5yr 3/4	Sandy silt
F1530	1530, 1531	Small circular posthole	370 x 370	160	Mid grey/brown 5yr 3/2	Silty sand
F1532	1532, 1533	Small circular posthole	450 x 450	520	Mid orange/brown – grey 5yr 3/2	Sandy silt
F1534	1534, 1535	Small sub-circular posthole	300 x 240	100	Black and dark brown 10yr 3/2	Silty sand
F1536	1536, 1537	Small circular posthole	300 x 270	130	Dark brown 5yr 3/2	Silty sand
F1876	1876, 1877	Small sub-circular posthole	260 x 220	110	Dark brown 10yr 4/3	Silty sand
F1900	1900, 1901	Small sub-circular posthole	360 x 320	80	Dark brown 5yr 3/3	Silty sand

Table 1: Features in Post-Built Structure 20

6.2.2.1 Post-built structure 20 was located in the north-west of the site and comprised eight postholes arranged in a rough triangular shape, although the exact layout is not completely clear. At its widest the structure measured roughly 3m and was approximately 7m in length. There were no small finds recovered from any of the postholes in PBS20 although two produced charred dating samples. As well as being badly truncated, most of the features within this post-built structure also had smaller diameters than most other postholes seen across the site. With the exception of F1532 all the postholes were very shallow. This may indicate that the structure, when standing, had been relatively lightweight and perhaps only temporary. The heavy truncation of the remaining eight postholes suggests that there may have originally been more, now lost through plough action. The layout of this structure partially resembled that of triangular post-built structures excavated during phase 1 of work on this site (Stafford and Johnson 2007) as well as other sites such as Bolam Lake, Northumberland (Waddington and Davies 2002) or Willington in the Trent Valley, Derbyshire (Brightman 2009).

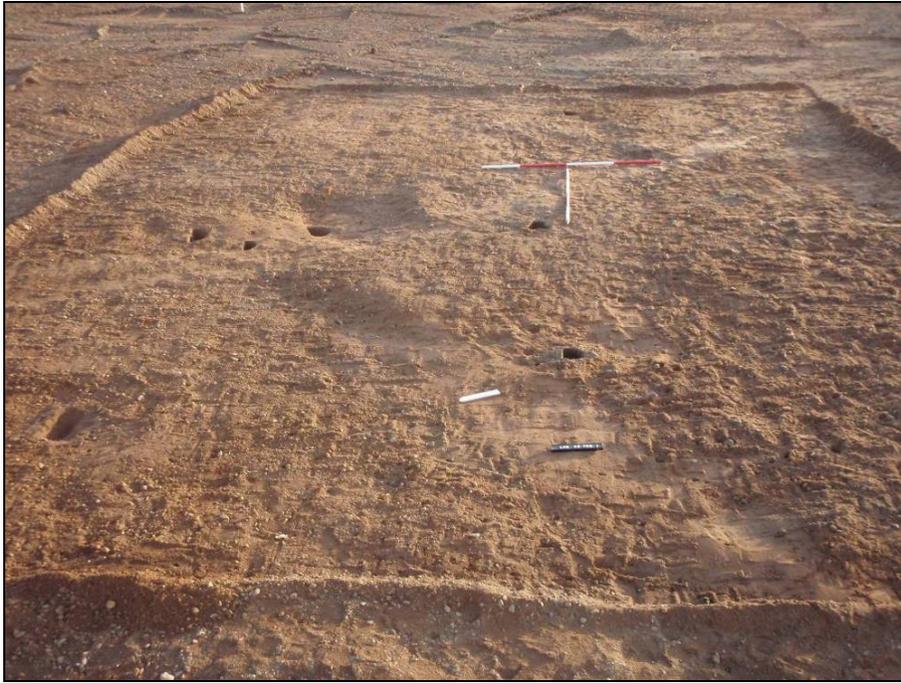


Figure 4: Post-Built Structure 20 looking south-east (Scale: 2 x 2m).

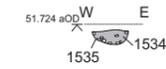
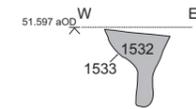
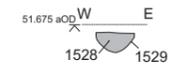
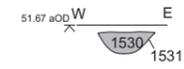
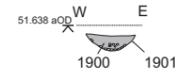
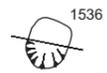
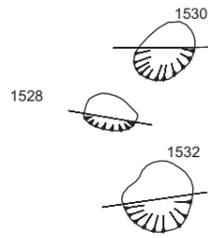


Fig.5
Plan and Sections of Post-built Structure 21



6.2.3 Post-built Structure 21 (PBS21)

Feature No.	Context Numbers	Description	Max. dimensions (mm)	Max. Depth (mm)	Colour of Fill	Composition
PBS21						
Postholes						
F1566	1566, 1567	Small circular posthole	320 x 300	140	Dark greyish brown 5yr 2.5/1	Sandy silt
F1568	1568, 1569	Small circular posthole	300 x 380	70	Orange grey 7.5yr ¾	Sandy silt
F1574	1574, 1575	Small sub-circular posthole	480 x 370	210	Dark greyish brown 10yr 2/2	
F1576	1576, 1577	Small circular posthole	380 x 380	120	Very dark brown 5yr 2.5/2	Silty sand
F1578	1578, 1579	Small circular posthole	350 x 320	150	Black 7.5yr 2.5/1	Silty sand
F1582	1582, 1583	Small circular posthole				
F1584	1584, 1585	Small cub-circular posthole	480 x 370	90	Dark brown 5yr ¾	Silty sand
F1588	1588, 1589	Double posthole	800 x 620	140-240	Very dark brown 5yr 2.5/2	Silty sand
F1814	1814, 1815	Oval shaped posthole	400 x 500	240	Dark brown 5yr 3/3	Sandy silt
F1818	1818, 1819	Small circular posthole	350 x 390	150	Brown 5yr 3/3	Silty sand
F1917	1917, 1918	Small oval shaped posthole	300 x 240	190	Grey/orange 10yr 4/4	Sandy silt
F1919	1919, 1920	Small circular posthole	360 x 190	100	Orange/grey	Sandy silt
F1921	1921, 1926	Small circular posthole	200 x 300	200	Dark greyish brown 5yr 3/2	Sandy silt
Pits						
F1590	1590, 1591	Circular fire pit	500 x 600	160	Very dark brown/black	Sandy silt

Table 2: Features in Post-Built Structure 21

6.2.3.1 PBS21 was a post-built circular structure. Thirteen of these features were postholes with the remaining one thought to have been a fire pit due to its shallow depth and dark-coloured fill. Eight out of the fourteen features were definitely associated with PBS21 while the remaining six did not form part of the principle plan and therefore may have been later intrusions. The structure measured approximately 8m in diameter and had two features (F1590, F1588) which may have represented a south-east facing ‘porch’. There were no small finds discovered in any of the features however six produced charred dating samples. The layout of Post-Built Structure 21 is similar to that of another circular post-built structure excavated during Phase 1 on this site. Post-Built Structure 14, which was excavated in 2006, also comprised a circle of postholes as well as two double postholes that indicated the presence of a ‘porch’.

6.2.3.2 During excavations at Cheviot Quarry, two circular post-built structures were found with this arrangement of postholes. These structures were dated to the Middle Bronze Age (Johnson and Waddington forthcoming). Possibly due to truncation however, other features noted previously at Lanton and also at

Cheviot Quarry such as floor or hearth deposits were not present in PBS21. The linear feature (F1642) which runs through the middle of PBS21 may also have removed any further features.



Figure 6: Post-Built Structure 21 looking east (Scale: 2 x 2m).



Fig. 7
Plan of Post-Built Structure 21



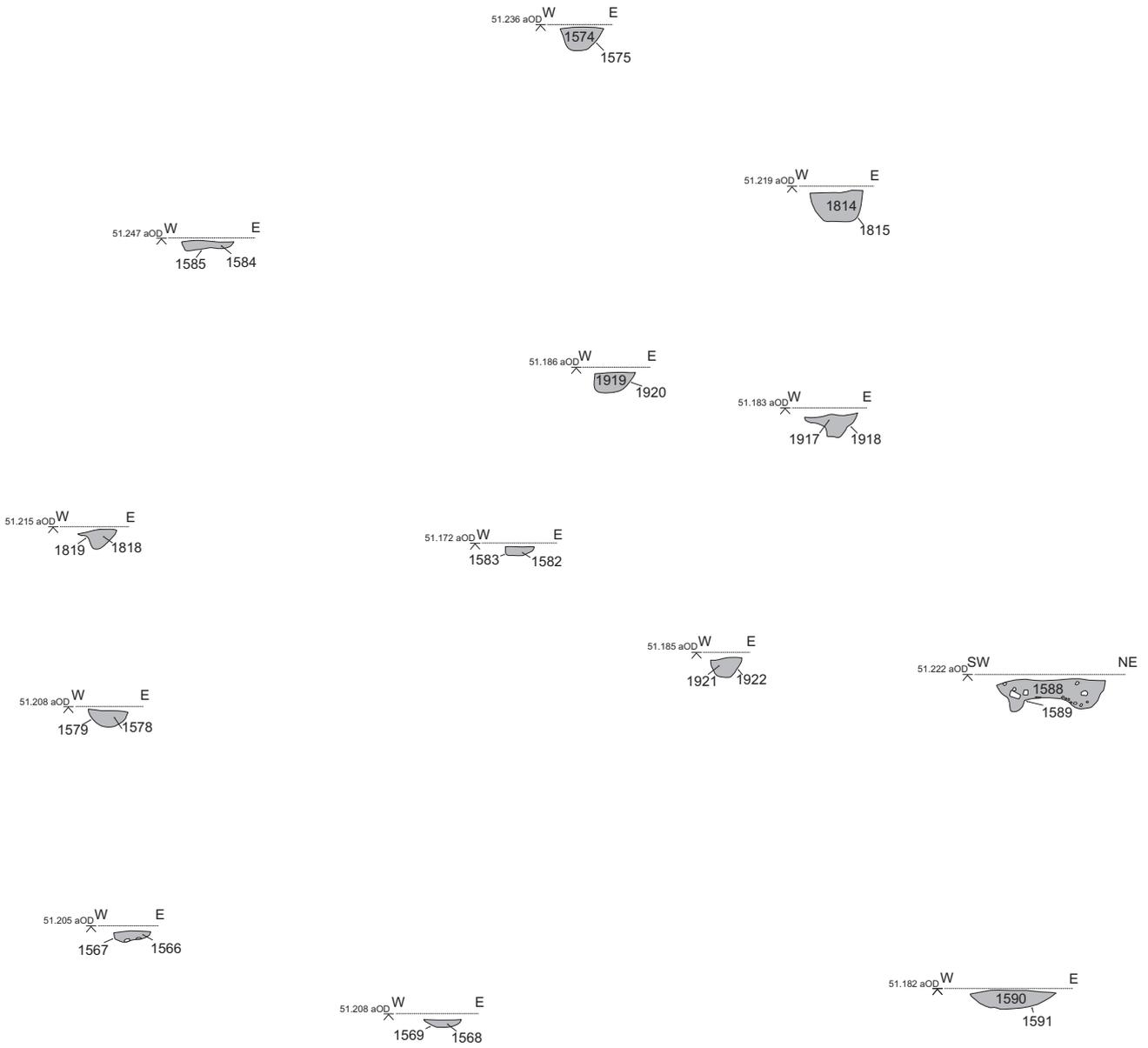


Fig. 8
Sections of Post-built Structure 21



6.2.4 *Post-built Structure 22 (PBS22)*

Feature No.	Context Numbers	Description	Max. dimensions (mm)	Max. Depth (mm)	Colour of Fill	Composition
PBS22						
Postholes						
F1734	1734, 1735	Large circular posthole	500 x 460	370	Dark greyish brown	Sandy silt
F1736	1736, 1737	Large circular posthole	520 x 410	410	Dark reddish brown 5yr3/4	Silty sand
F1738	1738, 1739	Large circular posthole				
F1740	1740, 1741	Large circular posthole	450 x 450	320	Greyish brown 5yr 3/4	Sand and gravel
F1782	1782, 1783	Large circular posthole	420 x 420	350	Greyish brown 5yr 3/4	Sand and gravel
F1904	1904, 1905	Large circular posthole	570 x 440	370	Reddish brown 5yr 3/4	Silty sand

Table 3: Features in Post-Built Structure 22

6.2.4.1 Post-built structure 22 was located in the north-east of the site and consisted of six large, and deep, circular post holes arranged in a rectangular form. The structure had an alignment from south-west to north-east and measured approximately 2m by 2.5m. Twelve sherds of pottery were recovered from one posthole (F1734) and are believed to date from the mid-Bronze Age period while three postholes produced charred dating samples. Although truncation across this area of the site was generally less than in others, the postholes were still deep enough to suggest that the structure would have been substantial and therefore probably permanent. Due to the size and depth of the features, it is possible that the structure would have had a raised floor. This may suggest that the structure was a granary, however this is purely speculative. This type of structure has previously been noted during the 2006 phase of excavation at Lanton Quarry (Stafford and Johnson 2007). Post-Built Structures 9 and 13, excavated in 2006, were both found to consist of six large postholes laid out in almost an identical manner to those in PBS22 of the 2008 excavations, although PBS22 was slightly smaller.



Figure 9: Post-Built Structure 22 looking north-east (Scale: 1m & 2m).

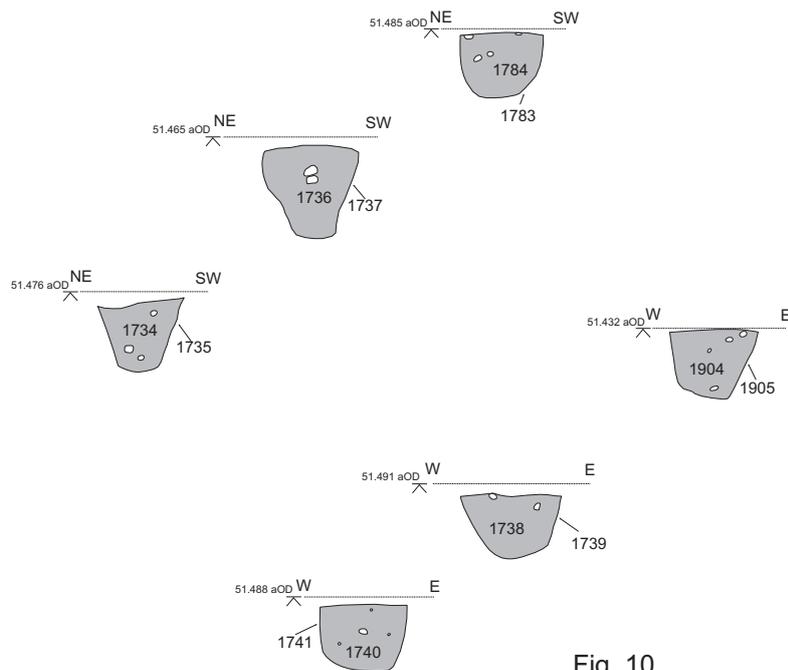
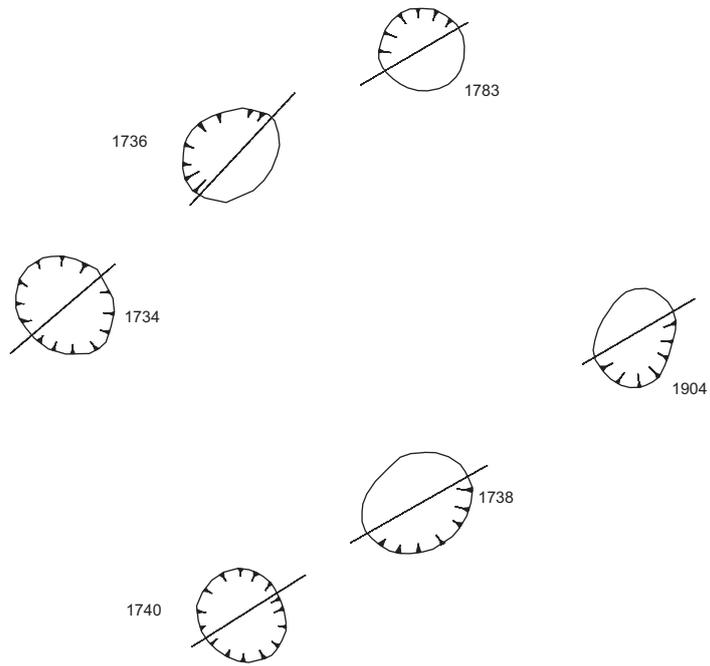


Fig. 10
Plan and Sections of Post-built Structure 22



6.2.5 Post-built Structure 23

Feature No.	Context Numbers	Description	Max. dimensions (mm)	Max. Depth (mm)	Colour of Fill	Composition
PBS23						
Postholes						
F1748	1748, 1749	Small circular posthole	290 x 290	55	Dark grey/brown 5yr 2.5/1	Sandy silt
F1756	1756, 1757	Small sub-circular posthole	270 x 240	90	Dark greyish brown 5yr 2.5/1	Silty sand
F1758	1758, 1759	Circular posthole	390 x 360	150	Dark greyish brown 5yr 2.5/1	Silty sand
F1760	1760, 1761	Circular posthole	270 x 270	150	Grey brown 5yr 2.5/1	Silty sand
F1762	1762, 1763	Irregularly shaped posthole	320 x 220	110	Greyish brown 5yr 2.5/1	Sand and gravel
F1764	1764, 1765	Circular posthole	360 x 370	100	Dark greyish brown 5yr 2.5/1	Sandy silt
F1922	1922, 1923	Sub-circular posthole	270 x 240	60	Dark greyish brown 5yr 3/2	Sandy silt
Stakeholes						
F1754	1754, 1755	Small stakehole	140 x 170	80	Dark greyish brown 5yr 2.5/1	Sandy silt
F1924	1924, 1925	Small stakehole	140 x 150	60	Dark greyish brown 5yr 2.5/1	Sandy silt
Pits						
F1750	1750, 1751	Oval shaped pit	800 x 470	150	Dark grey brown 5yr 2.5/1	Sandy silt

Table 4: Features in Post-Built Structure 23

6.2.5.1 Post-built structure 23 was located in the east of the site and comprised ten features: seven postholes, two small stakeholes and one possible pit. Many of the features were badly truncated and varied in size and depth to quite a degree. The features formed an irregular arrangement although it is possible that PBS23 was a triangular structure, similar to PBS20. Features F1758, F1760 and F1922 were the most substantial of the postholes, two of which had the greatest depth being 150mm deep below the start of the archaeological horizon. There was an approximate distance of 3.5m between F1758 and F1760, and a longer distance of 5m between F1758 and F1922. There were no finds or pottery or charred dating samples recovered from any of the features in PBS23.

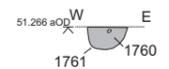
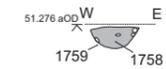
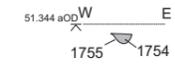
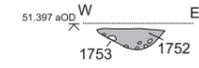
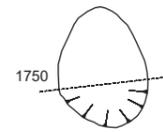


Fig. 11
Plan and Sections of Post-built Structure 23



6.2.5 Post-Built Structure 24 (PBS24)

Feature No.	Context Numbers	Description	Max. dimensions (mm)	Max. Depth (mm)	Colour of Fill	Composition
PBS24						
Postholes						
F1722	1722, 1723	Circular posthole	330 x 330	350	Grey brown	Sand and gravel
F1724	1724, 1725	Circular posthole	380 x 370	250	Dark greyish brown 5yr 2.5/2	Sandy silt
F1728	1728, 1729	Circular posthole	360 x 310	430	Dark reddish brown 5yr 2.5/1	Silty sand
F1730	1730, 1731	Sub-circular posthole	460 x 510	290	Dark reddish brown 5yr/2.5/1	Silty sand
F1732	1732, 1733	Circular posthole	340 x 320	320	Dark reddish brown 5yr 2.5/1	Silty sand

Table 5: Features in Post-built Structure 24

6.2.5.1 Post-Built Structure 24 was situated in the north-east corner of the site and lay approximately 4.5m to the west of Post-built Structure 22. The postholes were arranged in a triangular pattern and were all relatively similar in size and shape. This structure and its associated features also lay in very close proximity to PBS25 and the two were separated by pit F1934. Although truncation across this area of the site was generally less than in others, the postholes were still deep enough to suggest that the structure would have been substantial and therefore probably permanent. PBS24 measured approximately 2.5m at its widest extent and 2.5m at its longest. Pottery was discovered in two of the postholes and is believed to date from the Bronze Age period. The fact that each posthole was of considerable depth would indicate that the features describe the full structure.



Figure 12: Post-Built Structure 24 looking east (Scale: 2m).

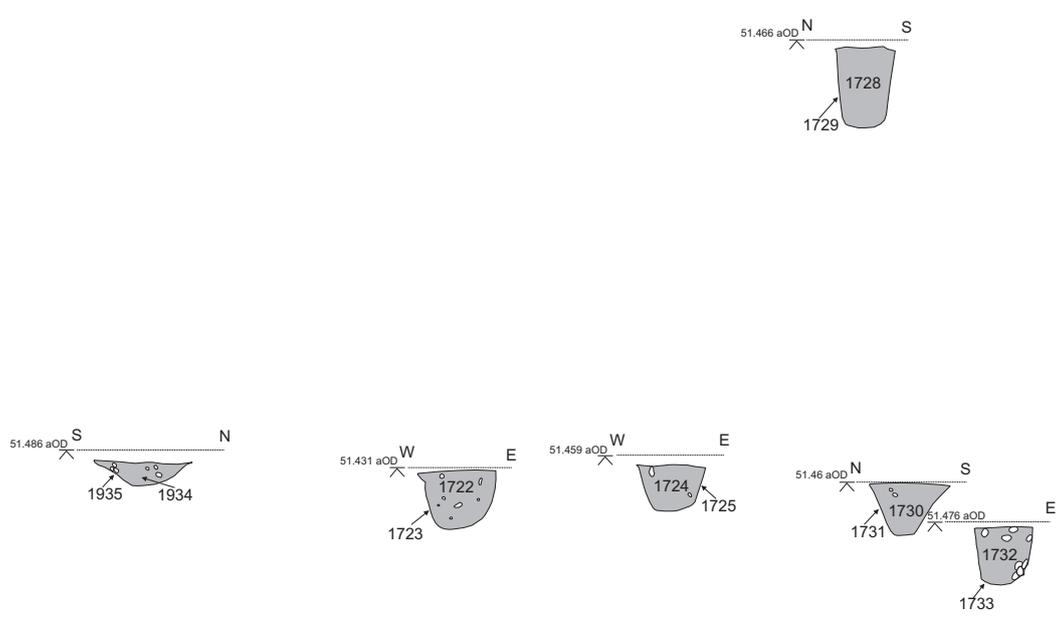
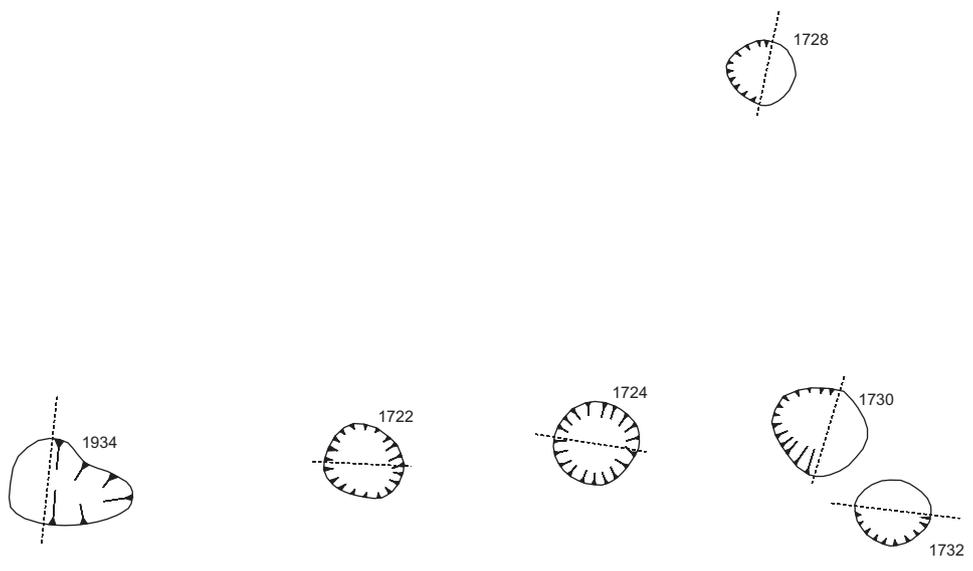
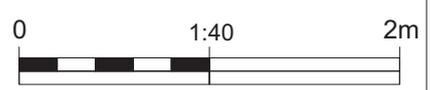


Fig. 13
Plan and Sections of Post-built Structure 24



6.2.6 Post-Built Structure 25 (PBS25)

Feature No.	Context No.s	Description	Max. dimensions (mm)	Max. Depth (mm)	Colour of Fill	Composition
PBS25						
Postholes						
F1936	1936, 1937	Circular posthole	560 x 550	260	Greyish brown 10yr 3/2	Sandy silt
F1938	1938, 1939	Sub-circular posthole	460 x 590	339	Greyish brown 10yr 3/2	Sandy silt
F1940	1940, 1941	Sub-circular posthole	360 x 410	220	Greyish brown 10yr 3/2	Sandy silt
F1942	1942, 1943	Sub-circular posthole	510 x 490	480	Greyish brown 10yr 3/2	Sandy silt
F1944	1944, 1945	Sub-circular posthole	410 x 420	330	Greyish brown 10yr 3/2	Sandy silt
F1946	1946, 1947	Sub-circular posthole	410 x 440	240	Dark grey brown 10yr 3/2	Sandy silt
F1948	1948, 1949	Small sub-circular posthole	390 x 360	290	Greyish brown 10yr 3/2	Sandy silt
F1950	1950, 1951	Sub-circular posthole	370 x 460	210	Greyish brown 10yr 3/2	Sandy silt
F1968	1968, 1968	Sub-circular posthole	460 x 600	350	Dark grey brown 10yr 3/2	Sandy silt

Table 6: Features in Post-built Structure 25

6.2.6.1 PBS25 was located in the north-east of the site, directly next to PBS24. The structure comprised nine postholes that formed a rough rectangle measuring approximately 3m by 2.5m. None of the postholes produced small finds. Features F1942, F1946, F1950, F1936, F1938 and F1938 were the most substantial and most probably represent a structure similar to PBS22. The three further postholes appear to have been later additions, perhaps for repair. The depth of the postholes along with these possible repairs would indicate that the structure stood for some time.



Figure 14: Post-Built Structure 25 looking east (Scale: 2m)

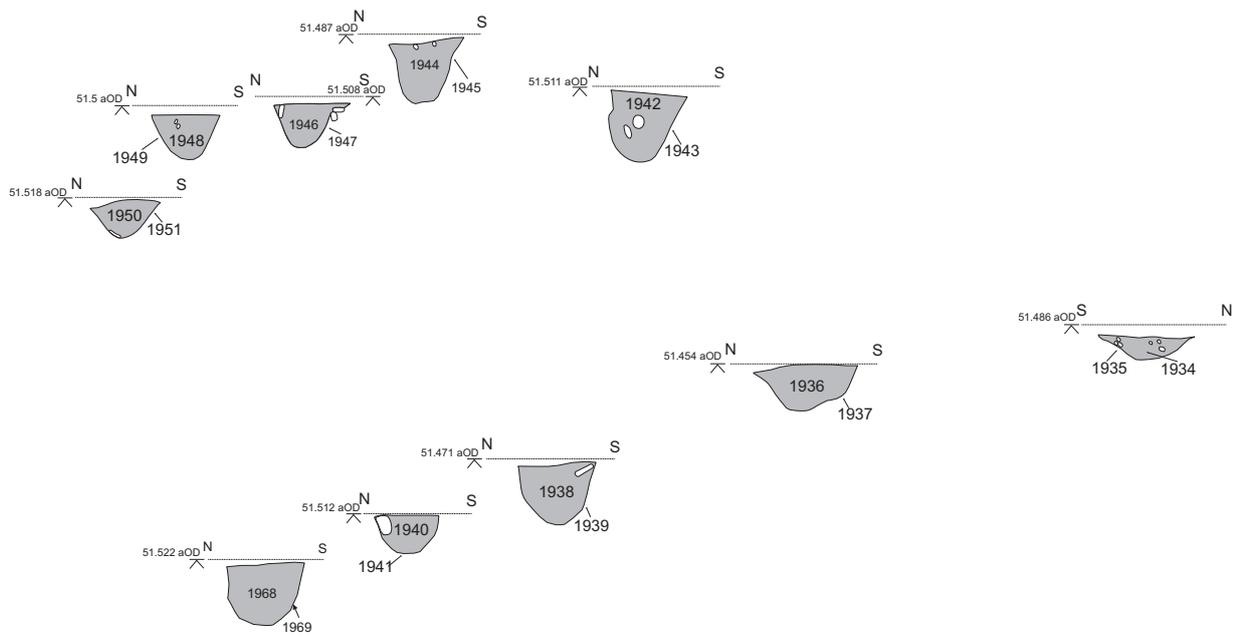
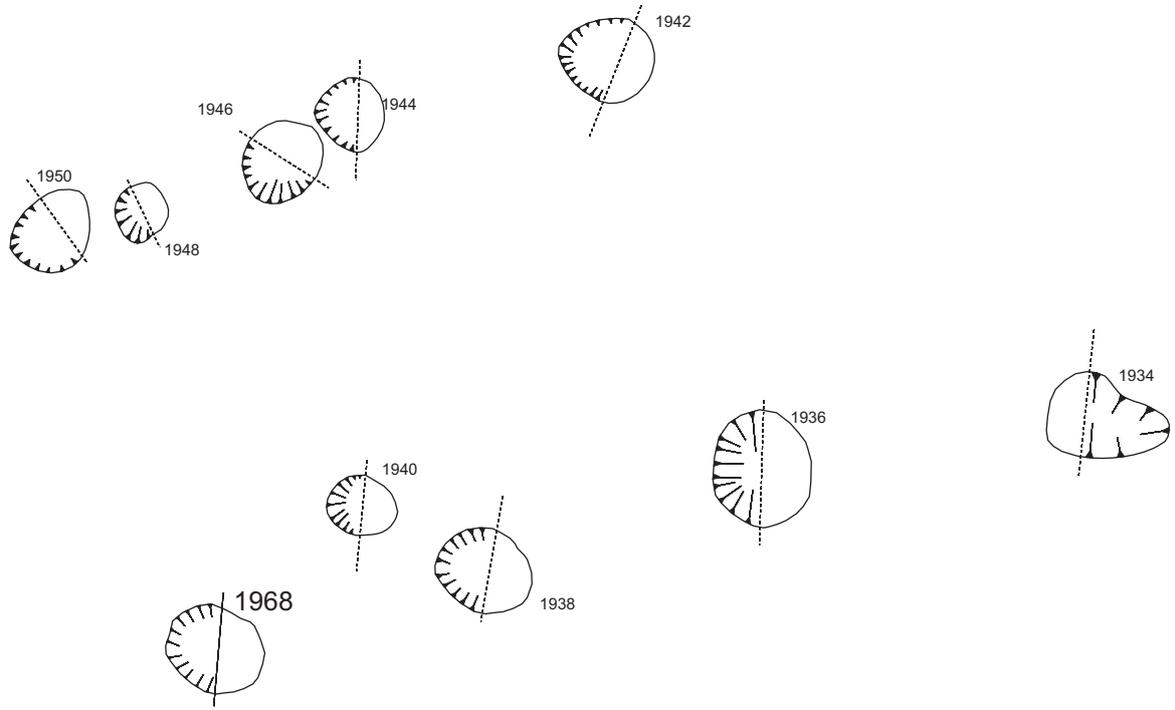


Fig. 15
Plan and Sections of Post-built Structure 25



6.2.7 Post-built Structure 26

Feature No.	Context Numbers	Description	Max. dimensions (mm)	Max. Depth (mm)	Colour of Fill	Composition
PBS26						
Postholes						
F1952	1952, 1953	Oval shaped posthole	510 x 470	350	Greyish brown 10yr 3/2	Silty sand
F1954	1954, 1955	Circular posthole	380 x 390	130	Grey/brown 10yr 3/2	Sandy silt
F1956	1956, 1957	Small circular posthole	190 x 200	50	Greyish brown 10yr 3/2	Sandy silt
F1958	1958, 1959	Small circular posthole	200 x 300	100	Dark grey/brown 10yr 3/2	Sandy silt
F1960	1960, 1961	Sub-circular posthole	220 x 190	90	Greyish brown 10yr 3/2	Sandy silt
F1962	1962, 1963	Sub-circular posthole	380 x 400	210	Dark brown/grey 10yr 3/2	Sandy silt
F1964	1964, 1965	Circular posthole	360 x 450	330	Dark brown/grey 10yr 3/2	Sandy silt
Unknown		Sub-circular posthole				

Table 7: Features in Post-built Structure 26

6.2.7.1 PBS26 consisted of eight postholes arranged in an irregular pattern. Unlike many of the other post-built structures on site it is not easy to discern whether this layout mostly resembles a rectangle or a triangle. There was a variation of substantially sized postholes and very shallow stakeholes, all of which had been truncated. The larger features had a considerable depth, however F1956, F1958 and F1960 were all very shallow which may have indicated phases of repair to the structure, although this is purely speculative. There were no finds or pottery recovered from any of the features.



Figure 16: Post-Built Structure 26 looking south-east (Scale: 2m)

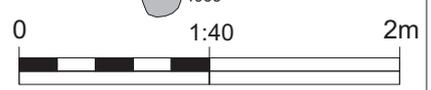
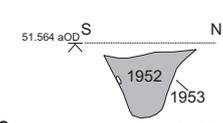
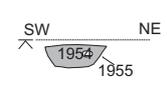
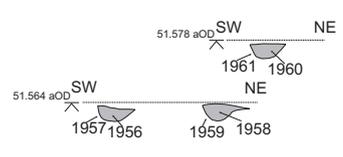
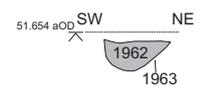
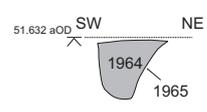
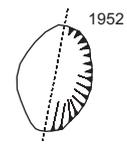
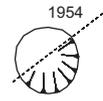
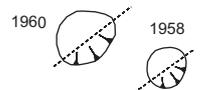
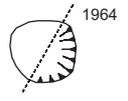


Fig. 17
Plan and Sections of Post-built Structure 26

6.3 *Pits*

6.3.1 Across the site there were a total of twenty-two pits and hearths. Many of these were isolated and did not appear to be associated with any of the seven post-built structures. Some pits were of a substantial size and a few produced large amounts of pottery as well as a few indicating burning activity. Some of the pit features were quite badly truncated. Most of the pits produced no artefacts although those that did produced considerable numbers of pottery sherds.

Feature No.	Context Numbers	Description	Max. dimensions (mm)	Max. Depth (mm)	Colour of Fill	Composition
F1500	1500, 1501	Small pit	350 x 460	120	Dark orange/brown 5yr 2.5/2	Sandy silt
F1510	1510, 1511	Small pit	400 x 380	55	Grey/brown 7.5yr 4/3	Sand
F1512	1512, 1513	Small pit	380 x 370	30	Dark grey 7.5yr 3/2	Sand
F1514	1514, 1515	Small pit	520 x 660	10	Mid orange/brown 5yr 4/3	Sandy silt
F1518	1518, 1519	Small pit	450 x 520	180	Dark orange/brown 7.5yr 4/2	Sandy silt
F1540	1540, 1541	Large pit	930 x 920	480	Greyish brown 7.5yr 4/2	Silty sand
F1542	1542, 1543	Large pear shaped pit	1100 x 1450	230	Mid brown/grey	Sandy silt
F1552	1552, 1553	Large oval shaped pit	1200 x 960	170	Black 2yr 2.5/1	Sandy silt
F1556	1556, 1557	Large fire pit	820 x 820	180	Dark brown/black 10yr 2/1	Sand and gravel
F1608	1608, 1609	Pit	500 x 550	150	Dark orange/brown	Silty sand
F1636	1636, 1637	Pit	610 x 680	180	Grey	Sandy silt
F1662	1662, 1663	Pit	390 x 390	70	Black 10yr 2/1	Sandy silt
F1666	1666, 1667	Large pit	790 x 910	320	Black 10yr 2/1	Sandy silt
F1750	1750, 1751	Large pit	800 x 470	150	Dark grey/brown 5yr 2.5/1	
F1774	1774, 1775	Large pit	1230 x 900	190	Black/grey	Sandy silt
F1778	1778, 1779	Pit	700 x 880	390	Orange to brown 5yr 4/4	Sandy silt
F1824	1824, 1825, 1927, 1928, 1929, 1930, 1931, 1932, 1933	Large Fire pit	1700 x 1500	700	Dark brown	Sand
F1874	1874, 1875	Large pit	850 x 950	230	Mid brown 10yr 4/2	Silty sand
F1878	1878, 1879	Large pit	1110 x 750	180	Dark yellow/brown 7.5yr 3/4	Silty sand
F1882	1882, 1883, 1914, 1915, 1916	Large pit	1100 x 1120	160	Dark black/grey 5yr 3/1	Sandy silt
F1896	1896, 1897	Pit	400 x 800	100	Grey/brown 7.5yr 4/3	Sandy silt
F1934	1934, 1935	Pit	510 x 620	150	Grey/brown 10yr 3/2	Sandy silt

Table 8: Feature descriptions of Pits

6.3.2 Two of the midden pits produced large amounts of pottery. F1882, situated in the south-east of the site, was found to contain 153 sherds of Early Neolithic pottery that appeared to have ‘slumped’ down the western side of the pit as part of a deliberate act of deposition. F1882 lay to the south of a posthole F1886 which was clearly related as pottery found within both F1886 and F1882 was found to derive from the same vessel (see separate Pottery Report). To the north of these two features was another pit and another posthole which also appeared to be related: pit F1666 and posthole F1664, the latter of which contained Early Neolithic pottery. F1556, thought to be a burning pit due to the dark colour of the fill, contained 47 sherds of prehistoric pottery.

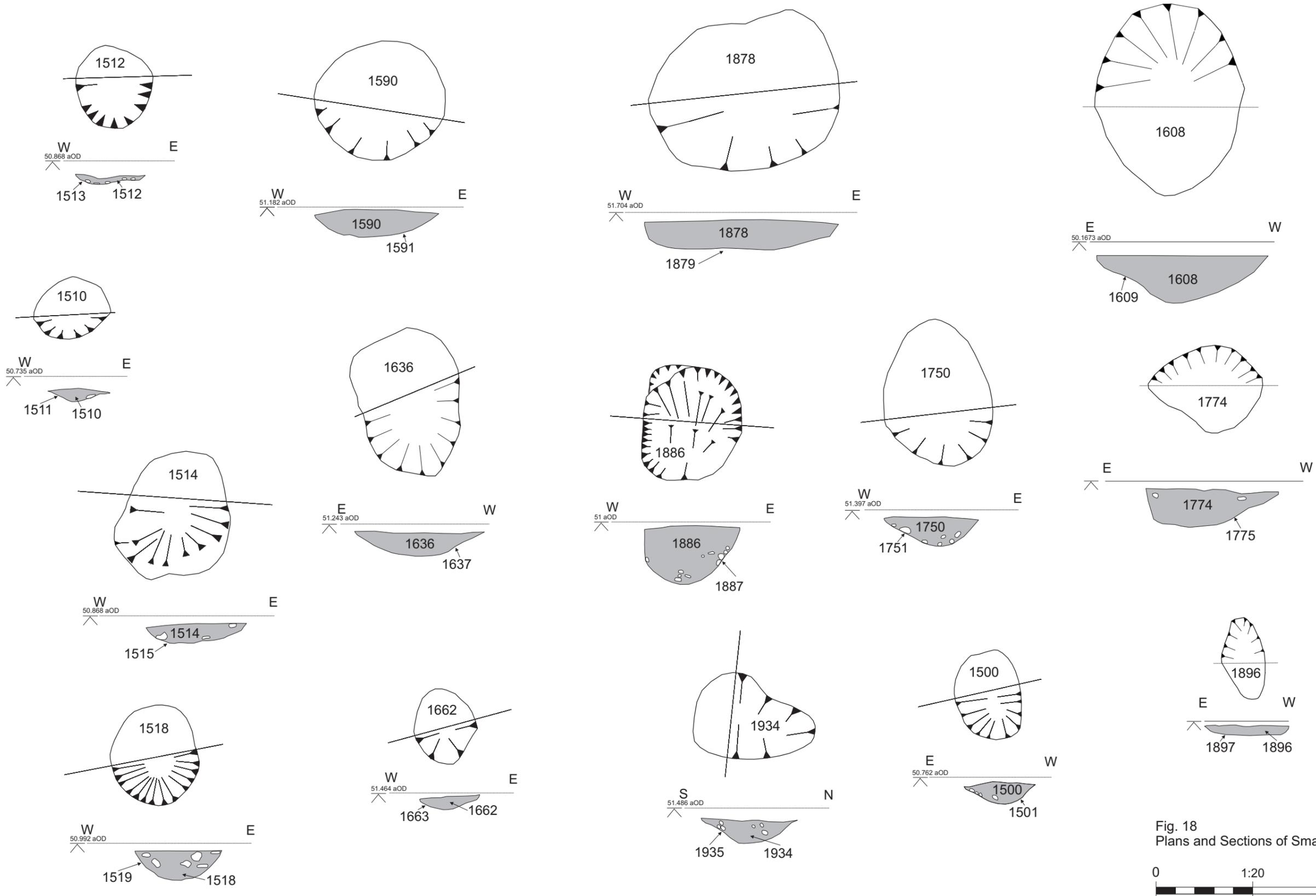
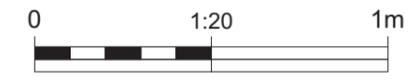


Fig. 18
Plans and Sections of Small Pits



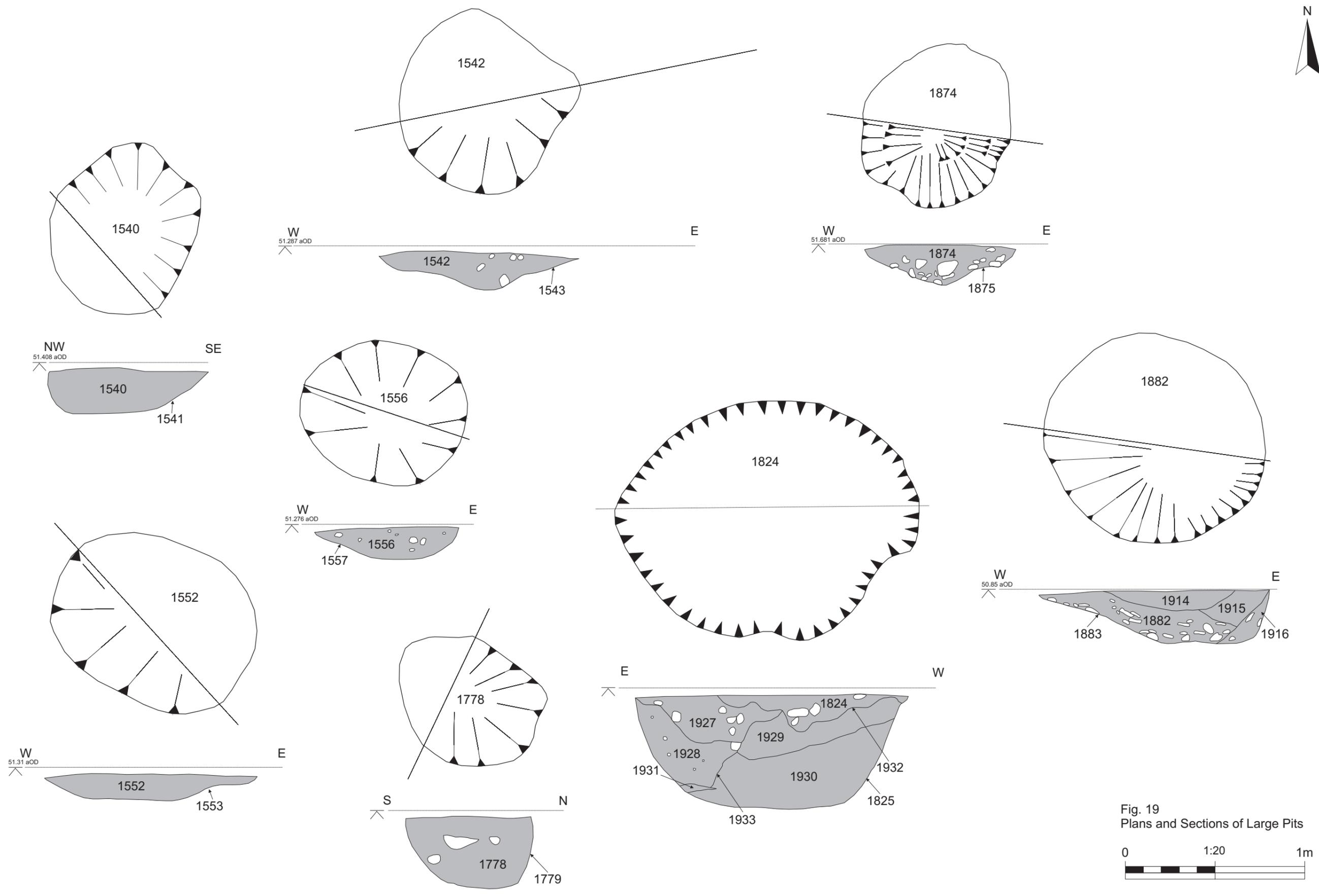


Fig. 19
Plans and Sections of Large Pits

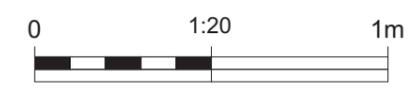
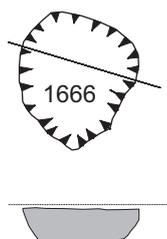
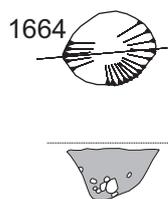
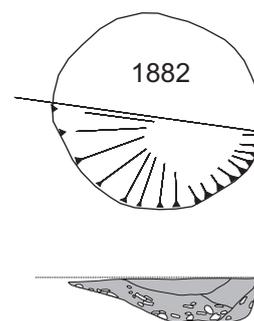
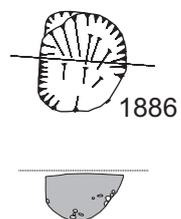


Fig. 20
Plans and Sections showing the relationship between
Pit F1882 and Posthole F1886 and between Pit F1666
and Posthole F1664.



6.4 *Isolated postholes and stakeholes*

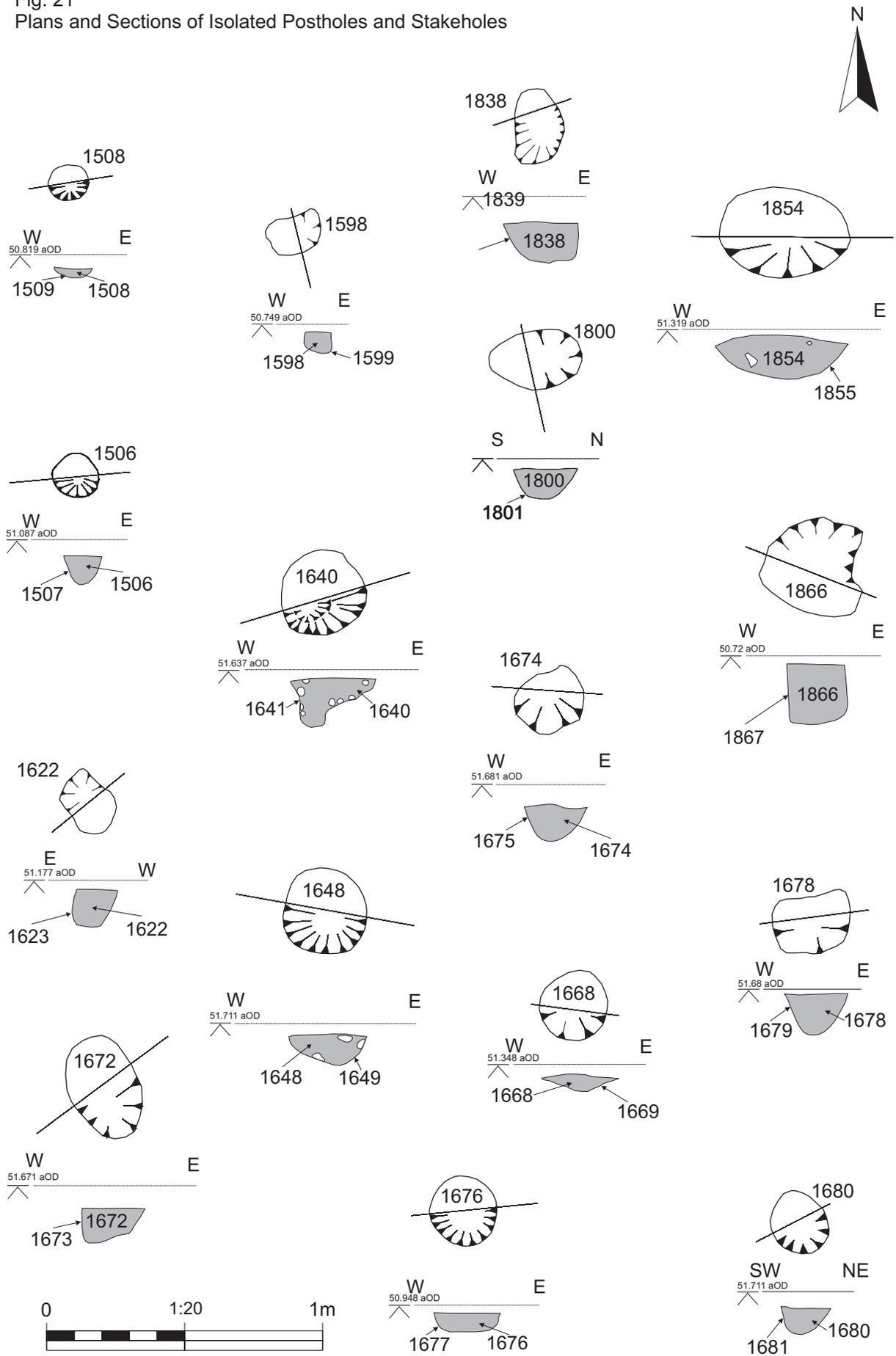
- 6.4.1 As well as the postholes and stakeholes contained within the seven post-built structures, there were a number of isolated features that did not appear to be connected to any of the structures. There were nineteen possible isolated postholes and stakeholes on the site. Due to the degree of truncation, particularly on the western side of the site, it is possible that these isolated features were once part of other structures along with postholes and stakeholes that have left no trace.

Feature No.	Context Numbers	Description	Max. dimensions (mm)	Max. Depth (mm)	Colour of Fill	Composition
F1506	1506, 1507	Small stakehole	130 x 130	100	Dark orange/brown 5yr 5/3	Sandy silt
F1508	1508, 1509	Small stakehole	130 x 130	30	Mid orange/brown 5yr 5/5	Sandy silt
F1598	1598, 1599	Small stakehole	250 x 300	50	Dark brown	Sand
F1622	1622, 1623	Posthole	350 x 230	180	Orange/brown 7.5yr 5/6	Sandy silt
F1640	1640, 1641	Posthole	330 x 300	200	Dark grey/brown 10yr 4/2	Sandy silt
F1648	1648, 1649	Posthole	280 x 260	110	Grey/brown 7.5yr 3/3	Sandy silt
F1664	1664, 1665	Posthole	500 x 450	340	Very dark brown/grey 10yr 2/1	Sandy silt
F1668	1668, 1669	Posthole	240 x 240	70	Dark brown/grey 7.5yr 3/2	Sand
F1672	1672, 1673	Posthole	120 x 135	140	Very dark grey/brown 7.5yr 3/2	Sandy silt
F1674	1674, 1675	Posthole	240 x 300	130	Very dark brown 7.5yr 2.5/3	Sandy silt
F1676	1676, 1677	Posthole	150 x 150	65	Mid dark brown/grey 10yr 4/2	Sandy silt
F1678	1678, 1679	Posthole	230 x 200	80	Dark greyish brown 7.5yr 3/2	Silty sand
F1680	1680, 1681	Posthole	300 x 180	95	Very dark brown 7yr 2.5/3	Silty sand
F1780	1780, 1781	Large posthole	1400 x 880	1260	Greyish brown 5yr 3/3	Sandy silt
F1800	1800, 1801	Posthole	250 x 380	130	Orange brown 5yr 3/2	Sand
F1838	1838, 1839	Posthole	360 x 300	180	Grey/brown 5yr 3/2	Sandy silt
F1854	1854, 1855	Posthole	470 x 340	160	Dark greyish brown 5yr 2.5/1	Sandy silt
F1866	1866, 1867	Posthole	250 x 270	250	Dark brown	Sandy silt
F1886	1886, 1887	Posthole	520 x 580	390		Sandy silt

Table 9: Feature descriptions of isolated postholes and stakeholes

- 6.4.2 F1780 was a particularly large and deep posthole at the north of the site. The feature was unique in form for this site. While the size of the feature mostly resembled that of a pit, its straight sides and 'bowl' shaped base implies that it could have held a large substantial timber post. There were no finds recovered from this feature.

Fig. 21
Plans and Sections of Isolated Postholes and Stakeholes



6.5 *Linear Feature*

There was one linear feature that ran from east to west across the southern section of the site and directly through the circular post-built structure (PBS21). The linear was thought to be a post-Medieval field boundary or woodland boundary as modern pottery was recovered from the fill. Due to truncation the dimensions and depth of the feature varied quite considerably, however the maximum recorded measurements are shown in the table below. Also in close proximity to the linear feature was a group of modern animal burials, thought to be lambs. These burials further support the dating of the linear feature as it is often typical for animals to be buried next to field boundaries.

Feature No.	Context Numbers	Description	Max. dimensions (mm)	Max. Depth (mm)	Colour of Fill	Composition
F1642	1642, 1643	Linear feature	1300 wide	220	Grey brown 5yr 3/2	Sand

Table 10: Feature description of Linear



Figure 22: Linear feature (F1642) section A-B looking west (Scale: 1m).



Figure 23: Linear feature (F1642) section D-E looking west (Scale: 1m).



Figure 24: Modern animal burial (Scale: 0.25m).

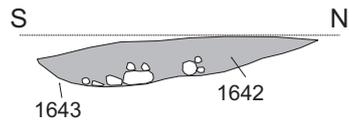
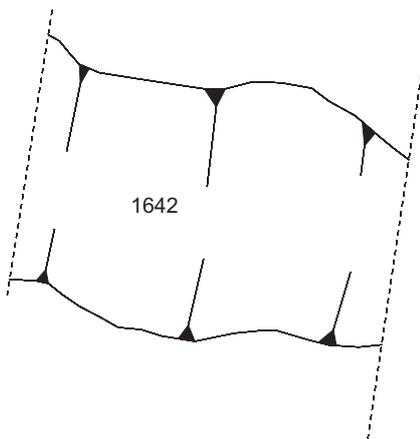
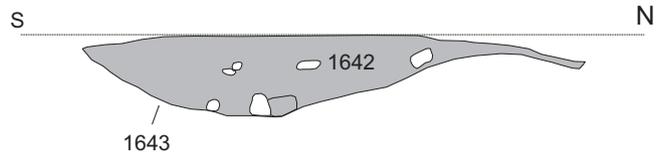
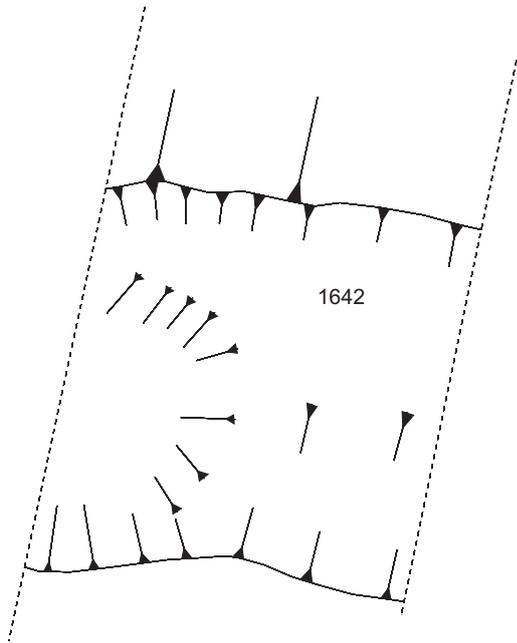


Fig 25.
Plans and Sections of Linear Feature (F1642)



6.6 *Cists*

6.6.1 There were two cists discovered on the site at the very northern edge of the trench. A single radiocarbon determination on the human remains from Cist 1 has shown that this feature, and therefore possibly both cists, belong to the late pre-Roman Iron Age. The details of the radiocarbon determination are discussed more fully in Section 8 below.

Feature No.	Context Numbers	Description	Max. dimensions (mm)	Max. Depth (mm)	Colour of Fill	Composition
Cist1	1830, 1831, 1832, 1833	Stone-built corbelled cist containing human remains	500 x 1000 (approx.)	350	Dark grey	Sandy silt
Cist2	1834, 1966, 1967	Stone-built cist	2000 x 1000 (approx.)	1500	Dark brown	Sandy silt

Table 11: Feature Descriptions of Cists

6.6.2 During the strip and record stage of the excavation the cists appeared as oval pits containing loose unmodified stones and were initially thought to be modern features, such as animal burials, due to the loose compaction of the fill. Cist 1 was the least disturbed and still had some of the cap stones lying in-situ once the initial rubble capping was removed. The cist was constructed using Cheviot stone and consisted of seventy-three stones of various sizes and shapes, although most were quite flat and not very deep, set in a corbelled arrangement. In some places the stones appeared to have been arranged in courses although the construction was irregular. The cist was still in good condition and did not appear to have been too disturbed. The burial had been placed in a crouched position facing east with the head to the north. It had been laid directly on to the base of the pit with the skull lying on a flat stone slab. The upper portion of a skull and some other bones thought to be from the leg and pelvis survived. The skull was lying on a flat stone in the north-east corner of the cist with the crown facing upwards, presumably in almost the original position. There were no grave goods or artefactual evidence from within the cist fills. The grave had been constructed by first excavating an oval pit into the sand and gravel substratum and then constructing the cist from stone cobbles employing a corbelling technique. Before the cist was closed off the burial had been inserted and then the final courses added and the capstones added. Stone rubble was then placed over the cist but whether this extended upwards into a low cairn remains unknown as the intensive agricultural activity on this site has meant that any above-ground traces have since been levelled.

6.6.3 Cist 2 lies to the south-east of Cist 1 and was more disturbed, perhaps by modern ploughing. The stones used to construct this feature differed from those used in Cist 1 in that they were less angular. During the first stages of excavation Cist 2 seemed to have an oval shape and appeared larger than Cist 1, however once the base was reached the bottom course created a space which was approximately 1000 x 500mm and rectangular. The disturbance of Cist 2 seemed to have affected even the lower courses of the construction by lifting the stones from their original positions and spreading them outwards which is why the feature seemed larger on the surface. Even towards the base the construction was very weak and many of the stones were loose even in their original positions. Once

fully excavated the cist was approximately 1500mm deep and there were no human remains or grave goods found surviving within.



Figure 26: Cist 1 (F1830), before total excavation, looking north-west (Scale: 0.25m).



Figure 27: Cist 1(F1830), after total excavation, with *in situ* human remains (Scale: 1m).



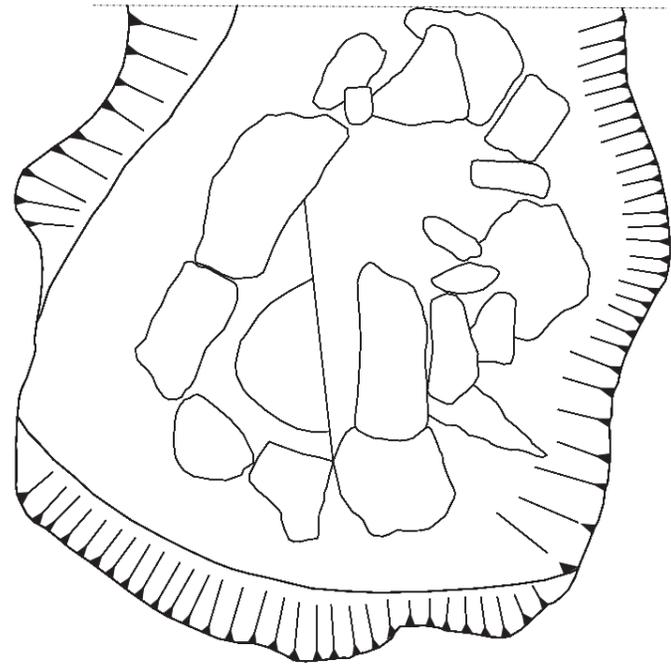
Figure 28: Cist 2 (F1834), before total excavation, looking north-west (Scale: 1m).



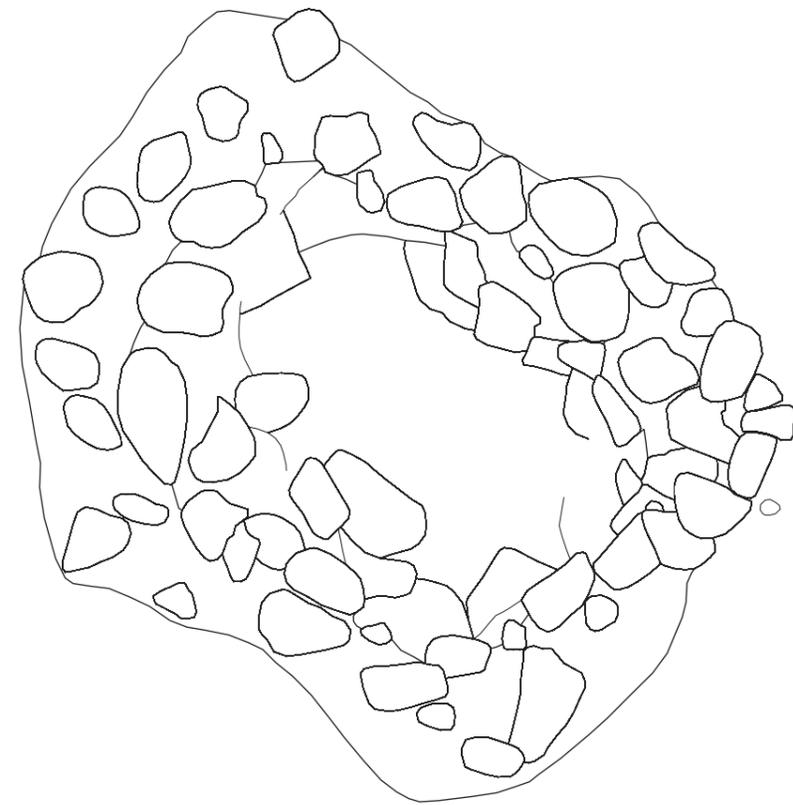
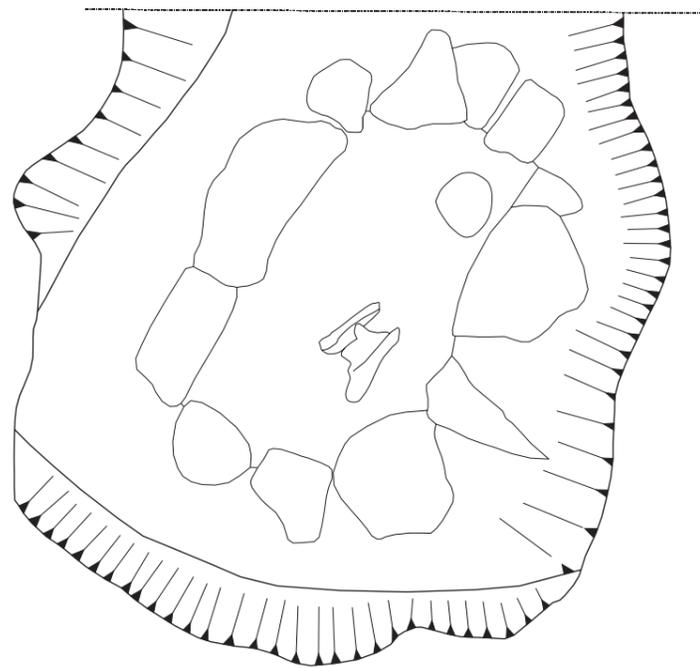
Figure 29: Cist 2 (F1834), after total excavation, looking north-west (Scale: 2m).



Cist 1 Before Excavation



Cist 1 After Excavation



Cist 2 After Excavation

Fig. 30
Plans of Cist 1 and Cist 2



6.7 Tree Throws

6.7.1 Across the site there were a number of features that were initially identified as possible pits or postholes but were later identified as non-anthropogenic tree throws or root features. Any features that turned out to be due to root action were deleted.

Feature No.	Context Numbers	Description	Max. dimensions (mm)	Max. Depth (mm)	Colour of Fill	Composition
F1502	1502, 1503, 1911, 1912, 1913, 1968	Tree throw	2940 x 2850	560	Greyish brown 5yr 3/3	Sand
F1544	1544, 1545	Tree throw	650 x 500	200	Grey/light brown	Sand

Table 12: Feature descriptions of tree throws.

6.7.2 F1502 was a very large feature and, during the strip and record, was thought to be a sunken-floored building similar to the other SFBs found during the previous phase of work on the site, as the dimensions in plan were typical of the other sunken floored buildings found during Phase 1. Once excavated the feature was found to have a substantial depth which is not typical of these structures. On the basis of its structural form and comparison with tree throws excavated elsewhere it is thought most likely to represent a tree throw. Some residual pottery and burnt agate was recovered from the fill.

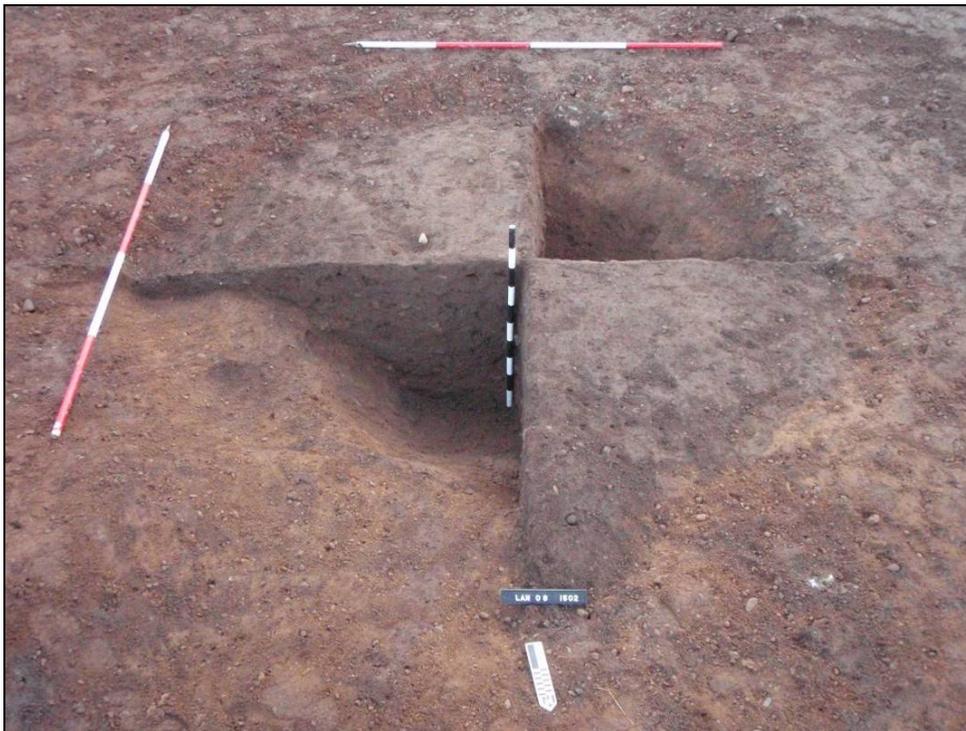


Figure 31: Tree throw, F1502, looking south (Scale: 2 x 2m and 1m).

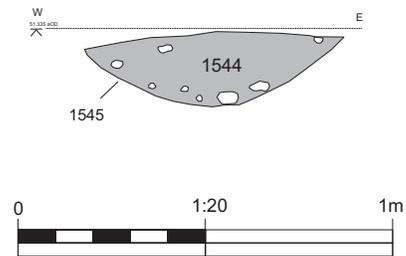
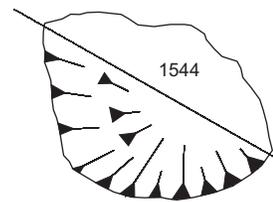
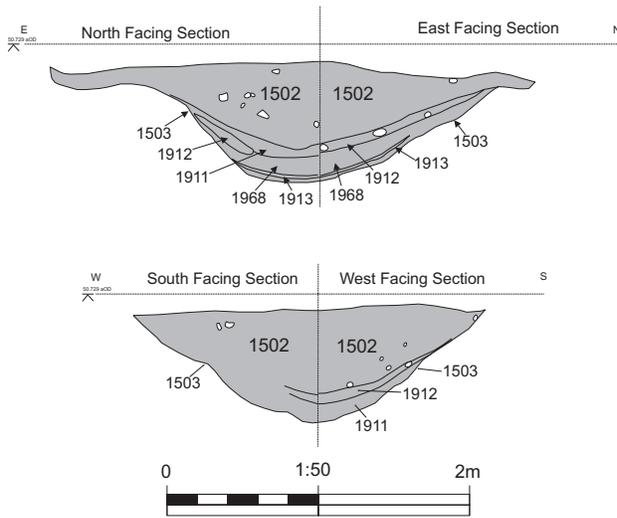
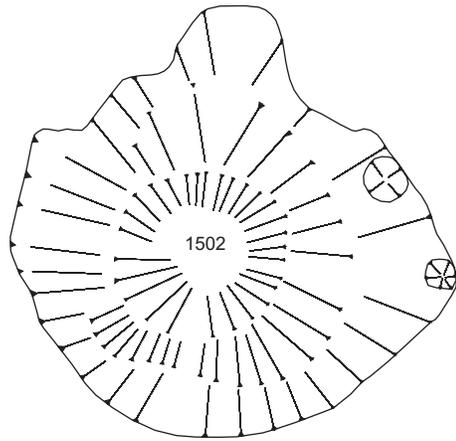


Fig.32
Plans and Sections of Tree Throws

7. Human Remains **- Alexandra M. Thornton, MSc.**

7.1 Site Context

7.1.1 The archaeological excavation at Lanton, Northumberland, undertaken in 2008 to 2009, uncovered a corbelled cist burial from Cist 1 which contained an articulated crouched inhumation or, given the placement of the skull with missing lower mandible in an upright position on the stone pad, the placement of body parts to approximate to a crouched inhumation. The cist was aligned along a north-east to south-west axis and the skeleton was positioned across the grave with its head laid in the north-east and its crouched lower limbs in the south-west of the cist. The body was supine and the head was placed facing the south.

7.2 Human Bone Analysis

7.2.1 Methods

7.2.1.1 The methods which were applied for the analysis of the skeleton correspond to those recommended within Brickley and McKinley's *'Guidelines to the Standards for Recording Human Remains'* (2004). A skeletal inventory of the remains excavated from the cist burial was produced in order to determine the minimum number of individuals within the burial. The completeness of the skeleton was also recorded. A dental inventory would have been produced using the Zsigmondy system (van Beek 1983, 5) if any dentition had remained.

7.2.1.2 Surface preservation of the remains was graded from 0 to 5+. A Grade 0 bone would be described as having a 'surface morphology (which is) clearly visible... (a) fresh appearance... and no modifications' (Brickley and McKinley 2004: 16). A bone valued as Grade 5+ would be described as having 'heavy erosion... across (the) whole surface, completely masking (the) normal surface morphology... with extensive penetrating erosion resulting in modification of (the) profile' (2004: 16).

7.2.1.3 The age at death of the skeletal remains was determined using the cranial suture closure method (Meindl and Lovejoy 1985). Unfortunately, the remains were so fragmentary and poorly preserved that no other ageing technique could be applied.

7.2.1.4 The sex of the skeleton was established using the skull as the areas of the pelvis which are typically used for sexing methods were not present in the assemblage. The overall shape of the skull, the supra-orbital ridges and the mastoid process were used to sex the skeleton.

7.2.1.5 Due to the fragmentary nature of the assemblage, in particular the tibia and femur, it was determined that analysis of the stature of the skeleton would not give an accurate result and was therefore abandoned. Analysis of the metric, non-metric traits and musculo-skeletal markers would also prove inconsequential as the skeleton lacked both the right and the left bones for comparison.

7.3 Results

7.3.1 The bone assemblage recovered from the cist burial at Lanton, Northumberland, was identified as human. No animal bone was excavated from inside the cist. The burial was of an articulated skeleton which had been laid supine in the cist with its legs crouched into its chest.

- 7.3.2 The surface preservation of the skeleton was deemed to be, on average, Grade 4 where ‘all of (the) bone surface (was) affected by erosive action... (the) general profile (was) maintained and depth of modification (was) not uniform across whole surface’ (Brickley and McKinley 2004, 16). The graded preservation of each bone can be seen in Table 1. The poor preservation of the remains was probably due to high levels of bacteria in the soil and invasive root action. Evidence of bacterial action and small sinuous roots were identified upon the skeletal elements, particularly the skull. The condition of the bone, particularly the surface preservation, is recorded in order to establish the processes that have affected the assemblage, such as ritual mortuary practices and post depositional action on the skeleton. Furthermore, the surface preservation of a skeleton is important to determine as this can be used to ascertain the likelihood that pathological lesions will be visible on the bone for analysis. In this case, the poor preservation of the skeletal assemblage suggests that some of the pathology which might have been observable on the skeleton may have been eroded. This may give a false impression that the human remains were pathology free.
- 7.3.3 A skeletal inventory was made identifying all of the bone which was recovered from the cist. This list can be found in Table 1. The skeleton was in an extremely fragmentary condition with approximately 15% of the skeleton surviving. The skeletal elements that remain are the superior portion of the skull, predominantly the parietal and frontal bones and a small portion of the occipital bone. The mandible and maxilla were not present. The right and part of the left temporal bone survived along with fragments of the left zygomatic bone and the inner cranium. The left acetabulum from the pelvis and the posterior half of the head of the left femur were recovered. A sixth of the inferior shaft of the left femur, an eighth of the inferior, anterior portion of the left tibia, half of the shaft of the fibula, the superior half of the left femoral shaft, half of the shaft of the right tibia and the inferior third of the left humerus survived. None of these bones were duplicated within the cist burial and therefore, the minimum number of individuals buried was one.

Skeletal element	Grade of preservation
Skull (superior)	4
Temporal bone	4
Zygomatic bone	3
Inner cranium	3
Acetabulum	4
Femoral head	4
Femur shaft (x2)	4
Tibia shaft (x2)	4
Fibula shaft	4
Humeral shaft	4
Average	4

Table 13: Skeletal elements present from the Lanton cist burial and their preservation.

- 7.3.4 The fragmentary nature of the remains was probably due to bacterial and root action. However, it cannot be overlooked that the parts of the skeleton that are particularly under-represented, such as the upper limb bones, vertebrae, ribs and scapula, may have been removed from the burial after the decomposition of the

body, either by humans or by scavenging animals. It is also possible that the skeleton was excarnated then partially transported into the cist and laid in the current position.

- 7.3.5 The sex of a skeleton is typically determined by using many sexing methods particularly focusing on the pelvis (overall shape, greater sciatic notch shape, pubic symphysis height, sub-pubic angle, sub-pubic concavity, medial ischio-pubic ridge) and skull (overall shape, supra-orbital ridges, zygomatic bone, mastoid process, mandibular ramus and body). Generally, it is recommended that human remains are not sexed unless the pelvis is present (Roberts 2009, 129). The Lanton skeleton is missing its pelvis, apart from the left acetabulum, and therefore sexing the remains would not be recommended normally. However, in this case, as the skeleton is so poorly preserved, it was thought that rudimentary sexing of the assemblage might be useful. The supra-orbital ridges and left mastoid process of the skull suggest the skeleton may be female (Fig. 33), but without the pelvis and other areas of the skull to contribute to this analysis, this assumption should not be taken as definite.



Fig. 33. The mastoid process from the Lanton skeleton is small and angled vertically which is typical for a female skull. (Photograph author's own).

- 7.3.6 The age at death of the remains is equally as problematic as the sex of the skeleton. It should also be noted that osteologists can only analyse the biological age at death of a skeleton and not necessarily the chronological age at death. This is due to the fact that human beings age at different rates depending on genetics, activity levels and diet. Generally, in order to determine a skeleton's age at death, the pubic symphysis degeneration (Brooks and Suchey 1990), the sternal rib ends (Iskan *et al.* 1984), fusion of the medial clavicle (Cox and Mays 2000; 65), the dental attrition (Miles 1963, 2001) and cranial suture closure (Meindl and Lovejoy 1985) are analysed. In this case, cranial suture closure is the only method that can be used upon this assemblage. The skeleton from the cist burial at Lanton had fully fused epiphyses in the femoral head and in the humerus indicating they are

adult. Furthermore, the cranial sutures were in an advanced stage of closure (Fig. 34) and the skeleton was therefore aged as between 34 and 76+ years. The locations of cranial suture closure and the determined age, using Meindl and Lovejoy's method (1985) are listed in Table 14. The composite scores and corresponding age ranges of the lateral-anterior sutures and the vault sutures are shown in Table 15.



Fig. 34. The skull showing completely fused sagittal and coronal cranial sutures. (Photograph author's own).

Cranial suture point	Degree of closure	Age
Midlambdoid	X	X
Lambda	2	45.2
Obelion	3	44.8
Anterior sagittal	3	46.9
Bregma	3	49.2
Midcoronal	3	51
Pterion	3	48.8
Sphenofrontal	3	50.6
Inferior sphenotemporal	X	X
Superior sphenotemporal	X	X

Table 14: Cranial sutures which are present and their degree closure. X represents a suture which was not present.

		Age range
Composite score for lateral-anterior suture closure	15	34-68+
Composite score for vault	20	23-76+

Table 15: Composite scores of specific suture sites and the corresponding age range.

- 7.3.7 The skeletal remains, as previous stated, were extremely fragmentary and poorly preserved. This meant that if there had been pathological lesions on the bones, they might not have survived. Furthermore, the skeletal elements which are missing from the assemblage may have revealed the largest amount of pathology. It is possible that this high bacterial action may have been the reason why these bones in particular are no longer present. Of the remaining bones, the majority did not have pathological lesions. This suggests that either the individual was fairly healthy and simply died of old age, or the disease of which they died from was acute and fast working, leaving no trace upon the skeleton. There was evidence of active, unhealed, bone formation in the form of straight lengths of woven bone on top of the cortex on the proximal quarter of the neck of the femoral head and distal quarter of the humeral shaft (Fig. 35). This indicates that an initial response to a disease was occurring at death.



Fig. 35: Evidence of possible non-specific infection at the distal end of the humeral shaft, seen as straight lengths of woven bone on the left hand side of the shaft (photograph author's own).

- 7.3.8 Palaeopathological lesions such as those seen on the Lanton skeleton can be caused by a multitude of diseases which affect the long bones including 'tuberculosis, trauma, non-specific infection and scurvy' (Roberts and Manchester 2005, 8). However, the unhealed lesions on the humerus and femur appear to be associated with the joints and combining this with the occurrence of osteophytes on and around the fovea of the femoral head, the lesions may represent active joint disease in the individual. Finally, there was no evidence for healed or unhealed bone trauma, such as breaks, nor any sign of animal gnawing or cut marks on the bones.

7.4 Conclusion

7.4.1 The cist burial from Lanton, Northumberland, contained the partial skeleton of a female aged from between 34 and 76+. The individual had active joint disease when they died, but this is unlikely to have been the cause of death. The remains were extremely fragmentary and poorly preserved suggesting that post depositional modifications to the burial had occurred. These may have either been due to natural taphonomic processes such as root action, or due to animal scavenging, or due to modification to the burial by humans after deposition of the body. Alternatively, the partial skeleton may have been buried in the cist originally after the individual had decomposed elsewhere.

8. Radio Carbon Dating

- Scottish Universities Environmental Research Centre (SUERC)

8.1 A radiocarbon determination was obtained on a single entity sample of human bone from the inhumation recovered from cist 1. The sample returned a date of cal. 170BC-30AD at 95.4% confidence (2045 ± 35 bp, SUERC-22817).

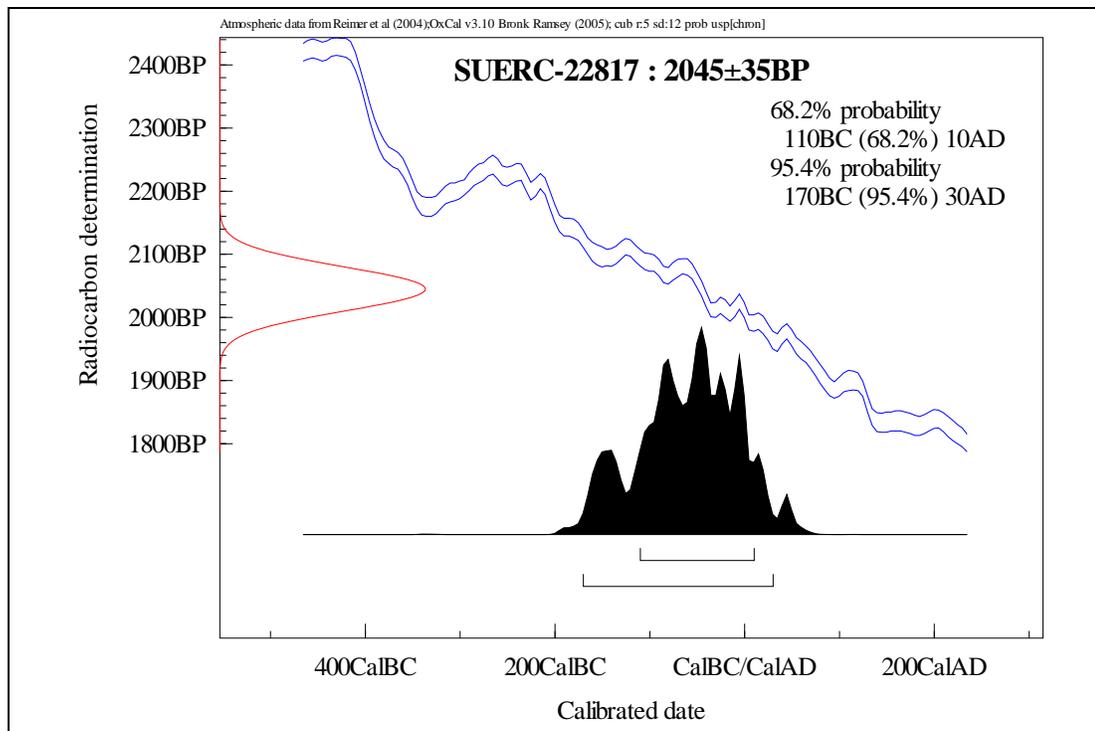


Fig. 36: Graph showing calibrated date from human bone sample taken from Cist 1

Sample	Material	Context	Conventional Radiocarbon Age	13C/2C Ratio	Calibrated Age at 2σ 95.4% probability
SUERC-22817	Human Bone (Femur)	Cist 1	2045 ± 35 BP	-20.6 ‰	170BC-30AD

Table 16: Radiocarbon determination details

9. Plant Macrofossil Analysis, Pollen and Charcoal Assessment By Archaeological Services Durham University (Report 2166)

9.1 Summary

9.1.2 A multi-phase site has been excavated by Archaeological Research Services Ltd, at Lanton Quarry, Northumberland. This report presents the results of: plant macrofossil analysis of 40 flots derived from bulk samples taken at the site; pollen assessment of two contexts from Early Neolithic midden pits; and an assessment of the radiocarbon dating potential of 100 hand-recovered charcoal samples.

9.2 Results

9.2.1 Plant macrofossil analysis

9.2.1.1 Early Neolithic

9.2.1.2 Charred plant macrofossil remains consisted of two cereal grains one of which was identified as cf. emmer wheat, and hazel nutshell fragments, with a single weed seed derived from a ruderal taxon.

9.2.1.3 Bronze Age

9.2.1.4 Charred plant macrofossil remains consisted of two cereal grains one of which was identified as barley, and hazel nutshell fragments.

9.2.1.5 Unphased

9.2.1.6 Charred plant macrofossil remains consisted of a single crab apple seed.

9.2.2 Pollen assessment

9.2.2.1 Pollen preservation was poor; a single grain from pine was identified with a few grains from wide niche herbs.

9.2.3 Charcoal assessment

9.2.3.1 Sixty-two samples contained material that would potentially be suitable for radiocarbon dating.

9.3 Project background

9.3.1 Location and background

9.3.1.1 A multi-phase site has been excavated by Archaeological Research Services Ltd, at Lanton Quarry, Northumberland. This report presents the results of plant macrofossil analysis carried out on flots derived from environmental samples selected from a series of post built structures and pits (generally interpreted as midden pits), which have been dated to Early Neolithic and Bronze Age. Two of these pit fills, contexts (1182) and (1556), are assessed for potential pollen analysis, and in addition, an assessment of the radiocarbon dating potential of a further 100 hand-recovered charcoal samples is provided.

9.3.2 Objective

9.3.2.1 The objectives were: to analyse the plant macrofossil evidence in order to provide information about the diet and agricultural practices of the Early Neolithic and Bronze Age inhabitants at the site, and the palaeoenvironment at that time; to assess the potential for pollen analysis of contexts from two pits; and to assess the availability of material that would be suitable for radiocarbon dating.

9.3.3 Dates

9.3.3.1 Analysis and report writing were carried out between 20th February and 20th April 2009.

9.3.4 Personnel

9.3.4.1 Plant macrofossil analysis, pollen and charcoal assessment and report preparation were conducted by Dr Helen Ranner. The processing of the pollen samples was undertaken by Mr Bryan Atkinson.

9.3.5 Archive

9.3.5 The site code is **LAN08**. The flots and charcoal samples are retained in the Environmental Laboratory at Archaeological Services Durham University, for collection.

9.4 Plant macrofossils

9.4.1 Method

9.4.1.1 The bulk environmental samples were processed by Archaeological Research Services Ltd. The flots were examined at $\times 40$ magnification. The soil from this site is of a free-draining nature, therefore only carbonised plant material will have been preserved; any uncharred plant remains would be later intrusive material and have not been included in this analysis. Identification of the charred plant remains was undertaken by comparison with modern reference material held in the Environmental Laboratory at Archaeological Services Durham University. Plant taxonomic nomenclature follows Stace (1997).

9.4.2 Results

9.4.2.1 The flots were relatively small and dominated by fire waste; this was principally charcoal, with traces of coal in context (1748), clinker in context (1886) and semi vitrified fuel waste in context (1590). Indeterminate fragments of calcined bone

were present in context (1590) samples <304> and <327>. Modern plant material comprising roots and seeds was recorded regularly.

9.4.2.2 Charred plant macrofossils were very scarce throughout. The Early Neolithic contexts contained two cereal grains, one of which showed the morphological characteristics of emmer wheat (context 1958), whilst the other was a wheat/barley grain in very poor condition (context 1526); single hazel nutshell fragments were present in contexts (1886) and (1882), but by contrast were abundant in context (1556); and a nutlet derived from the ruderal family of knotweeds was recorded from context (1526). Similarly, two cereal grains were recovered from the Bronze Age context (1588), and one of these was identifiable as barley; single hazel nutshell fragments were recorded in contexts (1566), (1921) and (1590); and charred rhizomes/tubers were present in context (1904). A carbonised crab apple seed was recorded from the unphased context (1664). The results are presented in Appendix I.

9.4.3 Discussion

9.4.4 Food plants

9.4.4.1 *Early Neolithic*

9.4.4.2 The charred food plant remains recorded in the Neolithic contexts, indicate that both cultivated and wild gathered material was being utilised at this site during the transition from hunter gatherer to farmer. Both barley and wheat were being used, as has previously been recorded at this site (Archaeological Services 2008), and also on six other Neolithic sites in the north of England, with an additional seven sites recording barley only (Hall & Huntley 2007). The particular use of emmer wheat cannot be confirmed, due to the absence of any definitive chaff, however, this early type of wheat has previously been recorded at six other Neolithic sites in the north of England (Hall & Huntley 2007), and particularly in the Milfield Basin (Huntley 1999; Archaeological Services 2000) and Whitton Hill (van der Veen 1985) in Northumberland. There is also evidence for the use of hazel nuts as an additional food source; evidence for the use of wild gathered hazel nuts, has previously been recorded at this site (Archaeological Services 2008), and at other Neolithic sites in the region (Hall and Huntley 2007).

9.4.4.3 *Bronze Age*

9.4.4.4 The charred food plant remains recorded in the Bronze Age contexts indicate that both cultivated cereals and wild gathered hazel nuts were being utilised at this site; this is additional information as previously there was no evidence for wild-gathered foods in this phase (Archaeological Services 2008). The use of barley is in common with other Bronze Age sites in northern England (Hall & Huntley 2007).

9.4.4.5 *Unphased*

9.4.4.6 The charred food plant remains suggest that wild-gathered crab apples were being utilised at the site. A piece of charred *Pyrus/Malus* (pear/apple) species endocarp was recorded previously from amongst the hand-recovered charcoal samples (Archaeological Services 2008), similarly this sample was also not attributed to a specific phase. Evidence for the use of crab apples in the Neolithic has previously been recorded in the region at A1 Walshford-Dishforth DEAR 4/93 (Huntley 1993), and regularly throughout Britain and Ireland:

pottery impressions and carbonised fragments in the south of Britain at Maiden Castle and Windmill Hill (Godwin 1975); at the site of a Neolithic timber hall at Balbridie in the Grampian region of Scotland (Fairweather & Ralston 1993); and in Ireland, for example, at Tankardstown South, Co. Limerick (Gowan 1988), and Castletown Tara 1, Co. Meath (Archaeological Services 2009).

9.4.5 The natural environment

9.4.5.1 Early Neolithic

9.4.5.2 The Early Neolithic contexts lack the variety of plant macrofossil remains that were recorded from this phase in the previous analysis (Archaeological Services 2008), and so further evidence for the natural environment is sparse. The presence of hazelnut shell fragments, which would have been discarded from gathered nuts, supports the previous interpretation of the presence of local woodland or scrub; this species would have proliferated and fruited well at woodland edges or in areas cleared for cultivation or habitation, where the availability of light was significantly increased. The presence of the ruderal taxon knotweed, also previously recorded (*ibid.*), suggests open and disturbed ground, typical of occupation sites.

9.4.5.3 Bronze Age

9.4.5.4 The presence of hazel nutshell fragments in the Bronze Age sediments suggests some continuity of the local woodland structure from the Neolithic, in continuing to provide an additional source of wild-gathered food.

9.4.5.5 Overview

9.4.5.6 Evidence for food plants and palaeoenvironment from the plant macrofossils and pollen is sparse throughout the phases sampled, however, it is clear from the hand-recovered charcoal samples that a variety of tree taxa were utilised (see section 9.6). The charcoal evidence suggests the proximity of mixed woodland perhaps with a canopy dominated by oak and an understorey of birch and hazel, with alder growing in the wetter areas and ash occupying drier areas.

9.5 Pollen assessment

9.5.1 Method

9.5.1.1 Pollen from two Early Neolithic pit fills, contexts (1556) and (1882), was assessed. Pollen was extracted from one ml of each sub-sample using standard preparation techniques (e.g. Moore *et al.* 1991), which included sodium hydroxide digestion, followed by sieving, heavy liquid separation, acetolysis and staining. A *Lycopodium* spore tablet of known concentration was added to provide marker grains in order to facilitate calculation of the total pollen concentrations. The pollen was mounted in silicone fluid and scanned at high magnification. Identification of pollen and spores was undertaken by comparison with modern reference material, using Moore *et al.* (1991) as a guide. Plant taxonomic nomenclature follows Stace (1997).

9.5.1.2 The potential concentration of pollen grains in each sub-sample was assessed using the ratio of marker grains to natural grains. Reliable calculations of absolute frequencies should be obtained by counting 150-200 marker grains, and 300-400 natural grains (after, Rull 1987). Using the initial sub-sample volume and the

marker grain concentration, a value of *c.* 27,000 natural grains per ml would be needed to achieve this level of counting.

9.5.2 Results

9.5.2.1 Pollen preservation was poor in both contexts. A few grains from the wide niche herb taxa, grasses and dandelions were recorded in both contexts, with a single grain from the tree taxon, pine, in context (1556). The estimated pollen concentration (grains per ml of sediment) was 1,841 for context (1556) and 1,723 for context (1882). Microscopic charcoal was abundant in both contexts.

9.5.3 Discussion

9.5.3.1 The pine pollen may not have derived from a local source, since pine pollen is anemophilous (adapted to wind pollination) and can be transported over large distances. The pollen from the herb taxa is more likely to be representative of the local flora but the taxa represented are typical of a wide variety of habitats; the presence of grasses and dandelions does suggest open and probably disturbed ground. The abundant microscopic charcoal is likely to represent a background level of charcoal dust associated with occupation. The quantity of pollen preserved in these samples (i.e. < 27,000 grains per ml of sediment) is unsuitable for any further analysis.

9.6 Charcoal assessment

9.6.1 Hand-recovered charcoal samples from 100 contexts associated with the post-built structures and pits were assessed for their potential to provide suitable material for radiocarbon dating. The transverse, radial and tangential sections were examined at up to $\times 600$ magnification using a Leica DMLM microscope. Identifications were assisted by the descriptions of Hather (2000), Schweingruber (1978) and modern reference material held in the Environmental Laboratory at Archaeological Services Durham University. Where possible two items were selected and weighed.

9.6.2 Sixty-two of the samples contained material that would potentially be suitable for radiocarbon dating. This comprised charcoal from birch, hazel, alder, Maloideae (hawthorn, apple, service etc.) and ash, and a few samples of charred hazelnut shell fragments. Oak timber charcoal was regularly recorded; the weights for these fragments are not included, as oak timber is not considered suitable for radiocarbon dating. A list of the items selected is presented in Table II in Appendix I, together with details of additional items recovered from the flots.

10. Discussion

10.1 Midden Pits

10.1.1 The Early Neolithic midden pits are almost identical in form to the midden pits excavated during the first phase of work at this site and also to the same type of feature found at Cheviot Quarry close by (Johnson and Waddington in press). This form of deposition, whether domestic or with some deeper purpose, appears to be a feature of Early Neolithic settlement within river valleys over a wide area. Almost identical midden pits containing Carinated Bowl pottery have been found in other areas of Britain focused on gravel terraces fringing large river valleys, as for example in the Trent Valley (Willington - Brightman forthcoming; Wheeler 1979).

10.2 Post-built structures

10.2.1 Disregarding the post-built circular house, there were two distinct 'styles' of post-built structure encountered during this phase of work, both with parallels to post-built structures excavated as part of the previous phase of work on the site.

10.2.2 The first type of structure (PBS 20, 23, 26) was characterised by an irregular plan of shallow, truncated postholes. From the significant depths of some other postholes across the site, it is clear that this is not a result of ploughing and the general shallow depth of the postholes is a genuine feature of this type of construction. While it is probable that these are lighter and perhaps more-temporary structures than the second style observed on the site, it is not possible to say much more about the possible form of these structures due to the irregular arrangement of postholes in plan. The more irregular post-built structures observed during the first phase of work on this site, while similar in some ways, were generally more deeply set and had a discernible, though variable, plan – mostly triangular or trapezoidal.

10.2.3 The second 'style' of structure (PBS 22, 24, 25) was characterised by deeply-set straight-sided large postholes in regular arrangements. PBS 22 and 25 were both rectangular in plan consisting of six postholes in the case of PBS 22 and nine postholes for PBS 25. The extra three postholes within the plan of PBS 25 appear to be replacements for previous timbers which, when considered along with the impressive size of the postholes, indicates that these were structures which were stoutly built, perhaps being quite tall, and stood for some time. PBS 24 took the form of a right-angle triangle in plan and lay directly next to, and largely on the same alignment as, PBS 25. The size and profile of postholes is almost identical between the two structures, and were it not for how deeply-set the postholes are, it would be tempting to suggest that PBS 24 was also originally a rectangle in plan, with two postholes now lost.

10.2.4 PBS 21 is also most probably of Bronze Age date. It is a post-built circular structure, which, although severely truncated, is clearly of very similar structure to the post-built roundhouses excavated during the previous phase of work on this site, and also the two roundhouses excavated during the excavations at nearby Cheviot Quarry (Johnson and Waddington in press). The form that these roundhouses take is of a circle of upright posts with a 'porch' or entrance, defined by a pair of opposed 'double' or 'dumb-bell' postholes, facing to the east or south-east, possibly in order to take advantage of the rising sun. These post-

built circular houses are an important phenomenon as they provide a lowland counterpart to the farming settlements still visible in the surrounding uplands, and they may represent the domestic landscape of a relatively new way of life. It is only through large-scale open-area excavation such as this, that these largely ephemeral, yet important remains, are increasingly coming to light.

- 10.2.5 The ‘rectangular style’ of structure noted above can be ascribed a provisional Bronze Age date through association with Middle Bronze Age pottery, and may therefore be contemporary with the circular building PBS 21. If this is correct then it is possible that the circular structures may represent dwellings and the sturdy ‘rectangulars’ some other form of domestic building. A tentative suggestion may be that the sturdiness of their construction is because they had raised floors, which would also account for the total lack of floor surfaces encountered, and if so could represent some form of granary or other storage structure.

10.3 Cists

- 10.3.1 Whilst unusual, the construction of Cist 1 is not unique in this area. In an article describing the excavation of a corbelled cist at Kelloe Mains by Piggott in 1964 (Halliday and Graham Ritchie 1982), the authors note that there are between six and eight examples of coursed – though not corbelled - stone cists in the Berwickshire District: Catch-a-Penny (Craw 1924; MacGregor 1976), Coldingham Loch (Smith 1979), The Hops Sand-pit, Cockburnspath (Stevenson 1966), Middlefield (Forrest 1953), Woodend (Hardy 1886), Billiemire and Hogs Law (Hardy 1872). Of these examples, Kelloe Mains, Hops Sand-pit, Middlefield and Catch-a-Penny are of single inhumations dating to the Romano-British period just slightly later than the Lanton inhumation. It would be misleading to view this as a burial practice specific to a single period however, as at least two of the other stone-coursed cists (Hoprig, Billiemire) noted above are dated to the Bronze Age through association with grave goods. In addition to these early sites, Iron Age grave pits and cists are known from Broxmouth and Dryburn Bridge near Dunbar in east Lothian which in both cases were associated and contained within contemporary settlements. Elsewhere, but closer to our site, a corbelled cist burial was discovered at Beadnell Caravan Park (ref) containing Iron Age-Romano-British burials of up to 15 individuals – all with their lower mandibles missing just like the burial in Cist 1 at Lanton Quarry. Therefore, the Lanton cists appear to fall into the tradition of Iron Age-Romano-British ‘long-cists’ and extend the largely south-east Scottish distribution further south into north Northumberland. The presence of the cists on the site could possibly indicate the presence of a Late Iron Age settlement nearby. Clearly, only a few people merited such special burial in the Iron Age and this suggests that the woman buried at Lanton was a person of some standing or special character.

11 Publicity, Confidentiality and Copyright

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13 Acknowledgements

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APPENDIX I

Plant Macrofossil Analysis, Pollen and Charcoal Assessment Data

Table Ia: Data from the plant macrofossil analysis of Early Neolithic contexts

Sample	322	340	318	304	321	308	302	309	303	306	341	329	313	344	316	338	305	301
Context	1524	1526	1534	1590	1876	1748	1756	1758	1764	1922	1952	1958	1960	1964	1518	1556	1882	1886
Post Built Structure no./ feature	20					23					26				midden pits			
<i>Material available for radiocarbon dating</i>		□		□							□	□			□	□	□	□
<i>Volume of flot (ml)</i>	<5	30	10	20	<5	<5	<5	<5	<5	<5	7	5	<5	<5	7	75	15	10
<i>Flot matrix (relative abundance)</i>																		
Bone (calcined) indet. frag.	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Charcoal	1	3	3	3	1	1	1	1	1	1	3	1	2	1	3	5	3	2
Clinker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Coal	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Roots (modern)	1	1	1	2	2	-	1	2	1	-	1	2	-	1	1	1	-	2
Seeds (uncharred)	2	1	1	1	2	-	-	-	-	-	2	1	1	1	-	-	-	2
<i>Charred remains (total counts)</i>																		
(c) <i>Triticum</i> cf. <i>dicoccum</i> (Emmer Wheat) grain	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
(c) <i>Triticum</i> sp/ <i>Hordeum</i> sp (Wheat/Barley species) grain	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(r) Polygonaceae (Knotweed family) nutlet	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(t) <i>Corylus avellana</i> (Hazel) nutshell frag.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.62g	1	1

[c-cultivated plant; r-ruderal; t-tree]

Relative abundance is based on a scale from 1 (lowest) to 5 (highest)

Table Ib: Data from the plant macrofossil analysis of the Bronze Age contexts

Sample	311	314	315	317	320	325	326	328	332	335	336	327	300	312	319	337	339	343	
Context	1582	1917	1568	1588	1818	1576	1584	1566	1921	1578	1558	1590	1904	1736	1734	1738	1936	1946	
Post Built Structure (PBS)	21											fire pit assoc. PBS21	22			25			
Phase	Middle Bronze Age											Bronze Age							
Material available for radiocarbon dating		□		□		□	□	□	□	□	□	□		□	□		□	□	
Volume of flot (ml)	<5	<5	<5	25	7	7	15	10	<5	<5	5	20	<5	<5	10	<5	<5	<5	
Flot matrix (relative abundance)																			
Bone (calcined) indet. frag.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	
Charcoal	1	2	2	3	2	3	2	3	2	1	3	3	2	1	2	2	2	2	
Rhizomes / tubers (charred)	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	
Roots (modern)	1	-	1	1	3	2	2	2	1	2	-	3	2	2	3	1	1	1	
Seeds (uncharred)	1	1	1	1	2	2	2	2	1	1	1	3	2	-	2	1	-	-	
Semi vitrified fuel waste	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	
Vegetative material (miscellaneous)	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	
Charred remains (total counts)																			
(c) <i>Hordeum</i> spp (Barley species) grain	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
(c) Cerealia indeterminate grain	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
(t) <i>Corylus avellana</i> (Hazel) nutshell frag.	-	-	-	-	-	-	-	1	1	-	-	1	-	-	-	-	-	-	
Indeterminate seed	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

[c-cultivated plant; t-tree]

Relative abundance is based on a scale from 1 (lowest) to 5 (highest)

Table Ic: Data from the plant macrofossil analysis of the unphased contexts

Sample	307	310	323	324
Context	1868	1536	1664	1666
Feature	?hearth	posthole	posthole	pit/hearth
<i>Material available for radiocarbon dating</i>			□	□
<i>Volume of flot (ml)</i>	<5	<5	60	200
<i>Flot matrix: (relative abundance)</i>				
Charcoal	1	1	4	5
Roots (modern)	-	1	1	1
Seeds (uncharred)	2	-	1	1
Vegetative material (miscellaneous)	1	-	-	-
<i>Charred remains (total counts)</i>				
Indeterminate seed	-	-	-	1

Relative abundance is based on a scale from 1 (lowest) to 5 (highest)

Table II: Identifications and weights of hand-recovered charcoal samples and carbonised items from the flots that are potentially suitable for radiocarbon dating

Context	Sample	Material	Weight (g)	Weight (g)
1503	317	s/e Birch charcoal	0.070	-
1518	*316	s/e Hazel charcoal	0.047	0.028
1526	320	Charcoal fragments - very small	-	-
	*340	(ch) cereal grain wheat/barley	0.009	-
		s/e Hazel charcoal (roundwood)	0.070	-
1528		s/e Hazel charcoal	0.090	-
		s/e Birch charcoal	0.045	-
1532		Oak timber	-	-
1534	319	s/e Hazel charcoal (roundwood)	0.118	-
1556	221	s/e Alder/Hazel/Holly	0.349	0.119
	300	Hazel nutshell fragments	0.163	0.245
	301	Hazel nutshell fragments	0.200	0.135
	302	s/e Maloideae charcoal	0.372	-
	303	s/e Maloideae charcoal	0.535	-
	*338	Hazel nutshell fragment	0.053	0.072
1566	315	s/e Hazel charcoal	0.025	-
	*328	Hazel nutshell fragment	0.008	-
		s/e Hazel/Alder charcoal	0.009	-
1558	*336	s/e Alder charcoal	0.025	0.020
1574	342	s/e Hazel charcoal	0.029	-
1576	313	s/e Birch charcoal	0.036	-
	314	s/e Hazel charcoal (roundwood)	0.138	0.169
	*325	s/e Hazel charcoal	0.030	0.011
1578	*335	s/e Birch charcoal	0.007	-
	343	s/e Hazel charcoal (roundwood)	0.068	0.171
1584	*326	s/e Hazel charcoal	0.056	-
1588	304	s/e Alder charcoal	0.152	-
	306	s/e Alder charcoal	1.849	-
	307	s/e Alder charcoal	1.289	-
	308	Oak timber	-	-
	*317	(ch) cereal grain barley	0.006	-
		s/e Hazel charcoal	0.050	-
1590	*304	s/e Maloideae charcoal	0.100	0.083
	*327	Hazel nutshell fragments	0.024	-
		s/e Hazel charcoal	0.026	-
1664	311	s/e Maloideae charcoal	0.223	0.131
	312	s/e Maloideae charcoal	0.186	-
	351	Oak timber	-	-
	352	s/e Maloideae charcoal (roundwood)	0.259	-
	353	Diffuse porous wood charcoal	0.529	-
	354	Oak timber	-	-
	355	s/e Hazel charcoal	0.161	-
	356	Oak timber	-	-
	357	s/e Maloideae charcoal	0.176	-
1724	371	Mineral	-	-
	372	Mineral	-	-
1734	*319	s/e Ash charcoal	0.084	-
		s/e Hazel charcoal	0.013	-
1736	*312	s/e Birch charcoal	0.009	-

[s/e-single entity; (ch)-carbonised; * samples from the flots]

Table II (cont.)

Context	Sample	Material	Weight (g)	Weight (g)	
1750	344	Charcoal fragments - very small	-	-	
	345	Charcoal fragments - very small	-	-	
	346	Oak timber	-	-	
	347	Oak timber	-	-	
	348	Oak timber	-	-	
	349	Oak timber	-	-	
	350	Oak timber	-	-	
1774	373	Charcoal fragments - very small	-	-	
1780	374	s/e Hazel charcoal	0.078	-	
		s/e Hazel charcoal	0.059	-	
1814	340	Oak timber	-	-	
	341	s/e Birch charcoal	0.084	0.049	
		Oak timber	-	-	
1824	375	Oak timber	-	-	
	376	s/e Hazel charcoal	0.321	-	
	377	s/e Birch charcoal	0.199	0.193	
	378	s/e Birch charcoal	0.260	0.096	
	379	s/e Hazel charcoal	0.207	-	
	380	s/e Hazel charcoal	0.048	-	
	381	s/e Hazel charcoal	0.167	-	
	382	s/e Alder charcoal	0.081	-	
	383	Oak timber	-	-	
	384		s/e Birch charcoal	0.145	-
			s/e Hazel charcoal	0.209	-
			s/e Birch charcoal	0.400	-
		s/e Hazel charcoal	0.210	-	
1854	316	s/e Maloideae charcoal	0.057	0.039	
1882	*305	Hazel nutshell fragment	0.020	-	
	321	Oak timber	-	-	
	322	s/e Maloideae charcoal	0.441	0.068	
	323	s/e Birch charcoal	0.031	0.055	
	324	Oak timber	-	-	
	325	Oak timber	-	-	
	326	Oak timber	-	-	
	327	s/e Maloideae charcoal	0.145	0.221	
	328	s/e Hazel charcoal	0.230	-	
	329	Oak timber	-	-	
	330	Oak timber	-	-	
	331	Oak timber	-	-	
	332	Oak timber	-	-	
	333	s/e Alder charcoal	0.134	-	
	334	Oak timber	-	-	
	335	s/e Hazel charcoal	0.192	-	
	336	s/e Hazel charcoal	0.203	-	
	337	Indeterminate root material	-	-	
	338	s/e Birch charcoal	0.206	-	
	339	s/e Hazel charcoal	0.426	-	
			s/e Hazel charcoal	0.180	-
		s/e Maloideae charcoal	0.180	-	
1886	*301	Hazel nutshell fragments	>0.010	-	
	309	Oak timber	-	-	
	310	s/e Hazel charcoal	0.188	-	

[s/e-single entity; (ch)-carbonised; * samples from the flots]

Table II (cont.)

Context	Sample	Material	Weight (g)	Weight (g)
1912	305	s/e Birch charcoal	0.030	-
1917	*314	s/e Birch charcoal	0.025	0.010
	318	s/e Alder charcoal	0.042	-
		s/e Birch charcoal	0.043	-
1921	*332	Hazel nutshell fragment	0.008	-
1927	386	s/e Hazel charcoal	0.077	0.067
	387	Calcined bone	-	-
1934	365	s/e Hazel charcoal	0.032	-
	367	s/e Hazel charcoal	0.051	-
	369	s/e Hazel charcoal	0.039	-
1936	*339	s/e Alder charcoal (roundwood)	0.113	-
	366	not suitable	-	-
1938	360	s/e Hazel charcoal	0.314	-
1942	363	s/e Alder charcoal	0.013	-
1946	*343	s/e Birch charcoal	0.044	-
1952	*341	s/e diffuse porous charcoal	0.043	-
	358	s/e Birch charcoal	0.037	-
	359	Oak timber	-	-
	362	Oak timber	-	-
	364	Oak timber	-	-
	368	s/e Hazel charcoal	0.022	-
	370	s/e Birch charcoal	0.012	0.016
1956	361	Oak timber	-	-
1958	*329	(ch) cereal grain cf. emmer wheat	0.010	-

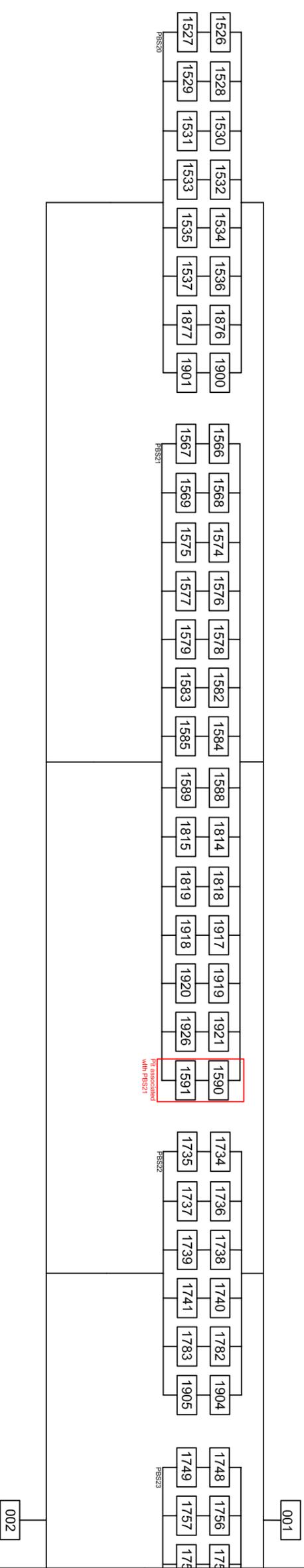
[s/e-single entity; (ch)-carbonised; * samples from the flots]

APPENDIX II

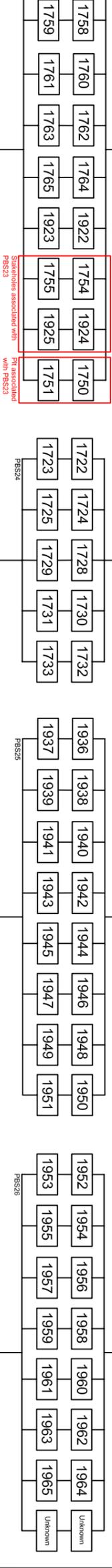
Harris Matrices

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Harris Matrix

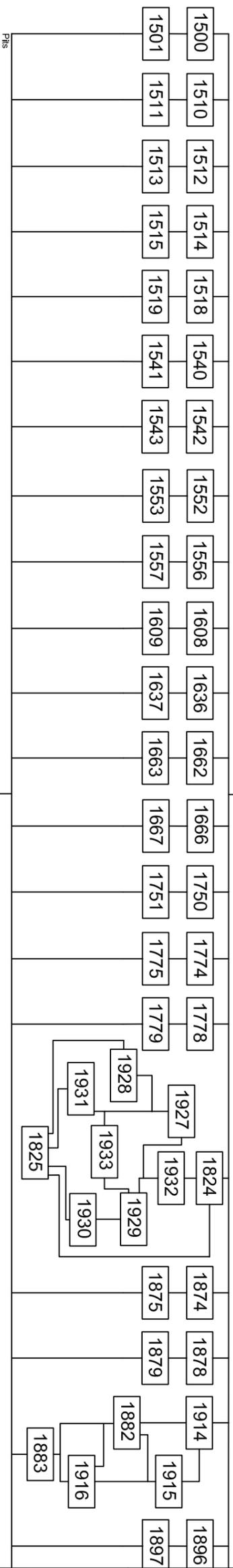


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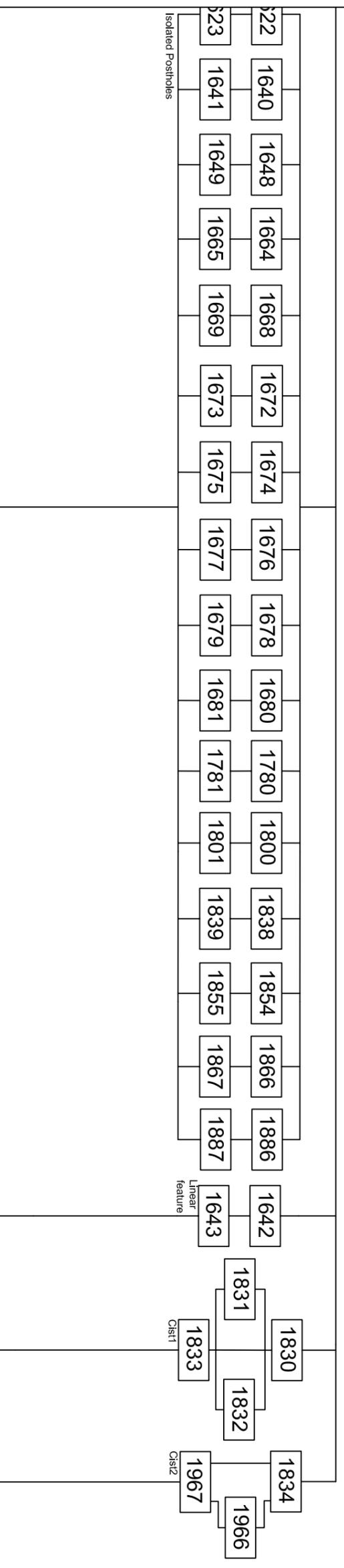


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