Prehistoric and Dark Age Settlement Remains from Cheviot Quarry, Milfield Basin, Northumberland

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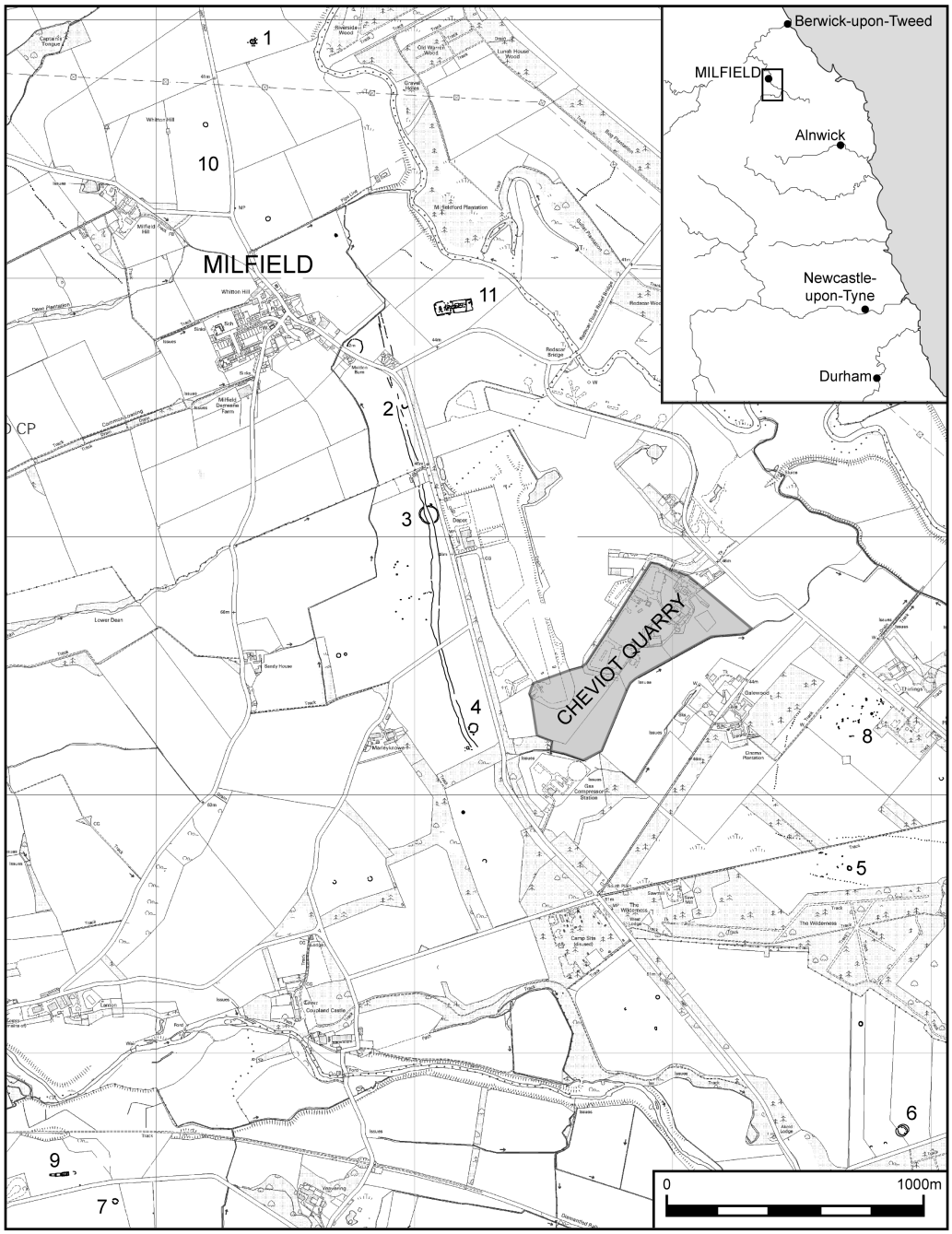
Archaeological excavations in advance of quarrying at Cheviot Quarry, Northumb. have produced important evidence for Neolithic, Late Bronze Age and Dark Age settlements. Neolithic pit features containing domestic midden material including broken pottery, lithics and cereal grains from two distinct parts of the quarry have provided evidence for what is interpreted as settlement and subsistence activity from the Early and Later Neolithic periods. Together with the Neolithic remains from the nearby sites at Thirlings and those recently excavated at Lanton Quarry, it provides evidence for significant, and perhaps intensive, settlement on the sand and gravel terraces of the Milfield Plain throughout the Neolithic. Indeed, these sites provide the precursors to the better known ceremonial and henge complex located nearby which probably dates to the Beaker period. Radiocarbon determinations associated with the full sequence of Neolithic pottery have been obtained from Cheviot Quarry and analysis of the residues adhering to the ceramics has provided some of the earliest evidence for dairy farming in the region, as well as information relating to other dietary and subsistence practices. Two substantial roundhouses with porches, internal hearths and pits containing domestic refuse, provide the first evidence for Late Bronze Age lowland settlement in the region. The botanical macrofossil and faunal evidence, together with the pottery residues, show clear evidence for arable and pastoral activity in a small, unenclosed farming settlement. A detailed programme of radiocarbon dating and the application of Bayesian modelling has shown that these two buildings are contemporary and date to the tenth century cal. BC. In addition to this prehistoric archaeology, three Dark Age, rectangular, post-built buildings were also discovered on the site and have been radiocarbon dated to the fifth or early sixth century cal. AD. These substantial, although heavily truncated, structures are thought to represent the homesteads of a small farming community, although the lack of material culture makes understanding their use and cultural attribution problematic. Because of their early date these buildings could have belonged to either post-Roman British inhabitants or perhaps early Anglo-Saxon mercenaries or settlers. A reconstruction of one of these buildings has been built close to the site at the nearby Maelmin Heritage Trail where it can be visited by the public.

INTRODUCTION

The excavations at Cheviot Quarry were centred at NT 94853265, 1.5 km south-east of the village of Milfield and 6 km north-west of Wooler, in the heart of the Milfield



ILLUS. 1 Map showing location of Cheviot Quarry and selected archaeology of the Milfield basin. Ordnance Survey data Crown Copyright, all rights reserved, reproduced with permission, License No. 100045420

plain (Illus. 1). The Milfield plain is an area of low-lying ground that 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 infilled 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 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 Yeavering 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 Cheviot 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, which contains an area of organic sediments that date to the immediate Post-Glacial period.

The sand and gravel terraces contain an incredibly rich archaeological resource and the excavations at Cheviot Quarry have revealed substantial evidence for Neolithic, Bronze Age and early medieval occupation. Varied and widespread archaeological features, particularly from the Mesolithic (Waddington 1999), Neolithic (Harding 1981; Miket 1981; 1987; Waddington 1999; 2000a), Bronze Age (Miket 1985) and Anglo-Saxon periods (Keeney 1935; Gates and O'Brien 1988; O'Brien and Miket 1991) are situated across the basin. Sites in the vicinity of the quarry include the extensive Beaker period ceremonial complex that incorporated the henges at Milfield North (NT 933349; Illus. 1, 1), Milfield South (NT 939225; Illus. 1, 2), Coupland (NT 940330; Illus. 1, 3), Marleyknowe (NT 942322; Illus. 1, 4), Ewart Park (NT 956317; Illus. 1, 5), Akeld (NT 958307; Illus. 1, 6) and Yeavering (NT 92843042; Illus. 1, 7). Excavations at Coupland (Waddington 1996), Lanton (Johnson and Waddington in press), Thirlings (Miket 1976 and Miket et al. this volume), and Yeavering (Ferrell 1990; Hope-Taylor 1977) have produced Neolithic pit complexes, and in the case of Thirlings and Lanton evidence for Neolithic structures that have produced substantial quantities of midden material typically comprising broken ceramics, lithics and burnt food waste. Early Bronze Age activity from the vicinity of the quarry is indicated by numerous ring ditches, such as the complexes known at Whitton Hill (Miket 1985; Illus. 1, 10) and those near Marleyknowe, and an Early-Middle Bronze Age house is known from Lookout Plantation at the north end of the basin (Monaghan 1994). There is also well-known evidence for Anglo-Saxon activity across this landscape, including the royal palace site at Yeavering (Hope-Taylor 1977; Illus. 1, 9), its successor at Maelmin (Gates and O'Brien 1988; Illus. 1, 11), the settlement site at Thirlings (O'Brien and Miket 1991; Illus. 1, 8), and the reuse of both the Milfield North and Milfield South henges as pagan burial sites (Scull and Harding 1990) and the henge at Yeavering as a site for metalworking (Tinniswood and Harding 1991).

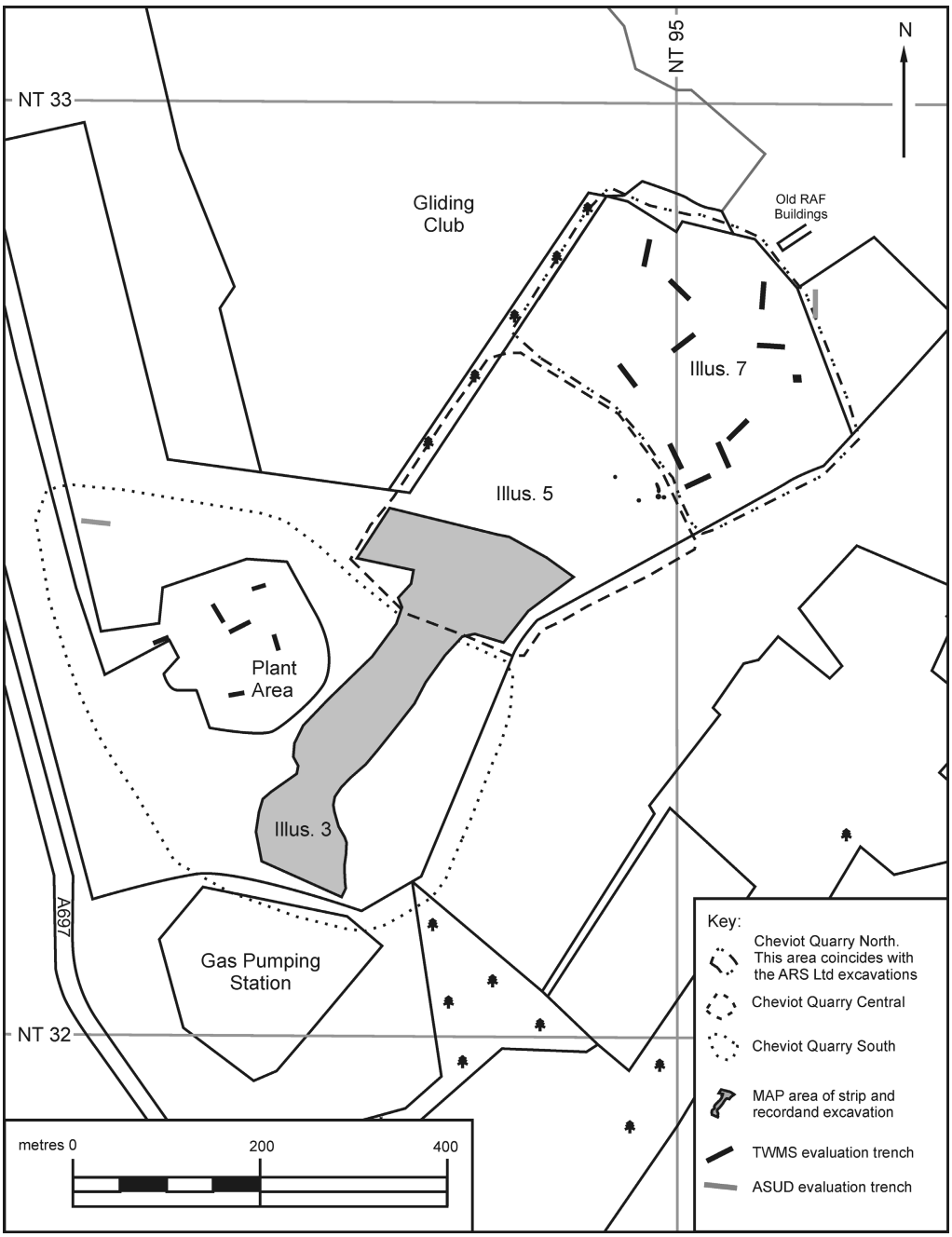
During World War II the area now occupied by Cheviot Quarry was transformed into RAF Milfield, a fighter pilot training school, which was operational between 1941 and 1946 (Pedersen 2007a). The majority of the structures associated with the airfield had very shallow foundations and did not have an impact below the plough-soil; however, some facilities were deliberately dug into the terrace deposits for defensive purposes. These included gun emplacements and an underground Battle Headquarters, as well as service trenches for cables and piping (Pedersen 2007a).

HISTORY OF INTERVENTIONS

A number of archaeological investigations have been undertaken within the quarry (see Illus. 2 for locations). In 1993 Archaeological Services, University of Durham (ASUD), excavated seventeen evaluation trenches. MAP Archaeological Consultancy Ltd (MAP) monitored topsoil stripping at the south end of the quarry in 2000, and excavated some of the exposed features and planned the rest before reinstating the topsoil over them after laying down a protective membrane. In 2003 Tyne and Wear Museums Service Archaeology Section (TWMS; Mabbit 2003) undertook geophysical survey, monitored topsoil stripping and excavated evaluation trenches; and in 2005 Archaeological Research Services Ltd (ARS Ltd) monitored topsoil stripping and excavated exposed features at the north end of the site. All these investigations were funded by Tarmac Northern Ltd as part of the mitigation works at the quarry. A further phase of investigation was undertaken by ARS Ltd in late 2006 supported through the Aggregate Levy Sustainability Fund distributed by English Heritage on behalf of the Department for Environment, Food and Rural Affairs (Defra), which involved excavating an area that lay outside the area covered by the existing planning conditions.

The ASUD excavations identified the remains of pits, a gully and post-holes in two trenches (Loveluck et al. 1992) along with thirty-seven diagnostic pottery fragments. Twenty-eight sherds of Early Neolithic Carinated Bowl were recovered from a pit immediately to the east of the A697 (NT 943325) and nine sherds of Later Neolithic Meldon Bridge-related pottery (along with forty-three tiny and heavily abraded sherds) were recovered from a pit in the south-east of the quarry at NT 951327 (Waddington 2000b).

Working of the sand and gravel deposits at Cheviot Quarry by Tarmac Northern Ltd began in 2000 at the southern end of the site and archaeological monitoring of the topsoil stripping was undertaken by MAP. The initial phase of the work revealed 109 archaeological features dating from the Early Neolithic through to the Early Bronze Age in the south of the extraction area, based on the ceramic associations. Operations ceased in this location and all exposed features were recorded in plan, with ceramic material taken from the surface deposits of some features. The archaeological features were re-covered with a synthetic membrane overlain by topsoil. No further extraction took place in this area. Extraction continued to the north, however, and fifty archaeological features, some of which produced prehistoric pottery and flints, were fully excavated (MAP 2000). During 2002 and early 2003 monitoring of topsoil stripping



ILLUS. 2 Map showing location of archaeological fieldwork at Cheviot Quarry

and excavation of evaluation trenches by TWMS revealed further evidence for Neolithic occupation within the quarry area (Mabbit 2003; Muncaster 2003a; 2003b).

In early 2005 ARS Ltd monitored topsoil stripping of 1.5 ha in advance of the final phase of extraction at the north end of the quarry. This revealed evidence for significant Neolithic occupation comprising numerous pits, hearths and post-holes, many of which contained Early and Late Neolithic pottery, as well as Dark Age occupation comprising three rectangular post-built structures. An application was made to the Aggregate Levy Sustainability Fund, through English Heritage, and funding was acquired to excavate fully the remaining 3 ha of the quarry not subject to a planning condition. This revealed Bronze Age occupation in the form of two circular buildings and an associated irregular building, together with other pit features. Funding was also acquired to bring together the results of all the interventions at the quarry as well as promoting a comprehensive public outreach programme based upon the archaeology of Cheviot Quarry (Pedersen 2007b).

EXCAVATION RESULTS

The archaeology of Cheviot Quarry was situated on land that had been occupied by the remnants of RAF Milfield since the end of World War II. Prior to this the land had been used for agriculture, both arable and pastoral, and parts of it may have been ploughed since the war. A dark brown sandy ploughsoil, varying in thickness between 0.1 m and 0.25 m, and containing many modern artefacts associated with RAF Milfield, overlay a coarser grey-brown, sandy subsoil that measured between 0.2 m and 0.3 m thick. These two deposits overlay the whole site and the varying thickness can be attributed to the natural unevenness of the underlying glaciofluvial deposits, and is also a consequence of construction activity during the building of RAF Milfield. Beneath the subsoil, the glaciofluvial deposits were formed from a mixture of gravel and coarse sand, although in places a fine sand occurred in patches as large as 20 m by 20 m. No archaeological features survived within the topsoil or subsoil other than those associated with RAF Milfield. The only surviving prehistoric and Dark Age features were those that had been cut into the natural glaciofluvial deposits and all were truncated as a result of agricultural practices and the construction of the World War II airfield. As fortune would have it, the usually shallow foundations of the airfield structures missed almost all the prehistoric and Dark Age features, with only one post-hole that formed part of one of the Late Bronze Age buildings being slightly truncated by a service trench, and a shallow pit containing Early Neolithic pottery having a modern post-hole cut into one edge of it.

A NOTE ON THE REPORTING OF THE RESULTS

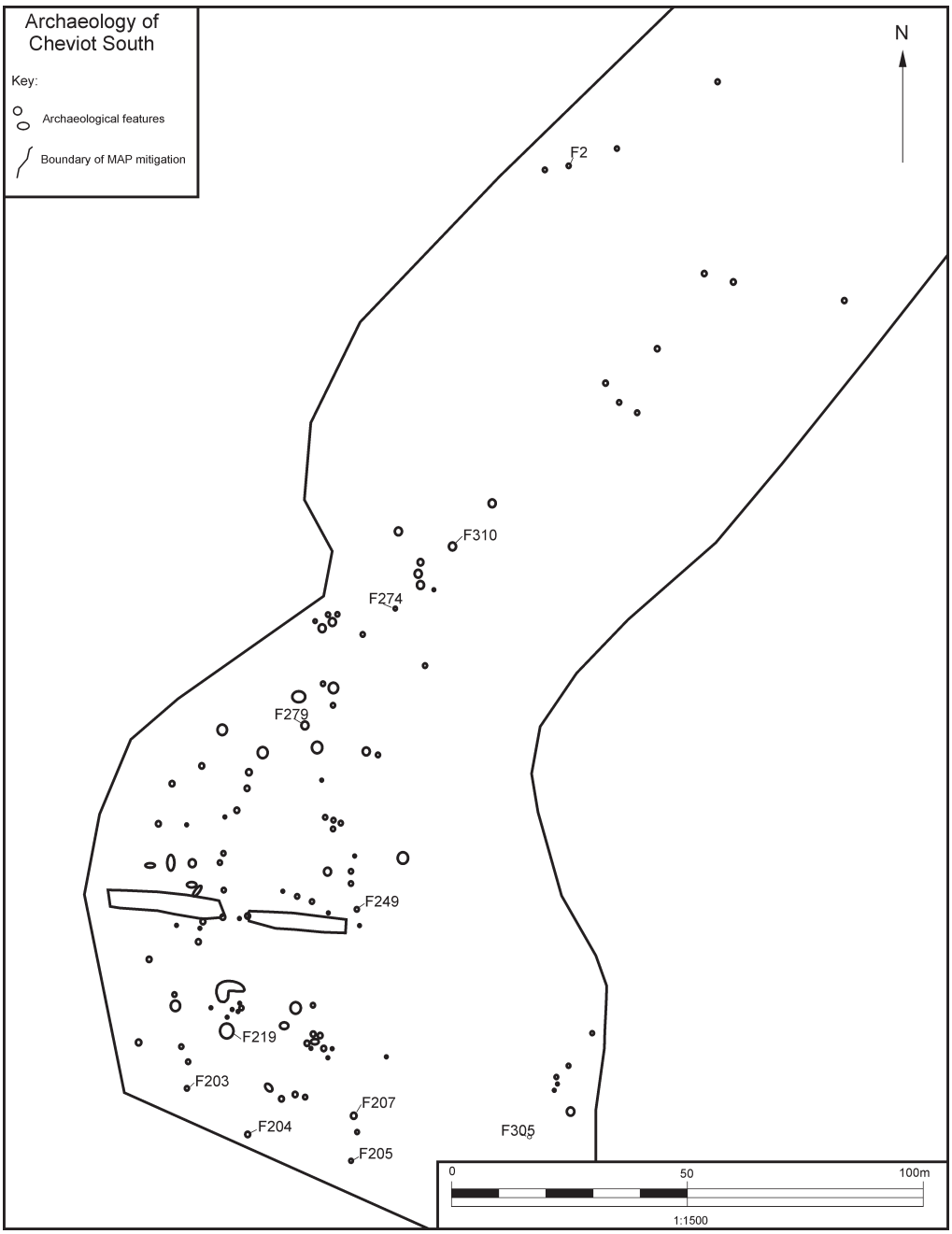
Archaeological interventions at Cheviot Quarry spanned thirteen years and seven phases of work by four different commercial archaeological companies. This work included watching briefs, geophysical survey, evaluation trenching and open-area excavation which produced six separate reports. Therefore, for the sake of clarity the

results have been divided into three areas of archaeological activity designated Cheviot Quarry South, Cheviot Quarry Central and Cheviot Quarry North (Illus. 2). Each intervention produced broadly similar evidence for prehistoric, and primarily Neolithic, activity distributed along the terrace edge; however, these areas appeared as relatively well-defined clusters of activity separated by areas of very few or no archaeological features. It should be stated that the only available data for the work undertaken by MAP and TWMS are those presented in their respective reports (MAP 2000; Mabbit 2003; Muncaster 2003a; 2003b) and the artefact archive. The data presented here, taken from these sources, are published in good faith and are as accurate as can be ascertained given the available documentation. Additionally, duplication of some numbering has occurred across the various interventions. In the tabular data presented here all features have been prefaced with an F and referenced to all associated contexts that can be accessed in the primary documentation archive. To save repetition, all dimensions given for features describe them as they survived below the start of the archaeological horizon. All features revealed during the archaeological works were truncated.

CHEVIOT QUARRY SOUTH

Archaeological interventions in the Cheviot Quarry South area (Illus. 3) comprised the excavation of evaluation trenches by ASUD in 1992 (Loveluck et al. 1992; Waddington 2000b), a watching brief by MAP in 2000 (MAP 2000), and the excavation of evaluation trenches by TWMS in 2003 (Muncaster 2003a). All the significant archaeology in this area was Neolithic and Early Bronze Age in origin (Table 1) and was primarily situated close to the terrace edge, overlooking the wetland of the Galewood Depression. In addition, four Neolithic features were found situated away from the terrace edge. In the MAP watching brief twelve pits, one irregular slot and one post-hole, as well as a further ninety-four unexcavated features that were interpreted as sixty-four pits, fifteen hearths, twelve post-holes, an interrupted linear ditch, a ditch with entranceway, and a curvilinear feature, were noted in an area measuring slightly less than a hectare. ASUD discovered one pit containing twenty-eight sherds of Carinated Bowl related to the Grimston Ware tradition (Waddington 2000b) and TWMS found a pit that contained four sherds of Early Neolithic ceramic from a Carinated Bowl and two from a Plain Ware vessel. This was closely associated with another pit and an irregular slot that were also thought to date to the Early Neolithic, as an additional six sherds, two of which were from the plain vessel found in the pit, were recovered from the turf root mat in the vicinity of these features.

Tarmac Northern Ltd decided not to extract the mineral deposits in the area of the MAP watching brief and the features were left *in situ*. They were recorded in plan, with surface finds of pottery, flint and nutshell recovered from at least ten contexts. As none of these features was excavated and surface finds were only recovered from a small percentage, ascribing functions and dates to them should be treated with considerable caution. However, the potential for the existence of a Neolithic enclosure or boundary feature in this area should not be discounted.



ILLUS. 3 Plan of the archaeology located in the Cheviot Quarry South area. (Redrawn from MAP 2000)

Ceramics were recovered from ten features (F203–05, F207, F219, F249, F274, F279, F305 and F310), and comprised Early Neolithic plain wares (including Carinated Bowls and simple plain bowls), Impressed Ware, Grooved Ware and Beaker and other Late Neolithic–Early Bronze Age vessels (Illus. 4). Carbonized residues from the Impressed Ware, Grooved Ware and Beaker assemblages were submitted for residue analysis and to acquire radiocarbon dates. A single, unstratified rim sherd of Flat-Rimmed Ware of Late Bronze Age–Early Iron Age date was also recovered from this area and four undiagnostic lithics were recovered from the surface of Pit F204.

A further ten features were situated in the northern part of Cheviot Quarry South (Illus. 3) and these were fully excavated by MAP (MAP 2000). The features occupied an area of around a quarter of a hectare and comprised a diffuse cluster of small pits and a possible post-hole. Feature 2 produced sherds from one Early Neolithic Carinated Bowl (Illus. 4) and three Early Neolithic plain vessels. A further three sherds that could not be attributed to a particular ceramic tradition were recovered from the topsoil in this area, along with eight lithics.

CHEVIOT QUARRY CENTRAL

Archaeological interventions in the Cheviot Quarry Central area comprised a watching brief by MAP in 2000 (MAP 2000) and a watching brief by TWMS in 2003 (Muncaster 2003a). The MAP watching brief revealed thirty-nine archaeological features to the south, while the TWMS watching brief revealed seven archaeological features to the north (Table 2 and Illus. 5). These features comprised twenty-seven pits, two hearths, one post-hole and a curvilinear feature. All the significant archaeology in this area was Neolithic in origin and was situated close to the terrace edge.

Of the twenty-four features in the southern part of this area, twenty-one were interpreted as pits (or 'scoops'), two were hearths and there was one post-hole. Feature 102, the largest pit in this area, contained a complete, undecorated Beaker vessel (Fill 1055). Carbonized residue from this vessel was submitted for analysis and to acquire a radiocarbon date. Charred material was present throughout the fills and charred hazelnuts were recorded from the primary fill (2000).

Ceramics (Illus. 6) were recovered from five features (F102, F114, F119, F124 and F126), and comprised Early Neolithic plain bowls, Impressed Ware, Beaker and other Late Neolithic–Early Bronze Age vessels. No Grooved Ware was found in this area. Two lithics were found and burnt bone was recovered from two pits (F113 and F139) and one hearth (F136). Hazelnut fragments were also recovered from pits F101, F102 and F106 (MAP 2000). In addition one well-preserved wheat (*Triticum* sp.) grain was found in a feature in this area. However, it is unclear which feature this botanical macrofossil came from and being a single grain its interpretative value is minimal.

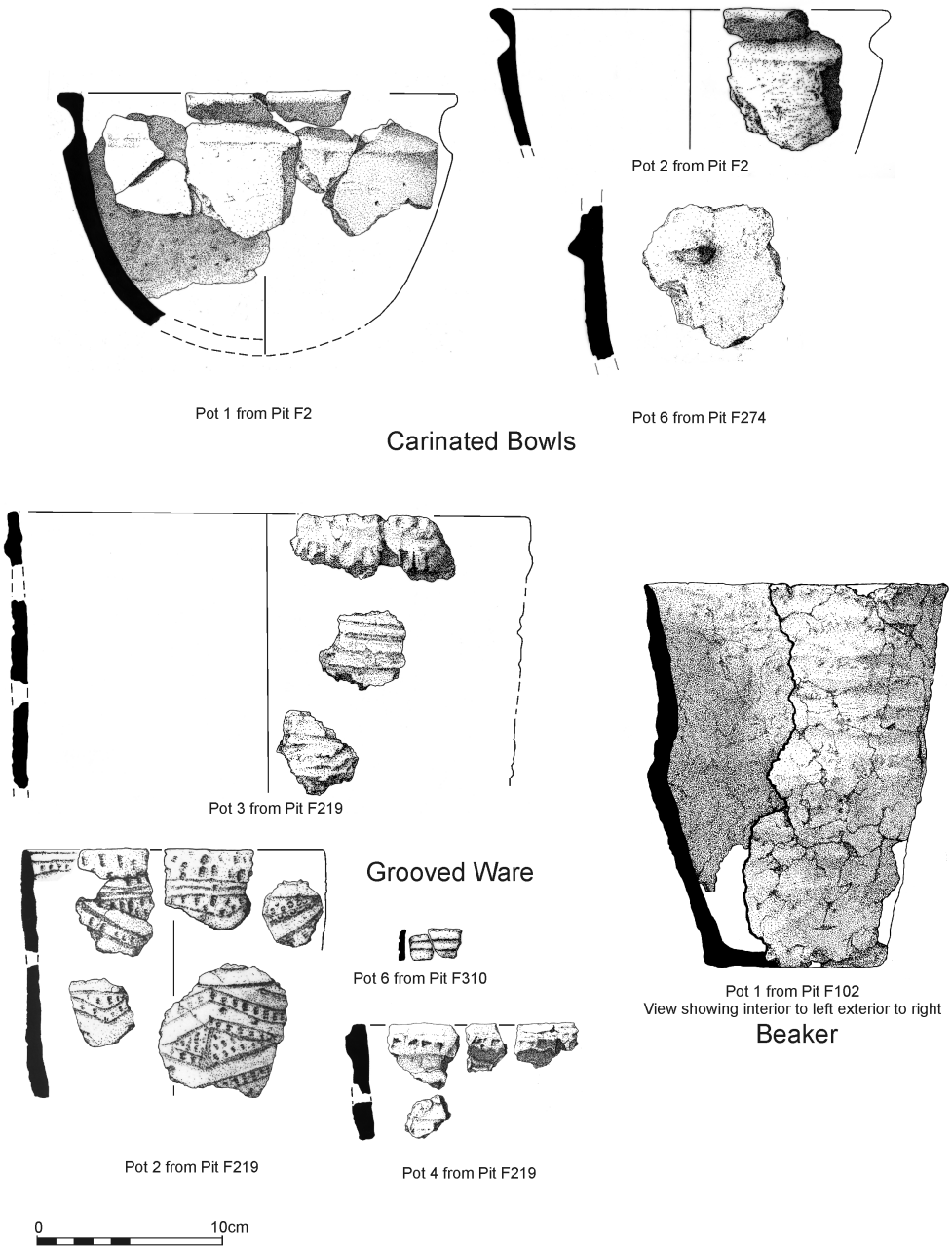
Of the seven features revealed in the northern part of this area, six were interpreted as pits and there was one curvilinear feature. Early Neolithic Carinated Bowls and plain bowls from eighteen vessels were recovered from four features (F9, F13, F18 and F21). Charred material was recovered from some of these features, but no environmental work was carried out on this material and none survives in the archive.

TABLE 1 Significant excavated archaeological features in Cheviot Quarry South area

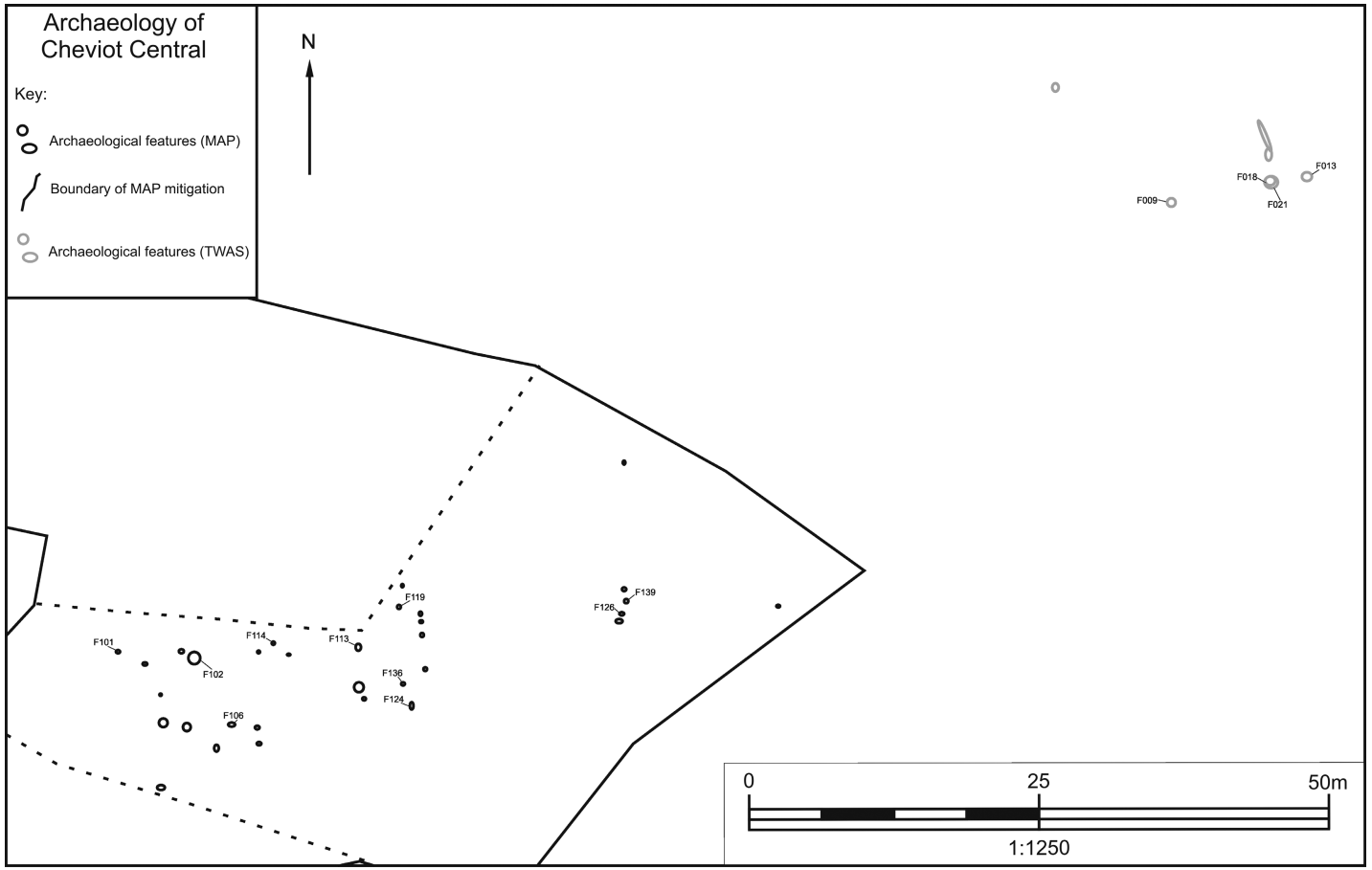
FEATURE NUMBER	ASSOC. CONTEXT NUMBERS	DESCRIPTION	MAX DIMENSIONS (M)	MAX DEPTH (M)	COLOUR OF FILL	TEXTURE OF FILL	SMALL FINDS AND ENVIRON-MENTAL MATERIAL	^{14}C DATES BP (UNCAL.)
ASUD								
Pits								
F0303	0303	Pit forming west terminal of a gully feature	–	–	–	–	28 ceramic sherds	–
TWMS								
Pits								
F3613	3613, 3614	Sub-circular pit with shallow profile	0.45 x 0.45	0.15	'Mid green-grey'	Sandy silt with rare charcoal flecking	–	–
F3600	3600, 3601	Sub-circular pit	0.56 x 0.56	0.20	Dark brown	Silt with rare charcoal flecking	5 ceramic sherds	–
Other features								
F3603	3603, 3604	Irregular slot	1.65 x 0.55	0.24	'Mid–brown'	Sandy silt with rare charcoal flecking	–	–
MAP								
Pits								
F1	1005, 1006	Sub-circular bowl shaped pit	1.04 x 0.80	0.30	Black	Gravelly–sand	Charred material, hazelnut	–

F2	1001, 1002	Sub-circular pit with gradually sloping sides	0.43 x 0.43	0.30	Very dark greyish-brown	Sandy silt	16 ceramic sherds, charred hazelnut	–
F3	1003, 1004	Shallow, steep-sided sub-circular pit	0.30 x 0.30	0.09	Very dark greyish-brown	Gravelly-sand	Charred material	–
F4	1007, 1008	Sub-circular pit with gradually sloping sides	0.36 x 0.32	0.04	Very dark greyish-brown	Sandy silt	–	–
F5	1011, 1012	Sub-circular pit with steep sides	0.58 x 0.42	0.15	Dark brown	'Gritty soil'	Charred hazelnut	–
F6	1015, 1016	Sub-circular shallow pit	0.60 x 0.50	0.05	Very dark brown	Gravel with occasional charcoal	Burnt clay	–
F7	1018, 1019, 1022, 1023	Large pit (cut 1023) with secondary feature (cut 1019) cut into one side	1.43 x 1.43	0.25	Strong brown primary fill (1022) with very brown fill (1018) in recut	Sandy silts	Lithic	–
F9	1009, 1010, 1013, 1014	Large pit with steeply sloping sides and three fills	1.00 x 0.80	0.3	Brown tertiary fill with very dark-brown secondary and greyish-brown primary fill	Sandy silts	–	–
Post–holes								
F10	1024	Circular shallow post-hole	0.35 x 0.35	0.05	Very dark greyish-brown	Sandy silt	–	–

This table does not include the 109 unexcavated features



ILLUS. 4 Pottery from the Cheviot Quarry South area



ILLUS. 5 Plan of the archaeology located in the Cheviot Quarry Central area. (Redrawn from MAP 2000 and Muncaster 2003a)

TABLE 2 Features found in Cheviot Quarry Central

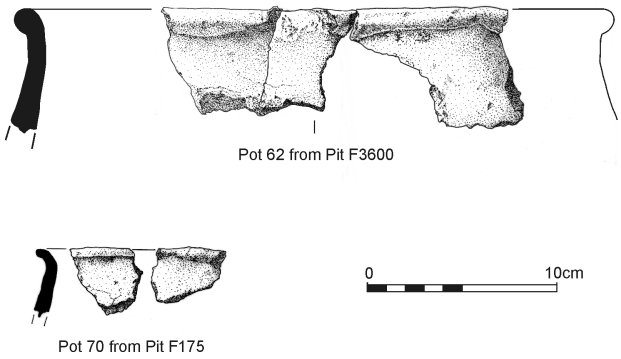
FEATURE NUMBER	ASSOC. CONTEXT NUMBERS	DESCRIPTION	MAX DIMENSIONS (M)	MAX DEPTH (M)	COLOUR OF FILL	TEXTURE OF FILL	SMALL FINDS AND ENVIRON-MENTAL MATERIAL	^{14}C DATES BP (UNCAL.)
MAP								
Pits								
F100	1033, 1044	Small steep-sided pit	0.55 x 0.55	0.25	Yellowish-brown	Sandy-gravel	1 lithic, charred material	–
F101	1034, 1045	Small steep-sided pit	0.4 x 0.35	0.23	Dark greyish-brown	Sandy-gravel	Charred hazelnut	–
F102	1030, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 2000,	Large steep-sided storage pit with six distinct fills and a later recut in top	2.10 x 2.10	1.6	Very dark greyish-brown to yellowish-brown	Sandy silts with small amounts of charcoal	Complete Beaker vessel in tertiary fill 1055, Hazelnut fragments in primary fill 2000	3625 ± 40
F103	1031, 1040	Shallow steep-sided flat-based pit	0.60 x 0.60	0.22	Brown	Sandy-gravel with evidence of fire-reddening	–	–
F104	1032, 1049	Large shallow pit	1.05 x 1.05	0.15	Very dark brown	Sandy-gravel with occasional cobbles	–	–
F105	1035, 1046, 1047, 1048	Large pit with two fills	1.30 x 1.30	0.6	Brown to yellowish-brown	Sandy-gravels	–	–
F106	1036, 1050	Fill of shallow scoop	0.85 x 0.85	0.05	Brown	Sandy-gravel	Charred material and hazelnut,	

							possibly a cereal grain	–
F109	1063, 1064	Shallow pit	0.60 x 0.60	0.12	Dark brown	Sandy-ash	–	–
F112	1093, 1094	Shallow elongated pit	0.87 x 0.48	0.16	Very dark brown	Gravel	–	–
F113	1065, 1066	Large flat-based elongated pit	1.30 x 0.72	0.31	Dark Yellowish-brown	Silty-gravel	Animal bone	–
F114	1079, 1080	Shallow pit	0.47 x 0.48	0.10	Very dark greyish-brown	Silt	3 ceramic sherds	–
F117	1081, 1082	Irregular shallow pit	0.25 x 0.25	0.10	Very dark greyish-brown	Gravel	1 lithic–	
F121	1112, 1113	Sub-circular pit	0.75 x 0.70	0.20	Dark grey	Silty sand	–	–
F122	1097, 1098, 1114	Sub-circular pit with flat base and steep sides and two fills	0.94 x 0.90	0.23	Yellowish-brown secondary fill and very dark greyish-brown primary fill	Gravel? secondary fill with a sand primary fill	–	–
F124	1105, 1106	Shallow elongated scoop	1.11 x 0.79	0.18	Dark greyish-brown	Silty sand	1 ceramic sherd	–
F126	1117, 1118	Sub-circular steep-sided pit	0.61 x 0.47	0.29	Brown	Sandy silt	1 ceramic sherd	–
F127	1121, 1122	Very shallow sub-circular pit	0.65 x 0.60	0.10	Very dark greyish-brown	Silty sand	–	–
F128	1129, 1130	Shallow sub-circular pit	0.68 x 0.68	0.12	Very dark greyish-brown	Sand	–	–
F129	1123, 1124	Shallow sub-circular pit	0.50 x 0.50	0.12	Brown	Sandy silt	–	–

TABLE 2 (continued)

FEATURE NUMBER	ASSOC. CONTEXT NUMBERS	DESCRIPTION	MAX DIMENSIONS (M)	MAX DEPTH (M)	COLOUR OF FILL	TEXTURE OF FILL	SMALL FINDS AND ENVIRON-MENTAL MATERIAL	^{14}C DATES BP (UNCAL.)
F135	1119, 1120	Very shallow pit	0.46 x 0.26	0.07	Dark greyish-brown	Sandy silt	–	–
F139	1110, 1111	Sub-circular flat-based pit	0.45 x 0.45	0.18	Very dark brown	Silty sand	Bone	–
Post-holes								
F125	1115, 1116	Circular steep-sided post-hole	0.40 x 0.40	0.35	Very dark brown	Sandy silt with frequent stone inclusions	–	
Hearths								
F119	1095, 1096	Circular hearth with gradually sloping sides and an irregular base	1.00 x 1.00	0.20	Black	Sandy silt	2 ceramic sherds	–
F136	1101, 1102	Circular hearth with gradually sloping sides and an irregular base	0.38 x 0.38	0.18	Dark greyish-brown	Gravel	Burnt bone	–
TWMS								
Pits								
F9	2, 3, 4, 6, 7, 8, 9	Sub-rectangular steep-sided flat-based pit with five fills	1.45 x 1.10	0.31	'Ashy' brown with dark charcoal patches and redeposited	Silty sands with 'ash' and frequent charcoal inclusions as well as	131 ceramic sherds, 1 lithic, burnt bone	–

					orange-brown natural	redeposited sand and gravel		
F10	10, 11	Circular shallow pit	0.85 x 0.85	0.10	Black	Ash and charcoal with small pebbles	Charred material	–
F13	13, 14	Sub-circular, steep-sided pit	0.90 x 0.90	0.26	Unknown	Sand and 'ash' with frequent heat fractured cobbles	1 ceramic sherd, charred material	–
F18	15, 16, 17, 18	Sub-circular vertical-sided flat-based pit with three fills	1.06 x 1.06	0.91	Dark-brown and 'Golden'	'Ashy' silty sands and rare charcoal inclusions	2 ceramic sherds	–
F21	19, 20, 21	Sub-circular bowl shaped pit and possible fire-reddening to cut	1.24 x 1.24 (overall pit dimensions)	0.26 (overall pit dimen-sions)	Unknown	'Ashy' silty sands with some heat fractured cobbles	2 ceramic sherds, charred material	–
F26	F24, 26	Shallow sub-rectangular pit	1.38 x 0.92	0.11	Light-brown	Sand	Charred material	–
Other features								
F23	22, 25, 29	Curving feature with return at northern end and variable depth and width	3.30 x 1.00	0.40	Greyish-brown	Silty sand with occasional charcoal flecks	Charred material	–



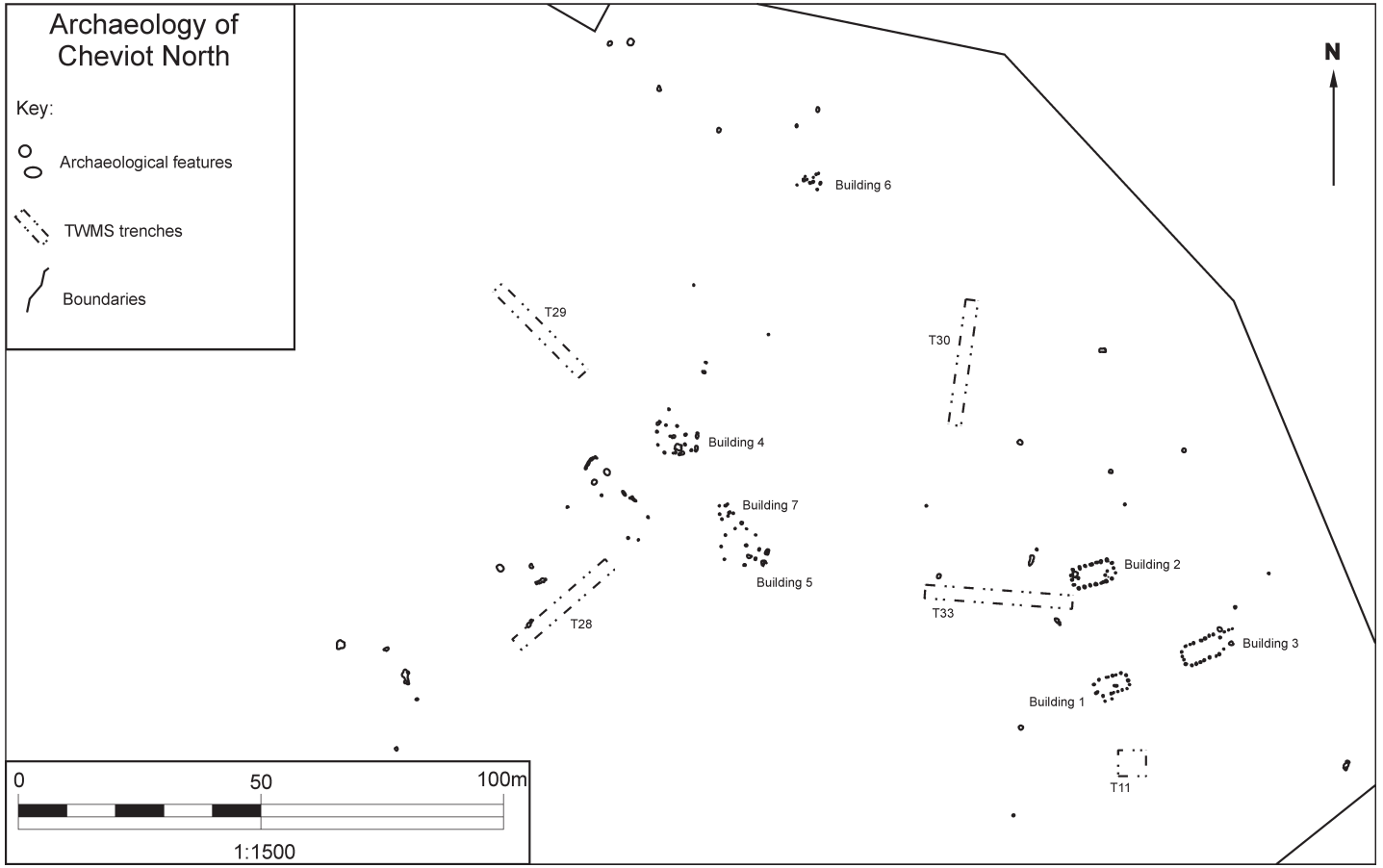
ILLUS. 6 Pottery from the Cheviot Quarry Central area

CHEVIOT QUARRY NORTH

This area of the quarry contained the greatest concentration and variety of archaeological features. Interventions comprised the excavation of evaluation trenches by ASUD in 1992 (Loveluck et al. 1992; Waddington 2000b), the excavation of evaluation trenches by TWMS in 2003 (Muncaster 2003a) and open-area excavation of 4.5 ha by ARS Ltd in 2005 (Illus. 7). The excavations revealed evidence for Neolithic domestic occupation consisting of seven pits, nine hearths, two post-holes and a possible structure (Table 3); Bronze Age settlement comprising two circular buildings and an associated irregular structure (Table 4); and three Dark Age post-built buildings also thought to represent a settlement (Table 5). There was also evidence for Mesolithic and Iron Age activity, represented by lithics and radiocarbon dates, together with a further twelve pits that could not be attributed a function or date on account of the lack of material culture, evidence for burning and any other structural details. All features were ascribed a feature number, prefaced with F, which corresponds with the final fill of each feature, and the cut for the feature was then ascribed the consecutive number thereafter (e.g. Feature F031 contains a fill 031 and the cut for the feature is 032). These numbers are used on the plan and section illustrations.

MESOLITHIC

No features could be attributed to the Mesolithic period, although there is evidence for Mesolithic activity in the form of twenty-one lithics (see report on lithic material, pp. 183–95, below), mostly recovered from the top of the sand and gravel substratum. In addition, one radiocarbon date from Late Bronze Age Building 4 taken on a residual oak (*Quercus*) twig from the fill of Post-hole F369 provided a Late Mesolithic date of 4690–4490 cal. BC (5740±35 BP, SUERC-9114). Given the proximity of the Galewood Depression, which was most likely an area of carr during the Mesolithic, as well as the small but widely dispersed lithic assemblage and the radiocarbon date, it is plausible that some of the undated features in this area of the quarry belong to the Mesolithic. Extensive fieldwalking has shown that Mesolithic occupation of the Milfield Basin was focused on these raised gravel terraces and they could have formed a zone of relatively intense, and perhaps semi-sedentary, occupation during the Late



ILLUS. 7 Plan of the archaeology located in the Cheviot Quarry North area

TABLE 3 Neolithic and Early Bronze Age features excavated by ARS Ltd found in the Cheviot Quarry North area

FEATURE NUMBER	ASSOC. CONTEXT NUMBERS	DESCRIPTION	MAX DIMENSIONS (M)	MAX DEPTH (M)	COLOUR OF FILL	TEXTURE OF FILL	SMALL FINDS AND ENVIRON-MENTAL MATERIAL	^{14}C DATES BP (UNCAL.)
Possible structure								
F029	029, 030	Curving timber slot with steep-sided V-shaped profile	4.05 x 0.40	0.25	Dark brown – dark grey with distinct patches of black charcoal	Sand with patches of charcoal	–	–
F031	031, 032, 052	Large circular storage pit with vertical sides, undercut at base, with two distinct fills	1.38 x 1.20	0.40	Medium brown secondary deposit 031 with black primary deposit 052	Silty sand secondary deposit with some charcoal inclusions and charred silty sand primary deposit with large amounts of charcoal inclusions	85 ceramic sherds, 5 lithics	4999 ± 32 4906 ± 34
F033	033, 034	Large sub-oval pit with vertical sides and a flat base	1.20 x 1.10	0.54	Light-grey-brown	Coarse sand and gravel	–	–
F035	035, 036	Sub-circular V-shaped post-hole	0.36 x 0.35	0.25	Medium brown	Sand	–	–
F037	037, 038	Elongated or phased steep-sided post-hole	1.04 x 0.38	0.27	Orange-brown	Sandy silt	1 lithic	–

F039	039, 040	Sub-circular vertical sided post-hole	0.55 x 0.45	0.20	Dark brown	Sand with some charcoal flecks	–	–
F041	041, 041	Steep-sided post-hole	0.35 x 0.30	0.15	Medium brown	Sand	–	–
F043	043, 044	Sub-circular steep-sided V-shaped post-hole	0.45 x 0.40	0.20	Medium brown	Sand with some charcoal flecks	Charred material	–
F054	054, 055	Irregular elongated or phased post-hole	1.47 x 0.55	0.30	Medium brown	Sand	–	–
Pits								
F005 (TWMS Pit F175)	005, 006	Irregular oval shallow pit	0.90 x 0.80	0.08	Medium-brown to black with fire-reddened sand	Fine sand	4 ceramic sherds, 2 lithics, charred material	–
F009	009, 010, 051	Large circular storage pit with vertical sides, undercut at base, with two distinct fills	1.47 x 1.25	0.34	Medium brown secondary deposit 009 with very dark brown to black primary deposit 051	Sand and gravel secondary deposit with some charcoal inclusions and charred sandy silt primary fill with large amount of charcoal inclusions	63 ceramic sherds, 13 lithics, quartzite carved stone ball, sandstone whetstone, quartz hammerstone, roughout granite object – poss. macehead, 9 lithics, large amounts of charred material	4933 ± 35 4870 ± 40

TABLE 3 (continued)

FEATURE NUMBER	ASSOC. CONTEXT NUMBERS	DESCRIPTION	MAX DIMENSIONS (M)	MAX DEPTH (M)	COLOUR OF FILL	TEXTURE OF FILL	SMALL FINDS AND ENVIRON-MENTAL MATERIAL	^{14}C DATES BP (UNCAL.)
F049	049, 050	Long irregular shallow pit	2.02 x 0.95	0.15	Red-brown	Sand with some gravel and charcoal flecks,	7 ceramic sherds, charred material	–
F224	224, 225	Long irregular shallow pit	3.12 x 1.20	0.07	Dark-brown-black	Sandy silt with charcoal	8 ceramic sherds, charred material	–
F262	262, 263, 297	Sub-oval flat-based pit with quite steep sides and two fills	1.81 x 1.74	0.27	Strong brown secondary fills over dark-brown-black primary fill with charcoal patches	Silty sand secondary fill with frequent charcoal flecks and a sandy silt primary fill	Hammerstone, charred material from primary deposit	–
F2061	2061, 2062	Irregular oval pit with vertical sides, undercut to the south and west and a flat base	1.20 x 1.08	0.40	Dark brown with area of black *in situ* burning	Silty sand with area of black burnt silty sand	2 ceramic sherds, charred material from area of *in situ* burning	–
F2133	2133, 2134	Sub-oval steep sided pit	0.85 x 0.80	0.36	Strong-brown	Silty sand with charcoal flecks	10 ceramics sherds, 3 lithics, coarse stone, sandstone whetstone, charred material	4152 ±031 4130 ±35

F2168	2168, 2169	Irregular oval flat-based pit	0.85 x 0.68	0.19	Dark-reddish-brown	Silty sand with charcoal flecks	3 ceramic sherds, charred material	4177 ± 33 4250 ± 35
Hearths								
F232	232, 233, 296	Sub-oval steep-sided hearth with V-shaped profile and fire-reddening to surrounding gravel	1.0 x 0.50	0.25	Brown secondary fill over black primary fill	Silty sand secondary fill with charcoal flecks over a burnt sand primary fill which contained fire-cracked cobbles	Large volume of charred material from primary fill	–
F2005	2005, 2006	Fill of hearth pit	0.91 x 0.68	0.31	Very dark brown	Silty sand	1 lithic, large volume of charred material	–
Stake-holes								
F027	027, 028	Small stake-hole	0.39 x 0.26	0.15	Very dark brown	Silty sand	–	–

TABLE 4 Late Bronze Age features in Cheviot Quarry North area

FEATURE NUMBER	ASSOC. CONTEXT NUMBERS	DESCRIPTION	MAX DIMENSIONS (M)	MAX DEPTH (M)	COLOUR OF FILL	TEXTURE OF FILL	SMALL FINDS AND ENVIRON-MENTAL MATERIAL	^{14}C DATES BP (UNCAL.)
F029	029, 030	Curving timber slot with steep-sided V-shaped profile	4.05 x 0.40	0.25	Dark brown – dark grey with distinct patches of black charcoal	Sand with patches of charcoal	–	–
Building 4								
F338	338, 339	'Hourglass' shaped vertical sided double post-hole	1.11 x 0.49	0.32	Light brown	Silt with frequent charcoal pieces	1 ceramic sherd, 1 lithic, charred material	–
F348	348, 349	'Hourglass' shaped vertical sided double post-hole	1.10 x 0.61	0.25	Reddish brown	Silt with frequent charcoal pieces	10 ceramic sherds, burnt bone, charred material	2775 ± 35 5015 ± 35
F365	365, 366	'Hourglass' shaped vertical sided double post-hole	1.22 x 0.54	0.45	Brown	Silt	1 lithic, burnt bone, charred material	–
F344	344, 345	Sub-circular steep-sided post-hole in post circuit	0.52 x 0.44	0.25	Brown	Silt with frequent	Charred material charcoal pieces	–
F346	346, 345	Sub-circular steep-sided post-hole in post circuit	0.41 x 0.34	0.29	Brown	Silt with frequent charcoal pieces	1 ceramic sherd, coarse stone, hazelnut	2725 ± 35 2800 ± 35

F355	355, 356	Sub-circular vertical-sided post-hole in post circuit	0.41 x 0.39	0.35	Brown	Silt with frequent charcoal pieces	Charred material	–
F359	359, 360	Sub-circular steep-sided post-hole in post circuit	0.38 x 0.32	0.25	Brown	Silt with frequent charcoal pieces	Burnt Bone, charred material	–
F361	361, 362	Sub-circular steep-sided post-hole in post circuit	0.34 x 0.37	0.28	Brown	Silt with frequent charcoal pieces	1 ceramic sherd, charred material	–
F363	363, 364	Sub-circular steep-sided post-hole in post circuit	0.45 x 0.35	0.28	Brown	Silt with frequent charcoal pieces	Charred material	2765 ± 35 2745 ± 35
F367	367, 368	Sub-circular vertical-sided post-hole in post circuit	0.34 x 0.29	0.28	Light brown	Silt with frequent charcoal pieces	1 ceramic sherd, charred material	–
F373	373, 374	Sub-circular vertical-sided post-hole	0.24 x 0.24	0.17	Reddish-brown	Silt with frequent charcoal pieces	Charred material in post circuit	–
F369	369, 370	Small stake-hole	0.15 x 0.12	0.06	Dark brown	Silt with frequent charcoal pieces	Charred material	5740 ±35
F478	478, 479	Sub-circular vertical-sided post-hole near centre	0.31 x 0.31	0.16	Dark brown	Silt with frequent charcoal pieces	Burnt bone, charred material	–
F375	375, 376	Very shallow circular pit	0.42 x 0.40	0.06	Dark brown	Silt	–	–
F342	342, 343	Sub-oval central hearth with fire-reddening to cut	0.63 x 0.62	0.19	Very dark brown	Charred silt with large quantities of charcoal	5 ceramic sherds, daub, hazelnut, burnt bone, coarse stone, large volume of charred material	2795 ± 40 2755 ± 55

TABLE 4 (continued)

FEATURE NUMBER	ASSOC. CONTEXT NUMBERS	DESCRIPTION	MAX DIMENSIONS (M)	MAX DEPTH (M)	COLOUR OF FILL	TEXTURE OF FILL	SMALL FINDS AND ENVIRON-MENTAL MATERIAL	^{14}C DATES BP (UNCAL.)
F340	340, 341, 477, 482, 483	Irregular oval storage pit with vertical sides undercut to the north and south with four fills	1.64 x 1.40	0.62	Dark brown and one black charred deposit (477) separated by a brown sand from upper fill	Silts with frequent charcoal flecks and large quantities of charcoal in 477 separated from upper fill by a clean, coarse sand	38 ceramic sherds, daub, 1 lithic, burnt bone, coarse stone, large volume of charred material	2759 ± 30 2693 ± 30
F352	352	Irregular oval shallow pit	0.95 x 0.72	0.19	Light brown	Silty sand and some charcoal	1 lithic, 1 1 ceramic sherd, burnt bone, charred material	–
F350	350, 351	Sub-circular steep-sided post-hole outside building	0.31 x 0.30	0.13	Dark brown	Silt with occasional charcoal flecks	–	–
Building 5								
F491	312, 313, 491, 492	Large sub-rectangular post pit with vertical sides and post-pipe 312	1.30 x 0.80	0.35	Brown fill of pit with very dark brown post-hole fill	Gravelly-silt fill of pit with very frequent large packing cobbles surrounding silt fill of post-holes	–	–
F489	489, 490, 493, 494	Large sub-rectangular post pit with vertical sides and post-pipe 493	1.20 x 0.90	0.40	Brown fill of pit with very dark brown post-hole fill	Gravelly-silt fill of pit with very frequent large packing cobbles surrounding silt fill of post-holes	Charred material	2805 ± 35

F312	312, 313	Fill of deep post-hole in Building 5	0.70 x 0.56	0.38	Very dark brown	Silt with some charcoal flecks	Charred material	2820 ±35 2795 ± 35
F302	302, 303	Sub-circular post-hole in post circuit	0.31 x 0.28	0.03	Brown	Silt with some charcoal flecks	Charred material	–
F304	304, 305	Sub-circular post-hole in post circuit	0.60 x 0.38	0.10	Brown	Silt with some charcoal flecks	Charred material	–
F308	308, 309	Sub-circular steep sided post-hole in post circuit	0.56 x 0.53	0.20	Dark brown	Silt with occasional charcoal flecks	Charred material	2785 ± 35 2735 ± 35
F316	316, 317	Sub-circular steep sided post-hole in post circuit	0.44 x 0.36	0.12	Dark brown	Silt with frequent charcoal pieces	2 ceramic sherds, burnt bone, charred material	2855 ± 35 2790 ± 30
F318	318, 319	Sub-circular post-hole in post circuit	0.36 x 0.32	0.09	Brown	Silt with frequent charcoal pieces	Charred material	–
F322	322, 323	Sub-circular post-hole in post circuit	0.35 x 0.22	0.09	Brown	Silt with frequent charcoal pieces	Charred material	–
F453	453, 454	Sub-circular post-hole in post circuit	0.27 x 0.26	0.14	Brown	Silt with occasional	Charred material charcoal flecks	–
F457	457, 457	Sub-circular post-hole in post circuit	0.30 x 0.30	0.06	Dark brown	Silt with occasional charcoal flecks	Charred material	–
F459	459, 460	Sub-circular post-hole in post circuit	0.30 x 0.28	0.10	Brown	Silt with occasional charcoal flecks	Charred material	–
F306	306, 307	Sub-oval hearth with irregular base and fire-reddened cut	0.80 x 0.66	0.13	Dark brown	Charred silt with frequent charcoal pieces	16 ceramic sherds, burnt bone, charred material	2785 ± 75
F314	314, 315	Sub-oval hearth with fire-reddened cut	0.50 x 0.49	0.14	Very dark brown	Charred silt with frequent charcoal pieces	2 ceramic sherds, burnt bone, large volume of charred material	–
F320	320, 321	Irregular possible pit	0.71 x 0.46	0.12	Dark brown	Silt with some charcoal flecks	Burnt bone, large volume of charred material	–

TABLE 4 (continued)

FEATURE NUMBER	ASSOC. CONTEXT NUMBERS	DESCRIPTION	MAX DIMENSIONS (M)	MAX DEPTH (M)	COLOUR OF FILL	TEXTURE OF FILL	SMALL FINDS AND ENVIRON-MENTAL MATERIAL	^{14}C DATES BP (UNCAL.)
Building 7								
F324	324, 325	Irregular oval vertical-sided post-hole	0.48 x 0.36	0.22	Brown	Silt with some charcoal flecks	–	–
F326	326, 327	Circular vertical-sided post-hole	0.34 x 0.34	0.26	Brown	Silt with some charcoal flecks	–	–
F328	328, 329	Circular vertical-sided post-hole	0.26 x 0.26	0.26	Brown	Silt with some charcoal flecks	–	–
F330	330, 331	Circular vertical-sided post-hole	0.35 x 0.35	0.10	Brown	Silt with some charcoal flecks	–	–
F332	332, 333	Circular vertical-sided post-hole	0.25 x 0.25	0.09	Brown	Silt with some charcoal flecks	–	–
F334	334, 335	Sub-oval vertical-sided post-hole	0.45 x 0.32	0.14	Brown	Silt with some charcoal flecks	–	–
F451	451, 452	Circular vertical-sided post-hole	0.27 x 0.26	0.14	Brown	Silt with some charcoal flecks	–	–
Hearths								
F381	381, 382	Oval steep-sided hearth with fire-reddening to cut	0.81 x 0.53	0.16	Charred dark brown to black	Charred silty sand with large quantities of charcoal and fire-cracked cobbles	Large volume of charred material	–
F383	383, 384	Sub-circular steep-sided hearth with fire-reddening to cut	0.45 x 0.40	0.11	Charred dark brown to black	Charred silty sand with large quantities of charcoal	Large volume of charred material	–

Mesolithic (Waddington 1999) from *c.* 8000 cal. BC, as indicated by the discovery of the Mesolithic house at nearby Howick (Waddington 2007).

NEOLITHIC AND EARLY BRONZE AGE

Neolithic and Early Bronze Age occupation on the site was characterized by a series of pits, post-holes and hearths, predominantly situated close to the terrace edge overlooking the Galewood Depression. ASUD discovered one pit (F1303) that contained nine sherds of Meldon Bridge Ware, an Impressed Ware sub-style characteristic of the Borders region, together with a further forty-three tiny and heavily abraded sherds (Waddington 2000b). TWMS found one pit (F175) that contained Early Neolithic plain vessels and Carinated Bowls as well as six lithics (Muncaster 2003b). A small linear feature, interpreted as an animal burrow, intruded into this feature and contained a further six sherds from a single Carinated Bowl as well as one unattributable sherd. This pit was also revealed during the excavations by ARS Ltd (F005) and a further four sherds of Carinated Bowl from two more vessels and two lithic flakes were recovered.

Twenty-one of the features revealed during the open area excavation by ARS Ltd could be ascribed to the Neolithic period. These consisted of eight pits, two hearths, one stake-hole, one post-hole and a group of nine features that are interpreted as a possible structure. The possible structure (Illus 8 and 9) comprised an irregular group of widely spaced post-holes and pits that may represent a large freestanding structure with two or more phases of activity. It covered an area that measured 18.5 m by 4.5 m and comprised two large pits (F031 and F033), a curvilinear slot (F029), and an irregular rectangular arrangement of smaller stake-holes and post-holes (F035, F037, F039, F041, F043, and F047). Some features outside the putative structure (F027, F009) were aligned on two of the pits (F031, F033) within the structure. The slot (F029) was situated at the north-western end of the structure and, given its form, may have held continuous timber uprights. Two shallow depressions towards the northern half of the deposit may represent individual post-holes. One of the depressions produced large quantities of charcoal and burnt hazelnut shell, accounting for the darkness of the fill in this particular location, but otherwise the sediment was identical to that from elsewhere in this feature. No artefacts were recovered but charred organic material was present throughout.

Situated 3.5 m to the south-east of the northern end of slot F029 was an artefact-rich midden pit, F031. This pit was clearly undercut and contained two distinct fills, the secondary deposit (031), a medium brown silty sand, being clearly differentiated from the primary fill (052), a black and burnt silty sand which did not appear to have been burnt *in situ*. The pit contained sherds from eleven Carinated Bowls of which four had sherds in both the primary and secondary fills, five had sherds exclusively in the secondary fill and two had sherds exclusively in the primary fill, including the most complete Carinated Bowl recovered from the site (Illus. 10; Pot 28). Carbonized residues from these vessels were submitted for analysis and radiocarbon dating. An additional radiocarbon date was taken on a charred hazelnut shell fragment. Four lithics and charred material, including over a thousand hazelnut shell fragments, were

TABLE 5 Dark Age features in Cheviot Quarry North area

FEATURE NUMBER	ASSOC. CONTEXT NUMBERS	DESCRIPTION	MAX DIMENSIONS (M)	MAX DEPTH (M)	COLOUR OF FILL	TEXTURE OF FILL	SMALL FINDS AND ENVIRON-MENTAL MATERIAL	^{14}C DATES BP (UNCAL.)
Building 1								
F2009	2009, 2010	Sub-circular steep-sided post-hole	0.34 x 0.32	0.13	Dark brown	Silty sand with few charcoal flecks	–	–
F2011	2011, 2012	Sub-circular vertical-sided post-hole	0.38 x 0.25	0.21	Dark brown	Silty sand with few charcoal flecks	1 lithic	–
F2015	2015, 2016	Sub-circular steep-sided post-hole	0.22 x 0.16	0.07	Brown	Silty sand with few charcoal flecks	–	–
F2017	2017, 2018	Sub-circular steep-sided post-hole	0.22 x 0.14	0.06	Brown	Silty sand with few charcoal flecks	Charred material	1620 ± 35
F2019	2019, 2020	Sub-circular steep-sided post-hole	0.39 x 0.39	0.16	Brown	Silty sand with few charcoal flecks	Charred material	1565 ± 50
F2021	2021, 2022	Sub-oval steep-sided post-hole	0.21 x 0.18	0.12	Brown	Silty sand with few charcoal flecks	–	–
F2023	2023, 2024	Irregular oval steep-sided post-hole	0.40 x 0.36	0.09	Brown	Silty sand with few charcoal flecks	–	–
F2025	2025, 2026	Sub-circular post-hole	0.42 x 0.29	0.07	Dark-reddish-brown	Silty sand with few charcoal flecks	–	–
F2027	2027, 2028	Sub-circular post-hole	0.59 x 0.47	0.15	Dark brown	Silty sand with few charcoal flecks	–	–
F2029	2029, 2030	Sub-circular steep-sided post-hole	0.33 x 0.25	0.17	Dark brown	Silty sand with few charcoal flecks	Charred material	2795 ± 35
F2031	2031, 2032	Sub-oval steep-sided post-hole	0.35 x 0.33	0.07	Dark-reddish-grey	Silty sand with few charcoal flecks	–	–
F2033	2033,2034	Sub-oval steep-sided post-hole	0.37 x 0.23	0.10	Dark-reddish-grey	Silty sand with few charcoal flecks	–	–
F2035	2035, 2036	Sub-oval vertical-sided post-hole	0.33 x 0.24	0.26	Dark brown	Silty sand with few charcoal flecks	–	–

F2037	2037, 2038	Sub-oval vertical-sided post-hole	0.35 x 0.28	0.18	Dark brown	Sandy silt with few charcoal pieces	Charred material	2735 ± 40
F2039	2039, 2040	Sub-oval vertical-sided post-hole	0.43 x 0.30	0.21	Dark-reddish-brown	Sandy silt with few charcoal flecks	–	–
F2041	2041, 2042	Sub-oval post-hole	0.74 x 0.24	0.12	Dark brown	Silty sand with few charcoal flecks	–	–
F2077	2077, 2078	Sub-circular steep-sided post-hole	0.30 x 0.24	0.08	Dark brown	Silty sand with few charcoal flecks	–	–
F2111	2111, 2112	Sub-circular steep-sided post-hole	0.22 x 0.20	0.09	Dark brown	Silty sand with few charcoal flecks	–	–
F2115	2115, 2116	Sub-circular steep-sided post-hole	0.32 x 0.30	0.19	Black	Silty sand with few charcoal flecks	–	–
F2079	2079, 2080	Sub-oval shallow pit	0.85 x 0.37	0.09	Red-brown	Silty sand with few charcoal flecks	–	–
Building 2								
F2045	2045, 2046	Sub-circular shallow-sided post-hole	0.45 x 0.30	0.13	Dark-reddish-brown	Silty sand with few charcoal flecks	–	–
F2047	2047, 2048	Sub-circular steep-sided post-hole	0.60 x 0.48	0.15	Dark-brown-grey	Silty sand with some charcoal pieces	Charred material	1545 ± 35 1531 ± 27
F2051	2051, 2052	Sub-circular steep-sided post-hole	0.57 x 0.55	0.24	Dark grey	Silty sand with few charcoal flecks	–	–
F2053	2053, 2054	Sub-oval steep-sided post-hole	0.62 x 0.36	0.22	Dark-brown-grey	Silty sand with some charcoal pieces	Charred material	1520 ± 35 1517 ± 26
F2055	2055, 2056	Sub-circular steep-sided post-hole	0.54 x 0.45	0.21	Dark-reddish-brown	Silty sand with few charcoal flecks	–	–
F2057	2057, 2058	Sub-oval steep-sided post-hole	0.72 x 0.35	0.32	Dark-reddish-brown	Silty sand with few charcoal flecks	Charred material	1575 ± 35
F2059	2059, 2060	Sub-oval steep-sided post-hole	0.46 x 0.36	0.14	Dark-reddish-brown	Silty sand with few charcoal flecks	–	–
F2081	2081, 2082	Sub-circular steep-sided post-hole	0.43 x 0.28	0.20	Dark-reddish-brown	Silty sand with few charcoal flecks	–	–
F2083	2083, 2084	Sub-circular vertical-sided post-hole	0.35 x 0.31	0.17	Dark-reddish-brown	Silty sand with few charcoal flecks	–	–
F2085	2085, 2086	Sub-oval steep-sided post-hole	0.48 x 0.40	0.18	Dark brown	Silty sand with few charcoal flecks	–	–

TABLE 5 (continued)

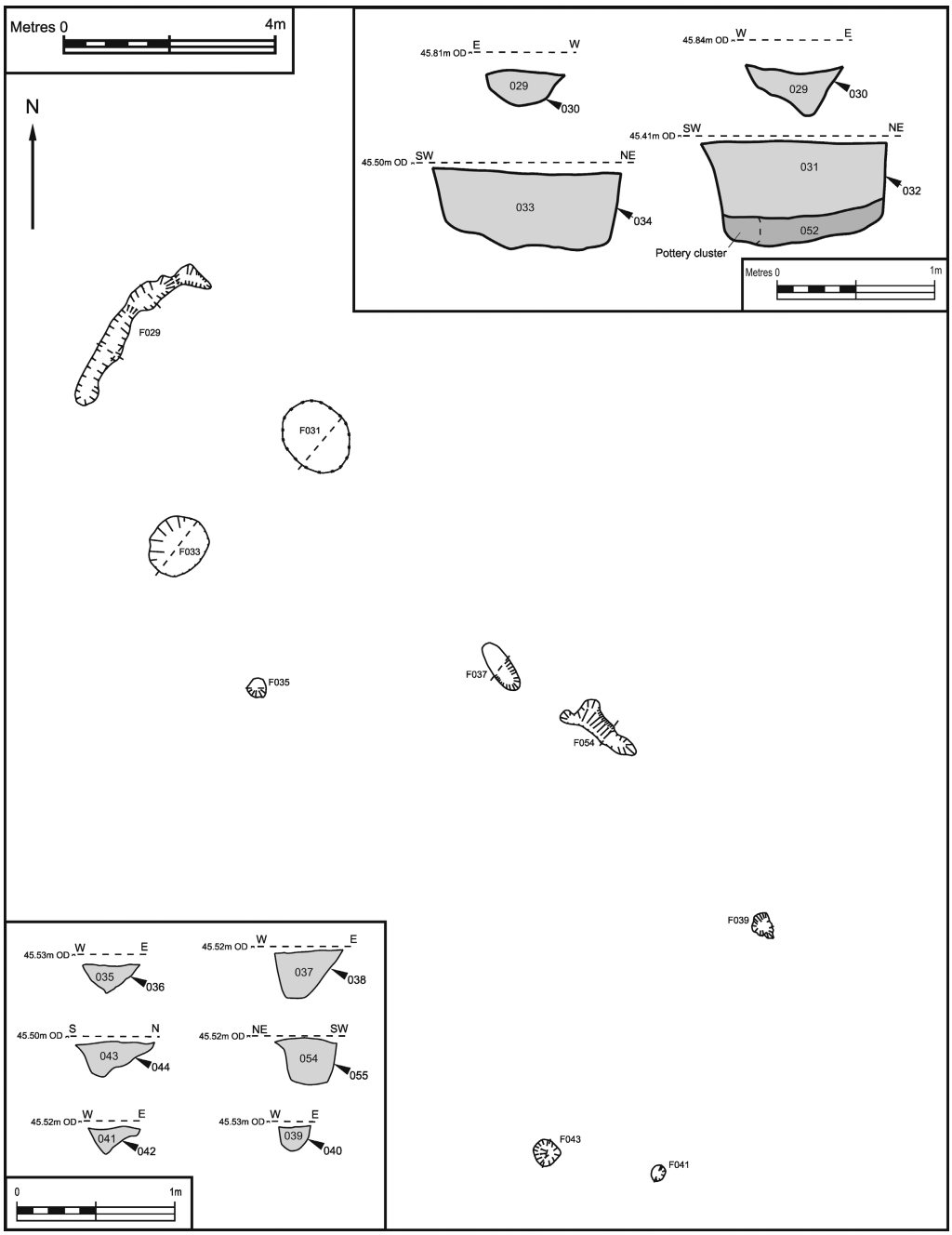
FEATURE NUMBER	ASSOC. CONTEXT NUMBERS	DESCRIPTION	MAX DIMENSIONS (M)	MAX DEPTH (M)	COLOUR OF FILL	TEXTURE OF FILL	SMALL FINDS AND ENVIRON-MENTAL MATERIAL	^{14}C DATES BP (UNCAL.)
F2087	2087, 2088	Sub-oval steep-sided post-hole	0.40 x 0.37	0.07	Dark-reddish-brown	Silty sand with few charcoal flecks	–	–
F2089	2089, 2090	Sub-circular steep-sided post-hole	0.38 x 0.36	0.09	Dark-brown-grey charcoal flecks	Silty sand with few	–	–
F2091	2091, 2092	Sub-circular steep-sided post-hole	0.47 x 0.36	0.28	Dark grey	Silty sand with few charcoal flecks	–	–
F2093	2093, 2094	Sub-circular steep-sided post-hole	0.34 x 0.32	0.15	Dark-reddish-brown	Silty sand with few charcoal flecks	–	–
F2095	2095, 2096	Sub-circular shallow post-hole	0.30 x 0.25	0.05	Dark-reddish-brown	Silty sand with few charcoal flecks	–	–
F2097	2097, 2098	Sub-circular vertical-sided post-hole	0.40 x 0.35	0.29	Dark-reddish-brown	Silty sand with few charcoal flecks	–	–
F2099	2099, 2100	Sub-oval steep-sided post-hole	0.60 x 0.45	0.35	Dark-reddish-brown	Silty sand with few charcoal flecks	–	–
F2103	2103, 2104	Sub-circular steep-sided post-hole	0.45 x 0.40	0.16	Dark-brown-grey	Silty sand with few charcoal flecks	–	–
F2105	2105, 2106	Sub-oval steep-sided post-hole	0.44 x 0.30	0.17	Dark-reddish-brown	Silty sand with few charcoal flecks	–	–
F2107	2107, 2108	Sub-oval steep-sided post-hole	0.42 x 0.28	0.15	Dark-reddish-brown	Silty sand with few charcoal pieces	Charred material	2315 ± 35 2290 ± 29
F2109	2109, 2110	Sub-circular steep-sided post-hole	0.35 x 0.32	0.20	Dark brown	Silty sand with few charcoal flecks	–	–
F2113	2113, 2114	Sub-oval steep-sided post-hole	0.45 x 0.29	0.10	Dark-reddish-brown	Silty sand with few charcoal flecks	–	–
F2165	2165, 2166	Sub-circular steep-sided post-hole	0.32 x 0.25	0.10	Dark brown	Silty sand with few charcoal flecks	–	–

Building 3

F2117	2117, 2118	Sub-circular steep-sided post-hole	0.37 x 0.33	0.25	Dark-reddish-brown	Silty sand with very few charcoal flecks	–	–
F2119	2119, 2120	Irregular circular steep-sided post-hole	0.45 x 0.36	0.24	Dark-reddish-brown	Silty sand with very few charcoal flecks	–	–
F2121	2121, 2122	Sub-circular steep-sided post-hole	0.39 x 0.39	0.13	Dark-reddish-brown	Silty sand with very few charcoal flecks	–	–
F2123	2123, 2124	Sub-circular steep-sided post-hole	0.43 x 0.40	0.18	Dark-reddish-brown	Silty sand with very few charcoal flecks	–	–
F2125	2125, 2126	Sub-oval steep-sided post-hole	0.29 x 0.21	0.16	Dark-reddish-brown	Silty sand with very few charcoal flecks	–	–
F2127	2127, 2128	Sub-circular steep-sided post-hole	0.38 x 0.35	0.32	Dark-reddish-brown	Silty sand with very few charcoal flecks	–	–
F2129	2129, 2130	Sub-circular steep-sided post-hole	0.27 x 0.27	0.10	Dark-reddish-brown	Silty sand with very few charcoal flecks	–	–
F2131	2131, 2132	Sub-circular steep-sided post-hole	0.52 x 0.38	0.14	Reddish-brown	Silty sand with very few charcoal flecks	–	–
F2135	2135, 2136	Sub-circular steep-sided post-hole	0.35 x 0.32	0.10	Yellowish-red	Silty sand with very few charcoal flecks	–	–
F2137	2137, 2138	Sub-oval steep-sided post-hole	0.35 x 0.30	0.09	Dark-reddish-brown	Silty sand with very few charcoal flecks	–	–
F2139	2139, 2140	Sub-circular steep-sided post-hole	0.52 x 0.47	0.16	Dark-reddish-brown	Silty sand with very few charcoal flecks	–	–
F2141	2141, 2142	Sub-oval steep-sided post-hole	0.46 x 0.35	0.32	Dark-reddish-brown	Silty sand with very few charcoal flecks	–	–
F2143	2143, 2144	Sub-oval steep-sided post-hole	0.36 x 0.34	0.29	Dark-reddish-brown	Silty sand with very few charcoal flecks	–	–
F2145	2145, 2146	Sub-circular steep-sided post-hole	0.25 x 0.18	0.12	Reddish-brown	Silty sand with very charcoal flecks	–	–
F2147	2147, 2148	Sub-oval steep-sided post-hole	0.39 x 0.34	0.17	Dark-reddish-brown	Silty sand with very few charcoal flecks	–	–
F2149	2149, 2150	Sub-circular shallow post-hole	0.39 x 0.26	0.05	Dark brown	Silty sand with very few charcoal flecks	1 lithic	–
F2151	2151, 2152	Sub-circular steep-sided post-hole	0.43 x 0.29	0.12	Dark brown	Silty sand with very few charcoal flecks	–	–

TABLE 5 (continued)

FEATURE NUMBER	ASSOC. CONTEXT NUMBERS	DESCRIPTION	MAX DIMENSIONS (M)	MAX DEPTH (M)	COLOUR OF FILL	TEXTURE OF FILL	SMALL FINDS AND ENVIRON-MENTAL MATERIAL	^{14}C DATES BP (UNCAL.)
F2153	2153, 2154	Sub-circular vertical-sided post-hole	0.46 x 0.43	0.22	Dark brown	Silty sand with very few charcoal flecks	–	–
F2155	2155, 2156	Sub-circular shallow post-hole	0.37 x 0.28	0.06	Dark brown	Silty sand with very few charcoal flecks	–	–
F2171	2171, 2172	Sub-circular shallow post-hole	0.48 x 0.33	0.04	Dark red	Silty sand with very few charcoal flecks	–	–
F2173	2173, 2174	Sub-oval steep-sided post-hole	0.30 x 0.24	0.11	Dark red	Silty sand with very few charcoal flecks	–	–
F2175	2175, 2176	Sub-circular shallow post-hole	0.26 x 0.22	0.09	Dark red	Silty sand with very few charcoal flecks	–	–
F2177	2177, 2178	Sub-circular steep-sided post-hole	0.17 x 0.13	0.09	Dark red	Silty sand with very few charcoal flecks	–	–



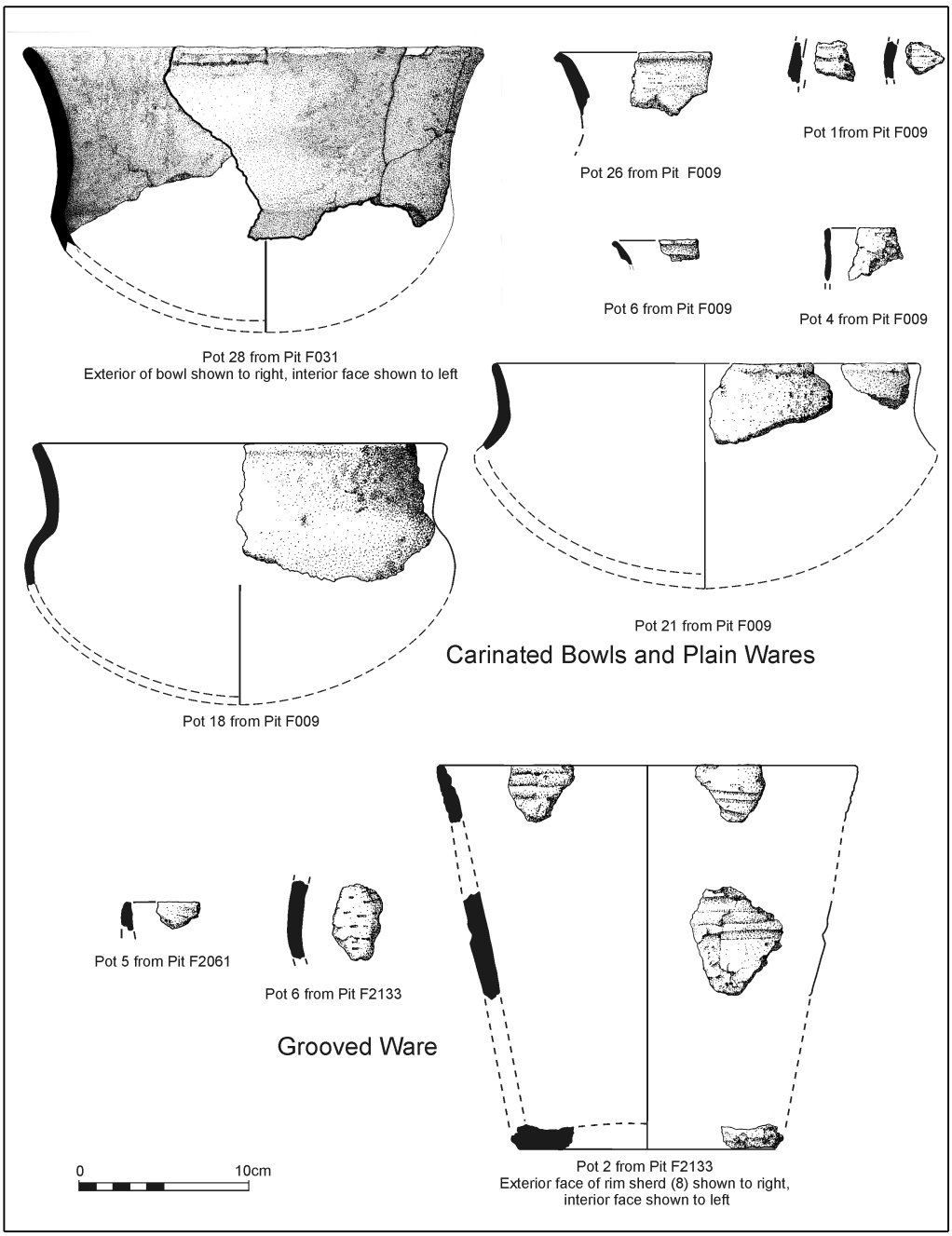
ILLUS. 8 Plan and sections of the Early Neolithic possible structure

ILLUS. 9 The Early Neolithic possible structure with the two large pits and curvilinear slot in the foreground

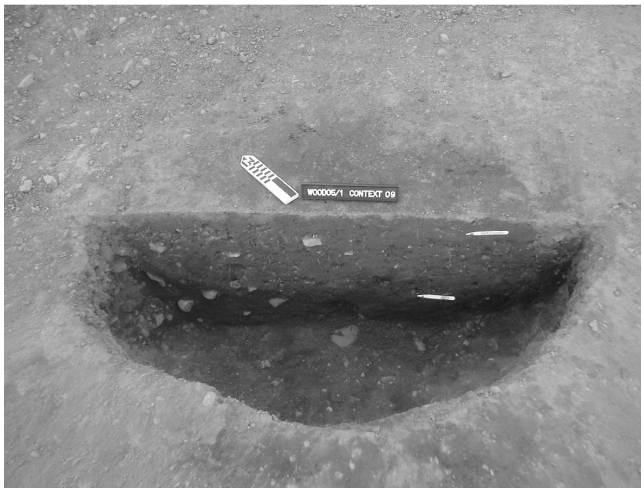
recovered from the secondary fill while the primary fill contained one lithic and was also exceptionally rich in charred hazelnut shells. It included five cereal grains that were identified as wheat (*Triticum* sp.), although the exact species could not be determined. A small number of other indeterminate cereal grains were found within both fills of the pit. Two radiocarbon dates, one on a sherd residue and one on a hazelnut shell, were obtained from the primary fill.

A second large pit (F033) produced no artefacts or organic material. A further six very steep-sided post-holes (F035, F037, F039, F041, F043 and F054) formed the rest of the possible structure. Two post-holes (F037 and F054) were much longer than they were wide, and it is possible that these represent phases of rebuilding activity through the replacement of posts, although no differentiation could be seen in the fills of these particular features. None of the post-holes produced any artefacts, although some did contain charred material.

The pits, hearths and post-holes were found predominantly to the west of the possible structure and therefore it is not absolutely certain that these features are contemporary, although this is suggested by the spatial layout. The pits varied considerably in size and form, and all were substantial features. Pit F009 (Illus. 11) was situated 26 m south-west of pit F033 and formed an alignment with F031, F033 and F027. It was



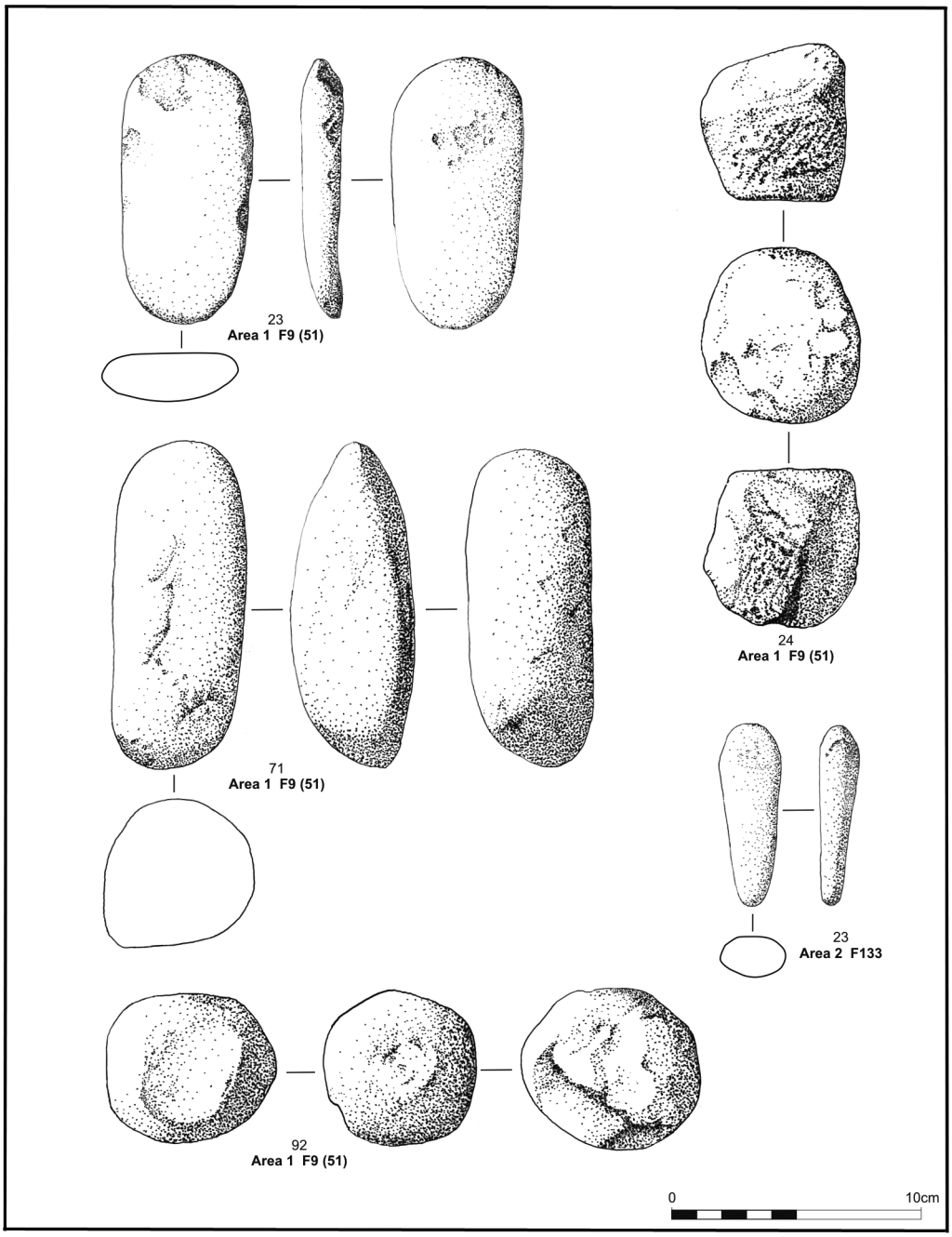
ILLUS. 10 Pottery from the Cheviot Quarry North area



ILLUS. 11 Artefact-rich pit F009 after half-sectioning, showing two distinctive deposits, the primary fill containing large volumes of charred organic material

clearly undercut around its base and had two distinct fills revealing exactly the same form and structuring of the deposits as in Pit F031, the primary fill (051) having being burned, although apparently not *in situ*, and both it and the secondary fill (009) contained charred organic material. This included numerous hazelnut fragments and eight emmer wheat (*Triticum dicoccum*) seeds and associated chaff along with twenty-five indeterminate cereal grains. Sherds from twenty-one Early Neolithic Carinated Bowls and plain vessels were recovered from these fills and, as with F031, a number of vessels had sherds present in both fills. Carbonized residues from sherds in the secondary fill were submitted for analysis and radiocarbon dating. Twenty-two broken lithics were recovered. These were generally undiagnostic, with one Neolithic blade that may have been an awl and one possible broken microlith, presumably residual, being the most noteworthy pieces. Also of interest were a number of coarse stone objects. A quartzite, carved stone ball roughout was found in the secondary fill, and a fine sandstone whetstone, a quartzite hammerstone and a possible granite object roughout were recovered from the primary fill (Illus. 12). The finds were distributed haphazardly with no evidence for special placement in the pit and all were broken, flawed or heavily used.

Pit F015 was situated 6 m east of Pit F009 and contained no artefacts, although charred material was present in abundance, and it is thought to form a part of the cluster of Neolithic activity in this area. Pit F049 was situated 9 m south-east of F009. Sherds from three Early Neolithic Carinated Bowls and a coarse plain vessel were recovered and some sherds were submitted for carbonized residue analysis (see below, pp. 223–33). Pit F224 had been disturbed to the south-west by a modern post-hole and was situated 60 m south-west of the possible structure and 2.5 m to the south-east of the alignment of F009, F027, F031 and F033. Sherds from five Early Neolithic vessels were found in this pit and carbonized residues from these sherds were submitted for analysis. Pit F262 was situated 75 m south-west of the possible structure



ILLUS. 12 Coarse stone artefacts from the Cheviot Quarry North area

and contained a distinctive, charred primary fill from which a quartzite hammerstone was recovered.

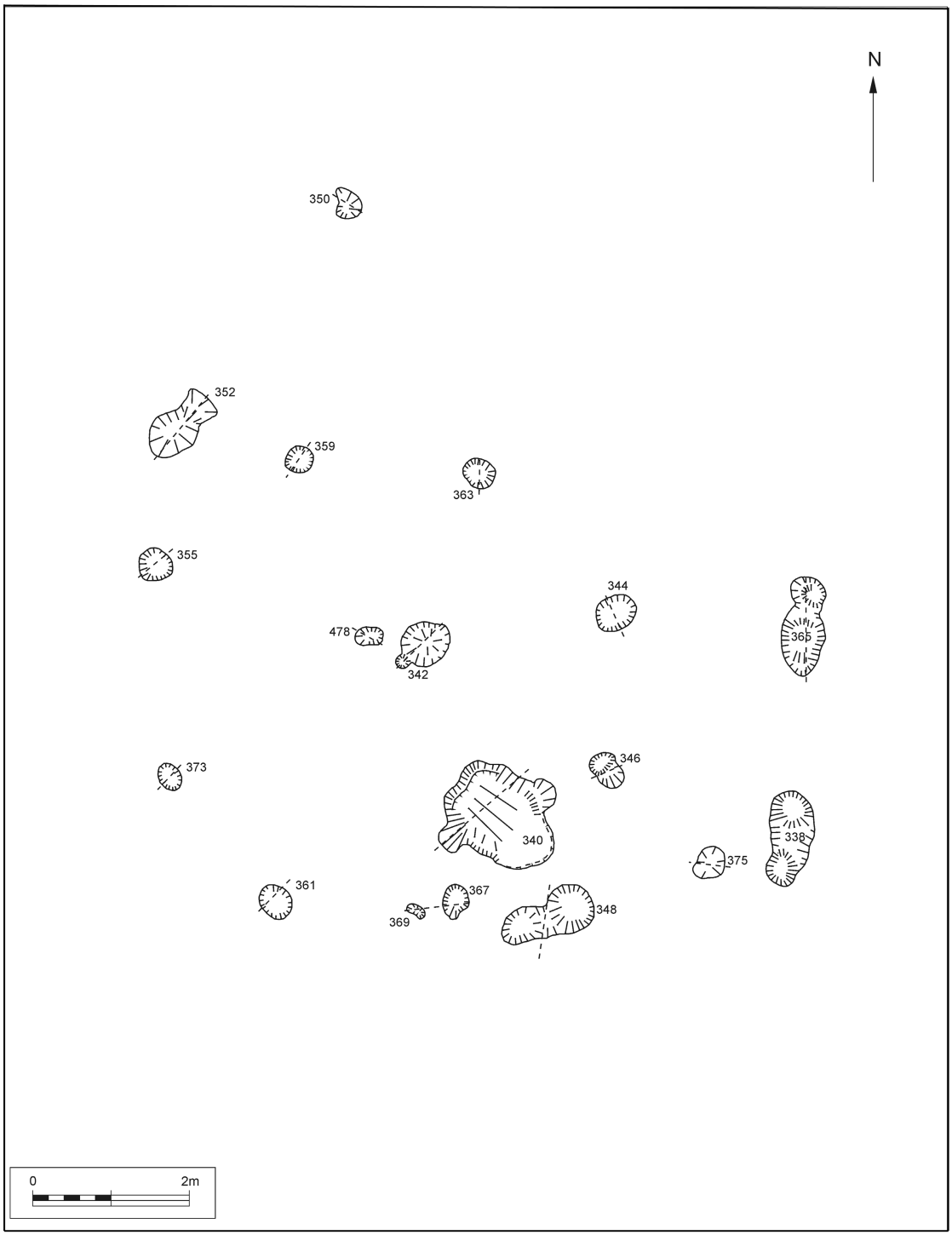
Two pits containing Grooved Ware were situated immediately to the east of Dark Age Building 3 (Illus. 25). The fills of both pits, F2133 and F2168, contained charred organic material, and the size and preservation of the numerous charred hazelnut shell fragments in F2133 suggest that the deposits had not been reworked but formed part of the original deposition event. Pit F2133 also contained sherds from four Grooved Ware vessels as well as three lithics, one of which was a knife, and a sandstone whetstone. Pit F2168 contained sherds from two Grooved Ware vessels and both pits had sherds with carbonized residues submitted for analysis, as well as radiocarbon dates taken from charred hazelnut shells. A further pit, F2061, was situated inside the north-west corner of Dark Age Building 2 (cf. Illus. 23) and contained a single sherd of Grooved Ware, and a few charred hazelnut fragments. An additional pit (F469) was situated in the north-east corner of the site. A single unattributable prehistoric sherd was recovered from the fill.

A number of hearths were revealed during excavation but, given the multi-period activity occurring in this area, definitively ascribing them to a specific period, without recourse to further radiocarbon dating, is problematic. Two hearths (F232 and F2005) are thought to be Neolithic in origin based on their spatial location and their similarity to other Neolithic hearth pits that have been excavated and dated elsewhere on this gravel terrace, at Coupland for example (Passmore and Waddington 2009). Hearth F232 was situated 60 m south-west of the possible structure and 3.5 m to the north-west of the alignment of F009, F027, F031 and F033, and hearth F2005 was situated to the south-east of the possible structure. Both contained burnt, black primary fills, and the presence of fire-reddened and cracked stones lining the cut of F232 and fire-cracked limestone (which is not native to the gravel terraces) lining the base and sides of F2005 suggest that *in situ* burning occurred in both features.

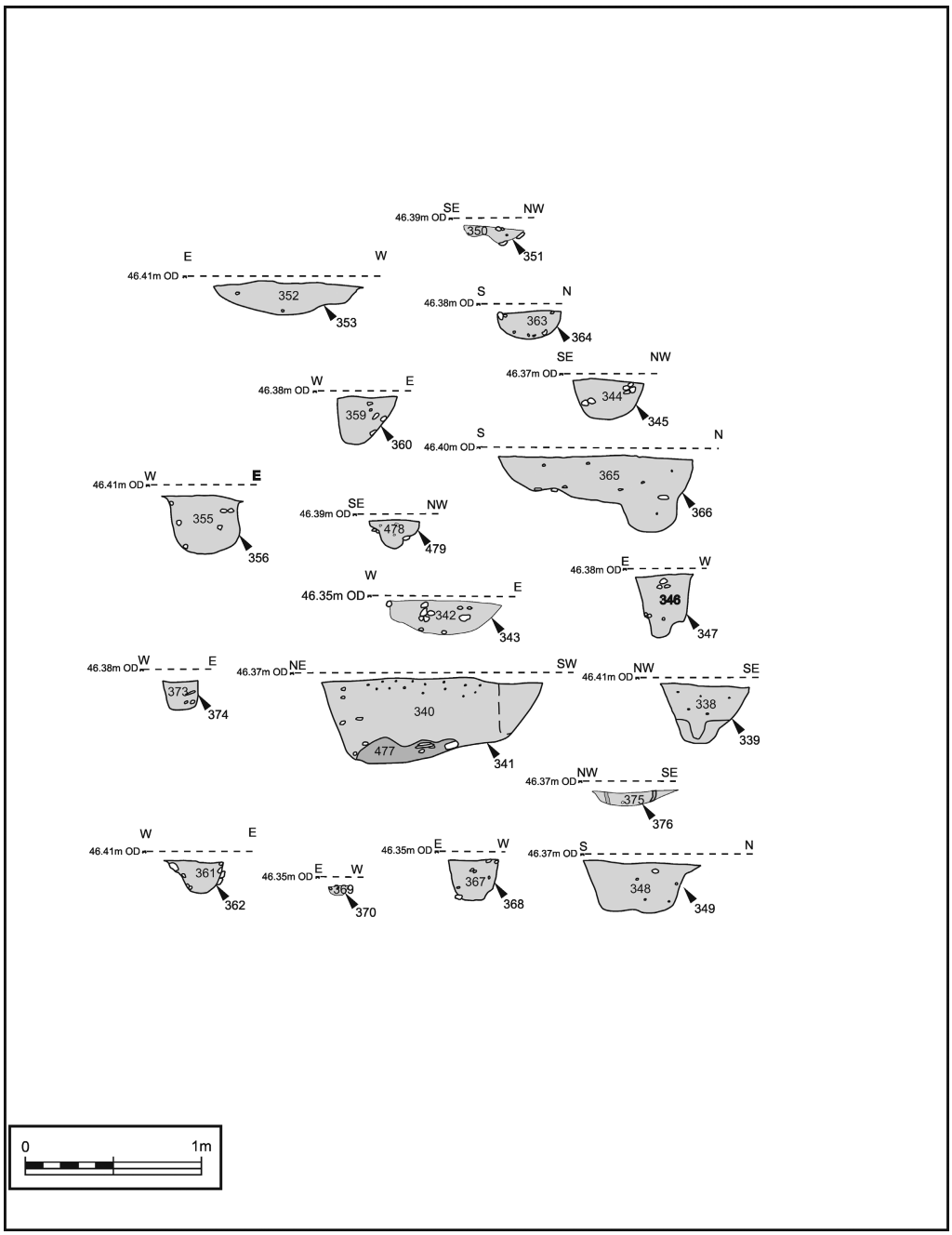
A solitary stake-hole, F027, may also be Neolithic. This feature was situated 7.5 m south-west of Pit F031 and formed an alignment with F033, F031 and F009.

LATE BRONZE AGE

Evidence for Late Bronze Age activity on the site came from two post-built roundhouses (Buildings 4 and 5) with associated hearths and pits, as well as a small irregular, sub-rectangular, post-built building (Building 7) situated between them. Buildings 4 and 5 were almost identical in form, comprising a circular ring of post-holes with two double post-holes situated outside the south-east quadrant forming a porch. Both had a central hearth feature and a midden pit situated in the south-west quadrant. Building 4 (Illus 13–15) measured 5.8 m across its internal diameter with an entrance porch to the south-east. It comprised a circle of eight post-holes (F344, F346, F355, F359, F361, F363, F367, and F373), three double post-holes (F338, F348 and F365) to the south and south-east, a central hearth (F342) with an associated small pit (F478), a large artefact-rich internal pit (F340), a shallow pit to the north (F352), a very shallow pit (F375) to the south, a stake-hole in the south side of the circle of post-holes (F369) and a small outlying post-hole (F350) to the north-east. The post-holes forming the



ILLUS. 13 Plan of Bronze Age roundhouse Building 4



ILLUS. 14 Sections of Bronze Age roundhouse Building 4

ILLUS. 15 Bronze Age roundhouse Building 4. The double post-holes forming the porch are at the bottom of the photograph with the artefact-rich pit to the centre left

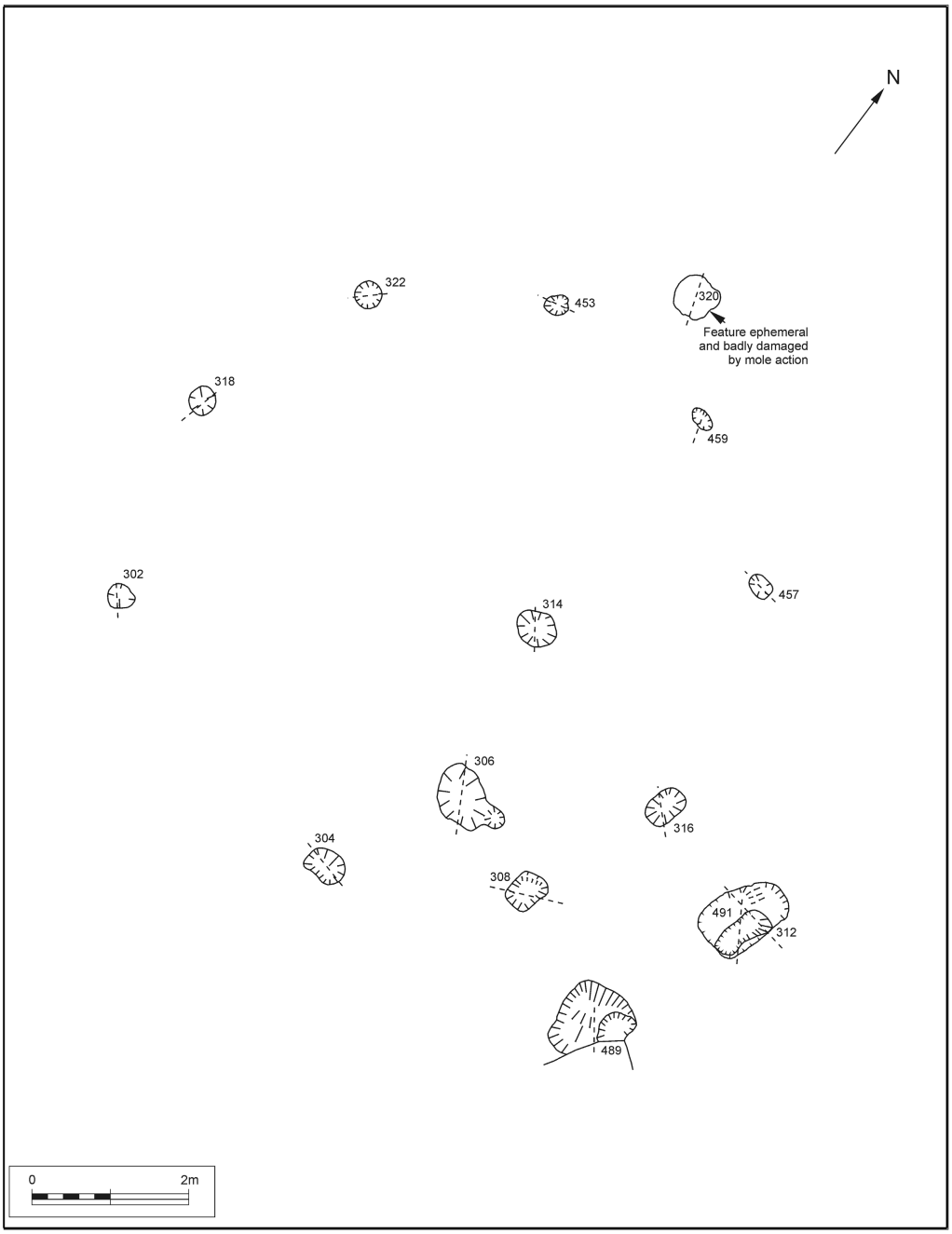
structure averaged 0.36 m in diameter and 0.27 m deep. Sherds from three Flat-Rimmed Ware vessels were recovered from Post-holes F346, F361 and F367 and eight charcoal samples from short-lived species were collected from them and submitted for radiocarbon dating. The central hearth was surrounded by fire-reddened gravel indicating that the black sandy silt fill was burned *in situ*. Five ceramic sherds from one vessel, one piece of daub and a possible stone used as a pestle or rubber were recovered, as well as significant volumes of charred organic material, including eighty-nine barley (Hulled *Hordeum vulgare*) seeds and two pieces of burnt bone. A barley seed was submitted for radiocarbon dating. The large internal pit, situated to the left of the entrance and containing large quantities of domestic midden waste, was undercut on the north and south sides, with vertical sides to the east and west. Sherds from thirty-one Flat-Rimmed Ware vessels were recovered and all but one of the vessels had sherds in only one fill. One fragment of daub was also recovered from the uppermost fill (340) and one lithic, a residual Mesolithic agate core, was found. Large quantities of charred organic material were recovered from throughout the fills including over 4000 barley (*Hordeum vulgare*) seeds and over 500 emmer wheat (*Triticum dicoccum*) seeds, as well as substantial amounts of chaff in the form of rachis segments, spikelets and glume bases (a further 270 barley grains and twenty-nine emmer wheat grains

were recovered from the post-holes and hearth of Building 4). Seventeen fragments of burnt bone were recovered, two of which could be identified as being from cattle and some of which were from sheep- or goat-sized animals. Two broken quernstones, from different querns but both made from Cheviot granite, were also recovered from the pit. Sherds from thirty-seven Flat-Rimmed Ware vessels were recovered from features within this building and a number had carbonized residues taken for analysis. A shallow pit, F352, situated to the north of the circle of posts contained a Flat-Rimmed Ware sherd and one very finely worked oblique arrowhead on a dark grey flint, which is obviously residual from earlier Neolithic activity in this area. Soil samples for geochemical analysis were systematically taken across a grid superimposed over this building (see below).

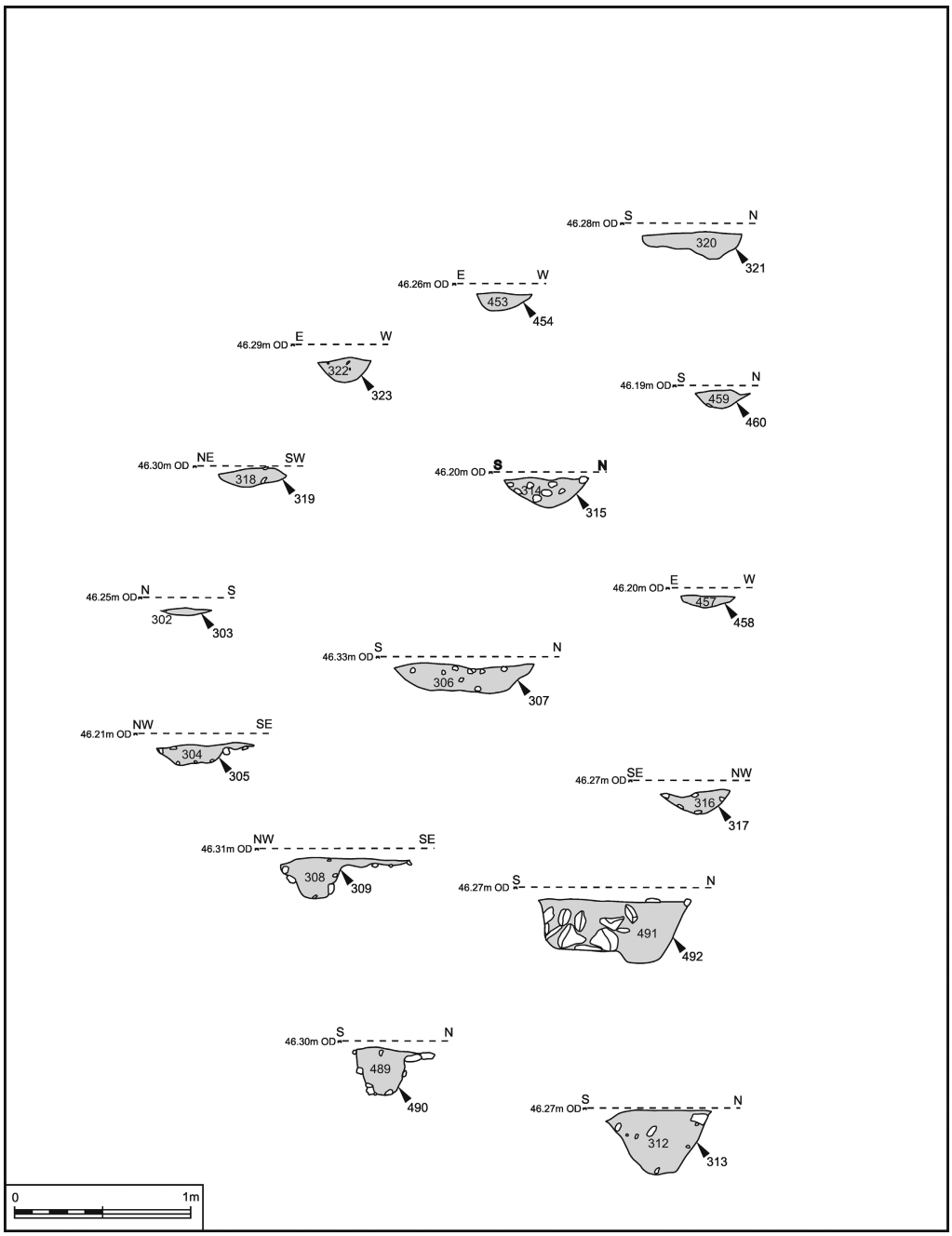
Building 5 (Illus 16–18) was a roundhouse of almost identical form to Building 4, which measured 7.8 m across its internal diameter with an entrance to the south-east. It was more heavily truncated than Building 4 and comprised a circle of nine post-holes (F302, F304, F308, F312, F316, F318, F322, F453, F457, and F459), two large post-pits with internal post-pipes (F310 and F491; F493 and F489) to the south and south-east forming a porch, two hearths, one centrally placed (F314) and one to the south (F306), and an outlying feature (F321) to the north-east. Eight charcoal samples from short-lived species were selected from four of the post-holes and submitted for radiocarbon dating. The large sub-rectangular post-pits forming the entrance porch contained substantial amounts of post-packing. Post-pit F493 and Post-pipe F489 had been truncated on their southern side by a Second World War service trench associated with the later airfield. The internal hearth features (F306 and F314) contained substantial amounts of charred organic material, a few fragments of burnt bone and were fire-reddened around their sides. Sherds from three Flat-Rimmed Ware vessels were found in this building and some were submitted for carbonized residue analysis. A possible pit, F320, was situated 1.0 m to the north-east of the ring of posts. It had been very badly damaged by mole action but charred organic material was present throughout, including one fragment of burnt bone. The original form and function of this feature is unclear and it may represent a mole burrow into which archaeological material has been dragged. Given the heavily truncated nature of Building 5, no geochemical samples were taken from this area. Both Building 4 and Building 5 are interpreted as substantial dwellings forming an unenclosed farming settlement.

Building 7 (Illus 19 and 20), 2 m by 2.5 m internally, comprised six post-holes (F326, F328, F330, F332, F336 and F451) in a sub-rectangular arrangement, and two internal pits or post-holes (F324 and F334). No material was recovered from this building and its function is unclear. Given its location between Buildings 4 and 5, however, it is thought most likely to be Late Bronze Age in date and the large size of the post-holes in comparison with the small surface area they cover may indicate that the timbers supported a tall superstructure raised to a considerable height off the ground. A potential storage facility or other farm building is considered the most likely interpretation. Soil samples for geochemical analysis were taken from this building.

Two hearths (F381 and F383), situated to the north-east of the buildings, may also date to the Late Bronze Age. Both contained fire-cracked cobbles and were



ILLUS. 16 Plan of Bronze Age roundhouse Building 5



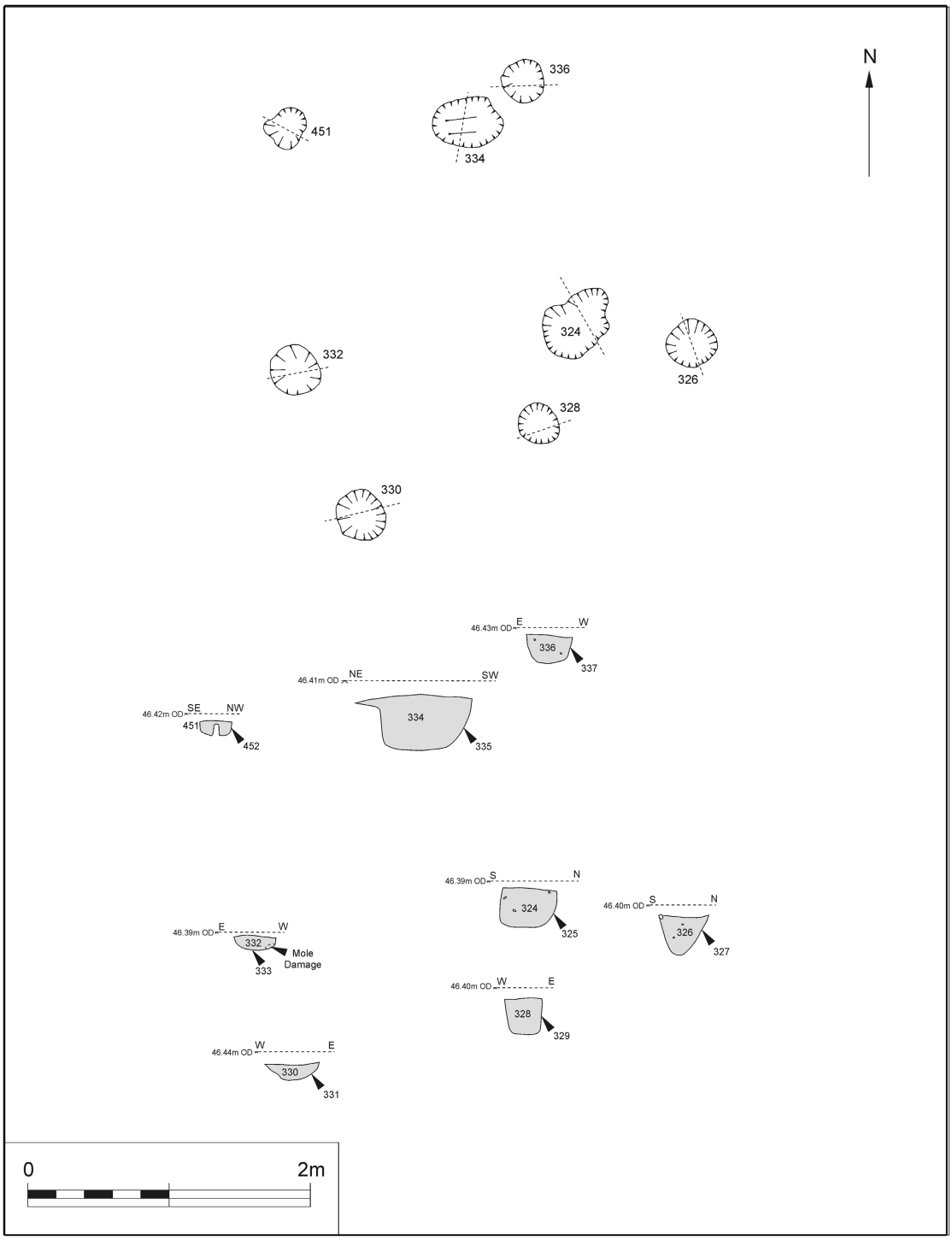
ILLUS. 17 Sections of Bronze Age roundhouse Building 5

ILLUS. 18 Bronze Age roundhouse Building 5 showing heavier truncation of the deposits than at Building 4

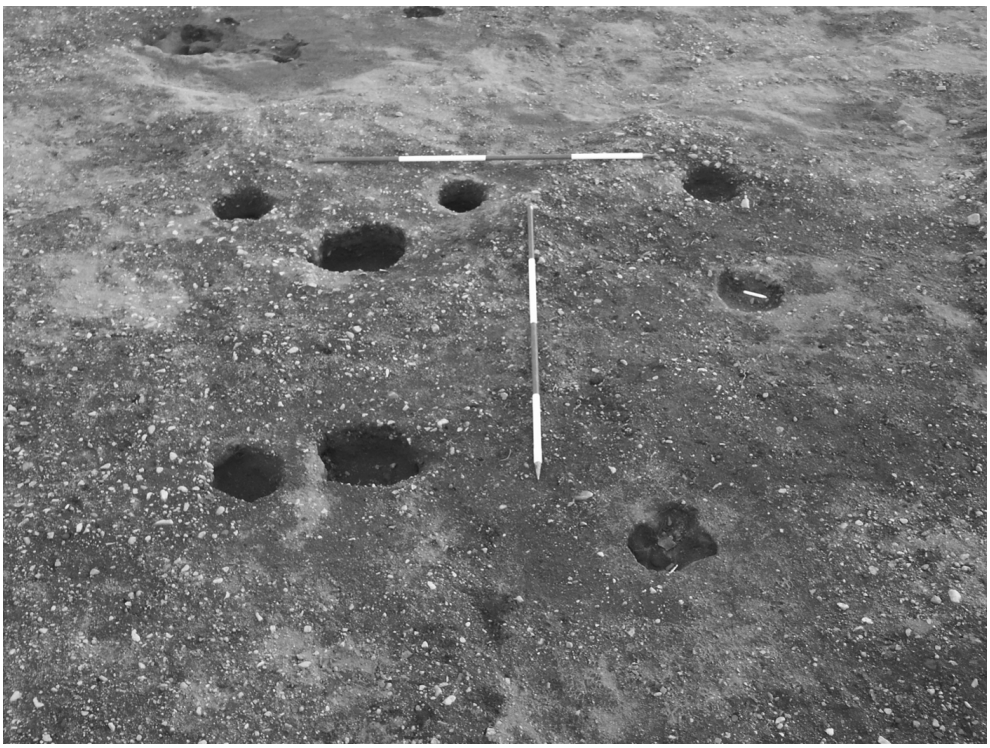
fire-reddened at their edges. No artefacts were recovered from these features but their proximity to, and downwind location from, the two buildings means they are thought to be associated with activities external to the roundhouses.

IRON AGE

No definite features or material culture belonging to the Iron Age were identified. However, two radiocarbon determinations, on an indeterminate twig fragment and a piece of willow (*Salix*) from the post-hole of Dark Age Building 2 (F2107) provided Middle Iron Age dates of 410–260 cal. (2315±35 BP; SUERC-8961) and 400–230 cal. BC (2290±29 BP; OxA-15547) and are obviously residual, suggesting that any Iron Age activity on the site has left little or no archaeological trace. Extensive Iron Age settlement is known from elsewhere on the gravel terrace, represented, for example, by the lowland cropmark of a multivallate fort at Sandy House 2 km to the south-west and the many sites on the Cheviot uplands overlooking the Milfield Basin (e.g. Jobey 1964; 1965). It may be that these charcoal fragments represent clearance activity associated with Iron Age agricultural practices on the fertile gravel soils.



ILLUS. 19 Plan and sections of Bronze Age Building 7

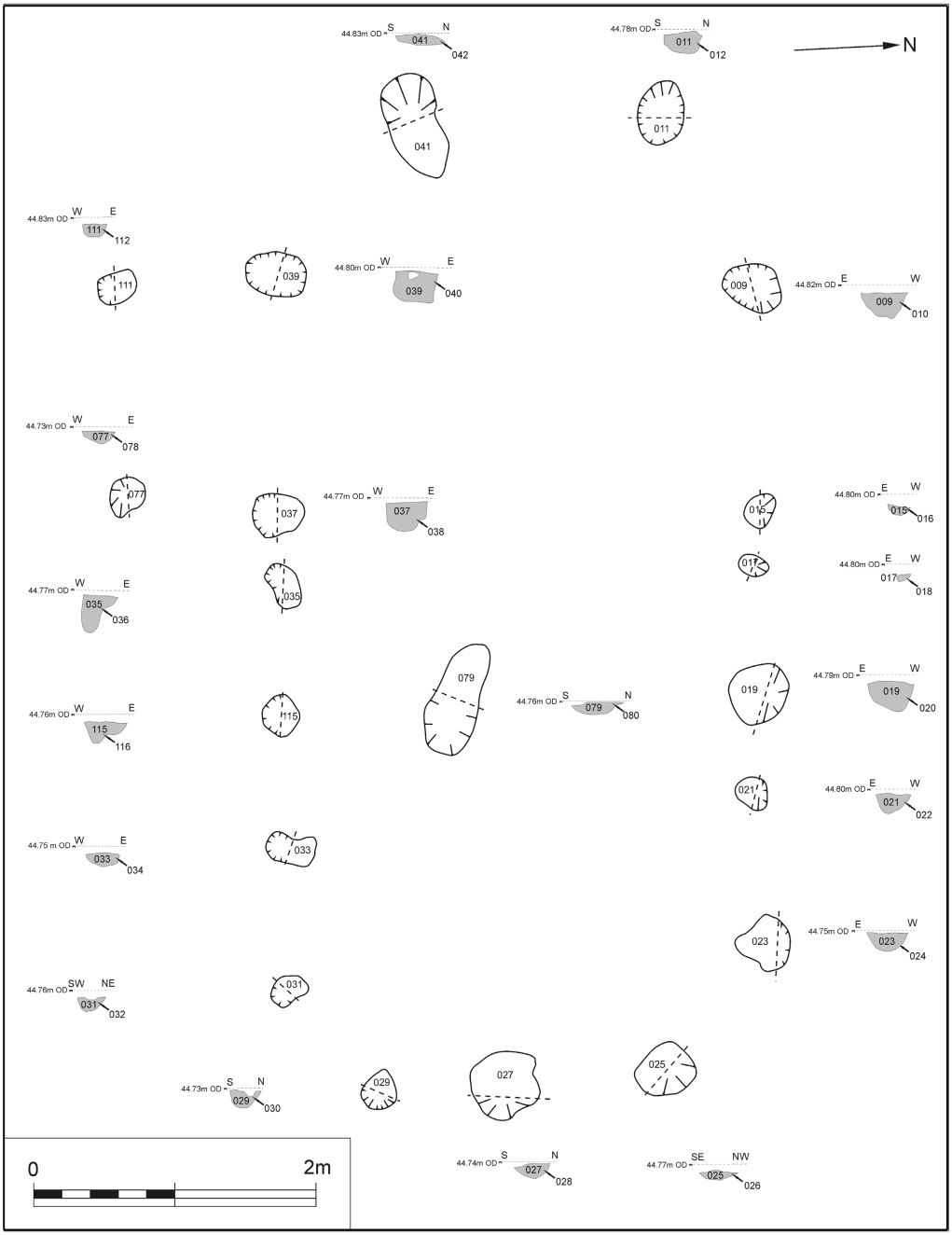


ILLUS. 20 Bronze Age Building 7

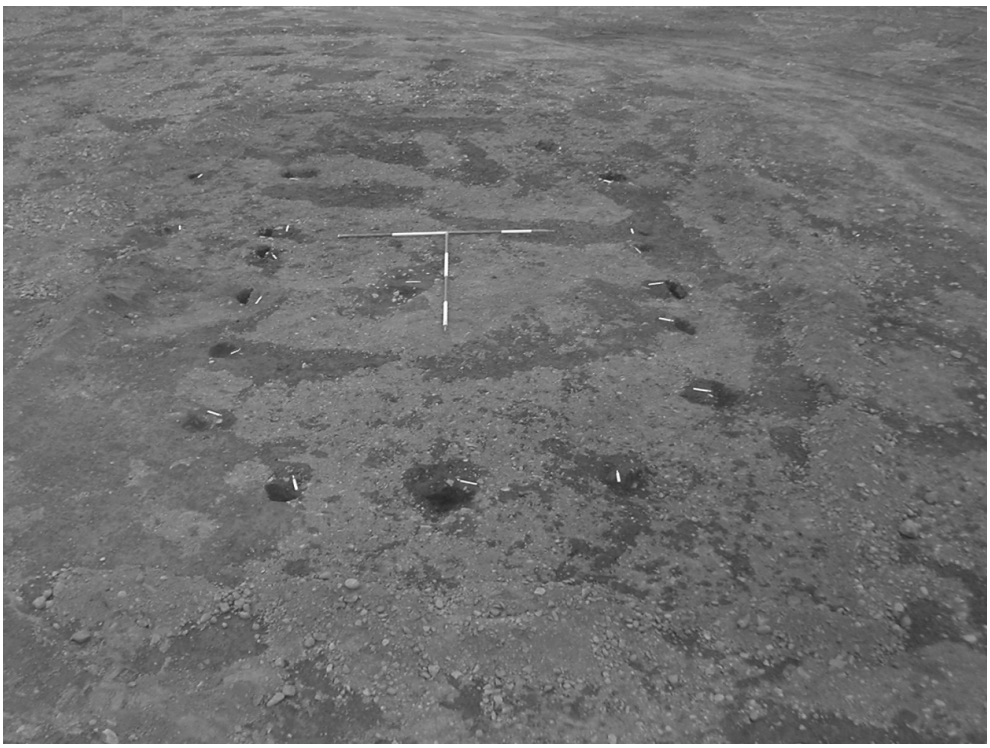
DARK AGE

Post-Roman or 'Dark Age' activity on the site is represented by the heavily truncated remains of three rectangular, post-built structures, located in a triangular layout about 15 m apart and each one on an east–west axis. Samples for geochemical analysis were taken from all these buildings. The term 'Dark Age' is used here, rather than 'Post-Roman' because this area was outside the Roman empire throughout most of the Roman occupation of Britain. The alternative term 'Early Medieval' is most commonly associated with Anglo-Saxon remains, and as we cannot be certain of the cultural attribution of these buildings it was thought that the term 'Dark Age' provided the least loaded term to describe the date of these buildings, falling as they do before what is taken to be the formal establishment of the Anglian kingdom of Bernicia in AD 547.

Building 1 (Illus 21–22) measured 7.3 m by 3.6 m internally being defined by six post-holes along each of its long axes that were directly opposed to each other, and three post-holes at its eastern end and two at its western end. Two external post-holes (F2111 and F0277) 0.6 m to the south of the western end of the southern alignment of post-holes formed a porch that is assumed to represent the entrance. An internal post-hole (F2079) was situated to the south-east of the building. One post-hole (F2011) produced an agate scraper that is residual from Mesolithic activity on the site.



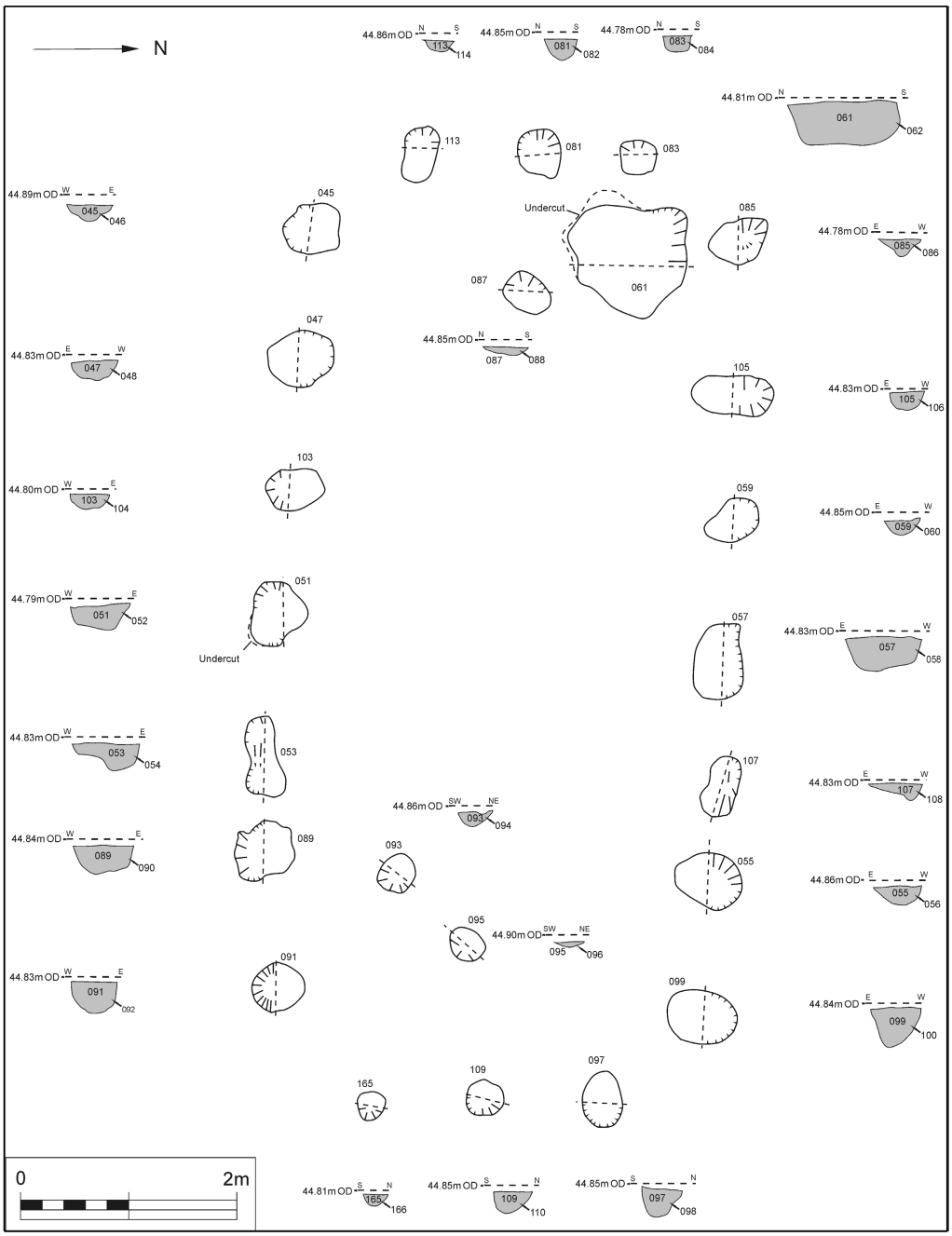
ILLUS. 21 Plan and sections of Dark Age Building 1



ILLUS. 22 Dark Age Building 1. The two post-holes forming the porch are situated at the centre left of the photograph

Building 2 (Illus 23–24) measured 9.28 m by 4.72 m internally being defined by seven opposed post-holes along each of its long axes and three post-holes at both the western and eastern ends. Two internal post-holes to the south-east (F2093 and F0295) may have formed an inner vestibule, while an internal shallow pit to the west (F2087) probably created an internal partition to the building. One lithic, a residual broken blade, was recovered from F2053. As mentioned previously, a large pit (F2061) was located in the north-west corner of this building which contained two sherds of Grooved Ware and contained evidence of *in situ* burning. This pit may be Dark Age, although it is thought more likely to be Late Neolithic, its location within the building being purely fortuitous.

Building 3 (Illus 25–26), 8.8 m by 4.4 m internally, was defined by seven post-holes along each of its long axes that were directly opposed to each other and four post-holes on the western end and two post-holes on the eastern end. A line of three external post-holes to the east may represent an extension of the structure in this direction, or more likely a short fence line associated with the two Grooved Ware pits (F2133 and F2168) mentioned previously. One lithic, a residual and possibly Neolithic scraper, was recovered from Post-hole F2149.



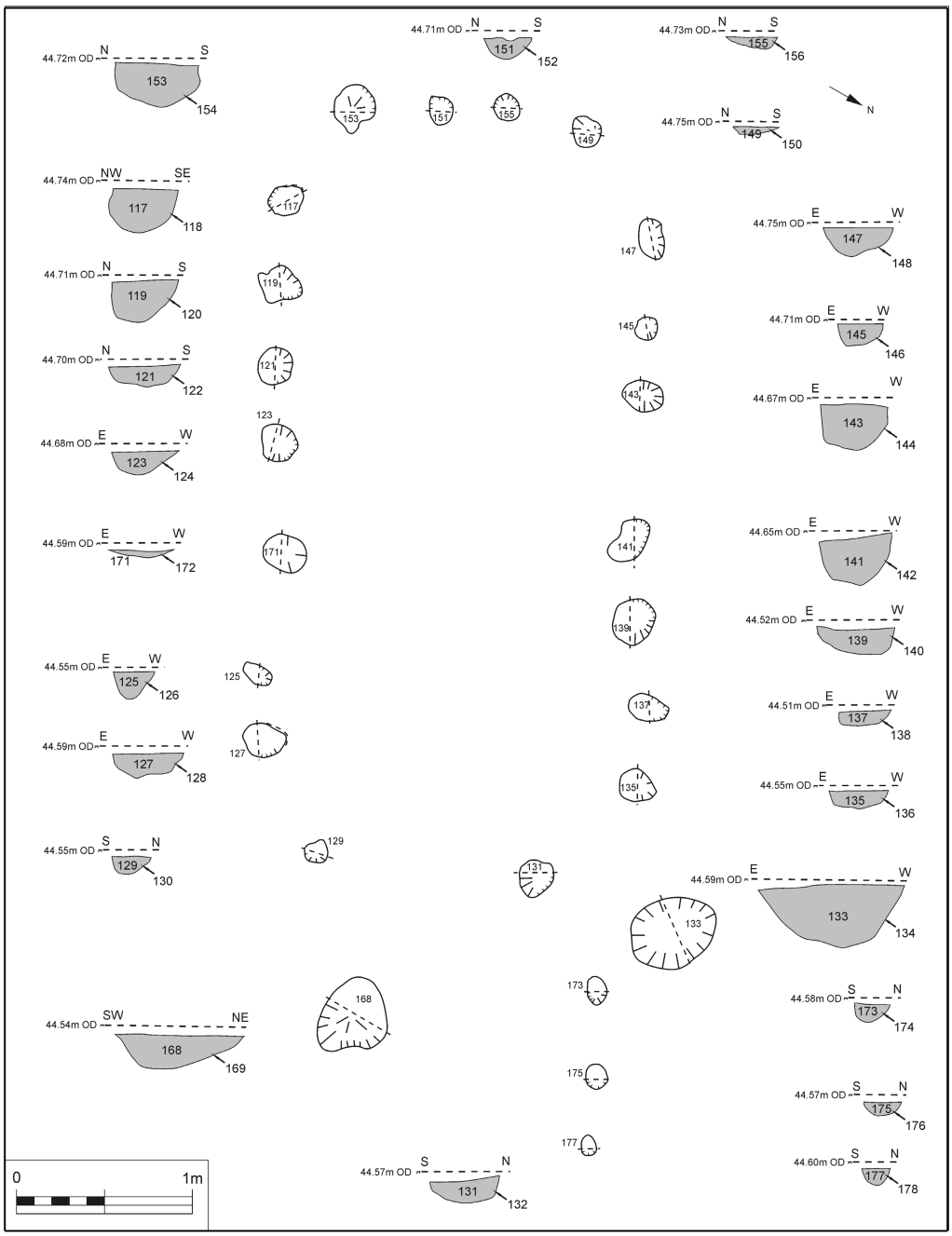
ILLUS. 23 Plan and sections of Dark Age Building 2

ILLUS. 24 Dark Age Building 2. The internal post-holes are visible at the bottom centre of the photograph and the large pit is towards the top of the photograph.

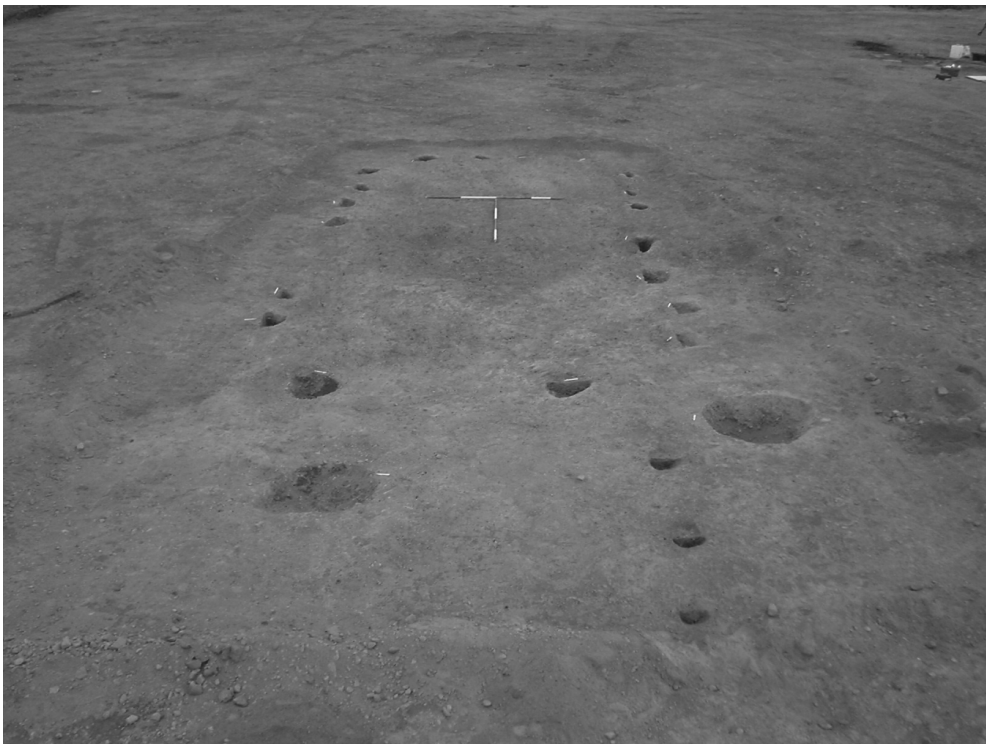
No Dark Age material culture was recovered, either from the buildings or the wider site, but three barley (*Hordeum vulgare*) seeds were recovered from two post-holes in Building 2 and four barley grains from a post-hole in Building 3. Buildings 1 and 2 had charred material submitted for radiocarbon dating. Two samples of short-lived species from each of four post-holes in both buildings were submitted. Insufficient material suitable for radiocarbon dating was recovered from Building 3.

RADIOCARBON DATING *by* D. HAMILTON, P. MARSHALL, C. WADDINGTON, C. BRONK RAMSEY, and G. COOK

Forty-three samples were submitted for radiocarbon dating by Accelerator Mass Spectrometry (AMS) at the Scottish Universities Environmental Research Centre (SUERC), East Kilbride and the Oxford Radiocarbon Accelerator Unit (ORAU). These consisted of twenty samples of charred wood, eight samples of carbonized wheat, six samples of carbonized hazelnut shell, and eight carbonized residues adhering to the interior surface of pottery sherds. The samples submitted to SUERC were prepared using methods outlined by Stenhouse and Baxter (1983), combusted to CO_2 (Vandeputte et al. 1996), converted to graphite (Slota et al. 1987), and measured as described by Maden et al. (2007). Those submitted to ORAU were prepared



ILLUS. 25 Plan and sections of Dark Age Building 3



ILLUS. 26 Dark Age Building 3. The two large pits and line of three stake-holes are visible at the bottom of the photograph

according to methods given in Hedges et al. (1989), apart from OxA-16070 which was pre-treated (UW) following the method described in Wright et al. (2001). All the samples were converted to graphite and dated by AMS (Dee and Bronk Ramsey 2000; Bronk Ramsey et al. 2004).

The results, given in Tables 6 and 7, are conventional radiocarbon ages (Stuiver and Polach 1977), and are quoted in accordance with the international standard known as the Trondheim convention (Stuiver and Kra 1986). The calibrations of these results, relating the radiocarbon measurements directly to calendar dates, have been calculated using the calibration curve of Reimer et al. (2004) and the computer program OxCal (v3.10) (Bronk Ramsey 1995; 1998; 2001). The calibrated date ranges for these samples are given in Table 6 and have been calculated using the maximum intercept method (Stuiver and Reimer 1986). They are quoted in the form recommended by Mook (1986), with the end points rounded outwards to ten years. The graphical distributions of the calibrated dates, given in outline in Illus 27, 29, and 31 are derived from the probability method (Stuiver and Reimer 1993).

GENERAL APPROACH

The Bayesian approach to the interpretation of archaeological chronologies has been described by Buck et al. (1996). It is based on the principle that, although the calibrated age ranges of

Table 6 Radiocarbon dates from Cheviot Quarry Buildings

LABORATORY NUMBER	CONTEXT	MATERIAL	$\delta^{13}C$ (‰)	RADIOCARBON AGE (BP)	CALIBRATED DATE (95% CONFIDENCE)	POSTERIOR DENSITY ESTIMATE (95% PROBABILITY)
Building 1						
SUERC-9104	Post-hole 2029.	charcoal, *Salix/Populus* sp.	−24.6	2795±35	1030–840 cal. BC	–
SUERC-9108	Post-hole 2037.	charcoal, *Corylus avellana*	−26.2	2735±40	980–800 cal. BC	–
SUERC-9102	Post-hole 2017.	charcoal, *Corylus avellana*	−26.9	1620±35	cal. AD 340–540	–
SUERC-9103	Post-hole 2019.	charcoal, *Corylus avellana*	−27.0 ⋆	1565±50	cal. AD 390–610	–
Building 2						
SUERC-8959	Post-hole 2053.	hulled *Hordeum* sp.	−23.8	1520±35	cal. AD 430–620	*cal. AD 430–600*
OxA-15545	Post-hole 2053.	*Hordeum* sp.	−24.4	1517±26	cal. AD 430–610	*cal. AD 430–600*
SUERC-8960	Post-hole 2047.	charcoal, *Corylus avellana*	−29.0	1545±35	cal. AD 420–600	*cal. AD 430–580*
OxA-15546	Post-hole 2047.	charcoal, *Salix/Populus* sp.	−25.4	1531±27	cal. AD 430–600	*cal. AD 430–590*
SUERC-8961	Post-hole 2107.	charcoal, *Salix* sp.	−24.9	2315±35	410–260 cal. BC	–
OxA-15547	Post-hole 2107.	charcoal, indeterminate	−26.2	2290±29	400–230 cal. BC	–
SUERC-8962	Post-hole 2057.	hulled *Hordeum* sp.	−22.7	1575±35	cal. AD 400–570	*cal. AD 430–570*
Building 4						
SUERC-9109	Post-hole 346.	charcoal, *Betula* sp.	−27.9	2725±35	970–800 cal. BC	*930–820 cal. BC*
SUERC-9110	Post-hole 346.	charcoal, *Corylus avellana*	−25.6	2800±35	1050–840 cal. BC	*970–840 cal. BC*
SUERC-9111	Post-hole 348.	charcoal, Pomoideae	−25.5	2775±35	1010–830 cal. BC	*970–830 cal. BC*
SUERC-9112	Post-hole 348.	charcoal, *Corylus avellana*	−26.2	5015±35	3950–3700 cal. BC	–
SUERC-9513	Post-hole 363.	charcoal, *Corylus avellana*	−25.6	2765±35	1010–820 cal. BC	*970–830 cal. BC*
SUERC-9113	Post-hole 363.	Emmer	−23.0	2745±35	980–810 cal. BC	*940–830 cal. BC*
SUERC-9114	Post-hole 369.	charcoal, *Quercus* sp., twig	−27.1	5740±35	4690–4490 cal. BC	–
SUERC-11294	Hearth 342.	*Hordeum*	−24.9	2795±40	1050–830 cal. BC	*970–840 cal. BC*
OxA-X-2178-15[1]	Hearth 342.	*Hordeum*	−28.3	2755± 55	1020-800 cal. BC	*960-830 cal. BC*

OxA-16066	Basal fill 483 of large pit F340.	*Hordeum*	−25.4	2759±30	1000–820 cal. BC	*940–830 cal. BC*
OxA-16067	Basal fill 483 of large pit F340.	carbonized residue	−25.9	2693±30	910–800 cal. BC	*920–820 cal. BC*
Building 5						
SUERC-9101	Post-pipe 489.	hulled *Hordeum* sp.	−24.2	2805±35	1050–840 cal. BC	*1010–900 cal. BC*
SUERC-9100	Post-pipe 489.	charcoal, *Corylus avellana*	−27.6	2850±35	1130–910 cal. BC	*1030–910 cal. BC*
SUERC-9094	Post-pipe 312.	charcoal, *Salix/Populus* sp.	−25.8	2820±35	1060–890 cal. BC	*1010–900 cal. BC*
SUERC-9093	Post-pipe 312.	charcoal, *Corylus avellana*	−27.0	2795±35	1030–840 cal. BC	*1000–900 cal. BC*
SUERC-9092	Post-hole 308.	charcoal, *Corylus avellana*	−26.4	2785±35	1020–830 cal. BC	*1010–890 cal. BC*
SUERC-9091	Post-hole 308.	charcoal, *Corylus avellana*	−25.4	2735±35	980–810 cal. BC	*1000–870 cal. BC*
SUERC-9098	Post-hole 316.	charcoal, *Corylus avellana*	−27.5	2855±35	1130–910 cal. BC	*1030–910 cal. BC*
SUERC-9099	Post-hole 316.	charcoal, *Corylus avellana*	−27.7	2790±30	1020–840 cal. BC	*1010–900 cal. BC*
OxA-X-2178-14[2]	Hearth 306.	carbonized residue	−31.6	2785±75	1130-800 cal. BC	*1020-880 cal. BC*

⋆ assumed $\delta^{13}C$

1 This sample yielded only 129 micrograms of carbon from the combustion of just under 10mg of pretreated material which is at the absolute limits of ORAU smallest sized graphites. The graphite produced yielded low target current during measurement of 4.7 microAmps which resulted in a higher than usual standard error.

2 This sample produced a low carbon yield (245 micrograms) and low target current of 8.3 microAmps.

TABLE 7 Radiocarbon results from carbonized residues and charred plant remains associated with specific depositional events that included pottery from Cheviot Quarry

LABORATORY NUMBER	CONTEXT	MATERIAL	$\delta^{13}C$ (‰)	RADIOCARBON AGE (BP)	CALIBRATED DATE (95% CONFIDENCE)	POSTERIOR DENSITY ESTIMATE (95% PROBABILITY)
OxA-16068	Basal fill 052 of large pit F031	Hazelnut - Carinated Bowl	−24.2	4999±32	3940–3700 cal. BC	
OxA-16097	Basal fill 051 of large pit F009	Hazelnut - Carinated Bowl	−26.5	4933±35	3790–3640 cal. BC	
OxA-16069★	Basal fill 052 of large pit F031	Carbonized residue - Carinated Bowl	−27.2	4906±34	3770–3630 cal. BC	
OxA-16162	Basal fill 051 of large pit F009	Carbonized residue - Carinated Bowl	−27.4	4870±40	3710–3530 cal. BC	
OxA-16099★	Fill of pit F204 excavated by MAP	Carbonized residue - Impressed Ware	−27.4	4348±34	3090–2890 cal. BC	
SUERC-11296	Fill of pit 2168	Hazelnut - Grooved Ware	−26.0	4250±35	2920–2760 cal. BC	
OxA-16096	Fill of pit 2168	Hazelnut - Grooved Ware	−23.3	4177±33	2890–2630 cal. BC	
OxA-16098	Fill of pit F219 excavated by MAP	Carbonized residue – Grooved Ware	−27.8	4155±33	2880–2580 cal. BC	
OxA-16070	Fill of pit 2133	Hazelnut - Grooved Ware	−23.7	4152±31	2880–2600 cal. BC	
OxA-16178	Fill of pit F219 excavated by MAP	Carbonized residue – Grooved Ware	−27.2	4148±32	2880–2580 cal. BC	
SUERC-11295	Fill of pit 2133 adjacent to Building 3	Hazelnut - Grooved Ware	−24.4	4130±35	2880–2570 cal. BC	
OxA-16163[1]	MAP/Pot 1	Carbonized residue - Beaker	−25.8	3625±40	2140–1880 cal. BC	

OxA-X-2178-14	Hearth 306. Building 5	Carbonized residue - Flat-Rimmed Ware 1020-880 cal. BC	−31.6	2785±75	1130-800 cal. BC	
OxA-16066	Basal fill 483 of large pit F340. Building 4	*Hordeum* - Flat-Rimmed Ware	−25.4	2759±30	1000–820 cal. BC	*940–830 cal. BC*
OxA-16067★	Basal fill 483 of large pit F340. Building 4	Carbonized residue – Flat- Rimmed Ware	−25.9	2693±30	910–800 cal. BC	*920–820 cal. BC*
OxA-X-2178-15	Hearth 342. Building 4	*Hordeum* – Flat-Rimmed Ware	−28.3	2755± 55	1020-800 cal. BC	*960-830 cal. BC*
SUERC-11294	Hearth 342. Building 4	*Hordeum* – Flat-Rimmed Ware	−24.9	2795±40	1050–830 cal. BC	*970–840 cal. BC*

★ Pot residues extracted from the surfaces of these samples produced very high yields of carbon (between 42-63% on combustion) which is much higher than usual

1 The measurable carbon obtained from combustion of this sample was very low (480 micrograms) and there was an offset between the d13C value measured on the AMS and that measured on the mass spectrometer.

radiocarbon measurements accurately estimate the calendar ages of the samples themselves, it is the dates of archaeological events associated with those samples that are important. Bayesian techniques can provide realistic estimates of the dates of such events by combining absolute dating evidence, such as radiocarbon results, with relative dating evidence, such as stratigraphic relationships between radiocarbon samples. These 'posterior density estimates' (which, by convention, are always expressed in italics) are not absolute. They are interpretative estimates, which will change as additional data become available or as the existing data are modelled from different perspectives.

The technique used is a form of Markov Chain Monte Carlo sampling, and has been applied using the programme OxCal (v3.10) (http://units.ox.ac.uk/departments/rlaha), which uses a mixture of the Metropolis-Hastings algorithm and the more specific Gibbs sampler (Gelfand and Smith 1990; Gilks et al. 1996). Details of the algorithms employed by this programme are available from the on-line manual or in Bronk Ramsey (1995; 1998; 2001). The algorithms used in the models described below can be derived from the structure shown in Illus 27 and 29.

OBJECTIVES AND SAMPLE SELECTION

The four structures with samples suitable for radiocarbon analysis at Cheviot Quarry were both spatially separated and morphologically different, there being two roundhouses and two rectangular buildings. The site also had numerous pit features that contained Neolithic and Bronze Age pottery including sherds of Carinated Bowl, Impressed Ware, Grooved Ware, Beaker and Flat-Rimmed Ware.

The objectives of the dating programme were to:

1 establish a chronology for the features on the site;
2 determine the chronological relationship between the Neolithic pits, the roundhouses, and the rectangular buildings;
3 establish the temporal relationship between the roundhouses;
4 establish the temporal relationship between the rectangular buildings;
5 determine whether the internal features relate to the use of the structures;
6 provide precise dates for pottery styles from the north of England.

The first stage in sample selection was to identify short-lived material, which was unlikely to be residual to the context from which it was recovered. The taphonomic relationship between a sample and its context is the most hazardous link in this process, since the mechanisms by which a sample came to be in its context are a matter of interpretative decision rather than certain knowledge. All samples consisted of single entities (Ashmore 1999). The categories of material selected for dating from Cheviot Quarry were:

- charcoal from short-lived species — from a context in which it seemed to have been freshly deposited, e.g. fuel in a hearth;
- charred hazelnut shells — where they formed substantial and discrete deposits likely to represent a single event related to the use of the feature;
- residues on well-preserved joining sherds — where the survival of the residue seemed to indicate that the sherds had not been exposed to weathering and the proximity of a number of sherds from the same vessel suggested that the vessel was not redeposited;
- samples of intrinsic interest — where the context was not the issue, such as residues on pottery sherds to date the pottery style.

Other samples with a less certain taphonomic origin comprised material from the fill of post-holes; interpreted as relating to the use of structures rather than its construction, as suggested

by experimental archaeology (Reynolds 1995). Where possible, duplicate samples from these contexts were submitted to test the assumption that the material was of the same actual age.

MODEL DEVELOPMENT AND ANALYSIS

Building 4

Duplicate samples were submitted from four post-holes, although one (F369) produced a Late Mesolithic date (SUERC-9114; 5740±35 BP) from a residual oak twig and another (F348) produced an Early Neolithic date (SUERC-9112; 5015±35 BP) from a residual hazelnut. Two samples of charcoal were submitted from Post-hole F346, which forms part of the east side of the entrance. The two measurements (SUERC-9109; 2725±35 BP and SUERC-9110; 2800±35 BP) are statistically consistent (T'=2.3; =1; T'(5%)=3.8; Ward and Wilson 1978) and could therefore be of the same actual age.

One sample of charcoal and one charred seed of emmer wheat were submitted from Post-hole F363, which forms part of the north side of the structure. The two measurements (SUERC-9513; 2765±35 BP and SUERC-9113; 2745±35 BP) are statistically consistent (T'=0.2; =1; T'(5%)=3.8) and could therefore be of the same actual age. Two samples of charcoal were submitted from double post-hole, F348, which lies on the south side of the entrance. The two measurements (SUERC-9111; 2775±35 BP and SUERC-9112; 5015±35 BP) are not statistically consistent (T'=1983.7; =1; T'(5%)=3.8), suggesting the context contains material of different ages. One sample of charcoal (SUERC-9114) was dated from Post-hole F369 which appears to form part of the south wall. A further four samples were dated from a hearth and pit feature within the structure. A single grain of *Hordeum* sp. and a carbonized residue from fill F483 of pit feature F340 within the building, produced two measurements (OxA-16066; 2759±30 BP and OxA-16067; 2693±30 BP) which are statistically consistent (T'=2.4; =1; T'(5%)=3.8) and could therefore be of the same actual age. Finally, two single grains of carbonized *Hordeum* sp. from the central hearth F342 also gave statistically consistent measurements (T'=0.3; =1; T'(5%)=3.8; SUERC-11294; 2795±40 BP and OxA-X-2178-15; 2755±55 BP).

The eleven measurements on samples from Building 4 are not statistically consistent (T'=11403.6; =10; T'(5%)=18.3). However, if the two obvious Mesolithic and Neolithic dates (SUERC-9112 and SUERC-9114) are excluded, the remaining nine measurements are statistically consistent (T'=8.1; =8; T'(5%)=15.5) suggesting that these samples could all be of the same age and place the building in the Late Bronze Age.

Building 5

Duplicate samples were submitted from four post-holes and a single sample from the hearth (F306) of Building 5. Owing to the heavy truncation in this part of the site, the four post-holes that make up the porch were selected for dating as these were the best-preserved and most intact features. One sample of charcoal and one grain of carbonized *Hordeum* sp. were submitted from Post-hole F489. The two measurements (SUERC-9101; 2805±35 BP and SUERC-9100; 2850±35 BP) are statistically consistent (T'=0.8; =1; T'(5%)=3.8) and could therefore be of the same actual age. Two samples of charcoal were submitted from Post-hole F312. The two measurements (SUERC-9094; 2820±35 BP and SUERC-9093; 2795±35 BP) are statistically consistent (T'=0.3; =1; T'(5%)=3.8) and could therefore be of the same actual age. Two samples of charcoal were submitted from Post-hole F308; the measurements (SUERC-9092; 2785±35 BP and SUERC-9091; 2735±35 BP) are also statistically consistent (T'=1.0; =1; T'(5%)=3.8). Finally, the two samples of charcoal submitted from Post-hole F316

(SUERC-9098; 2855±35 BP and SUERC-9099; 2790±35 BP) are statistically consistent (T'=2.0; =1; T'(5%)=3.8) and could therefore be of the same actual age.

A single measurement (OxA-X-2178-14; 2785±75 BP) came from the residue adhering to the interior of a sherd of Late Bronze Age Flat-Rimmed ware, one of sixteen sherds from the hearth F306.

All nine measurements from Building 5 are statistically consistent (T'=8.6; =8; T'(5%)=15.5) and suggest that the samples could all be of the same actual age. A chi-square test of the eighteen measurements on non-residual material from the roundhouses shows that they are statistically consistent (T'=25.6; =17; T'(5%)=27.6) and suggests that these two buildings might be of the same actual date and that they were in use contemporaneously.

Building 1

Building 1 is made up of nineteen post-holes. Duplicate samples were submitted from four post-holes, although one sample from each post-hole failed at pre-treatment because it yielded insufficient carbon. This was all the suitable material for radiocarbon analysis, so no replacement samples could be submitted. One sample of charcoal (SUERC-9104) was dated from Post-hole F029, which forms part of the east gable wall. One sample of charcoal (SUERC-9104) was dated from Post-hole F037, which is an entrance post in the south wall. One sample of charcoal was dated from Post-holes F017 (SUERC-9102) and F019 (SUERC-9103) which are positioned next to one another and form part of the north wall.

The four measurements on samples from Building 1 are not statistically consistent (T'=882.0; =3; T'(5%)=7.8). However, by excluding SUERC-9104 and SUERC-9108, the remaining two measurements are statistically consistent (T'=0.8; =1; T'(5%)=3.8). The removal of these two Bronze Age measurements, no doubt residual material from the known Late Bronze Age occupation of the site, in favour of the 'Dark Age' measurements is based upon the spatial proximity and morphological similarity of Buildings 1 and 2, the latter with nearly twice as many measurements having been attributed to the 'Dark Age' (see below).

Building 2

Building 2 is made up of twenty post-holes. Duplicate samples were submitted from four post-holes, although one sample failed from Post-hole F057. Two samples of *Hordeum* sp. were submitted from Post-hole F053, which is centrally located in the south wall. The two measurements (SUERC-8959; 1520 ± 35 BP and OxA-15545; 1517±26 BP) are statistically consistent (T'=0.0; =1; T'(5%)=3.8) and could therefore be of the same actual age. Two samples of charcoal were submitted from Post-hole F047, which lies to the west end of the south wall. The two measurements (SUERC-8960; 1545 ± 35 BP and OxA-15546; 1531 ± 27 BP) are statistically consistent (T'=0.1; =1; T'(5%)=3.8) and could therefore be of the same actual age. One sample of charred *Hordeum* sp. (SUERC-8962) was dated from Post-hole F057, which is centrally located in the north wall. Two samples of charcoal were submitted from Post-hole F107, which is centrally located in the north wall, next to F057 and opposed to F053. The two measurements (SUERC-8961; 2315±35 BP and OxA-15547; 2290±29 BP) are statistically consistent (T'=0.3; =1; T'(5%)=3.8) and could therefore be of the same actual age.

The seven measurements from Building 2 are not statistically consistent (T'=890.4; =6; T'(5%)=12.6). However, if the two measurements from Post-hole F107 are excluded as being residual Iron Age material, the remaining samples are statistically consistent (T'=2.1; =4; T'(5%)=9.5). The model in Illus. 29 has therefore excluded both SUERC-8961 and OxA-15547. A chi-square test of the seven measurements on the non-residual material from the

rectangular buildings shows that they are statistically consistent (T'=7.4; =6; T'(5%)=12.6) and suggests that these two buildings might be of the same actual date.

Pottery

Eight radiocarbon determinations were made on carbonized residues adhering to the interior surfaces of pottery sherds. To test the accuracy and consistency of the residue dates and purported associated material (i.e. hazelnut shells from the same feature fills), duplicate samples from the same pit fill were submitted where possible. The contexts that this material came from were clearly single event deposits.

Pit F031 (Context 052) from the northern area contained eighty-five Carinated Bowl sherds and over 1000 hazelnut shells. Two samples were submitted; a carbonized residue and hazelnut shell. The two results (OxA-16068; 4999 ± 32 BP and OxA-16069; 4906 ± 34 BP) are not statistically consistent (T'=4.0; =1; T'(5%)=3.8). They are, however, consistent at the 99% critical value (T'(1%)=6.6), and this slight inconsistency is likely to be due to random statistical scatter on the measurements. Therefore, it is possible that these two samples are of the same actual age.

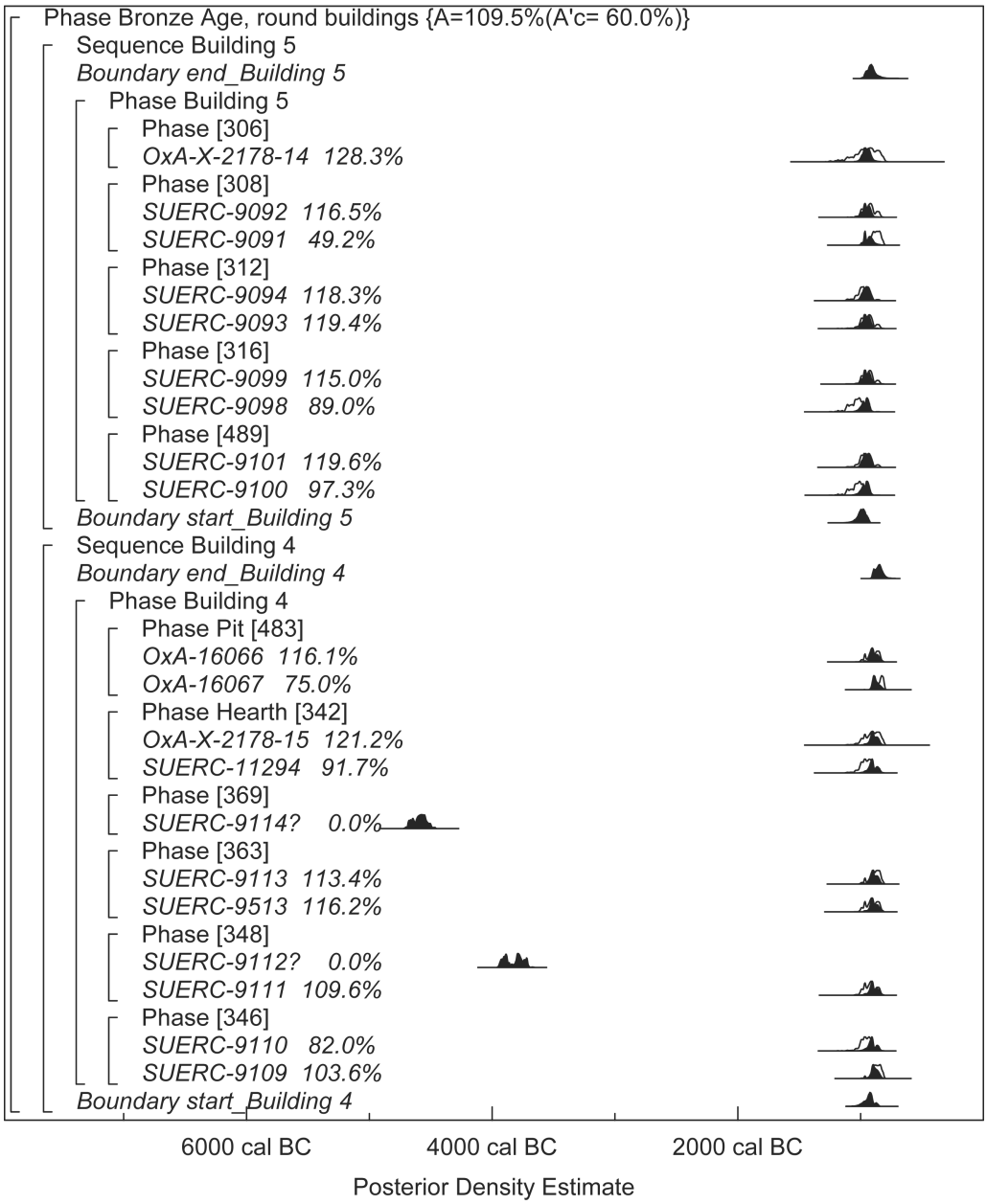
Pit F009 (Context 051) also from the northern area contained sixty-three Carinated Bowl sherds and numerous hazelnut shells. Two samples were submitted, one each of carbonized residue and hazelnut shell. The two results (OxA-16097; 4933±35 BP and OxA-16162; 4870±40 BP) are statistically consistent (T'=1.4; =1; T'(5%)=3.8) and could be of the same actual age.

The residue adhering to the interior of one Impressed Ware sherd from the MAP excavations at Cheviot Quarry South was dated: OxA-16099 (4348±34 BP) from the fill of Pit F204 providing a date around the beginning of the third millennium cal. BC.

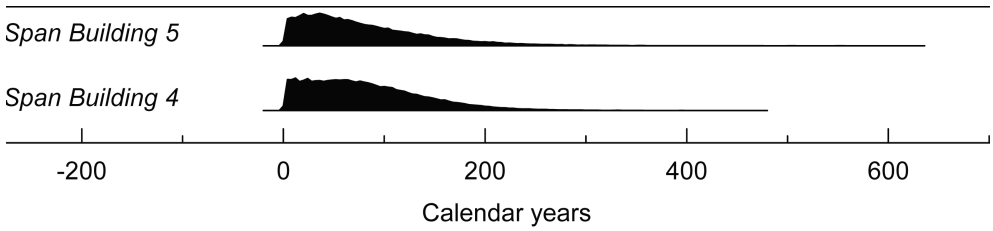
The Grooved Ware from the northern area had no visible residues and so the pottery from this area was dated by submitting duplicate charred hazelnut shells from the same deposit, where the shells were clearly associated and thought to be part of the same depositional event. Pit F2133 (Context 2133) contained ten Grooved Ware sherds and a small number of hazelnut shells. Two hazelnut shells were submitted for dating from this context. The two measurements (OxA-16070; 4152±31 BP and SUERC-11295; 4130±35 BP) are statistically consistent (T'=0.2; =1; T'(5%)=3.8) and are likely to be of the same actual age. Pit F2168 (2168) contained three Grooved Ware sherds and a small number of carbonized hazelnut shells. The two measurements, on hazelnut shells (OxA-16096; 4177±33 BP and SUERC-11296; 4250±35 BP), are statistically consistent (T'=2.3; =1; T'(5%)=3.8) and could be of the same age. Pits F2133 and F2168 were located immediately (less than 1 m) east of Dark Age Building 3. The single pit that produced Grooved Ware from the southern area, Pit F219, produced sherds from a variety of Grooved Ware vessels and the carbonized residues from two sherds from separate vessels were submitted. The two results from Pit F219 (OxA-16178, 4148±32 BP; and OxA-16098, 4155±33 BP) are statistically consistent (T'=0.0; =1; T'(5%)=3.8) and could be of the same actual age. The results suggest the material within the pit broadly dates to the second quarter of the third millennium cal. BC.

One residue adhering to a Beaker sherd from the MAP excavations was dated; OxA-16163 (3625±40 BP) from Pit F102. This produced a date spanning the centuries around 2000 cal. BC placing it well within the time-span associated with Beaker ceramics elsewhere in the country (cf. Needham 2005).

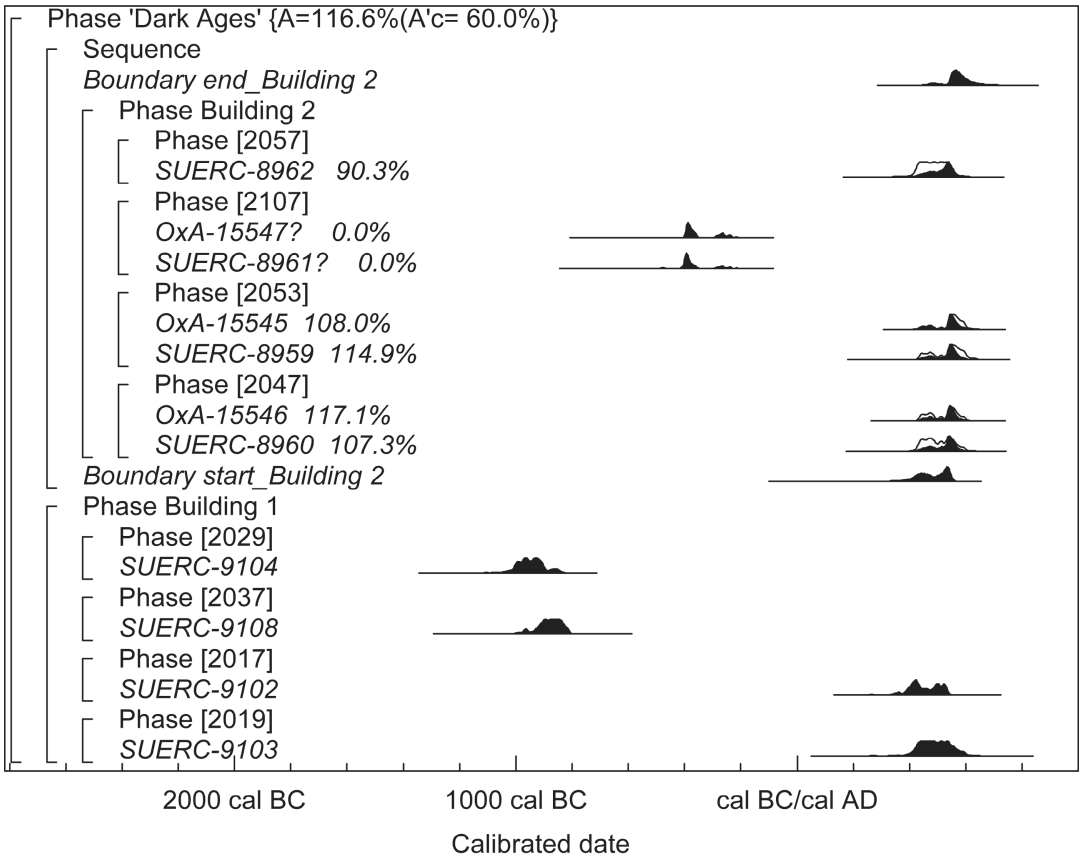
Two charred barley grains from a significant amount of charred organic material (including eighty-nine grains) were submitted from Hearth F342 in Building 4 to date the associated Flat-Rimmed Ware vessel (five sherds from the same vessel). The two measurements are statistically



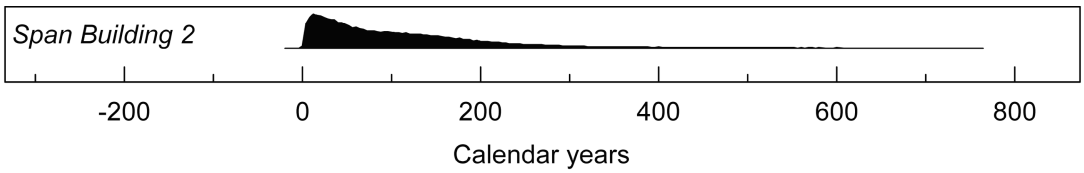
ILLUS. 27 Probability distributions of dates from Cheviot Quarry Roundhouses: each distribution represents the relative probability that an event occurs at a particular time. For each of the radiocarbon dates two distributions have been plotted, one in outline, which is the result of simple radiocarbon calibration, and a solid one, which is based on the chronological model used. A question mark (?) indicates that the result has been excluded from the model The large square brackets down the left hand side along with the OxCal keywords define the model exactly. SUERC-9112 and -9114 have been excluded from the model as they are likely to be residual material.



ILLUS. 28 Probability distribution of the number of years during which the Cheviot Quarry roundhouses were in use. The distribution is derived from the model defined in Illus. 27.



ILLUS. 29 Probability distributions of dates from Cheviot Quarry rectangular buildings: each distribution represents the relative probability that an event occurs at a particular time. For each of the radiocarbon dates two distributions have been plotted, one in outline, which is the result of simple radiocarbon calibration, and a solid one, which is based on the chronological model used. A question mark (?) indicates that the result has been excluded from the model The large square brackets down the left hand side along with the OxCal keywords define the model exactly. SUERC-8961, -9104, -9108, and OxA-15547 have been excluded from the model as they are likely to represent residual material.



ILLUS. 30 Distribution of the number of years during which the Cheviot Quarry Building 2 was in use. The distribution is derived from the model defined in Illus. 29.

consistent (T'=0.3; =1; T'(5%)=3.8; SUERC-11294; 2795±40 BP and OxA-X-2178–15; 2755±55 BP) and could be of the same actual age. One charred barley grain and a carbonized residue from a pottery sherd were dated from the basal fill of the internal midden Pit F340 in Building 4. The two measurements are statistically consistent (T'=2.4; =1; T'(5%)=3.8; OxA-16066; 2759 ± 30 BP and OxA-16067; 2693 ± 30 BP) and could be of the same actual age. A further carbonized residue adhering to a sherd of Flat-Rimmed Ware from Hearth F306 in Building 5 dates to 1130-800 cal. BC (OxA-X-2178-14; 2785±75 BP).

DISCUSSION OF RESULTS

The models shown in Illus 27 and 29 share the underlying assumption that the samples selected from post-holes, hearths, and pits come from continuous phases of activity (i.e. the use of individual structures). While the Bayesian models allow us to provide estimates for specific archaeological events, the truncated nature of the archaeological deposits only really allows us to give minimum estimates for the start, end, and span of use of individual structures.

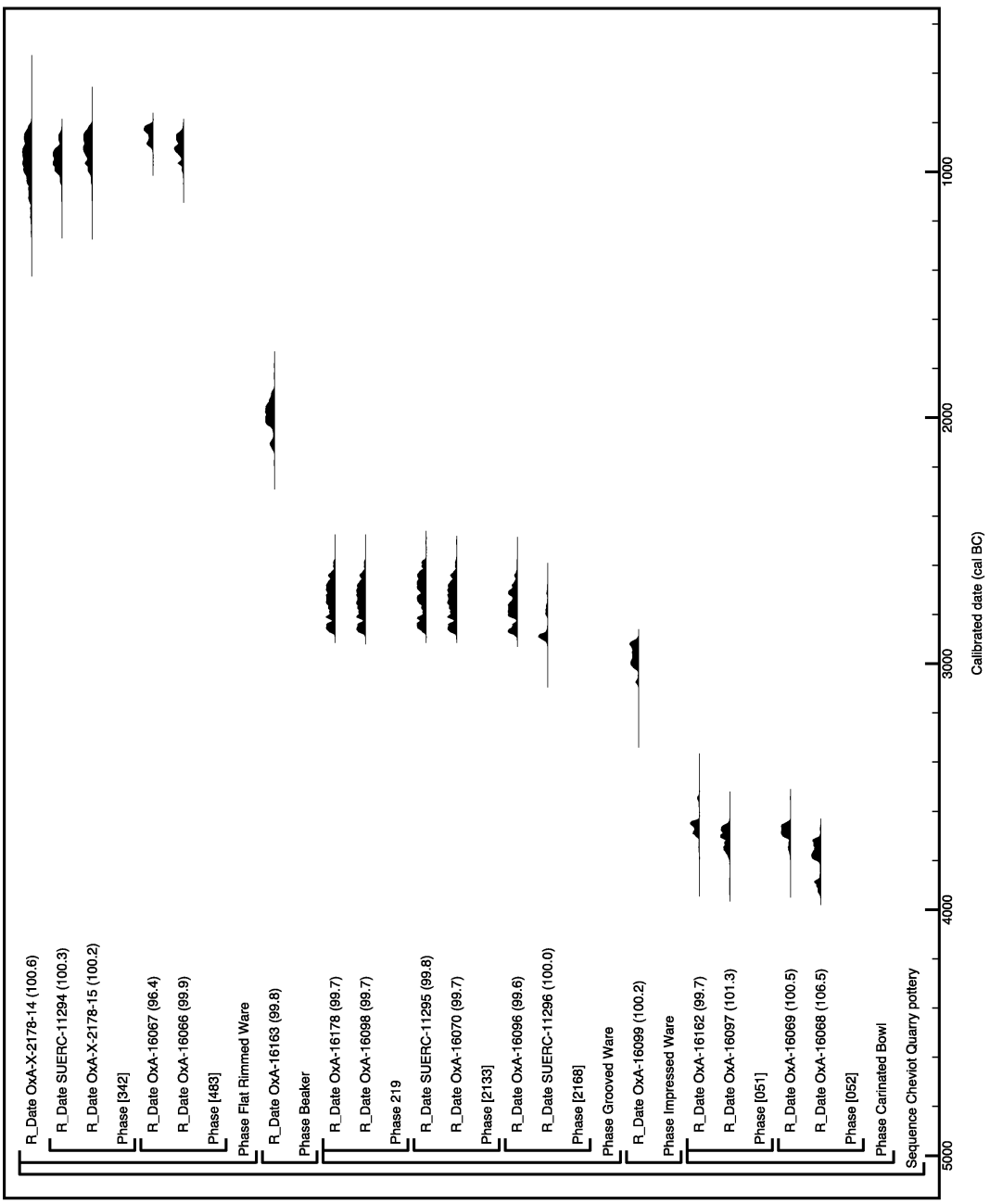
Buildings 4 and 5

The model and results for the roundhouses, Buildings 4 and 5, are shown in Illus 27 and 28. This model (Illus. 27) shows good overall agreement ($A_{overall}$=109.5%; A'=60.0%) and provides an estimate for the start of use of Building 5 of *1080–920 cal. BC (95% probability; start_Building 5*) and end of *980–820 cal. BC* (*95% probability; end_Building 5*). It was in use for a minimum of *1–210 years* (*95% probability; Span Building 5*), and probably *1–110 years* (*68% probability*).

The use of Building 4 is estimated to have started in *1020–850 cal. BC* (*95% probability; start_Building 4*) and ended *910–790 cal. BC* (*95% probability; end_Building 4*). The model suggests it was in use for a minimum of *1–200 years* (*95% probability; Span Building 4*), and probably *1–110 years* (*68% probability*).

Further analysis of the results shows it is 86.9% probable that Building 5 was constructed before Building 4 and 88.8% probable that it went out of use first as well, although Building 4 was probably constructed before Building 5 went out of use (65.7% probability).

ILLUS. 31 (opposite) Probability distributions of dates from Cheviot Quarry ceramics: each distribution represents the relative probability that an event occurs at a particular time. For each of the radiocarbon dates two distributions have been plotted, one in outline, which is the result of simple radiocarbon calibration, and a solid one, which is based on the chronological model used. The large square brackets down the left hand side along with the OxCal keywords define the model exactly.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R_Date SUERC-11294 (100.3)
R_Date OxA-X-2178-15 (100.2)
Phase [342]
R_Date OxA-16067 (96.4)
R_Date OxA-16066 (99.9)
Phase [483]
Phase Flat Rimmed Ware
R_Date OxA-16163 (99.8)
Phase Beaker
R_Date OxA-16178 (99.7)
R_Date OxA-16098 (99.7)
Phase 219
R_Date SUERC-11295 (99.8)
R_Date OxA-16070 (99.7)
Phase [2133]
R_Date OxA-16096 (99.6)
R_Date SUERC-11296 (100.0)
Phase [2168]
Phase Grooved Ware
R_Date OxA-16099 (100.2)
Phase Impressed Ware
R_Date OxA-16162 (99.7)
R_Date OxA-16097 (101.3)
Phase [051]
R_Date OxA-16069 (100.5)
R_Date OxA-16068 (106.5)
Phase [052]
Phase Carinated Bowl
Sequence Cheviot Quarry pottery
5000
4000
3000
2000
1000
Calibrated date (cal BC)

Buildings 1 and 2

The model and results for Buildings 1 and 2 are shown in Illus 29 and 30. This model (Illus. 29) shows good overall agreement ($A_{overall}$=116.6%; A'=60.0%) and provides estimates for the start of activity associated with Building 2 of *cal. AD 330–570* (*95% probability; start_Building 2*) and end of *cal AD 450–700* (*95% probability; end_ Building 2*). The structure is estimated to have been in use for a minimum of *1–310 years* (*95% probability; Span Building 2*), and probably for *1–140 years* (*68% probability*).

Pottery

The figure shown in Illus. 31 assumes a simple typological sequence from Carinated Bowl to Impressed Ware, Grooved Ware, Beaker, and eventually Flat-Rimmed Ware. It suggests that Carinated Bowls were in use at the site in the earlier part of the fourth millennium cal. BC, Impressed Ware at the beginning of third millennium cal. BC, Grooved Ware in the earlier part of the third millennium cal. BC, Beaker at the end of the third millennium cal. BC and Flat-Rimmed Ware around the end of the second millennium and start of the first millennium cal. BC.

BOTANICAL MACROFOSSIL ANALYSIS *by* BEN JOHNSON and JACQUELINE COTTON

METHODOLOGY

Ninety-four features from the ARS Ltd excavation, comprising pits, hearths and post-holes, were excavated by hand and all material excavated was processed on site by flotation. The bulk samples, of varying volumes from 10 to >100 litres, were sieved to five fractions (5 mm, 2 mm, 1 mm 500 microns and 300 microns). Owing to the absence of wetland areas at the site waterlogged plant remains were not preserved. Non-charred material present in the samples was not contemporary with the contexts and has not been analysed as it represents later intrusive material such as roots etc. All material was scanned at low magnifications using a Leica MZ6 microscope and identifications made with reference to modern material and published sources. The flot matrix of all samples was also recorded. For clarity, all material is discussed in relation to the context from which it derived and has been divided by period into Neolithic, Late Bronze Age and Dark Age. The period divisions have been ascribed based upon the radiocarbon dating and ceramic associations referred to above.

RESULTS

A summary of the results are presented in Table 8. Counts of all charred plant macrofossils were recorded. In one instance (Late Bronze Age fill of Pit F340), the very high abundance of cereal grains meant that the number present in the sample was derived by weight, by counting the number of cereal grains present in 25% of the sample and taking a mean weight that could be used to estimate the total number of each type of cereal grain present. The flot matrix in all samples was almost entirely charred wood fragments, with most containing rootlet material. The material varied in preservation quality, with some being very well preserved and some being highly abraded, suggesting it had been moved around prior to burial. This information is presented in Table 8 and has been taken into account in the discussion. The flots were generally very clean, with little adherence of fine silts.

Neolithic contexts

Artefact-rich pit F031 produced over 1000 charred hazelnut fragments, which included fragments over 5 mm in size, suggesting the material was fresh when deposited. Five grains of wheat (*Triticum* sp.) were found in the basal fill, with the remainder, from both fills, being too degraded to allow identification. Artefact-rich pit F009 contained little charred material in its upper fill, although twenty-three charred hazelnut fragments and six degraded cereal grains were counted. The basal fill contained over 100 hazelnut fragments and eight wheat (*Triticum* sp.) grains along with twenty-one indeterminate cereal grains and twenty-eight emmer wheat (*Triticum dicoccum*) spikelet fragments. Feature F2061 contained one hazelnut fragment and moderate amounts of charred wood. Pit F2133, outside Building 3, contained charred hazelnut shell fragments, some over 5 mm in size, and charred wood, suggesting the material was fresh when deposited. Pit F2168 also contained charred hazelnut shell fragments although these were small and abraded, as was the small quantity of charred wood, suggesting movement of the deposit prior to burial. Hearth feature F2013 produced one charred hazelnut fragment and one indeterminate cereal grain. Charred weed seeds were only recorded in Hearth F2005, and only in low numbers. These were dominated by grasses (Poaceae sp.), sedges (Cyperaceae sp.) and knotweeds (Polygonaceae sp.).

Late Bronze Age contexts

Cereal grains were the most common and abundant material, with most being barley (*Hordeum vulgare*) although emmer wheat was also present. Well-developed hulled barley grains were frequent, although some from the naked variety were noted. The small amount of chaff present (rachis segments) suggest that all were from the 6-row variety. In addition, there were a considerable number of grains of emmer wheat (*Triticum dicoccum*) and its chaff, particularly as glume bases and spikelet forks. Barley was recovered from almost every context in Building 4, with the exception of Post-holes F355 and F361 and the shallow pit F375. The most significant quantities were recovered from the large midden pit, F340, which contained around 4000 grains. Over 550 wheat (*Triticum* sp.) grains were also found in the fills of Pit F340, with over 500 of those grains coming from the upper fill of that pit. Small numbers of wheat grains were also found in Hearth F342, Post-holes F346, F348, F359 and F365, as well as Pit F352. Glume bases and spikelets from emmer wheat (*Triticum dicoccum*) were also recovered from Building 4, predominantly from the upper fill of Pit F340 and it is suggested that the wheat grains found are therefore emmer, rather than spelt (*Triticum spelta*). An apple pip (*Malus* sp.) was recovered from Post-hole F346, a sloe stone (*Prunus spinosa*) from Hearth F342 and small quantities of charred hazelnut were found in the uppermost fill of Pit F340. Barley was also recovered in small amounts from Post-holes F312 and F489, forming the entrance porch to Building 5, and its internal hearth, F314. No wheat grains were found inside Building 5, but a glume base and a spikelet from emmer wheat (*Triticum dicoccum*) were found in the large entrance pit F491. Weed seeds were uncommon throughout the various contexts from Buildings 4 and 5. The seeds which were present were dominated by sedges (Cyperaceae sp.) and knotweeds (Polygonaceae sp.) with some grasses (Poaceae sp.). Few contexts produced more than a handful of any particular weed, and they are not thought to represent specific collection practices by human action, but to be indicative of the local environmental context.

Dark Age contexts

None of the Dark Age contexts sampled produced any plant macrofossils, other than Post-hole F2131 in Building 3, which contained four barley (*Hordeum* sp.) grains. Only small amounts of abraded charcoal were recovered from these contexts.

TABLE 8. Botanical macrofossil numbers from Cheviot Quarry

CONTEXT NUMBER	306	312	489	491	314	338	340	342	344	346
Volume	25	40	30	50	25	50	100	35	20	10
Condition	Good	Abrad.	Good	Good	Good	Abrad.	Good	Abrad.	Abrad.	Abrad.
CEREALS										
Hordeum vulgare	0	3	4	0	4	10	3315	86	32	37
Trit. dicoccum	0	0	0	0	0	0	535	10	0	4
Cerealia indet.	0	0	0	0	0	1	322	26	0	15
CHAFF										
spikelet Trit. dicoccum	0	0	0	1	0	0	13	0	0	2
glume Trit. dicoccum	0	0	0	1	0	1	21	0	0	1
rachis Hordeum	0	0	0	0	0	0	3	0	0	0
WEEDS										
Poaceae spp.	0	0	0	0	0	3	50	11	2	3
Polygonaceae spp.	2	3	2	4	0	2	5	7	2	1
Persicaria lapathfolium	2	3	0	8	2	0	27	11	7	9
Rumex spp.	0	12	0	0	1	4	34	19	11	8
Carex spp.	1	5	1	3	2	7	33	27	7	12
Eleocharsis palustris	0	0	0	0	0	2	4	2	0	0
Atriplex/Cheno	2	9	1	9	4	1	55	15	15	16
Vicia/Lathyrus	0	0	0	0	0	1	0	0	0	0
Leguminosae	0	0	0	0	0	0	0	0	0	0
Ranunculus repens	0	0	0	0	0	0	17	3	0	0
Silene vulgaris	0	0	0	1	0	1	0	0	0	0
OTHER										
Malus	0	0	0	0	0	0	0	0	0	1
Prunus spinosa	0	0	0	0	0	0	0	1	0	0
Cor. ave.	0	0	0	0	0	0	27	0	0	0

TABLE 8. (continued)

348	352	359	363	365	367	373	477	2005	2131	TOTALS
50 Good	40 Good	15 Abrad.	15 Good	45 Abrad.	15 Good	15 Good	20 Good	35 Good	20 Abrad.	655
14	10	24	16	22	6	13	693	0	4	4293
6	1	5	0	3	0	0	28	0	0	592
7	5	10	0	5	0	3	83	0	0	477
2	0	0	0	0	0	2	0	0	0	20
2	0	1	0	3	0	0	0	0	0	30
0	0	0	0	0	0	0	1	0	0	4
7	2	1	2	2	1	1	38	13	0	136
0	0	0	3	0	2	1	0	7	0	41
2	7	11	2	15	2	6	11	7	0	132
9	11	7	2	0	1	0	1	12	0	132
9	1	3	3	12	2	7	2	20	0	157
2	0	0	0	1	0	1	0	2	0	14
8	12	18	7	21	7	11	16	7	0	234
0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	1	0	1
1	0	0	0	0	0	0	0	0	0	21
0	0	0	0	0	0	0	0	0	0	2
0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	27

BOTANICAL MACROFOSSIL DISCUSSION

Neolithic

The two large artefact-rich midden pits (F031 and F009) contained slightly different botanical macrofossil assemblages. F031 contained a large quantity of charred hazelnut shells, which most likely represents the remains of a systematically gathered foodstuff. The charring/roasting of them may have been undertaken to assist in opening the nut and making them more edible or to extract oil from the nuts, or perhaps even to help preserve them. The material in this pit appears fresh, suggesting this midden waste had been placed into the pit immediately after the burning episode. The small number of cereal grains recovered from this pit, coupled with the absence of chaff, indicates the grain deposits were incidental to the deposit and that the pit was not used for grain storage, or in direct proximity to a cereal processing area, and that waste deposition from these processes took place elsewhere. Pit F009 contained a smaller number of botanical remains than F031, but it did include some charred hazelnut shells, as well as emmer wheat spikelet fragments and glume bases, which represent the waste products from processing arable crops (Hillman 1981). The presence of chaff suggests that some of the deposit comes from the waste products from nearby cereal processing, and indicates the cultivation of arable crops for consumption at, or near, the site. Only Pit F009 produced any chaff and this may suggest that wheat processing was specific to this locality on the site. The absence of chaff from the upper fill may be a result of preservation conditions, but it is more likely that the carbonized lower fill represents a specific waste deposit formed as a result of food processing activities, including cooking. The deliberate deposition of this material as a single deposit in the lower fill of the pit, with the same pattern witnessed in Pit F031, implies that food processing was a structured activity that included keeping certain tasks and resulting cooking debris separate from other activities and that its disposal in large deep pits followed a set routine. The small numbers of plant remains from Hearth F2005, thought to be Neolithic in date, are only from weed species, with no evidence of either domesticated or wild resources being harvested. The weed seeds are very similar to those found in association with the Late Bronze Age buildings, and are from a grassland environment, perhaps used for stock grazing. Pits F2133 and F2168, situated close to Building 3, both contained charred hazelnut fragments. Those in F2133 were much better preserved than those in F2168 and suggest deposition immediately after they were burnt. They may represent the burning of nuts for fuel, or the fact that the nuts were still attached to the wood when it was used as fuel. Conversely, and probably most likely, they represent food waste products. The fewer, more abraded charred hazelnut fragments from F2168 probably represent different circumstances of deposition, and it may be that the material in this case was incidentally incorporated into the feature fill.

Late Bronze Age

Large volumes of barley and emmer wheat were recovered from almost all contexts in Building 4, as well as some barley and a very small amount of emmer wheat chaff being recovered from two post-holes and the central hearth in Building 5. The plant remains associated with the Late Bronze Age buildings show clear evidence of arable agricultural practices. The much larger volumes recovered from Building 4, in comparison to Building 5, are most likely due to the differential preservation conditions given that Building 5 was very heavily truncated to the point that only the basal few centimetres of some of the post-holes and pits survived. Alternatively there may have been less processing and deposition of cereal crops in Building 5, compared to Building 4, but the fact that material was recovered from what were only very meagre deposits in Building 5 suggests that processing of cereal crops was probably an impor-

tant activity in this house as well. The recovery of barley and emmer wheat grains, as well as emmer wheat chaff, from almost all the pits and post-holes in Building 4 indicates significant processing of cereals within this building. The deposition of the material within Hearth F342 shows food processing activities around the fireplace.

Pit F340 produced by far the largest concentration of macrofossils and, given the presence of large volumes of broken pottery along with the broken quernstones, it is evident that this pit contained domestic midden deposits, echoing the earlier practice observed for the Neolithic. The well-preserved nature of the macrofossils is indicative of burial almost immediately after the burning episode during which they were charred, and that they were not moved around prior to deposition. The assemblage was dominated by barley, suggesting significant local cultivation of this cereal. Emmer wheat formed around 15% of the cereal assemblage, again suggesting significant local cultivation of this cereal, although in smaller quantities than the barley. The presence of the quernstones implies that the emmer wheat was ground into flour, and perhaps some of the barley too, presumably for use in making bread and other cereal-based food. The barley could have also been used for other purposes, such as brewing, as well as forming a useful source of winter fodder for stock. The small numbers of weed seeds are not thought to represent any deliberate harvesting of these plants, but were most likely accidentally incorporated into the assemblage during harvesting and processing activities. All are indicative of grasslands, probably representing areas of pasture for stock grazing, or present as weeds among the arable fields. The presence of a single sloe stone and a single apple pip, along with a small number of charred hazelnuts, indicates the small-scale harvesting of fruits and wild resources.

Dark Age

The only plant macrofossils recovered from Building 3 were four barley seeds. These were heavily abraded and it was not clear whether they were from the hulled or naked variety. They most likely indicate localized agricultural practices, but the lack of any storage pits or midden waste means that it is not possible to determine whether cereal processing and storage took place within or around these buildings.

COARSE STONE ARTEFACTS *by* CLIVE WADDINGTON

The coarse stone assemblage comprises a small number of artefacts, all of which come from the northern area of the site (see Table 9). The artefacts are from a restricted number of features; these being the fills of one of the Neolithic artefact-rich midden pits (F009), one from a pit associated with Building 3 (F2133) and two quernstones from the fill of an artefact-rich midden pit (F340) inside one of the Late Bronze Age roundhouses (Building 4). Eleven coarse stone objects were recovered including two quernstones, one small rubbing stone, one hammerstone and a possible hammerstone, two whetstones, a roughly shaped stone ball and a quartz nodule, a smoothed granite piece — possibly a roughout of some sort, and a group of degraded sandstone fragments.

STONE BALL

Stone balls are known from north-east England and include examples from Hetton to the east of the Milfield basin (Speak and Aylett 1996) and Houghton-le-Side, Co. Durham (Speak and Aylett 1996; Marshall 1977). The one reported here was quite clearly intended to have six faces, which would place it in Marshall's Type 4a classification (1977), but a flaw in the rock has

TABLE 9 Northern Area Coarse Stone Catalogue

CONTEXT	CONTEXT DESCRIPTION	SMALL FIND NO	DESCRIPTION	MAX DIMENS. LENGTH WIDTH THICKNESS	PERIOD
009	F009 upper pit fill	92	This shaped quartzite nodule has been deliberately shaped into a ball and then two of the six facets chamfered flat. This appears to have been attempted unsuccessfully on two of the other facets, but these have resulted in uneven surfaces. This is possibly an attempt at a carved stone ball (see Marshall 1977; 1983) intended to have 6 facets, which would place it in Marshall's Type 4a (1977).	67 mm 67 mm 62 mm	Early Neolithic
009	F009 upper pit fill	105	A small natural white quartz nodule, alien to the immediate surrounding geology. This may be a natural inclusion within the stony fill but it was retained as it could also have been thought to have special significance.	62 mm 38 mm 37 mm	Early Neolithic
009	F009 upper pit fill	–	A concentration of heavily degraded unmodified sandstone fragments were found in the west side of the upper pit fill [009] some against the side of the pit.		
051	F009 lower pit fill	23	A remarkably flat and symmetrical sandstone whetstone. It has four chips missing from it but is otherwise in pristine condition. There is an area of pitting or wear at the broad end of the convex surface. The piece is symmetrical along its long axis when set on its widest plane but on its narrow side the stone has a plano-convex section. It has evidently been smoothed into shape.	109 mm 54 mm 17 mm	Early Neolithic
051	F009 lower pit fill	24	Quartzite hammerstone with wear and crushing at two opposed ends. Evidently used for knapping flint or other hard stone.	75 mm 65 mm 58 mm	Early Neolithic

051	F009 lower pit fill	71	A large smoothed piece of granite found nestling within a large sherd of Grimston Ware pottery lying on its side. Although not obviously an artefact, the frost-shattered igneous rocks of the Cheviots are rarely found so smooth, and given its position within the large discarded pot sherd and its possible shaped sides (one is flat) into a shape resembling a macehead, suggest this could perhaps be a roughout.	136 mm 55.5 mm 55 mm	Early Neolithic
2133	Fill of pit associated with Building 3	23	Symmetrical small whetstone that appears to be made from sandstone.	73 mm 26 mm 16 mm	Early Neolithic
342	Fill of hearth associated with Building 4	283	A small irregular-shaped, angular granite rubbing stone with two shaped sides, one of which is very flat and suited to rubbing. Located within a pit inside one of the Late Bronze Age roundhouses (Building 4) along with two quernstones.	100 mm 59 mm 57.5 mm	Late Bronze Age
262	Fill of pit	221	A possible hammerstone made from granitic rock with quartz inclusions with no obvious wear/possibly unused. Symmetrical, smooth oval shape with slight tapering to one end.	82 mm 61 mm 51 mm	
340	Fill of pit associated with Building 4	266	Granite quernstone segment with one flat, smooth side. Actual size not known due to fresh breakages across either end. The quernstone is broader (239 mm) at one end, tapering to a depth of 11mm at the other. Found in a pit inside one of the Late Bronze Age roundhouses (building 4) along with another quernstone and other domestic waste.	187 mm 158 mm 63 mm	Late Bronze Age
340	Fill of pit associated with Building 4	?	Large, irregular angular pink granite quernstone with two flat sides. Its total length is not known due to a fresh breakage at one end. The quernstone is soot-blackened on both of the flat sides and the underneath. The burning may be the result of its use close to a hearth.	183 mm 22.5 mm (Full width not known) 122 mm	Late Bronze Age

meant that two of the faces were damaged during the chipping process by too much being removed and the piece has then been discarded. Though unprepossessing in comparison with some of the more finely decorated specimens, this example is still important as it adds to a growing corpus of such artefacts from northern England. Although around 400 are known from Britain, with most of these coming from Aberdeenshire, Orkney and Perthshire, other English examples are known from Cumbria and Yorkshire. Identifying a use for these objects is problematic as they evidently have some kind of symbolic value rather than being tools designed for a manual task. Given their size they appear to be for holding in the hand, as far as human contact goes, but equally they could have been intended as display items perhaps intended for special placement within the home. Elaborately carved stone balls and related objects have been found in domestic settings, as at Skara Brae (Childe 1931), and so the presence of this ball in a pit filled with discarded domestic material does not mean this site has to be interpreted as a ritual site. Rather it is in keeping with the site's interpretation as a predominantly residential site with domestic and broken midden waste purposely buried in the pits — though this is not to say that ritualized activity did not form a routine part of life at residential sites. A further point to note is that this carved stone ball roughout is from a securely dated Early Neolithic context and this is important as few stone balls have any associated radiocarbon dates and they are generally thought of as Late Neolithic (Young 2008).

QUARTZ NODULE

A single, smooth, apparently unmodified white quartz nodule was found in the same pit (F009) as the stone ball. As they are uncommon in the surrounding sand and gravel deposits this piece may have been deliberately selected for inclusion in the fill of the pit. An interest in white quartz is well attested across Neolithic monuments in the British Isles and if this stone was intended as something deserving of deposition in this pit it would not be unusual.

WHETSTONES

A whetstone with some chips evident on it came from the Neolithic pit that contained the stone ball (F009). It is possible that this whetstone was used as a smoothing stone in the manufacture of other stone tools and artefacts. A second whetstone came from Dark Age Building 3 and, given the date of these buildings, is more likely to be associated with sharpening metal objects.

HAMMERSTONES

The quartzite hammerstone shows wear at both ends, indicating its use in the process of lithic reduction. Being harder than flint, the quartzite, which can be found locally, appears to have been specially selected for use in the knapping process. Other quartzite hammerstones are known from north-east England (e.g. fig. 27 in Waddington 2004, 18). The granite cobble, interpreted as a hammerstone due to its symmetrical ovoid shape, does not have obvious signs of wear so may have been new or unused.

QUERNS

The presence of two broken quernstones made from volcanic igneous rock from Late Bronze Age Building 4 indicates that grain was being grown nearby and processed into flour. This supports the botanical macrofossil evidence from the same pit, which revealed that barley and wheat were both being cultivated close to the site.

LITHIC ANALYSIS *by* CLIVE WADDINGTON

INTRODUCTION

A small assemblage of chipped stone lithics totalling ninety-three pieces was retrieved from the various archaeological interventions at Cheviot Quarry. The excavation work by MAP at the southern site produced sixteen chipped stone artefacts (Table 10) while nine lithics were retrieved from the various evaluation trenches by TWMS in the northern and central area of the site (Table 11). The excavation of the northern area by ARS Ltd produced sixty-eight chipped stone lithics (Table 12). Most of the lithics came from the fills of features (sixty-six pieces) while only a few (twenty-seven pieces) came from unstratified contexts. As a result of long-term burial in feature fills the majority of the assemblage is in a good state of preservation with little evidence for any of the Neolithic pieces having developed patinas, and those that are broken have clearly broken in antiquity prior to deposition.

METHOD STATEMENT

All lithics were washed on return to the laboratory and, after air drying, placed in labelled polythene bags. Measurements are given for complete pieces only in accordance with standard lithic recording conventions (Saville 1980). Colours are only recorded when the piece is not burnt or patinated. The lithics for each area are reported in separate catalogues below. All ARS Ltd contexts were dry-sieved through a 5 mm mesh to maximize finds recovery and their remaining fills passed through a flotation tank and graduated sieves.

DISCUSSION

Types

The chipped stone artefacts recovered from excavations at Cheviot Quarry can be broken down into their broad types. Table 13 summarizes these artefacts.

The range of flint tools is quite extensive for such a small assemblage and includes primarily Mesolithic pieces from unstratified contexts, such as the topsoil and top of the sand and gravel substratum, and Neolithic pieces from the buried pit fills. The Mesolithic pieces include a variety of microlithic blade cores together with some small modified flakes, blades and an awl. The Neolithic material is more wide-ranging and together with the usual flakes and blades, the latter being frequently parallel-sided, includes an oblique arrowhead and the tip portion of what appears to have been a leaf-shaped arrowhead, together with a possible awl, a knife and an assortment of other modified blade tools including one that has been used as a double-ended composite tool (Find 197, northern area) and two classic Neolithic end-scrapers (Finds 2 and 14 from the southern area). Most of the other pieces are blades of one form or another, but there are also occasional flakes and chips, much of which is debitage.

Flaking and Manufacture

The lithics from the Neolithic features on the site are characterized by a parallel-sided blade tradition. The employment of a blade-based technology has been noted on Neolithic sites elsewhere in Northumberland (e.g. Waddington 2000a; 2001; 2004; Waddington and Davies 2002). However, in contrast to the Mesolithic blade tools the Neolithic blade material tends to be larger and made of better quality flint, some of which appears to be nodular and imported into the region. The Mesolithic pieces are characterized by their microlithic size, and the

TABLE 10 Northern Area Excavations Chipped Stone Catalogue (ARS Ltd intervention)

CONTEXT	CONTEXT DESCRIPTION	SMALL FIND NO	DESCRIPTION	MAX DIMENS. LENGTH WIDTH THICKNESS	PERIOD
Unstrat	Base of topsoil	207	Broken blue-grey chert primary flake		
Unstrat	Base of topsoil	224	Burnt and broken flint blade segment with triangular cross-section		Prob. Neolithic
Unstrat	Base of topsoil	226	Small brown agate core with narrow parallel-sided blade removal for a microlithic bladelet	21.5 mm 21 mm	Mesolithic
Unstrat	Base of topsoil	227	Small agate orange-grey flake.	14.5 mm 16 mm 7.5 mm	
Unstrat	Base of topsoil	424	Medium grey broken nodular flint flake with a small area of cortex present.		
Unstrat	Base of topsoil	425	Small translucent agate flake with slight modification on one edge. Size of the piece is microlithic and therefore probably of Mesolithic date.	17 mm 12.5 mm 5.5 mm	Mesolithic
Unstrat	Base of topsoil	426	Modified small white agate flake, possibly originally an awl but the tip has snapped off. Size indicates it is probably Mesolithic.		Mesolithic
Unstrat	Base of topsoil	428	White agate edge-trimmed flake made on a blade that has been chipped off using a bi-polar technique.	30 mm 16.5 mm 6 mm	Mesolithic
Unstrat	Base of topsoil	430	Small purple-grey agate blade with possible modification of the tip.	19 mm 9.5 mm 6.5 mm	Mesolithic
Unstrat	Base of topsoil	431	Broken light grey flint blade segment. Possible utilization along both surviving long edges.		
002	Subsoil, unstratified	6	Patinated multi-platform light grey agate blade core. Secondary deposit stage in the reduction sequence.	38 mm 35.5 mm	Mesolithic
002	Subsoil, unstratified deposit	15	Patinated multi-platform agate blade core. Secondary stage in the reduction sequence.	36.5 mm 31 mm	Mesolithic

003	Top of natural sand and gravel substratum	208	Broken red-grey agate edge-trimmed blade segment with triangular cross-section.		Mesolithic
003	Top of natural sand and gravel substratum	209	Broken green-grey chert core with small blade and squat flake removal scars suggesting a Mesolithic date.		Mesolithic
003	Top of natural sand and gravel substratum	210	Red agate flake core with microlithic bladelet removal scars.	17.5 mm 15.5 mm	Mesolithic
003	Top of natural sand and gravel substratum	211	Tiny light grey flint chip probably resulting from the tertiary stage of tool production.	9.5 mm 7.5 mm 1.5 mm	
003	Top of natural sand and gravel substratum	212	Tiny light grey flint chip probably resulting from the tertiary stage of tool production.	8 mm 6 mm 0.5 mm	
003	Top of natural sand and gravel substratum	213	Secondary brown chert flake.	23.5 mm 23.5 mm 10 mm	Mesolithic
003	Top of natural sand and gravel substratum	215	Light grey agate exhausted micro-core with many tiny flake removal scars.	14.5 mm 16 mm	Mesolithic
003	Top of natural sand and gravel substratum	229	Heavily patinated agate edge-trimmed flake.	27 mm 17 mm 11 mm	Mesolithic
003	Top of natural sand and gravel substratum	230	Small white agate primary flake.	21.5 mm 10.5 mm 10 mm	
003	Top of natural sand and gravel substratum	231	Retouched white agate awl with part of tip missing.		Mesolithic
003	Top of natural sand and gravel substratum	234	Patinated agate opposed platform core with microlithic blade removals.	38.5 mm 33 mm	Mesolithic
003	Top of natural sand and gravel substratum	327	Light grey tip end of a broken arrowhead almost certainly of leaf or kite shape.		Neolithic
005	Small pit fill	2	Heavily burnt and broken flint flake, now in two pieces		
005	Small pit fill	5	Light grey flint flake belonging to the secondary phase of the reduction sequence.	17 mm 12 mm 1 mm	

TABLE 10 (continued)

CONTEXT	CONTEXT DESCRIPTION	SMALL FIND NO	DESCRIPTION	MAX DIMENS. LENGTH WIDTH THICKNESS	PERIOD
009	F009 upper fill	79	Broken and burnt flint edge-trimmed blade. Tertiary stage of reduction sequence.		
009	F009 upper pit fill	80	Banded agate flake, red and grey in colour. Undiagnostic. Secondary stage in the reduction sequence.	25.5 mm 15 mm 9.5 mm	
009	F009 upper pit fill	81	Light grey parallel-sided flint blade that was probably used as an awl. It appears to have been made from a recycled tool. Good quality nodular or possible boulder clay flint. Tertiary stage of reduction sequence.	30.5 mm 11.5 mm 6.5 mm	Neolithic
009	F009 upper pit fill	82	Broken and heavily burnt retouched flint flake. Tertiary stage of reduction sequence.		
009	F009 upper pit fill	83	Light grey flint flake. Secondary stage in the reduction sequence.	23 mm 22 mm 9.5 mm	
009	F009 upper pit fill	84	Burnt flint flake. Secondary stage in the reduction sequence.	30.5 mm 14 mm 2 mm	
009	F009 upper pit fill	85	Patinated flint flake from a boulder clay source. Undiagnostic. Secondary stage in the reduction sequence.	26.5 mm 19 mm 6.5 mm	
009	F009 upper pit fill	86	Broken medium grey flint blade made from high quality flint. Secondary stage in the reduction sequence.		
009	F009 upper pit fill	87	Broken heavily burnt flint parallel-sided blade segment.		
009	F009 upper pit fill	88	Edge-trimmed parallel-sided light grey flint, broken bladelet segment, perhaps once part of a microlith. Tertiary stage of reduction sequence.		Mesolithic

009	F009 upper pit fill	89	High quality dark grey flint utilised, though broken, parallel-sided blade segment. Tertiary stage of reduction sequence.	
009	F009 upper pit fill	90	Patinated flint chip.	12 mm 8 mm 1 mm
009	F009 upper pit fill	91	Heavily burnt broken blade segment.	
051	F009 lower pit fill	72	Medium grey flint flake debitage. Undiagnostic. Secondary stage in the reduction sequence.	18 mm 20 mm 3 mm
051	F009 lower pit fill	73	Medium grey flint blade debitage. Secondary stage in the reduction sequence.	28 mm 9 mm 3 mm
051	F009 lower pit fill	74	Edge-trimmed burnt flint blade with broken tip.Probably glacial flint. Tertiary stage of reduction sequence.	
051	F009 lower pit fill	75	Light grey patinated broken flint chip. Debitage.Tertiary stage of reduction sequence.	
051	F009 lower pit fill	76	Light grey flint blade debitage. Tertiary stage of reduction sequence.	19 mm 8 mm 2 mm
051	F009 lower pit fill	77	Medium grey broken flint flake. Debitage. Secondary stage in the reduction sequence.	
051	F009 lower pit fill	198	Broken light grey chunky flint parallel-sided blade made from high quality flint. Triangular section.	
051	F009 lower pit fill	199	Medium grey speckled flint broken blade segment with surviving cortex indicating a glacial origin for the flint. Triangular section.	
051	F009 lower pit fill	200	Broken medium grey speckled flint flake. Undiagnostic.	
031	F031 upper pit fill	151	Broken black chert bladelet segment.	
031	F031 upper pit fill	152	Light grey broken flint blade segment.	
031	F031 upper pit fill	163	Broken dark grey nodular flint parallel-sided retouched blade butt. Triangular section. Tertiary stage of reduction sequence.	

TABLE 10 (continued)

CONTEXT	CONTEXT DESCRIPTION	SMALL FIND NO	DESCRIPTION	MAX DIMENS. LENGTH WIDTH THICKNESS	PERIOD
031	F031 upper pit fill	164	Recycled, previously patinated, light grey flint parallel-sided blade. Secondary stage in the reduction sequence.	30 mm 9.5 mm 4 mm	
052	F031 lower pit fill	197	Retouched double-ended parallel-sided blade tool made from high quality dark grey nodular flint. Tertiary stage of reduction sequence.	44.5 mm 18.5 mm 5.5 mm	Neolithic
037	F037 structural slot fill	78	Red agate broken scraper. Tertiary stage of reduction sequence.		Mesolithic
338	Post-hole fill in Building 4	301	Broken red-grey agate blade segment with broadly triangular cross-section. Appears to have been edge-trimmed down one of the long edges.		Mesolithic
340	Pit fill within Building 4	258	Small red-grey agate core that appears to have been re-modified into a stubby tiny scraper.	19.5 mm 13.5 mm 15 mm	Mesolithic
365	Post-hole fill in Building 4	300	Tiny white agate flake.	13 mm 10.5 mm 4 mm	
352	Fill of pit immediately outside wall line of Building 4	274	Dark grey flint oblique arrowhead with its main tang and tip broken. It is probably made from nodular flint and has been finely made by bifacial working. A typical diagnostic Neolithic artefact.		Neolithic
2005	Hearth pit fill	28	Broken agate edge-trimmed blade with triangular section and deep red in colour.		
2005	Hearth pit fill	29	Broken light grey flint chip. Debitage.		

2011	Post-hole fill in Building 1	1	Brown speckled agate scraper. Tertiary stage of reduction sequence.	17.5 mm 21 mm 9.5 mm	Mesolithic
2053	Post-hole fill in Building 2	3	Medium grey broken parallel-sided flint blade segment.		
2063	Pit fill	14	Stubby light purple agate end scraper made on a short triangular section blade.	19.5 mm 13.5 mm 7.5 mm	Mesolithic
2133	F2133	7	Light grey speckled flint knife made on a parallel-sided blade of good quality flint. Tertiary stage of reduction sequence.	55 mm 24 mm 7 mm	Neolithic
2133	Fill of pit associated with Building 3	24	Heavily burnt broken flint flake.		
2133	Fill of pit associated with Building 3	25	Broken, brown, chert stubby blade. Undiagnostic.		
2149	Post-hole fill in Building 3	10	Retouched parallel-sided blade tool made on good quality medium grey flint. Abruptly retouched along both long edges. Possibly a scraper. Tertiary stage of reduction sequence.	24.5 mm 12 mm 4 mm	Neolithic
2159	Pit fill	12	Light grey speckled flint broken parallel-sided blade. Secondary stage in the reduction sequence.		

TABLE 11 Northern and Central Area Chipped Stone Catalogue (Tyne and Wear Museums Service intervention)

CONTEXT	CONTEXT DESCRIPTION	SMALL FIND NO	DESCRIPTION	MAX DIMENS. length width thickness	CHRONOL. DIAGNOST
Trench 28	Lower pit fill 176	1	Light grey broken edge-trimmed blade. Trimmed along both edges and typical of early Neolithic manufacturing traditions.		Neolithic
Trench 28	Lower pit fill 176	2	A dark grey broken flint flake. A small area of cortex surviving on the striking platform indicates it is nodular flint imported to the region. Undiagnostic.		
Trench 28	Lower pit fill 176	3	A medium grey flint blade. Unmodified.	35 mm 21 mm 4 mm	
Trench 28	Lower pit fill 176	4	A light grey broken flint blade with evidence of some possible utilisation along the shorter of the long edges.		
Trench 28	Upper pit fill 174	5	A medium grey unmodified blade with narrow parallel-sided blade scar removals on dorsal side.	26.5 mm 14.5 mm 2 mm	Neolithic
Trench 28	Upper pit fill 174	6	A small broken dark grey flint fragment.		
Trench 5	Fill of post-hole 102	7	A broken light grey retouched blade made from agate that occurs locally in the glacial outwash sand and gravel deposits.		Mesolithic-Early Neolithic
Unstrat.	Topsoil	8	Small stubby agate blade. Undiagnostic.	25 mm 16.5 mm 7.5 mm	
MQ03	3	9	Light grey broken blade segment from a narrow parallel-sided blade form. Probably Neolithic.		Neolithic

microlithic size of blade scars on cores, as well as by comparison with types such as those found in the securely dated assemblage from the Howick Mesolithic hut (Waddington 2007).

The flaking scars indicate the use of hard and soft hammers to knap the flint as well as evidence for the use of indirect percussion using a punch. The use of hard hammers is confirmed by the presence of a quartzite hammerstone in Pit F009 (northern area) which has pitting resulting from wear on two of its opposed ends. In Northumberland it is rare to find a knapping implement directly associated with a period-specific flint assemblage. The quality of the waste flakes reveals experienced workmanship; however, most of the working on site appears to be associated with the finishing and maintenance of tools with very little evidence for primary chipping, which appears to have taken place elsewhere.

Raw Material

The lithic raw material comprises diverse types including agates and cherts as well as boulder clay flint, recycled chipped and patinated flints, and imported nodular flint (Table 14). The speckled grey boulder clay flint could be from a local source, but given the size of some of the pieces it is thought more likely that some of this material could have been imported from north-east Yorkshire where good-quality light grey flint can be found in the boulder clay (Young 1984). The nodular flint has evidently travelled a considerable distance from its primary source to arrive in the Milfield plain. The closest source of nodular flint is the Yorkshire Wolds, which lies over 160 km to the south.

The non-flint raw materials can all be obtained locally in the river gravels, screes and boulder clays of the surrounding landscape. However, the flint material is varied in colour and quality, suggesting a variety of sources. The occurrence of at least two nodular flints is important as this indicates wide-ranging contacts and shifting of bulky and heavy goods over substantial distances from the nearest source in the Yorkshire Wolds. Some of the flint is from secondary sources such as boulder clays, river gravels and the beach.

The lithic industries represented by the assemblage include a small element of Mesolithic material based around the use of locally available (usually non-flint) materials (i.e. agate and chert) and their chipping into small, stubby, blade forms. The Neolithic industry on the other hand is based primarily around the working of flint to produce larger blades and blade-based tools, together with some flakes.

The lithics add an important dimension to the Cheviot Quarry site as the presence of Mesolithic cores and scrapers testify to activity on this site prior to the Neolithic and this is supported by the Mesolithic radiocarbon date produced on an oak twig and a hazel twig from Post-hole F369. The Mesolithic cores from the excavations in the northern area are from an unstratified horizon (subsoil) whereas the scraper (ARS Ltd Small Find 1) is from a post-hole in Building 1, so the latter is likely to be residual and the same is also the case for the scraper (ARS Ltd Small Find 78) from a structural slot, F037, that forms part of the possible freestanding Neolithic structure in the northern area. A retouched bladelet that is probably a microlith fragment (ARS Ltd Small Find 88) is from an indisputably Neolithic pit and so this is also likely to be residual. The scraper (ARS Ltd Small Find 14) is from a pit, F2063, which lies away from the buildings and this feature could in fact be Mesolithic, or it could be a residual artefact in a later feature.

It is perhaps surprising that, given the quantity of ceramics recovered, a greater number of flints were not found in the Neolithic deposits. This suggests that greater attention may have been given to the disposal of ceramic material relative to lithics, probably because broken pots are more difficult to repair or reuse than a broken flint tool. Furthermore, the lithics and coarse stone objects found in the pits were usually broken or flawed, and this is paralleled by the find

TABLE 12 Southern Area Chipped Stone Catalogue (Map intervention)

CONTEXT	CONTEXT DESCRIPTION	SMALL FIND NO	DESCRIPTION	MAX DIMENS. length width thickness	CHRONOL. DIAGNOST
Trench 28	Upper pit fill 174	5	A medium grey unmodified blade with narrow parallel-sided blade scar removals on dorsal side.	26.5 mm 14.5 mm	Neolithic
Topsoil	1028	3	Light grey flint flake made from secondary till flint.	22 mm 21 mm 3.5 mm	
F7	Fill 1018 of pit F7	2	Light grey end scraper with unifacial retouch around all edges, the distal end surviving while the proximal end appears to have been deliberately removed. This tool belongs to the tertiary stage of the reduction sequence and is typical of Neolithic implements in the region.	29 mm 18.5 mm 8.5 mm	Neolithic
F4	Pit F4	4	Small dark grey flint flake belonging to the secondary or tertiary stage of the reduction sequence. Undiagnostic.	16.5 mm 12.5 mm 1 mm	
F4	Pit F4	5	Light grey broken flint flake belonging to the secondary or tertiary stage of the reduction sequence. Undiagnostic.		
F4	Pit F4	6	Small broken burnt flint flake belonging to the secondary or tertiary stage of the reduction sequence. Undiagnostic.		
F4	Pit F4	7	Light grey broken blade segment. Undiagnostic.		
F4	Pit F4	8	Small dark grey flake belonging to the tertiary stage of the reduction sequence.	13 mm 7.5 mm 2 mm	
F4	Pit F4	9	Small broken dark grey flake belonging to the tertiary stage of the reduction sequence.		

F85		11	Small broken light grey flint belonging to the secondary or tertiary stage of the reduction sequence. Undiagnostic.	22.5 mm 13.5 mm 2 mm	
F90		12	Light grey unmodified flint flake with area of surviving cortex indicating it is from a secondary till source.	37 mm 34.5 mm 6 mm	
F100	Fill of small pit F100	13	Dark grey unmodified irregular flake with small area of cortex surviving which suggests it is probably from a till source	30 mm 36.5 mm 7 mm	
F117	Fill of pit F117	14	Light grey end scraper made on a parallel-sided blade form with unifacial retouch around all edges. A typical Neolithic artefact form for this region.	43.5 mm 17 mm 5 mm	Neolithic
F204		10	Small dark grey flake belonging to the secondary or tertiary stage of the reduction sequence. Undiagnostic.	14 mm 7 mm 1.5 mm	
F204		15	Small broken light grey flint flake belonging to the secondary or tertiary stage of the reduction sequence. Undiagnostic.		
F204		16	Small dark grey flint flake belonging to the secondary or tertiary stage of the reduction sequence.	15 mm 5.5 mm 1 mm	
F204		17	Small dark grey flint flake belonging to the secondary or tertiary stage of the reduction sequence.	12 mm 10.5 mm 2 mm	

TABLE 13 Summary of chipped stone artefacts

TYPE	NO.
Core	8
Flakes and Chips	36
Blade	21
Utilized Blade	2
Retouched Flake	5
Retouched Blade	11
Scraper	5
Arrowhead	2
Awl	2
Knife	1
TOTAL	93

TABLE 14 Breakdown of lithic assemblage by raw material

RAW MATERIAL	NO.
Flint	63
Agate	25
Chert	5
TOTAL	93

TABLE 15 Schofield's 'Expected assemblage characteristics for domestic and industrial areas assuming a policy of extra-home range production' (i.e. where flint is imported from a source area some distance from the main settlement area).

ACTIVITY	LITHIC DENSITY	PRIMARY WASTE	TOOLS	CORES
Settlement	Low	Low	High	High
Industrial	High	High	Low	Low

of a broken stone axehead in a pit at the Bolam Lake Neolithic settlement (Waddington and Davies 2002). Although objects that could have symbolic and ritual connotations were found in Pit F009 (stone ball and whetstone) these artefacts are discarded roughouts and flawed pieces.

The flint assemblage is a purely functional and utilitarian set of material. The range of tools, including a variety of blade tools, an awl and a knife indicate that a range of activities took place across the site. The range of blade tools present in the Neolithic assemblage is indicative of general processing activities while the arrowheads may have been manufactured on site for use elsewhere. The relative paucity of debitage indicates that, although stone tool production clearly took place, most of the primary chipping took place elsewhere. The lack of cores suggests that at least part of the knapping process also took place elsewhere. Indeed the complete absence of primary waste is important in this regard as it indicates two things: 1) that the primary working took place away from the settlement site, presumably at or near the source of the raw material, and that 2) flint densities are going to be higher at the source/knapping sites than at settlements away from the source area. This finds support in the generalized model put forward by Schofield (1991, 119) based on his work in Hampshire. According to this model, at settlement sites there should be a high proportion of tools and a low proportion of

primary waste (see Table 15) and this is certainly the case in both the northern and southern area Neolithic sites at Cheviot Quarry.

Some of the lithic pieces comprising the Neolithic assemblage are chronologically diagnostic, such as the arrowheads, end-scrapers and blade tools. However, the problem of dating Neolithic tools in northern England is compounded by the fact that there are very few dated assemblages of Neolithic flintwork in this region, and so recognizing datable signatures relies on noting the presence of just a few universal artefact types. What is more, in the case of northern England, those few Neolithic assemblages that are dated are small, consisting of just a handful of flints (e.g. Waddington and Davies 2002).

The vast majority of the lithic assemblage originally associated with this site will have lain within the topsoil and this horizon has been heavily disturbed by earlier ploughing, the construction of the airfield buildings in the northern area and finally by its complete removal by machine during the surface strip. Therefore, the importance of the topsoil for hosting lithic material and preserving part of the record of past Stone Age activity should not be overlooked in future mitigation programmes.

CERAMIC ANALYSIS *by* CLIVE WADDINGTON

INTRODUCTION

A substantial assemblage of prehistoric pottery was recovered from pit features in the northern, central and southern areas of Cheviot Quarry. In the northern area the Neolithic pits produced mostly Early Neolithic Carinated Bowl pottery allied to the Grimston Ware tradition, together with a small amount of Grooved Ware pottery. A further nine sherds and forty-three fragments of Impressed Ware (Meldon Bridge substyle) pottery were found during evaluation trenching by ASUD also in the northern area. The latter pottery has been published previously (Waddington 2000b) and it provides an important link in the sequence from Carinated Bowl to Grooved Ware in this part of the quarry. Elsewhere on the northern site the two Late Bronze Age roundhouses produced an important assemblage of Flat-Rimmed Ware material, primarily from internal pits and hearths, with a few additional sherds found in post-hole fills.

In the central area fieldwork by TWMS uncovered a small dispersed group of pits that contained Early Neolithic Carinated Bowl fragments. In the southern area fieldwork by MAP led to the identification of a large group of Neolithic pits and associated features. Some of these were excavated, producing a sequence of Neolithic pottery that included Carinated Bowl and plain vessel sherds, Impressed Ware, Grooved Ware and Beaker ceramics (MAP 2000). Some vessels referred to in the original pottery assessment for the MAP intervention no longer exist in the artefact archive and this includes sherds from a single vessel in each of features F7 (Context 1018) and F207, and sherds from three supposed early Beaker vessels, including two cord-decorated Beakers (AOC) and a comb-decorated vessel from F254. These missing sherds are not discussed further in this report.

Evaluation trenching by TWMS, also in the southern area, revealed a pit that contained fragments of several carinated vessels. A further twenty-eight sherds of Carinated Bowl pottery were recovered from a pit in an evaluation trench excavated

by ASUD in this part of the quarry, and these have been published in full elsewhere (Waddington 2000b).

Together, the ceramic assemblage from Cheviot Quarry forms one of the largest of Neolithic date so far recovered in Northumberland, numbering over 400 sherds and representing around 108 pots; the only assemblage that has produced a larger quantity being the excavations at nearby Thirlings (see Miket this volume). Likewise, the assemblage of Late Bronze Age Flat-Rimmed Ware is also substantial, comprising 136 sherds that represent at least forty-two individual pots.

NEOLITHIC POTTERY

Early Neolithic Ceramics

The sherds comprising the Early Neolithic ceramic assemblage (see Tables 16–20) display the typical attributes associated with Carinated Bowls and related pottery including a well-fired highly burnished fabric, everted rims, carinations, occasional upright shoulders, an absence of decoration and in many cases an open and shallow profile (see Gibson and Woods 1997, 175–78). Although earlier commentators have attempted to distinguish Grimston Ware from other types of Early Neolithic carinated vessels, such as Heslerton Ware (Piggott 1954, 114) and Towthorpe Ware (Manby 1975), the most recent review of this pottery type sought to differentiate between Carinated Bowls, most similar to the Grimston Ware from the type site at Hanging Grimston, and Shouldered Bowls, which have an upright shoulder and carination on the upper part of the vessel (Herne 1988). The majority of the Early Neolithic ceramic material from Cheviot Quarry fits into the Carinated Bowl class as defined by Herne (1988) and the original Grimston Ware class as defined by Piggott (1954, 114). From the southern area of the site there are occasional examples of what Herne has termed Shouldered Bowls as well as what is termed here 'Plain Ware' vessels that have no shoulder or carination but rather an open or upright body with plain rounded rim.

Fabric

The Early Neolithic fabrics all contain crushed stone inclusions as an opening agent. These inclusions have clearly been specially prepared for the purpose and are usually made out of either sandstone or quartz. The fabrics are, generally, evenly fired throughout making the pots strong and durable. Both thick- and thin-walled vessels are evident, with most of the material ranging between 4 mm and 10 mm in thickness. Pitted surfaces are common where organics have burnt out during the firing process. The consistent colouring on most pots indicates an even firing process which is likely to have taken place in a reducing atmosphere, given the dark colour of many of the sherds. Seed impressions can also be seen. The pots are finely made and have a very highly burnished finish on both the inner and outer surfaces, with grass-wiping common. A few of the rougher pots, from the southern area of the site, have crushed stone inclusions erupting from the surface, indicating vessels that have been less well finished than the very highly burnished vessels from the northern area of the site. A

number of the sherds have fractured along coil lines, revealing the method by which the pots were constructed.

Form

The vessels are mostly of carinated bipartite form usually, though not always, with a slack shoulder. They range in size from large storage/cooking vessels to small bowls. The sherds from Pot 1 (ARS Ltd intervention) are a little unusual in that they appear to have some lightly incised, horizontal linear drag lines on their outer surface. Decoration is unusual, though by no means unique, on Early Neolithic ceramics from northern England. There is a good example of a lugged vessel from the southern area assemblage (Pot 6 MAP intervention). The Cheviot Quarry sherds are from vessels of different sizes, including some of substantial proportions (e.g. Pots 18 and 28).

Numbers

Seventy-nine Early Neolithic vessels could be identified. Thirty-three of the pots (148 sherds) came from the fills of two pits, F009 and F031, in the northern area. No certain matches could be made between sherds or pots from different pits, although some sherds from the same pot were found distributed between the upper and lower fills of the same pit (e.g. Pots 1 and 3 in Pit F009). Pit F009 contained twenty-one pots, Pit F031 contained eleven pots.

IMPRESSED WARE

No Impressed Ware was recovered from the northern area of the quarry site during the interventions reported here, although a small assemblage related to the Meldon Bridge sub-style was recovered during evaluation trenching in this area by ASUD and has been published elsewhere (Waddington 2000b). Finds of Impressed Ware are relatively rare in Northumberland and there is a need to undertake further study of this ceramic type in the region. The sherds from the southern area of Cheviot Quarry (Table 21) show a distinctive coarse fabric from substantial vessels with roughly burnished surfaces, sometimes unevenly fired and with typical fingernail, comb and stab decoration. The rims are distinctive and include flattened T-shaped profiles, bevelled rims and large rounded rims — all of which can be richly decorated on their outer, upper and inner lips.

Fabric

The Impressed Ware ceramics have a distinctive fabric being hard, thick-walled, sometimes fairly coarse pots of varying size, but including some very substantial vessels. They have been made using the coil technique and contain large prepared, angular, crushed stone inclusions as well as sand in some cases. They can be evenly or unevenly fired and the stone inclusions can often be seen erupting on the inner and outer surfaces. The Impressed Ware often has a distinctive orange-brown or dark grey colour.

TABLE 16 Northern Area Early Neolithic Ceramic Catalogue (ARS Ltd intervention)

POT NO.	SMALL FIND NO.	FEATURE NO. AND CONTEXT	DESCRIPTION
1	99, 45	Pit F009 (context 009 and 051)	Two sherds from a well fired thin-walled pot, the fabric averaging 6 mm thick with slight linear grooved impression evident on both sherds. Red-brown surface with brown core.
2	100, 93	Pit F009 (context 009)	Two small well-fired body sherds with pale brown surface and grey core. Fine crushed stone inclusions <1.5 mm across, fabric averages 5 mm thick. Grass wiped and burnished surfaces.
3	35, 59, 102	Pit F009 (context 009 and 051)	Three body sherds from a well-fired coarse pot with light orange brown surface, grey core and blackened internal surface. Many crushed stone inclusions <4 mm across. Rough external surface, fabric averages 8 mm thick.
4	95, 98, 104	Pit F009 (context 009)	Rim sherd with plain, slightly everted profile and two small body sherds from a coarse pot with grass-wiped surface. Crushed stone inclusions averaging 2 mm across. Pale brown surface, grey core. Fabric averages 6 mm thick.
5	96	Pit F009 (context 009)	Small thick-walled body sherd with smooth burnished outer surface. Brown surface and brown core. Crushed stone inclusions <3 mm across and fabric averages 10 mm thick.
6	101	Pit F009 (context 009)	Small thin rim sherd from a small bowl or cup with a slightly everted rim profile. Finely finished with brown surface and core. Fine crushed stone inclusions <1.5 mm across and fabric averages 4 mm thick.
7	94	Pit F009 (context 009)	A small coarse pale brown body sherd with fabric averaging 6 mm thick. Possible internal linear decoration formed by two parallel lines. Crushed stone inclusions <2 mm across.
8	54, 58	Pit F009 (context 051)	Two rim sherds from a well-fired, slack-shouldered vessel with slightly rolled rim. Dark grey burnished surface with brown core. Crushed stone inclusions <1.5 mm across and fabric averages 9 mm thick.
9	25, 30	Pit F009 (context 051)	Two body sherds from a finely made vessel. Rusty brown exterior surface with grey core and blackened interior surface. Crushed stone inclusions <3 mm across and fabric averaging 5.5 mm thick.
10	28, 34, 37, 38, 39, 42, 43, 46, 47, 52, 55, 68, 69, 70, 103	Pit F009 (context 051)	Fifteen body sherds from a well-fired vessel with fairly sharp carination. Brown surface, brown core and blackened inner surface. Fine crushed stone inclusions <1.5 mm across and fabric 6 mm thick.
11	27	Pit F009 (context 051)	A small sherd from well-made coarse pot. Orange-brown surface and grey core. Crushed stone inclusions averaging 1.5 mm across and fabric 6 mm thick.

12	49	Pit F009 (context 051)	Small sherd from a finely made grass-burnished pot. Brown surface and grey core with stone inclusions 2 mm across and fabric 6 mm thick.
13	51	Pit F009 (context 051)	A rim sherd from a finely made grass-burnished pot with slightly everted rim. Pale brown surface and grey core with stone inclusions <2 mm across and fabric averaging 6 mm thick.
14	44	Pit F009	A small body sherd from a coarse pot. Pale brown surface and brown core with stone inclusions <3 mm (context 051) across and fabric 7 mm thick.
15	56	Pit F009 (context 051)	Small body sherd from a coarse pot. Orange-brown fabric with stone inclusions <3 mm across and fabric 9 mm thick.
16	63	Pit F009 (context 051)	A small pale brown body sherd broken across the fabric so of unknown thickness. Stone inclusions <2 mm across.
17	40	Pit F009 (context 051)	Body sherd from a coarse pot with brown surface and grey core. Burnt out organic inclusions together with stone inclusions up to 4 mm across and fabric averaging 6 mm thick.
18	33, 36, 50, 66, 97	Pit F009 (context 051)	A finely made carinated bowl with burnished inner and outer surface and plain slightly everted rim. Grey fabric and grey core averaging 7 mm thick. Crushed stone inclusions <4 mm across. Coil made. The reconstructed bowl rim would measure around 0.3 m in diameter. 1 rim sherd (50).
19	18	Pit F9 (context 51)	A rim sherd from a finely made carinated vessel with everted rim, now in many pieces as it collapsed during lifting. Orange surface with black core, fabric averaging 6mm thick. Crushed stone inclusions <3 mm across.
20	20, 21, 22, 29, 31, 32, 41, 48, 57, 61, 64, 65, 67	Pit F009 (context 051)	A thick-walled and substantial well-made pot, now with cracking of the burnished outer surface. Brown surface and grey core, the fabric averaging 8 mm thick. Crushed stone inclusions <4 mm across.
21	19, 26, 60, 62	Pit F009 (context 051)	A well-made carinated pot with slightly everted rim. Brown surface and brown core with fabric averaging 7 mm thick. Crushed stone inclusions <2 mm across. 1 rim sherd (19).
22	1, 3, 8	Pit F005	Broken sherds from a carinated pot with dark brown surface and black sore with fabric averaging 7 mm thick. Crushed stone inclusions <5 mm across.
23	6	Pit F005	Tiny body sherd from a finely made and highly burnished pot. Brown surface and brown core with fabric 9.5 mm thick and containing crushed stone inclusions <3 mm across.
24	11, 12, 16, 17	Pit F049	A finely made carinated vessel with plain slightly everted rim with dark brown burnished surface and dark grey core. Fabric contains crushed stone inclusions <5 mm across and averages 8.5 mm thick.
25	15, 13	Pit F049	Two body sherds of well-made coarseware with orange-brown surface and dark grey/black core. Fabric contains crushed stone inclusions <3 mm across and averaging 8 mm thick.

TABLE 16 (continued)

POT NO.	SMALL FIND NO.	FEATURE NO. AND CONTEXT	DESCRIPTION
26	4	Pit F009	A finely made carinated bowl with plain everted rim and burnished finish. Dark grey surface and dark grey core containing crushed stone inclusions <3 mm across and averaging 8 mm thick.
27	14	Pit F049	A rim sherd from a coarseware vessel with plain vertical rim. Brown surface and black core. Fabric contains crushed sandstone inclusions <2 mm across and averaging 7 mm thick.
28	176, 178, 177, 174, 128, 119, 117, 118, 116, 111, 113, 107, 108, 114, 112, 120, 107, 106, 109, 115, 110, 167, 168, 169, 192, 193, 194, 195,	Pit F031 (contexts 031 and 052)	A finely made carinated bowl with 6 rim sherds displaying a plain slightly everted rim. A substantial bipartite vessel with reconstructed rim thought to have measured around 0.4 m in diameter. This is the most complete pot with several large sherds surviving. Most of the fragments were all found together in the lower west edge of the lower pit fill. Finely burnished with a brown-grey surface and brown core and having been evenly fired. Fabric contains crushed angular stone (quartz) <5 mm across and averaging 9 mm thick. This pot could be reconstructed.
29	49, 186, 188	Pit F031	A large coarseware carinated pot with lightly burnished brown surface and black core. Fabric contains crushed angular stone inclusions <5 mm across and averages 8.5 mm thick.
30	179, 173, 162, 180, 185, 175, 161, 133, 140, 142, 130, 183, 187, 184, 196	Pit F031	A large well-made and highly burnished carinated pot with slightly everted plain rim with brown surface and dark grey core. Fabric contains crushed stone inclusions <4 mm across and averaging 6 mm thick. Two rim sherds.
31	154, 156, 134, 147, 141, 139, 171, 135, 181, 146, 137, 166	Pit F031	A finely made carinated pot with brown surface and brown core. Fabric contains crushed stone <3 mm across and averages 7 mm thick.
32	124, 172, 125, 189, 126, 123, 121, 122, 127, 125, 129	Pit F031	A large, well-made, coarseware pot with burnished brown surface and dark grey core. Fabric contains crushed stone inclusions <5 mm across and averages 10 mm thick. Coil made vessel with burnt out organics.

33	136, 143, 150,	Pit F031	A finely made slack carinated vessel with slightly everted rim and with a highly burnished grey-brown surface and brown core. Fabric contains fine crushed stone inclusions <2 mm across and averages 6 mm thick.
34	132, 145, 138, 153, 165	Pit F031	A well-made carinated vessel with slightly rolled over and flattened rim. Highly burnished with brown- grey surface and brown core. Fabric contains crushed stone quartz inclusions <3 mm across and averages 6 mm thick. 1 rim sherd present.
35	170	Pit F031	A rolled-over rim sherd from a large thick-walled carinated pot. Brown surface with grey core. Fabric contains crushed stone inclusions <3 mm across and averages 9 mm thick.
36	155, 178	Pit F031	A well-made and highly burnished carinated pot. Brown-grey surface with brown core. Fabric contains crushed stone inclusions <2 mm across and averages 6.5 mm thick.
37	157	Pit F031	A well-made burnished carinated pot. Brown surface with brown core and blackened inner surface. Fabric contains crushed stone inclusions <2 mm across and averages 6.5 mm thick.
38	131	Pit F031	A highly burnished thin-walled pot from a small vessel. Orange-brown blackened surface with brown core. Fabric contains crushed stone inclusions <2 mm across and averages 4 mm thick.
39	222	Pit F224	An everted rim sherd from a well-made and fired burnished slack vessel. External residue adhesing to outer surface. Dark brown inner and outer surface. Fabric contains crushed stone inclusions <2 mm across and averages 8 mm thick.
40	201, 432, 434	Pit F224	A well-made burnished thin-walled vessel. External residue adhesing to sherd 201. Dark brown inner surface with orange-brown outer surface and dark brown core suggesting an uneven firing process. Fabric contains crushed stone inclusions <4 mm across and averages 9 mm thick.
41	203, 225	Pit F224	A burnished vessel with dark brown inner surface, orange-brown external surface and blackened core. Fabric contains crushed stone inclusions <2 mm across and averages 8 mm thick.
42	202, 433	Pit F224	A thin-walled burnished vessel with dark brown internal surface and core and orange-brown external surface. Fabric contains crushed stone inclusions <1 mm across and averages 5 mm thick. Probably part of a small bowl.
43	435	Pit F224	A thin-walled burnished vessel with dark brown internal surface and core and orange-brown external surface. Fabric contains crushed stone inclusions <1 mm across and averages 8 mm thick. Probably part of a small bowl.
Unattrib-utable	204, 205, 206	Pit F224	Tiny pot fragments unable to be assigned to a vessel.

TABLE 17 Northern Area Early Neolithic Ceramic Catalogue (Tyne and Wear Museums Service intervention)

POT NO.	SMALL FIND NO.	FEATURE NO. AND CONTEXT	DESCRIPTION
64	Sherds 15, 16, 17, 18, 19 and 21	Trench 28 Animal burrow? (F173)	Seven body sherds from a thinned-walled plain ware with reddened outer surface and dark brown inner surface and core. Sherds 15 and 18 have burnt organic residue adhering to their inner surface. The fabric contains crushed stone inclusions <4.5 mm across and averages 6mm thick.
65	Sherd 26 Sherd 38	Pit F175 Upper fill (Context 174) Lower fill (Context 176)	Two small body sherds from pit F175 with one each from the upper (174) and lower (176) fills respectively. The outer surface, inner surface and core are a distinctive red brown colour. The fabric is coarse containing crushed stone inclusions <4 mm across and averaging 8 mm thick.
66	Sherds 22, 24, 28 Sherds 43, 44	Pit F175 Upper fill (Context 174) Lower fill (Context 176)	Five sherds from a plain ware bowl, three larger sherds of which appear to have burnt organic residues on their surface. The vessel has a red brown outer surface and fire blackened inner surface with dark brown to black core. The fabric contains crushed stone inclusions <3 mm across and averages 7 mm thick. Sherds 22, 24 and 28 are from the upper fill (174) and sherds 43 and 44 are from the lower fill (176).
67	Sherd 27 Sherds 29, 32, 37, 48	Pit F175 Upper fill (Context 174) Lower fill (Context 176)	Five sherds from a vessel with a sharp carination with dark brown outer surface and dark brown inner surface and core. The fabric contains crushed stone inclusions <3 mm across and averages 6-7 mm thick. Sherd 27 is from the upper fill (174) and sherds 29, 32, 37 and 48 are from the lower fill (176).
68	Sherds 48, 49, 51, 52	Pit F175 (Context 176)	Four body sherds from a plain ware bowl with orange brown outer surface and dark brown inner surface and core. Although burnished, it is a coarse fabric with crushed stone inclusions <3.5 mm across and averaging 7-8mm thick. All sherds are from the lower fill (176).
69	Sherd 23 Sherds 33, 36	Pit F175 Upper fill (Context 174) Lower fill (Context 176)	Three small body sherds from a plain ware vessel with red brown outer surface and darker brown inner surface and core. Sherds 23 and 36 both have burnt organic residues adhering to their inner surfaces. The fabric contains crushed stone inclusions <4 mm across and averages 5-6 mm thick.

70	Sherds 30, 31	Pit F175 (Context 176)	Two small rim sherds form a carinated bowl with everted rim. The inner rim diameter is approximately 0.27 m. The vessel has a dark brown evenly fired and well burnished inner and outer surface with dark grey core. The fabric contains crushed sandstone inclusions <5 mm across and averages 6 mm thick.
71	Sherds 45, 47, 53	Pit F175 (Context 176)	Three small sherds from a plain ware bowl with brown outer surface and dark grey inner surface and core. Both inner and outer surfaces are burnished. The fabric contains crushed stone inclusions <3 mm across and averages 7-8mm thick.
72	Sherds 35, 40, 41, 42, 50	Pit F175 (Context 176)	Five small body sherds from a plain ware vessel with burnished inner and outer surfaces that are light brown and dark brown respectively. The fabric is relatively fine and contains finely crushed stone inclusions <2 mm across. The fabric averages 5 mm thick.
73	Sherd 39	Pit F175 (Context 176)	One small sherd of coarse plain pottery with burnished inner and outer surfaces. The outer surface is a dark brown colour and the inner surface and core a darker brown still. The fabric contains coarse stone inclusions <5 mm across and averages 7 mm across.
Unattrib-utable	Sherd 20	Trench 28 Animal burrow? (Context 173)	
Unattrib-utable	Sherd 25	Pit F175 Upper fill (Context 174)	
Unattrib-utable	Sherd 34	Pit F175 Lower fill (Context 176)	

TABLE 18 Central Area Early Neolithic Ceramic Catalogue (Tyne and Wear Museums Service intervention)

POT NO.	SMALL FIND NO.	FEATURE NO. AND CONTEXT	DESCRIPTION
44		F9 Context 8	A medium sized carinated bowl with a pale brown external surface and darker brown internal surface. The core varies between fire-blackened and pale brown due to having been unevenly fired. Inclusions were largely organic but have burnt out during the firing process to produce a corky fabric with surface pitting. The vessel averages between 6 and 7 mm thick. Some of the 30 sherds and additional 79 tiny fragments comprising this vessel can be joined together. The vessel has a typical everted rim with pronounced carination 70 mm below the rim. Organic residues survive on the internal surface of some of the sherds. There were at least 6 rim sherds.
45		F9 Context 8	Seven sherds belonging to a thick-walled plain vessel with no evidence for a carination. It has a pale brown external surface and a darker brown inner surface with a pale brown core indicating an even firing process. Fabric contains crushed stone inclusions of <6 mm across that include crushed sandstone and quartz. Fabric averages 10-11 mm thick.
46		F9 Context 8	A single sherd from a plain ceramic vessel with a pink brown external surface and soot blackened internal surface and dark grey core. The fabric contains crushed stone inclusions <5.5 mm across made from crushed quartz and averages 8mm thick.
47		F9 Context 8	Three sherds of which two are rim fragments belonging to a plain bowl with slightly everted rim and evidence for a carination. The thick walled vessel had a pale brown outer surface and dark brown internal surface and core. The fabric contained organic inclusions which have burnt out during the firing process to produce a corky fabric. The fabric averages 7 mm thick.
48		F9 Context 8	Two body sherds from a plainware vessel with pale brown outer surface and darker brown internal surface and core. This unremarkable vessel has been burnished on its external surface and contains crushed stone inclusions <8mm across. The fabric averages 6-7 mm thick.
49		F9 Context 8	Five sherds of which one is a rim, from a plainware vessel with upright rim and slight carination. The vessel had a medium brown internal and external surface and a brown to black internal core containing crushed stone inclusion <6 mm across.
50		F9 Context 3	Five sherds of which one is a rim sherd from an open carinated bowl with pronounced everted rim giving a flared inner lip with a clear carination 35 mm below the rim. Medium brown inner and outer surface with darker core. Fabric contains crushed sandstone and quartz inclusions <4 mm across. This highly burnished vessel averages 8-10 mm across.

51	F9 Context 3	Two small body sherds from a small thin-walled plain vessel. Pale brown outer surface and a dark brown inner surface and core contains fine crushed stone inclusion <3 mm across. Fabric averages 4.5 mm across.
52	F21 Context 20	Two sherds from a thick-walled plain vessel with no evidence for a pronounced carination. It has a pale brown outer surface and dark brown inner surface, both of which are highly burnished. It has a dark brown core showing that it has been evenly fired. The fabric contains crushed coarse stone inclusions <6 mm across. The fabric averages 12 mm thick.
53	F21 Context 20	Two sherds of which one is a rim from a carinated bowl with a slightly everted rolled over rim. A highly burnished and pale brown inner and outer surface with pale brown evenly fired core. The fabric contains finely crushed stone inclusions <4 mm across and averaging 7 mm thick.
54	F21 Context 20	Four sherds of which one is a rim from a carinated bowl with a very slightly everted rim. This highly burnished vessel has a pale brown outer surface and darker brown inner surface and core. The fabric contains crushed sandstone inclusions <4 mm across and an average thickness of 7 mm.
55	F21 Context 20	A small finely burnished body sherd from a plainware vessel with pale brown outer surface and dark brown inner surface and core. The fabric contains crushed fell sandstone inclusions <4 mm across and averages 6mm thick.
56	MQ03	A single, broken rim fragment that conjoins from a slightly everted rimmed ware vessel, This highly burnished unstrat. vessel has a light brown outer surface and a darker brown inner surface with a heat blackened core. It contains finely crushed stone inclusions <3 mm across and averaging 6 mm thick.
57	MQ03	Two small body sherds from a plainware vessel with orange brown outer surface and dark grey inner surface. unstrat. Internal residues survive on the larger of the two sherds. The fabric contains crushed stone inclusions <7 mm across and averaging 9 mm thick. The outer surface is not as burnished as on the more finely made Neolithic pots.
58	F9 Context 4	A single small body sherd with highly burnished inner and outer surfaces from a plain bowl with slight carination. A darker brown outer surface and light brown inner surface with an orange brown core. The fabric contains crushed stone inclusions <5 mm across and averages 6.5 mm thick.
59	F18 Context 15	Two small body sherds from a highly burnished plainware bowl. Both of which have residues adhering to their inner surface. The vessel has a red brown outer surface with a dark grey inner surface and core. The fabric contains crushed stone inclusions <6 mm across and averages 7 mm thick.

TABLE 18 (continued)

POT NO.	SMALL FIND NO.	FEATURE NO. AND CONTEXT	DESCRIPTION
60		F13 Context 14	One tiny rim sherd from a slightly everted plain bowl. The small size of the rim means it is an indeterminable diameter. It has an orange brown inner and outer surface with darker brown core. The fabric contains finely crushed stone inclusions <5mm across and averages 6 mm thick.
61		F21 Context 19	A single small body sherd from a plain vessel with a well burnished inner and outer surface. The outer surface is pale brown, the inner surface dark brown and the core includes fire blackened areas. Fabric contains coarse crushed stone inclusions <5mm across and averaging 9 mm thick.
62	Sherds 1, 2, 3 and 7	Pit F3600 (Context 3601)	Sherds 1, 2 and 3, of which 1 and 2 conjoin with rim sherd 7 from the roof mat above pit F3600, belong to a carinated vessel with everted and rolled over rim. It is highly burnished on both surfaces and has an open bowl profile. It has a dark brown inner and outer surface and core, having been evenly fired throughout. The fabric contains crushed stone inclusions <4mm across and averages 10 mm thick. It has an internal rim diameter of 0.31 m.
63	Sherds 4 and 5 Sherds 6 and 9	Pit F3600 (Context 3601) Sherds 6 and 9 are from the roof mat (3605) from above F3600	Four undecorated thick-walled body sherds from a plain ware vessel and one of which shows evidence it comes from a slack-shouldered globular vessel. It has an orange brown outer surface and darker brown inner surface and core. The fabric contains crushed sandstone inclusions <10 mm across and averages 12 mm thick.

TABLE 19 Southern Area Early Neolithic Ceramic Catalogue (Tyne and Wear Museums Service intervention)

POT NO.	SMALL FIND NO.	FEATURE NO. AND CONTEXT	DESCRIPTION
62	Sherds 1, 2, 3 and 7	Pit F3600 (Context 3601)	Sherds 1, 2 and 3, of which 1 and 2 conjoin with rim sherd 7 from the roof mat above pit F3600, belong to a carinated vessel with everted and rolled over rim. It is highly burnished on both surfaces and has an open bowl profile. It has a dark brown inner and outer surface and core, having been evenly fired throughout. The fabric contains crushed stone inclusions <4 mm across and averages 10 mm thick. It has an internal rim diameter of 0.31 m.
63	Sherds 4 and 5 Sherds 6 and 9	Pit F3600 (Context 3601) Sherds 6 and 9 are from the roof mat (3605) from above F3600	Four undecorated thick-walled body sherds from a plain ware vessel and one of which shows evidence it comes from a slack shouldered globular vessel. It has an orange brown outer surface and darker brown inner surface and core. The fabric contains crushed sandstone inclusions <10 mm across and averages 12 mm thick.
Unattrib-utable	Sherds 10, 11, 12, 13	Turf Root Mat (Context 3605)	

TABLE 20 Southern Area Early Neolithic Ceramic Catalogue (MAP Intervention)

POT NO.	SMALL FIND NO.	FEATURE NO. AND CONTEXT	DESCRIPTION
1		F2 (Context 1001)	Sixteen sherds, of which 3 are rims, from a globular Carinated Bowl with a carination high up in its profile and an everted rim. This is a classic example of a Carinated Bowl. It has an internal rim diameter of approximately 160 mm.
2		F2 (Context 1001)	A tiny rim sherd from a Plain Ware open dish with everted rim. It is burnished on its inner and outer surfaces and has slight incised horizontal lines below the inner lip. The fabric contains crushed stone inclusions averaging 2 mm across. The fabric averages 5 mm thick.
3		F2 (Context 1001)	A small rim sherd from an open Plain Ware vessel with everted rim, burnished on its inner and outer surfaces and containing crushed stone inclusions up to 7 mm across, some of which erupt on its outer surface. It has a dark brown inner surface and core and lighter brown outer surface. It has a wall thickness of 4-6 mm. It is too small a section of rim to determine its diameter.
4		F2 (Context 1001)	Three sherds from a Plain Ware vessel with burnished internal and external surfaces, but with coarse stone inclusions up to 4 mm across erupting from the outer surface. It has a red-brown outer and inner surface with dark grey core. The fabric averages 6-10 mm thick and one sherd has charred organic residues adhering to its internal surface.
5		F114 (Context 1079)	Three large wall sherds from a substantial Plain Ware vessel. It has a red-brown external surface with darker brown inner surface and core. It is burnished on both surfaces but its crushed stone inclusions that average 6 mm across erupt from both surfaces. It has a wall thickness of 10-11 mm.
6		F274	A single large wall sherd from a substantial Plain Ware vessel with good example of a lug on its external surface. It is highly burnished on both its inner and outer surfaces which are both brown in colour. The core is dark grey and contains crushed stone inclusions averaging 4mm across. It has an average wall thickness of 10 mm.

Form

As with Impressed Ware ceramics from elsewhere in the British Isles, the material from this site indicates vessels with flat, and occasionally, rounded bases. The base sherd from Pot 1 indicates a flat-based vessel with rounded, decorated rim, while the rims from Pots 2 and 3 indicate vessels with a T-shaped profile rim and flattened rim respectively. The body sherds give the impression of either slightly rounded profiles or (e.g. Pot 1) a more flowerpot-shaped profile. This range of Impressed Ware material is in keeping with other sherds of this ceramic tradition from the region including those from Thirlings (Miket 1987 and this volume), Yeavering (Ferrell 1990), Crookham (Leeds 1927; Longworth 1969; Miket 1976), Redscar Bridge (Leeds 1927; Miket 1976), Kyloe Crags (Tait 1968), Alnwick (Leeds 1927), Elson (Tait 1968) and Allendale (Tait 1968).

Numbers

Four Impressed Ware pots can be identified from the southern area (Table 21); however, this may underestimate the actual number somewhat as several of the unattributable vessels from the southern area interventions could also belong to this tradition (see Table 25).

GROOVED WARE

Grooved Ware was recovered from both the northern area and southern area of the site (Tables 22 and 23, and 24 respectively). Finds of Grooved Ware are relatively rare in Northumberland and their chronology and use is only just beginning to be understood. The sherds from Cheviot Quarry show clear evidence for grooved decoration on the outer surfaces, and in one case on the inner rim bevel (Pot 2 northern area and Pot 2 from F219 southern area), while fingernail impressions are present on several other sherds from these contexts. Slight raised cordons are also present on Pots 3 and 4 from Pit F219 in the southern area, with jabbed decoration on the cordon of Pot 4 and vertical short grooves on the slighter cordon of Pot 3. The fabric of Pot 2 reveals a well-made vessel that on first glance could suggest this is part of a Beaker, particularly given that it is also a relatively small pot. However, the straight-sided character of this vessel points rather towards a small tub-shaped vessel and the infilled triangle and lozenge decoration recalls the decoration found on other Grooved Ware pots such as those from Lion Point (Longworth et al. 1971) and Creeting St Mary (Piggott 1954).

Fabric

The Grooved Ware ceramics are from well-made, fairly coarse fabric, pots of varying size, although Pot 2 from Pit F219 in the southern area is of a finer fabric. They have been made using the coil technique and contain prepared crushed stone inclusions. They show evidence of having been evenly fired and burnt out organics can sometimes be noted.

TABLE 21 Southern Area Impressed Ware Catalogue (MAP intervention)

POT NO.	SMALL FIND NO.	FEATURE NO. AND CONTEXT	DESCRIPTION
1		F204	An assemblage of small sherds and crumbs that probably all come from the same Impressed Ware vessel. A surviving rim sherd indicates a vessel with rounded lip with fingernail impressions in horizontal rows on its outer surface. Other sherds reveal zoning of the fingernail decoration with horizontal incised lines. If all the sherds belong to the same vessel, which is likely, the surviving base sherd shows it to have a flat base and that the vessel has an overall flowerpot shape. The vessel has a red brown outer surface and core with darker brown burnished inner surface. This well fired pot has finely crushed stone and sand inclusions up to 6 mm across. The wall thickness averages 12 mm across with the base 25 mm thick. Some burnt organic residues survive on the internal surface of the pot and three of these sherds were submitted for residue analysis. Not a sufficient amount of the rim survives to determine the rim diameter.
2		F279	A single rim sherd from a substantial Impressed Ware vessel. The rim has an expanded T-profile with narrow neck containing a horizontal row of paired finger and thumbnail impressions and this decoration continues below the neck. There are two concentric rows of jabbed impressions on top of the rim and outer edge. The vessel has a dark brown outer surface and core with reddened inner surface. The fabric contains crushed stone inclusions >6 mm across and an average wall thickness of around 12 mm. It has an internal rim diameter of 250 mm.
3		F126	A single rim sherd from an Impressed Ware vessel with broad flat rim above a shallow neck and shoulder. No decoration visible on this piece. It has a layered fabric containing coarse stone inclusions that erupt through the surface and average 6 mm across. It has a red brown outer and inner surface with dark grey core. The wall averages 8 mm thick and an internal rim diameter of approximately 150 mm.
4		F203	Two small sherds and seven flakes from a probable Impressed Ware vessel. One sherd has two parallel grooves, the second a herringbone pattern of fingernail impressions above an incised line. The vessel has a dark brown outer and inner surface with a dark grey core. Several of the sherds have burnt organic residue adhering to the internal surface The fabric contains crushed stone inclusions up to 8 mm across and the wall averages 6.5–8 mm thick.

TABLE 22 Northern Area Grooved Ware Catalogue (ARS Ltd intervention)

POT NO.	SMALL FIND NO.	FEATURE NO. AND CONTEXT	DESCRIPTION
1	15	Pit F2163	A body sherd from a large well-fired coarse pot with grooved decoration on the outer surface. Orange-brown surface with brown core. Fabric contains crushed stone inclusions <6 mm across and averages 10 mm thick.
2	8, 9, 17, 18, 19, 20, 26,	Pit F2133	A large flat-based vessel with inner bevelled rim with grooved decoration on inner bevel and grooved decoration on outer surface. Orange-brown surface with brown core. Fabric contains crushed stone inclusions <6 mm across and averages 8mm thick
3	16, 27	Pit F2168	A large coarseware vessel with grooved decoration on outer surface. Orange-brown surface with grey core. Fabric contains crushed stone inclusions <4 mm across and averages 12 mm thick.
4	11	Pit F2168	A well made pot with grooved design on its brown surface; grey core. Fabric contains crushed stone inclusions <2 mm across and averages 7 mm thick.
5	2, 4	Pit F2061	Thin-walled vessel with plain rim (4) with 1 fingernail impression visible. Pale brown surface and core containing crushed stone inclusions <2 mm across with fabric averaging 6mm thick. Although occasional fingernail impressions are found on Grooved Ware this sherd could, instead, belong to an Impressed Ware pot.
6	13	Pit F2133	Body sherd with fingernail decoration on outer surface. Brown surface and black core with fabric containing crushed stone inclusions <3 mm across and averaging 7 mm thick.
7	21	Pit F2133	Thin-walled coarseware vessel. Tiny sherd with orange-brown surface and grey core containing crushed stone inclusions <2 mm across. Fabric averages 4 mm thick.
8	22	Pit F2133	Thick-walled coarseware pot. Tiny sherd with orange-brown surface and brown core. Fabric contains crushed stone inclusions <2 mm across and averages 9 mm thick.

TABLE 23 Northern Area Grooved Ware Catalogue (Tyne and Wear Museums Service intervention)

POT NO.	FEATURE NO. AND CONTEXT	DESCRIPTION
1	F163	A body sherd with a tiny section of rim surviving from an open dish red coloured vessel with tightly spaced parallel grooved decoration on the outer surface running vertically from the rim down to the base. The fabric contains crushed stone inclusions less than 3 mm across and averages 11 mm thick. The rim is too small to allow the diameter of the pot to be reconstructed.

TABLE 24 Southern Area Grooved Ware and Beaker Catalogue (MAP intervention)

POT NO.	FEATURE NO. AND CONTEXT	DESCRIPTION
1	F102	A large undecorated Beaker currently broken into many sherds and fractured by earth pressure. The entire pot is reconstructable and has a height of 210mm and with an internal rim diameter of 140 mm and a base of 100mm diameter. It has a slack profile and is of bipartite form. It has a moulded lip with an internal bevel. Grass imprints can be observed on the flat base, It has a coarse fabric containing angular stone inclusions >10mm across erupting through the surfaces and a burnished exterior moulded into shallow horizontal corrugations. It has orange brown internal and external surfaces and a grey core and measures 8-11 mm thick. Some patches of residue survive.
2	F219	Six sherds of which two are rims, from a small decorated Grooved Ware vessel with inscribed grooves forming lozenges and triangles, the spaces between containing stab impressions. A relatively fine fabric with brown external and internal surfaces and grey core. The fabric contains crushed stone inclusions up to 8mm across and averages 5-7 mm thick. Internal rim diameter is 130 mm.

3	F219	Two joining rim sherds of a tub-shaped Grooved Ware vessel, now in three pieces and several body sherds and fragments form a vessel with an upright rounded lip with slight rough cordon below with vertical strokes. Wall sherds have horizontal grooves. Coarse fabric containing crushed stone inclusions up to 10 mm across, some of which erupt from the surfaces. It has an orange brown to buff external surface and dark grey inner surface and core and a wall thickness of 8-10 mm thick. An area of residues survives on the internal surface of one of the rim sherds. Internal rim diameter is 170 mm.
4	F219	Three small sherds from a Grooved Ware-related vessel with a flattened lip and crude cordon below the rim that has indistinct jabbed decoration. Some shallow horizontal grooving below. A fourth body sherd also survives with a broken perforation through the wall. Coarse fabric containing angular stone inclusions up to 10mm across, some of which erupt from its external dark brown surface and its internal red-brown surface. The fabric is between 10 and 12 mm thick. Residues survive on both the internal and external surfaces.
5	F219	A sherd from the base of a coarseware flat-based, thick-walled vessel. The fabric contains large crushed stone inclusions up to 12 mm across and averages 11-13 mm thick. It has a pale red-brown outer surface and darker grey brown core. The internal surface is caked with a burnt organic residue.
6	F310	Two tiny sherds with parallel, horizontal cord decoration. The vessel has a brown outer surface and dark grey inner surface and core. It is a fine ceramic with smooth surfaces and sand inclusions. It has a wall thickness of 4 mm. Probable Grooved Ware fragments.
7	F310	Four tiny sherds from a probable Grooved Ware vessel with occasional fingernail impressions. It has a smooth outer surface and gritty inner surface, but is otherwise a relatively fine, gritty fabric. It has a red-brown outer surface and core with a more buff-coloured inner surface. Wall thickness is 7 mm.
Unattrib-utable	F219	An additional 17 small sherds and crumbs from pots with a fairly thick-walled fabric with angular stone inclusions were recovered from the same context but could not be assigned with certainty to any of the other vessels from this context (vessels 2–5).

TABLE 25 Southern Area Unattributable Catalogue: (MAP intervention)

POT NO.	FEATURE NO. AND CONTEXT	DESCRIPTION
1	Unstratified Topsoil (1028)	Two sherds unattributable to any obvious vessel type recovered from the topsoil. There are two sherds with a red-brown outer surface and dark brown inner surface – one with crushed stone inclusions averaging 3 mm across. There is no decoration and the walls average 8 mm thick.
2	Unstratified Topsoil (1028)	A tiny sherd with a red-brown gritty fabric and wall thickness of 6 mm.
3	F205	A tiny crumb from a vessel with red-brown fabric containing crushed stone grits averaging 2 mm across.
4	F207	A single sherd from thick-walled coarse ware vessel with red-brown inner and outer surface and dark grey core, containing crushed stone inclusions averaging 6 mm across, some of which erupt on the inner surface. Wall thickness 16 mm. This type of fabric suggests it could be from an Impressed Ware vessel.
5	F119 (1095)	A single sherd with a pale brown smooth exterior and dark grey inner surface and core. The fabric contains crushed stone and sand inclusions and has been well-fired. Average wall thickness 10 mm. On the basis of the fabric and the erupting inclusions on its external surface these suggest the sherd belongs to the Impressed Ware tradition.
6	F119 (1095)	A single sherd of coarse ware pottery with red-brown inner and outer surfaces and dark grey ore. The fabric contains crushed stone inclusions averaging 6 mm across, some of which erupt on the external surface which is rough and unburnished. Average wall thickness of 30 mm and traces of soot residues on its internal surface. The sherd is likely to belong to the Impressed Ware tradition.
7	F305	A single small sherd from a vessel with burnished inner and outer surfaces. The outer surface being buff coloured and the inner surface and core being dark grey to black. The fabric contains crushed quartzitic inclusions averaging 3 mm across and has a wall thickness of 10.5 mm. This sherd may belong to a Carinated Bowl.
8	F124 (1105)	A single small sherd from a substantial coarse ware vessel with a wall thickness of 14–15 mm. Has an evenly fired fabric that contains sand crushed stone inclusions up to 11 mm across. It has red-brown internal and external surfaces and core. On the basis of the fabric, this sherd is likely to belong to a later Neolithic pottery style.
9	F249	Two crumbs from a vessel with a dark grey fabric.

Form

The base sherd from Pot 2 indicates flat-based tubs while the rim sherd from the same pot indicates vertical rims. The body sherds tend to be straight sided along the vertical axis. This evidence points towards fairly substantial bucket or tub-shaped vessels. The unusually shaped and decorated sherd from the TWMS intervention indicates an open dish vessel, perhaps with a rounded base, with a plain rounded rim but with tightly spaced, parallel-groove decoration running from the rim towards the base. The grooved decoration and suggestion of lozenge motifs on the decoration of some sherds implies parallels with Smith's 'Clacton' style (Smith 1956), whereas the fingernail impressions on Pots 7 and 8 northern area recall Smith's Woodhenge style, and the near vertical internal bevel on Pot 2 northern area is suggestive of Durrington Walls style. This range of Grooved Ware styles is in keeping with the styles known to be present in the Milfield basin as, in Gibson's recent review, they are also present at the nearby sites of Old Yeavering, Ewart 1 pit alignment, Redscar Bridge and Milfield North (Gibson 2002).

Numbers

At least thirteen Grooved Ware pots can be identified. Pit F2133 contained four pots, Pit F2168 two pots, and Pits 163 and F2061 one each. Pot 1 from the TWMS intervention came from the unstratified topsoil horizon from an evaluation trench. Pit F219 in the southern area produced sherds from four Grooved Ware vessels together with 17 small unattributable sherds whilst Pit F310 produced sherds from two possible Grooved Ware vessels.

BEAKER CERAMICS

The only Beaker ceramics recovered from the site came from the southern area (Table 24). The single Beaker that is described in Table 24 (Pot 1) is largely complete. It is worth noting that sherds from two early cord-decorated Beakers (AOC — All Over Cord) and a comb-decorated Beaker were found in Pit F254 during the MAP intervention and they are reported in the assessment undertaken by T. G. Manby. However, these sherds could not be located in the archive and so are not included in the catalogue below.

Fabric

The Beaker ceramic (Pot 1) is a well-made pot with prepared fine inclusions of stone, quartz and sand with thin walls that have been evenly fired. It has been made using the coil technique and contains prepared crushed stone inclusions. It shows evidence of having been evenly fired and burnt out organics can sometimes be noted.

Form

The large undecorated Beaker (Pot 1), which falls slightly more towards a long neck classification rather than a short, has virtually all its component sherds present, having

TABLE 26 Northern Area: Unknown Period (ARS Ltd intervention)

POT NO.	SMALL FIND NO.	FEATURE NO. AND CONTEXT	DESCRIPTION
Unattrib-utable	273	Pit F469	A small sherd from a coarse ceramic vessel of prehistoric age. Blackened fabric throughout. Small quartzitic inclusions and averaging 5 mm thick.

fractured in the ground due to soil pressure. The Beaker does not have any decoration on its surfaces.

Numbers

One complete Beaker and fragments from three further Beakers (see above) were present. The complete Beaker came from Pit F102 while the three other Beakers not described here came from Pit F254.

LATER PREHISTORIC POTTERY: FLAT-RIMMED WARE

Although the term 'Flat-Rimmed Ware' has in the past been used to refer to coarse wares dating from the third to first millennia cal. BC (Coles and Taylor 1970, 97), it is used here specifically to refer to an assemblage comprising predominantly flat-rimmed vessels that date to the late second and early first millennia cal. BC as Hedges outlined some time ago (Hedges 1975, 69). As Hedges stated, the term Flat-Rimmed Ware is really a reference to what are 'simple, crude, bucket- and barrel-shaped pots', although it is probably unfair on the potters of this utilitarian coarseware to label it as 'the lowest common denominator of bad pottery' as Piggott described it (1955, 57). All the Flat-Rimmed Ware sherds in this assemblage, with the exception of one from the topsoil in the southern area (Table 28), were recovered from the two Late Bronze Age roundhouses in the northern area of the site (Table 27) with the majority of sherds coming from Pit F340 inside Building 4. The sherds display the typical attributes associated with Flat-Rimmed Ware pottery including flat, but also bevelled and flared rims, coarse fabric, a mixture of evenly and poorly fired vessels, an absence of decoration and a mixture of bowl, situlate (barrel), bucket and flowerpot-shaped vessels (see Feacham 1961, 83–84; Jobey 1978, 85–87; Gibson and Woods 1997, 156–57). Cordons and grooving, though present in some regional assemblages of this period, such as those from Green Knowe (Jobey 1978), Dalnagar (Coles 1962) and Culbin Sands (Coles and Taylor 1970), are only occasionally found among the assemblage. This somewhat featureless ceramic material is the principal pottery of the Middle to Late Bronze Age outside Deverel-Rimbury and Trevisker areas and is typical in north-east England and eastern Scotland where it has been found at other sites such as Green Knowe (Feacham 1961; Jobey 1978), Standrop Rigg (Jobey 1983) and Lookout

Plantation (Monaghan 1994), the latter lying less than 8 km north-west of Cheviot Quarry.

Fabric

The fabrics all contain coarse, crushed sandstone inclusions, some of which erupt on both surfaces, as an opening agent. These inclusions have clearly been specially prepared for the purpose and are made out of either sandstone or quartz. The fabrics are usually evenly fired throughout, making the pots strong and durable. Both thick- and thin-walled vessels are evident, with most of the material ranging between 4 mm and 13 mm in thickness. Pitted surfaces are common where organics have burnt out during the firing process. The consistent colouring on most pots indicates an even firing process, which is likely to have taken place in an oxidizing atmosphere given the bright orange colour of many of the sherds. The surfaces are generally orange-brown in colour with the cores being usually a darker brown to black, though in some cases the entire fabric is orange-brown throughout. The pots are coarsely made, though some have a burnished finish on both the inner and outer surfaces, with grass-wiping common. A number of the sherds have fractured along coil lines, revealing the method by which the pots were constructed.

Form

The vessels are all hand built and are of bowl, situlate or bucket shape, typically with upright flat or slightly rounded rims. Occasionally rims with internal bevels are present and there are a few examples of slightly more developed rims which, though still flat, flare out beyond the wall of the vessel. They range in size from large storage and cooking vessels to small bowls. The sherds are from vessels of widely different sizes including some of substantial proportions (e.g. Pots 1, 5, 6, 20–24 and 27). The presence of burnt carbon encrustations on a number of sherds indicates the use of these vessels for cooking purposes (see also residue analysis).

Numbers

About 137 sherds of Flat-Rimmed Ware pottery were found with around forty-two different vessels represented. Thirty-one of the thirty-eight pots from Building 4 came from the various fills of Pit F340, while three vessels were present in the more truncated deposits from Building 5. No certain matches could be made between sherds or pots from different pits, although some sherds from the same pot were found distributed between the upper and lower fills of the same pit (e.g. Pots 21 and 23 in Pit F340).

TABLE 27 Flat-Rimmed Ware Catalogue Northern Area (ARS Ltd intervention)

POT NO.	SMALL FIND NO.	FEATURE NO. AND CONTEXT	DESCRIPTION
Building 5			
1	420, 421	Hearth F314	Large flat-based thick-walled coarse ceramic vessel with no decoration visible. Probably part of a storage vessel. Orange-brown oxidized external and internal surfaces with dark brown core. Fabric contains crushed stone inclusions <5 mm across and averages 13 mm thick.
2	347, 423	Post-hole F316	Two sherds from a thick-walled coarse ceramic vessel. Orange-brown internal surface and core with dark brown outer surface. Fabric contains crushed stone grits <6 mm across and averages 11 mm thick.
3	401, 402, 403, 404, 405, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416	Hearth F306	Sherds from the basal section of a flat-based flower-pot shaped undecorated coarse vessel, for use as storage or cooking. It has a dark brown inner surface with orange-brown external surface and core. Fabric contains crushed stone inclusions <5 mm across and averages 11 mm thick.
Building 4			
4	352	Pit F352	A single sherd from an undecorated coarse vessel. It has a dark brown inner surface with orange-brown external surface and core. Fabric contains crushed stone inclusions <3 mm across and averages 11 mm thick.
5	348, 351, 352, 362, 365, 368, 400	Pit F340 Fill 477	Sherds from a large deep bowl with upright neck and flat rim – there are three rim sherds present. Internal residues are visible on several sherds suggesting use as a cooking or serving vessel. It may be round based. It has an orange-brown inner surface and dark brown outer surface. Coarse fabric containing crushed stone inclusions <9 mm across and averaging 10–11 mm thick.
6	320, 330, 333, 335, 353, 355, 360, 398	Pit F340 Fill 477	A flat-rimmed substantial coarse ceramic bowl. Probably round-based. Orange-brown fabric throughout containing crushed stone inclusions <6 mm across. Uneven surfaces but typically around 8–10 mm thick.
7	334, 336, 337, 357, 358, 359	Pit F340 Fill 477	Sherds from a thin-walled coarse ceramic bowl with orange-brown fabric throughout. Fabric contains crushed stone inclusions <5 mm across and averaging 7 mm thick.
8	281	Pit F340 Fill 477	Single thick-walled body sherd from a well made burnished bowl. Dark brown inner surface and core with buff external surface. Fabric contains crushed stone inclusions <4 mm across and averages 13 mm thick.

9	341, 356	Pit F340 Fill 477	Sherds from a coarse ceramic vessel. Dark brown inner surface with residues adhesing and orange-brown outer surface and core. Fabric contains crushed stone inclusions <4 mm across and averaging 7 mm thick.
10	340, 350	Pit F340 Fill 477	Sherds from a Flat-Rimmed Ware vessel that has an everted flat rim probably forming part of an eating dish or cooking bowl. Dark brown internal surface and orange-brown external surface. Fabric contains crushed stone inclusions <4 mm across and averaging 7 mm thick.
11	332, 354	Pit F340 Fill 477	Flat-Rimmed bowl with upright neck. Dark brown inner surface and core with orange-brown outer surface. Coarse fabric containing crushed stone inclusions <6 mm across and averaging 10 mm thick.
12	331, 339	Pit F340 Fill 477	Sherds from a coarseware pot, evenly fired with orange-brown inner and outer surfaces and core. Fabric contains crushed stone inclusions <4 mm across and averaging 8.5 mm thick.
13	282	Pit F340 Fill 477	Rim sherd from a coarseware bowl with upstanding rim. Dark brown fabric throughout containing crushed stone inclusions <4 mm across and averaging 11 mm thick.
14	361	Pit F340 Fill 477	Rim sherd from a coarseware bowl with upstanding rim. Dark brown inner surface with buff outer surface and core. Fabric contains crushed stone inclusions <4 mm across and averaging 8–10 mm thick across its uneven surface.
Unattrib-utable sherds	338, 349, 399	Pit F340 Fill 477	Various tiny sherds from coarseware vessels unable to be attributed to any vessels due to their fragmentary nature and small size.
15	369, 373 joins with 370	Pit F340 Fill 482	Three rim sherds from an everted Flat-Rimmed Ware vessel with a very slight shoulder indicating a shallow bowl, probably for cooking. All sherds contain internal surface residues. Dark brown internal surface and core with orange-brown external surface. Fabric contains crushed stone inclusions up to 9 mm across and averaging 7 mm thick.
16	382	Pit F340 Fill 483	Single everted flat rim sherd with slight shoulder forming part of a shallow bowl. Dark brown inner surface with residue adhesing and core with orange-brown external surface. Coarse fabric contains crushed stone inclusions <4 mm across and averaging 7 mm thick.
17	319, 367, 385, 386, 389	Pit F340 Fill 483	Sherds from an upright deep flat-rimmed bowl with residue surviving on inner and outer surfaces – suggesting it has been used in the cooking process. Orange-brown surfaces and core and evenly fired throughout. Coarse fabric contains crushed stone inclusions <7 mm across and averaging 13 mm thick.
18	257, 381, 387, 388	Pit F340 Fill 483	A coarseware vessel with some residue surviving on inner surface suggesting use in the cooking process. Coarse fabric contains crushed stone inclusions <6 mm across and averaging 9–11 mm thick.
19	269	Pit and Fill F340	Body sherd from a very large coarseware bucket-shaped vessel. Orange-brown fabric and evenly fired throughout. Fabric contains crushed stone inclusions <6 mm across and averaging 9–11 mm thick across its uneven surface.

TABLE 27 (continued)

POT NO.	SMALL FIND NO.	FEATURE NO. AND CONTEXT	DESCRIPTION
20	241, 242, 285, 286, 287, 288, 289, 290, 291,	Post-hole F348	A large coarseware vessel with upright rim, internally sharp angled bevel and slight carination. Bright orange and evenly fired fabric which includes crushed stone inclusions <7 mm across and averaging 12–15 mm thick.
21	364, 380	Pit F340 Fills 482 and 483	Two sherds from a large coarseware vessel. Orange-brown oxidized outer surface with burnished inner surface. Fabric contains crushed stone inclusions up to 5 mm across and averaging 12 mm thick.
22	365, 372	Pit F340 Fill 482	Two sherds, including one rim, from a sizeable vessel with smoothed inner and outer orange-brown surfaces. Bright orange and evenly fired oxidised fabric which contains crushed stone inclusions up to 5 mm across and averaging 8–9 mm thick.
23	377, 390	Pit F340 Fills 482 and 483	Two body sherds from a large coarseware vessel, both of which have residue surviving on their inner surface. Dark brown fabric with oxidized orange-brown smoothed outer surface. Fabric contains crushed stone inclusions up to 5 mm across and averaging 12 mm thick.
24	371, 378, 383	Pit F340 Fill 482	Three rim sherds probably from the same large coarseware vessel with a flat rim and a slightly curving profile suggesting it is a bowl. Although it has a smoothed inner and outer surface the dark brown fabric contains crushed stone inclusions <6 mm across and averaging 11 mm thick. The sherds appear to have surviving residues on their inner and outer surface from where food has presumably boiled over the rim.
25	379	Pit F340 Fill 482	A single rim sherd from an open bowl with flat rim. Fabric is very coarse with orange-brown oxidised inner and outer surfaces with dark brown core that contains crushed stone inclusions <5 mm across and averaging 13 mm thick.
26	249, 371, 398	Pit and Fill F340	Three sherds from a coarseware pot with flat rim and smoothed and oxidised orange-brown inner and outer surfaces. Fabric contains crushed stone inclusions <8 mm across and averaging 9 mm thick.
27	310, 313, 391, 392, 394	Pit and Fill F340	Five sherds from a substantial coarseware vessel, no rim sherds present. Only slightly smoothed surfaces with oxidised fabric predominantly orange-brown in colour. Fabric is very coarse and contains crushed stone inclusions <8 mm across and averaging 10 mm thick.
28	270, 309, 395	Pit and Fill F340	Three sherds from a well burnished vessel with a flared and distinctive flat rim suggesting its use as some kind of serving or eating vessel. Darker brown in colour compared to most to most of the other Flat-Rimmed Ware vessels and with a slightly less coarse fabric. Fabric contains crushed stone inclusions <5 mm across and averaging 8 mm thick.

29	303, 304, 372	Pit and Fill F340	Three sherds including two rims from a well-made coarseware vessel with flat rim and slightly curving profile suggestive of a bowl. Orange-brown and oxidised external surface with darker brown inner surface. Fabric contains crushed stone inclusions <6 mm across and averaging 10 mm thick.
30	253, 316, 396	Pit and Fill F340	Three sherds from a relatively highly smoothed vessel with plain flat rim. Oxidised orange-brown outer surface with darker brown inner surface. Fabric contains finer inclusions than in most other vessels being <3 mm across and averaging 8–9 mm thick.
31	247, 255, 314, 317	Pit and Fill F340	Four tiny scraps of pottery from a distinctive vessel with red outer surface and brown inner surface with one sherd, 317, having residue surviving. Fabric contains crushed stone inclusions <5 mm across and averaging 7 mm thick.
32	256, 280	Pit and Fill F340	Sherds from a large coarseware vessel that is probably of bucket shape. Fabric has a smooth outer surface and coarse inner surface, both orange-brown in colour, the lack of inner burnishing suggesting its use as a storage vessel for non-liquids. Fabric contains crushed stone inclusions <10 mm across and averaging 11 mm thick.
33	302	Pit and Fill F340	A distinctive evenly fired orange-brown flat-rimmed sherd. Fabric contains crushed stone inclusions <7 mm across and averaging 10mm thick.
34	393	Pit and Fill F340	A thick sherd from a large vessel with slightly curved profile suggestive of a bowl with burnt residue surviving on its inner surface implying its use as a cooking vessel. Fabric contains crushed stone inclusions <4 mm across and averaging 13 mm thick.
35	304	Pit and Fill F340	A small body sherd from a burnished vessel with orange-brown outer surface and dark brown inner surface. Fabric contains crushed stone inclusions <3 mm across and averaging 8 mm thick.
Unattrib-utable	250, 251, 254, 306, 307, 308, 318, 328	Pit and Fill F340	Eight small abraded sherds too fragmentary to be assigned to any of the vessels identified. All sherds are coarseware and match the general characteristics of the Flat-Rimmed Ware assemblage from this pit.
36	237, 239, 261, 263, 264	Hearth F342	Sherds from a coarseware vessel with oxidised orange-brown and smoothed outer and inner surface. Fabric contains crushed stone inclusions <6 mm across and averaging 11 mm thick.
37	277	Post-hole F367	A sherd from a coarseware vessel with residue surviving on its inner surface. Smoothed orange-brown outer surface with dark brown core. Fabric contains crushed stone inclusions <8 mm across and averaging 10 mm thick.
38	284	Post-hole F361	An abraded sherd from a coarseware vessel with orange-brown inner surface, no outer surface surviving. Fabric is coarse and contains crushed stone inclusions 6 mm across.
39	267	Double Post-hole F348	Sherd from a distinctive bright orange coarseware vessel with oxidised fabric and smoothed inner and outer surfaces. Fabric contains crushed stone inclusions <4 mm across and averaging 12 mm thick.

TABLE 27 (continued)

POT NO.	SMALL FIND NO.	FEATURE NO. AND CONTEXT	DESCRIPTION
40	298	Post-hole F346	Single small sherd with oxidised bright orange fabric from a coarseware vessel, well smoothed on both inner and outer surfaces. Fabric contains crushed stone inclusions <4 mm across and averaging 11 mm thick.
Burnt Clay	245	Post-hole F361	A small piece of burnt clay or daub.
Unattrib-utable	244	Double Post-hole F338	Tiny fragments form a coarseware vessel.
Unattrib-utable	246	Post-hole F363	Two small abraded fragments from a coarseware vessel without surviving surfaces.
41	Unstratified	Near Building 4	Two connecting sherds from a coarseware vessel with orange-brown outer surface and black core and inner surface, the latter being highly burnished. Fabric contains crushed stone inclusions <2 mm across and averaging 9 mm thick. Being unstratified and of markedly different and finer production it is possible that this sherd is residual Neolithic material
Unattrib-utable	Unstratified	Near Building 4	A sherd from a coarseware vessel with orange-brown outer surface, black core and light grey inner surface. Fine quartz inclusions <2 mm across and averaging 10 mm thick. Being unstratified and of markedly different and finer production it is possible that this sherd is residual Neolithic material

TABLE 28 Flat-Rimmed Ware Catalogue Southern Area (MAP intervention)

POT NO.	SMALL FIND NO.	FEATURE NO. AND CONTEXT	DESCRIPTION
42		Unstratified	A rim sherd from a later prehistoric vessel related to the Flat-Rimmed Ware tradition with a buff brown inner and outer surface and dark grey core. It has no decoration and forms part of a large, open, sloping-walled vessel – probably some kind of coarseware dish. It is likely to date from the Late Bronze Age-Iron Age. There is evidence for a possible perforation. The fabric contains sand inclusions and occasional crushed stones up to 4 mm across and has a wall thickness of 16 mm. The rim section is too small to obtain a reliable diameter.

CARBONIZED RESIDUE ANALYSIS BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY, BULK STABLE ISOTOPES AND COMPOUND SPECIFIC-COMBUSTION ISOTOPE RATIO-MASS SPECTROMETRY *by* BEN STERN

Molecular and isotopic analyses have been undertaken on a total of fifty-four ceramic sherds dating from the Neolithic (Carinated Bowl, Impressed Ware and Grooved Ware), Early Bronze Age (Beaker) and Late Bronze Age (Flat-Rimmed Ware) and selected associated soils. Molecular analysis has been used to examine lipids present in visible organic residues (where present) and ceramic absorbed lipids from the interior and exterior surfaces of each sherd, in order to determine vessel use and function. Isotopic analysis of both the bulk visible residues and compound specific analysis of the $C_{16:0}$ and $C_{18:0}$ fatty acids has been used to distinguish ruminant dairy and ruminant/non-ruminant adipose fats.

METHODS

Sample preparation

Where present, scrapings of any adhering visible residues were taken from the surfaces of the sherds. Sub-samples of the ceramic (between 0.1 and 0.3 g) were also removed to a depth of 2 mm from both the exterior and interior surfaces of each sherd with a *Dremmel* electric drill fitted with a tungsten abrasive bit. The interior/exterior was determined by the sherd curvature.

Preparation for Gas chromatography-mass spectrometry (GC-MS)

These samples were extracted with three aliquots of ~3 ml DCM:MeOH (dichloromethane:methanol 2:1, v/v), with ultrasonication for five minutes. The solvent extract was transferred to a clean glass vial. The solvent was removed under a stream of nitrogen. Excess BSTFA (N, O- bis(trimethylsilyl)trifluoroacetamide) with 1% TMCS (trimethylchlorosilane) (*Pierce*) was added to derivatize the sample. An additional drop of DCM was added to ensure thorough mixing of sample and reagent, and the sample was left overnight. Excess derivatizing agent was removed under a stream of nitrogen. The samples were diluted in DCM for analysis by GC-MS. A modern pot (previously solvent extracted) was also analysed using the same method as the samples.

Preparation for Gas chromatography-combustion isotope ratio-mass spectrometry (GC-CIR-MS)

The method employed in this study was adapted from Dudd et al. (1999) and Mottram et al. (1999). Selected sherd powders (from the interior surfaces) and visible residues were solvent extracted as described above. The solvent was removed under a stream of nitrogen. The lipid extracts were then saponified by heating with 4 ml 5% aqueous methanolic NaOH (5% NaOH in 95:5 methanol:deionized water v/v) for two hours at 70°C in closed vials. Once cooled, the samples were acidified using approximately 20 drops of concentrated HCl (checking the samples are acidic). The solvent soluble portion was extracted with 3 × 2 ml hexane, again evaporating to dryness with gentle heat and a stream of nitrogen. The saponified lipid extracts were then methylated using 2 ml boron trifluoride (BF_3) methanol complex per sample and heated in a closed vial at 70°C for one hour. The resultant fatty acid methyl esters (FAMES) were extracted using 3 × 2 ml hexane and evaporated to dryness. To dissolve the FAMES 2ml

of DCM was added to each sample which was either allowed to stand or was shaken gently. A 400 µl sub-sample was transferred to a clean vial and evaporated to dryness for analysis by GC. The remainder of the sample was transferred to a clean vial, evaporated to dryness and stored in a freezer prior to GC-CIR-MS analysis.

Gas chromatography-mass spectrometry (GC-MS)

Analysis was carried out by combined gas chromatography-mass spectrometry (GC-MS) using a Hewlett Packard 5890 series II GC connected to a 5972 series mass selective detector. The splitless injector and interface were maintained at 300°C and 340°C respectively. Helium was the carrier gas at constant inlet pressure. The temperature of the oven was programmed from 50°C (2 mins) to 340°C (10 mins) at 10°C/min. The GC was fitted with a 15 m × 0.25 mm, 0.1 m OV1 phase fused silica column (MEGA). The column was directly inserted into the ion source where electron impact (EI) spectra were obtained at 70 eV with full scan from m/z 50 to 700.

Bulk stable isotopes $\delta^{13}C$ and $\delta^{15}N$ (IR-MS)

Pressed tin capsules (5 mm × 9 mm) were used, into which approximately 1 mg amounts of samples were weighed. Samples were flash combusted in a column containing Cr_2O_3 and silvered cobalt (I) oxide held at a temperature of 1020°C and the resultant gases reduced in a column of elemental copper at 680°C then passed through a water trap of magnesium perchlorate before being separated by the GC column prior to introduction to the MS (Europa 20/20).

Gas chromatography-combustion isotope ratio-mass spectrometry (GC-CIR-MS) of the major fatty acids ($C_{16:0}$ and $C_{18:0}$)

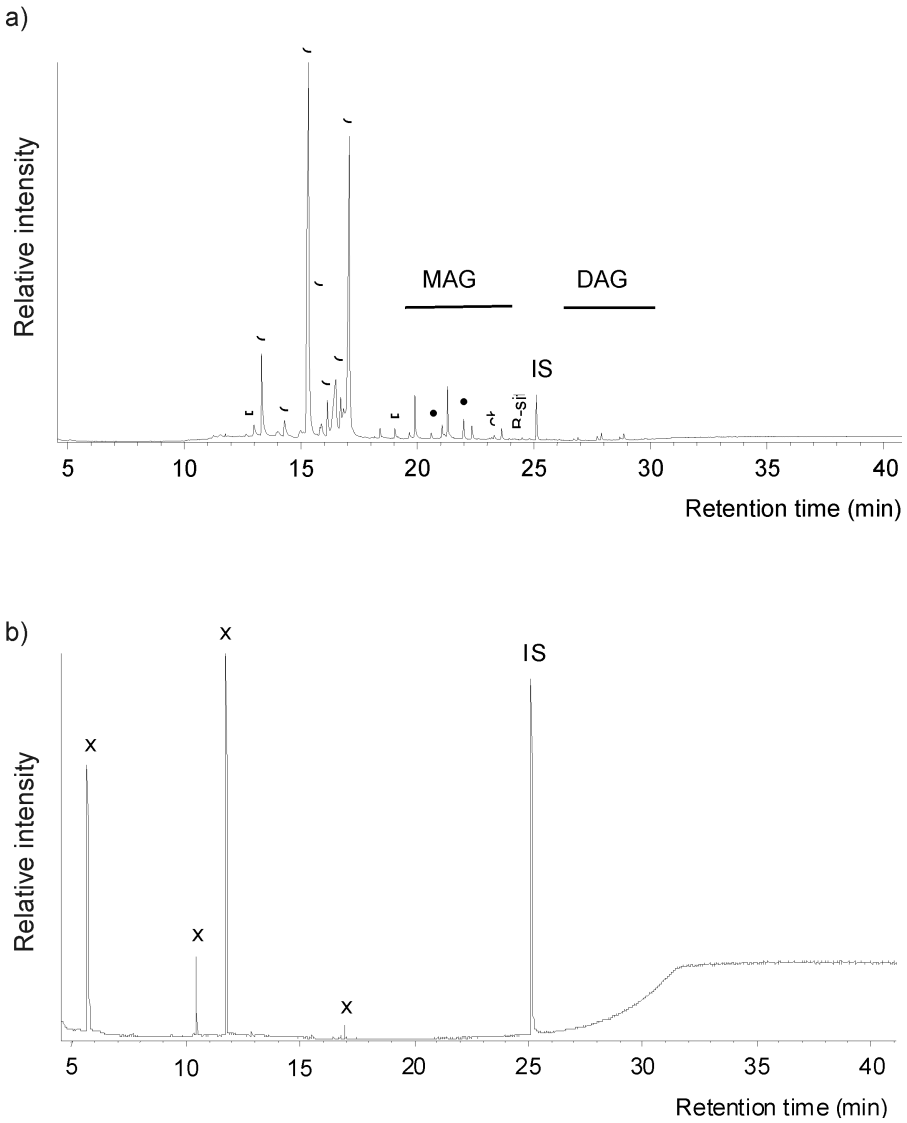
Analysis was carried out by Dr Andy Stott of the Centre for Ecology and Hydrology, Lancaster, UK. Originally twenty samples were selected for GC-IR-MS; however, after sample preparation and confirmation of correct derivatization by GC it was found that only fourteen of these samples contained sufficient $C_{16:0}$ and $C_{18:0}$ for analysis. Samples were determined in duplicate. The error on the fatty acid methyl ester standard that was analysed in batch was better than 0.2 per ml for both $C_{16:0}$ and $C_{18:0}$. As the fatty acids are derivatized with an extra carbon we needed to take account of this (the results are presented as corrected values). The $\delta^{13}C$ value of the methyl group carbon was determined as –44.67 ‰. Values for archaeological samples are corrected using the formula: $C_{16:0}$ = (16 chain length FA + 1 extra from methyl group) × (measured $\delta^{13}C$ value of compound by GC-CIR-MS) – ($\delta^{13}C$ of BF_3) divided by number of original C atoms in fatty acid chain (i.e. 17 × (Deriv fame value) – (–44.67)/16 For the C18 = 19 × deriv fame value – (–44.67)/18)

RESULTS

Molecular results: Gas chromatography-mass spectrometry (GC-MS)

Typical examples of the GC-MS results are shown in Illus. 32. Due to the large number of samples the molecular data are summarized in Table 29, which includes the sherd type and interpretation of the recovered lipids.

One hundred and forty-one samples from fifty-four sherds were analysed by GC-MS for this study (including soils, visible residues, exterior and interior ceramic absorbed). Of these,



ILLUS. 32 Examples of mass chromatograms of the BSTFA derivatized solvent extracts from a) absorbed lipid from the internal surface and b) the absorbed lipid from the external surface of sherd MAP204, Mid-Neolithic Impressed Ware. IS = internal standard, x = analytical artefact

58 yielded no lipid, 30 contained a degraded oil/fat (with an additional 18 possibly containing degraded oil/fat, 22 had molecular evidence that the vessel was used for heating, 10 had biomarkers indicating the fat was an animal source, 2 contained an animal/plant mixture and 2 possibly contained beeswax. When the same data are examined per sherd the majority of the lipids are extracted from the interior 2 mm of each vessel. Where lipids are extracted only from

TABLE 29 Sherd code, contexts, type, date and interpretation of recovered lipids.

SAMPLE . CODE	CONTEXT NUMBER	POT TYPE	CONTEXT DATE (uncal. C years BP)	Interpretation of molecular evidence
16811	F2168	Grooved Ware	4177 ±33BP	Possible degraded oil/fat absorbed into the interior surface
16816	F2168	Grooved Ware	4177 ±33BP	Possible degraded oil/fat absorbed into the interior surface
1338	F2133	Grooved Ware	4152 ±31BP	No lipid, fossil fuel contamination
1635	F2163	Grooved Ware	Late Neolithic	No lipid
13313	F2133	Grooved Ware	4152 ±31BP	No lipid
52173	F052	Carinated Bowl	Early Neolithic	Lipids absorbed into the interior surface indicate the vessel was used for heating oil/fat, the exterior surface also yields possible degraded oil/fat
5125	F051	Carinated Bowl	4348 ±34BP	Possible degraded oil/fat absorbed into both the interior and exterior surfaces
52127	F052	Carinated Bowl	4348 ±34BP	Possible degraded oil/fat absorbed into the interior surface
13321	F2133	Grooved Ware	4152 ±31BP	No lipid
31149	F031	Carinated Bowl	Early Neolithic	Possible degraded oil/fat absorbed into the interior surface
5134	F051	Carinated Bowl	4348 ±34BP	Lipids absorbed into the interior surface indicate the vessel was used for heating Milk
4913	F049	Carinated Bowl	Early Neolithic	Possible degraded oil/fat absorbed into the interior surface
31140	F031	Carinated Bowl	Early Neolithic	Animal fat from interior visible residue, but no ceramic absorbed lipids
52177	F052	Carinated Bowl	Early Neolithic	Possible degraded oil/fat absorbed into the interior surface, animal fat absorbed into the exterior surface
MQ219	MAP F219	Beaker	Late Neolithic/ Early Bronze Age	Possible degraded oil/fat from the interior visible residue, but no ceramic absorbed lipids
306/406	F306	Flat-rimmed Ware	Late Bronze Age	Lipids absorbed into the interior surface indicate the vessel was used for heating Milk. Lipids from the visible residue on the exterior surface indicate that the vessel was used for heating oil/fat
52123	F052	Carinated Bowl	Early Neolithic	Cow Milk/Adipose identified in the interior visible residue. Interior absorbed lipid indicates vessel used for heating oil/fat
51/65	F051	Carinated Bowl	4348 ±34BP	Degraded Milk in the interior visible residue. Possible degraded oil/fat absorbed into the interior ceramic whilst the lipid absorbed into the exterior indicates the vessel was used for heating oil/fat
F204	MAP F204	Impressed Ware	Mid-Neolithic	No lipid

F219	MAP F219	Impressed Ware	Mid-Neolithic	Possible degraded oil/fat from the interior visible residue. The interior absorbed residue indicates that the vessel was used for heating oil/fat and possible mixture with Beeswax.
MMRB/ 4sav	?	Beaker	Late Neolithic/ Early Bronze Age	Degraded fat/oil from the interior visible residue and absorbed into the interior and exterior surfaces
DVORY	F483	Flat-rimmed Ware	2693 ±30 BP	Visible residue and lipids absorbed into the interior surface of the ceramic indicate the vessel used for heating an oil/fat. Fossil fuel contamination of the exterior surface
224434	F224	Carinated Bowl	Early Neolithic	No lipid
224201	F224	Carinated Bowl	Early Neolithic	No lipid
224222	F224	Carinated Bowl	Early Neolithic	Lipids absorbed into the interior surface indicate the presence of degraded Milk and that the vessel was used for heating Milk
314421	F314	Flat-rimmed Ware	Late Bronze Age	Degraded oil/fat absorbed into the interior and exterior surfaces
477368	F477	Flat-rimmed Ware	Late Bronze Age	No lipid
482373/0	F482	Flat-rimmed Ware	Late Bronze Age	Lipids from the interior visible residue and absorbed into the interior and exterior surfaces indicate the vessel was used for heating an oil/fat
482369	F482	Flat-rimmed Ware	Late Bronze Age	Degraded oil/fat from the interior visible residue and from both exterior and interior absorbed surfaces. The lipid from the interior surface also indicates a degraded animal fat and that the vessel was used for heating oil/fat
483382	F483	Flat-rimmed Ware	2693 ±30 BP	No lipid
485389	F485	Flat-rimmed Ware	Late Bronze Age	Degraded oil/fat lipids extracted from interior and exterior visible residues and absorbed from both surfaces. Interior visible, interior and exterior ceramic absorbed indicate that the vessel was used for heating oil/fat. Possible beeswax absorbed into the exterior surface
340367	F340	Flat-rimmed Ware	Late Bronze Age	Animal fat identified in the interior visible residue. Lipids absorbed into the interior surface indicate that the vessel was used for heating oil/fat
340319	F340	Flat-rimmed Ware	Late Bronze Age	The visible residue from the interior surface indicates that the vessel was used for heating an animal fat. An oil/fat absorbed into the interior surface was also heated. A fat/oil is absorbed into the exterior surface
340257	F340	Flat-rimmed Ware	Late Bronze Age	Degraded fat/oil absorbed into both interior and exterior surfaces. Possible beeswax in the visible residue on the interior

TABLE 29 (continued)

SAMPLE . CODE	CONTEXT NUMBER	POT TYPE	CONTEXT DATE (uncal. C years BP)	Interpretation of molecular evidence
340269	F340	Flat-rimmed Ware	Late Bronze Age	No lipid
483388	F483	Flat-rimmed Ware	Late Bronze Age	Interior of vessel used for heating oil/fat. Degraded oil/fat absorbed into exterior surface
348289	F348	Flat-rimmed Ware	Late Bronze Age	No lipid
306413	F306	Flat-rimmed Ware	Late Bronze Age	Lipids absorbed into the interior ceramic indicate that the vessel was used for heating Cow Milk/Adipose
352248	F352	Flat-rimmed Ware	Late Bronze Age	Interior of vessel used for heating oil/fat
459V	?	?		Degraded fat/oil from the interior visible residue, no ceramic absorbed lipids
F13317	F2133	Grooved Ware	Late Neolithic	No lipid
F13318	F2133	Grooved Ware	Late Neolithic	Degraded animal fat extracted from the interior visible and absorbed fractions. Degraded fat/oil absorbed into the exterior surface. Burnt cellulose (wood/higher plants) from the interior visible residue
F219	MAP F219	Beaker	Late Neolithic/ Early Bronze Age	Possible degraded fat/oil from the interior visible residue, degraded animal fat identified absorbed into the interior surface of the ceramic
F3128	F052	Carinated Bowl	Early Neolithic	Degraded fat/oil absorbed into the interior surface with animal fat absorbed into the exterior surface
F5110	F051	Carinated Bowl	Early Neolithic	Possible degraded oil/fat absorbed into both interior and exterior surfaces
MAP1	MAP 1055	Beaker	Late Neolithic/ Early Bronze Age	Degraded Milk from the interior visible residue, identified as degraded fat/oil in the ceramic absorbed fraction. Lipids identified as degraded animal fat from the exterior absorbed fraction
MAP 204	MAP F204	Impressed Ware	Mid-Neolithic	Animal fat/plant mixture absorbed into interior surface
MAP 2204	MAP F204	Impressed Ware	Mid-Neolithic	Animal fat/plant mixture absorbed into the exterior surface, with a degraded oil/fat identified from the exterior visible residue

the interior 2 mm, contamination from the burial environment can be excluded and the lipids can be considered to represent the content of the vessel. In some cases lipids were also extracted from the exterior surface. This can either be attributed to overspill from the vessel or to migration of the lipids through the ceramic.

Overall a wide range of lipids was extracted from the sherds and the general preservation of the organic residues was very good, although there was evidence of degradation of some lipids. For the interpretation of vessel use, the presence of mono-di- and triacylglycerols was used to indicate the presence of an oil/fat. When these biomarkers were not present, but significant abundances of fatty acids were recovered from the vessel, this was interpreted as containing a degraded oil/fat. Based on a degraded fatty acid or acylglycerol distribution, it is not possible to identify the source any further (i.e. to distinguish animal fat from plant oil). Cholesterol was used to identify the presence of an animal input and the absence of squalene was then used to confirm that the cholesterol had not been introduced due to contamination by recent handling. Phytosterols were used to indicate the input of plant materials. Molecular evidence that the vessel was used for heating was based on the presence and distribution pattern of odd numbered ketones, which are known to be derived from the heating of oils in ceramic vessels to temperatures in excess of 300°C (Evershed et al. 1995; Raven et al. 1997). Beeswax was tentatively identified from the presence and distribution of *n*-alkanes, long chain alcohols and wax esters (e.g. Heron et al. 1994; Evershed et al. 1997; Regert et al. 2001). Levoglucosan is a marker for burning biomass, in particular cellulose (Simoneit 2002), which could originate from the fuel used for heating or from the burial matrix, which for some samples is known to contain burnt remains.

No significant contamination of the prehistoric residues was found. The distribution of solvent extracts from the soil samples was different from those of the sherd samples and therefore contamination from the burial matrix can be excluded. In addition, the modern pot that was used to examine contamination during sample preparation and analysis yielded only trace levels of fatty acids. These are ubiquitous compounds and, despite the precautions used to avoid contamination, their presence at such low abundances is not unexpected. Almost all the samples yielded compounds called phthalate plasticisers (labelled as P, Illus. 32); these are modern synthetic compounds and are associated with leaching from plastics. In addition, a number of known analytical artefacts (labelled as x) were identified. These components do not represent significant contamination and do not interfere with the interpretation of the extracts from the samples.

Results for bulk stable isotopes (IR-MS) and gas chromatography-combustion isotope ratio-mass spectrometry (GC-CIR-MS)

For bulk stable isotope analysis twenty residues were selected for their potential to contain preserved organic material. Bulk analysis determines the combined isotopic value of the sample which may itself be very heterogeneous in its composition, for example containing a mixture of lipid, carbohydrate and protein, each component having its own isotopic signature. For these samples the recovered carbon varied between 2% and 44%, indicating that the majority of the visible residues were not organic material and that they were highly heterogeneous. In addition, the yields of nitrogen were all less than 5%, making the $\delta^{15}N$ values unreliable and therefore they are not interpreted any further. The low nitrogen yields do, however, exclude the presence of protein in these samples. The bulk $\delta^{13}C$ values ranged from −30.6 to −26.1‰ with an average of −27.5‰. This is typical of a terrestrial C3 environment, and although only a crude measure, can be used to exclude a marine input, which would be expected to have more positive values.

Fourteen samples containing sufficient $C_{16:0}$ and $C_{18:0}$ fatty acids for analysis were selected for compound-specific analysis (Illus. 33). Previous work has shown that when the characteristic lipid distributions have been lost by degradation it is still possible to assign sources based on the carbon isotopic values of the principal fatty acids. This is due to differences in the biosynthesis and routings of these components and has been used to distinguish ruminant (hoofed beasts such as cattle, sheep or goat) dairy, ruminant adipose and porcine (pig) adipose fats, among others (e.g. Dudd et al. 1999; Mottram et al. 1999; Evershed et al. 2002; Copley et al. 2005a; Copley et al. 2005b). Corrections for derivatization and the modern burning of fossil fuels have previously been applied (Evershed et al. 2002) and therefore make the two data sets directly comparable. Illus. 33 shows that sources such as pig, fish, goose, deer and chicken can be excluded. However, the number of data points for these modern samples are presently limited and therefore the true natural variability of these food sources is not known.

Illus. 34 shows the same data as in Illus. 33 at a more detailed level. Five samples, 51/65, 224222 (both Carinated Bowl), MAP1V (Beaker), and the mean value of samples 5134 (Carinated Bowl) and 306/406 (Flat-Rimmed Ware), all plot within the area defined by modern cow's milk. Two samples, 52123 (Carinated Bowl) and 306413 (Flat-Rimmed Ware), are within the overlapping isotopic values of cow's milk and cow adipose fat. Sample MQ219 (Beaker) is just within the overlapping areas of modern sheep and cow adipose fat.

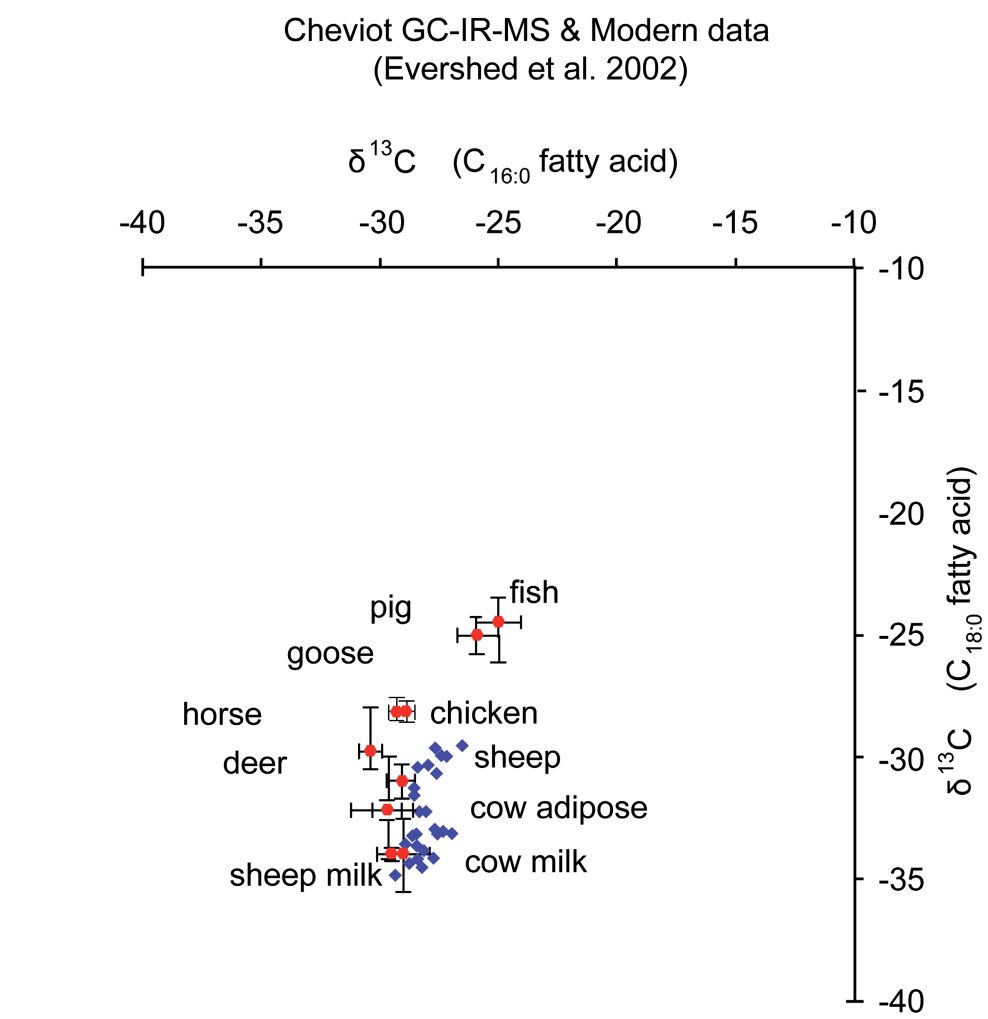
The remaining six samples 482369, 352248, 314421, 483388 and 485389 (all Flat-Rimmed Ware) and F219 (Impressed Ware) are not within the boundary values of the modern reference samples. Of these, Samples 352248, 314421, F219 and 485389 could be on the theoretical bovine and porcine mixing line, or could represent different isotopic values to modern-day food sources owing to a different animal dietary regime in antiquity (Evershed et al. 2002).

DISCUSSION

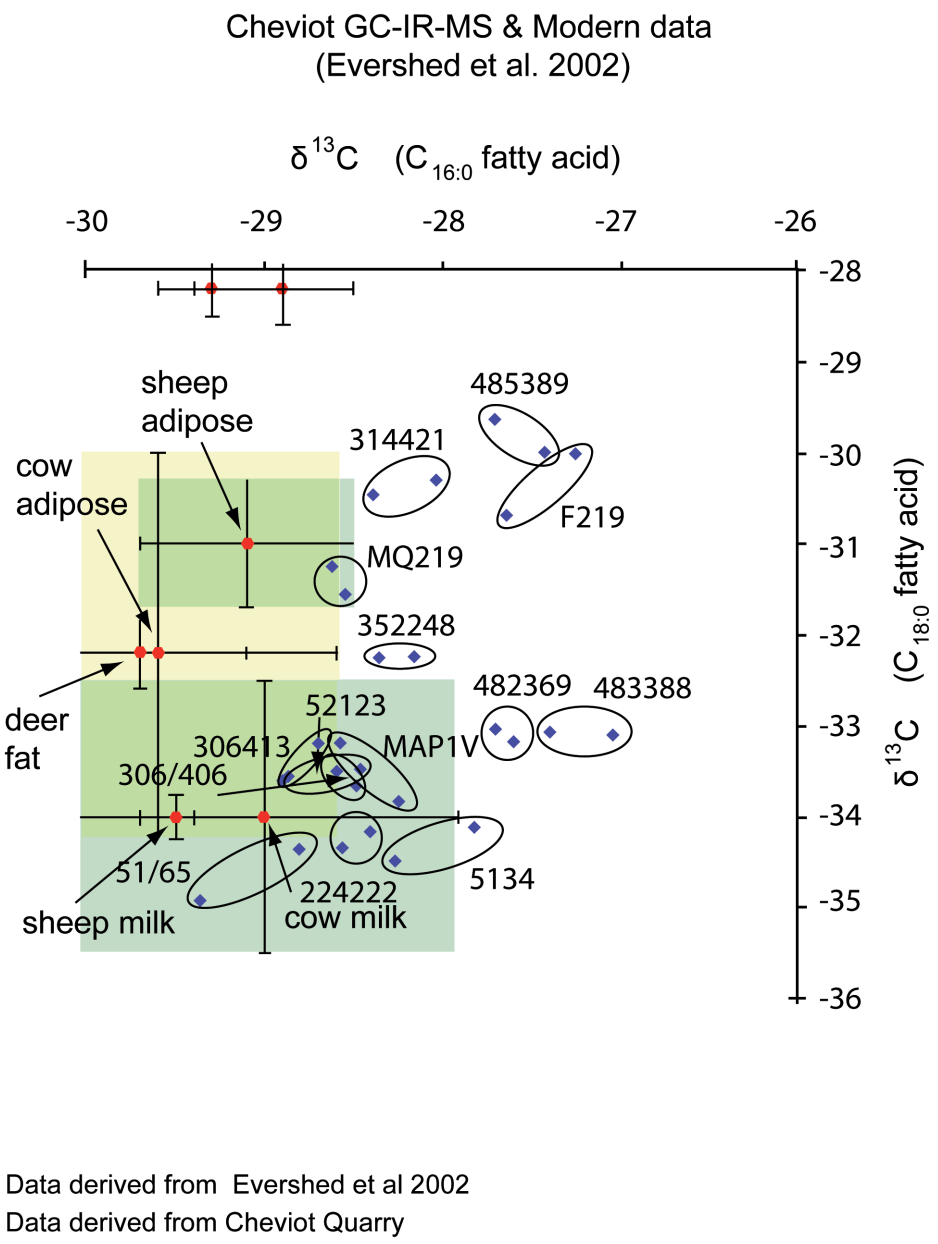
Due to the relatively small number of samples and the selection of samples for analysis based on the presence of sufficient C16:0 and C18:0 fatty acids it is not possible to identify any clear patterns of vessel use relating to either date or pottery type (Illus. 34 and Table 29). It is, however, apparent that dairying was present in all periods from the Early Neolithic to the Late Bronze Age. Previous studies of dairying based on lipid residues from a large number of sherds from a range of sites in southern Britain (Copley et al. 2005a; 2005b) report the extensive use of ruminant dairy fats (5%–41% of sherds) during the British Bronze Age and approximately 25% during the British Neolithic.

Examination of the Cheviot Quarry residues in order to correlate vessel use with type found no obvious association, although Beakers were less likely to contain lipids than other vessel types. These reported findings contrast with a previous study by Dudd et al. (1999) who observed that Grooved Wares were more likely to be associated with porcine (pig) fats while Impressed Wares were associated with ruminant fats (cattle, sheep or goat).

The possible assignment of beeswax to three sherds, 340257 and 485389 (both Flat-Rimmed Ware) and F219 (Impressed Ware) is intriguing, especially as all three contained a degraded fat/oil as well as the beeswax. Although the addition of honey is a possibility, the usual assumption is that beeswax was used as a waterproofing/sealing agent for the pottery. The use as a sealant is possible for two of the vessels as it was recovered from the interior surfaces; however, from sample 485389 (Flat-Rimmed Ware) the beeswax was extracted from the exterior surface. Low numbers of sherds containing beeswax have also been reported by Copley et al. (2005a; 2005b). The authors also report the mixing of animal and plant products with the beeswax and they argue that beeswax was not commonly used with vessels associated with cooking or processing foodstuffs.



ILLUS. 33 Plot of compound specific $\delta_{13}C$ (‰) for the $C_{16:0}$ and $C_{18:0}$ fatty acids. Blue points (including duplicate values) are data from archaeological samples. The error on the fatty acid methyl ester standard run 'in batch' was better than 0.2 per mil for both the $C_{16:0}$ and $C_{18:0}$. Red points are data derived from Evershed et al. (2002); the error bars here represent the range of values for these modern samples. These modern data have previously been corrected for the extra carbon due to derivatization and for the modern burning of fossil fuels.



ILLUS. 34 Detailed plot of compound specific $\delta_{13}C$ (‰) for the $C_{16:0}$ and $C_{18:0}$ fatty acids. Ellipses enclose the duplicate samples.

Plant products were positively identified in only two sherds: MAP 204 and MAP 2204 (both Impressed Ware). Both these vessels also had evidence for animal fats. Similar mixing and the pattern of low numbers of sherds with plant biomarkers were observed by Copley et al. (2005b).

GEOCHEMICAL SURVEY

INTRODUCTION

Geochemical analysis was undertaken across one of the Late Bronze Age roundhouses (Building 4) and the adjacent subrectangular structure (Building 7), as well as the three Dark Age buildings (Buildings 1–3) in order to see whether some insight into the type, and spatial extent, of activities within these buildings could be gained. Each building had a rectangular grid set out to cover the interior and to continue 1.5 m beyond the post-holes defining each structure. An additional six soil samples were taken at each building at a distance of 4.5 m away from the structural post-holes to act as controls. All samples were taken from the surface of the sand and gravel substratum using small hand tools and placed in individually labelled plastic bags. The samples were taken at 0.8 m intervals for Buildings 1–3 and at 1 m intervals for Buildings 4 and 7. The area of Building 1 was 93.6 m^2, Building 2, 104.5 m^2; Building 3, 97.4 m^2; Building 4, 159 m^2; and Building 7, 50.5 m^2. No samples were taken from Building 5 which, due to the heavy truncation of the deposits, was not deemed suitable for geochemical analysis.

ANALYTICAL TECHNIQUES

Multi-element soil analysis: the technique

Multi-element geochemical survey relies upon the assumption that changes occur within the soil chemistry of an area as a result of human intervention and that the function of various structures in and around archaeological sites is reflected in the elemental composition of the associated deposits. The method utilizes energy dispersive X-ray fluorescence (EDXRF) to provide a rapid, quantitative multi-element analysis of soils from archaeological deposits and sites. The technique allows for the simultaneous accurate analysis of all the major and minor elements present within the sample, thus providing a detailed characterization of the soil. The elements under investigation are sodium (Na), magnesium (Mg), aluminium (Al), silicon (Si), phosphorus (P), sulphur (S), potassium (K), calcium (Ca), titanium (Ti), manganese (Mn) and iron (Fe). The group was chosen as it includes eleven of the sixteen most abundant geological elements, five of which are soil macronutrients (Ca, Mg, K, P and S) and two micronutrients (Mn and Fe).

Sample preparation

The samples were dried and sieved to collect the <2 mm fraction. This was ground to a fine powder and 0.5 g were pressed into a 13 mm diameter pellet ready for analysis.

Analysis

The analysis was undertaken using an Oxford Instruments ED2000 energy dispersive X-ray fluorescence spectrometer (EDXRF) employing a silver anode X-ray tube running at 10kV. All analyses were carried out under vacuum to allow detection of the low atomic number elements and the spectra were collected for a live time of 100 seconds.

Simultaneous analysis was undertaken for the elements sodium (Na), magnesium (Mg), aluminium (Al), silicon (Si), sulphur (S), potassium (K), calcium (Ca), titanium (Ti), manganese (Mn) and iron (Fe), the results being calibrated using an intensity based correction model (Lucas-Tooth and Price 1961; Lucas-Tooth and Pyne 1964; LaChance and Traill 1967) derived from the analysis of a suite of eight international soil standards.

The results as weight per cent of element were then transferred to appropriate software for statistical analysis and mapping.

Presentation

The raw data (Illus 36–39) for each element are mapped as separate two-dimensional colour-coded images using a scaling based on the rainbow sequence of colours. This offers a smooth transition from indigo and blue that represent low values, through yellow, to orange and red that represent the high values, and provides a very intuitive means of visually interpreting the data. This empirical observation allows such factors as the topography of the area, the geology and, for example, the history of land use to be taken into account. When appropriate, interpolation of the raw data, using a spherical kriging model (Isaaks and Srivastava 1989), was undertaken to aid visualization further and facilitate comparison between data sets. Further interrogation of the data may be undertaken using Trend Surface analysis (Davis 1986). The data were separated into two components, both the widespread or regional variations across the area and the local deviations from this trend, thus producing a simulation of the broad features, which may be seen as background variation, and, through observation of the residuals, highlighting any local anomalies (Clogg and Ferrell 1993). Summary colour-coded plots of the analytical data were produced at a scale of 1:350 for the elements magnesium, aluminium, silicon, phosphorus, sulphur, potassium, calcium, titanium, manganese and iron in addition to the results of the magnetic susceptibility measurements. The results for sodium were not included as the concentrations were below the minimum detectable levels. Trend surface analysis was not deemed appropriate as the sampled areas were not contiguous. A colour scale accompanies each plot showing the maximum and minimum percentage element concentrations.

Magnetic Susceptibility

Magnetic susceptibility is a measure of how magnetic a sample is. This can provide information on the minerals found in soils and sediments, and hence the processes of their formation. Enhancement of magnetic susceptibility of soils can be attributed to heating or burning and, to a lesser extent, fermentation caused by bacterial action on organic deposits and can therefore indicate anthropogenic activity.

Sample preparation

The samples were dried and sieved to collect the <2 mm fraction.

Analysis

The measurements were undertaken on a known weight (approximately 10 g) of sample using a Bartington MS2B sensor. The resulting values were mass corrected to 10 g to allow comparison of absolute mass-specific magnetic susceptibility.

Presentation

The magnetic susceptibility results were plotted as colour-coded images as with the elemental data (Illus. 40).

GEOCHEMICAL RESULTS

The present discussion of the results of the survey is based on the observed distribution patterns for the elements. From these observations a number of areas of archaeological activity have been identified and within these areas a variety of levels and types of activity. These are shown in the interpretation plot (Illus. 35).

Aluminium, titanium and iron

The distribution patterns for these elements are generally similar in relatively undisturbed soil and can give an insight into the general nature of the soil and any changes across the sampled area. They can therefore highlight areas of erosion and removal of a soil horizon, provide evidence as to the extent of disturbance within deposits and identify any changes in the underlying geology. Considering the distribution of these elements is also particularly useful in assessing and interpreting the distribution of the more well-defined anthropogenic indicators (e.g. phosphorus). The plots of these elements were very similar across both the Late Bronze Age and the Dark Age buildings. They showed a fairly homogeneous distribution with typical concentration ranges indicating little change in the general characteristics of the soil. A number of discrete areas of enhancement or depletion were present, particularly within the plot of iron concentrations and these will be considered within the later discussion.

Silicon

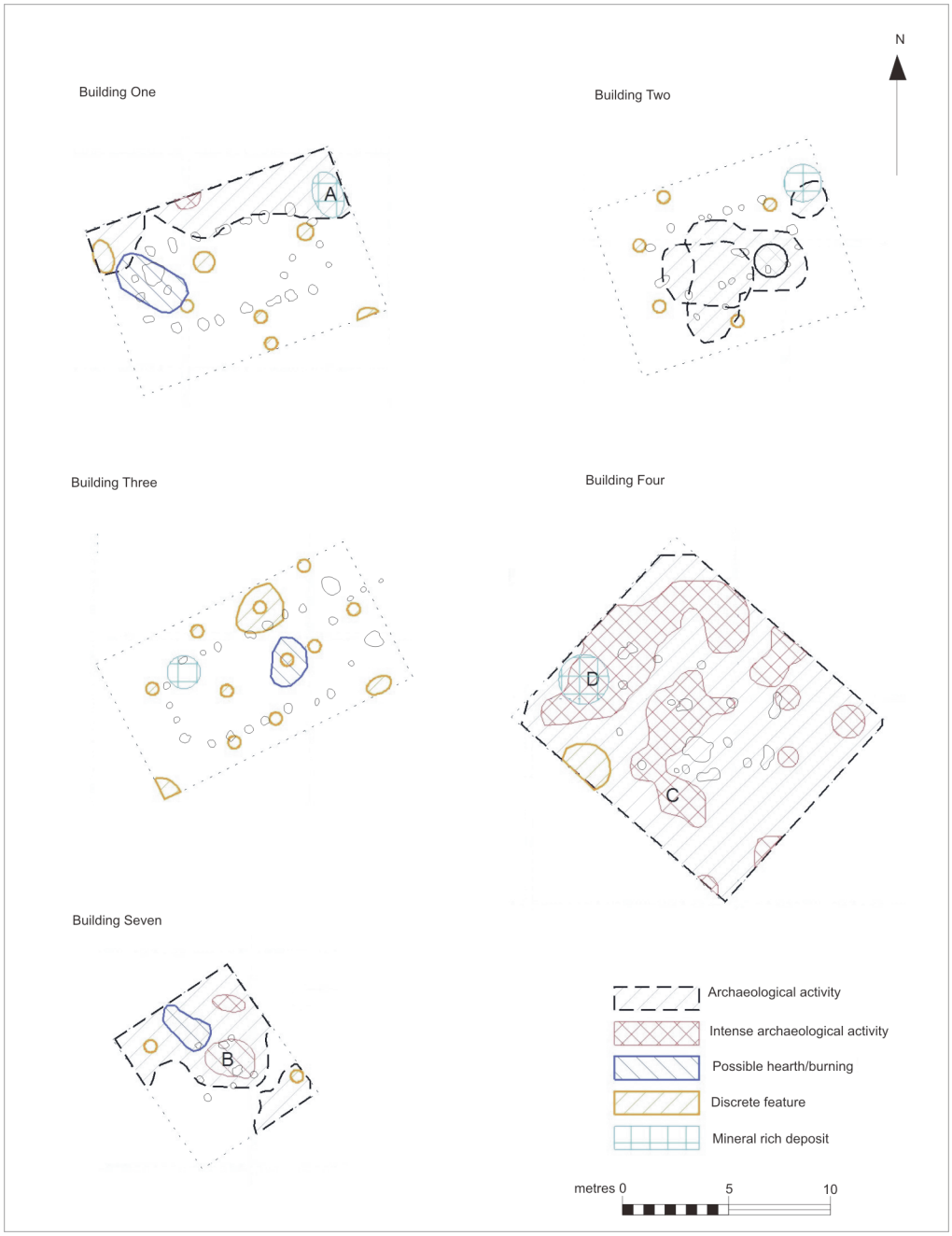
As with the aluminium and titanium, this showed a reasonably homogeneous distribution across the Late Bronze Age and the Dark Age buildings with a typical concentration range. This supports the evidence that the general soil characteristics within all five areas are similar. Areas showing lower concentrations generally correlate with more mineral-rich deposits.

Calcium (Illus. 36)

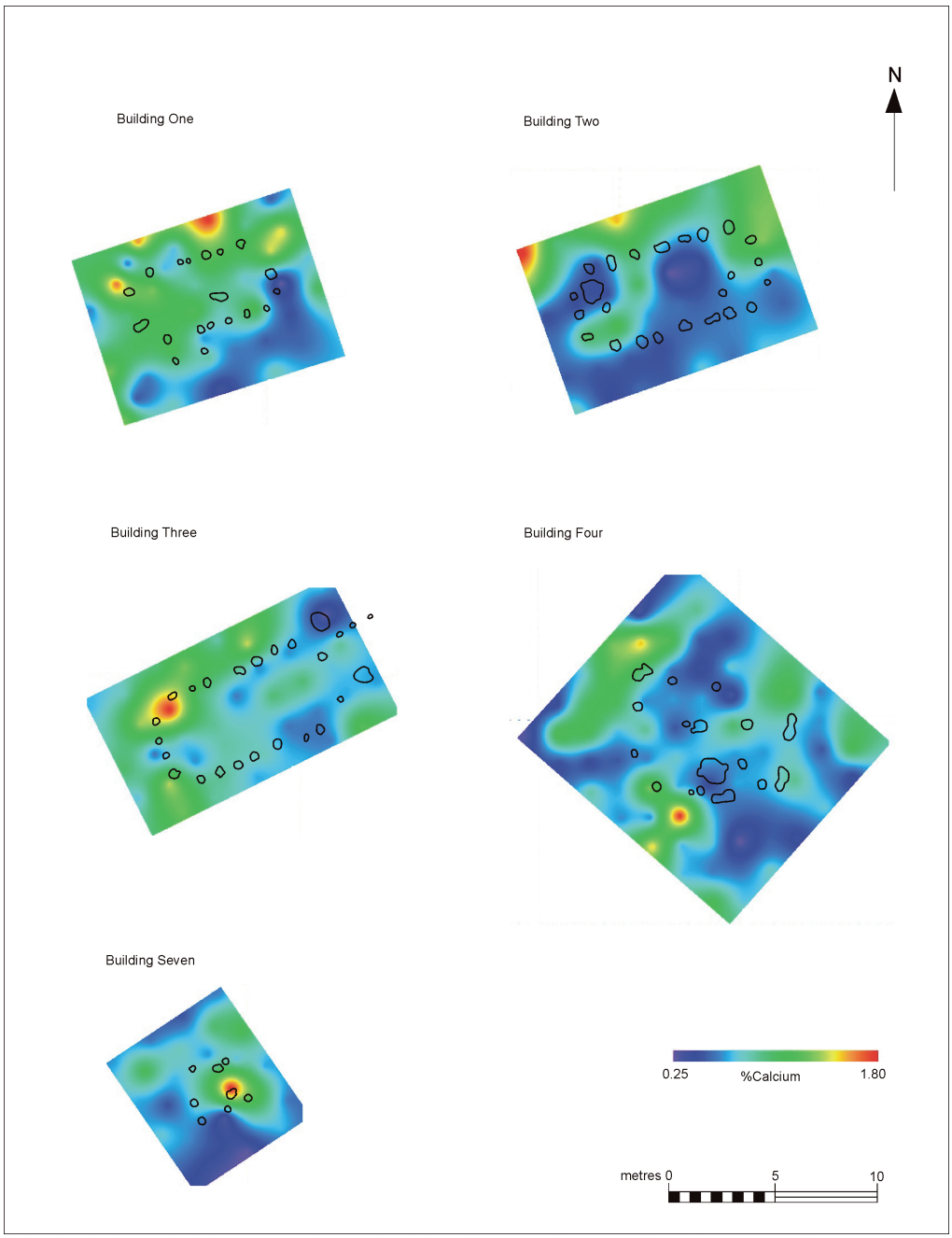
The Late Bronze Age Buildings 4 and 7 show clear, discrete areas of enhancement that correlate well with the distribution of the elements phosphorus, sulphur, iron and magnesium, suggesting significant anthropogenic deposits. Calcium-rich material includes bone of which some was excavated from features within these areas. Dark Age Buildings 1 and 3 show a reasonably even spread of calcium values with depleted areas within the south-east corners. A number of discrete high values occur towards the north edge of the areas. Building 2, however, shows a clear division between high and low values following a north–south divide. These features may be due to natural drainage systems or indicate the presence of anthropogenic deposits.

Phosphorus (Illus. 37)

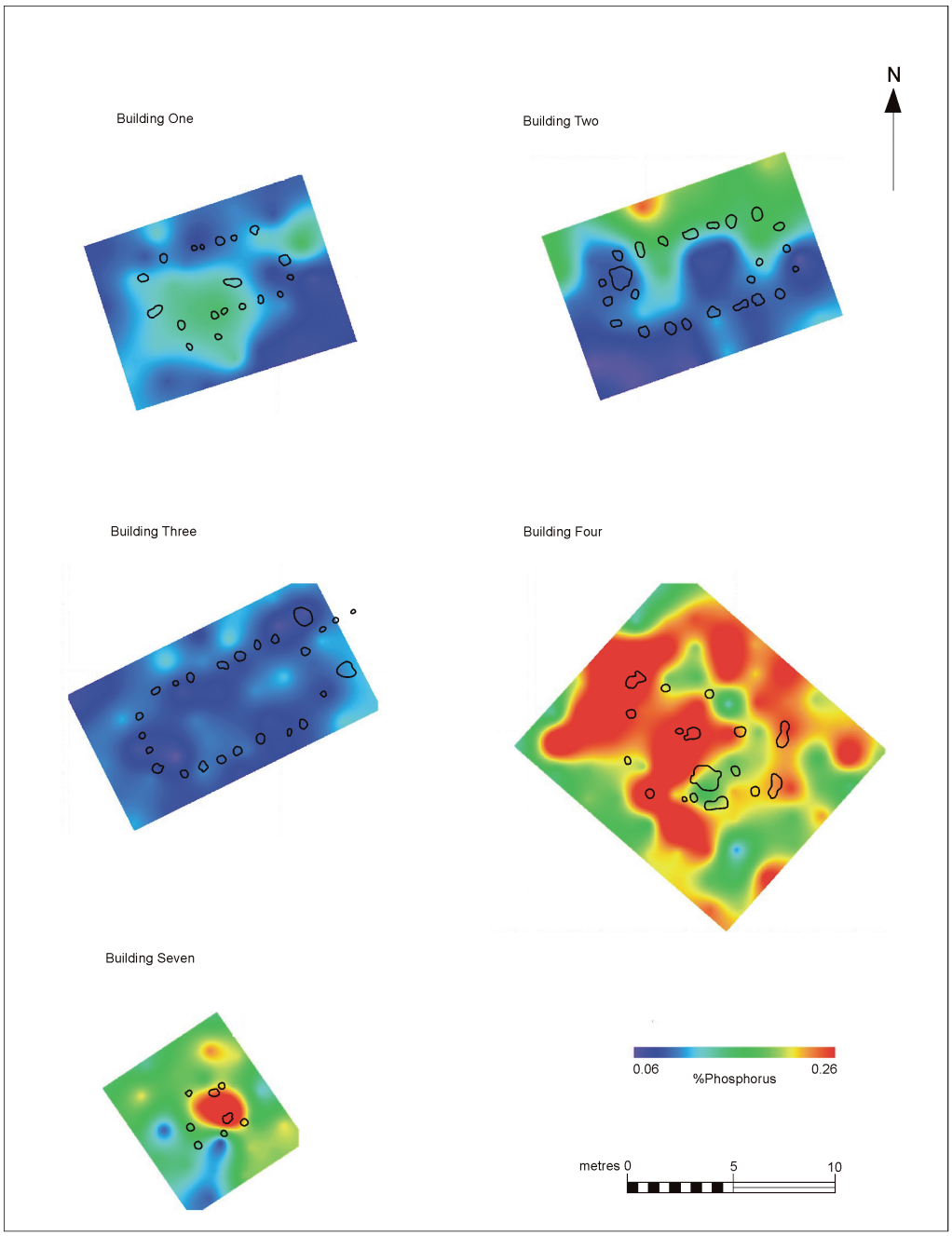
There is a clear difference in the phosphorus distribution across the Late Bronze Age and the Dark Age buildings. When considering this in light of the previous discussion of aluminium etc. the evidence suggests that these areas of high concentrations reflect the high level and possibly extended duration of anthropogenic activity. Additionally, with Dark Age Building 2 the higher values extend along the north edge showing a very similar distribution to that of calcium. Values are much lower within Buildings 1 and 3 which could well reflect less extended periods of activity. There are two spreads of higher values within Building 1 while Building 3 shows small discrete features that could be related to post-hole deposits.



ILLUS. 35 Interpretative plots of distribution of geochemical signatures



ILLUS. 36 Plot of distribution of calcium



ILLUS. 37 Plot of distribution of phosphorus

Manganese, sulphur, potassium and magnesium

The distribution of these elements is difficult to interpret in terms of the archaeology. It is probable that the general variations are due to factors such as drainage and soil coverage across the areas. There are, however, a number of anomalies that may be associated with archaeological features.

Manganese

Depleted manganese values have been found to be associated with long-term occupation sequences and there is a suggestion that a similar pattern defined Late Bronze Age Building 4. The high anomalies occur as discrete spots indicating mineral-rich deposits.

Sulphur

In many respects the sulphur followed a similar pattern to that of manganese and phosphorus with broad concentrations occurring in Late Bronze Age Buildings 4 and 7 and Dark Age Building 1. Again, the particularly high values are present as discrete spots suggesting the presence of individual mineral-rich features.

Potassium and magnesium (Illus 38–39)

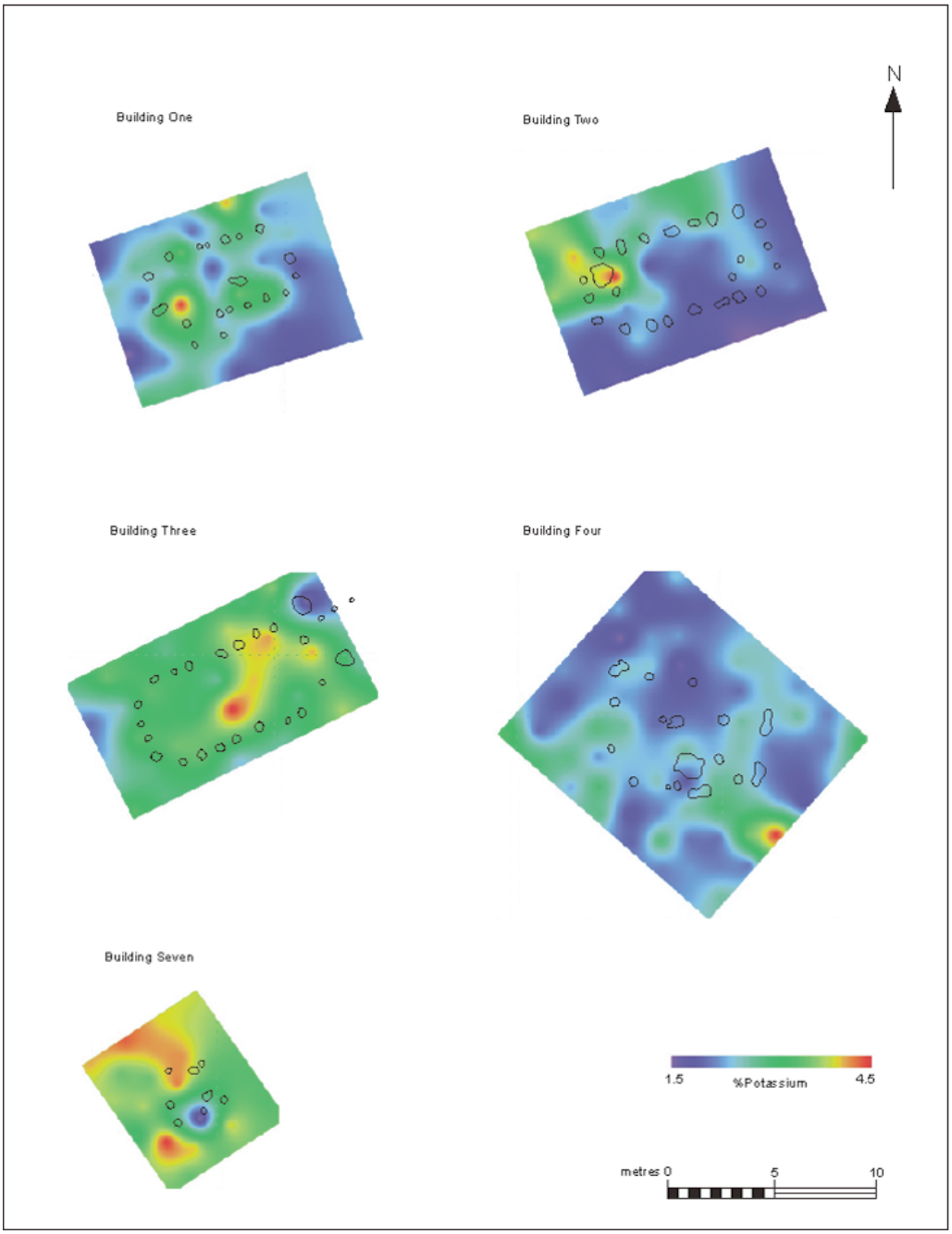
Both these elements are often associated with hearths or areas of burning due to their relatively high concentrations in wood ash. From the distribution plots, however, there appears to be little correlation between the two elements with the exception of an area to the east of centre in Dark Age Building 3. The concentration level and range for magnesium is, however, low and narrow and most probably reflects the variation in the natural soil matrix. The concentration range for potassium is much greater and the delineation of areas of enhancement much clearer suggesting areas of activity (possibly hearths) within Dark Age Buildings 2 and 3.

Magnetic Susceptibility (Illus. 40)

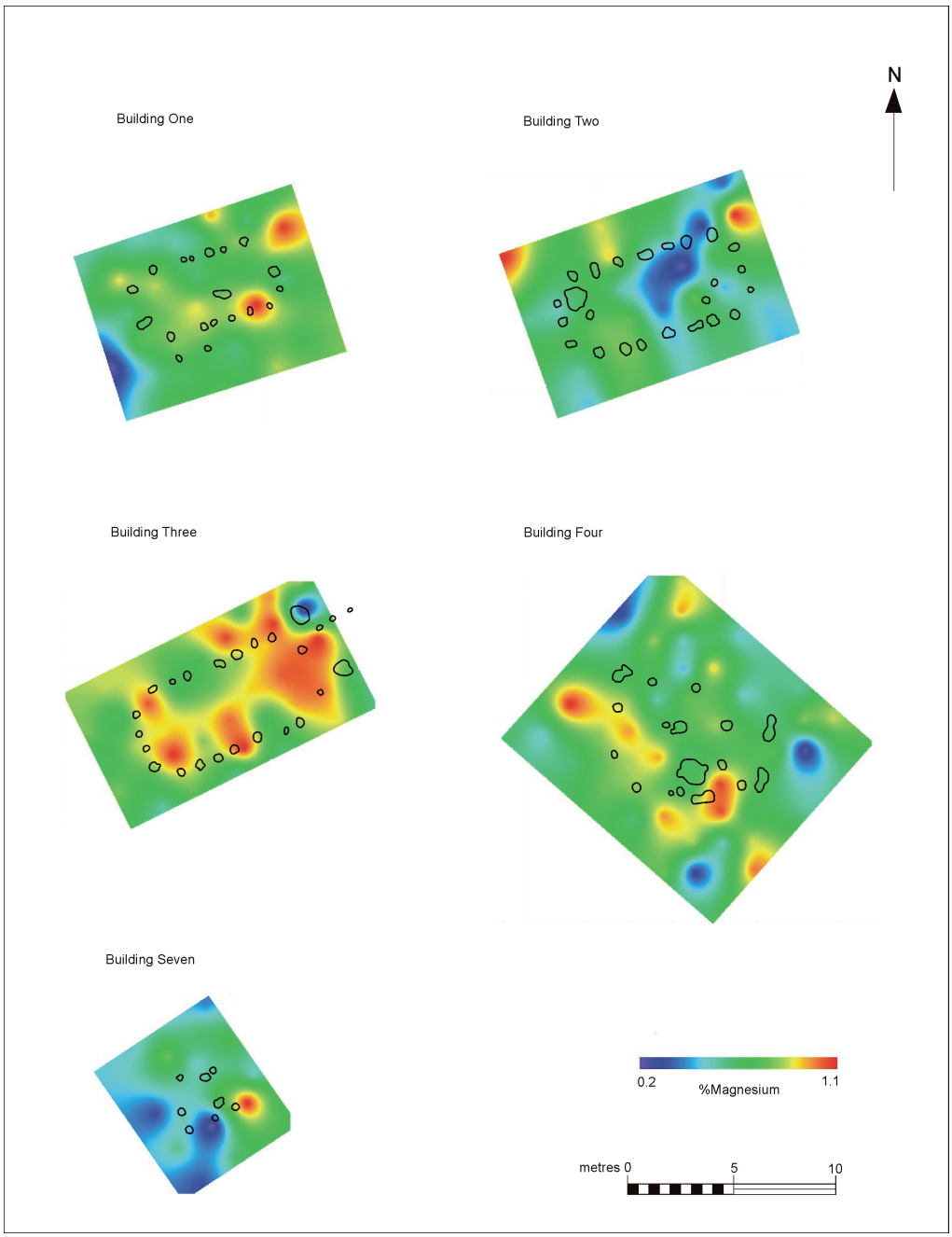
Enhancement of magnetic susceptibility of soils can be attributed to heating or burning and to a lesser extent by fermentation caused by bacterial action on organic deposits, and can therefore indicate anthropogenic activity. The distribution plot for magnetic susceptibility correlates well with areas identified in the previous discussion of the geoelemental signatures, particularly in a broad sense with that of phosphorus. There is also correlation with a number of discrete area/features such as those identified by high potassium concentrations. Enhanced magnetic susceptibility is clearly seen across Late Bronze Age Buildings 4 and 7 and across a substantial area of Dark Age Building 1 while smaller discrete areas of enhancement can be identified in Dark Age Buildings 2 and 3 (cf. phosphorus).

Investigation of control samples

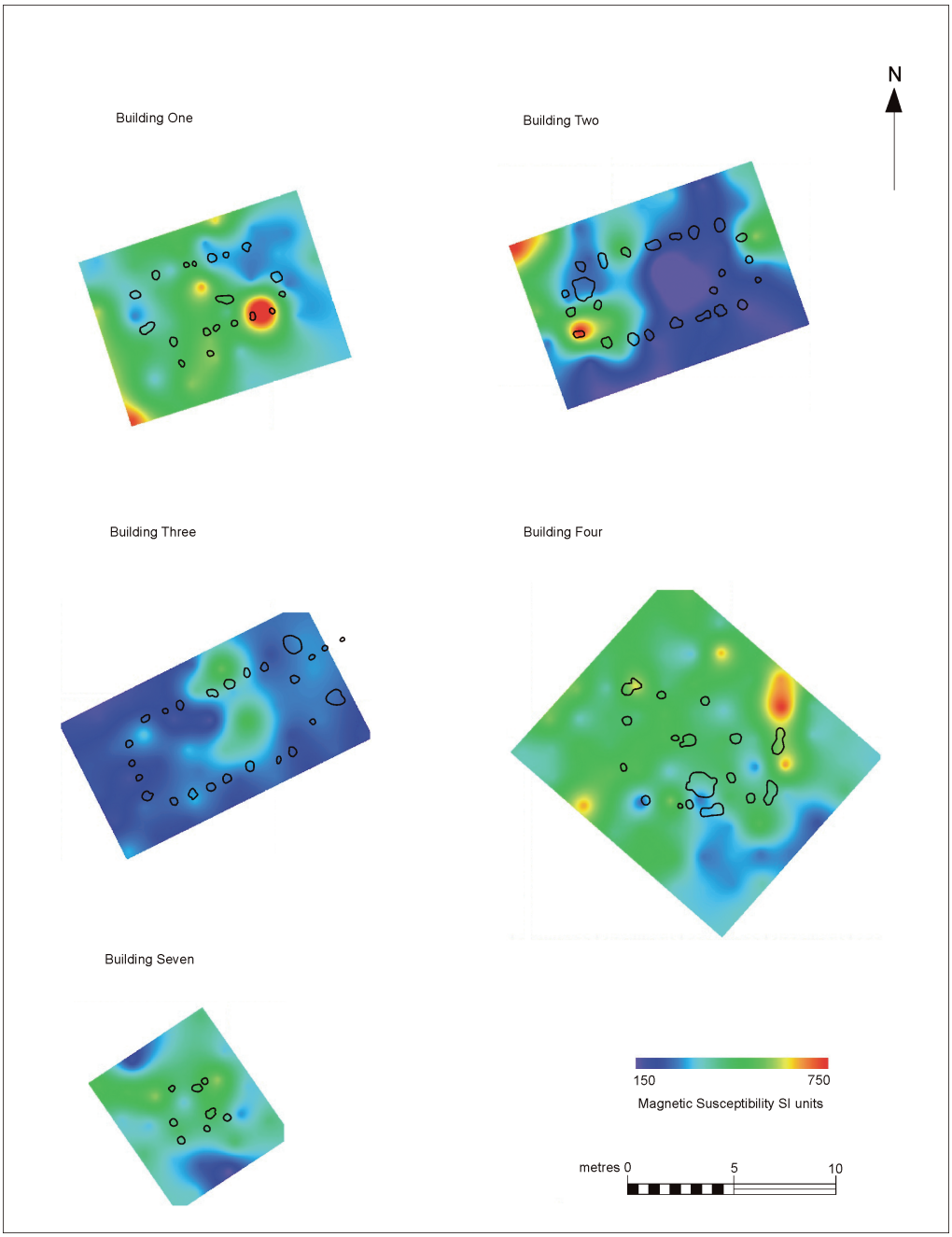
As phosphorus appears to be the prime indicator of anthropogenic activity the relationship between the samples from inside the surveyed area and the controls was undertaken by plotting the mean and standard deviation of this element concentration from each area and control set. The results are shown in Illus. 41. It can be seen that there is a clear difference between the interior of Dark Age Buildings 1–3 and to some extent Late Bronze Age Building 7 and the control samples from the exterior of the buildings. With Late Bronze Age Building 4, however, there is less distinction and it is probable that the anthropogenic deposits extend slightly to the north-east of the area.



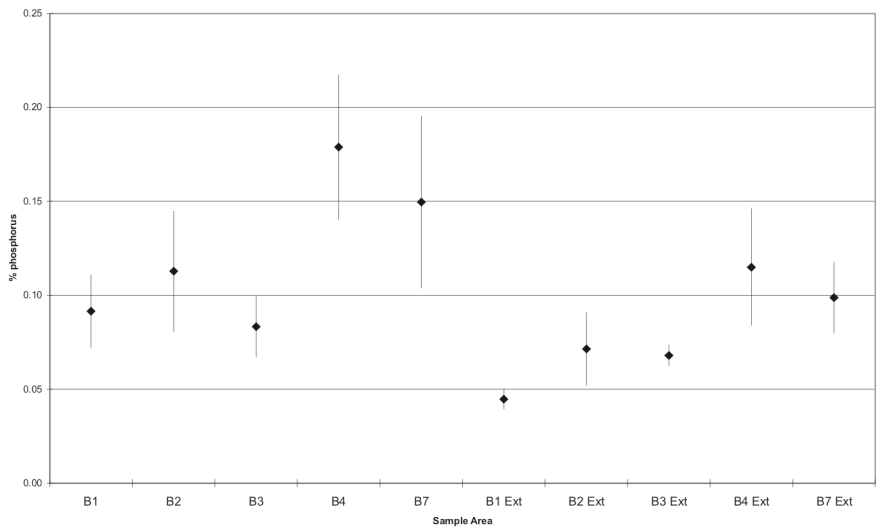
ILLUS. 38 Plot of distribution of potassium



ILLUS. 39 Plot of distribution of magnesium



ILLUS. 40 Plot of magnetic susceptibility



ILLUS. 41 Plot of the mean and standard deviation for phosphorus for each sample area (B1, B2 etc.) and control set (B1 Ext, B2 Ext etc.)

GEOCHEMICAL CONCLUSION

The survey has detected a number of areas of potential archaeological activity and within these areas a variety of levels and types of activity. There was, however, no consistent pattern across the building areas. The main indicators for suggested areas of anthropogenic activity have been shown to be phosphorus, magnetic susceptibility, potassium and manganese. Calcium and magnesium have provided some supporting evidence while aluminium, titanium and iron have shown the nature and variation in the soil coverage across the area. The identified areas of activity are shown in the interpretation plots (Illus. 35) and are defined below.

General areas of archaeological activity

These are zones of activity that suggest a concentration of archaeological features and material. These zones may exist *per se* or may have been produced by the movement of material from discrete features through, for example, ploughing. Both the interior and exterior of Late Bronze Age Building 4 showed evidence for archaeological activity, while activity at Late Bronze Age Building 7 was confined to its interior and primarily its north side, with a small area of activity to the south-east. All these zones of activity extended beyond the areas sampled. Archaeological activity in Dark Age Building 1 appears to have been confined to the interior of the structure, while activity at Dark Age Building 2 is situated externally to the north side. No general zones of activity were noted in Dark Age Building 3, and the variation across the three buildings probably represents different activities in each building.

Areas of intense archaeological activity

These are discrete areas or features that have probably experienced either very intense or lengthy use. Typical features would be pits or rubbish deposits. Late Bronze Age Building 4 in particular shows a broad spread of intense activity which could be attributed to material from

a number of archaeologically rich deposits and sustained human occupation. These have been identified around External Areas C and D (Building 4) and around the internal hearth and large artefact-rich pit F340, while another potentially rich area is the interior of Building 7 at Position B. An area of intense archaeological activity has also been identified externally around Position A in Dark Age Building 2.

Possible hearths or areas of burning

Areas in which the chemical fingerprint, particularly enhanced potassium, magnesium and magnetic susceptibility, suggests some form of pyrotechnological activity and most probably indicates the presence of hearths. No such areas exist in Late Bronze Age Building 4, even though an internal hearth was found during the excavations, but a possible area was plotted to the north of Late Bronze Age Building 7. Evidence for burning in Dark Age Building 2 was confined to the area around the large pit, F2063, which contained an *in situ* hearth deposit in its fill, and to Dark Age Building 3, which had a discrete feature situated centrally within the structure, presumably from a hearth feature that was not cut into the sand and gravel substratum and had not survived as an archaeological feature.

Discrete features

These are small areas that show a slightly different chemical fingerprint to the general background and may be features of archaeological origin. Only three areas were identified in Late Bronze Age Buildings 4 and 7 and do not relate to any specific archaeological features. Those areas identified in the Dark Age buildings all relate to post-holes.

Mineral-rich deposits

Mineral-rich deposits are areas where the chemical signature shows enhanced levels of a number of elements suggesting a significantly different deposit type from the immediate surroundings. This could be due to the build-up of sediments within cut features. No such areas were identified in the Late Bronze Age buildings, but were found in all three Dark Age buildings, externally and to the north-east in Buildings 1 and 2 and internally to the north-west in Building 3.

A NOTE ON THE ANIMAL BONE
by POLYDORA BAKER

The total quantity of material comprised *c.* 200 burnt bone fragments from Building 4 and Pit F340 in particular, many of which may be the broken remnants of larger pieces. The condition of the material was very poor with the bone being heavily fragmented, and most fragments are in the 0.50 mm to 20 mm size range. Most fragments are white in colour with cracking on the larger pieces, suggesting considerable degradation from a combination of burning and/or soil acids or weathering.

The fragments include cranial and postcranial material from small to medium-sized (sheep–goat sized) animals. Only one specimen is certainly identifiable to anatomical part and taxon, a complete unfused epiphysis from the proximal end of a humerus,

from a cow. A second piece is the fragment of the proximal epiphysis of a long bone from a caprine. A third specimen is the ramus of a jaw, and looks to be caprine.

DISCUSSION

The results of these excavations are of considerable significance to research into the Neolithic, Late Bronze Age and early medieval periods in north-east England and in Britain more widely, particularly given the detailed radiometric dating associated with the structures and ceramics, and the rarity of Neolithic settlements, Late Bronze Age lowland houses in the Borders region and buildings dating to the fifth–early sixth centuries AD. A fuller integration of this information into the wider regional and national context will appear in a forthcoming synthetic volume (Passmore and Waddington in press). The discussion presented here therefore seeks only to interpret the archaeology of Cheviot Quarry within its immediate setting and identify the main themes of interest.

NEOLITHIC

The excavations at Cheviot Quarry have added significant information to the understanding of Neolithic occupation in the Milfield Basin. While excavations on sites of this period have occurred across the Basin, most notably at Yeavering (Hope-Taylor 1977) and Coupland (Passmore and Waddington 2009), the Cheviot Quarry sites, together with that at Thirlings (Miket 1976; 1987; see also this volume), have provided the first opportunities to analyse and interpret data from such large-scale open area excavations, positioned in the centre of the Milfield plain, that pre-date the henge complex. There are two areas of Neolithic activity within the quarry, at Cheviot Quarry South and Cheviot Quarry North, with a few scattered pits containing Neolithic material situated between them. Both are midden pit sites, with distinctive bell-shaped pits being found at the Cheviot Quarry North site, made by scooping out the sand and gravel substratum to form vertical-sided features that flare out at their base due to the less compacted sand and gravel at a lower level falling into the pit void. The practice of digging midden pits and placing deposits of broken and used material within them continues throughout the Neolithic until around 2400 cal. BC, at which point they become increasingly rare and there is a spread of monumental architecture across the previously intensively settled sand and gravel areas of the valley floor in the form of henges and related hengiform and ring ditch sites.

Chronology

For the purposes of this paper, and based upon a recent programme of Bayesian modelling on the corpus of radiocarbon dates from the basin as a whole which is to be published elsewhere (Passmore and Waddington in press), the Neolithic in the Milfield basin can be seen to date from *c.* 3900 cal. BC to c. 2400 cal. BC and the earliest part of the Early Bronze Age, referred to here as the Beaker or Chalcolithic period, from *c.* 2400 cal. BC.

Relating the Neolithic settlement activity at Cheviot Quarry to the ritual components of the basin is problematic as there are few ceremonial monuments that have been dated specifically to the Neolithic period in the Milfield plain. The dates currently available for the henge monuments place them in the Beaker period. It has been suggested that a causewayed enclosure is sited at Flodden Hill, to the north-west of Milfield village (Gates and Palmer 2004), overlooking the Cheviot Quarry area. However, the authors acknowledge that the enigmatic nature of the aerial photographic evidence means the feature could be ascribed to a different monument type entirely, and the authors of this paper remain unconvinced of a Neolithic attribution, particularly given its landscape position draped down the side of a slope. A large, circular burial cairn at Broomridge on the Fell Sandstone escarpment near Ford, on the north-east side of the basin, was constructed over a burnt deposit containing over 200 sherds of Carinated Bowl, a stone axe head, flints and burnt human remains (Greenwell and Rolleston 1877; Newbigin 1935). A long mound has been located south of the Basin on Dod Hill (Gates 1982). However, neither of these monuments is located near to the settlement foci on the sand and gravel terraces. Closer to Cheviot Quarry, however, there are two possible mortuary enclosures, to the west of Milfield village and at Ewart (Miket 1976), and there is a third possible site at Wark on the River Tweed 13 km to the north-west (Gates in Passmore and Waddington 2009). None of the stone circles or standing stones in Northumberland has yet been dated although dates are expected from the recently excavated site at Duddo that overlooks the northern entrance into the basin (Miket pers. comm.). Neither the potential mortuary enclosures, nor the putative causewayed enclosure, have ever been excavated and so the monumental and ceremonial aspects of the Neolithic landscape of the Milfield area remain elusive in contrast to the Beaker period and later, when the construction of at least ten henge-related monuments, as well as a double pit alignment and the ring ditch cemetery at Whitton Hill created an extensive ceremonial landscape. The corpus of radiocarbon dates (taken from Milfield North, Milfield South, Coupland and Whitton Hill Hengiform Site 1) show that the tradition of henge building in the basin appears to post-date 2400 cal. BC and continues to *c.* 1900 cal. BC (Passmore and Waddington in press), and can therefore be ascribed to the Beaker period, and not the Neolithic proper as defined by the occurrence of Carinated Bowl, Impressed Ware and Grooved Ware pottery. The Beaker date, from a carbonized residue, of 2140–1880 cal. BC (3625±40 BP, OxA-16163) fits very well with dates reported from elsewhere in Northumberland.

Site function

It is argued here that the archaeology from Cheviot Quarry primarily represents domestic settlement activity even though there is an absence of any obvious dwelling structures. None of the pits, hearths and post-holes can be neatly grouped into a building form, as has been possible for the structures recognized at the nearby sites at Thirlings (Miket this volume) and at Lanton Quarry (Stafford and Johnson 2007; Waddington in press), and yet there is clear evidence for extensive human activity in both the north and south areas of the site. Most of the Neolithic pits contained

domestic midden material comprising food waste, processing tools, cooking, storage and serving vessels, all of which had been used or broken. This range of residues and material culture has clearly resulted from food consumption that could be typically associated with settlement activity. Similar clusters of pits with these typical associations have been discovered widely across the British Isles (e.g. Garrow et al. 2005; Garrow 2006), although elsewhere in the region such pit clusters have been found associated with the remains of truncated post-supported structures, some of which contain hearths. Examples include the recent find of eight Neolithic structures at the nearby Lanton Quarry associated with pits and hearths that contained primarily Carinated Bowl and Plain Wares (Stafford and Johnson 2007), the Early Neolithic settlement at Bolam Lake (Waddington and Davies 2002), the site at Whitton Park in Milfield village (Waddington 2006) and the settlement at Thirlings (Miket 1987; and this volume). Both Bolam Lake and Whitton Park produced evidence for structures built around a triangular arrangement of post-holes. That at Bolam Lake was interpreted as a structure supported by a slight timber frame (Waddington and Davies 2002, 23) and that at Whitton Park a group of post-holes with evidence for fairly substantial timbers (Waddington 2006, 13). At Thirlings, pits and post-hole clusters of varying shape including a circular structure, horseshoe-shaped structure and others (Miket this volume), were found associated with large amounts of Carinated and Plain Ware Bowls, Impressed Ware and Grooved Ware. In these cases the midden pits appear to be directly associated with post-built structures and, what is more, the evidence from the Milfield Basin currently indicates considerable continuity in the location and form of settlement sites throughout the Neolithic, as well as the routine practices of midden disposal in nearby pits and perhaps even farming activities associated with them. The lack of evidence for settlement structures at the Cheviot Quarry sites could be explained in two ways; either that there never were any such structures or more probably, that if such structures existed, their foundations were never deep enough to leave any traces in the sand and gravel substratum, particularly as the Cheviot Quarry site had been so heavily truncated. Given the fact that much more substantial Late Bronze Age and Dark Age buildings barely survived, the latter option seems the most likely reason for an absence of detectable Neolithic structures on the site.

The attribution of these sites as settlements does not in any way preclude ritualized behaviour or other types of symbolic acts or ceremonial activities taking place at them. Indeed the presence of Beaker pottery in some of the pits at the Cheviot Quarry South site could represent the remains of burial pits where any skeletal remains will have long since vanished on account of the acidic conditions. In fact the deliberate disposal of midden material in deeply excavated pits on site after site indicates that Neolithic settlements were structured around a suite of organizing routines that pervaded much of the British Isles, and ones that continued throughout much of the Neolithic. Although there was no direct evidence for specially placed deposits within the pit fills, the deliberate burial of midden material in deep pits is clearly a routine practice, and this in itself indicates the integration of structured routines and ideologically driven practice within what is ostensibly a residential setting. The burying of domestic midden material in pits could be interpreted as ritualized behaviour, as it represents a repetitive, though ostensibly unnecessary, task. There is no pressing

utilitarian reason to excavate deep pit features to discard such material, as this could easily be disposed of elsewhere or in more shallow pits. It has been noted that in the Later Bronze Age domestic material was used to manure field plots at Houseledge West nearby in the Cheviot Hills (Burgess 1980), and such practices could have been undertaken in earlier periods, for which no evidence survives. However, at least some domestic material during the Neolithic was deliberately buried, and this practice must relate to people's belief systems particularly as it is an organizing principle of Neolithic residential sites throughout the British Isles. Whatever ideological or symbolic belief lay behind this practice, there was clearly a need to dispose of certain artefacts and materials in a prescribed fashion when consumed in a particular kind of way, whether this was through feasting or day to day consumption. What is apparent is that all the Neolithic material recovered during the excavation was either broken, as in the case of the pottery, or had been used, as for example the quartzite hammerstone and the flint tools. Even the stone ball roughout, an artefact with symbolic rather than functional connotations, was a flawed and unfinished piece.

Even though the Neolithic sites at Cheviot Quarry clearly reflect settlement activity of some kind it is difficult, if not impossible, to establish exactly what kind of settlement they represent given the lack of any associated structures. It is not clear whether these features represent a fully sedentary population, or a more mobile community with debris from large communal feasting events. Sowing, tending and harvesting the crops, as well as looking after dairy herds and producing large ceramic vessels, as indicated at Cheviot Quarry North, suggests more sedentary groups. However, if the pit site reflects occasional aggregation events for large groups then residency may have continued over several weeks and this may have made it worthwhile making and using pottery vessels and bringing sufficient food to last the course. If large community events took place at pit sites then they may have formed the foci for Neolithic ceremonial activities that preceded the construction of the Chalcolithic period ceremonial monuments. If this was the case then it is not necessary to see them as places visited by highly mobile groups, but rather as central foci for otherwise dispersed agricultural groups who may have lived the rest of the year close to their cultivation plots and grazing grounds. However, although such a view may seem plausible, it does not satisfactorily account for the large number of pit sites that are now being recognized across the sand and gravel terrace surfaces of the Milfield Basin which would imply that aggregation events took place every few hundred metres across the terrace surface, as this is the frequency with which Neolithic midden pit clusters are now coming to light. Neither does this view explain why many of the pit sites are associated with timber-built structures, nor indeed the occurrence of cereal spikelets and glume bases at the Cheviot Quarry North site — botanical remains usually associated with the preliminary processing of grain and normally linked to active farming settlements. Perhaps, instead, the pit sites encompass a range of residential sites including sedentary farming settlements, short-lived pastoral sites and large, short-stay aggregation sites, and that the routines associated with the disposal of cooking debris was common to them all. This could account for why some pit sites are more extensive than others, why some have timber-built buildings associated with them and others appear not to, and why some have the entire Neolithic ceramic sequence present and others only

have pottery relating to one or two ceramic phases of the Neolithic. In short, the apparent consistency of Neolithic pit sites may disguise a diversity of residential sites that are linked by the commonality of structured midden disposal in pits. Bearing such possibilities in mind it is suggested that the Cheviot Quarry North site is probably the remains of a mixed faming settlement site occupied in the Early Neolithic and again in the Late Neolithic, while the Cheviot Quarry South site, with its much larger number of pits and evidence for a possible contemporary enclosure, may represent a different kind of site, perhaps a larger nucleated settlement or a place where occasional aggregations of people took place. However, without further investigation of the Cheviot Quarry South site it will be difficult to establish with any certainty the status of this site other than it being a place where some form of Neolithic residence took place.

A change in beliefs and routines associated with midden disposal appears to have taken place at the onset of the Beaker or Chalcolithic period and hence the paucity of domestic Beaker sites. Moreover, those pits with Beakers often contain complete vessels and are most commonly associated with burials. At the same time the ceremonial complex of henge and related monuments appears to have been constructed across the very same sand and gravel terraces, although more reliable dates are required for the monument complex, upon which the Neolithic settlements had previously been located. The period around 2400 cal. BC clearly marks a departure in social, economic, land use and ideological terms in this area. This can be seen in the adoption of the Beaker package, the advent of the first metalwork into the region, the probable expansion of settlement and farming into the uplands (see Waddington 1999), the monumentalization of the previous Neolithic settlement foci on the sand and gravel terraces, the adoption of cist burials and the breaking up of rock art panels (Waddington 1998; Waddington et al. 2005) and their inclusion into the new henge monuments as at Milfield South (Harding 1981). It is these dislocations that effectively bring the Neolithic to a close in this region while heralding a new era defined by new beliefs, ceremonial behaviour, monument construction, intensification of agricultural production and, importantly, the introduction of metal.

Land-use and environmental context

There is some evidence to infer that areas of open ground existed at, or close to, the Cheviot Quarry North site, based upon the few weed seeds recovered from the Neolithic pits, and it may be that these formed areas of grazing for the dairy animals whose presence is testified by the use of secondary dairy products on the Neolithic ceramics. In addition there must have been areas of arable agriculture where barley and emmer wheat were grown locally, while areas of wetland, or carr, such as the Galewood Depression, and areas of woodland would have provided wild resources such as hazelnuts. This picture is reinforced by excavated evidence from nearby sites such as the Coupland Enclosure, situated only 1 km to the north-west. Here emmer wheat, barley and oats were recovered, indicating limited cultivation close to the site, and abundant charred hazelnut shells were also found (Passmore and Waddington 2009). Pollen analysis from sites around the basin has also indicated a relatively open grassland environment with sporadic tree cover at this time (Tipping 1998; Passmore

and Waddington in press). It is thought therefore that the settlement activity at Cheviot Quarry is situated within a patchwork landscape of pastoral and arable land interspersed with areas of woodland and focused towards the edges of the sand and gravel terraces overlooking the wetlands of the Galewood Depression and the larger floodplain proper of the valley floor once occupied by a Glacial lake.

Material Culture

The dating programme has supplied radiocarbon dates on the full range of Neolithic pottery encountered in Northumberland, from Carinated Bowls and Plain Ware through Impressed Ware, Grooved Ware and Beaker vessels. The radiocarbon dates retrieved from the site are taken from residues on the ceramics and charred hazelnut shell fragments directly associated with the ceramics. The dates show Carinated Bowls and Plain Ware being used in the first half of the fourth millennium cal. BC, the Impressed Ware being used in the centuries either side of *c.* 3000 cal. BC, the Grooved Ware in use during the first half of the third millennium cal. BC and the Beaker being used in the centuries around *c.* 2000 cal. BC.

The Early Neolithic Carinated Bowls and Plain Wares vary in size from large storage and cooking vessels through to small bowls for eating, drinking and serving and were generally well-fired, highly burnished pieces. All display the typical attributes associated with this style including everted rims, carinations, occasional upright shoulders and an absence of decoration. One fragment from the northern part of the site did appear to have lightly incised decoration consisting of horizontal drag lines, and there was a good example of a lugged vessel from the southern part of the site. Four Impressed Ware vessels were recovered from the southern area of the quarry and were all from substantial vessels, one a distinct flowerpot shape, with coarse fabrics and roughly burnished surfaces. Decoration on some of the pieces included fingernail, comb and stab impressions. Seven Grooved Ware vessels were recovered from the northern area of the quarry and were well-made, bucket-shaped vessels of varying size. The sherds show evidence of grooved decoration on their outer surfaces and in one case on the inner rim bevel. Six Grooved Ware vessels were recovered from Pit F219 in the southern area of the quarry and were again all from well-made vessels that included one highly decorated tub-shaped vessel with triangle and lozenge decoration on its outer surface and decoration on the inner rim bevel, whilst two of the other vessels had cordons just below the rim, both of which were roughly decorated. Sherds from four Beakers were recovered, all from the southern area of the site, although only one vessel was available for reporting in full here.

The analysis on the residues adhering to the pottery sherds has not shown any distinctive pattern between vessel type and content; however, there is clear evidence for dairy practices, beginning in the Early Neolithic and continuing through to the Beaker period. Mixed plant and animal residues within vessels show the use of pots for cooking a variety of foodstuffs, perhaps in the form of a stew, whilst pots with specifically plant or animal residues may represent the cooking of distinct food or drink products, or may be residues from other processes such as the creation of medicines or dyes. The presence of beeswax on an Impressed Ware pot suggests this

vessel was not used for cooking purposes but rather as watertight, and perhaps airtight, storage.

LATE BRONZE AGE

The Late Bronze Age archaeology, comprising two substantial circular houses and an associated structure that may have served as a raised granary or other such storage structure, provides new insights into this poorly understood period in north-east England and is the first evidence for Late Bronze Age lowland settlement in the region. This important evidence will contribute to the debate regarding Late Bronze Age upland abandonment (see for example Burgess 1984; 1985; 1989; Young and Simmonds 1995). The presence of substantial dwelling structures, coupled with extensive agricultural and pastoral practices, represents a different style of remains to the more insubstantial settlement record currently available in the region for the Neolithic and Beaker period.

Chronology

Based upon the radiocarbon dating undertaken as part of this study, the buildings were constructed during the tenth century cal. BC and most likely continued in use well into the ninth century cal. BC. Building 4 was probably in use for between *20 and 120 years*, while Building 5 was probably in use for between *40 and 160 years* (both at *68% probability*). Based on the dating evidence and the Bayesian analysis the houses appear to have been in use for at least one, and perhaps two or three, generations. The use of these houses overlapped, although there is an 86.9% probability that Building 5 was built slightly earlier than Building 4. They represent an unenclosed mixed farming settlement providing a home for what may have been an extended family unit. Perhaps the second house was constructed for offspring and their family, with the irregular structure (Building 6) perhaps providing a storage facility for grain and/or feed. Prior to the discovery of these buildings little settlement evidence had been found in the lowland areas of the north-east and Borders dating to between the twelfth and the eighth centuries cal. BC, in marked contrast to the extensive upland settlement across the Cheviots and parts of the sandstone escarpment known from the Early and Middle Bronze Age and later in the Iron Age (Jobey 1965; 1985; Gates 1983; Burgess 1984; 1985).

Site form

The two circular buildings, with their distinct protruding porches and substantial timber uprights, appear to have supported a weighty superstructure, with a roof of thatch or turf. The double post-holes at the entrances could at first glance suggest repair of these uprights. However, the fact that they are seen in the same form on both of the roundhouses, and have also been noted at another Bronze Age roundhouse at the nearby Lanton Quarry site (Stafford and Johnson 2007) suggests a deliberate constructional intentionality. Having two substantial posts to support what is a relatively slight part of the superstructure implies that this elaboration of the entrance was more likely

to do with the creation of an imposing façade that may have expressed the prestige and/or cultural identity of their occupants. An important observation in respect of these houses is the consistency of their layout. Not only do they have distinctive porches but the entrances in both cases are positioned to face south-east; both houses have a central hearth area and in both cases pits containing domestic midden waste were located to the left of the entrance porch as one entered the house. What is more, another Late Bronze Age house has recently been discovered at Lanton Quarry and this house also possessed these same distinctive features. Such design and layout consistencies may reflect more than just the popularity of certain constructional styles of the time. They may provide an insight into pervading social, ideological and symbolic imperatives that governed the way such houses were built and used. By demonstrating such commonalities in the appearance of the buildings, the inhabitants may have been deliberately affirming their belonging and allegiance as well as conforming to ideologically motivated protocols. The use of architecture to promote cultural identity and enhance group cohesion may reflect a need, important at the time, for cementing social and political ties in the face of stresses caused by settlement contraction from the uplands and other more marginal areas.

Material culture

The pottery from the houses is all coarseware for use in a domestic context and its form and contents shows that it was associated with storage, cooking, serving, eating and drinking in a mixture of flat-based and bowl-shaped vessels. The geochemical analysis from the area of Building 4 suggests human activity caused changes to the geochemical signature of the sand and gravel substratum in specific locales internally and externally to the house (see above). This signature, particularly in the distribution of phosphates appears to have been spread by ploughing, but there is a defined area to the north side of the house, opposite the entrance porch, and an internal area surrounding the central hearth and near the large artefact-rich midden pit. The activities undertaken in these areas are unknown, but the presence of two quernstones, one in the hearth and one in the artefact-rich pit, in association with large quantities of barley and emmer wheat, shows that the area around the hearth was used, at the very least, for the preparation of flour for use in making bread and related foodstuffs. The area would also have been used for other domestic activities, perhaps including woodworking, clothes-making and tool repairs, although no direct evidence of such activities survives. The presence of activity around the rear wall of the house opposite the entrance porch recalls the evidence from the Iron Age roundhouse recorded below the Roman fort at Arbeia, South Shields (Hodgson et al. 2001, 141, 147), where evidence for heather and bracken was most concentrated in this part of the house, leading to the suggestion that this was where people slept. However, the geochemical signature at the Cheviot Quarry house extends outside the rear wall and could, therefore, also relate to external activity, perhaps wood storage under the eaves of the building or some other activity unless the house extended beyond the internal uprights into a simple cone-shaped building flush with the outer door of the porch. The site is interpreted as a permanent unenclosed farming settlement situated on the

valley floor. The structural forms of the Middle to Late Bronze Age upland farming settlements are very similar to those found at Cheviot Quarry, although many of the upland sites have stone-founded walls or clearance stones mounded against where the timber walls had stood, and typically measure between six metres and eight metres in diameter (Gates 1983). This compares with diameters of 5.8 m and 7.8 m for Buildings 4 and 5 at Cheviot Quarry. The two houses from Cheviot Quarry fit comfortably within this settlement tradition although the porch arrangements appear distinctive.

Land use and environmental context

The large quantities of barley and emmer wheat recovered are only the second such assemblage from Northumberland dating to the Late Bronze Age, the other being the site at Hallshill (van der Veen 1992), and together with the fragments of burnt animal bone and the plant and animal residues surviving on the pottery fragments, indicate a mixed farming regime, with both arable and pastoral activities important. The analysis of the macrofossils and residues produced evidence for mixed farming, comprising barley and wheat production as well as rearing cattle for meat and dairy products and possibly sheep and goat. In addition there appears to have been some use of gathered resources including hazelnuts, apples and sloes.

Shifting Bronze Age settlement?

The abandonment of many upland farming settlements during the Late Bronze Age has been hotly debated in recent decades (e.g. Gates 1983; Burgess 1985; 1989; Jobey 1985; Young and Simmonds 1995). Those, like the authors, who accept that some degree of settlement expansion and contraction into and from the uplands undoubtedly took place throughout later prehistory, resulting in the fossilized remains of Bronze and Iron Age settlements across the hillsides, usually link abandonment to a combination of processes such as the effects of soil erosion, soil exhaustion, deforestation, climatic impacts and perhaps changing socio-political organization.

One of the arguments that has been raised against Burgess's view of upland abandonment in the Cheviot Hills after *c.* 1200 cal. BC (Burgess 1985; 1989) is the lack of evidence for settlements in the lowlands in the Late Bronze Age. With the discovery of the two Cheviot Quarry houses, together with another Late Bronze Age house recently discovered at the nearby Lanton Quarry (Johnson and Waddington in press), the evidence for Late Bronze Age settlement in lowland areas is now emerging. As these buildings only survive as heavily truncated post-built buildings, difficult to recognize in the sand and gravel substratum, it is not surprising that they have not been discovered before as they will almost certainly not show on aerial photographs or as a result of geophysical survey, and it would require an extremely fortuitously located evaluation trench to identify one. Therefore, it should come as no surprise that such features have been discovered only as a result of large open area topsoil stripping. Given the difficulties of prospecting for, and indeed recognizing, such sites it is conceivable that Late Bronze Age farming settlements are in fact widespread across the valley floor of the Milfield Basin.

DARK AGE

The three Dark Age buildings of rectangular plan dating to the late fifth–early sixth centuries AD provide new evidence for what is a poorly understood period across much of the north-east and Britain more generally.

Chronology

The dating of the three buildings is intriguing. While only two produced enough material to allow radiocarbon dating, all three buildings, given their shared form, alignment and proximity, are considered to be contemporary. The dating has shown that two of the buildings are fifth or early sixth century cal. AD in date and were probably in use for between *one and one hundred and forty years (68% probability)* (see above), with the most likely span of use falling within the centre of the range. This suggests that the houses were probably used by at least two generations of people and possibly more. Given the dates of the buildings, there exists the important question about who built them. The formal beginning of the Anglo-Saxon kingdom of Bernicia is usually associated with the documented assault on Bamburgh on the Northumberland coast around AD 547 (see Bede's *Ecclesiastical History*). However, the radiocarbon dating of the rectangular timber buildings at Cheviot Quarry shows that they almost certainly pre-date this invasion, and so raises the possibility that they may have been the homes of an indigenous British population. Anglian and Saxon mercenaries are known to have been in the British Isles since before its abandonment by the Romans in the early fifth century AD, and these buildings could feasibly represent the dwellings of such a group, their descendants, or later raidersettlers. The cultural attribution of these buildings therefore remains a puzzle, though it is worth noting that the structural form does have something in common with Germanic post-built buildings such as those at Peelo and Flögeln (see Hamerow 2002, 49) but, this said, the Cheviot buildings are not of exactly the same form as the post-built buildings at the Anglian settlement at nearby Thirlings (O'Brien and Miket 1991). The Thirlings post-built buildings were thought to have held paired posts, but this was clearly not the case with the Cheviot Quarry post-holes. Therefore, the cultural status of the Cheviot Quarry rectangular buildings remains in doubt and, although we now have buildings here dating to one of the classic settlement gaps in the British archaeological record, it will require further discoveries with material culture associations to provide a more definitive view of whether these buildings are those of the indigenous British, the Anglian newcomers or indeed descendants of intermarriage in what was a rapidly changing cultural milieu at this time.

Settlement form and function

The three Dark Age buildings pose challenges to interpretation. As with the Late Bronze Age circular buildings, they were built with substantial timber uprights and would have supported a large superstructure, presumably covered with thatch. The series of opposed post-holes can be interpreted as supporting crossbeams which in turn supported a wall plate and rafters (see below for fuller discussion of the

reconstruction). The entrances to each structure also vary; Building 1 having an external porch to the south, Building 2 having a possible internal division representing an entrance to the south-east while a wider spacing of post-holes in the centre of the northern side could also represent a doorway, and Building 3 having a distinct gap in the post-holes on the short east side that presumably held the door. Whether these differences are due to different functions associated with each building is unclear as, being heavily truncated, no contemporary material culture was recovered. The geochemical results from each building do show some internal variation in the signature of the sand and gravel substratum, and these most likely represent different areas of activity within each building although, as with the results from the Late Bronze Age houses, these have probably been spread by ploughing (see above). It does show, however, that internal features to the buildings, such as hearths indicated by the presence of high concentrations of potassium, have not survived. The variations shown by the geochemical analysis are potentially associated with human activity as shown, for example, by enhanced levels of potassium, magnesium and magnetic susceptibility measurements that probably indicate hearth areas. If hearths had existed then it supports the view that these buildings were used as dwellings rather than as byres or hay barns. The lack of any material culture associated with industrial activity (smithing, pottery manufacture etc.) also suggests that these were domestic dwellings and, during Anglo-Saxon times at least, industrial activity is typically associated with sunken-featured buildings, rather than post-built structures (Hamerow 2002). Given the small amount of barley seed recovered the most likely interpretation is that the buildings represent the homes of a small nucleated farming community.

SUMMARY

The rich and varied archaeology of Cheviot Quarry has shown that the gravel terraces of the Milfield Basin formed a key focus for human activity during prehistoric and early medieval times. These raised, free-draining terraces are attractive for early agriculture and settlement, and this particular terrace, sited along the northern fringe of the Galewood Depression and close to the River Till, would have provided an appealing situation with easy access to fresh water, potential hunting and fowling in the wetlands and light, fertile soils for agriculture, while remaining free from flood risk.

The large-scale open-area excavations, only possible when substantial developments such as quarrying are undertaken, have shown that there is important evidence surviving within the heavily cultivated lowland areas of the Milfield plain. The only reason this wealth of Neolithic, Bronze Age and Dark Age archaeology was found was because large areas of the landscape were stripped back under archaeological supervision. Traditionally, Neolithic settlements, Late Bronze Age lowland settlements and Dark Age settlements are very rarely found, yet Cheviot Quarry has produced significant and abundant evidence for all three categories. Moreover, none of these sites could have been discovered through traditional archaeological prospection techniques such as aerial photographic survey or geophysical survey and evaluation trenching would have required extremely fortuitous positioning. This is most clearly

demonstrated when it is considered that two phases of extensive evaluation trenching took place in the north part of Cheviot Quarry and this work revealed evidence for a solitary Neolithic pit but, when the surrounding area was stripped, a large number of further Neolithic features, along with Late Bronze Age and Dark Age buildings were revealed. Therefore, without the opportunities afforded by large-scale topsoil stripping, such sites are unlikely to be found. More importantly, if a watching brief or strip, map and sample condition had not been placed on this area then all this archaeology would have been removed without trace or record. This sounds an important note of caution for archaeological decision-making in respect of the planning system, because by deciding that no further archaeological mitigation is required in areas where evaluation trenching produces few or no results, such a decision could mean that areas with substantial and important archaeological remains are written off. In archaeologically sensitive areas, such as the sand and gravel terraces of the Milfield plain, strip, map and sample conditions provide perhaps the best and most practical means of ensuring that archaeological remains are fully recorded and understood before they are removed by development.

'RECONSTRUCTION' OF A DARK AGE BUILDING

During late 2006 and early 2007 a 1:1 scale reconstruction of one of the Dark Age buildings was undertaken at the Maelmin Heritage Trail in the village of Milfield, about 1.5 km north of where the building originally stood. The Maelmin Heritage Trail is an archaeological heritage trail named after the adjacent site of the early medieval royal town of 'Maelmin' mentioned by Bede in his *Ecclesiastical History* as the successor to Ad Gefrin (Yeavering), and a royal estate centre of the kings of Northumbria. The trail is open all year round and is free to visit. The reconstruction was undertaken by ARS Ltd staff and professional joiner, Peter Stapley, and thatcher, Alan Jones, with assistance from local volunteers and archaeologists who had worked on the original excavations. The timbers used were local softwoods and the thatching material was water reed. It was decided to use the plan of Building 2, with seven opposed post-holes along each long axis and three on each short axis, to make the construction. As all the archaeological remains that survived were post-holes, anything from the ground upwards is an interpretation of how the building may have been constructed. All wood was fitted together using simple jointing techniques (Illus. 42) and held in place using wooden pegs; techniques that would have been used by early medieval craftsmen. The opposed post-holes most likely supported a post and lintel construction, given that the holes were vertical, with rafters up to a ridge beam to form the roof. This method was therefore adopted for the construction.

A series of timber uprights was concreted into hand-dug post-holes (for health and safety reasons) and a joist framework inserted to provide support for a planked timber floor. Each upright was 3 m high along the long axes but increasing in height to over 4 m at the apex of the gable ends. A series of lintels was then attached, using mortise and tenon joints, between each pair of opposed post-holes (Illus. 43). This framework then had a timber wall plate laid along both long axes to provide support for the rafters and a series of upright posts jointed, using the mortise and tenon technique, to the

ILLUS. 42 Carpenter Peter Stapley creating a mortise-and-tenon joint to connect the timber uprights with the lintels

ILLUS. 43 The timber framework of uprights and lintels in place, with uprights to support the ridge pole and rafters placed in the centre of each lintel

ILLUS. 44 Attaching the rafters to the ridge pole and wall plate

ILLUS. 45 Thatching, using a technique known as 'fleeking' in progress

ILLUS. 46 The reconstructed Dark Age Hall.

centre of each lintel to provide support for the ridge beam (Illus. 44). Vertical boards, similar to those used on the floor, were attached between the wall plate and the floor joists to produce a simple overlapping plank wall. A simple door, made with a timber frame and planks, was placed where a larger gap between the post-holes had been noted on the plan, producing a door in the centre of the northern long side. The timber construction took a group of four people just over two weeks to complete. A woven mat of reed, known as 'fleeking', was attached to the rafters and formed the base on to which the overlying water reed thatch was attached to provide the water-proofing layer (Illus. 45). This process took two people three weeks to complete.

The reconstruction has provided a very substantial and robust timber building (Illus. 46) for use by schools and community groups who visit the Maelmin Heritage Trail. Information panels and leaflets explaining the archaeology of Cheviot Quarry and the wider landscape were also produced, providing visitors to the Trail with an overview of the archaeological discoveries at the quarry.

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