ARCHAEOLOGICAL SERVICES WYAS

Byram Park
Brotherton
North Yorkshire

Archaeological Watching Brief
and Strip and Record Operation

August 2009

Report No. 1979
Volume 1: Text

CLIENT
Darrington Quarries Ltd

Byram Park, Brotherton
North Yorkshire

Archaeological Watching Brief and Strip and Record Operation

Summary

An extensive series of archaeological investigations at Byram Park, Brotherton was carried out during the expansion of Brotherton Quarry between 1998 and 2007. The works followed the identification of a number of possible archaeological features on aerial photographs, indicative of part of a rectilinear field system. The investigations confirmed this interpretation and in addition revealed numerous other ditches, gullies and discrete features. Seven inhumations were also identified. The majority of the artefacts recovered from the site were dated to the mid-2nd to early 4th century, with small assemblages of very late Roman or early post-Roman, and Anglo-Saxon pottery also identified. A program of radiocarbon dating revealed one inhumation dating to the Iron Age, while the remainder were Romano-British. Additionally, a number of features, including two post-hole alignments, were identified as dating to the post-medieval remodelling of Byram Park.

ARCHAEOLOGICAL
SERVICES
WYAS

Report Information

Client:	Darrington Quarries Ltd
Address:	Darrington Leys, Criddling Stubbs, Knottingley, WF11 0AH
Report Type:	Archaeological Watching Brief and Strip and Record Operation
Location:	Byram Park, Brotherton
County:	North Yorkshire
Grid Reference:	SE 490 266
Period(s) of activity represented:	?Prehistoric, Iron Age, Romano-British, Medieval, post-Medieval
Report Number:	1979
Project Numbers:	1719,1862, 2003, 2718, 2938, 3074, 3113, 3154
Site Codes:	FCQ98, FOQ99, FOQ02, BYP05, BYP06, BYP07
Planning Application No.:	-
Museum Accession No.:	2009.58
Date of fieldwork:	July 1998, September 1999, October 2000, September 2002, June-August 2005, May-July 2006, April-May 2007, August-October 2007
Date of report:	August 2009
Project Management:	Richard O'Neill BA, Jane Richardson PhD MIfA, Ian Roberts BSc FSA MIfA, Paul Wheelhouse BA MIfA
Fieldwork supervisors:	David Cudlip BA, Kate Howell BSc AIfA, Richard O'Neill, Christina Robinson BA, Andrew Walsh BSc AIfA, Jennifer Wylie BA MA AIfA
Report:	Andrew Walsh
Illustrations:	Ian Atkins BSc, Mark Chisnall BA, Jon Prudhoe and Andrew Walsh
Photography:	ASWYAS staff
Research:	Mitchell Pollington BA MA
Specialists:	Diane Alldritt (carbonised plant macrofossils and charcoal) Alex Beacock (molluscs) Ian Brooks (lithics) John Carrott (molluscs) Hilary Cool (small finds) Chris Cumberpatch (post-Roman pottery) Alison Deegan (aerial photography) Louise Ford (samian) Geoff Gaunt (querns) Peter Guest (coins) Dave Heslop (querns) Malin Holst (human bone)

Specialists (continued):
Jennifer Jones (industrial residues)
Malcolm Lillie (geology and soil micromorphology)
Ruth Leary (Romano-British pottery)
Jane Richardson (animal bone and shell)
Felicity Wild (samian)
Jane Young (ceramic building material)

Produced by:
Archaeological Services WYAS, PO Box 30,
Nepshaw Lane South, Morley, Leeds LS27 0UG
Telephone: 0113 383 7500
Email: admin@aswyas.com

Authorisation for distribution: ----------

ISOQAR ISO 9001:2000
Certificate No. 125/93

Contents

Volume 1

Bibliography

Volume 2
Figures
Plates

Appendices

List of Figures

List of Plates

List of Tables

List of Graphs

Acknowledgements

Archaeological Services WYAS would like to thank Bob Binstead of Darrington Quarries for commissioning the work and his help and support throughout, and Geoff Sneap and all the staff of Brotherton Quarry for their patience and help through the years. The works were monitored by the Heritage Section of North Yorkshire County Council. The watching brief was managed by Richard O'Neill and Paul Wheelhouse, and supervised by Richard O'Neill, David Cudlip, Kate Howell, and Christina Robinson. The fieldwork was undertaken by Helen Clough, Graham Robbins, Marina Rose and Thomas Smith. The strip and record was managed by Ian Roberts and Paul Wheelhouse, and supervised by Andrew Walsh and Jennifer Wylie with additional supervision from Karen Bolchover, James Gidman, and Marina Rose. The fieldwork was undertaken by Victoria Brown, Mike Burns, Clare Coulter, Christina Elcock, Paul Gelderd, John Howard, Paul Major, Debora Moretti, Mo Muldowney, Tom Smith, Richard Szymanski, Neil Walmsley, Emma Watson, Phil Weston, Richard Whawell and David Williams. The site surveys were undertaken by James Gidman, Alison Morgan, Mitchell Pollington and Andrew Walsh. The post-excavation work was supervised by Alison Morgan and the illustrations are by Ian Atkins, Mark Chisnall, John Prudhoe and Andrew Walsh. The report was edited by Jane Richardson and Ian Roberts. In addition to the named specialists, Archaeological Services WYAS would also like to thank Karen Barker for conserving and X-raying the metal objects recovered from the excavations.

1 Introduction

Archaeological Services WYAS (ASWYAS) was commissioned by Darrington Quarries Ltd to undertake a series of archaeological investigations at Brotherton Quarry, Brotherton, North Yorkshire prior to limestone extraction. The work comprised of four phases of watching brief carried out from 1998 to 2002, and four seasons of a strip and record operation undertaken between 2005 and 2007. This report details the results from all of the archaeological investigations, although additional investigations to the east of the 2005-2007 areas are ongoing.

Site location and topography

The quarry is centred on NGR SE 490 266 and located approximately 1km north-east of the village of Brotherton and 6km north of the town of Knottingley (Fig. 1). The site is situated within Byram Park, formerly the grounds associated with Byram Hall, on gently undulating land above the River Aire which follows a north-west to south-east course approximately 1.5km to the south-west of the site. The site is bounded to the north, west and south-west by woodland. There is no physical boundary to the south and east (Fig. 2).

Soils, geology and land-use

The site lies in an area mapped as Upper Magnesian Limestone of the Permian Age (British Geological Survey 1978) overlain by calcareous fine loamy soils of the Aberford Association (Soil Survey of England and Wales 1983). Silts, clays and sands of 25-foot drift derivation are located in areas immediately to the east of quarry area and these generally overlie Sherwood Sandstones of later Triassic age (M. Lillie pers. comm.). Within the site boundaries the land exhibits *c*.11m variation in elevation from *c*.23m OD in the west to 12m OD in the north-east.

2 Archaeological and Historical Background

by Mitchell Pollington

The following is extracted from a desk-based assessment of the area undertaken in 2008 (Pollington 2008).

Archaeological background, sites and features

Palaeolithic and Mesolithic period (c.10,000 to 4400 BC)

The earliest human activity within northern England probably followed the retreat of the ice sheets around 10,000 BC, as small Nomadic groups moved north with the improving climate. Evidence of Palaeolithic activity remains scarce, and is largely restricted to upland cave sites, and no archaeological remains of this date have previously been found in the study area. The post-glacial landscape largely comprised treeless tundra, but by the early Mesolithic period, about 7600 BC, this gave way to woodland as the climate improved. Such environmental change increased the potential for human activity as the spread of woodland led to an

expansion in animal and plant resources. The nomadic nature of Mesolithic groups means that they have left few occupation remains and archaeological evidence for them is largely limited to finds of flint implements, such as microlithic blades. No sites or finds of a Mesolithic date have previously been recorded within the local area.

Neolithic and Bronze Age period (c.4400 to 2500 BC)

The Neolithic period is marked by the introduction of farming, as nomadic hunter-gatherer subsistence gave way to agriculture and the domestication of animals. This appears to have had a dramatic effect on the landscape with a marked change in the character of forest vegetation and a major decline in woodland coverage from about 3000 BC (Smith 1970). This period is also characterised by the introduction of large ritual and funerary monuments, such as Ferrybridge Henge, which is situated about 1.5km to the south-west of the proposed quarry site (Roberts 2005). The Bronze Age saw the introduction of limited copper and bronze working, but is also marked by a change in burial practices away from collective inhumations and cremation, to single burials, often placed beneath barrows. A number of such barrows have been identified and excavated close to Ferrybridge Henge suggesting that the henge continued to be of significance in the landscape into the Bronze Age. The site of another possible barrow, surviving as a cropmark ring-ditch, has been identified in fields to the east of Burton Salmon, approximately 1km north east of the quarry. Evidence of late Bronze Age settlement is limited in the Yorkshire region, although a sherd of early Bronze Age pottery, as well as a number of worked flints, was discovered during recent archaeological excavations to the east of the present site (Moretti 2008).

Iron Age and Roman periods (c.800 BC to c.AD 410)

During the Late Iron Age the site came within the tribal territory of the Brigantes, who were Roman allies under their queen, Cartimandua, from at least AD 52. Cartimandua, however, was deposed by her consort Venutius in about AD 69/70 provoking a Roman invasion and subsequent annexation of the tribal territory. This led to the establishment of Roman forts at Castleford, 6km to the west of the quarry, and at Roall, 7km to the east.

Extensive areas of probable Iron Age and Romano-British field systems, enclosures, settlements and trackways have been recorded as crop marks within and around the site as part of the English Heritage Lower Wharfedale National Mapping Programme (LWNMP; Fig. 2). An aerial photograph assessment of the quarry, undertaken by Alison Deegan prior to the 2005 excavations, confirmed the results of the LWNMP and tentatively identified a rectilinear enclosure (Deegan n.d.; Appendix 4). Excavations undertaken by ASWYAS in 2007, on the eastern side of the proposed development site (Fig. 2) uncovered a number of ditches, interpreted as an enclosure, a trackway and field boundaries, as well as pits and post-holes, and a heavily truncated human burial (Moretti 2008). These features have been dated to the Late Iron Age and Roman periods.

Post Roman and Anglo-Saxon periods (c.AD 410 to 1066)

In the century following the end of Roman rule in AD 410, the former province fragmented into a number of smaller kingdoms, some of which were controlled by the romanised British population, and others established by incoming Anglo-Saxon groups from northern Europe. The proposed quarry site fell within the British Kingdom of Elmet, which may have been in existence from the late 5th century, until its conquest by the Anglo-Saxon kingdom of Northumbria in the early 7th century. Northumbria was itself conquered by a Viking army in AD 866-867, and the place-name evidence throughout the Yorkshire region indicates extensive Scandinavian settlement and influence across the area. This area was in turn conquered by the English by the mid-10th century.

Evidence for the post-Roman and early Anglo-Saxon periods in Yorkshire is slight, and no archaeological features or finds of this period have been discovered in the vicinity of the quarry, or the surrounding area. It is likely that many of the existing villages around the park, however, originated as settlements by the later Anglo-Saxon period, as both Burton Salmon and Birkin are mentioned in a charter dating to around AD 1030 (Smith 1961). Other villages, such as Hillam and Beal, which are not recorded until the Domesday Book in 1086, may also have pre-Norman origins.

Medieval period (1066 to c.1500)

There are no documentary references to an estate at Byram prior to the late 13th century, when a document of 1284 apparently refers to the stocking of the park with deer from Galtres forest. Members of the 'de Byram' family, however, had been prominent in the area since at least the later 12th century, and it is likely that a deer park was established by that time. The existing pattern of villages in the study area is also likely to have been well established by the 12th century (see above).

The only archaeological features of a medieval date that have been identified within the quarry site are areas of ridge and furrow ploughing, surviving as crop marks. These are largely concentrated outside of the area of the historic park, although areas of ridge and furrow have been identified within the extraction area.

The 17th and 18th centuries

The Byram estate was purchased by the Ramsden family in 1612, by which time it is likely that a house already stood on the site of Byram Hall; a sketch of the house made by Samuel Buck in around 1720 appears to show a house of Elizabethan or Jacobean style (Buck *c*.1720), albeit with possible later architectural additions (Waterson and Meadows 1998, 22). Oliver Cromwell is also said to have stayed at the hall during the siege of Pontefract in 1648 (Jauncey 1922, 10). The layout of the park and gardens around the house during the 17th and early 18th century are largely unknown, and the only known features of this date are the sandstone gatepiers surviving to the north of the Orangery. The historian Ralph Thoresby described the 'very curious gardens' at Byram in his diary in 1712, and differentiates these from 'that part where the pheasants breed', presumably the wider park (Thoresby 1830, 93).

The only cartographic depiction of Byram Park in the 18th century is from Thomas Jefferys' 'Survey of the County of Yorkshire' of 1775. Although this depiction is much stylised due to the scale of the map, it does show the house within a rectangular park, with an avenue aligned approximately north-south to the south of the house, and a carriageway leading into the park from Brotherton to the west (Jefferys 1775).

Major changes to the hall and the wider park landscape were carried out in the late 18th century. In about 1770, the architect John Carr was employed by Sir John Ramsden to remodel the old hall in a classical style, with only the doorway containing the family coat of arms retained (Waterson and Meadows 1998, 22). In 1782, Lancelot 'Capability' Brown visited Byram Park, and a survey and design for a new park landscape was prepared by his assistant, John Spyers (Stroud 1975, 198). Brown's exact design, and to what extent this was carried out at Byram Park following his death in 1783, is unclear. The First Edition Ordnance Survey map of 1852 (surveyed in the late 1840s), however, shows an open 'naturalistic' park landscape, interspersed by stands of trees, directly adjoining the main house (at least on the western and southern sides of Byram Hall), characteristic of Brown's designs. The carriageways and paths that cut across this landscape also followed more circuitous and curving alignments at this time and were probably designed to maximise vistas across the park and the approach to the hall, rather than having a purely practical function. One of the typical features of a Brown designed landscape is the serpentine lake, such as the lake situated to the east of Byram Hall at the very centre of the park, which is likely to have originated as part of Brown's design.

The 19th century

The parishes around Byram Park were enclosed in the late 18th and early 19th centuries; Brotherton in 1799, Birkin in 1815, and Burton Salmon in 1824. While this process created an irregular pattern of fields at the eastern end of the park, close to Birkin and to the south around the village of Sutton, the new fields to the east of Burton Salmon were more regular in size, with straight boundaries dividing areas of previously open common land (Birkin Tithe Map 1815; Ordnance Survey 1852).

It appears that there were few major changes to the landscape or buildings at Byram Park during the first half of the 19th century, although further additions and minor alterations were probably made to the gardens and around the lake. In the second half of the century, prior to the late 1880s, however, extensive alterations were made to the landscape of the park, particularly on its northern and eastern sides. During this time large areas of fields were planted as mixed woodland, extending or creating various plantations and woods (Ordnance Survey 1892; 1893a) that were cut through by new formal paths, the line of which were continued into the open parkland by avenues of trees, connecting them into a wider geometric design. These new paths and avenues also connected with a new more formal layout of straight carriageways on the south-western side of the park, which replaced the earlier more sinuous routes. These included a new north-south carriageway leading from Sutton Lane up

to the front of Byram Hall, and the straightening of the carriageway leading from the entrance at Brotherton, and the extension of this route through to Kitson Spinney, at the south-western corner of the park (Ordnance Survey 1892; 1893a; 1893b; 1894). A carriageway was also laid out allowing access to the park from the north-west, together with a new lodge. Other alterations to the park included the addition of an ice house situated within a small area of woodland to the south-east of the quarry.

During the first half of the 19th century, much of the land to the immediate west of the park was part of Coppering Kilns Quarry, a limestone quarry which also contained numerous limekilns, and it has been suggested that there had been quarrying in this area since the early 18th century (Fletcher 1997). As the name of the quarry suggests, this may also have been the site of a copper works involved in the production of sulphates for use as a pottery glaze. The industrial activity on this site ended in the later 19th century, and by the 1890s the old quarry works had been filled with water and turned into a fish pond, with woodland planted across the area. This appears to have been undertaken as part of a wider scheme to incorporate the old quarry workings and adjacent farmland into part of the wider park landscape (Ordnance Survey 1892).

The 20th century

By the early 20th century, the park was recorded as well wooded and containing a herd of about 300 fallow deer (Page 1907). The Ramsden family's business affairs lay largely outside of Yorkshire, however, and following the First World War Sir John Frenchville Ramsden began to sell the remaining family holdings in the county, and in 1922 Byram Park was itself sold. By the time of the sale, Byram Hall already stood empty, and the park was purchased based on the perceived potential for mineral extraction on the estate, and in 1923 it was sold on to Airedale Collieries Ltd. It appears that the coal reserves in the area were judged to be uneconomical to mine, however, as in 1924 Airedale Collieries sold the estate for half the original purchase price (Pickersgill 1996, 20). Following this sale, Byram Hall rapidly fell into disrepair, and in the 1930s the main block of the house collapsed, and much of the statuary and ornamental stone work in the adjacent gardens and around the lake was sold off. The majority of the park was turned over to intensive arable cultivation and extensive areas of woodland were subsequently felled and sold. The only large area of surviving woodland that formed part of the late 19th-century park landscape design is Great Hagg Wood, formerly Kitson Spinney, on the park's south-eastern side, where part of the formal path which leads through the woods survives as a track.

3 Aims and Objectives

The aims of the archaeological investigations were to identify and establish the extent, condition, date and function of the archaeological remains within the extraction areas. This would allow the chronology of the site, its components and phases to be established in order to place the site in its regional context and would mitigate the destruction of any buried archaeological remains through 'preservation by record'.

4 Methodology

All works have been carried out in accordance with relevant industry standards (English Heritage 1991, 2006; Institute of Field Archaeologists 2001). Since 1998, Brotherton Quarry has been developed in two areas (Fig. 2). Extraction in the 'original application area', originally known as 'Foxcliffe Quarry', began in 1998 covering an area of *c*.9.5ha. Excavation in the 'extension application area', known as 'Byram Park', began in 2005, covering an area of *c*.10ha and is currently ongoing.

The archaeological mitigation for Foxcliffe Quarry consisted of an archaeological watching brief focused on a double ditch visible through aerial photographs (Fig. 2). This was undertaken in four phases during 8th July 1998, 8th-14th September 1999, 3rd-4th October 2000, and 3rd-11th September 2002 (Fig. 3).

The archaeological mitigation for Byram Park consists of an ongoing archaeological strip and record operation. This report includes the results of the first four phases of the operation, covering 3.7ha of the proposed 10ha area. Later phases will be reported separately. The strip and record operation was undertaken between 13th June-1st August 2005, 4th May-17th July 2006, 30th April-8th May 2007, and 13th August-9th October 2007 (Fig. 4). A further area (0.5ha in size), which is not due for mineral extraction until *c*.2010-2014, was incorrectly stripped by sub-contractors in August 2007. It was rapidly planned by ASWYAS staff and then re-buried.

The position of all investigation areas was established by Darrington Quarries Ltd or their sub-contractors and machine excavated using a 360º mechanical excavator equipped with a toothless ditching bucket. An archaeologist was present throughout and the resulting surfaces were inspected for archaeological remains. Where deposits required clarification, the relevant area was cleaned by hand.

All archaeological and potential archaeological features were investigated according to the requirements of the North Yorkshire Heritage Unit (now the North Yorkshire County Council Heritage and Environment Section). An appropriate written, drawn and photographic record was made of all the features and trenches in accordance with ASWYAS standard methodologies (ASWYAS 2003). A soil sampling strategy was undertaken for the recovery and identification of carbonised plant remains, vertebrate remains and molluscs. Soil samples of up to 30 litres were taken from the primary fills of all archaeological remains, and deposits and subsequent fills when there was evidence of carbonised remains.

The site archive contains all the information gathered during the investigations and is indexed in Appendix 1. A concordance of contexts, artefacts and environmental samples is listed in Appendix 2. The written scheme of investigation for Byram Park (ASWYAS 2005) is included in Appendix 3, and an 'Assessment of the air photographic evidence for a site Byram Park', undertaken by Alison Deegan, is included in Appendix 4. The site archive is

currently held by ASWYAS in an appropriate and stable environment and will be deposited at Doncaster Museum within a timescale agreed between ASWYAS and the recipient museum.

5 Results

The excavations have revealed a sequence of phases of landscape use, based on stratigraphic relationships, radiocarbon dates and dateable artefacts. These are:

- the late Neolithic/Bronze Age (Phase 1), represented by a possible timber circle;
- the Iron Age (Phase 2), represented by a single inhumation;
- the Late Iron Age (Phase 3), represented by the first enclosure and division of the land;
- the Romano-British period (Phase 4), represented the continued use of the field system and enclosure, and further sub-division of the land;
- Anglo-Saxon activity (Phase 5), represented by an assemblage of Late Anglo-Saxon pottery;
- and finally later medieval and post-medieval activity (Phase 6).

The fills of the majority of features were mid-reddish brown, sandy silts or silty sands which contained between 5 and 20% burnt or heat fractured pebbles. The colour and texture of fills in individual features are only discussed if they vary from this norm. Due to the similarity between fills, stratigraphic relationships between features were rarely identified. The features are generally described west to east.

Foxcliffe Quarry Watching Brief (1998-2002)

Phase 4: Romano-British

A pair of parallel linear ditches, previously identified as crop marks, were exposed for 185m on an approximately north-south alignment across the site (Figs 5, 6 and 7, S.1). The western ditch (32) was between 1.8m wide at the southern end and 0.79m at the northern end. It was between 0.86m and 0.36m deep and had a V-shaped profile with a flat base containing between one and two fills (Fig. 7, S.1 and S.3). A single sherd of undiagnostic Romano-British greyware was recovered. The eastern ditch (31), was between 2.14m and 0.84m wide, and 1.13m and 0.43m deep and had a similar profile to Ditch 32 (Fig. 7, S.1 and S.7). Two fills were identified throughout its length, but no finds were recovered.

Ditch 31 was cut by Ditch 33 to form a T-shaped intersection (Figs 5, 6 and 7, S.11). Ditch 33 was aligned approximately east-west and was exposed for a distance of 122m before becoming truncated to the east. It was between 1.1m and 1.3m wide and up to 0.5m deep. Its primary fill was overlain by a thick layer of sand which partially covered the site (Lillie, see below; Fig. 7, S.5). In total, seven sherds of medieval pottery (from both primary and

secondary fills) were recovered, along with four sherds of mid to late 2nd to mid-4th-century Romano-British pottery from a secondary fill.

Unphased features

A heavily truncated pit (212) was identified between Ditches 31 and 32 (Figs 5 and 6). It was sub-circular in plan and had a diameter of approximately 0.5m, surviving to a maximum depth of 0.07m (Fig. 7, S.9). Its single fill produced no finds.

Gully 219, a curvilinear feature approximately 7m long (Figs 5 and 6; Plate 1), had a V-shaped profile with a flat base and was 0.64m wide and 0.4m deep (Fig. 7, S.13). The gully contained two fills, of which the upper was probably wind-blown sand in origin, and no finds were recovered. It was centred approximately 10m to the north-east of the intersection of Ditches 31 and 33, and with them formed corner Enclosure C (Fig. 6). The approximate area of this enclosure was 50m².

A group of 26 sub-circular features, up to 0.3m wide and 0.5m deep, were excavated and assigned numbers 101 to 149 inclusive (not shown in plan). They were initially believed to be post-holes, although after a site visit by Malcolm Lillie were identified as natural solution features (Lillie, see below). Solution features continued to be identified in all later areas.

Byram Park Strip and Record Operation (2005-2007)

Summary

Removal of 0.3m-0.4m of topsoil, revealed numerous linear and discrete features across the area. A detailed site plan is included in the rear of this volume (Fig. 8). Smaller phase plans are also included. While the stratigraphy of most of the site was topsoil onto plated limestone bedrock, to the north-east of the site a large deposit of sand overlying the limestone was identified (Plate 2). Where this occurred a subsoil deposit (1001), typically 0.3m deep also had to be removed.

The linear features largely appeared to form part of a large rectilinear field system, and the enclosure tentatively identified during the aerial photograph investigation was also revealed (Enclosure A). The discrete features were mostly made up of small pits and occasional post-holes, although three possible corn driers were also identified. In addition, seven inhumations and a possible cremation were identified. The features are described by phase starting in the north west (around Enclosure A) and then moving south and east. The inhumations are described separately.

Phase 1: Prehistoric? (Fig. 9)

Prior to the excavations of August 2007, Neolithic or Bronze Age features were not anticipated, and the flint tools were believed to be largely residual (Brooks, see below). An area, however, was incorrectly stripped of topsoil providing a fortuitous look at part of the site not due for extraction until *c*.2011-2014. This exposed part of an unenclosed ring of post-holes in the southern section. The ring has a diameter of approximately 11m and could

represent either the truncated remains of a late Neolithic or early Bronze Age timber circle, or a later prehistoric roundhouse. The post-holes were not excavated at the time but future extraction at the quarry will allow these features to be fully excavated and recorded.

Phase 2: Iron Age (Fig. 10)

Following excavation, radiocarbon dates were sought for all inhumations and, interestingly, Skeleton 10 was radiocarbon dated in the range 800-540 BC (Table 15, SUERC-17938). The poorly preserved skeleton was of a male aged over 36, who was placed flexed on his left side in Grave 1414, with his head to the south-east (Plates 3 and 4). The grave was 1.72m long, 0.73m wide and 0.2m deep (Fig. 11). No grave goods or other finds were recovered from the grave fill. A burial of this date was unexpected as no demonstrable Iron Age features or artefacts had been identified previously.

Phase 3: Late Iron Age-early Romano-British (Fig. 12)

It is only in the Late Iron Age that the landscape began to be divided up by ditches, forming a large enclosure and a curvilinear system of fields. Although many of the features assigned to this phase contained Romano-British pottery, radiocarbon dating of bone from Ditch 11 provided a Late Iron Age date range. As a result, this feature, together with spatially associated features (such as Enclosure A and Ditch 34) have been placed in this phase. Evidence of recutting from some of the ditches demonstrates their maintenance over time and this may explain the presence of Romano-British pottery in Late Iron Age features.

Enclosure A measured approximately 38m by 30m and covered an estimated area of 1120m² although the north-western corner of the enclosure was not exposed during the archaeological works. It has been placed in the Late Iron Age phase due to its association with Ditch 11. The enclosure was sub-rectangular in plan and orientated roughly east to west, with an entrance on the eastern side. It was formed by Ditch 6/7, which had a V-shaped profile with a flat base and was between 1.12m and 2.05m wide and 0.46m and 0.85m deep (Fig. 13, S.80, S.84, S.96, and S.180; Fig. 14, S.196 and S.209). The enclosure ditch typically contained a single fill, with no major recutting events noted except in the section excavated to the north of the enclosure entrance (Fig. 14, S.196). The pottery recovered from the enclosure ditch dated from the mid-2nd to 4th-century (Leary, see below). Although intersections were carefully targeted during the excavations stratigraphic relationships between the enclosure ditches and the rest of Ditch 6 and Ditch 11 could not be established and it is unclear whether Enclosure A was an earlier free standing feature in the landscape or if it was constructed at the same time as the other ditches.

Within Enclosure A, only a linear gully and six discrete feature were identified. Although occasionally associated with Roman pottery, the features are described here due to their spatial association with Enclosure A. Running parallel to its northern boundary was a short gully (12). It ran for a length of 16m, and was between 0.48m and 0.96m wide and 0.17m and 0.2m deep. No finds were recovered from this feature. South of Gully 12, four post-holes (1286, 1288, 1300, and 1302; Group 38) were identified, measuring between 0.37m and

0.44m in diameter and 0.17m and 0.21m in depth (Fig. 14, S.192 and S.199). Possibly associated with these post-holes was Pit 1284, which showed evidence of *in situ* burning. It was 1.2m long by 0.4m wide, and 0.3m deep, and filled by a single reddish brown fill 1283 containing charcoal and burnt stone (Fig. 14, S.187). Two sherds of pottery, dating from the mid-2nd to mid-3rd century, were recovered from the pit. The four post-holes and pit do not appear to correspond to any structural form, although they may represent the heavily truncated remains of a building within the enclosure. Also within Enclosure A, subrectangular Pit 1306 was identified. It had a U-shaped profile and was 1.28m long, 0.46m wide and 0.12m deep (Fig. 14, S.205). Three sherds of Dales ware, giving an optimum date of the early 4th century, were recovered.

Ditch 11 was exposed for a distance of 158m, running off the south-eastern corner of Enclosure A on a north-west to south-east orientation, before curving towards the north-east. As noted above a stratigrahic relationship could not be established between the Enclosure A (Ditch 6) and Ditch 11. Ditch 11 was between 1.6m and 2.3m wide, and between 0.75m and 1.05m deep, and had a variable, but generally V-shaped, profile with a flat or rounded base (Fig. 13, S.135; Fig. 14, S.425). It contained between one and three fills with a possible recut identified in two sections approximately half way along the exposed ditch (Fig. 13, S.131), although this was not manifested in other sections. A piece of animal bone from a primary fill was radiocarbon dated in the range 360-50 BC (Table 15, SUERC-17936). The pottery recovered from the ditch could not be closely dated but a group of hand-made shell tempered ware was mid-3rd century AD or later.

Ditch 34 was exposed over a distance of 173m and is included in this phase due to its curvilinear form, which mirrors the course of Ditch 11. It varied in width and depth from 0.4m and 0.04m respectively at the western end, where it appeared to be truncated away, to 1.18m and 0.22m respectively in the most easterly section. It had a broad U-shaped profile (Fig. 14, S.416) and no finds were recovered from its single fill. A single sherd of pottery, which may date to the Late Iron Age, was recovered during machining from the surface of the ditch at section 1571 (Fig. 8).

Ditch 36 was orientated north-west to south-east, and exposed for a distance of 11m. In plan it appeared to have been appended to Ditch 11, although once the area was cleaned it was apparent that the ditch (36) was heavily truncated and a relationship was not going to be established. No finds were recovered from this feature and it has been placed in this phase due to this probable relationship with Ditch 11. It was 1.04m wide and 0.29m deep at the northern section adjacent to the trench edge (Fig. 14, S.368) but only 0.92m wide and 0.09m deep, 4.7m to the south.

Ditch 13, which ran for at least 39m on an approximate north-south orientation, contained a single fill and had a U-shaped profile. It was between 0.84m and 1.11m wide, and 0.25m to 0.29m deep (Fig. 13, S.139). At the northern end the ditch ran into the sandy subsoil deposit, becoming very ephemeral. Three test slots were dug along its projected course to try and

confirm its length, the northern and central slot were unsuccessful, but it was identified in the southern test slot. Although no datable finds were recovered from the ditch it has been allocated to this phase because it was cut by Romano-British Ditch 4 (Fig. 13, S.146), and appears to represent a sub-division of the field formed by Ditches 11 and 34.

Two gullies, apparently forming a disjointed curving boundary were identified approximately 12m east of Enclosure A. Gully 15 ran for 38m curving from a north-west to south-east alignment. It was between 0.6m and 1.04m wide and between 0.21m and 0.38m deep (Fig. 13, S.161 and S.185), and contained Romano-British pottery which probably dated to the 2nd century. A piece of animal bone was radiocarbon dated in the range 40 BC-AD 130 (Table 15, SUERC-17932). Immediately west of the southern terminus of Gully 15 was Gully 22, which measured 10.2m in length, approximately 0.6m in width and was between 0.17m and 0.36m deep (Fig. 14, S.217). Both gullies had U-shaped profiles. The inclusion of these gullies in this Late Iron Age phase is tentative at best given the Romano-British pottery but their respect of Enclosure A and Ditch 11 implies that these features were extant when the gullies were cut.

Ditch 8 was located near the southern boundary of the site. It was L-shaped in plan, orientated approximately north-south for 8.1m before turning west and continuing for 7.8m before terminating. It was between 0.73m and 0.82m wide, and 0.2m and 0.48m deep, and varied in profile from U to V-shaped (Fig. 13, S.1 and S.30). A single primary fill was present throughout except at the western terminus where a dark brown sandy silt secondary deposit (1042) contained the remains of a cremated adult human. A radiocarbon date on a piece of hazel charcoal from the cremation deposit was in the range 160 BC-AD 70 (Table 15, SUERC-17926), placing the cremation and Ditch 8 in the Late Iron Age. Associated with the cremation were a number of copper alloy and iron objects including a small copper alloy rivet and hobnails, many of which showed evidence of burning and were probably pyre goods (Cool, see below). The relationship between Ditch 8 and Ditch 2 was not established during the excavation (Fig. 16, S.28). Spatially, the two features are very unlikely to be contemporary and the early radiocarbon date of Ditch 8, combined with the phasing of the rectilinear field system, suggests that that Ditch 2 is a later, Romano-British, feature (Phase 4).

Phase 4: Romano-British

During the Romano-British period, the field system established in the Late Iron Age continued in use despite the superimposition of a rectilinear system. Unfortunately the datable pottery and radiocarbon dates associated with this phase gave a broad spread of dates, often ranging from the early 2nd to late 4th-centuries AD.

The field system ditches and gullies

South-west of Enclosure A was Ditch 3 which was exposed for a distance of 92m on an approximate north-south alignment. This field boundary ditch had a U-shaped profile and was between 1.3m and 1.8m wide, and 0.51m and 0.81m deep (Fig. 16, S.66). It had a single

fill which contained pottery typically dating to the 2nd century although six sherds of Late Anglo-Saxon pottery were also recovered (Cumberpatch, see below).

Ditch 26 was exposed for 23m on a broadly east-west alignment. In plan it appeared to articulate with the western side of Ditch 3, although excavation revealed the original cut of Ditch 26 turned north-east, terminating just before intersecting with Ditch 3. A 0.33m deep recut (Fig. 17, S.114), however, turned south-east and intersected Ditch 3, although unfortunately a stratigraphic relationship between the two features was not clearly defined. Ditch 26 was 1.6m wide and was between 0.49m and 0.63m deep, with a U-shaped profile (Fig. 16, S.64). No finds were recovered from any of its fills.

Ditch 4 was exposed over a distance of 270m, appended to the eastern side of Ditch 3, on an approximate east-west alignment, before curving to north-eastwards towards the eastern limits of the excavation. It had a broad U-shaped profile with a flat base, and varied in width from 0.9m to 1.85m and depth from 0.1m to 0.5m (Fig. 16, S.56; Fig. 17, S.253, S. 409 and S.419). It contained a single fill, which in one section (1127; Fig. 16, S.98) contained a large dump of pottery dated to the late 3rd-century (Leary, see below). This ditch, which cut Ditch 13 and Grave 1067 (SK5), almost certainly represents a later Romano-British subdivision of the field system, presumably a replacement for the Late Iron Age Ditch 34.

Associated with Ditch 4 were Gullies 18, 27 and 28. These were heavily truncated, surviving to a maximum depth of 0.2m, and it was not possible to establish their relationship with Ditch 3. Gullies 18 and 27 probably represent two surviving segments of the same gully, which may have formed a possible trackway with Ditch 4, and were a maximum of 0.45m wide and 0.1m deep (Fig. 17, S.248). Gully 28 formed a corner enclosure with Ditches 3 and 4 (Enclosure B). It ran east from Ditch 3 for 8m before turning south-east to meet Ditch 4 (Fig. 16, S.98) and was between 0.09m and 0.2m deep and 0.25m and 1.1m wide. The area of the corner enclosure (B) was approximately 106m². No finds were recovered from these gullies and they have been placed in Phase 4 due to their physical relationship with Ditches 3 and 4. It is acknowledged that the linear gully (18/27) cannot be contemporary with the corner enclosure (Gully 28), but since their sequential relationship has not been established it is not possible to say whether the linear gully was earlier than the corner enclosure or vice versa.

Ditch 1 was exposed over a distance of 254m, although only the western 142m was targeted for excavation. It was orientated east to west, had a broadly V-shaped profile and was between 0.95m and 1.94m wide, and 0.32m and 0.58m deep (Fig. 16, S.13 and S.24). It contained a single fill, although the pottery recovered ranged in date from the mid-2nd century to the mid-3rd century. Where Ditch 1 formed a T-shape intersection with Ditch 3, a stratigraphic relationship could not be ascertained.

Ditch 2 was exposed for a distance of 12.6m on an approximate north-south alignment, south of Ditch 1. It was up to 1.8m wide and between 0.32m and 0.55m deep, and had a U-shaped

profile with a flat base (Fig. 16, S.3). Its single fill contained no datable finds. It terminated 2m south of Ditch 1, near the intersection between Ditches 1 and 3.

Gully 16 was exposed over a distance of 150m although only 38m was targeted by the current investigations. It ran parallel to Ditch 1 for its entire visible length, but was heavily truncated with a maximum depth of 0.14m (Fig. 17, S.315), and was between 0.65m and 0.9m wide. No datable finds were recovered from Ditch 16 and only due to its spatial association with Ditch 1, has it been placed in the Romano-British phase.

Gully 23 was exposed for 32m and appeared to be L-shaped in plan although it was only partly exposed by the works. It was between 0.52m and 0.91m wide and 0.11m and 0.29m deep and had a U-shaped profile (Fig. 17, S.311). It had a single fill which contained no datable finds. Possibly mirroring this curving alignment was Gully 29. It was exposed for a distance of 9.1m to the east of Gully 23, on an approximate north-south alignment, before curving north-west and terminating. It varied in width and depth from 0.77m and 0.13m respectively at the southern site boundary (Fig. 17, S.316), to 0.13m and 0.06m at its northern terminus. It contained no datable finds. Gullies 23 and 29 have been placed in Phase 4 on the basis of their spatial relationship to each other and corn driers 1436 and 1458, which they may have enclosed. Gully 23 was cut by medieval Gully 30 (Fig. 17, S.323).

In the north-eastern corner of the site Ditch 37 was exposed for a distance of 32m on an approximate north-west to south-east alignment. It was between 1.53m and 1.6m wide, and 0.38m and 0.51m deep (Fig. 17, S.422) and its single fill contained no finds. It has been placed in Phase 4 on the basis of the results of more recent excavations to the east (Walsh in prep.). Here Ditch 37 continued on a south-easterly direction for a further 150m, intersecting with Ditches 34, 4, and 1, as well as previously unidentified ditches. These relationships, together with provisional dating of the pottery, suggest it was a Romano-British rather than Late Iron Age ditch.

The inhumations and ritual deposits (Fig. 18)

An isolated single inhumation, near the corner of the field formed by Ditches 1 and 3 (Grave 1016), contained the moderately well preserved skeleton of a male aged over 46 (SK1), who had been placed in an extended supine position with his head to the west (Plate 5). The grave was 2.15m long, 0.6m wide and 0.18m deep, from which a single iron nail was recovered. The skeleton has been radiocarbon dated in the range AD 250-420 (Table 15, SUERC-17920).

The remaining five inhumations (Skeletons 2, 3, 5, 6 and 8), all poorly preserved, and a cow skeleton (SK 7), were found together in a small area near the centre of the site (Figs 8 and 15).

Skeleton 2 is that of a possible female aged over 26, who had been placed in a supine position with her legs flexed to the left, in Grave 1018. The grave, orientated north to south, was heavily truncated with the northern half of the grave, including the upper body and

cranium, absent (Plate 6). The maximum surviving length of the grave was 1.05m, with a width of 0.5m and depth of 0.09m. Three iron nail fragments were recovered from the fill. The skeleton has been radiocarbon dated in the range AD 250-420 (Table 15, SUERC-17921).

Skeleton 3 is that of a male aged over 46 that had been placed in Grave 1020 with his head to the east in an extended supine position (Plate 7). The grave was 1.83m long, 0.53m wide and 0.19m deep and two iron nail fragments were recovered from the fill. The skeleton has been radiocarbon dated in the range AD 130-390 (Table 15, SUERC-17922).

Skeleton 5 is that of an adult male placed in Grave 1067 in an extended supine position with his head to the north. The grave had been cut by Ditch 4, leaving only part of the right arm, pelvic region and lower limbs (Plate 8). The grave was at least 1.4m long, and was 0.6m wide and 0.04m deep, from which a scrap of shell tempered ware (3rd-4th century AD) was recovered. The skeleton has been radiocarbon dated in the range AD 230-410 (Table 15, SUERC-17928).

Skeleton 6 is that of a female aged over 26, who had been placed in Grave 1071, in a flexed position on her right side (Plate 9). The grave was 1.22m long, 0.68m wide and 0.10m deep. The grave contained a scrap of shell tempered ware, dating to the 3rd or 4th century as well as nine iron nail fragments, a copper-alloy fragment and a fragment of mineralised wood. Most of the iron nails had mineralised wood adhering to them (Cool, see below), which given their location within the grave suggests they were from a wooden coffin. The skeleton has been radiocarbon dated in the range AD 130-340 (Table 15, SUERC-17929).

Skeleton 8 is that of a juvenile, aged between 4 and 7, who was placed in Grave 1150, in an extended supine position. The skeleton was 10% complete with only part of the lower limbs surviving (Plate 10). The northern half of the grave, containing the upper body and cranium, had been cut by Pit 1094. It was at least 0.8m long, and was 0.53m wide and 0.03m deep. A fragment of an iron nail was recovered from the fill. The skeleton has been radiocarbon dated in the range AD 250-420 (Table 15, SUERC-17921).

Pit 1130 was 1.82m long, 0.98m wide and 0.28m deep, into which a near complete cow skeleton (SK7) had been placed (Plate 11). The partial remains of second animal had also been placed in the pit. The cow has been radiocarbon dated in the range AD 130-350 (Table 15, SUERC-17930), and its spatial association with the contemporary human burials might suggest a ritual deposition, rather than the casual discard of a diseased individual.

The corn driers (Fig. 19)

Feature 1065 was located approximately 8m south-east of the intersection of Ditches 3 and 4, and was identified as a possible corn drier, orientated approximately north to south, although no *in situ* burning was noted on the limestone bedrock. The feature was broadly U-shaped in profile, containing three fills, and was 3.45m in length, 0.9m in width and 0.51m deep (Fig. 19, S.48). The earliest fill was a small dark silty deposit (1064), visible in plan only, that

contained a small amount of cereal grain. This was radiocarbon dated in the range AD 210-410 (Table 15, SUERC-17927). This was overlain to the east by a thin (0.02m) reddish clayey silt (1063). The third and final fill was a reddish brown sandy silt (1063), which contained late Roman or early post-Roman, and Anglo-Saxon pottery, suggesting the feature may have been in use, or was at least open, well beyond the end of the Roman period.

Corn drier 1436 was orientated north to south and was 3.42m long, 0.9m wide and 0.40m deep (Fig. 19, S.298). At the southern end it was 1.3m wide, forming a curtailed L-shape plan by virtue of a rectangular flue (Fig. 19, P.306; Plate 12). The upper fill was a reddish brown sandy silt (1434), which covered the entire feature and produced animal bone and a single iron nail. Below fill 1434 was an orangey brown silty clay (1435) which was present in the centre of the feature. This deposit covered 1446 at the northern end of the feature, and 1447 at the southern end. Both 1446 and 1447 were very dark brown silty deposits with had burnt clay and charcoal inclusions visible. An iron hobnail was recovered from the sample taken from fill 1446, and a grain fragment from this fill gave a radiocarbon date in the range AD 130-390 (Table 15, SUERC-17939). Under each of these burnt deposits was a thin greyish brown silty layer (1465 to the north, and 1466 to the south). The western side of the feature appears to have been partially stone lined (Plate 12).

Corn drier 1458 was located 3m east of corn drier 1436 (Plate 13) and was 3.70m long, 1.08m wide and 0.60m deep (Fig. 19, S.303 and P.307). It was sub-rectangular in plan, and had near vertical sides, with a 0.75m wide flat base. Evidence of *in situ* burning was apparent on the limestone bedrock that formed its sides and base. The upper fill (1467) contained large blocks of natural limestone, up to 0.6m in diameter. This overlaid a reddish brown sandy silt (1468) which contained a large quantity of animal bone at the southern end of the feature. Under 1468, in the centre of the feature, was a layer of redeposited natural limestone which had been partly burnt or heated. Below was a very dark brown silt (1470) which was visible across the entire base of the feature, containing late Romano-British or early post-Roman pottery. The earliest fill was a layer of weathered natural limestone at the southern end of the feature. Grain from the primary fill has been radiocarbon dated in the range AD 240-410 (Table 15, SUERC-17940) placing the use of the feature firmly in the late Roman period.

Other discrete features

North of Ditch 11 two discrete features were identified dating to the Romano-British period. Between Enclosure A and Gully 15 was post-hole 1314. It was 0.25m in diameter and 0.21m deep with a U-shaped profile and a single sherd of pottery, probably dating to the 2nd century, was recovered the fill. Cutting Gully 15 was Pit 1253 (Fig. 8) which contained evidence of *in situ* burning in and around the dark brown sandy silt primary fill (1252). A loose, reddish brown sandy silt, secondary fill also contained frequent burnt stone. Pottery from the two fills is dated to the 2nd century.

Approximately 85m east of Enclosure A was an isolated pit, 1508, from which 35 sherds of late Roman and early post-Roman Huntcliff ware pottery was recovered. The pit was 0.15m

deep and 0.58m in diameter, and contained a single fill (Fig. 17, S.338). A piece of lead was also recovered from this pit.

North of Ditch 4, near the area where most of the inhumations were concentrated, was Pit 1092. This irregular feature was filled by an orangey brown silty sand primary fill (1091), and a dark black silty sand secondary deposit (1090). Fill 1090 contained a single sherd of pottery, probably dating to the late 4th century. A small assemblage of animal bone was also recovered from both fills.

At the western end of the 'field' formed by Ditches 1, 3 and 4, five discrete features dating to the Romano-British period were identified. Pit 1081, 1.49m in length and 1.04m in width, was very shallow at only 0.12m in depth (Fig. 16, S.60), but its grey brown silty sand fill contained shell tempered ware dating to the 3rd to 4th-centuries, as well as slag, animal bone and oyster shells.

Pit 1006, was 1.85m long and 1.0m wide and 0.19m deep (Fig. 16, S.11). It was filled by a single deposit which contained eight sherds of pottery from a single vessel, which could only be broadly dated to the Romano-British period.

Pit 1061 was 1.85m long by 1.1m wide and 0.24m deep (Fig. 16, S.42). Its single fill contained pottery, samian and mortaria dating from the mid-2nd century to the mid-4th century.

Feature 1364 contained a copper-alloy object and a Roman tegula tile. It was very irregular in plan, although it had a regular, 0.21m deep, U-shape profile. Post-hole 1370, which lay approximately 8m south-east of 1364, contained a Roman imbrex tile. The post-hole was sub-circular in plan, with a U-shaped profile, and was approximately 0.5m in diameter, and 0.24m deep.

South of Ditch 1, two discrete features attributed to the Romano-British phase of activity were identified. Pit 1049 was 0.88m long, 0.54m wide and 0.54m deep. It contained a single greyish brown sandy silt fill from which 56 sherds of pottery, probably dating to the mid to late 3rd century were recovered. It also contained a coin dating to AD 270-90, four iron objects and three fragments of glass including part of a bottle handle. A second coin, dating to AD 273-4, was found in the fill of Furrow 10 which cut this pit. It is highly likely that this coin originated from the pit.

Pit 1004 was 2.4m in length and 1.15m in width. It was 0.63m wide and 0.5m deep and contained two fills, both of which contained Huntcliff ware dating the pit to the late Roman or early post-Roman period. Unfortunately the feature was destroyed prior to its full excavation and recording when tracked over by machine.

Phase 5: Anglo-Saxon (Fig. 20)

Approximately 11m south-east of Gully 22 was Gully 21. It survived to a length of 8.5m although the north-eastern terminus was not identified due to a patch of heavily disturbed

natural. It was between 0.49m and 0.72m wide and 0.15m deep and 0.32m deep (Fig. 21, S.270) and it contained a small assemblage of Late Anglo-Saxon pottery (Cumberpatch, see below).

East of Gully 21 was Gully 14. It was orientated north-south from Ditch 9 (Fig. 21, S.137), and was 20m in length. The northern end was heavily truncated but it appeared to turn west and run for a further 11m. It was between 0.55m and 1.07m wide and had a maximum depth of 0.24m (Fig. 21, S.216). A single sherd of late Anglo-Saxon pottery was recovered, and it is presumed that Gullies 14 and 21 form an Anglo-Saxon enclosure appended to the pre-existing course of Ditch 9.

Ditch 9 was exposed intermittingly for 117m on an east-west orientation and was between 1.4m and 3.0m wide and 0.08m and 0.29m deep (Fig. 21, S.88). A worn late-3rd century coin was recovered from this feature, as well as two sherds of medieval pottery. This ditch is thought to be an Anglo-Saxon replacement for Ditches 6 and 11, which would not have been compatible the practice of ridge and furrow ploughing.

Additionally Anglo-Saxon pottery was also recovered in the north-eastern part of the site from Ditch 3 and the upper fill of corn drier 1065, suggesting a concentration of Anglo-Saxon activity in this area of the site.

Phase 6: The later features (Fig. 22)

Furrow 10 cut two Roman pits, 1049 and 1053 (Fig. 23, S.46). A Roman coin, dated to AD 273-4 (Cool and Guest, see below), was recovered from the fill of this furrow at the point where it cut Pit 1049, and it is highly likely that the coin originated in this pit.

Furrows 19 and 20 were initially associated with the Romano-British field system although subsequent re-evaluation of the site concluded that they are plough furrows. Both late Saxon and early medieval pottery were recovered from these features.

Two sections of Gully 25 were exposed over a distance of 47m and 18m, orientated on an approximately north to south alignment, parallel to Furrows 19 and 20. Unfortunately the gully was located on the boundary between two areas of extraction and was partly lost. It was between 0.3m and 0.5m wide, and 0.12m and 0.25m deep, with a U-shaped profile (Fig. 23, S.309; Plate 13), and contained two small sherds of medieval pottery. At the northern end it ran into a patch of disturbed natural. Three test pits were excavated although none established the presence of the gully. Running parallel to Gully 25 was Gully 30 which was exposed for a distance of 30m and was between 0.6m and 0.81m wide and was 0.3m deep. It had a U-shaped profile which contained a single fill from which residual Romano-British pottery was recovered.

A number of features, probably dating to post-medieval remodelling of the deer park, were identified across the site. The fills of these features typically contained quantities of lime mortar and peaty inclusions.

Gully 17 was visible, intermittently, for approximately 41m. It was 0.5m wide and had a maximum depth of 0.12m, and was filled by a crushed lime mortar. No finds were recovered from Gully 17. Post-hole alignment 35 consisted of twenty post-holes, exposed over a distance of 105m. All were sub-square or sub-rectangular in plan, and generally had near vertical sides with a flat or gently rounded base (Fig. 23, S.343). They were all filled by a fairly loose light brown silty sand. The post-holes were spaced approximately 2.6m apart, although some larger gaps were also recorded. Both Gully 17 and post-hole alignment 35 were orientated north-east to south-west, and probably represent the remains of a tree-lined avenue or path. A second gully (39), filled entirely with crushed lime mortar, was identified orientated approximately east to west. In plan it converged to meet with Gully 17, and may represent the remains of a second path.

South-west of these features, a further five discrete pits were assigned to this phase. Pit 1346, 0.75m in diameter and 0.5m deep, had a U-shaped profile and contained an early modern roof tile fragment of 18th to 20th-century date. Two sub-rectangular pits, 1352 and 1497, had near identical dimensions. Both were approximately 1.0m long by 0.47m wide, with Pit 1352 surviving to a depth of 0.27m and Pit 1497 to a depth of 0.17m. They had vertical sides and flat bases, and may represent a continuation of post-hole alignment 35.

Pit 1358 was at least 1.6m long and 1.4m wide, and was recut twice (Fig. 23, S.256). The fill of the primary pit, which was 0.87m deep, was interesting in that it contained seven alternating layers of fine or crushed limestone fragments and reddish brown sandy clay. A piece of bone from the fill this pit was radiocarbon dated in the range AD 1460-1650 (Table 15, SUERC-17937). It was recut twice, initially by 1366 which was only 0.25m deep, and contained a single dark brown sandy clay and finally by 1350 which contained a lime mortar rich fill. The subsequent recut (1350) was 0.4m deep.

Lying just to the south of Pit 1358, Pit 1374 was approximately 1.5m in diameter, and 0.42m deep, and contained two fills (Fig. 23, S.266). The upper fill (1371) was a very light brown colour with a high concentration of limestone, while the lower fill (1373) was a dark brown silty clay. A modern sheep was buried in Pit 1396, which cut into Furrow 19.

Finally, in the southern part of the site, a second row of north-west to south-east post-holes was identified (post-hole alignment 24). It consisted of five post-holes, spaced approximately 3m apart, which were between 0.39m and 0.74m in diameter and 0.18m and 0.24m in depth (Fig. 23, S.288, and S.296). All contained a similar brown silty sand with mortar inclusions. The south western post-hole (1445) cut Furrow 19 (Fig. 23, S.297).

Unphased features (Fig. 24)

Because of a lack of stratigraphic or dating evidence the remaining features are unphased. Ditch 5 is described below and the discrete features are summarised in Table 1.

Ditch 5 was 13.4m long and orientated approximately east-west, located near the western edge of the site. It was between 0.7m and 0.78m wide, and 0.1m and 0.3m deep, with a

broad, shallow U-shaped profile (Fig. 25, S.51). The western terminus of this ditch contained an unusually high concentration of burnt stone.

Table 1. Summary of unphased pits and post-holes from Byram Park

Feature No.	Area	Description	Dimensions (m)	Notes and finds
1053	BYP 05	An ovoid, U-shaped profile, pit filled by a dark brown sitly sand (1052) and cut by Furrow 10	L 1.72 W 0.61 D 0.24	Large deposit of *Triticum aestivum (*Alldritt, see below). Animal bone (Fig. 23, S.46)
1079	BYP 05	An ovoid, U-shaped profile, pit filled by a grey brown silty sand (1078)	L 1.54 W 0.9 D 0.24	Animal bone
1083	BYP 05	An ovoid, U-shaped profile, pit filled by a reddish brown silty sand (1082)	L 1.45 W 1.10 D 0.31	Fe object, animal bone
1089	BYP 05	A sub-circular, U-shaped profile, pit or large post-hole filled by a greyish brown silty sand (1088)	L 0.90 W 0.80 D 0.36	No finds
1094	BYP 05	A sub-rectangular, U-shaped profile, pit filled by a greyish brown silty sand (1093).	L 3.0 W 1.5 D 0.20	Cuts RB Grave 1150 (SK8). Animal bone
1122	BYP 05	A sub-circular, U-shaped profile, pit or post-hole filled by a dark brown silty sand (1121)	L 0.64 W 0.56 D 0.06	Animal bone
1164	BYP 05	A sub-circular, U-shaped profile, post-hole filled by a greyish brown silty sand (1163)	L 0.44 W 0.39 D 0.19	No finds
1186	BYP 06	A sub-circular, U-shaped profile, tree bowl filled by a reddish brown sandy silt (1185)	L 0.98 W 0.98 D 0.24	No finds
1222	BYP 06	A sub-circular, U-shaped profile, post-hole filled by an orangey brown clayey sand (1223)	L 0.30 W 0.30 D 0.07	No finds
1251	BYP 06	A sub-rectangular, U-shaped profile, pit filled by a reddish brown sandy silt (1250)	L 1.58 W 1.04 D 0.19	No finds
1258	BYP 06	A sub-circular, U-shaped profile, pit filled by a reddish brown silty sand (1257)	L 1.30 W 1.00 D 0.17	No finds
1290	BYP 06	A sub-circular, U-shaped profile, pit filled by a greyish brown silty sand (1289)	L 1.60 W 1.40 D 0.10	No finds
1304	BYP 06	A sub-circular, U-shaped profile, pit filled by reddish brown silty sand (1303)	L 2.05 W 1.95 D 0.14	No finds
1316	BYP 06	A sub-rectangular, U-shaped profile, post-hole filled by a dark brown clayey silt (1315)	L 0.36 W 0.25 D 0.14	No finds
1328	BYP 06	A sub-circular, U-shaped profile post-hole filled by a dark brown silt (1327)	L 0.28 W 0.28 D 0.03	Cuts Ditch 4. Animal bone

Feature No.	Area	Description	Dimensions (m)	Notes and finds
1340	BYP 06	A double post-hole, U-shape in profile, filled by greyish brown sandy clay (1339)	L 0.80 W 0.80 D 0.25	No finds
1348	BYP 06	A sub-circular, U shaped profile, post-hole filled by a reddish brown sandy silt (1347)	L 0.51 W 0.51 D 0.17	No finds
1354	BYP 06	An ovoid, U-shaped profile, tree bowl filled by a reddish brown sandy silt (1353). No relationship established with Furrow 1356	L 3.70 W 1.06 D 0.22	No finds
1378	BYP 06	A sub-rectangular, U-shaped profile, pit filled by a reddish brown sandy silt (1377)	L 2.35 W 1.10 D 0.31	Animal bone
1398	BYP 06	A sub-rectangular, U-shaped profile, pit filled by a dark brown sandy clay (1397)	L 0.60 W 0.48 D 0.18	No finds
1433	BYP 06	An ovoid, U-shaped profile, pit filled by a reddish brown silty sand (1432)	L 1.70 W 1.40 D 0.30	No finds
1501	BYP 07	A sub-circular, U-shaped profile, pit filled by a reddish brown sandy silt (1500)	L 2.12 W 1.93 D 0.29	No finds
1510	BYP 07	A sub-circular, V-shaped profile, post-hole filled by a mid-brown silty sand (1511)	L 0.23 W 0.23 D 0.20	No finds
1528	BYP 07	An ovoid, V-shaped profile, pit or post-hole filled by an orangey brown silty sand (1529)	L 0.90 W 0.58 D 0.13	No finds
1585	BYP 07	A sub-square, U-shaped profile, pit filled by a mottled brown silty sand (1584). No relationship established with 1583	L 2.90 W 2.44 D 0.63	No finds
1586	BYP 07	A sub-circular, U-shaped profile, post-hole filled by mottled reddish brown silty sand (1587) and post-pipe 1588	L 0.68 W 0.68 D 0.31	No finds
1588	BYP 07	Sub-circular post-pipe in post-hole 1586, filled by yellowish brown sand (1589)	L 0.39 W 0.39 D 30.31	No finds
1603	BYP 07	A sub-circular, U-shaped profile, post-hole filled by a greyish brown silty sand (1602)	L 0.42 W 0.35 D 0.07	No finds

6 Artefact Record

Where appropriate, specialist reports are accompanied by a catalogue. Catalogue entries conclude with contextual details in italics, for example: *BYP06; Ditch 6; context 1246; Site Phase 2*. The entries are ordered by context number. Items marked with an asterisk have been illustrated (Figs 26-30)

The Romano-British pottery by Ruth Leary

Introduction

During the course of the excavations 572 sherds (11376g) of Romano-British pottery were recovered. The pottery assemblage ranged from the 2nd to the late 4th-century but no sherds demand a date in the 1st century and, indeed, none need be of early 2nd century date. Romano-British pottery was found in 29 features and 50 contexts. Only eleven features had more than ten sherds and the average sherd weight was 20g.

An archive catalogue was compiled for all the pottery according to the standard laid down by the Study Group for Romano-British Pottery (Darling 2004a). Pottery was recorded detailing specific fabrics and forms, decorative treatment, condition, cross-joins/same vessel and was quantified by sherd count, weight and rim percentage values, giving estimated vessel equivalents. All the pottery from the site was catalogued in the archive (Appendix 5) and the stratified pottery was examined in order to date the features. Key groups are catalogued below and uncatalogued material is summarised. National fabric collection codes (Tomber and Dore 1998) are included where possible.

Pottery fabric descriptions

The fabric of the pottery was first examined by eye and sorted into fabric groups on the basis of colour, hardness, feel, fracture, inclusions and manufacturing technique. A sample of the sherds was further examined under an x30 binocular microscope to verify these divisions. The size of the sample was as large as was felt necessary for each fabric group.

Colour:	narrative description only
Hardness:	after Peacock 1977
	soft - can be scratched by finger nail
	hard - can be scratched with penknife blade
	very hard - cannot be scratched
Feel:	tactile qualities
	smooth - no irregularities
	rough - irregularities can be felt
	sandy - grains can be felt across the surface
	leathery - smoothed surface like polished leather
	soapy - smooth feel like soap
Fracture:	visual texture of fresh break, after Orton 1980
	smooth - flat or slightly curved with no visible irregularities

irregular - medium, fairly widely spaced irregularities

finely irregular - small, fairly closely spaced irregularities

laminar - stepped effect

hackly - large and generally angular irregularities

Inclusions:

Type: after Peacock 1977

Frequency: indicated on a 4-point scale - abundant, moderate, sparse and rare where abundant is a break packed with an inclusion and rare is a break with only one or two of an inclusion.

Sorting: after Orton 1980

Shape: angular - convex shape, sharp corners

subangular - convex shape, rounded corners

rounded - convex shape no corners

platey - flat

Size: subvisible - only just visible at x30 and too small to measure

fine - 0.1-0.25mm

medium - 0.25-0.5mm

coarse - 0.5-1mm

very coarse - over 1mm

Black burnished wares

BB1 as Tomber and Dore 1998, South-East Dorset BB1 (DOR BB1).

BB1/RBB1 Dorset or Rossington BB1.

RBB1 Rossington BB1. Tomber and Dore 1998, ROS BB1.

Parchment ware

CRA PA Crambeck Parchment ware, Tomber and Dore 1998, CRA PA.

Shell and calcite wares

CTA2 Dales ware. Tomber and Dore 1998, DAL SH.

CTA3 Huntcliff ware. Tomber and Dore 1998, HUN CG.

CTB Greyish brown. Hard with soapy feel and laminar fracture. Moderate, ill-sorted, fine to very coarse shell and rare, medium-coarse, subangular quartz., rare, medium gold mica and medium, rounded brown inclusions - clay pellets. North Lincolnshire/Humberside type

Reduced wares

GRA1 Light grey, hard, smooth feel and fracture. Moderate, very fine, subvisible quartz, rare, medium, rounded white inclusions and fine mica.

GRB1 South Yorkshire grey ware. Medium grey, hard, sandy feel and irregular fracture. Abundant, well-sorted, medium, subrounded quartz.

GRB2 Hard, medium grey with irregular fracture. Abundant, well-sorted, medium, subrounded and some subangular quartz, sparse, rounded coarse white calcareous inclusion. South Yorkshire grey ware variant or regional variant.

GRB3 Hard medium grey. Slightly sandy fabric with irregular fracture. Moderate. Medium, well-sorted, subangular quartz; sparse, fine, rounded brown inclusions (oxides?) and one grey rock inclusion - ? sandstone or igneous. Norton or East Yorkshire product.

GRB4 Greyish brown with smooth feel and finely irregular fracture. Moderate, fine, quartz and sparse, medium, subrounded quartz and rare, medium, rounded brown inclusion - clay pellets?. Unknown source.

GRB5 Dark grey with brown margin and grey core. Hard with smooth feel and finely irregular fracture. Abundant fine subangular quartz. Unknown source.

GRB6 Grey. Very hard with granular feel and granular fracture. Abundant, well-sorted, subangular medium quartz. South Yorkshire variant.

GRB7 Grey with brown core. Hard with slightly sandy feel. Irregular fracture. Sparse, well-sorted, medium, subrounded quartz and rounded brown inclusions. Unknown source.

GRB8 Dark grey. Hard, slightly gritty with irregular fracture. Moderate, ill-sorted, medium, subangular quartz and rare, medium rounded white inclusions. Unknown source.

GRB9 Medium grey. Very hard with gritty feel and hackly fracture. Abundant, well-sorted, subangular quartz and rare, very coarse, rounded sandstone. Local?

GRB10 Dark grey with grey core and brown margins. Hard, gritty with irregular fracture. Moderate, ill-sorted, fine to coarse, angular and subangular quartz. Late gritty grey ware related to Huntcliff ware.

GRB11 Black burnished fabric. Hard, smooth with hackly fracture. Abundant, well-sorted, coarse, subangular quartz and sparse, coarse, pink, subangular inclusions. Only one sherd, a basal sherd from a burnished bowl or dish with zigzag burnish like that on BB1 vessels. Possibly a BB1 copy.

Grog-tempered ware

GTA10 Grey, hard with bumpy feel. Irregular fracture. Sparse subangular medium quartz, ill-sorted medium-very coarse grey angular and subangular clay inclusions - grog. And medium, rounded, black inclusions. Perhaps a Trent Valley kiln product.

Mortaria

MH2 White or cream. Hard and smooth with finely irregular fracture. Rare quartz and grey inclusions. Trituration grits have re-fired bright orange and are angular 2-4mm Mancetter-Hartshill. Tomber and Dore 1998, MAH WH.

MOWS White slipped orange ware. Hard and sandy with irregular fracture. Moderate, eel-sorted, medium, subrounded quartz and rare, medium, rounded orange/brown inclusions. No surviving trituration grits but fabric compares well with GRB1 and OAB1 suggesting a South Yorkshire source.

Oxidised wares

OAB1 Orange with grey core. Hard and sandy with irregular fracture. Moderate, well-sorted, medium, subrounded quartz as GRB1, probably oxidised South Yorkshire ware.

OAB2 Orange. Hard, smooth with smooth fracture. Sparse, medium, subangular quartz with moderate subvisible very fine quartz. Sparse, medium, rounded brown and orange inclusions. Possibly an Ebor ware but not a close match.

OAB3 Yellow/buff ware. Hard with smooth feel and irregular fracture. Moderate, medium. Subangular quartz, sparse, medium, rounded white inclusions and voids, rare, ill-sorted, rounded brown inclusions, moderate fine mica. Unknown fabric.

Vessel types

The assemblage was dominated by kitchen wares. The jars were made up of everted-rim jars and a cupped-rim jar from the South Yorkshire kilns, dating to the late 2nd to mid-3rd century (Buckland *et al.* 2001, types Ea; Buckland and Dolby 1980, type Eb; Leary 2007a, for discussion of dating), Dales ware jars, most common from the mid-3rd to early 4th century (Darling 1999, 131; Rush *et al.* 2000, 158), a Rossington Bridge, 2nd-century BB1 jar (Buckland *et al.* 2001, 66-8), late 2nd and late 3rd to early 4th-century Dorset BB1 jars (Gillam 1976, nos 4, 10 and 11), two Huntcliff jars and one Huntcliff type jar in a gritty grey ware (Gillam 1970, no. 163). One lugged jar represented by lug and bodysherds may be from

the South Yorkshire kilns (Buckland *et al.* 1980, type F) while a chunky everted GTA10 rim probably came from a similar large jar, perhaps from the Trent Valley kilns (Field and Palmer-Brown 1991, fig. 16 nos 46-7 and fig. 17 no. 7). A group of deep, wide-mouthed jar/bowls was also present. These included the subconical type with flat rim common in the South Yorkshire kilns around Doncaster (Buckland *et al.* 2001, type Hc-d), a bead-rim deep bowl in a shell-tempered ware which compares well with forms and fabrics made around the Humberside and north Lincolnshire (May 1996, fig. 20.25 no. 1306) and a slight shouldered, wide-mouthed jar with chunky everted rim in fabric GRB2 which may be from the South Yorkshire kilns or a related pottery nearer to the site, perhaps near Castleford.

About 17% of the bowls and dishes were samian vessels and these included at least one decorated bowl. Other coarse ware bowls comprised BB1 bead and flange bowls (Holbrook and Bidwell 1991, 98), a bowl, of uncertain form, with an out-turned rim and a Crambeck type 9 bowl in Crambeck parchment ware (Corder 1937). A bowl or dish with lipped rim and a dish with a down bent rim, both types made at the South Yorkshire kilns (Buckland *et al.* 1980, type Ca), were also identified. One carinated beaker/bowl was of a type made at the Norton and East Yorkshire kilns. Swan suggests that at Holme-on-Spalding the type with inward sloping walls pre-date those with straight walls and dates from *c*.AD 220/30 (2002, 59 fig. 15 no. 204-5) while at Norton she suggested that the biconical vessel (*ibid.*, no. 223) may predate the main period of production in AD 200/210-270. Fragments from three multi-reeded hammerhead mortaria from the Mancetter-Harthill kilns were present and one scrap from a thick-walled vessel in an oxidised white-slipped fabric compared well to the South Yorkshire wares and although no trituration grits were present, is likely to be from a south Yorkshire mortarium. Bodysherds from at least two or three Dressel 20 amphorae were present.

Discussion of the stratified group

Ditch 1

A small group of fifteen sherds (182g) was scattered along the fill of this ditch in three contexts, 1021, 1039 and 1046. The diagnostic sherds included a BB1 jar sherd with acute lattice burnish of Hadrianic-early Antonine type (2nd century after AD 120), a deep bowl with a short flat rim in South Yorkshire grey ware and a Dales ware jar. Dales ware has been dated by Swan to the second decade of the 3rd century and after. Darling notes that it is uncommon before the mid-3rd century at Lincoln and Rush noted that it was not common before the early 4th century at Castleford. Dales ware was not very common on the site (10% by weight) and such a quantity compares well with the 2nd to mid-3rd-century groups at West Moor Park (Leary 2004) and contrasts with the slightly higher levels at groups with a late 3rd to early 4th-century element at Parlington Hollins, Bawtry and site C4SA, A1 north excavations (Evans 2001, table 8; Leary 2006 and Leary 2007b). This suggests that the site did not benefit from the rise in Dales ware available in the region in the later 3rd and early 4th century. The Dales ware gives a *terminus post quem* in the early 3rd century for the primary fill of this ditch with an optimum date lying in the mid-3rd century.

Ditch 3

A small group of eleven sherds came from three contexts. Nine of these sherds were undiagnostic GRB1 sherds from 1031. The stamped base and lower body of a mid to late 2nd century Central Gaulish samian, Drag. 31 or 31R, came from 1056 and a GRB1 out bent rim from a flat rim bowl/dish or perhaps a carinated bowl came from 1009. Although the form of this last vessel has not been fully determined a 2nd century date would be in keeping with possible types and the date of the samian in the mid to late 2nd century agrees with this.

Ditch 4

The 169 sherds (4061g) included substantial amounts of a fragmented Dales ware jar and a GRB2 shouldered, everted rim jar/bowl. Eighteen burnt and abraded sherds from a late BB1 jar as well as eight sherds from a second late BB1 jar were identified along with a large sherd giving the profile of a BB1 plain rim dish and two sherds from a burnt BB1 bead and flange bowl. Six sherds from a small carinated beaker/bowl in a “crisp” grey ware similar to those from East Yorkshire or the Norton kilns were also present. The number of sherds from some of these vessels and the fresh condition of some of them suggests this is a contemporary group of debris including burnt cooking pots. The BB1 jars and bowls give a *terminus post quem* of *c*.AD 270 and given the quantity of BB1 ware and the established decline of this ware in the early 4th century at Castleford, a date in the late 3rd century is likely (Rush *et al.* 2000, 158). All but four sherds came from 1127. A single Dales ware rim came from fill 1076 and three very small scraps of vesicular ware came from 1595. These scraps had rhomboidal voids and so are likely to belong to the CTA3 East Yorkshire calcite gritted ware dating to the mid to late 4th century or later.

Ditch 6

One hundred and seventy two sherds (2442g) came from primary fills 1105, 1107, 1113, 1123, 1271 1281 and 1310 and secondary fill 1266. This ditch had clearly been partially cleaned out and recut along some lengths and this would go some way to explaining the broad date range - mid to late 2nd to late 3rd/4th-century - of the vessels represented. The groups from fills 1105, 1107, 1113 and 1123 were small – two to five sherds - and not closely datable, although they are indicative of a date after the mid to late 2nd century. The secondary re-cut fill, 1266, included a Dales ware rim suggesting a date in the 3rd to early 4th century, probably after the middle of the 3rd century. Primary fill 1271, however, contained a larger group of some 59 sherds which included several large Dressel 20 amphora sherds, three sherds from a BB1 developed bead and flange bowl of late 3rd to 4th-century date as well as samian of the mid to late 2nd century, a Dales ware jar rim, sherds from a lugged jar and a lipped rim bowl or dish from the south Yorkshire kilns. This suggests the lower fill accumulated in the mid to late 3rd century but included pottery circulating in the late 2nd to early 3rd century. Another larger group was found in primary fill 1281. This was predominantly of late 2nd century date and included a late 2nd century BB1 jar and bowl, a late 2nd century samian bowl, and a CTB deep jar/bowl unlikely to be later than the 2nd

century. This fill seems to have been accumulating at a rather earlier period compared with fill 1271. A further 26 sherds came from fill 1310 in the ditch terminus. This group included 2nd-century samian and rim and base sherds from another Dales ware jar. Thus most of the pottery suggests primary infilling took place in the late 2nd to mid-3rd century apart from the bead and flange bowl from fill 1272.

Other ditches

Ditch 7 contained only one undiagnostic Romano-British sherd and similarly the grey ware from Ditch 11 could not be closely dated although sherds of Dressel 20 amphora must fall within the importation period for that ware from the mid-1st to the 3rd century and a group of handmade shell-tempered ware sherds from a jar, may be Dales ware giving a date in the 3rd to 4th century, probably after the mid-3rd century. Very small scraps of grey ware (GRB1), five burnt GRB8 bodysherds and three GTA10 bodysherds came from Gully 15. GTA10 ware is most likely to belong to the 2nd century but the grey wares are not closely datable. A GRB11 sherd from Ditch 30 was of BB1 type but probably a local copy. This sherd came from the base of a bowl or dish with burnished zigzag design on it. It is not closely datable although it must post-date AD 120. It is not a Rossington Bridge product and is more likely to belong to a later industry perhaps in the 3rd century when BB1 was common at centres like Castleford. Undiagnostic grey ware sherds came from Ditches 31 and 33. A base from a deep bowl in South Yorkshire grey ware from Ditch 33 belongs to a period from the mid to late 2nd century to the mid-4th century. An abraded, burnt vesicular sherd from Ditch 34 has rhomboidal vesicles such as those originally with calcite grits. Such wares came from East Yorkshire and although this could date earlier, this one is likely to belong to the mid to late 4th century or later since all the diagnostic CTA3 sherds were of this date. A tiny GRA1 scrap from Ditch 35 had no diagnostic features but is of Roman type.

Pit 1006

Calcite gritted ware sherds from the primary and secondary fills of Pit 1006 date to the 3rd or 4th century. Since diagnostic sherds from the site in this ware are of late 4th-century date, a late date is likely.

Pit 1049

Of the 56 sherds from the primary fill of this pit, 40 came from one Dales ware jar. Other sherds included a plain-rim dish, oxidised but possibly originally reduced, a BB1 and a GRB1 bead and flange bowl (AD 270+, Holbrook and Bidwell 1991, 98), a South Yorkshire cupped-rim jar (Buckland *et al*. 1980, type Eb) and mid to late 2nd-century samian. The bead and flange bowls give a *terminus post quem* of *c*.AD 270 and the small amount of BB1 and presence of Dales ware fit a late 3rd-century date.

Pit 1061

The eight sherds from here included much of a South Yorkshire grey ware dish with down bent flat rim and a mid-3rd to mid-4th century multi-reeded rim mortarium as well as a small,

abraded, mid to late 2nd-century samian sherds, two Dales ware sherds and a grey ware jar base.

Pit 1508

Thirty-five sherds from the base and lower body of a CTA3 jar, of mid to late 4th-century date or later, were recovered from this pit.

Other features

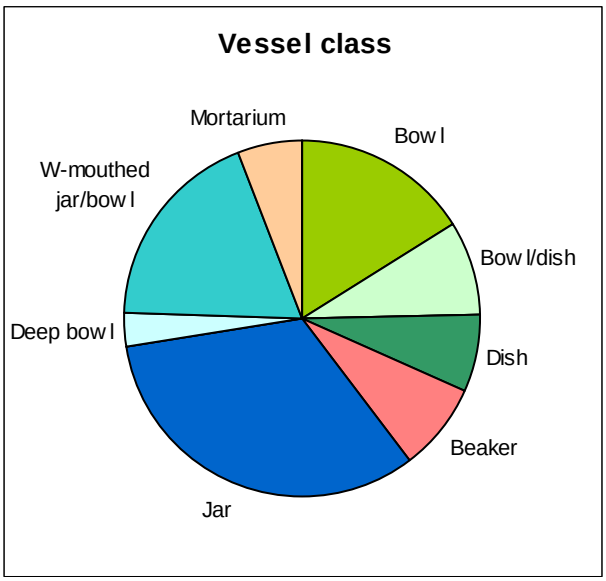
Shell-tempered ware bodysherds came from Grave 1071, Pit 1081 and Pit 1306 giving a 3rd to 4th-century date range. A flat-rim BB1 bowl from 1254 gives this feature a date from AD 120 to the mid-2nd century and a GTA10 rim from post-hole 1314 belongs to a large jar of 2nd-century date. BB1 sherds from the primary fill 1252 of hearth 1253 and in hearth 1284 fill 1283 give a *terminus post quem* in AD 120. An everted rim sherd from 1283 belongs to the 2nd to mid-3rd century. Huntcliff ware was found in the secondary fill of a corn dryer (1458) and is of late 4th-century date or later. Two Huntcliff ware jar rims came from unstratified deposits.

Spatial analysis, functional groups and site status

The majority of the pottery sherds (77% by count and 72% by weight) came from the fills of Ditches 4 and 6 and Pit 1049. The rest of the assemblage was made up of small groups of abraded sherds which may have been casual losses or all that were left after re-cutting ditches. Ceramic debris does not seem to have been deposited in pits regularly apart from Pit 1049. Ditches 4 and 6 differed in their amounts of Dales ware and BB1, with Ditch 4 having twice as much BB1 and Dales ware than Ditch 6, while Ditch 6 had more South Yorkshire grey ware. This accords with the earlier date range suggested for Ditch 6. Ditch 6 contained sherds of amphora and samian whereas Ditch 4 did not, perhaps suggesting activity relating to domestic activity within the vicinity of Ditch 6.

Although the site clearly falls into the common rural settlement category, there is some evidence for social differentiation within this group. Some aspects of the assemblage suggest some degree of affluence and selective adoption of Roman habits. The relative quantity of samian, for example, is relatively high for a rural site in this area and the presence of sherds from two to three oil amphorae reinforces this impression. In addition, the ratio of jars to bowls (55:32), although within the range common on rural sites, was towards the low end (Evans 1993, figs 7 and 13).

Graph 1. Relative quantities of vessel types



Pottery supply

The site drew its pottery from a wide area. Imported wares from Central Gaul and South Spain made up nearly 7% by sherd count and a further 21% by sherd count and 18% by weight came from Dorset and Mancetter-Hartshill near Coventry. The South Yorkshire kiln products were the most numerous, providing at least 26% by count and 19% by weight which may rise to 38% by count and 62% by weight if the GRB2 fabric group also came from these kilns. Smaller amounts of pottery came from the East Yorkshire kilns. This group was made up of East Yorkshire grey ware (2-3%), calcite-gritted ware (1-2%), gritty grey ware (GRB10) and parchment ware (1%). A single vessel was of north Lincolnshire/Humberside origin and at least one large jar probably came from one of the Trent Valley kilns. Very small numbers of sherds were present in grey wares which did not compare well with the South Yorkshire wares. The origin of these is unknown.

Table 2. Wares by sherd count, weight and EVES

Ware	Nos	Weight	Rim%	Rel % Nos	Rel % g	Rel % rim equivalents
BB1	97	982.7	142	17.0	8.6	28.7
BB1/RBB1	15	5.8	0	2.6	0.1	0.0
GRB11	1	8.6	0	0.2	0.1	0.0
CRA PA	6	82.1	20	1.0	0.7	4.0
CTA2	117	1064.4	35	20.5	9.4	7.1
CTA3	46	1482.2	4	8.0	13.0	0.8
CTB	3	32.8	4	0.5	0.3	0.8
DR20	9	1221.1	0	1.6	10.7	0.0
GRA1	2	20.6	0	0.3	0.2	0.0
Miscellaneous grey wares	32	271.6	41	5.6	2.4	8.3
GRB1	135	1960.5	71	23.6	17.2	14.4

Ware	Nos	Weight	Rim%	Rel % Nos	Rel % g	Rel % rim equivalents
GRB10	1	25.2	6	0.2	0.2	1.2
GRB2	59	3186	90	10.3	28.0	18.2
GTA10	4	49.7	5	0.7	0.4	1.0
MH2	9	650.3	29	1.6	5.7	5.9
MOWS	1	10.3	0	0.2	0.1	0.0
OAB1	7	51.1	9	1.2	0.4	1.8
OAB2	1	33	0	0.2	0.3	0.0
OAB3	1	12.3	12	0.2	0.1	2.4
Samian	26	225.6	26	4.5	2.0	5.3
Total	572	11375.9	494	100.0	100.0	100.0

Conditions

One vessel, a GRB3 jar, had a post-firing perforation in the body, probably a rivet hole. Four coarse ware vessels were burnt - a GRB8 jar, a BB1 bowl or dish, a BB1 developed bead and flange bowl and a BB1 late jar. The base of a GRB1 jar showed cracking and surface spalling, possible due to weathering.

Pottery overview

The site assemblage is typical of the pattern outlined by Evans (2001, 175-6) for sites excavated on the M1-A1 link road route lying to the east and on the A1 (M) Darrington to Dishforth route (Leary 2007b). The quantity of South Yorkshire products is comparable to that found on sites such as Swillington Common and Parlington Hollins (Evans 2001, tables 6 and 8) but nearly 40% less than at West Moor Park, Armthorpe (Leary 2004), a site situated nearer to the South Yorkshire production zone. The shortfall in coarse ware was made up with Dorset BB1 ware. Evans and Rush have observed that this ware is the second most common coarse ware in this area around Castleford and Evans suggests that this was being channelled through Castleford to the surrounding rural settlements (Evans 2001, 176 and Rush *et al.* 2000, 158). Dales ware was present on the site at a similar level to BB1 in keeping with evidence for activity in the early 4th century. At around 20% by count and 10% by weight, the level of supply to the site is comparable to neighbouring sites such as Redlands Quarry, Methley and Wakefield Europort (Evans n.d.) 23% and 19% by sherd count respectively, both occupied in the late 3rd to early 4th or early 4th century. It is a little lower than the later site at Parlington Hollins (29% by count and 18% by weight, Evans 2001) where pottery deposition declined after the mid-4th century.

The small amount of East Yorkshire calcite-gritted ware, late gritty ware GRB10, parchment and grey wares reflects the date range of the settlement. At sites such as Dalton Parlours East Yorkshire calcite-gritted wares dominated the upper well fills (Sumpter 1990, table 29) and at late sites such as Swillington Common over 10% of the assemblage was of this type (Evans 2001, table 6). It also occurred at Bullerthorpe Lane, Swillington Common, Parlington Hollins, Barrowby and Roman Ridge on the M1-A1 link road (Evans 2001, 176) and on sites

C4SA, M, Q, XX15 and XX19A on the A1(M) excavations (Leary 2007b). Apart from Dalton Parlours, East Yorkshire grey wares have not been identified in any great numbers in this area although they were present at Castleford (Rush *et al.* 2000, 158). Crambeck parchment ware has also been identified at Bullerthorpe Lane (a mortarium, Evans 2001, 155) and at site Q on the A1(M) excavations (bowl or mortarium, Leary 2007b).

Fine wares are rare on rural sites in the area. The proportion of samian vessels, 5%, is relatively high with most sites having less than 3%. Similarly amphora is rarely present and few sites have more than 1%. This relates to the status of the settlement and the character of the areas excavated. The mortaria came principally from Mancetter-Hartshill with only one probable South Yorkshire vessel. Other rural sites around Castleford have mortaria from Lincoln, the Nene Valley potteries and even Oxford but the Mancetter-Hartshill kiln commonly supply 1-2% with the South Yorkshire mortaria being the most common type (Evans 2001, table 18). The lack of mortaria from South Yorkshire is slightly anomalous.

Uncommon types such as the GTA large jar can be paralleled at A1(M) site XX8 and XX15 (Leary 2007b) and to the west at Sykehouse (Cumberpatch *et al.* 2003, no 67) while the CTB jar from north Lincolnshire/Humberside is related to vessels at Castleford (Rush *et al*. 2000, fabric 82, nos 107 and 172).

The assemblage provides a useful addition to the existing datasets for rural settlement in the area dating from the mid to late 2nd to late 3rd or early 4th century, with a late scatter of late 4th-century or later material.

Catalogue

1* GRB1 deep, subconical bowl with short, flat rim (Buckland *et al*. 1980 type Hc-d). Eight sherds. 133g. Re 11%. *BYP 05; Ditch 1; context 1021; Site Phase 4*

2* CTA2 Dales ware jar rim. 19g. Re 5%. *BYP05; Ditch 1; context 1046; Site Phase 4*

3* OAB1 plain-rim dish. Possibly originally reduced. 29g. Re 9%. *BYP05; Pit 1049; context 1048; Site Phase 4*

4* GRB1 bead and flange bowl with long flange. AD 270+ (Holbrook and Bidwell 1991, 98). 20g. Re 5%. *BYP05; Pit 1049; context 1048; Site Phase 4*

5* GRB1 cupped-rim jar, Buckland *et al*. 1980, type Eb. 12g. Re 9%. *BYP05; Pit 1049; context 1048; Site Phase 4*

6* BB1 bead and flange bowl. 200g. Re 20% *BYP05; Pit 1049; context 1048; Site Phase 4*

7* GRB1 profile of dish with down bent flat rim, Buckland and Dolby 1980, type Ca. 275g. Re 11%. *BYP05; Pit 1061; context 1060; Site Phase 4*

8* MH2 profile of multi-reeded hammerhead rim mortarium with six reeds. Mid-3rd to mid-4th century. 300g. Re 20%. *BYP05; Pit 1061; context 1060; Site Phase 4*

9* OAB3 everted rim jar with internal rebate. Similar to a Huntcliff ware jar rim form. Possibly a late 4th century date. 12g. Re 12%. *BYP05; Pit 1092; context 1090; Site Phase 4*

10* CTA2 base, body and incomplete rim sherds from Dale ware jar. 158g. RE. 6%. *BYP05; Ditch 4; context 1127; Site Phase 4*

11* GRB2, 55 sherds from the base, body and rim of a shouldered deep. Wide-mouthed jar/bowl. Similar to Buckland *et al.* 1980, type Hc-d. 3054g. RE 80%. *BYP05; Ditch 4; context 1127; Site Phase 4*

12* GRB3 carinated beaker/bowl with everted rim. cf. Bidwell and Croom 1997, no. 171 in later 3rd century context, Corder and Sheppard 1930, type 10. Swan suggested that the biconical vessel from Norton (2002, no. 223) may predate the main period of production in AD 200/210-270. 44g. RE 35%. *BYP05; Ditch 4; context 1127; Site Phase 4*

13* BB1 jar with splayed rim, cf. Gillam 1976, no. 11. Late 3rd to 4th-century. 105g. RE 32%. *BYP05; Ditch 4; context 1127; Site Phase 4*

14* BB1 rim and body fragments from BB1 jar with cavetto rim, cf. Gillam 1976, no. 10, late 3rd to 4th-century. This vessel has been extensively and severely burnt causing damage to the surfaces and consequent deterioration of the sherds. Traces of obtuse lattice burnish. 156g. Re 25%. *BYP05; Ditch 4; context 1127; Site Phase 4*

15* BB1 two small rim sherds from a developed bead and flange bowl. AD 270+. 9g. RE 6%. *BYP05; Ditch 4; context 1127; Site Phase 4*

16* BB1 plain-rim dish. Late 2nd to 4th-century. The lack of decoration suggests a late date. 100g. Re 11%. *BYP05; Ditch 4; context 1127; Site Phase 4*

17* BB1 flat rim bowl or dish with acute lattice burnish. Gillam 1976, no. 58-9, Hadrianic-early Antonine. 101g. Re 21%. *BYP06; Pit 1253; context 1254; Site Phase 4*

18* BB1 bead and flange bowl. AD 270+. Holbrook and Bidwell 1991, 98. 52g. RE 12g. *BYP06; Ditch 6; context 1271; Site Phase 3*

19* CTA2 Dales ware jar. 30g. Re 8%. *BYP06; Ditch 6; context 1271; Site Phase 3*

20* GRB1 lug and body of large jar. Buckland *et al.* 1980, type F. 111g. *BYP06; Ditch 6; context 1271; Site Phase 3*

21* GRB1 lipped rim bowl or dish. Buckland *et al*. 1980, type Ca. 17g. Re 5%. *BYP06; Ditch 6; context 1271; Site Phase 3*

22* CTB bead rim deep bowl/jar. cf. May 1996, fig. 20.25 no 1306, and dating in Darling 2004b, 42. 1st to 2nd century. 33g. Re 4%. *BYP06; Ditch 6; context 1281; Site Phase 3*

23* GTA10 chunky everted rim from large jar, perhaps a lugged jar. The fabric suggests an early date in the late 1st or 2nd-century. This ware group was common in the Trent Valley. 20g. Re 5%. *BYP06; Pit 1314; context 1313; Site Phase 4*

24* CTA3 bodysherd with lattice burnish. Monaghan 1997, 907-11. Late 4th century. 27g. *BYP06; corn drier 1458; context 1470; Site Phase 4*

25* CTA3 Huntcliff jar. Monaghan 1997, 907-11. Late 4th century or later. 15g. Re 4%. *BYP05; unstratified*

26* CRA PA Crambeck type 9 bowl with wallsided reeded rim (Corder 1937). Late 4th century or later (Bidwell 2005). 82g. RE 20%. *BYP05; unstratified*

27* MH2 multi-reeded, hammerhead mortarium. Mid-3rd to mid-4th century. 169g. Re 9%. *BYP05; unstratified*

28* GRB10 Huntcliff type jar. Late 4th century or later. 25g. Re 6%. *BYP06; unstratified*

Samian by Louise Ford and Felicity Wild

A total of 26 sherds were recovered during this phase of the investigations, probably representing nine or ten vessels, all of which are Central Gaulish with Lezoux fabric. The forms comprised dishes and bowls, one of which was decorated. This provided a general date range for the whole assemblage from the mid to late 2nd century AD.

Catalogue

1 Dish, probably Form 18/31, 18/31R or 31, Central Gaulish, mid to late 2nd century. *BYP05; Pit 1049; context 1048; Site Phase 4*

2 Bowl, either Form 31 or 31R, Central Gaulish, mid to late 2nd century. Remains of a stamp are noted on the interior base of the sherd, possibly starting with a ‘p’ or a ‘d’. *BYP05; Ditch 3; context 1056; Site Phase 4*

3 Dish, probably Form 31 or 31R, Central Gaulish, mid to late 2nd century. *BYP05; Pit 1061; context 1060; Site Phase 4*

4 Dish, Form 31, Central Gaulish, mid to late 2nd century. *BYP06; Ditch 6; context 1271; Site Phase 3*

5 Bowl rim, probably Form 30, 37 or 38, Central Gaulish, mid to late 2nd century. The decorated sherd below may come from the same bowl. *BYP06; Ditch 6; context 1271; Site Phase 3*

6 Decorated body sherd showing an ovolo and a wavy line border, probably from a Form 37. In one case, the ovolo impression overlap, making it difficult to identify precisely, but this ovolo (Rogers 1974, B76) and wavy line border were used by Geminus iv (Stanfield and Simpson 1958, pl. 66, 16). The ovolo was also used by Arcanus (Stanfield and Simpson 1958, 156). The fabric is Central Gaulish and the decoration suggests a date *c.*AD 120-145. *BYP06; Ditch 6; context 1271; Site Phase 3*

7 A further fourteen body sherds were recovered from the same context, which all have Central Gaulish fabrics suggesting a 2nd-century date. They probably comprise two or three vessels. *BYP06; Ditch 6; context 1271; Site Phase 3*

8 Dish, probably form 18/31 or 18/31R or 31 or 31R, Central Gaulish, mid to late 2nd century. *BYP06; Ditch 6; context 1271; Site Phase 3*

9 Dish, Form 36, Central Gaulish, late 2nd century. One of the body sherds joins the rim. *BYP06; context 1281; Site Phase 3*

10 A further two body sherds were uncovered from the same context, which were both Central Gaulish. They were probably part of the same vessel as above and therefore date to the 2nd century. *BYP06; Ditch 6; context 1281; Site Phase 3*

11 Dish, probably Form 18/31, 31 or 31R, Central Gaulish, 2nd century. *BYP06; Ditch 6; context 1310; Site Phase 3*

Post-Roman pottery by Chris Cumberpatch

Introduction

The assemblage consisted in total of 77 sherds of pottery weighing 458g and represented a maximum of 76 vessels. The pottery was catalogued (Appendix 6) and the results are discussed below.

Discussion

A small group of hand-made sherds in a distinctive black sandy textured fabric were initially considered to be of Roman date but, following examination (Leary pers. comm.) were passed to the author for examination. The sherds were compared with an example from 16 - 20 Church Street, Bawtry (Cumberpatch 1996) which forms part of the regional ceramics reference collection (Cumberpatch 2004) and found to possess similar characteristics in terms of the range and type of inclusions as well as colour. Reference to the corpus of Anglo-Saxon and medieval pottery from Lincoln (Young *et al.* 2005) suggested that the sherds were similar to the non-local Late Saxon fabric B (Young *et al*. 2005, 69-70). A caveat to this identification must be noted. The rim sherd from context 1086 (Fig. 28) does not resemble

those published by Young *et al*. (2005, fig. 62) although it does have a distinctive rim profile. The sherd is clearly hand-made (rather than wheel-thrown) and is slightly everted with an external bulge. The neck, between the rim and the cordon, seems to have shallow finger marks around it but these are so shallow that it is difficult to determine whether they were intended as decoration or are simply evidence of the method of manufacture.

Although there was some variation between sherds in terms of the size and density of the fine quartz grit, in general terms they were all rather similar and contained abundant angular to sub-angular quartz grit varying in size between 0.05mm and 0.1mm with rarer, somewhat more rounded grains of up to 0.2mm. The sherd from the upper fill (1062) of corn drier 1065 was the finest in texture, with the rim sherd from Ditch 3 (fill 1086) and a body sherd from Gully 21 (fill 1387) noticeably coarser both in cross-section and on the surface, but this was a matter of degree and does not seem to indicate any significant difference between the sherds.

Given the small size of this group of sherds (and the assemblage as a whole) it is difficult to draw any far-reaching conclusions from it, but it would seem to indicate some form of activity on or close to the site in the pre-Conquest period.

The medieval and later pottery assemblage consisted of material dating to the earlier medieval period (later 11th to later 13th-century), the early modern period (later 17th to 18th-century) with a smaller quantity of recent (19th-century) pottery.

The medieval wares, although few were attributable to specific sources, are all of recognisable local and regional types. The Buff Gritty wares resemble the better known Hillam type wares but lack the non-crystalline red grit, the presence of which characterise the latter type. Further details have been published elsewhere (Cumberpatch 2002, 176). The Coarse Sandy wares and Buff Sandy wares resemble the Buff Gritty wares in everything except for the size and density of the inclusions which are smaller and sparser in nature. They are of local origin and represent the products of local potteries, most probably village-based, which seem to have been responsible for the production of a large proportion of the domestic cooking wares found in West Yorkshire and the southern parts of North Yorkshire. One sherd of Hillam type ware (BYP06 unstratified) was unusual in that it was part of the rim of a jug (or less probably, a jar). Such vessels are not unknown in Hillam type fabrics, but they are much less common than are cooking pots (Cumberpatch 2002, 173-4).

Later medieval Northern Gritty ware was represented by a two sherds of pottery and this, together with some of the unidentified Oxidised Sandy wares and Reduced Sandy wares was amongst the few types of later medieval pottery from the sites. None of these wares were identifiable to source and it was particularly notable that Humberwares were absent from the assemblage.

Later post-medieval, early modern wares and recent wares were represented by a variety of wares. Tablewares included sherds of Late Blackware, Redware and Type 1 Slipware representing the vernacular tablewares and individual sherds of Pearlware, transfer printed

Whiteware and one or possibly two sherds of Porcelain. The latter may be of Chinese origin but it is also possible that they are sherds of 19th-century date decorated in a Chinese style.

Conclusion

Few general conclusions can be drawn from this small assemblage of pottery, but it is of interest in indicating long-lived, but probably not continuous activity on the site. Leaving aside the Roman material which has been considered above, the earliest pottery from the site is the local Late Saxon ware which is followed by the early post-conquest Hillam type ware and most probably some of the Coarse Sandy, Buff Gritty and Buff Sandy wares. Later medieval pottery was notable by its rarity and post-medieval (late 15th to early 17th-century) pottery was absent. On this evidence, activity appears to have resumed in the area in the later 17th and 18th-centuries after a hiatus following the pre-Conquest and medieval activity on or close to the site.

Ceramic building material by Jane Young

Introduction

A total of seven fragments of ceramic building material ranging in date from the Roman to the early modern period and six fragments of fired clay were submitted for examination. The condition of the fragments varies slightly to well abraded, mainly dependent on the hardness of the fabric. The material was examined visually and then recorded using locally and nationally agreed codenames. Tegula flange types follow the classification by Betts (1986). The resulting archive was then recorded on an Access database and complies with the guidelines laid out in Slowikowski *et al.* (2001).

Overall Chronology and Source

A limited range of ceramic building material was found on the site, the type and general date range for these types are shown in Table 3. The three Roman tiles and the fired clay fragments are in similar fine oxidised fabrics that are possibly of fairly local origin, although this could only be confirmed by scientific analysis. It is not possible to determine the source of the early modern brick and tile, or the unidentifiable fragments.

Table 3. Ceramic building material codenames and total quantities by fragment count

Site	Context	Codename	Full name	Date	Fragments
BYP05	1039	FIRED CLAY	Fired clay	-	2
BYP05	1041	FIRED CLAY	Fired clay	Roman? loomweight	4
BYP05	1062	TEG	Tegula	Roman	1
BYP06	1345	BRK	Brick	18th to 20th	1
BYP06	1363	TEG	Tegula	Roman	1
BYP06	1369	IMB	Imbrex	Roman	1
BYP06	unstratified	PNR	Flat roofer	late 18th to 20th	1
BYP07	1522	RTMISC	Roman or post-Roman tile	Roman to early modern	1
BYP07	1564	RTMISC	Roman or post-Roman tile	Roman to early modern	1

The Roman Tile

Three identifiable Roman tiles, two Tegula and one Imbrex, were recovered from the site. All three tiles are in a similar fine oxidised fabric containing abundant fine subround to round quartz suggesting that they came from the same production site. The two Tegula, recovered from corn drier 1065 (fill 1062) and Pit 1362 (fill 1363), have the same flange type. This type is common in several areas of the country including London, where it is classified as a Type 21 flange. There is unfortunately no local dating evidence for the use of this flange type and therefore the two Tegula fragments can only be dated to the general Roman period, as can the edge of an Imbrex found in post-hole 1370.

Post-Roman

A single unstratified early modern tile fragment in a fine red fabric is either from a flat roofer or a pantile and is of 18th to 20th-century date. A handmade brick recovered from the fill of Pit 1346 probably dates to the 18th to 20th centuries. Only two small undiagnostic fragments came from the 2007 excavation (BYP07). These are either of Roman or medieval to early modern date.

The Fired Clay

Two small and very abraded fragments of fired clay in a fine silty fabric came from Ditch 1 (fill 1039). The fragments are too abraded to identify. The four fragments from Ditch 8 (fill 1041), however, have a curved profile that suggests that they may have been part of an object, possibly a rounded or bucolical loom weight of Roman date (Vince pers. comm.). These fragments are in the same fabric as the two abraded ones found in Ditch 1.

Summary

The material recovered dates between the Roman and the early modern periods and includes examples of Roman roof tile, early modern roof tile and brick as well as fragments of fired clay.

Small finds by Hilary Cool with coin identifications by Peter Guest

The information small finds can provide about the occupation on the site is somewhat limited because so many of them consist of relatively featureless fragments of metalwork. The material that can be independently dated suggests a period of occupation in the mid to late Roman period. There are three coins belonging to the last third of the 3rd century (nos 45, 29 and 22). One of these (no. 29) is very worn which might suggest continuing activity into the 4th century, although it was found in an Anglo-Saxon ditch indicating it was lost and later redeposited. Two fragments of blue/green glass (nos 8 and 23) come from prismatic bottles. These were in common use from the late 1st to the early 3rd centuries (Price and Cottam 1998, 194-200). One of the fragments (no. 8) has been re-worked to make a sharp-edged tool but this re-use could have happened contemporaneously with the ordinary use of the bottles, as the thick wall fragments were a favoured raw material for such tools. A 1st to 3rd-century date would also be appropriate for the blue/green, but otherwise undiagnostic, glass vessel

fragments no. 24. Hobnails (nos 18, 19 and 59) were recovered from two contexts, and they too are indicative of a Roman date though cannot be closely dated within the period. The widespread presence of metalwork, especially iron, supports the general Roman date even if the objects the fragments were derived from cannot often be identified. The 1st to 3rd centuries were a period when metal artefacts were relatively plentiful, whereas a change in attitude to iron can start to be detected by the late 4th century, perhaps because it was becoming less common. Material that is definitely of post-Roman date is rare. There is one fragment of glass that is of post medieval or early modern date (no. 96) and three iron nails and bolts that are relatively modern (nos 54, 78 and 80). Two of these (54 and 78) must be intrusive as they come from contexts that are phased to Phases 3 and 6 respectively.

Iron nails are the most numerous type of object found and are summarised in Table 4. As can be seen they are divided approximately evenly between the grave fills and other contexts. Grave 1071 had the bulk of the nails from the graves (nos 30 to 36). These were clearly nails from a wooden coffin given their location and the fact that wood from the coffin was minerally preserved in the corrosion products. There was also minerally preserved wood on one of the nails from Grave 1020 (no. 6). The nails in the other fills (no. 2 from Grave 1016; nos 3-5 from Grave 1018 and no. 40 from Grave 1150) were all fragmentary and wood grain preserved, so they need not have been coffin furniture given the general scatter of nails found in non-funerary contexts. The presence of an iron nail fragment (no. 39) in the fill of animal 'burial' (SK7) highlights the fact that nail fragments in grave fills need not automatically indicate the presence of coffins.

Table 4. The iron nails (excluding numbers 54 and 78 which are of relatively modern date)

Condition	Grave contexts	Cremation debris	Other contexts	Total
Complete	-	-	2	2
Head and shank	5	-	11	16
Shank only	12	1	4	17
Total	17	1	17	35

Two small assemblages of material call for special comment, that from the Phase 3 ditch terminal 1043 (nos 13-21) and that from the primary fill of the Phase 4 pit, 1049 (nos 22-8). The former is described as coming from a cremation scatter, and there can be no doubt that these items were from pyre goods as many show signs of burning. The recognisable items are hobnails (nos 42-3), and a small copper alloy rivet with scraps of shanks that might come from others (no. 13). The size of the rivet and shank fragments suggest that their function was probably primarily decorative. They could have been used to attach leather, thin veneers or fabric to a surface but would not have been suitable for joinery. No. 16 might possibly have come from the head of a bow brooch which would suggest a 1st or 2nd-century date, but it must be stressed that the identification of this scrap is tentative. The study of pyre goods from Late Iron Age and Romano-British graves is still in its infancy and there is little *comparanda*

for those from rural northern sites. Generally hobnails from shoes are a common find, with levels of 10% or more of burials having them not being uncommon (Cool and Leary forthcoming, Table 2). The presence of hobnails on the pyre thus need no cause no surprise but the amount of burnt copper alloy does appear exceptional and would hint at a well-furnished pyre.

Work by McKinley (2000) has shown that the human bone from pyre sites is rarely collected in its entirety for formal urned burial which means that much pyre debris must have been disposed of in other ways, either left on the pyre or deposited in other features. Some formal cremation burials can show odd features in the bone collected such as unusually low proportions of the skull, given that fragments of these can be easily identified on the pyre and might be expected to be collected (McKinley 2004, 301). This suggests that pyre debris might sometimes have been collected for deposition outside of the cemetery area. Given that this scatter of cremated material was found in a ditch terminal, a type of location that was often chosen for structured deposition, and given that the debris were from a richly furnished pyre, one might suspect that the material derives from the funeral of an important person and that scattering it was intended to be protective in some way.

Within the context of the finds from the site, the primary fill of Pit 1049 produced a relatively large assemblage of material. The combination of the coin and glass fragments (nos 22-4) provide firm evidence for a late 3rd-century date and by association date the iron object no. 25. In shape this resembles the plates sometimes found amongst groups of hobnails in burials and plausibly interpreted as boot plates. No. 25 is 70mm long and thus much larger than most boot plates. The largest complete example from Lankhill, for example, was 35mm long (Clarke 1979, fig. 38 no. G233). It would seem too large to be a heal plate if judged by the size of Roman nailed shoes (see for example Rhodes 1980, figs 59-60), though could possibly have been placed below the toes. A similar item which was clearly too large to be a boot plate was recovered from the Carlingwark Loch hoard (Piggott 1953, 32 no. C9, fig. 8, 110mm long) where it was suggested it was used to fasten wood. On that example the projections at either end were clearly spikes unlike the case here, and a similar explanation does not seem satisfactory. Given its size, the suggestion that no. 25 is a boot plate must remain tentative, though within the *corpus* of Roman ironwork this currently seems the most plausible identification.

Amongst the other finds there are several items that are commonly found in Roman assemblages such as the fragment from a copper alloy needle no. 50 and pieces of ironwork relating to joinery (a double-spiked loop no. 11 and a T-clamp no. 75). A copper alloy mending patch (no. 69) is an interesting find. These are possibly best known from medieval contexts where they were used to mend sheet vessels (Egan 1998, 176 nos 488-94) but they are often found on Roman sites where a medieval date seems highly unlikely as, for example, at the Dalton Parlours villa (Wrathmell and Nicholson 1990, 89 nos 51-7, fig. 72). What they were used for is currently unknown. Copper alloy beads such as no. 48 are occasionally

found in securely dated Roman contexts such as that from the late 2nd to early 3rd century drain deposit at the fortress baths at Caerleon (Brewer 1986, 181 no. 111, fig. 59), but were never a common find. No. 48 has a very wide aperture so it is possible that it might have been intended as a ferrule rather than a necklace bead. A lead rod (no. 87) from a Phase 4 pit fill could be part of a fragmentary pottery repair given the expanded end, though lead repairs of this size normally take the form of rectangular clamps (Miles *et al.* 2007, fig. 5.30 no. 55) rather than rods as here.

The site has also produced a number of copper alloy items that are not so closely paralled within Roman assemblages, or indeed in those of other dates. Superficially no. 42 resembles some heavy cast bracelets with hook and eye fastenings in use in the 4th century. The tapering perforation in the 'eye' would be unusual for such a bracelet and they do not normally show the type of wear that this one does. The type of perforation and the wear suggest that it might have been part of a hinge with second element articulating with it. No. 64 appears to be a small spacer possibly from a necklace. No. 79 has a recessed field as if for enamel though no trace of any infill was found during conservation. The broken perforations at one end suggest it may originally have been part of a belt or strap fitting. No. 74 may also have been a strap terminal made of sheet metal.

In addition to the metalwork and glass there were also fragments of fired clay (no. 12). The extant surfaces are irregular and suggest a thickness of *c*.6mm. This indicates the fragments cannot have come from a loom weight, and it is possible they may have come from daub smeared around brushwood. A fragment of probable iron smithing slag from a Phase 4 ditch fill (no. 86) points to iron-working taking place in the vicinity.

The majority of the material came from the ditch fills of the Phase 3 enclosures and field systems with 40 items coming from those contexts compared to 19 from Phase 4 ones. The finds discussed here suggest there was no great difference in the type of occupation between the phases and, where dateable, the objects are broadly contemporary. Hobnails and blue/green glass bottle fragments came from both phases, as did structural ironwork fittings such as the double spiked loop, the T-clamp and the nails. All of these items are typical of occupation that post-dates the arrival of Roman power in the area.

Within the context of southern Britain this would be an impoverished assemblage to come from a 2nd to 3rd-century site. Within the context of this region, however, it is quite large and varied. Metalwork and glass vessel fragments tend to be very rare on rural sites there as can be seen by reference to the sites excavated during the building of the A1/M1 Link Road (Roberts *et al.* 2001) and Moss Carr, Methley (Roberts and Richardson 2002). On the whole the inhabitants of such sites in the Roman period had little interest in 'Roman' material culture. The inhabitants in the vicinity of this site seem to have been somewhat an exception to this general picture.

Catalogue

1 Loop head. Iron. Rectangular-sectioned bar with end bent over to form a closed loop; shank broken. Diameter of loop 18mm, section of bar 10mm by 4.5mm. *BYP06; context 1001*

2 Nail. Iron. Shank fragment. *BYP05; Grave 1016; context 1015; Site Phase 4*

3 Nail. Iron. Head and shank fragment. Head diameter 21mm. *BYP05; Grave 1018; context 1017; Site Phase 4*

4 Nail. Iron. Head and shank fragment. Head diameter *c*.25mm. *BYP05; Grave 1018; context 1017; Site Phase 4*

5 Nail. Iron. Shank fragment. *BYP05; Grave 1018; context 1017; Site Phase 4*

6 Nail. Iron. Shank fragment. Minerally preserved transverse wood grain. *BYP05; Grave 1020; context 1019; Site Phase 4*

7 Nail. Iron. Shank fragment bent at end. *BYP05; Grave 1020; context 1019; Site Phase 4*

8* Bottle. Prismatic bottle; body fragment re-used as tool. Blue/green glass. Triangular fragment with short side showing deliberate flaking. Dimensions 40mm by 21mm. *BYP05; Ditch 1; context 1022; Site Phase 4*

9 Nail. Iron. Head and shank fragment. Diameter of head 20mm. *BYP05; Ditch 1; context 1022; Site Phase 4*

10 Nail. Iron. Shank fragment. *BYP05; Furrow 10; context 1026; Site Phase 6*

11 Double spiked loop. Iron. Legs parallel. Length 45mm. *BYP05; Ditch 3; context 1031; Site Phase 4*

12 Six fragments fired clay, oxidised orange externally, reduced grey internally, exterior irregularly curved; interior broken with one fragment retaining curved face. Maximum thickness 6mm. 5.1g. *BYP05; Ditch 8; context 1041; Site Phase 3*

13 Rivet. Copper alloy. Flattened ovoid head, broken probably square-sectioned shank. Sample also contained nine small flakes and fragments possibly from shanks of this rivet or similar one and *c*.25 small fragments, larger ones showing evidence of burning. Present rivet length 7mm, head diameter 4mm. Total weight 1.3g. *BYP05; Ditch 8; context 1042; Site Phase 3*

14 Strip. Copper alloy. Fragment of strip bent to form three sides of a rectangle, also small additional fragments of strip and small scraps of possible burnt copper alloy. Dimensions of rectangular strip 10mm by 8mm, width strip 3mm. 2g. *BYP05; Ditch 8; context 1042; Site Phase 3*

15 Fragment. Copper alloy. 'D'-sectioned curved bar with small projection at one side; very corroded. Diameter *c*.25mm, section 4.5mm. *BYP05; Ditch 8; context 1042; Site Phase 3*

16 Fragment. Copper alloy. Vesicular and burnt. Curved with detached fragment of pin. ?Head of bow brooch. Dimensions 13mm by 10mm by 7mm. *BYP05; Ditch 8; context 1042; Site Phase 3*

17 Fragments (2). Copper alloy. Corroded, vesivular, probably burnt. 1.5g. *BYP05; Ditch 8; context 1042; Site Phase 3*

18 Hobnail. Iron. Slightly domed head. Length 12mm. *BYP05; Ditch 8; context 1042; Site Phase 3*

19 Iron. Seven plate fragments and 26 fragments including small possible shank fragments of hobnails. 15g. *BYP05; Ditch 8; context 1042; Site Phase 3*

20 Fragments. Iron. Small flakes of sheet. *BYP05; Ditch 8; context 1042; Site Phase 3*

21 Nail. Iron. Shank fragment. *BYP05; Ditch 8; context 1042; Site Phase 3*

22 Coin. Copper alloy. Barbarous radiate. Ovberse: as TETRICUS I. Reverse: as PAX AUG (?). Reverse shows Pax? holding sceptre in left hand, but with legend [….]OSC. Date 270-290. 2g. *BYP05; Pit 1049; context 1048; Site Phase 4*

23 Bottle; handle fragment. Blue/green glass. Part of reeded angular handle. Dimensions 30mm by 24mm. *BYP05; Pit 1049; context 1048; Site Phase 4*

24 Body fragments (2). Blue/green glass. *BYP05; Pit 1049; context 1048; Site Phase 4*

25* Boot plate? Iron. Oval plate with projecting tabs at either short end bent under the plate. Dimensions 70mm by 38mm, thickness 3mm. *BYP05; Pit 1049; context 1048; Site Phase 4*

26 Stud. Iron. Circular disc with off-centre stump of square-sectioned shank behind. Diameter 37mm, section shank 7mm. *BYP05; Pit 1049; context 1048; Site Phase 4*

27 Nail. Iron. Head and shank fragment. Head diameter *c*.20mm. *BYP05; Pit 1049; context 1048; Site Phase 4*

28 Strap. Iron. Curved. Width 18mm, diameter *c*.60-80mm. *BYP05; Pit 1049; context 1048; Site Phase 4*

29 Coin. Copper alloy. Radiate. Obverse: TETRICUS II. Reverse: PIETAS[AUG]G. RIC V (ii) Tetricus II 254/5. Date 273-274. 2g. *BYP05; Furrow 10; context 1050; Site Phase 6*

30 Nail shank fragments (3) with minerally preserved transverse wood grain. Also one fragment of minerally preserved wood. *BYP05; Grave 1071; context 1070; Site Phase 4*

31 Nail. Iron. Shank only. Traces of minerally preserved wood grain at a slight angle to long axis. Length 51mm. *BYP05; Grave 1071; context 1070; Site Phase 4*

32 Nail. Iron. Shank fragment. Transverse minerally preserved wood grain. *BYP05; Grave 1071; context 1070; Site Phase 4*

33 Nail. Iron. Lower part of shank. Also iron corrosion with minerally preserved wood grain. *BYP05; Grave 1071; context 1070; Site Phase 4*

34 Nail. Iron. Head and shank fragment. Head diameter 22mm. *BYP05; Grave 1071; context 1070; Site Phase 4*

35 Nail. Iron. Shank fragment broken at junction with head. *BYP05; Grave 1071; context 1070; Site Phase 4*

36 Nail. Iron. Shank fragment. *BYP05; Grave 1071; context 1070; Site Phase 4*

37 Fragment. Copper alloy. 1g. *BYP05; Grave 1071; context 1070; Site Phase 4*

38 Bar. Iron. Rectangular section expanding to one bevelled end. Possibly an unfinished forging. Length 60mm, maximum thickness 14mm, maximum width 20mm. *BYP05; Pit 1083; context 1082; Site Phase 4; unphased*

39 Nail. Iron. Head only. Diameter 11mm. *BYP05; Pit 1130; context 1129; Site Phase 4*

40 Nail. Iron. Fragment of broken head and shank. *BYP05; Grave 1150; context 1149; Site Phase 4*

41 Nail. Iron. Head and shank fragment. *BYP06; Ditch 11; context 1200; Site Phase 3*

42* Hinged fitting(?). Copper alloy. Circular-sectioned hoop, outer face has alternate narrow and wide vertical ribs; one end broken, other end a flat ended perforated terminal, perforation tapering to upper face and piece shows wear on the underside of the outer edge. Outer diameter *c*.55mm, section 5mm by 4.5mm. *BYP06; Ditch 11; context 1202; Site Phase 3*

43 Strap. Iron. Square fragment. Dimensions 17mm by 16mm. *BYP06; Ditch 11; context 1209; Site Phase 3*

44 Nail(?). Iron. Flake from shank. *BYP06; Ditch 11; context 1209; Site Phase 3*

45 Coin. Copper alloy. Barbarous radiate. Obverse: radiate bust. Reverse: illegible. Very worn. Date 260-290. 1g. *BYP06; Ditch 9; context 1216; Site Phase 5*

46 Strip. Copper alloy. Rectangular-sectioned; both ends broken. Also one tiny fragment. Present length 7mm, section 2.5mm by 1mm. 0.1g. *BYP06; Gully 14; context 1234; Site Phase 5*

47 Nail. Iron. Complete. Length 75mm. *BYP06; Gully 38; context 1238; Site Phase 6*

48* Bead. Copper alloy. Circular outline; convex outer face, concave inner face. Diameter 10mm, width 7mm, thickness 1mm. 1.6mm. *BYP06; Ditch 11; context 1260; Site Phase 3*

49 Penannular ring. Copper alloy. Square-sectioned rod bent into a ring of slightly oval outline with ends touching slightly. Diameter 16.5mm by 15mm, section 2mm. *BYP06; Ditch 6; context 1266; Site Phase 3*

50 Needle. Copper alloy. Circular-sectioned wire tapering to point, other end flattening and broken across bottom of perforation. Bent. Length 37mm, section 1.5mm. 0.2g. *BYP06; Ditch 6; context 1266; Site Phase 3*

51 Fragment. Copper alloy. 0.3g. *BYP06; Ditch 6; context 1266; Site Phase 3*

52 Fragment. Copper alloy. 1g. *BYP06; Ditch 6; context 1266; Site Phase 3*

53 Fragment. Copper alloy. Weight less than 0.1g. *BYP06; Ditch 6; context 1266; Site Phase 3*

54 Nail. Iron. Head and shank fragment. Head diameter 12mm. (Relatively modern). *BYP06; Gully 15; context 1267; Site Phase 3*

55 Fragments. Copper alloy. One oval lump and some tiny fragments. 0.2g. *BYP06; Gully 15; context 1267; Site Phase 3*

56 Fragment. Copper alloy. Much corroded. 0.3g. *BYP06; Gully 15; context 1267; Site Phase 3*

57* Rod. Copper alloy. Oval-sectioned with casting seam down either end expanding slightly towards one end; flat-ended. Length 34mm, section 6mm by 5.5mm. *BYP06; Ditch 6; context 1271; Site Phase 3*

58 Nail. Iron. Head and shank fragment. *BYP06; Ditch 6; context 1271; Site Phase 3*

59 Spike or nail. Iron. Square-sectioned shank tapering, both ends broken. Present length 57mm, maximum width 7mm. *BYP06; Ditch 11; context 1273; Site Phase 3*

60 Nail. Iron. Complete shank, head broken off. Present length 50mm. *BYP06; Ditch 11; context 1273; Site Phase 3*

61 Nail. Iron. Shank fragment. *BYP06; Ditch 11; context 1273; Site Phase 3*

62 Strip fragment. Copper alloy. Tapering to one angled end. Length 25mm, sections 6mm by 2mm, 2.5mm by 2mm. *BYP06; Ditch 11; context 1276; Site Phase 3*

63 Strip. Iron. Length 75mm. *BYP06; Ditch 11; context 1273; Site Phase 3*

64 Spacer block. Copper alloy. Rectangular with wedge-shaped cross-section; Two circular perforations through narrow axis. Length 12mm, maximum width 4mm, minimum width 2mm, depth 6mm, perforation diameter 2mm. *BYP06; Gully 15; context 1279; Site Phase 3*

65 Wire. Copper alloy. Circular-sectioned; both ends broken. Bent. Length *c*.65mm, section 1.5mm. 0.8g. *BYP06; Gully 15; context 1279; Site Phase 3*

66 Shank. Copper alloy. Circular-section tapering to point; other end broken. Present length 7.5mm, section 2mm by 1.5mm. Weight less than 0.1g. *BYP06; Gully 15; context 1279; Site Phase 3*

67 Fragment. Copper alloy. Oval-shaped, plano-convex. Dimensions 13mm by 9mm by 6mm. *BYP06; Gully 15; context 1279; Site Phase 3*

68 Fragment. Copper alloy. Weight less than 0.1g. *BYP06; Gully 15; context 1279; Site Phase 3*

69 Mending patch. Copper alloy. Diamond-shaped sheet with ends bent towards centre, bent back on themselves and flattened. Edges now damaged. Dimension 11mm by 7mm, thickness 1mm. 0.3g. *BYP06; Ditch 6; context 1281; Site Phase 3*

70 Rod. Copper alloy. Circular-sectioned; both ends broken. Length 8mm, section 4mm. 0.5mm. *BYP06; Ditch 6; context 1281; Site Phase 3*

71 Sheet. Copper alloy. One irregular fragment, also 14 small globular fragments. 2g. *BYP06; Ditch 6; context 1281; Site Phase 3*.

72 Nail. Iron. Head and shank fragment. Head diameter 16mm. *BYP06; Ditch 6; context 1281; Site Phase 3*

73 Nail. Iron. Complete. Length 28mm. *BYP06; post-hole 1288; context 1287; Site Phase 3*

74* Strap terminal? Copper alloy. Rectangular sheet, one short end bent over; other end has circular perforation in one corner and broken across perforation in the other; V-notch behind extant perforation. Length 18mm, width 23mm, thickness 0.5mm, perforation diameter 2mm. *BYP06; Ditch 6; context 1310; Site Phase 3*

75 T-clamp. Iron. Curved head, one side broken; broken shank. Current length 38mm, head width 32mm. *BYP06; Ditch 6; context 1310; Site Phase 3*

76 Nail. Iron. Head broken, shank bent at 90º. *BYP06; Furrow 1332; context 1331; Site Phase 6*

77 Nail. Iron. Shank fragment. *BYP06; Furrow 1332; context 1331; Site Phase 6*

78 Nail. Iron. Shank fragment. (Probably modern). *BYP06; Furrow 1332; context 1331; Site Phase 6*

79* Strap fitting. Copper alloy. Rectangular plate with edges bent up to form a recessed field. One narrow end broken, other broken across two circular perforations. Present length 28mm, width 20mm, thickness 1mm. *BYP06; Pit 1364; context 1363; Site Phase 4*

80 Bolt. Iron. Square-sectioned head and shank, base broken. Present length 107mm. (Modern). *BYP06; Pit 1374; context 1373; Site Phase 6*

81 Strip. Copper alloy. Oval-sectioned, both ends broken. Length 5.5mm, section 3mm by 2.5mm. Weight less then 0.1g. *BYP06; Furrow 19; context 1407; Site Phase 6*

82 Nail. Iron. Shank fragment. *BYP06; Gully 23; context 1431; Site Phase 4*

83 Nail. Iron. Head and shank fragment. Head diameter 20mm. *BYP06; corn drier 1436; context 1434; Site Phase 4*

84 Hobnail. Iron. Complete with domed head. Burnt. Length 15mm. *BYP06; corn drier 1436; context 1446; Site Phase 4*

85 Nail. Iron. Head and shank fragment. Head diameter 12mm. *BYP06; Gully 25; context 1463; Site Phase 4*

86 Slag fragment. Iron. *BYP06; Ditch 1; context 1484; Site Phase 4*

87 Pottery repair?. Lead alloy. Oval-sectioned rods with ends curved through 90º; one end has expanded edges, other broken. Length 68mm, section 7mm by 4.5mm. *BYP07; Pit 1508; context 1509; Site Phase 4*

88 Rivetted strip. Iron. Two overlapping strips now corroded together, one retaining rivet. Length 25mm, maximum width 10mm. *BYP07; post-hole alignment 35; context 1535; Site Phase 6*

89 Rod. Iron. curved. Length *c*.20mm, width 3mm. *BYP07; post-hole alignment 35; context 1552; Site Phase 6*

90 Fragment. Copper alloy. Highly corroded. Dimensions 10mm by 8mm by 8mm. *BYP06; unstratified*

91 Fragment. Copper alloy. Much corroded. Weight 0.7g. *BYP06; unstratified*

92 Strip. Lead alloy. Rectangular and twisted. 23g. Length 70mm, section 12mm by 3mm. *BYP05; unstratified*

93 Nail. Iron. Head and shank fragment, tip missing. Present length 52mm. *BYP05; unstratified*

94 Nail. Iron. Head and shank fragment. Head diameter 12mm. *BYP06; unstratified*

95 Nail. Iron. Head and shank fragment. *BYP05; unstratified*

96 Glass vessel fragment. Fragment of olive green late post-medieval/early modern glass. *BYP06; unstratified*

Industrial residues by Jennifer Jones

Introduction

Industrial residues were recovered from seventeen stratified contexts. The total weight of the recovered assemblage was 511.1g, though almost half of that weight came from a single piece of ironworking residue. Apart from possible corn driers, no industrial features were identified at the site. The contexts of the residues ranged through fills of ditches, pits, gullies and graves. The majority of other site finds have been identified to the Roman period, but there are thought to be some prehistoric, medieval and post-medieval elements to the site.

Methodology and examination

All the material was examined visually and under X16 magnification. The aim of the examination was to characterise the residues and identify the industrial processes from which they originated. Classification was primarily based on morphology, density, colour and vesicular. Weight and identifications were recorded (Table 5). Category criteria were based on the English Heritage Centre for Archaeology Guidelines on Archaeometallurgy (Bayley *et al.* 2001). In addition to visual and microscopic examination, EDXRF (energy dispersive X-ray fluorescence) analysis was undertaken on selected samples and sub-samples.

EDXRF analysis

Samples or sub-samples from the majority of residues were examined using EDXRF (energy dispersive X-ray fluorescence) analysis. All the crucible fragments were analysed. The aim of the EDXRF analysis was to look at the range of major and minor elements present in the samples to assist with or confirm identifications.

EDXRF Methodology

Some small samples were analysed whole. For the larger pieces, a sub-sample was removed to create a freshly broken interior surface for analysis. Analysis of the crucible samples used a method designed to detect the range of elements commonly present in copper alloys. For other analyses, an EDXRF method designed to detect the full range of major and trace geological elements was used. Results from both methods were normalised to 100%.

Results

The residue identifications are presented in Table 5 and discussed below.

Table 5. Residue identifications and weights

Site	Context	Context description	Weight (g)	Identification
FOQ99	206	Ditch fill	21.9	smithing slag
BYP05	1019 <18>Sk3	Grave fill	3.83	calcium rich natural material
BYP05	1019 <18>Sk3	Grave fill	9.43	hammerscale
BYP05	1019 <22>Sk3	Grave fill	1.79	hammerscale
BYP05	1019 <24>Sk3	Grave fill	1.02	hammerscale
BYP05	1019 <27>Sk3	Grave fill	1.14	hammerscale
BYP05	1042 <33>	Ditch terminus fill	7.96	copper alloy rich vitrified fragments ?from crucible
BYP05	1042 <33>	Ditch terminus fill	12.98	hammerscale
BYP05	1063 <43>	possible kiln fill	1.24	hammerscale
BYP05	1064 <44>	burnt deposit in poss. Corn drier	1.07	hammerscale
BYP05	1066 <45>	Grave fill	6.09	hammerscale
BYP05	1078 <50>	Pit fill	0.92	hammerscale
BYP05	1119 <62>	Ditch fill	2.66	hammerscale
BYP05	1149 <68>	Grave fill	1.99	hammerscale
BYP05	1080	Pit fill	2.92	fuel ash slag
BYP06	u/s		2.01	probable smithing slag
BYP06	u/s		217.4	smithing hearth bottom
BYP06	1191	Gully fill	55.05	fuel ash slag
BYP06	1202	Ditch fill	27.79	probable smithing slag
BYP06	1202	Ditch fill	2.17	fuel ash slag
BYP06	1266	Ditch fill	0.32	?charred nut fragment
BYP06	1266	Ditch fill	9.02	crucible body fragment
BYP06	1267	Gully fill	2.48	abraded ceramic fragments x 5
BYP06	1267	Gully fill	3.79	ceramic ?mould fragment
BYP06	1267	Gully fill	3.2	crucible rim fragment
BYP06	1271	Ditch fill	5.02	fuel ash slag
BYP06	1271	Ditch fill	0.6	ceramic fragment
BYP06	1271 cruc1	Ditch fill	18.1	crucible ?base fragment
BYP06	1271 cruc2	Ditch fill	5.68	crucible rim fragment
BYP06	1271 cruc3	Ditch fill	18.69	crucible rim fragment
BYP06	1271 cruc4	Ditch fill	6.86	crucible body fragment
BYP06	1271 cruc5	Ditch fill	6.96	crucible body fragment
BYP06	1271 cruc6	Ditch fill	3.23	crucible body fragment
BYP06	1271 cruc7	Ditch fill	2.64	crucible body fragment
BYP06	1271 cruc8	Ditch fill	6.14	?
BYP06	1281 small cruc	Ditch fill	4.35	crucible body fragment
BYP06	1281 large cruc	Ditch fill	29.83	crucible rim fragment
BYP06	1399	Gully fill	2.82	fuel ash slag

Discussion

Ironworking residues

Residues from ironworking were found in four contexts, two stratified (Ditch 33, fill 206 and Ditch 11, fill 1202) and two unstratified from BYP06. The total weight of these was 483g, including the large unstratified sample weighing 217g. All four were identified positively or probably as deriving from smithing.

Smelting of iron ore results in an iron bloom - a spongy mass of metallic iron, which still contains quite a high percentage of trapped slag. This slag must be worked (hammered) out of the bloom by smithing, while the bloom is kept at a high temperature to facilitate slag expulsion. The expelled slag forms drips and small pools around the smithing hearth, which may consolidate into irregularly shaped small or large lumps, or form into the characteristic plano-convex shapes of smithing hearth bottoms, such as the unstratified example here. Accumulations of smithing slag would be periodically cleared out of the smithing hearth. The cleaned iron could then be used to forge or repair objects.

Further evidence of smithing comes from the spheroidal and flake hammerscale, total quantity 40g, recovered from environmental samples taken from a variety of contexts at the site in 2005. Hammerscale is tiny flakes or spheroids of the iron oxide skin which forms on heated iron, and which are forcibly expelled from the surface by smithing. The highly magnetic flakes or spheroids accumulate on the ground around the smithing hearth. Hammerscale is very small (*c*.1-4mm) and difficult to detect during excavation. It is usually picked up during the processing of environmental samples, as here.

The findspots of the residues gives no context for their production, and the quantities recovered suggest that smithing was not a major industrial activity at the site. The pieces examined could be the result of just a few episodes of smithing.

Crucibles

Twelve pieces of crucible were recovered from five stratified contexts, fill 1042 from Ditch 8, 1266, 1271 and 1281 from Ditch 6, and 1267 from Gully 15, with the seven of the fragments coming from fill 1272. The appearance of these seven pieces is very similar – light grey, lightweight fabric with a darker grey inside surface – and they may be parts of a single crucible. EDXRF analysis of the vitrified layers detected the same suite of elements (copper, zinc, lead, tin and antimony) at varying concentrations. The same elements were also detected in analyses of the other crucible fragments.

Crucibles were used for the casting of copper alloy objects, not for the primary smelting of copper ores. The metal was melted in the crucible, often in small quantities, and then poured directly into the mould. The surfaces of the crucible could become vitrified due to the high temperatures involved, and small quantities of the melted metal become chemically bonded with the crucible surface, appearing as corroded fragments and globules within the fabric of the vessel (Plates 14 and 15).

The presence of copper, zinc, lead, tin and antimony in the crucible residues suggests that a quaternary alloy was being cast. Quaternary alloys can be the result of recycling copper alloy scrap fragments of varying composition – for instance pieces of brass (Cu:Zn) together with bronze (Cu:Sn), both of which may be leaded. Melting the fragments together would result in a quaternary alloy, containing the range of elements found here. Evidence for recycling metals and production of quaternary alloys has been detected by analysis from several sites of the Roman period in Britain (Dungworth 1995), though such alloys cannot be said to have been produced exclusively at that time. The possibility that the production of a quaternary alloy was a deliberate choice must also be borne in mind.

Metal recycling could be a minor and episodic activity in the past, and the small quantity of residues recovered and the lack of evidence for other copper metalworking activity at the site would suggest that this might be the case at Byram Park.

Fuel ash slag

Five samples of material identified as fuel ash slag, with a total weight of 68g, were recovered from five contexts in the 2005 and 2006 seasons.

Fuel ash slag is a lightweight, vesicular material, of varying colour, which can be glassy and fragile, formed during combustion, when the non-organic components of alkali-rich fuels such as wood react with silicates present in earth, stone or ceramic. In samples from the site, EDXRF analysis detected a range of common earth elements, including silica, iron, aluminium, sodium, phosphorus and potassium, which are consistent with this identification. The sample from Gully 17 (fill 1191) also had small fragments of shaley fuel agglomerated in it. Fuel ash slag can form at temperatures easily achieved in a domestic hearth, if the correct conditions are present. Its presence does not necessarily suggest that industrial processes were taking place on site.

Catalogue

1 A nodule of iron-rich residue, sub-circular in shape, 27mm diameter. The interior is dark coloured, fairly dense and vesicular. There is no evidence for gradual build-up of the material. This is a fragment of ironworking slag, probably from smithing. *FOQ99; Ditch 33; context 206; Site Phase 4*

2 Twenty small (largest 14mm by 10mm by 7mm), irregularly shaped fragments of vitrified black/green/red coloured material, with inclusions and associated globules of corroded copper alloy. The form and appearance of these is very similar to the vitrified crucible lining fragments discussed below. EDXRF analysis detected copper, zinc, lead, tin and antimony. *BYP05; Ditch 8; context 1042; Site Phase 4*

3 An irregularly shaped piece of lightweight, black, highly vesicular material, the surface lustrous when freshly broken. This is a piece of fuel ash residue. *BYP05; Pit 1081; context 1080; Site Phase 4*

4 Two pieces of similar, lightweight, highly vesicular material, grey/brown in colour, with white/cream powdery material covering parts of the surface. Small pieces of burnt shaley fuel are agglomerated within. The material has been plastic or molten. These are pieces of fuel ash slag, the identification confirmed by EDXRF detection of a range of common earth elements, including silica, iron, aluminium, sodium, phosphorus and potassium. EDXRF suggests that the powdery material on the surface is calcium based, and may derive from soil in the burial environment. *BYP06; Gully 17; context 1191; Site Phase 6*

5 A nodule of dark coloured ironworking slag, 35mm diameter. The interior is dense in the centre and vesicular around the edges. This is probably a piece of smithing slag. *BYP06; Ditch 11; context 1202; Site Phase 3*

6 A ‘drip’ shape of flowed material, 16mm long. The surface is fairly smooth and the interior greyish and semi-vitrified. This is a drip of fuel ash slag, its identification confirmed by EDXRF detection of a range of common earth elements, including silica, iron, aluminium, sodium, phosphorus and potassium. *BYP06; Ditch 11; context 1202; Site Phase 3*

7 Curved crucible body sherd, 29mm by 31mm by 19mm thick. Fabric is light grey outside, with a darker layer inside, very light in weight, and semi-vitrified inside and out. There is a further very thin vitrified layer on the outside, but no visible copper rich deposits. EDXRF analysis of the outside vitrified layer detected low levels of copper, lead, tin and zinc. *BYP 06; Ditch 6; context 1266; Site Phase 3*

8 Five small, highly abraded fragments of ceramic vessel (largest 14mm by 11mm by 7mm). Light grey powdery surfaces. No evidence of vitrification or copper rich deposits. *BYP06; Gully 15; context 1267; Site Phase 3*

9 Piece of ceramic 22.5mm long by 20mm wide by 10mm thick max. Part of one long edge and one rounded short edge are probably original. The ‘back’ is very slightly convex, part red/buff and part dark grey in colour. The ‘front’ is all-over dark grey with faint shaping suggesting a mould. EDXRF could not confirm this, however, as no significant levels of elements used in the production of copper alloys were detected. *BYP06; Gully 15; context 1267; Site Phase 3*

10 Crucible rim 19mm by 18mm by 7mm thick. Fabric is mid-grey in colour. Rim and inside edges have a discontinuous, dark coloured vitrified layer. Small corroded copper deposits, green and red in colour, are visible in the fabric, at the broken edge and in the vitrified surface layer. EDXRF analysis detected copper, zinc, lead, tin and antimony. *BYP06; Gully 15; context 1267; Site Phase 3*

11 Irregularly shaped ceramic fragment 12mm by 9mm by 6mm thick, with no original edges. One face is black, the other is red. No evidence of vitrification or copper rich deposits. *BYP06; Ditch 6; context 1271; Site Phase 3*

12 Crucible 1: Curved crucible base sherd, 34mm by 29mm by 14mm thick max. Fabric is light grey outside, with small areas of reddening, with a darker layer inside, very light in weight, and semi-vitrified throughout. Small corroded copper deposits, green and red in colour, are visible in the fabric. EDXRF analysis detected copper, zinc, lead, tin and antimony. *BYP06; Ditch 6; context 1271; Site Phase 3*

13 Crucible 2: Crucible rim sherd, 22mm by 19mm by 12mm thick, with an intact, rounded rim edge. Fabric is light grey outside, with a darker layer inside, light in weight, and semi-vitrified inside with an uneven, black/red vitrified layer with small corroded copper deposits, green and red in colour. EDXRF analysis detected copper, zinc, lead, tin and antimony. *BYP06; Ditch 6; context 1271; Site Phase 3*

14 Crucible 3: Crucible rim sherd, 35mm by 32mm by 15mm thick. Fabric is mid-grey in colour, with vitrified areas, particularly on the outside and along the edge of the rim. Small corroded copper deposits, green and red in colour, are visible in the fabric (Plates 14 and 15). EDXRF analysis detected copper, zinc, lead, tin and antimony. *BYP06; Ditch 6; context 1271; Site Phase 3*

15 Crucible 4: Crucible body sherd, 27mm by 21mm by 13mm thick. Light grey fabric, with a darker grey layer inside. Fabric is semi-vitrified, especially inside, which also has an uneven, black/red vitrified layer with small corroded copper deposits, green and red in colour. EDXRF analysis detected copper, zinc, lead, tin and antimony. *BYP06; Ditch 6; context 1271; Site Phase 3*

16 Crucible 5: A flat crucible body sherd, 30mm by 23mm by 10mm thick. Fabric is light in weight, light grey outside, with a darker grey layer inside with an uneven, black/red vitrified layer with small corroded copper deposits, green and red in colour. EDXRF analysis detected copper, zinc, lead, tin and antimony. *BYP06; Ditch 6; context 1271; Site Phase 3*

17 Crucible 6: Crucible body sherd, 20mm by 14mm by 12mm thick. The fabric is light grey and semi-vitrified, with an uneven, black/red vitrified layer on both faces with some visible small corroded copper deposits, green and red in colour. EDXRF analysis detected copper, zinc, lead, tin and antimony. *BYP06; Ditch 6; context 1271; Site Phase 3*

18 Crucible 7: Small crucible body sherd, 15mm by 16mm by 9mm thick. The fabric is light grey and semi-vitrified, with small areas of reddening on the outside. The inside has an uneven, black/red vitrified layer with small corroded copper deposits, green

and red in colour. EDXRF analysis detected copper, zinc, lead, tin and antimony. *BYP06; Ditch 6; context 1271; Site Phase 3*

19 Crucible 8: Irregularly shaped piece of ceramic, 32mm by 19mm by 20mm thick, with no original edges. The fabric is red with a glassy, vitrified layer 3-4mm thick on the inside. The piece has clearly been exposed to high temperatures, either by accident or design. EDXRF analysis suggests that the elements making up the vitrified layer were drawn from the fabric of the sherd itself, suggesting the vitrification was accidental. *BYP06; Ditch 6; context 1271; Site Phase 3*

20 Small crucible: Slightly curved crucible body sherd, 26mm by 22mm by 10mm thick. Fabric is mid-grey in colour. The inside surface is vitrified with small corroded globular copper deposits, green and red in colour. EDXRF analysis detected low levels of copper, lead, tin, antimony and zinc. *BYP06; Ditch 6; context 1281; Site Phase 3*

21 Large crucible: Crucible rim sherd, 40mm by 50mm by 17mm thick. The fabric is light grey with a dark uneven vitrified layer with small corroded copper deposits, green and red in colour, on the inside and over the rim edge. EDXRF analysis detected copper, zinc, lead, tin and antimony. *BYP06; Ditch 6; context 1281; Site Phase 3*

22 Piece of ironworking slag, dark coloured and fairly dense, with a partly flowed surface. This is probably a piece of smithing slag. *BYP06; unstratified*

23 A piece of ironworking slag, 73.5mm diameter and up to 35mm thick. There is a roughly ‘U’-shaped groove in the top surface, and the underside is part rounded and part angular, suggesting that the material formed against a shaped surface or hollow. The interior is moderately dense, very dark coloured and uniformly vesicular. Examination under X16 magnification shows agglomerated fragments of charcoal in the residue. This could be a smithing hearth bottom, with the shaping of the top surface caused by blasts of air from the bellows used to heat the iron bloom. EDXRF analysis found that iron and silica made up 88% of the material, alongside a suite of trace elements consistent with its identification as an ironworking slag. *BYP06; unstratified*

Lithics by Ian Brooks

A total of 37 flint artefacts were recovered from 23 contexts during the archaeological works. No concentrations of flint artefacts were noted, indeed no context contained more than three artefacts (Table 6). Of this relatively small collection, five were formal tools (13.5% of the assemblage), the remaining artefacts being flakes or broken flakes of various forms.

Table 6. Summary of the flint assemblage

Context	Primary Flakes	Secondary Flakes	Tertiary Flakes	Broken Flakes	Tools	Cores	Worked Lumps	Other	Total
201		1		1				1	3
213			1						1
1031			1						1
1039		1	1						2
1041			1						1
1042				1					1
1048				1	1				2
1056				1					1
1076			1						1
1097				1					1
1109				1					1
1200			2	1					3
1210			1		1				2
1225				1					1
1266			1						1
1310			1	1					2
1343			1						1
1422					1				1
1519		1							1
1541				1					1
1550				2					2
1599					1				1
unstratified		1	2	2	1				6
Total	0	4	13	14	5	0	0	1	37

The flakes were divided into four groups: primary flakes with completely cortical dorsal surfaces, secondary flakes with partly cortical dorsal surfaces, tertiary flakes with uncorticated dorsal surfaces and broken flakes. Where possible the flint colours are defined by the Geological Society of America's Rock-Color Chart (Goddard *et al.* 1948). The description of the tools follows that of Inizan *et al.* (1992).

There are no local sources of flint close to the site. The nearest possible primary (chalk) source for flint is that of the Yorkshire Wolds (Rawson *et al.* 1978), particularly where the line of the Wolds is broken by the Humber. The flint here, however, tends to be of relatively poor quality, often opaque, pale grey in colour and faulted. More importantly there are a series of derived sources available, particularly the tills and associated gravels of East Yorkshire, outcropping along the coast between Flamborough Head and Kilnsea (Brooks 1989; Henson 1985). These contain considerable flint resources, often of good quality which could be used for tool manufacture. The river gravels of the Humber and Trent also contain some flint resources derived from the till and chalk deposits through which they pass. The range of raw materials exhibited within the collection and the preservation state of cortex on

some of the artefacts suggest that a derived source was being exploited with most likely a till source forming the main resource used.

The artefacts, particularly the flakes and broken flakes, are relatively small, ranging in length from 11mm to 56mm with an average length of only 25.1mm. The flakes tend to be tertiary flakes with only four secondary flakes and no primary flakes having been found. Only three blade fragments were recovered with remaining flakes having a length/width ratio of between 0.45 and 1.94 showing the range of flake types within the collection. The small size of the artefacts and lack of cortical pieces presumably reflects the distance to the raw material sources and would suggest that no primary reduction was being carried out on the site.

The tools consist of two scrapers, an awl, a fragment of a knife and a single microlith. The two scrapers show two different knapping strategies with one scraper being made on a thick flake with abrupt retouch with stepped fractures, whilst the other is on a thin secondary flake with very fine, regular retouch along the distal end of the flake. The dating of the majority of scrapers is somewhat problematic; however, the thicker scraper conforms to Late Neolithic or Early Bronze Age forms (Butler 2005, 166). The awl shows considerable use wear at its tip and extending approximately 11mm up the tool. Both the tip and the edges are rounded showing that this tool was either used against a highly abrasive material, or was used over a long period of time. The possible knife fragment is made on a secondary flake, possibly a blade, with fine, unifacial, direct, retouch along both sides. Once again it is likely to be Late Neolithic or Early Bronze Age in date. Whilst being rather small the microlith is a rod microlith of Late Mesolithic form.

The flint assemblage from Byram Park demonstrates a level of activity within the area from at least the Late Mesolithic with the majority of artefacts probably being Late Neolithic or Early Bronze Age in date. No signs of extensive knapping have been shown, with a very low number of cortical pieces having been recovered. It is likely that the majority of the artefacts recovered are the result of relatively low levels of activity, probably including the maintenance of flint tools and the limited working of relatively small flint pebbles or nodules. These were probably brought to the site from the till resources of Lincolnshire and East Yorkshire.

Catalogue

1 A unifacial knife made on the proximal end of a broken secondary flake. The tool is defined by a series of short, semi-abrupt, scaled removals along both sides. The bulb of percussion has been trimmed to produce a flatter edge to the tool. The artefact is covered by a thin grey patination on a dark yellowish brown (10YR 4/2) flint of moderate translucency. The cortex is heavily worn suggesting a possible till source. 37mm by 20mm by 6mm. *BYP05; Pit 1049; context 1048; Site Phase 4*

2 An end scraper on a thick, secondary flake, possibly a core fragment. The tool is defined by a series of short, stepped, abrupt removals along the distal end of the

original flake. The dorsal surface has a series of removals over most of the surface possibly suggesting that the blank for this tool may have been part of a flake core. The artefact is totally patinated to a pale grey colour making it impossible to determine the raw material type used; however, the surviving cortex is worn suggesting a till source for the flint. 39mm by 35mm by 14mm. *BYP06; Ditch 11; context 1210; Site Phase 3*

3 A small rod microlith with abrupt retouch along the right hand side of a microblade. The tool is totally patinated to a grey colour making it impossible to determine the original flint type. 12mm by 3mm by 2mm. *BYP06; Gully 25; context 1422; Site Phase 4*

4 An awl on a secondary blade. The distal end of this tool has been worked to a point with unifacial, abrupt, stepped removals. There is considerable wear and rounding extending 11mm from the tip. Some attempt has been made to straighten the original flake by a series of invasive, sub-parallel, low angle removals along the left, ventral edge. The tool is made on an opaque olive grey (5Y 3/2) flint with an eroded cortex suggesting a derived source. 56mm by 17mm by 7mm. *BYP07; Ditch 37; context 1599; Site Phase 4*

5 An end scraper on a secondary flake. The tool is made with very fine, short, semi-abrupt, scaled removals along the distal end. This end is also slightly smoothed suggesting a level of use. The scraper is on a light olive grey flint of poor translucency with a highly worn cortex. 31mm by 18mm by 5mm. *BYP05; unstratified*

Quern fragment by Dave Heslop, with geological identification by Geoff Gaunt

Catalogue

1* Half fragment of beehive quern broken vertically, with a hammer blow on the grinding face - the scar clearly evident (Fig. 30). A large piece has been broken off the lower profile, through the single handle hole. Roughly hemispherical form with upright neck, but not collar - the lower profile is curved but the upper is straight, to emphasize the lip. The handle hole is of conical section, and circular cross-section, the aperture missing, but the extant socket penetrates 60mm into the body. The outer wall is well-made, with regular fine pecked tooling on body and hopper, giving a very regularly, dimpled surface. The grinding face has been worn smooth, and is slightly concave, particularly towards the outer margin. Sandstone, pale greyish brown, medium to (sparsely) coarse grained, moderately sorted, fairly well compacted. Coal Measures, most likely from Glass Houghton Rock or Ackworth Rock (Appendix 7). *BYP06; unstratified*

7 Environmental Record

Human bone by Malin Holst

Introduction

A total of seven inhumed skeletons were recovered during the excavations. The majority of burials were found in the central western part of the excavation area, with the exception of Skeletons 1 and 10, which were interred in the southern part of the excavation.

The burials were in graves, which were often truncated by ploughing. Four of the skeleton were interred in supine extended positions (Table 7), while one skeleton lay flexed to the right and another was flexed the left. While the torso of Skeleton 2 was supine, the legs were flexed to the left. Four of the skeletons were interred with the heads to the north and the feet to the south. Skeleton 1 was buried with a west to east orientation, Skeleton 3 east to west, and Skeleton 10 was orientated southwest to northeast. Some of the burials contained artefacts, the majority of which were ferrous.

Table 7. Summary of archaeological information of complete skeletons

Skeleton No.	Position	Orientation	Artefacts	Feature type	Radiocarbon date (95.4% probability)
1	Supine extended	West to east	Ferrous object (1)	Grave pit	AD 250-420
2	Supine with legs flexed to left	North to south	Ferrous objects (2)	Grave pit	AD 250-420
3	Supine extended	East to west	Ferrous object (1)	Grave pit	AD 130-390
5	Supine extended	North to south	Animal tooth (1)	Grave pit	AD 230-410
6	Flexed on right	North to south	Pot (1), ferrous nails (9), copper alloy object (1), animal bone (3)	Grave pit	AD 130-340
8	Supine extended	North to south	-	Grave pit	AD 230-410
10	Flexed on left	South-east to north-west	-	Grave pit	800-720 BC 700-540 BC

Aims and objectives

The aim of the skeletal analysis was to determine the age, sex and stature of the skeletons, as well as to record and diagnose any skeletal manifestations of disease and trauma.

Methodology

The skeletons were analysed in detail, assessing the preservation and completeness, as well as determining the age, sex and stature of the individuals (Appendix 8). All pathological lesions were recorded and described.

Osteological analysis

Preservation

Skeletal preservation depends upon a number of factors, including the age and sex of the individual as well as the size, shape and robusticity of the bone. Burial environment, post-depositional disturbance and treatment following excavation can also have a considerable impact on bone condition. Preservation of human remains is assessed subjectively, depending on the severity of bone surface erosion and post-mortem breaks, but disregarding completeness.

Preservation was assessed using a grading system of five categories: very poor, poor, moderate, good and excellent. Excellent preservation implied no bone erosion and very few or no post-depositional breaks, whereas very poor preservation indicated complete or almost complete loss of the bone surface due to erosion and severe fragmentation.

None of the skeletons were well preserved. One of the skeletons was in a moderate condition (Table 8). The bones exhibited severe erosion and had suffered from some post-mortem breaks. The majority of skeletons (71%) were poorly preserved and showed severe evidence for erosion and many post-mortem breaks. One skeleton was very badly preserved, with fragmentation of the bone into tiny pieces. The severe erosion evident on all bones meant that any surface pathology would have been lost.

Table 8. Summary of osteological and palaeopathological results

Skeleton No.	Preservation	Completeness	Age	Sex	Stature	Pathology
1	Moderate	75%	46+	Male	-	Spinal DJD, bone excavations
2	Poor	45%	26+	Female?	-	-
3	Poor	60%	46+	Male	162.3 ± 3.27cm	Spinal DJD, tibial *osteochondrosis dissecans*, bone excavations, *enthesopathies*
5	Poor	35%	18+	Male	-	Coxa vara, DJD in hands
6	Poor	65%	26+	Female	-	Spinal DJD
8	Very poor	10%	4-7	-	-	-
10	Poor	65%	36+	Male	-	Spinal DJD

The shallow nature of the burials, combined with truncation of some graves by ploughing had caused the loss of the majority of spongy bones, including the spine's and joints. Additionally, many of the smaller bones, such as fingers and toes had been lost. As a result, the skeletons were only between 10% and 75% complete (see Table 8).

Minimum number of individuals

A count of the 'minimum number of individuals' (MNI) recovered from a cemetery is carried out as standard procedure in osteological reports on inhumations in order to establish how many individuals are represented by the articulated and disarticulated human bones (without

taking the archaeologically defined graves into account). The MNI is calculated by counting all long bone ends, as well as other larger skeletal elements recovered. The largest number of these is then taken as the MNI. The MNI is likely to be lower than the actual number of skeletons which would have been interred on the site, but represents the minimum number of individuals which can be scientifically proven to be represented.

A total of six adult acetabuli (hip joints) and proximal femora suggested a MNI of six adult individuals. There was a juvenile MNI of one individual. Thus, the count of the skeletal joints suggests that a MNI of six adults and one juvenile are represented in the Byram Park assemblage.

Assessment of age

Age was determined using standard ageing techniques, as specified in Scheuer and Black (2000a; 2000b) and Cox (2000). Age estimation relies on the presence of the pelvis and uses different stages of bone development and degeneration in order to calculate the age of an individual. Age is split into a number of categories, from foetus (up to 40 weeks in *utero*), neonate (around the time of birth), infant (newborn to one year), juvenile (1-12 years), adolescent (13-17 years), young adult (18-25 years), young middle adult (26-35 years), old middle adult (36-45 years), mature adult (46+) to adult (an individual whose age could not be determined more accurately as over the age of seventeen).

In the majority of cases age was based on the skeletal fusion and the tooth wear. In those cases where age determination could also be gained from other characteristics, it was found that the tooth wear underestimated the age of the skeleton. It is therefore likely that most of the individuals were under-aged.

One individual was aged over eighteen years old; two individuals were aged over 26; whilst another individual was aged 36 years or older. Two mature adults were relatively complete and so age estimation was also based on the pelvic characteristics (Table 8). Additionally, there was a juvenile, whose age was based on the approximate long bone length and skeletal fusion and calculated to be between four and seven years old.

Sex determination

Sex determination was carried out using standard osteological techniques, such as those described by Mays and Cox (2000). Assessment of sex in both males and females relies on the preservation of the skull and the pelvis and can only be carried out once sexual characteristics have developed, during late puberty and early adulthood. It was possible to determine sex in all six adults. One female and a possible female (Skeletons 2 and 6) were present; the remaining four adults were all had definite male traits (see Table 8).

Metric analysis

Stature depends on two main factors, heredity and environment. However, stature can also fluctuate between chronological periods. Stature can only be established in skeletons if at

least one complete and fully fused long bone is present. The bone is measured on an osteometric board, and stature is then calculated using a regression formula developed upon individuals of known stature.

Based on measurements of the femur, male Skeleton 3 was 162.3cm tall, with a standard error of ± 3.27cm. The stature of this skeleton was lower than the mean stature for Roman males calculated by Caffell (1997), which is 169.03cm.

Leg measurements were obtained from the femora and tibiae and used to calculate robusticity indices. The *platymeria* index is a method of calculating the shape and robusticity of the femoral shaft. Of the seven femora that could be measured, all were *platymeric* (broad and flat). The *platycnemia* index of the tibiae was calculated in order to establish the degree of tibial shaft flatness. A total of four tibial shafts could be measured. Three were *eurycnemic* (of average dimensions), while one tibia was *mesocnemic* (flat).

It was not possible to measure any of the skulls fully to calculate the cranial shape, as the skulls were incomplete and very fragmentary.

Non-metric traits

Non-metric traits are additional sutures, facets, bony processes, canals and foramina, which occur in a minority of skeletons and are believed to suggest hereditary affiliation between skeletons (Saunders 1989). The origins of non-metric traits have been extensively discussed in the osteological literature and it is now thought that while most non-metric traits have genetic origins, some can be produced by factors such as mechanical stress (Kennedy 1989) or environment (Trinkhaus 1978). A total of thirty cranial (skull) and thirty post-cranial (bones of the body and limbs) non-metric traits were selected from the osteological literature (Buikstra and Ubelaker 1994; Finnegan 1978; Berry and Berry 1967). The majority of non-metric traits were observed on the skull and these were anomalies that would not have affected the individual.

No cranial non-metric traits were noted in the Byram Park skeletons, largely due to the incomplete and fragmentary nature of the skulls recovered.

Cranial traits are more likely to be genetic in origin than those noted on the remaining part of the skeleton, which can often be created by mechanical stress. The latter traits included *hypotrochanteric fossae*, which are depressed areas at the back of the femora at the attachments of the *gluteus maximus* bottom muscle and these were noted in four skeletons (Skeletons 1, 6, 8 and 10) A similar type of muscular trauma is the *third trochanter*, which is a raised area thought to reflect strain on the muscle; these were noted in a further skeleton (Skeleton 3). Other post-cranial traits observed included *circumflex sulcus* (a groove on the scapula; Skeleton 10) and *exostosis in trochanteric fossa* (Skeleton 5). The latter trait is thought to reflect muscle strain to the *obturator externus* muscle. None of these traits would have caused any symptoms.

Conclusion

The osteological analysis of the skeletal remains identified a juvenile, four adult males, a female and a possible female. The majority of adults were too badly preserved to determine age accurately, but were probably middle-aged. There were also two mature adults. The evidence suggests that those individuals that survived birth and the first few months of life were likely to survive to middle age.

Stature could only be calculated in the case of a male adult, who was of much lower stature than the Roman average. The skeletons were well-built with strong muscle attachments, particularly at the hip and thigh.

Pathological Analysis

Pathological conditions (disease) can manifest themselves on the skeleton, especially when these are chronic conditions or the result of trauma to the bone. The bone elements to which muscles attach can also provide information on muscle trauma and excessive use of muscles.

Degenerative joint disease

The most common type of joint disease observed tends to be degenerative joint disease (DJD). DJD is characterised by both bone formation (osteophytes) and bone resorption (porosity) at and around the articular surfaces of the joints, which can cause great discomfort and disability (Rogers 2001).

Four of the adults suffered from spinal joint disease (Skeletons 1, 3, 6 and 10). Two of the males, Skeletons 1 and 3, were mature adults, the third male, Skeleton 10, was aged 36 years or older and the age of the female (Skeleton 6) was at least 26 years old. The DJD was slight to moderate and only affected the lumbar vertebrae, which survived much better than the remainder of the spine. It is likely that much more DJD would have been observed had the joints and vertebrae survived in better condition.

The distal hand phalanges (finger tips) of Skeleton 5 showed evidence for osteophyte formation (outgrowths of bone) indicative of joint degeneration. The right hip joint of Skeleton 1 also showed evidence for slight DJD.

Trauma

Occasionally, it is possible to infer trauma to the soft tissue on the bones, in the form of ligamentous or muscular trauma. This is expressed through the formation of bony processes (*enthesopathies*) at the site of ligament attachments. Additionally, it is possible to observe bone defects at the site of muscle insertions, which are the result of constant micro-trauma and are usually activity-related (Hawkey and Merbs 1995, 334).

The majority of muscular trauma was noted in the legs. Skeleton 3 exhibited bone excavations at both humeri for *teres major* and *pectoralis major*, two of the rotator cuff muscles that aid in movement of the shoulder. Bone excavations were noted on the ulnae of

Skeletons 3 and 6 at the attachment of *brachialis,* which flexes the forearm (Stone and Stone 1990).

Skeleton 3 had bone defects at the attachments of the *soleus* muscle, which flexes the foot downwards (Stone and Stone 1990, 185); this type of trauma may be related to squatting. Skeleton 1, 3, 6, 8 and 10 showed evidence for muscular strain to the *gluteus maximus*, the main muscle of the bottom, which extends and laterally rotates the hip joint and extends the trunk.

Miscellaneous pathology

Circular cortical defects were seen on both knees (lateral condyles of proximal femora) of Skeleton 6. Unfortunately, the bones were badly eroded. However, it could be determined that the lesions were large (14.1mm in diameter) and consisted of circular lesions. It is probable that these defects were *osteochondritis dissecans* lesions. This condition is characterised by necrosis (death) of part of the joint area, with separation of a small bone fragment from the joint surface, which can then become disconnected and remain as a loose body within the joint capsule, or it may be resorped or become re-attached. *Osteochondritis dissecans* is most commonly observed at the knee, ankle and elbow (Aufderheide and Rodríguz-Martín 1998, 82). The condition tends to have little effect in adolescents, who are most likely to suffer from *osteochondritis dissecans*. Adults with the condition, on the other hand, can suffer pain, interlocking and instability of the joint (Clanton and DeLee 1982, 59). The initiating mechanism for *osteochondritis* is now thought to be multifactoral, and related to trauma at a susceptible location (Frederico *et al.* 1990). *Osteochondritis* is associated with other conditions which lead to fragmentation and collapse of joints, such as Scheuermann's disease of the spine and Perthes' disease of the hip (Roberts and Manchester 1995, 87), all of which affect males more often than females.

The femora of Skeleton 5, a badly preserved male who was at least eighteen years old, had short and horizontal femoral necks and the head of the femur was below the level of the greater trochanter. This condition (*coxa vara*) is not present at birth, but develops slowly due to a congenital ossification defect of the femoral neck (Salter 1999). Because of the defect, the muscles of the hip cannot hold the pelvis level during walking, and the individual will have had a lurching (although painless) type of limp (*ibid*).

Conclusion

Little skeletal evidence for pathology was observed. This was probably due to the severe surface erosion of the skeletons and poor preservation of the joints and vertebrae, which meant that most joint and superficial pathology would have been lost.

The individuals from Byram Park were physically active. This was indicated by the widespread muscular trauma, especially to the hips and forearms. Most of the adults exhibited spinal lesions indicative of joint degeneration, which is thought to have been age-related.

Two of the adults showed evidence for joint problems. A male mature adult had lesions on both knees indicative of trauma. A second male, who was at least eighteen years old, had a congenital condition affecting the hip joints, which would have caused a lurching limp.

Dental health

Analysis of the teeth from archaeological populations provides vital clues about health, diet and oral hygiene, as well as information about environmental and congenital conditions.

Few of the jaw bones had survived in the ground as a result of post-depositional factors. Only four of the skeletons had jaws and teeth. Of the four adults with teeth, a total of 94 tooth positions were present, and 93 teeth were recovered (Table 9). One tooth had been lost ante-mortem, and no teeth had been lost post-mortem. However, this is unlikely to reflect the true prevalence, as most of the surviving jaws were very fragmentary and eroded and it was thus not possible to assess in most cases whether teeth had been lost or not.

Table 9. Summary of dental pathology

SK No.	Number of teeth present	Calculus	Caries	Abscesses	DEH	Infractions	Wear	Periodontitis
1	11 permanent	1	1	-	-	-	Severe	-
2	-	-	-	-	-	-	-	-
3	24 permanent	-	2	-	2	-	Moderate	-
5	-	-	-	-	-	-	-	-
6	31 permanent	9	1	-	-	-	Moderate	-
8	-	-	-	-	-	-	-	-
10	27 permanent	-	3	-	6	-	Severe	-

Dental wear tends to be more common and severe in archaeological populations than in modern teeth. Severity of the dental wear was assessed using a chart developed by Smith (1984). Each tooth was scored using a grading system ranging from 1 (no wear) to 8 (severe attrition of the whole tooth crown). The wear was moderate to severe and did not show a correlation with age.

Calculus (dental plaque) is commonly observed in archaeological populations whose dental hygiene was not as rigorous as it is today. Calculus mineralises and forms concretions on the tooth crowns, along the line of the gums. Calculus was observed in a small number of teeth (11%), and was slight to moderate (see Table 9). The calculus prevalence rate at this site was much lower than the Roman prevalence of 43.4% (Roberts and Cox 2003, 132). This is probably related to the poor preservation of the skeletons and teeth, which would also have affected calculus survival. Periodontitis (receding gums) and dental abscesses were not observed, due to the severe erosion of the jaw bones (see Table 9).

Cavities are multifactoral in origin, but develop as a result of aggressive bacterial attack in the presence of sucrose (Hillson 1996, 282) and fermentable carbohydrates (Roberts and Manchester 1995, 47). All four skeletons had cavities (see Table 9). This gives a prevalence rate of 7.5% of caries lesions in this population, which is exactly the same as the overall Roman prevalence rate of 7.5% (Roberts and Cox 2003, 132).

Another type of dental pathology observed was *dental enamel hypoplasia* (DEH). DEH is the manifestation of lines, grooves or pits on the crown surface of the teeth, which represent the cessation of crown formation. The defects are caused by periods of severe stress during the first to seventh year of childhood, including malnutrition or disease. DEH was observed in six teeth (6.5%), which belonged to a female and a male (see Appendix 8). The prevalence of DEH was lower compared to the prevalence rate for the Roman period, at 9.1% (Roberts and Cox 2003, 140).

The dental health of the four adults with teeth was moderate, with little calculus formation, which was probably due to its loss through post-depositional factors, and the Roman average rate of cavities. Periodontal disease and abscesses could not be observed because of the poor survival of the jaw bones. The prevalence rate of *dental enamel hypoplasia* was lower than that for the Roman period, suggesting that some of the children at Byram Park did not suffer from severe episodes of hardship during the first seven years of childhood.

Mortuary practise

The funerary ritual at Byram Park was varied, with skeletons buried in different positions and orientations. The five skeletons in the central area of the site were interred in a cluster, at the most 6m apart. Skeletons 1 and 10, both male adults, were between 50m and 60m to the south of this cluster and approximately 60m apart.

Discussion and summary

The osteological analysis of the skeletal assemblage has provided a glimpse into the lives of the people buried there. Funerary use of the site is thought to largely date to the mid to late Romano-British period, although radiocarbon dating has revealed one skeleton dated to the Iron Age

Burial occurred partly in formal grave pits, usually in a north to south direction and extended supine position, though other orientations and flexed positions were observed. The skeletal remains were in a very poor to moderate condition and therefore largely incomplete. The small group of skeletons included one female, one possible female, four males and one juvenile.

It was often difficult to estimate age accurately and it is thought that several individuals are under-aged. However, the demographic data together with the palaeopathological evidence suggest that the risk of dying was greatest in older adulthood. This, together with the relative scarcity of lesions indicative of childhood stress, suggests that the individuals from Byram Park endured relatively little suffering in the form of malnutrition or disease. Only two

individuals displayed lesions on the teeth indicative of arrested growth as a result of disease or malnutrition during the first seven years of childhood. However, the presence of the single juvenile indicates that not everyone survived childhood. This child died aged between four and seven years, a time when children would suffer from the common childhood diseases, which could cause fatalities. Alternatively, it is possible that childhood mortality was greater, but that younger children were buried elsewhere.

Evidence for trauma to those muscles responsible for hip and forearm movement was noted in many of the skeletons. This, together with evidence for spinal and other joint disease noted in four of the adults, suggested that these people carried out physically demanding activities. It is likely that involvement in these activities began in the late teens and continued throughout life.

One mature adult male had lesions on the knees indicative of trauma, while another individual had a congenital defect of the hip joints, leading to a lurching limp.

Cremated bone by Malin Holst

The single assemblage of cremated bone was osteologically analysed. Most of the bone was charred, and black in colour, while some bone fragments had been well-calcined and were white (Table 10). According to McKinley (1989), the body requires a minimum temperature of 500° Celsius over seven to eight hours to achieve complete calcination of the bone. The bone was of very unusual consistency; with an almost fossilised feel to it.

Table 10. Summary of the assemblage preservation

Context No.	Feature Type	Inclusions	Bone State	Preservation	Age	Sex	Weight (g)
1042	Ditch terminus	Burnt artefacts	Black to white	Moderate	Adult	-	34.4

The fragment size of cremated bone is frequently attributed to post-cremation processes. This is because skeletal elements retrieved from modern crematoria tend to be comparatively large before being ground down for scattering or deposition in the urn. Bone is also prone to fragmentation if it is moved while still hot (McKinley 1994, 340). Most of the bone was derived from the 10mm sieve (Table 11).

Table 11. Summary of cremated bone fragment size

Context No.	10mm (g)	10mm (%)	5mm (g)	5mm (%)	2mm (g)	2mm (%)	Residue	Weight (g)
1042	24.6	71.5	8.3	24	1.5	4.5	-	34.4

The quantity of cremated bone recovered was 34.4g (see Table 11). The amount of bone retrieved from the burials weighed considerably less than that produced by modern

crematoria, which tends to range from 1000.5g to 2422.5g with an average of 1625.9g (McKinley 1993). Wahl (1982, 25) found that archaeologically recovered remains of cremated adults tend to weigh less (between 250g and 2500g), as a result of the commonly practised custom of selecting only some of the cremated bone from the pyre for inclusion in the burial, thereby representing a symbolic, or token, interment. The burial from Byram Park produced 2% of the quantity of bone expected to remain following cremation.

It was possible to identify 73% of the skeletal elements in the burial (Table 12). The majority of bone elements recovered derived from the lower limb or were unidentifiable long bone fragments.

Table 12. Summary of identifiable elements in the cremation burials

Context No.	Skull (g)	Skull (%)	Axial (g)	Axial (%)	UL (g)	UL (%)	LL (g)	LL (%)	UIL (g)	UIL (%)	Total ID (g)	Total ID (%)	Total UID (g)	Total UID (%)
1042	0.7	3	1.7	7	-	-	12.3	49	10/4	41	25.1	73	9.3	27

It was possible to identify age in the individual, based on the size of the bones and the fact that the distal tibia was fully fused. This suggested that the individual was at least eighteen years old. It was not possible to identify the sex of the individual.

Animal bone and shell by Jane Richardson

In total, 3430 animal bone fragments and four oyster shells were recovered (Table 13). The data are presented by phase, although too few bones and shells were retrieved to allow comparisons between the phases, particularly when bone zones (easily identifiable and non-reproducible parts) are considered (Table 14). The latter fall well below the minimum reliable sample size of around 500 (with reference to a number of statistical parameters after van der Veen and Fieller 1982, 296).

Methodology

Bones were identified to taxa wherever possible, although lower-order categories were also used (e.g. sheep/goat, cattle-sized). The separation of sheep and goat bones was routinely attempted, using the criteria of Boessneck (1969) and Payne (1969, 1985). As the assemblage was small, all fragments were recorded although identification of diagnostic element zones was also made.

For age-at-death data, epiphyseal fusion (after Silver 1969) and the eruption and wear of deciduous and permanent check teeth were considered. Dental eruption and wear were recorded using the letter codes of Grant (1982).

Bone condition, erosion, fragment size and fresh breaks were recorded in order to assess bone preservation, while gnawing, burning and butchery marks were noted to determine bone treatment. Butchery was routinely differentiated into chop and cut (knife) marks and the

position and direction of these marks were noted in order to identify dismembering, filleting and skinning activities.

Given the fragmented nature of the assemblage, the recovery of biometrical data was not attempted, but pathological bones were noted.

Results

The assemblage is of questionable relevance due to its small size, the broad chronological framework involved, and the fragmented, poorly preserved nature of many of the bones. The very low proportion of bones identified as diagnostic zones (8%) is a reflection of the highly fragmented nature of the assemblage. Gnawing, butchery and burning, however, are rare (one, eight and nineteen bones respectively). Interestingly the eight butchered bones are exclusively horse metapodials from a single Phase 3 deposit, the secondary fill (1042) within the terminus of Ditch 8. All bone fragments had been sawn and they are likely to represent waste from a bone worker. Horse metapodials are regularly worked as they provide a suitable length of straight bone. Interestingly, the worked horse bones (none of which were burnt) were found in association with the cremated human remains and copper-alloy and iron objects from Ditch 8.

The Phase 3 assemblage is exclusively recovered from ditch deposits and is dominated by undiagnostic cattle-sized limb bone fragments, and cattle loose teeth and lower limb bone fragments. These may indicate the disposal of primary butchery waste (i.e. low-utility parts such as heads and feet that might be discarded at the place of slaughter). The data, however, are sparse and this interpretation is tentative at best. Age data are also scarce and only sub-adult and adult cattle were noted.

The Phase 4 assemblage is also dominated cattle and cattle-sized bones, including by a partial cattle skeleton from Pit 1130, in addition to part of the vertebral column of a second animal (Plate 11). This deposit of a cow aged *c*.7 to 10 years at death (after Halstead 1985) and a cattle back bone probably represents a structured deposit representing ritualised activity. Its possible association with nearby human burials makes the likelihood of ritual activity more likely. Whole or a major potion of a carcass *directly* associated with inhumations are known but are more commonly sheep or goat (Philpott 1991, 203). A total of 40 bones from Phase 4 were recovered from the graves themselves. The presence of vole, mouse and amphibian bones are likely to represent later intrusions, however, while a single sheep's tooth and a few bird foot bones were probably introduced as the graves were backfilled. The remaining cattle bones and the few sheep bones from non-grave contexts presumably represent food consumption. Certainly bones associated with meat-rich parts of the body are present, as well as bones from sub-adult cattle and sheep, most likely raised specifically for their meat.

The majority of Phase 6 bones represents an adult male sheep skeleton recovered from Pit 1396 and adult goat bones from Gully 25 that may represent another partial skeleton. The sheep had suffered from an ossification of ligaments following a strain or dislocation,

commonly referred to as ‘penning elbow’. As the name suggests, this trauma (leading to joint disease) can occur when animals are closely corralled (Baker and Brothwell 1980, 127).

Table 13. Animal bone and shell fragments by phase

Phase	3	4	5	6	Unphased	Total
Cattle	68	1480		10	27	1585
Cattle-sized	622	224		17	7	870
Horse	26	2				28
Pig	4	3			2	9
Pig-sized		1				1
Sheep	1	1		471		473
Sheep/goat	10	24		11	2	47
Goat				30		30
Sheep-sized	41	69		100	18	228
Dog		56		1	1	58
Bird sp.		10				10
Vole sp.		3				3
Mouse sp.		5				5
Frog/toad	1	29		1	1	32
Undiagnostic	3	28	1	11	8	51
Oyster		4				4
Total	776	1939	1	652	66	3434

Table 14. Animal bone and shell zones by phase

Phase	3	4	6	Unphased	Total
Cattle	9	84	2	23	118
Horse	23	1			24
Pig	4	1			5
Sheep	1	1	59		61
Sheep/goat	3	4	2	1	10
Goat			8		8
Dog		4		1	5
Bird sp.		7			7
Frog/toad	1	29	1	1	32
Oyster		1			1
Total	41	132	72	26	271

Conclusions

Unfortunately the bone assemblage is too small for meaningful interpretation and any conclusions reached here should be treated with caution. Nevertheless, Phase 3 bone may represent primary butchery and bone working waste (the latter associated with a funerary deposit), while some meat consumption and the deposit of a cow and part carcass in association with human burials can be associated with Phase 4. During the post-medieval period (Phase 6) a sheep was deposited in Pit 1396 and a partial goat skeleton was deposited in Gully 25.

Carbonised plant macrofossils and charcoal by Diane Alldritt

Introduction

A total of 148 flots were analysed for carbonised plant material including charcoal. A further nineteen bags of possible charred material sorted from the retents were also examined.

Methodology

Bulk environmental samples were processed by ASWYAS using an Ankara-style water flotation system (French 1971), a 1mm mesh and a 300 micron sieve. Flots were subsequently dried prior to sorting and identification. All charcoal suitable for identification was examined using a high powered Vickers M10 metallurgical microscope. The reference photographs of Schweingruber (1990) were consulted for charcoal identification. All charcoal was bagged separately by type. Plant nomenclature utilised in the text follows Stace (1997) for all vascular plants apart from cereals, which follow Zohary and Hopf (2000).

Results

Catalogued data results are presented by phase in Appendix 9, Table 16 for FOQ99; Table 17 for BYP05; Table 18 for BYP06 and Table 19 for BYP07.

Charred plant material was extremely scarce in the majority of samples examined, with typically <2.5ml of carbonised remains visible. Occasionally a few samples produced from 15ml to up to 60ml of material, with most of this being degraded cereal grain or charcoal. Samples 40 (1052) and 151 (1446) were the most abundant with 80ml and 200ml of carbonised fragments, almost all cereal grain, which will be discussed in detail below. Due to the large volume of cereal in these two samples only a 25% portion was fully examined from each, with the remainder of the sample scanned. In contrast thirteen bulk samples processed from the 2007 season produced no flot whatsoever, hence these are listed in the appropriate table but will not be discussed further, and are not included in the total number of samples given in the introduction. Modern root material was in evidence throughout the samples, generally from <2.5ml to 30ml in volume, but could be considered scarce overall. Occasional modern (non-carbonised) seeds were also encountered and probably represent general background material.

Discussion

The environmental samples produced a limited range of carbonised plant material, which consisted mostly of cereal grain, a little charcoal and very few weed seeds. Abundant non-marine mollusc shells were also visible throughout a large portion of the samples, and a small amount of bone was recovered. Fewer shells were seen in the BYP07 samples, than from the previous seasons. Approximate shell amounts per sample have been estimated and included in the four tables. Occasional remains of burnt peat-like material and other cindery vesicular burnt organic fragments were present in both the BYP06 and BYP07 samples.

The majority of the cereal grain present was poorly preserved and vesicular, and consisted mainly of wheat types, with very little barley or oats. The degraded nature of the grain meant it was often not possible to separate the various cereal types, although the evidence overwhelmingly pointed to an abundance of *Triticum aestivum* sl. (bread/spelt wheat). Interestingly, two fragments of *Triticum spelta* (spelt wheat) glume base were identified from sample 54 (1091) indicating that a proportion of the wheat was probably the spelt type. Scarce examples of *Hordeum vulgare* var. *vulgare* (hulled barley) and *Hordeum vulgare* sl. (barley) were also encountered, together with rare specimens of *Avena* sp. (oat). No cereal grain was recovered from FOQ99. The evidence from BYP05 and BYP06 is skewed slightly by the two large cereal samples, number 40 from the fill of unphased Pit 1053 (1052) and sample 151 from a fill of the Phase 4 corn drier 1436 (1446), with the remainder of the samples producing single specimens or low numbers of grain by comparison. Another Phase 4 context (1446, sample 151) is notable for containing more grain than all the other samples, mostly spelt wheat type, but with low numbers of barley and oats also present. These large concentrations are very different from the remainder of the site and confirm the interpretation of context 1436 as part of a corn drier, while indicating that Pit 1053 was used to dump waste material from cereal drying or cooking.

Carbonised weeds were recovered from four Phase 4 feature fills (Graves 1016, 1067 and 1071 and Ditch 11) as well as two unphased pits (1053 and 1094), which on the basis of their weed content might be regarded as potentially Phase 4 features. Weeds of *Chenopodium album* (fat hen) and *Polygonum aviculare* sl. (knotgrasses) indicated waste ground or land disturbed for agriculture. A single *Vicia* sp. (vetch) from 1071 may have been a cultivar or a field weed. Overall, weeds were scarce and did not provide very much information regarding the local crop ecology. The lack of weeds present in the samples could suggest a clean cereal crop arriving at the site, or at least, a crop that has been partially processed elsewhere.

Charcoal fragments large enough to identify were present in eight samples from a range of phases. These pieces were identified as *Quercus* (oak), *Corylus* (hazel), *Betula* (birch) and cf. *Betula* (cf. birch), with occasional fragments found to be indeterminate due to poor preservation. Oak was the most regularly encountered charcoal type, with the largest amount coming from Phase 3 Ditch 8 (1042). The fill of a Phase 3 pit (1283) also produced frequent charcoal most of which was hazel. Hence, it is likely that oak woodland was being exploited

for fuel, but the presence of lighter, more open wooded areas or woodland edges was suggested by the use of hazel.

It is interesting that occasional pieces of burnt peat-like or vesicular organic material were recovered in samples from a range of phases. Many of these fragments were cindery and brittle in nature, although it was sometimes possible to distinguish the more peat-like organic material from the vesicular cindery (possibly industrial) material examined.

Conclusions

The bulk environmental samples produced a large amount of carbonised cereal grain concentrated in a very few, predominantly Phase 4 (Roman) samples, whilst the majority of the one hundred and forty-eight samples analysed produced single specimens or low numbers of macrofossils only. Cereal grain dominated the overall assemblage, with large amounts of bread/spelt wheat recovered, in particular from the two large cereal samples, and it is most likely that spelt wheat was the main cereal type in use at the site in the Roman period. Trace amounts of barley and oats were also present, but their relative importance is difficult to gauge given that the two large samples skew the data in favour of wheat. The evidence from bread/spelt wheat may represent a single day's worth of corn drying in a cereal drying kiln. Therefore it is important that the presence of barley and oats is not overlooked, as they may have had a role in the feeding of both humans and animals at the site.

Oak and hazel were the main charcoal types recovered, with trace indications of birch. These types indicated mixed deciduous woodland, probably with some oak trees in the area, but also with lighter open areas or woodland edges being exploited for fuel and construction purposes. There is also some suggestion that peat lands were cut for fuel, and in occasional samples a more vesicular brittle burnt material was encountered which may also be organic in origin.

Mollusc remains by John Carrott and Alex Beacock

Introduction

In total 148 washovers from pre-processed bulk sediment samples ('GBA'/'BS' *sensu* Dobney *et al*. 1992), mostly from fills of ditches, pits, graves and other cut features across the site, were submitted for an assessment of their bioarchaeological/palaeoecological potential. The washovers were from samples taken during four phases of excavation of the site.

Method

A large number of bulk sediment samples from the site were processed to 1mm (with a 300 micron sieve for the lighter washover fraction).

All of the 148 washovers submitted were examined for their content of mollusc remains. The washovers were scanned and the remains were identified to species (main sources Cameron 2003, Cameron and Redfern 1976, Ellis 1969, Kerney 1999, Kerney and Cameron 1979) where possible.

The abundance of the snail taxa present was recorded semi-quantitatively on a four-point scale: f – few (up to 3 individuals); s – some (4 to 20 individuals); m – many (21-50 individuals); vm – very many (more than 50 individuals). Where minimum numbers of individuals could be readily determined counts were recorded.

Brief notes were made of other biological remains where present.

Results

Catalogued information for the snail assemblages is presented in Appendix 10, Tables 20 to 23 (for site codes: FOQ99, BYP05, BYP06 and BYP07 respectively), in context number order.

With a small number of exceptions, the bulk of the material in each washover comprised varying proportions of modern rootlet (and sometimes other modern plant remains such as 'straw', seeds/fruits), fine sediment 'dust', charred remains (i.e. cinder, charcoal, charred grain) and coal. There were occasional washovers where the snail assemblage was the dominant component, for example: FOQ99 context 211 – primary fill of Ditch 32; Byram Park Phase 3 context 1277, the primary fill of Ditch 11; Phase 4 contexts 1009, 1084 and 1446, the primary fills of Ditches 1 and 26 and the secondary fill of corn drier 1436 repectively and unphased contexts 1052 and 1250, the primary fills of Pits 1053 and 1251. The vast majority of the deposits with snail assemblages were from features dated to the Roman period or not assigned to a particular group; the exceptions being Phase 3 context 1533 from Ditch 34, and Phase 6 contexts 1191 (from Gully 17), context 1496 (Pit 1497), and 1522 (Post-hole 1523).

All but fourteen of the washovers gave at least a few snail remains and for almost all of these the assemblage was dominated by *Cecilioides acicula* (the unphased Pit 1290 contained a few other snails but no *C. acicula*). This is a burrowing species which may penetrate to more than two metres depth in well-drained soils, living in cracks and rootlet holes. Its remains almost certainly represent modern intrusions into the deposits – as do the ubiquitous modern rootlets and earthworm egg capsules; there were also some likely contaminants e.g. modern beetles, arthropods and cereal 'straw' fragments present in some of the washovers. Discounting the *C. acicula*, most of the deposits yielded very small to moderate assemblages of land snails, with occasional records of taxa associated with waterside vegetation (small succineids – Phase 2 context 1413 (Grave 1414); Phase 3 contexts 1271 (ditch 6) and 1301 (Post-hole 1302); Phase 4 contexts 1015 (Grave 1016), 1019 (Grave 1020), 1064 (corn drier 1065), and 1070 (Grave 1071); Phase 5 context 1387 (Gully 21); Phase 6 contexts 1054 (Furrow 10), 1349 (Pit 1350), 1351 (Pit 1352) and 1415 (Gully 25); and unphased contexts 1250 (Pit 1251) and 1257 (Pit 1258). A single record of a freshwater planorbid (Phase 4 context 1070 of Grave 1071) was also noted.

The shells of smaller snail taxa were moderately well preserved, but those of larger forms were often fragmented and unidentifiable shell fragments were almost always present.

Definite species level identifications were quite often prevented by small amounts of encrusted sediment obscuring diagnostic features (e.g. in the mouth of the shell), however.

Discussion and statement of potential

Most of the assemblages of snails other than *Cecilioides acicula* were rather small to be of interpretative value in isolation but, taken as a whole, they consistently reflect an open landscape of mostly dry, calcareous, short-turfed grassland – *Vallonia* species were almost always present in relatively large numbers and sometimes accompanied by *Vertigo* ?*pygmaea*. There were also quite frequent records for *Carychium* and other species (e.g. *Cochlicopa* sp?p.) which would indicate damp (perhaps even wet), well-vegetated, sheltered habitats, and some larger assemblages containing groups of species suggesting ground litter under woodland (*Discus rotundatus*, *Acanthinula aculeata*, *Clausilia bidentata*). One or two assemblages also gave remains of taxa typically found on exposed rock within areas of short, dry, calcareous grassland (*Pupilla muscorum* and *Truncatellina cylindrica*; the latter a rare and still declining species). Lastly, there were the occasional records of taxa associated with waterside vegetation (small succineids) and a single freshwater planorbid.

Some variation of habitats was indicated by the snail assemblages. The landscape appears to have been predominantly open, calcareous, short-turfed grassland, with strong suggestions of areas of woodland in the vicinity of Phase 4 (Roman) Ditches 1, 3 and 6 and Phase 6 (medieval) Furrow 10 at Byram Park, and Phase 4 Ditches 31, 32 and 33 at Foxcliffe Quarry. There were also hints of the presence of woodland, or a least greater vegetative cover (e.g. hedgerow), from Phase 4 Ditch 26 (Byram Park). The assemblage from 1446 (the secondary fill of corn drier 1436) also gave strong hints of woodland but here may represent snails accidentally collected whilst gathering fuel for the corn-drier, but not necessarily the immediate surroundings.

Many of the smaller assemblages from ditch fills contained both dry, open ground taxa and those of damper more shaded habitats – typically both *Vallonia* and *Carychium* species, sometimes together with lesser numbers of other forms of similar environments – but without the indicators for woodland. These most likely represent a mixing of the general fauna of the open landscape with another exploiting the modified (damper, more shaded) environment provided by vegetation (perhaps simply grass sufficiently long to remain permanently damp at the base) growing within the ditches.

The sides of ditches perhaps provided the exposed habitats favoured by the *Pupilla muscorum* and/or *Truncatellina cylindrica* recorded from the primary fills of Phase 4 Ditches 32 and 33 at Foxcliffe Quarry, and Ditches 3, 5, 6 and 26 (Byram Park).

Species indicating standing water were very rare. There was only a single record for an aquatic taxon – the planorbid fragment – and this was recovered from a grave fill (Grave 1071 of skeleton SK6) and probably introduced during the burial. Occasional shells (never more than two individuals per context) of a small succineid, taxa usually associated with

wetland/waterside vegetation, were recovered from fifteen deposits, including the fill of Grave 1071 and three other grave fills. The other eleven contexts with records for this taxa were fills of pits (4), post-holes (2), ditch/furrow/gully (4) and a burnt deposit at the base of the corn drier 1065, and it seems more likely that these were also introduced by human activity rather than representing an aspect of the immediate environment in and around the features.

In summary, the snail assemblages at the site were very similar to those recorded from the Roman period deposits at the nearby site at Ferrybridge (Carrott 2003); though, in general, much smaller. They reflect the same open environment of dry, calcareous, short-turfed grassland, with areas of woodland and both more exposed and more shaded/damper conditions – provided by the sides of, and vegetation growth within, cut features such as ditches. The scarcity of aquatic and waterside taxa suggests that the features did not hold standing water at the time these deposits were formed.

Geology and soil micromorphology by Malcolm Lillie

Introduction

A site visit was made to Foxcliffe Quarry on 9th September 1999 in order to elucidate the nature of a deep subsoil deposit revealed on the site, and to confirm the natural origin of the solution features which had been identified across the area.

Wind-blown deposits

The red-brown wind blown sand deposits overlying the Romano-British ditch features at the site obviously represent a phase of natural re-working of the surficial sand deposits in the vicinity of the site. Post-Roman re-working has been noted further east on the western footslopes of the Wolds in the Vale of York and Trent valleys (Buckland 1982, Gaunt 1994, Lillie and Gearey 1999). The deposits exhibit a fine granular component characteristic of blow sand deposits. Their distribution across the quarry and the fact that they overlie the Romano-British ditches would confirm their origin as being of re-worked aeolian derivation.

Limestone Solution features

The limestone surface in evidence is thinly bedded (0.05m or less on average) and heavily jointed. In general, preferential weathering occurs along joints and bedding planes and can result in the formation of range of features. It is a characteristic of such surfaces that weathering pits, grooves and runnels develop during the solution process. Similar features are more obviously typical of karst landscapes such as the Pennines.

While the solution features in the surface are of a relatively small-scale (often <0.3m diameter), they do indeed follow the linear arrangement suggestive of solution occurring along joints in the limestone surface. This is typical of this form of landscape feature. In addition, the features are also funnel-like in profile, again a characteristic of the morphology of features in this environment.

Excavation of one of these features during the field visit highlighted the existence of a weathered interface between the feature fill and the limestone surface indicating natural sub-aerial weathering processes at this location. This evidence would suggest that the solution features had remained exposed for some indeterminate period of time prior to infilling.

Radiocarbon dating

A radiocarbon dating programme was carried out by the Scottish Universities Environment Research Centre (SUERC). The programme focused on the human remains which, due to a lack of datable finds, were largely undated. Samples from the primary fills of a small number of key features including the corn driers, as well as a small number of linear and discrete features, were also included in the programme. The results are presented in Table 15. They confirm that the inhumations largely date to the Roman period although they introduce the presence of mid to late Iron Age activity on the site.

Table 15. Results of the radiocarbon dating programme

Lab. code	Phase/ context	Feature/group	Sample material	Radiocarbon Age BP	Calibrated Age d1 (68%)	Calibrated Age d2 (95%)	Delta ^{13}C rel. VPDB (‰)
SUERC-17920 (GU-16508)	4/1015	Grave SK1	Human bone	1695±35	AD 260-280 + AD 320-410	AD 250-420	-20.0
SUERC-17921 (GU-16509)	4/1017	Grave SK2	Human bone	1690±30	AD 260-280 + AD 330-410	AD 250-420	-20.2
SUERC-17922 (GU-16510)	4/1019	Grave SK3	Human bone	1763±35	AD 220-340	AD 130-390	-19.7
SUERC-17926 (GU-16511)	3/1042	Ditch 8 terminus (?cremation)	*Corylus* (hazel) sp. charcoal	2020±35	55 BC-AD30 + AD 40-50	160-130 BC + 120 BC-AD70	-25.6
SUERC-17927 (GU-16512)	4/1064	?Corn drier 1065	*Hordeum vulgare* (barley) grain	1745±35	AD 240-340	AD 210-410	-22.2
SUERC-17928 (GU-16513)	4/1066	Grave SK5	Human bone	1735±35	AD 245-345	AD 230-410	-19.5
SUERC-17929 (GU-16514)	4/1070	Grave SK6	Human bone	1785±35	AD 140-150 + AD 160-200 + AD 210-260 + AD 280-330	AD 130-340	-19.9
SUERC-17930 (GU-16515)	4/1129	Pit SK7	Cow bone	1780±35	AD 170-200 + AD 210-330	AD 130-350	-21.5
SUERC-17931 (GU-16516)	4/1149	Grave SK8	Human bone	1725±35	AD 250-380	AD 230-410	-19.7
SUERC-17932 (GU-16517)	3/1255	Gully 15	Horse bone	1945±35	AD 15-85 + AD 105-120	40 BC-AD 130	-22.2
SUERC-17936 (GU-16518)	3/1277	Ditch 11	Large mammal c.f. long bone	2140±35	350-320 BC + 210-100 BC	360-280 BC + 240-50 BC	-22.2
SUERC-17937 (GU-16519)	6/1373	Pit 1374	Cattle bone	340±35	AD 1480-1530 + AD 1550-1640	1460-1650 AD	-20.9
SUERC-17938 (GU-16520)	2/1413	Grave SK10	Human bone	2540±35	800-740 BC + 690-660 BC + 650-590 BC	800-720 BC + 700-540 BC	-20.7
SUERC-17939 (GU-16521)	4/1446	?Corn drier 1436	*Triticum aesitivum* (bread/spelt wheat) grain	1755±35	AD 235-335	AD 130-390	-23.1
SUERC-17940 (GU-16522)	4/1471	?Corn drier 1458	*Triticum aesitivum* (bread/spelt wheat) grain	1710±35	AD 250-300 + AD 320-390	AD 240-410	-21.4

9 Discussion

Dating and phasing the site

Late Iron Age or Romano-British?

With a small number of exceptions, very few discernable stratigraphic relationships could be established, and pottery from the field system, enclosure ditches, and trackway generally presented a broad date range, typically from the mid-2nd to early 4th centuries. Romano-British activity was more visible and more easily dated than that from the Iron Age (Brennand *et al*. 2007, 400), but many of the ditches of apparent Roman date may have had earlier origins. Indeed, the radiocarbon dates from Ditches 8, 11 and 15 were all Late Iron Age.

Radiocarbon dating indicates that Ditch 11 and Gully 15 (and by association Enclosure A) were the earliest features, constructed during the Late Iron Age, forming elements of an irregular curvilinear field system. The common alignment of Ditch 34 suggests it was contemporary with Ditch 11, the only find from this feature significantly being sherd of possible Late Iron Age pottery.

The first major modification of the field system appears to be the addition of Ditches 1, 3, 26 and 37, probably during the early Roman period, converting the curvilinear field system into a rectilinear system. Other additions to the field system that occurred during the Roman period included a series of gullies to the south of the site which were only partially exposed by the excavations. These features possibly form some sort of enclosure and/or trackway(s). A possible trackway was also formed by the construction of Gully 16, which ran parallel to Ditch 1.

Ditch 4 almost certainly represents final major modification to the field system in the Roman period, which probably occurred during the late 3rd or early 4th century. Physically the ditch was much shallower with a broad flat base, compared to the deeper U or V-shaped ditches recorded elsewhere, and although it did contain some pottery which was mid-2nd century, most of the pottery dated to the 3rd or 4th centuries. This ditch divided the field formed by Ditches 1, 3 and 11 into two, mirroring the curvilinear plan of Ditch 11, and cutting across an earlier Romano-British burial area. Associated with Ditch 4 was a gully, represented by Gullies 18 and 27, which may have formed a peripheral trackway, similar to that formed by Ditch 1 and Gully 16 to the south. An enclosure (Gully 28), probably used for livestock management, was constructed in the later Romano-British period exploiting the newly formed corner between Ditches 3 and 4. The corner enclosure and trackway are not contemporary, but unfortunately it was not possible to establish the relationship between the two due the truncated nature of these features.

Late Roman, Anglo-Saxon and Medieval continuity?

Although the enclosure and field system was probably constructed over a number of phases, it is almost certain that the majority of features were in use until at least the 4th-century and

possibly survived as extant earthworks for a much longer period. Two pits (1004 and 1506) were identified containing Huntcliff ware pottery, which dates to the late 4th century, confirming activity at the site until the end of the Roman period, and possibly into the post-Roman period. Interestingly both Late Anglo-Saxon and early medieval pottery was also recovered from the fills of a number of ditches. While the smaller fragments of pottery may be intrusive, perhaps due to bioturbation, the presence of a large Anglo-Saxon rim sherd and five other smaller sherds in Ditch 3, is less easily explained. Excluding a large samian sherd, the ditch only produced fifteen sherds of pottery, of which over a third is apparently Anglo-Saxon. It should also be noted that the ridge and furrow also appeared to respect the earlier field systems.

North of Ditch 9 and south of Ditch 4 furrows were identified orientated north to south, while between these two ditches they were orientated east to west. It is presumed that Ditch 9 is an Late Anglo-Saxon replacement for Ditches 6 and 11, the angle of which would have been incompatible with ridge and furrow ploughing, while Ditches 4 is presumed to have still been extant in the Late Anglo-Saxon period. Ditch 3 may also have been extant into the Late Anglo-Saxon period, which might explain the presence of the Anglo-Saxon pottery in the ditch.

Although survival of Romano-British field systems into later periods is extremely rare (Roberts *et. al.* forthcoming), it has occasionally been noted elsewhere in the region (Webb 2006), and recent work on the A1(M) to the west of the site has also shown that major field boundaries established in the Late Iron Age occasionally continued in use up to the 19th century or modern day (Brennand *et al*. 2007, 400).

Later features

Many other features, including two post-hole alignments and a small number of gullies and pits, are almost certainly the result of various phases of remodelling of the park during the post-medieval period, when various tree lined avenues and tracks were created. It is interesting to note that there is a hiatus in pottery use during the late 15th and early 17th century, probably indicating the period of use as a deer park, with the return of pottery during the late 17th and 18th centuries correlating with the various phases of remodelling of the park.

Settlement and economy

Direct evidence of settlement was limited to one tentative structure, represented by four post-holes. The post-holes, in an L-shaped array, were located within Late Iron Age Enclosure A. A pit, which may have been contemporary with the post-holes, contained some evidence of *in situ* burning and may have been a hearth within the structure. The ditch forming Enclosure A produced slag and crucible material, indicative of industry close by, and one might suspect that this enclosure was used for settlement and small-scale industry, rather than, for example, a simple stock enclosure.

A small assemblage of Roman roof tile was recovered from two discrete features in the southern part of the site. The three fragments were all of a similar, possibly local, fabric. Their location in one small area of the site provides tentative evidence for a Romanised structure, or structures, in the vicinity.

In contrast to the scarcity of evidence for occupation activity, in the form of structures, agricultural field boundaries, part of either an earlier curvilinear field system or a later rectilinear field system with access tracks, are clearly represented. These seem to extend across the whole of the Byram Park area and beyond. Almost certainly of agricultural use were two Romano-British corner enclosures (Enclosures B and C), which were most likely used as temporary livestock pens at particular times of the farming year, although elsewhere such sites have provided evidence for settlement, crop processing and industrial activity. Although evidence of arable farming, in the form of unprocessed cereal crops, was limited, three features were identified as probable corn driers and at least one pit contained a large deposit of wheat (*Triticum aestivum*; bread/spelt wheat). Consequently, a mixed agricultural regime of livestock and arable farming is proposed at least during the Roman period. Barley and oat grains were also noted and may have played an important role in feeding both humans and livestock.

Although the basis of the site's economy was apparently agriculture, the site does hint at a higher than expected level of affluence than might be expected from a rural site in this part of Yorkshire. The quantity and variety of metalwork and glass from the site is unusually and, together with the presence of samian and amphora, suggests the inhabitants had adopted some trappings of Roman culture and lifestyle.

The burials and ritual remains with Hilary Cool

Seven inhumations and one cremation were identified on the site. One of inhumations was dated to the Iron Age, while the others were all firmly dated to the Roman period. The cremation in Ditch 8 has been dated to the Late Iron Age.

The Iron Age burial (SK10) was placed in a simple sub-rectangular grave, cut into the limestone bedrock. No grave goods, or other finds, were associated with the burial.

All the Romano-British inhumations were in simple unlined graves cut into the limestone bedrock. No 'grave goods' were recovered although small sherds of Romano-British pottery were found with SKs 5 and 6, and iron nails were also recovered from all grave fills with the exception of SK5. While the presence of iron nails does not necessarily imply the use of coffins (as evidenced by the presence of an iron nail with the cow burial SK7), the presence of minerally preserved wood adhering to most of the nine nails found with SK6 does suggest that this individual was probably buried in a coffin.

The complete cow burial, and partial cow skeleton from the same pit, are contemporary with the Romano-British burials, having been radiocarbon dated to AD 130-350. Their association

with five of the inhumations possibly represents a ritual use rather than the disposal of diseased cattle. The partial skeleton may be the remains of a beast consumed during the human funerary process, while the complete skeleton may represent a special structured deposition of an entire beast during the same ceremony.

The human cremation found in the western terminus of Ditch 8 only produced 2% of the bone expected to remain following a cremation. Associated with the deposit was a rich selection (in comparison to other regional parallels) of iron and copper alloy objects, some of which showed evidence of burning.

Work by McKinley (2000) has shown that the human bone from pyre sites is rarely collected in its entirety for formal urned burial which means that much pyre debris must have been disposed of in other ways, either left on the pyre or deposited in other features. Some formal cremation burials can show odd features in the bone collected such as unusually low proportions of the skull, given that fragments of these can be easily identified on the pyre and might be expected to be collected (McKinley 2004, 301). This suggests that pyre debris might sometimes have been collected for deposition outside of the cemetery area. Given that this scatter of cremated material was found in a ditch terminal, a type of location that was often chosen for structured deposition, and given that the debris was from a relatively richly furnished pyre, one might suspect that the material derives from the funeral of an important person and that scattering it was intended to be protective in some way.

Preservation

The preservation of organic remains was highly variable across the site. Bone and other organic remains generally survived in a moderate or poor state of perseveration in features cut into the limestone bedrock. Very few features that cut the sandy natural (covering the north east corner of the 2006 area and most of the 2007 area) produced any bone or organic material.

Despite the relative absence of crop marks, the excavated site has revealed an extensive number of features associated with a largely rectilinear field system, the continuation of which across the entire Byram Park area and beyond remains likely. The next areas of archaeological investigation to be reported are those to the east of the present area, hopefully providing additional dating evidence for the ditches already exposed (including the currently undated Ditch 37), and further defining and clarifying the sequence of landscape use.

10 Conclusions

by Ian Roberts

The large-scale open area excavations carried out at Byram Park between 1998 and 2007 have revealed elements of an extensive sub-divided landscape dating from the Iron Age and which probably reached its apogee in the Late Roman period.

Although the preserved archaeology is predominantly representative of agricultural field systems, the close proximity of a settlement is apparent from a number of human burials and a range of artefacts indicative of human occupation. Predominately the artefacts are of later Roman date, although small quantities of Iron Age and Anglo-Saxon material attest to earlier and later activity.

The Roman finds hint at a greater adoption of Roman material culture than is usual for many Romano-British sites in the area, whilst the presence of Anglo-Saxon activity, albeit in a localised part of the site, presents potential of continuity of use that can rarely be demonstrated in this region.

It is anticipated that future archaeological work in advance of further phases of mineral extraction at Byram Park will further clarify the extent, chronology and function of this former landscape.

Bibliography

ASWYAS, 2003, 'Archaeological Recording Manual', unpubl.

ASWYAS, 2005, 'Byram Park, Brotherton, North Yorkshire: Written Scheme of Investigation for a Strip and Record Operation', unpubl.

Aufderheide, A.C. and Rodríguez-Martín, C., 1998, *The Cambridge Encyclopaedia of Human Paleopathology*

Baker, J. and Brothwell, D., 1980, *Animal Diseases in Archaeology*

Bayley, J., Dungworth, D. and Paynter, S., 2001, *Archaeometallurgy*, English Heritage Centre for Archaeology Guidelines

Betts, I., 1986, 'Identifying Ceramic Building Material', Museum of London Department of Urban Archaeology, unpubl.

Berry, A.C. and Berry, R.J., 1967, 'Epigenetic variation in the human cranium', *J. Anatomy* 101, 361-379

Bidwell, P., 2005, 'The dating of Crambeck Parchment Ware', *J. Roman Pottery Stud.* 12, 15-21

Bidwell, P.T. and Croom, A., 1997, 'The coarse wares', in Wenham L.P, and Heywood B., *The 1968 to 1970 Excavations in the Vicus at Malton, North Yorkshire*, Yorkshire Archaeol. Rep. 3, 61-103

Birkin Tithe Map, 1815, West Yorkshire Archive Service

Boessneck, J., 1969, 'Osteological difference between sheep (*Ovis aiies* Linne) and goats (*Capra hircus* Linne)', in Brothwell, D. and Higgs, E. (eds), *Science in Archaeology*, 331-358

Brennand, M., Brown., F., Howard-Davis, C. and Lupton, A., 2007, 'Synthesis', in Brown *et al*., 379-410

Brewer, R.J., 1986, 'Other objects of bronze', in Zienkiewicz, J.D., *The Legionary Fortress Baths at Caerleon: II the Finds*, 172-89

British Geological Survey, 1978, *Wakefield, Sheet 78, Solid and Drift Edition, 1:50 000 Series*

Brooks, I.P., 1989, 'The viability of micropalaeontology to the sourcing of flint', unpubl. PhD. Thesis, Univ. Sheffield

Brown, F., Howard-Davis, C., Brennand, M., Boyle, A., Evans, T., O'Connor, S., Spence., Heawood, R. and Lupton, A., 2007, *The Archaeology of the A1(M) Darrington to Dishforth DBFO Road Scheme*, Lancaster Imprints 12

Buck, S., *c*.1720, *Samuel Buck's Yorkshire Sketchbook*

Buckland, P.C., 1982, 'The cover sands of north Lincolnshire and the Vale of York', in Adam, B.H., Fenn, C.R. and Morris L. (eds), *Papers in Earth Sciences*, Lovatt Lectures, 143-78

Buckland, P.C. and Dolby, M.J., 1980, *A Roman Pottery Kiln Site at Blaxton Quarry, Auckley,* Archaeol. Doncaster 4, pt 1

Buckland, P.C., Dolby, M.J. and Magilton, J.R., 1980, 'The Romano-British pottery industries of South Yorkshire: a review', *Britannia* 11, 145-64

Buckland, P.C., Hartley, K.H. and Rigby, V., 2001, 'The Roman Pottery kilns at Rossington Bridge Excavations 1956-1961', *J. Roman Pottery Stud.* 9, 1-96

Buikstra, J.E. and Ubelaker D.H. (eds), 1994, *Standards for Data Collection from Human Skeletal Remains* (Fayetteville)

Butler, C., 2005, *Prehistoric Flintwork*

Caffell, A., 1997, 'A Comparison of Stature between British Skeletal Populations', unpubl. dissertation, Univ. Bradford

Cameron, R., 2003, *Keys for the Identification of Land Snails in the British Isles*, Field Studies Council Occasional Publication 79

Cameron, R.A.D. and Redfern, M., 1976, *British Land Snails*. *Synopses of the British Fauna (New Series) 6*

Carrott, J., 2003, 'Technical report: mollusc remains from excavations at Ferrybridge, West Yorkshire (site code: FBH01)', Paleoecology Research Services Rep. 2003/35

Clanton, T.O. and DeLee, J.C., 1982, '*Osteochondritis dissecans*: history, pathophysiology and current treatment concepts', *Clinical Orthopedic Rel. Research* 167, 50-64

Clarke, G., 1979, *The Roman Cemetery at Lankhills*, Winchester Studies 3 Pre-Roman and Roman Winchester Part II

Cool, H.E.M. and Leary, R.S., forthcoming, 'Aspects of the use of samian pottery in Romano-British funerary practices', in Bird, D. and Bird, J. (eds), *A Festschrift for Brenda Dickinson*

Corder, P., 1937, 'A pair of fourth century Romano-British kilns near Crambeck', *Antiq. J*. 17, 392-413

Corder, P. and Sheppard, T., 1930, *The Roman Pottery at Throlam Holme-on-Spalding Moor E. Yorkshire*, Roman Malton and District Rep. 3

Cox, M., 2000, 'Ageing adults from the skeleton', in Cox and Mays (eds), 61-82

Cox, M. and Mays, S., 2000, *Human Osteology in Archaeology and Forensic Science*

Cumberpatch, C.G., 1996, 'The pottery', in Dunkley, J.A. and Cumberpatch C.G. (eds), *Excavations at 16 - 20 Church Street, Bawtry, South Yorkshire*, Br. Archaeol. Rep. Br. Ser. 248

Cumberpatch, C.G., 2002, 'The pottery', in Roberts, I., *Pontefract Castle: Archaeological Excavations 1982–86*, Yorkshire Archaeol. 8, 169-226

Cumberpatch, C.G., 2004, *South Yorkshire and North Derbyshire Medieval Ceramics Reference Collection*, http://ads.ahds.ac.uk/catalogue/specColl/ceramics_eh_2003/

Cumberpatch, C.G., Leary, R.S. and Willis, S., 2003. 'The pottery', in Roberts, I., *Excavations at Topham Farm, Sykehouse, South Yorkshire*, Archaeol. Serv. WYAS Publ. 5, 18-24

Darling, M.J., 1999, 'Roman Pottery', in Colyer, C., Gilmour, B.J.J. and Jones, M.J., *The defences of the Lower City. Excavations at the Park and west Parade 1970-2 and a discussion of other sites excavated up to 1994*, Counc. Brit. Archaeol. Res. Rep. 114, 52-123

Darling, M.J., 2004a, 'Guidelines for the Archiving of Roman Pottery', *J. Roman Pottery Stud.* 11, 67-74

Darling, M.J., 2004b, 'Report on the pottery', in Palmer-Brown, C. and Munford, W., 'Romano-British life in north Nottinghamshire, fresh evidence from Raymoth Lane, Worksop', *Transactions of Thoroton Society, Nottinghamshir*e 108, 37-51

Deegan, A., n.d., 'Assessment of the air photographic evidence for a site at Byram Park, Brotherton, North Yorkshire', unpubl.

Dobney, K., Hall, A.R., Kenward, H.K. and Milles, A., 1992, 'A working classification of sample types for environmental archaeology', *Circaea, the Journal of the Association for Environmental Archaeology* 9, 24-6

Dungworth, D., 1995, 'Iron Age and Roman copper alloys from Northern Britain', unpubl. PhD Thesis, Univ. Durham

Egan, G., 1998, *The Medieval Household Daily Living c.1150 - c.1450*, Medieval Finds from Excavations in London 3 (2nd Edition Woodbridge and Rochester NY)

Ellis, A.E., 1969, *British Snails: A Guide to the Non-Marine Gastropoda of Great Britain and Ireland – Pleistocene to Recent*

English Heritage, 1991, *Management of Archaeological Projects*

English Heritage, 2006, *Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide*

Evans, J., 1993, 'Pottery function and finewares in the Roman north', *J. Roman Pottery Stud.* 6, 95-119

Evans, J., 2001, 'Iron Age, Roman and Early Anglo-Saxon Pottery', in Roberts, I., Burgess, A. and Berg, D., (eds), *A New Link to the Past. The Archaeological Landscape of the M1-A1 Link Road*. Yorkshire Archaeol. 7

Evans, J., n.d., 'The West Yorkshire rural Romano-British sites: the pottery', Rep. for West Yorkshire Archaeology Service

Field, F.N. and Palmer-Brown, C.P.H., 1991, 'New evidence for a Romano-British greyware pottery industry in the Trent Valley', *Lincolnshire Hist. Archaeol.* 26, 40-56

Finnegan, M., 1978, 'Non-metric variation of the infracranial skeleton', *J. Anatomy* 125, 23-37

Fletcher, M., 1997, 'Foxcliffe Quarry, Byram-cum-Sutton, Brotherton, North Yorkshire: Desk-based Assessment', ASWYAS Rep. 519

Frederico, D.J., Lynch, J.K. and Jokl, P., 1990, '*Osteochondritis dissecans* of the knee: a historical review of etiology and treatment', *Arthroscopy: the Journal of Arthroscopy and Related Surgery* 6 (3), 190-197

French, D.H., 1971, 'An Experiment in Water Sieving', *Anatolian Studies* 21, 59-64

Gaunt, G.D., 1994, *Geology of the country around Goole, Doncaster and the Isle of Axholme, Memoir for the one-inch sheets 79 and 88 (England and Wales)*, Brit. Geol. Surv.

Gillam, J.P., 1970, *Types of Roman Coarse Pottery Vessels in Northern Britain*

Gillam, J.P., 1976, 'Coarse fumed ware in northern Britain and beyond', *Glasgow Archaeol. J.* 4, 57-89

Goddard, E.N., Trask, P.D., De Ford, R.K., Rove, O.N., Singewald, J.T. and Overbeck, R.M., 1948, *Rock-color Chart*, Geol. Soc. America (Boulder, Colorado)

Grant, A., 1982, 'The use of tooth wear as a guide to the age of domestic ungulates', in Wilson, B., Grigson, C. and Payne, S. (eds), *Ageing and Sexing Animal Bones from Archaeological Sites*, Br. Archaeol. Rep. Br. Ser. 109, 91-108

Halstead, P., 1985, 'A study of mandibular teeth from Romano-British contexts at Maxey', in Pryor, F., French, C., Crowther, D., Gurney, D., Simpson, G. and Taylor, M., *Archaeology and Environment in the Lower Welland Valley Volume 1*, 219-224

Hawkey, D.E. and Merbs, C.F., 1995, 'Activity-induced musculoskeletal stress markers (MSM) and subsistence strategy changes among ancient Hudson Bay Eskimos', *International Journal of Osteoarchaeology* 5, 324-338

Henson, D., 1985, 'The flint resources of Yorkshire and the East Midlands', *Lithics* 5, 2-9

Hillson, S., 1996, *Dental Anthropology*

Holbrook, N. and Bidwell, P.T., 1991, *Roman Finds from Exeter*, Exeter Archaeol. Rep. Vol. 4

Inizan, M.L., Roche, H. and Tixier, J., 1992, *Technology of knapped stone* (Meudon)

Institute of Field Archaeologists, 2001, *Standards and Guidance for archaeological excavation*

Işcan, M.Y. and Kennedy, K.A.R. (eds), 1989, *Reconstruction of Life from the Skeleton* (New York)

Jauncey, E., 1992, *A Short Account of the Parish of Brotherton*, (Yorkshire Archaeological Society ref. 130 K14)

Jefferys, T., 1775, 'A Survey of the County of Yorkshire'

Kerney, M., 1999, *Atlas of the Land and Freshwater Molluscs of Britain and Ireland*

Kerney, M.P. and Cameron, R.A.D., 1979, *A Field Guide to the Land Snails of Britain and North-West Europe*

Kennedy, K.A.R., 1989, 'Skeletal markers of occupational stress', in Işcan and Kennedy (eds), 129-160

Leary, R.S., 2004, 'The Roman pottery', in Richardson, J. and Rose, M. (eds), 'Lincolnshire Way, Armthorpe, South Yorkshire: Archaeological Evaluation and Excavation', ASWYAS Rep. 1212

Leary, R.S., 2006, 'The Roman pottery', in Berg, B., and Major, P. (eds), 'River Idle Washlands, Bawtry, South Yorkshire: Archaeological Watching Brief', ASWYAS Rep. 1559

Leary, R.S., 2007a, 'The Roman pottery from excavations at St Wilfrid's Rd, Cantley', Rep. for Pre-Construct Archaeology

Leary, R.S., 2007b, 'The Romano-British coursewares', in Brown *et al.*, 236-254

Lillie, M. and Gearey, B., 1999, 'Introduction to the Palaeoenvironmental survey', in Van de Noort, R. and Ellis S., *Wetland Heritage of the Vale of York*, 21-34

May, J., 1996, *Dragonby: Report on Excavations at an Iron Age and Romano-British Settlement in North Lincolnshire*, 587-90

Mays, S. and Cox, M., 2000, 'Sex determination in skeletal remains', in Cox and Mays (eds), 117-130

McKinley, J.I., 1989, 'Cremations: expectations, methodologies, and realities', in Roberts, C.A., Lee, F. and Bintliff, J. (eds), *Burial Archaeology: Current Research, Methods and Developments*, Br. Archaeol. Rep. Br. Ser. 211, 65-76

McKinley, J.I., 1993, 'Bone fragment size and weights of bone from modern British cremations and the implications for the interpretation of archaeological cremations', *International Journal of Osteoarchaeology* 3, 283-287

McKinley, J.I., 1994, 'Bone fragment size in British cremation burials and its implications for pyre technology and ritual', *J. Archaeol. Sci.* 21, 339-342

McKinley, J.I., 2000, 'Pheonix rising: aspects of cremation in Roman Britain', in Pearce, J., Millett, M. and Struck, M. (eds), *Burial, Society and Context in the Roman World*, 38-44

McKinley, J.I., 2004, 'The human remains and aspects of pyre technology and cremation rituals', in Cool, H.E.M, *The Roman Cemetery at Brougham, Cumbria*, Britannia Monograph 21, 283-309

Miles, D., Palmer, S., Smith, A. and Perpetua Jones, G., 2007, *Iron Age and Roman Settlement in the Upper Thames Valley: Excavations at Claydon Pike and other Sites within the Cotswold Water Park*, Thames Valley Landscapes Monograph 26

Monaghan, J., 1997, 'Roman pottery from York. The pottery', Fasc. 8, *The Archaeology of York Vol. 16*

Moretti, D., 2008, Darrington Quarry Pipeline Extension, Byram Park, Brotherton, North Yorkshire', ASWYAS Rep. 1795

Ordnance Survey, 1852, First Edition County Series 6 inch map sheet (West Riding), 235 (surveyed 1845-1849)

Ordnance Survey, 1892, County Series 6 inch map sheet (West Riding), 235.NW (surveyed 1890)

Ordnance Survey, 1893a, County Series 6 inch map sheet (West Riding), 235.NE (surveyed 1889)

Ordnance Survey, 1893b, County Series 6 inch map sheet (West Riding), 235.SE (surveyed 1890)

Ordnance Survey, 1894, County Series 6 inch map sheet (West Riding), 235.SW (surveyed 1890-1)

Orton, C.R., 1980, 'Introduction to the pottery reports', in Jones, D.M., Excavations at Billingsgate Buildings 'Triangle', Lower Thames Street 1974, *Trans. London and Middlesex Archaeol. Soc. Spec. Pap. 4*

Page, W., 1907, *A History of the County of York: Volume One*

Payne, S., 1969, 'A metrical distinction between sheep and goat metacarpals', in Ucko, P.J. and Dimbleby, D.W. (eds), *The Domestication and Exploitation of Plants and Animals*, 295-305

Payne, S., 1985, 'Morphological distinctions between the mandibular teeth of young sheep, *Ovis* and goats, *Capra*', *J. Archaeol. Sci.* 12, 139-147

Peacock, D.P.S., 1977, *Pottery and Early Commerce*

Philpott, R., 1991, *Burial Practices in Roman Britain. A Survey of Grave Treatment and Furnishings A.D. 43-410*, Br. Archaeol. Rep. Br. Ser. 219

Pickersgill, D., 1996, *Reminders of Days Gone By: A History of Byram Hall and Park*

Piggott, S., 1953, 'Three metal-work hoards of the Roman period from Southern Scotland', *Proc. Soc. Antiq. Scot.* 87, 1-50

Pollington, M., 2008, 'Byram Park, North Yorkshire: Archaeological Desk-based Assessment', ASWYAS Rep. 1852

Price, J. and Cottam, S., 1998, *Romano-British glass vessels*: *a handbook,* Practical Handbook in Archaeology 14, Counc. Br. Archaeol.

Rawson, P.F., Curry, D., Dilley, F.C., Hancock, J.M., Kennedy, W.J., Neale, J.W., Wood, C.J. and Worssam, B.C., 1978, *A Correlation of Cretaceous Rocks in the British Isles,* Geol. Soc. London Spec. Rep. 9

Rhodes, M., 1980, 'Leather footwear' in Jones, D.M., *Excavations at Billingsgate Buildings 'Triangle', Lower Thames Street, 1974,* London and Middlesex Archaeological Society Special Paper 4, 99-128

Roberts, C. and Cox, M., 2003, *Health and Disease in Britain from Prehistory to the Present Day*

Roberts, C.A. and Manchester, K., 1995, *The Archaeology of Disease*

Roberts, I. (ed.), 2005, *Ferrybridge Henge: The Ritual Landscape*

Roberts, I., Burgess, A. and Berg, D. (eds), 2001, *A New Link to the Past, The Archaeological Landscape of the M1-A1 Link Road.* Yorkshire Archaeol. 7

Roberts, I. and Richardson, J., 2002, *Romano-British Settlement Enclosures at Moss Carr, Methley, West Yorkshire,* Archaeol. Serv. (WYAS) Publ. 2

Roberts, I., Deegan, A. and Berg, D., forthcoming, *Understanding the Cropmark Landscapes of the Magnesian Limestone*

Rogers, G., 1974, *Poteries Sigillées de la Gaule Centrale. 1. Les Motifs non Figures,* Gallia Supplement 28 (Paris)

Rogers, J., 2001, 'The palaeopathology of joint disease', in Cox and Mays (eds), *Human Osteology in Archaeology and Forensic Science,*163-182

Rush, P., Dickinson, B., Hartley, B.R. and Hartley, K.F., 2000, *Roman Castleford: Excavations 1974-85. Vol. III The Pottery*, Yorkshire Archaeol. 6

Salter, R.B., 1999, *Textbook of Disorders and Injuries of the Musculoskeletal System*

Saunders, S.R., 1989, 'Non-metric variation', in Işcan and Kennedy (eds), 95-108

Scheuer, L. and Black, S., 2000a, 'Development and ageing of the juvenile skeleton', in Cox and Mays (eds), 9-22

Scheuer, L. and Black, S., 2000b, *Developmental Juvenile Osteology* (San Diego)

Schweingruber, F.H., 1990, *Anatomy of European Woods* (Berne and Stuttgart)

Silver, I.A., 1969, 'The ageing of domestic animals', in Brothwell, D. and Higgs, E. (eds), *Science in Archaeology*, 283-302

Slowikowski, A., Nenk, B. and Pearce, J., 2001, *Minimum Standards for the Processing, Recording, Analysis and Publication of Post-Roman Ceramics*, Medieval Pottery Research Group, Occasional Paper 2

Smith, A.G., 1970, 'The Influence of Mesolithic and Neolithic Man on British Vegetation: a discussion', in Walker, D. and West, R.G. (eds), *Studies in the Vegetational History of the British Isles*, 81-93

Smith, A.H., 1961, *The Place-names of the West Riding of Yorkshire*, Engl. Place-name Soc. 33, pt. 4

Smith, B.H., 1984, 'Patterns of molar wear in hunter-gatherers and agriculturalists', *Am. J. Phys. Anthropol.* 63, 39-56

Soil Survey of England and Wales, 1983, *Soils of Northern England*

Stace, C., 1997, *New Flora of the British Isles*

Stanfield, J. and Simpson, G., 1958, *Central Gaulish Potters*

Stone, R.J. and Stone, J.A., 1990, *Atlas of the Skeletal Muscles* (Iowa)

Stroud, D., 1975, *Capability Brown*

Sumpter, A.B., 1990, 'The Roman Pottery', in Wrathmell and Nicholson (eds), 135-46 and 235-45

Swan, V.G., 2002, 'The Roman pottery of Yorkshire in its wider historical context', in Wilson, P., and Price, J. (eds), *Aspects of Industry in Roman Yorkshire and the North*, 35-79

Thoresby, R., 1830, *The Diary of Ralph Thoresby FRS: Volume 2*

Tomber, R. and Dore, J., 1998, *The National Roman Fabric Reference Collection. A Handbook*

Trinkhaus, E., 1978, 'Bilateral asymmetry of human skeletal non-metric traits', *Am. J. Phys. Anthropol.* 49, 315-318

van der Veen, M. and Fieller, N., 1982, 'Sampling seeds', *J. Archaeol. Sci.* 9, 287-298

Wahl, J., 1982, 'Leichenbranduntersuchungen. Ein Überblick über die Bearbeitungs-und Aussagemöglichkeiten von Brandgräbern', *Prähistorische Zeitschrift* 57, 2-125

Walsh, A., in prep., 'Byram Park Excavations 2008, Brotherton, North Yorkshire: Archaeological Excavation', ASYWAS

Waterson, R. and Meadows, P., 1998, *Lost Houses of the West Riding*

Webb, A., 2006, 'Proposed Newton Lane Surface Mine, Near Leeds, West Yorkshire: Geophysical Survey', ASWYAS Rep. 1595

Wrathmell, S. and Nicholson, A., 1990, *Dalton Parlours Iron Age Settlement and Roman Villa,* Yorkshire Archaeol. 3

Young, J., Vince, A. and Naylor V., 2005, *A Corpus of Anglo-Saxon and Medieval pottery from Lincoln,* Lincoln Archaeological Studies No. 7

Zohary, D. and Hopf, M., 2000, *Domestication of Plants in the Old World*