

Excavations on the Route of the Dalkeith Northern Bypass, 1994–95 and 2006

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1 ABSTRACT

An evaluation and subsequent targeted excavations were carried out along the route of the proposed A68 Dalkeith Northern Bypass by the Centre for Field Archaeology (CFA) between September 1994 and March 1995, with additional watching briefs taking place in 1997. The work was commissioned by Historic Scotland on behalf of the Roads Directorate of the Scottish Office Industry Department. The bypass was not constructed at the time, and further pre-construction mitigation work was recommended in 2005, with fieldwork being carried out in 2006–08 by CFA Archaeology Ltd, for Historic Scotland on behalf of Transport Scotland.

This report describes the results of the evalua-

tions and each excavation individually. The route traverses a narrow strip of the Lothian plain which contained several prehistoric sites (two ring-groove structures, a stone-paved area and two pit alignments), a Roman temporary camp, a post-medieval building, an 18th-century designed landscape, and two industrial sites (a brick and tile works and a coal pit engine house). Several sites also produced ephemeral remains of earlier or later date. Overall, the results indicated a settlement pattern and land use which concentrated on the sands and gravels of the river terraces, with far less settlement on the unforgiving compacted clays which otherwise characterise large parts of the road corridor.

2 INTRODUCTION

2.1 Route location, topography and geology

This report brings together the results of excavations on the route of the proposed A68 Dalkeith Northern Bypass. The bypass route, measuring *c* 5.5km in length (*illus* 2.1), runs approximately ESE from the A720 Edinburgh City Bypass (NGR: NT 335 695), to the road junction at Newfarm, where it turns south-eastwards to the junction of the B6414 and the road to Cousland. The route continues south-eastwards to a junction on the A6124 and joins the present A68 at Fordel Mains Farm (NGR: NT 378 667).

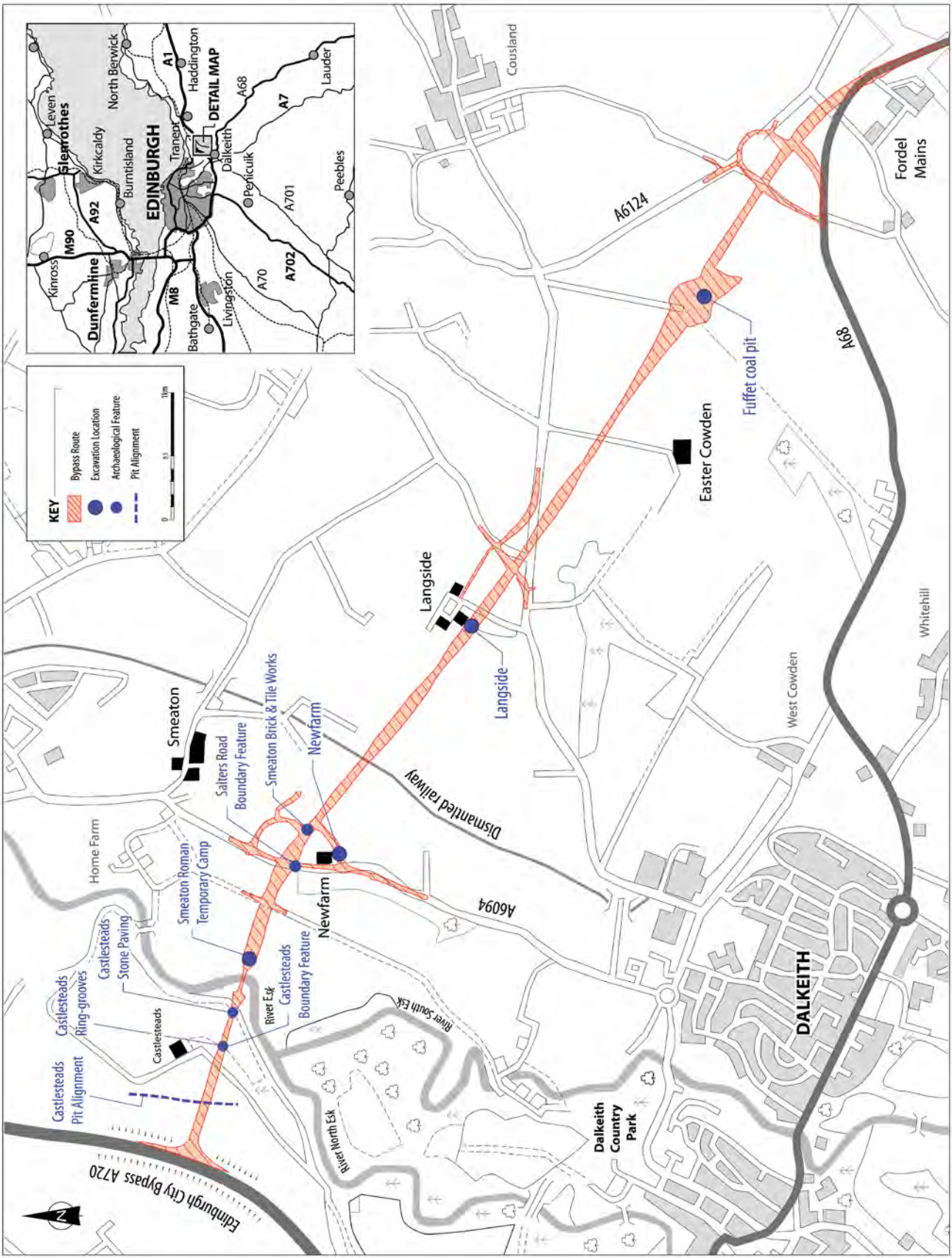
The west end of the route is at a high point of ground which slopes away gently on all sides, and the route itself follows the slope down to the sandy and gravelly terrace of the River Esk, crossing it at a slight meander within woodland close to Pickle Dirt. On the other side of the river, above a sheer cliff face, the ground along the route rises gently towards Newfarm. The slope beyond this to the south-east

rises more steeply, reaching *c* 170m above OD at the point where the proposed route meets the A68.

Geologically, most of the route is underlain by sedimentary formations, primarily Coal Measures and limestones of Carboniferous age between Newton and Fordel Mains. With the exceptions of the immediate margins of the River Esk itself, all the land along the route has been classed by the Macaulay Land Use Research Institute as being of Class 1 or Class 2 (*Soil Survey of Scotland 1973*). The Soil Survey map identifies two soil associations along the bypass route. Brown forest soils overlying free-draining fluvioglacial sand and gravel, belonging to the Darvel Association, occur at the north-western end. Three series within the Rowanhill Association (of tills derived from Carboniferous deposits) characterise the remainder of the bypass route. Of these latter, that at the south-eastern end (Greenside series) is the best quality, being freely drained brown forest soil. The intermediate series (Macmerry; Winton),

Table 2.1 Sites known or identified along the proposed route

Area	Site	NMRS ref	Fieldwork	Report
Castlesteads	pit alignment	NT36NW 53	Excavation	Section 4.2
	ring-grooves	NT36NW 147	Excavation	Section 5
	stone paving and lithic scatter	NT36NW 165	Excavation	Section 6
	plantation boundary feature		Excavation	Section 9.5
	west wall of Dalkeith Park		Survey	Section 9.3
Smeaton	Roman temporary camp	NT36NW 33	Excavation	Section 7
	brick and tile works	NT36NW 109	Excavation	Section 10.3
Newfarm	cist cemetery	NT36NW 5	Not located	Section 3.3
	quarry pit and rig-and-furrow		Evaluation	Section 3.3
	ditches and stone features		Excavation	Section 8
	post-medieval building		Excavation	Section 8
	cropmark	NT36NW 146	Evaluation	Section 3.3
	ditch		Evaluation	Section 3.3
	county boundary (Pickle Dirt)		Excavation	Section 9.4
	SE wall of Dalkeith Park		Survey	Section 9.3
Langside	old gravel pit previously recorded as enclosure	NT36NE 67	None	Section 3.3
	modern pits		Evaluation	Section 3.3
	pit alignment		Excavation	Section 4.3
	railway trackbed		Evaluation	Section 3.3
Easter Cowden	field boundary		Evaluation	Section 3.3
	Fuffet coal pit engine house	NT36NE 92	Excavation	Section 10.4
Fordel Mains	ditch		Evaluation	Section 3.3



Illus 2.1 Location plan

gleyed and imperfectly drained soils, are nonetheless of very considerable agricultural value.

2.2 Archaeological background

The Esk Valley has a rich archaeological record, most notably in terms of cropmark evidence as recorded by aerial photography (eg [Brown 2002](#)). This is particularly true of the sand and gravel areas but less so to the south-east on the Rowanhill association soils.

A number of archaeological sites were known within or very close to the route corridor in advance of the evaluation. These were, from approximately west to east, a pit alignment at Castlesteads, a Roman temporary camp at Smeaton, the site of Smeaton brick and tile works and the site of a cist cemetery at Newfarm. The site of the engine house at Fuffet coal pit was the only other site identified during the project within the route corridor prior to the commencement of fieldwork. A possible enclosure site recorded previously at Langside was reinterpreted through desk-based assessment as an old gravel pit (see [Section 3.3](#)), and no archaeological work took place at that location. [Table 2.1](#) lists these known sites and those discovered during the project.

2.3 Investigation strategy and its evolution

The results reported here are the outcome of more than one phase of archaeological work which took place over a period of almost 15 years, and which was made possible by the construction of the bypass being deferred. This allowed the strategy for archaeological investigations to evolve in response to developments in understanding of evaluation sampling strategies and, in one case, site-specific investigation strategies.

The initial fieldwork was carried out by the Centre for Field Archaeology (CFA), University of Edinburgh, between 1994 and 1995. This work was commissioned by Historic Scotland, on behalf of the Roads Directorate of the Scottish Office Industry Department (SOID), through a process of competitive tender. The objectives of this work, as defined by Historic Scotland, were to:

- 1) undertake appropriate field evaluation of the road construction corridor to identify, characterise and excavate archaeological features within the road corridor;
- 2) excavate an appropriate proportion of the known archaeological features, and substantial areas around them, in particular the cropmarks of a pit alignment at Castlesteads, a Roman temporary camp at Smeaton, and a brick and tile works at Smeaton;
- 3) obtain evidence of the nature, function and date of the features, taking due account of the

recovery of environmental evidence relating not only to the features themselves but to the surrounding area.

CFA's Project Design contained strategies and methodologies to meet these objectives, and they are set out in the relevant sections of this report. Areas trenched as part of the field evaluation were selected on a judgemental basis, with those areas considered most likely to reveal archaeological remains examined preferentially, and others considered likely to have poor archaeological survival avoided. Topographical, geological and pedological factors were also taken into account in siting trenches.

Overall, the intrusive archaeological works in 1994–95 investigated in the order of 4% of the land within the compulsory purchase order areas, which defined the limits of the land available for archaeological investigation. In line with the selection strategy, the investigations were not evenly distributed. In two areas west of the River Esk, the investigations examined over 20% overall of the available land, due to the presence of identified archaeological sites requiring set-piece excavation. For most of the remaining arable areas the evaluation examined in the order of 2–5% of land parcels, although in some areas little or no evaluation work was carried out as a result of land access issues. The field evaluation led to the discovery of archaeological sites additional to those previously known, which were subsequently excavated, following the agreement of scopes of work with Historic Scotland – these included timber roundhouses and an area of stone paving at Castlesteads, and the Fuffet coal pit engine house.

In 1996 an archaeological watching brief undertaken during the diversion of a gas pipeline, which was necessary to accommodate the new bypass, led to the discovery and excavation of the Early Historic long cist cemetery and prehistoric structures and a pit alignment at Newfarm. As this investigation was undertaken through different contractual arrangements, it was reported upon and published separately from the investigations contained in this report ([Rees 2002](#), who names the site as 'Thornybark'). A watching brief undertaken within Smeaton Roman temporary camp as part of the same pipeline diversion produced no archaeological findings ([Rees 1997](#)).

After the 1994–95 archaeological works had been completed, the construction of the bypass was deferred for several years. The results were prepared for publication, and were on the point of being published when the construction project was revived in 2005. At that time Historic Scotland commissioned CFA Archaeology (who had been spun out of the University of Edinburgh in 2000) to undertake a review of previous work and prepare a mitigation study for further advance archaeological works ([Anderson 2005](#)) with the aim of increasing the level of evaluation to 10% of all

areas of suitable land, as recommended by Hey & Lacy (2001, 43). The mitigation strategy report also recommended fuller investigation of the Roman temporary camp (since alternative investigation techniques for examining Roman camps had proved effective elsewhere since the initial work at the camp, especially at Dullatur (Lowe & Moloney 2000)); recording those parts of the Dalkeith park designed landscape that would be affected by the development; and the use of metal-detecting as a prospective technique (following a recommendation to that effect made by Midlothian Council's Archaeological Advisor at that time).

The mitigation strategy report formed the basis of a further programme of pre-construction archaeological investigations carried out along the bypass

route between 2005 and 2008, commissioned by Historic Scotland on behalf of Transport Scotland, and awarded to CFA Archaeology through a process of competitive tender. In addition to the works specified above, a pit alignment at Langside and a series of features at Newfarm were excavated following their discovery during the additional field evaluation works and the agreement of a scope of works with Historic Scotland. Small-scale targeted watching briefs were conducted during road construction works to address specific issues that had not been resolved during the pre-construction works. Further details of these works can be found in unpublished documents lodged with the project archive at RCAHMS (Suddaby et al 2007; O'Connell & Suddaby 2008).

3 EVALUATION *by R Strachan, A Rees & I Suddaby*

3.1 Introduction

An initial archaeological evaluation was undertaken between September and November 1994. This was upgraded to meet current Historic Scotland standards between December 2005 and February 2006 (illus 2.1). The objectives were to identify, characterise and excavate archaeological features within the corridor, in those areas where no archaeological remains had previously been identified.

3.2 Methods

Desk-based assessment was carried out using the following sources: the National Monuments Record of Scotland (NMRS); vertical, stereo and oblique aerial photographs, held by the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS); the first, second and subsequent editions of the Ordnance Survey 6" map coverage of the area; and the early maps of the area held in the National Library of Scotland. Soil and geology maps were consulted in order that a representative sample of subsoils along the road corridor could be examined.

The road corridor was walked to locate any previously unidentified surface archaeological remains. Most fields on the route line were under crop in both 1994 and 2005, and therefore the potential for artefact and feature identification was limited. Although no upstanding archaeological features were found, a scatter of worked flint and chert was located at Castlesteads Park, which subsequent trenching proved to be associated with buried archaeological features (see Sections 5 and 6). The area to the south of the Smeaton brick and tile works was opencast mined between 1994 and 2005.

The evaluations were designed to examine areas between known sites and to test areas within the corridor adjacent to known sites. In 1994, a total of c 9,872m² (154 trenches) was stripped of topsoil by JCB. In 2005–06, 14,504m² (185 trenches) were excavated, mostly using a tracked excavator. All topsoil removal was conducted under continuous archaeological supervision, and trenches were hand-cleaned to reveal any archaeological features.

3.3 Results

Desk-based assessment discounted the site of the Langside cropmark enclosure (NMRS ref: NT36NE 67) as its location corresponded with the site of

an 'old gravel pit' and 'gravel pit' depicted on the Ordnance Survey first and second edition maps (*Edinburghshire, sheet VII, 1854; Edinburghshire, sheet VIII NE, 1909*) respectively.

The evaluation did not locate any archaeological evidence for the known pit alignment (NMRS ref: NT36NW 52) where its extrapolated line intersected the road corridor immediately beside the Edinburgh City Bypass (NT 335 696). Excavation located deposits of levelling material associated with the construction of the bypass, and the pit alignment had probably been destroyed here at that time, if it ever existed. The pit alignment forms part of an extensive network of such features identified from aerial photographs (Halliday 1982), of which two further examples were examined (Section 4). The 2005–06 evaluation added little to the 1994 results although a number of lithics were recovered, again largely in unstratified deposits, with a concentration in two trenches located close to the stone-paved area at Castlesteads.

The 1994 evaluation did not find any direct evidence of the cist cemetery south-east of Newfarm (NMRS ref: NT36NW 5) although a gas pipe trench, excavated in 1970, which cut through two long cists, was identified. Subsequent excavations carried out from September to December 1996 (Rees 2002) revealed that the cist cemetery did not extend into the road corridor. However, evaluation work in 2006 uncovered three stone features on a similar alignment to the long cists near the edge of the corridor. The 2006 evaluation also identified a linear ditch and a post-medieval building adjacent to Salter's Road. The former is clearly shown on an aerial photograph of the Smeaton brick and tile works and the latter appears on the first edition Ordnance Survey map (1854).

An access track to the Penicuik to Musselburgh cycleway crossed a cropmark feature (NT36NW 146, NGR: NT 3470 6870), and this was revealed to stem from dumped mining spoil.

Just north of the Old Dalkeith Colliery Road and adjacent to the site of Smeaton brick and tile works, trenches revealed deep deposits of brick and tile waste material, apparently backfilled into the clay extraction pits depicted on old maps.

Moving south-east, a pit alignment (NGR: NT 3563 6837) was recorded in the clay subsoil adjacent to Langside Farm in 2005. Two small pits, both containing modern pottery, were located in 1994 within the field south-east of Langside Farm (NGR: NT 3571 6830), and the ash trackbed of the mineral line from Smeaton colliery to Langside Head colliery was recorded alongside the B6414 in 2005. All of these lines were closed by 1934 (Wham 2006). Beyond

Langside, the route continues to gain height and the remains of a ploughed-out field boundary (relating to one present on the Ordnance Survey First Edition map of 1854) was recorded north of Easter Cowden farm (NGR: NT 3617 6796). None of the buried peat deposits containing tree remains that were recorded to the north of the Bellyford Burn in 1994 (NGR: NT 3680 6760) were traced in 2005. Finally, an isolated length of ditch was located north-west of Fordel Mains, in a field known locally as 'Kiln Park' (NGR: NT 3728 6726). No further work was undertaken at these locations.

The 1994 evaluation located two previously unknown archaeological sites within the north-western end of the road corridor and confirmed the existence of a third site previously thought to have been removed. Trial-trenching in the field east of Castlesteads Park produced evidence of two ring-groove structures with associated negative features

at NGR: NT 3397 6935. Further east, on the edge of a river terrace overlooking the River Esk, an enigmatic area of rough paving was located at NGR: NT 3430 6910. Further excavation was conducted at these sites (Sections 5 and 6). At Easter Cowden, the remains of the engine house associated with Fuffet coal pit (NGR: NT 3693 6743) were located during trial-trenching. This structure, present on the Ordnance Survey First Edition map (1854) but absent from the second edition map (1909) and thought to have been destroyed, was found to be in fair condition, buried beneath dump deposits of industrial waste material.

In addition to the sites mentioned above, the evaluation also produced evidence of numerous field drains, in the form of stone-slabbed culverts, and modern tile drains. Full details of the evaluation results are available in the archive (Strachan & Rees 1995; O'Connell & Suddaby 2008).

4 CASTLESTEADS AND LANGSIDE PIT ALIGNMENTS

by *K Cameron & S Mitchell*

4.1 Introduction

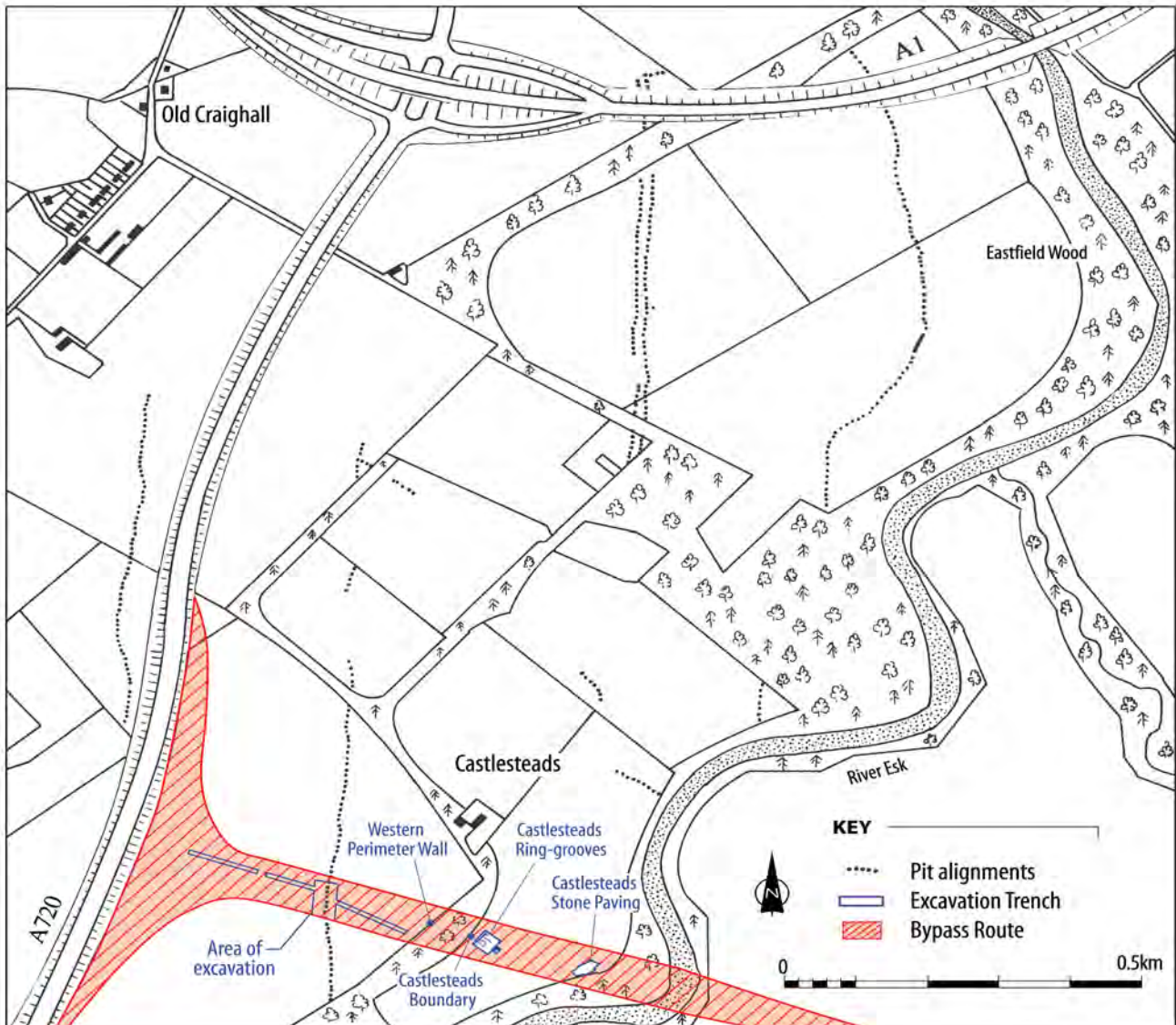
Pit alignments were discovered at Castlesteads, Langside and Thornybank. Castlesteads and Langside are described individually below, and compared in the discussion. Thornybank has been published previously (Rees 2002). The pit alignment at Castlesteads is described first.

4.2 Castlesteads pit alignment, by K Cameron

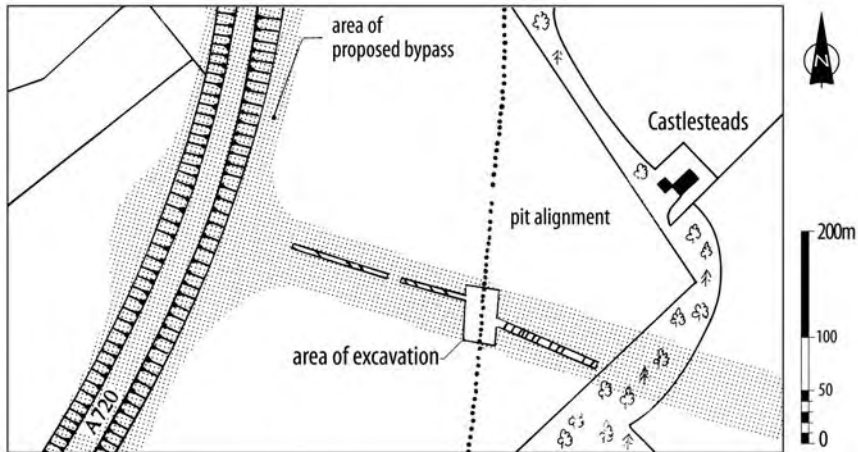
4.2.1 Introduction

The pit alignment in the field to the south-west of

Castlesteads (NMRS ref : NT36NW 53) was discovered by aerial photography as one of a series of cropmarks in the Castlesteads/Newton area (illus 4.1–4.2; Halliday 1982). This example is described in NMRS records as consisting of around 80 pits, centred c 3–5m apart, disposed in a single line and orientated approximately from north to south. Aerial photographs of the area and the rectified cropmark plot produced by RCAHMS also show an extensive area of cultivation marks orientated obliquely to the pit alignment in its vicinity. The proposed road corridor, which determined the sector available for excavation, was approximately 40m wide where it intersected the course of the pit alignment.



Illus 4.1 Pit alignments around Castlesteads (after Halliday 1982)

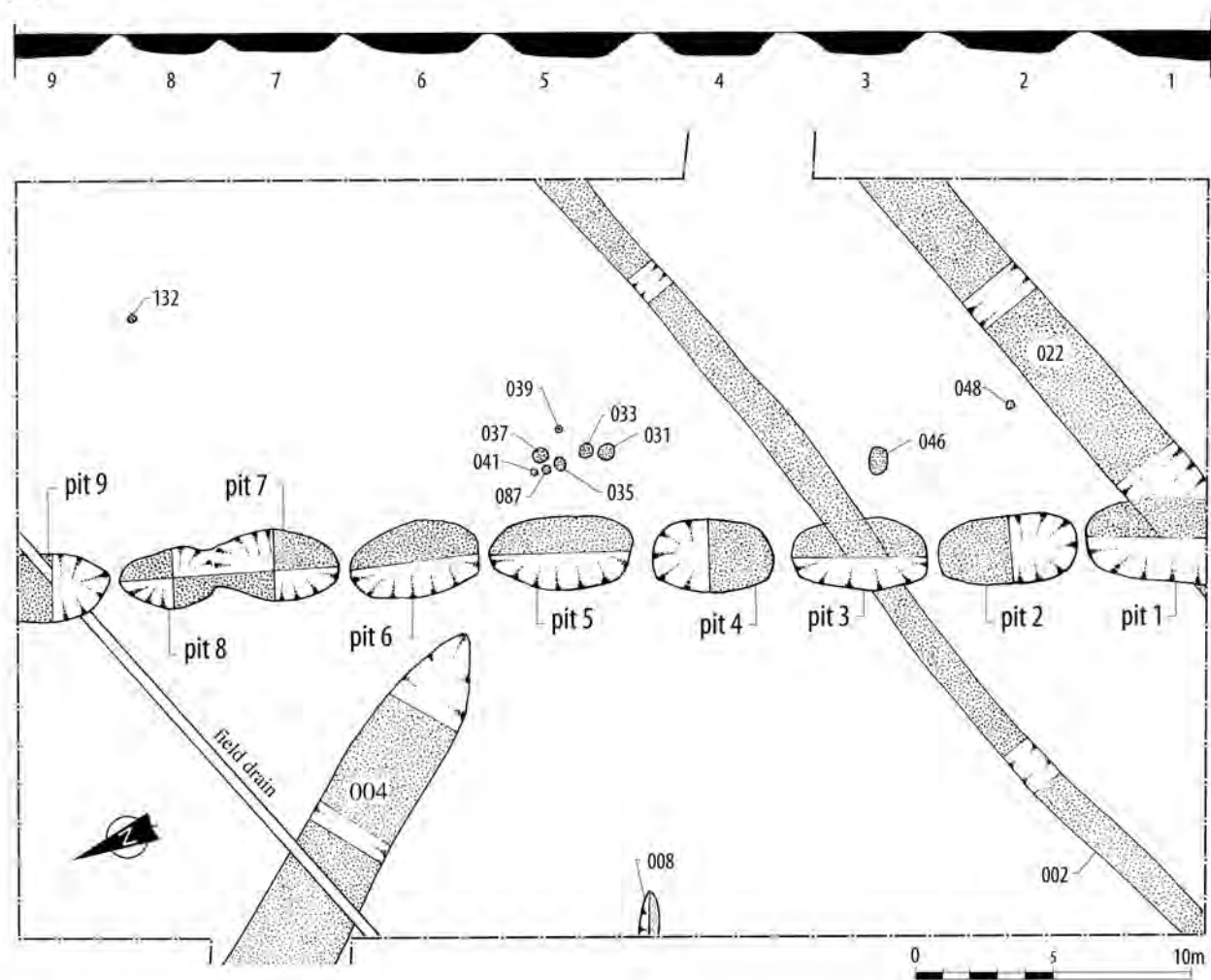


Illus 4.2 Aerial photograph of the pit alignment looking north (Crown Copyright: RCAHMS; Ref. SC973255, 2003)

The pit alignment here considered is only one of a number of such features identified in the Newton and Castlesteads area, which together remain one of the most coherent systems of this type revealed

by cropmarks on the Lothian Plain (Halliday 1982; pers comm). At least three other lines of pits are known to run parallel to it at intervals of around 350m; a double line is located to the east with a

pit profiles



Illus 4.3 Plan of features and composite profile along pit alignment

single line beyond this, and a single line is present to the west. The latter was extrapolated into the line of the proposed route but was not identified during the evaluation (see Section 3.3). Halliday (1982, 76) argues that together they comprise a series of ‘pitted boundaries’ covering an area of about 120 hectares, which define enclosures up to 24 hectares in extent (illus 4.1). Elsewhere in eastern Scotland, cropmark pit alignments sometimes delimit closed forms, but the Castlesteads examples seem to comprise mainly a series of approximately parallel alignments. A few alignments running north-west to south-east have been identified (illus 4.1), but these are limited in extent.

The field through which the examined pit alignment runs has been intensively cultivated. Roy’s map (1747–55) indicates that rig cultivation was practised prior to the agricultural improvements that led to the enclosure of the land, and provides a cartographic context for the cropmark evidence. No traces of either positive or negative features were visible on the ground surface prior to excavation. Once c 0.25–0.35m of topsoil had been stripped by

machine, the pit alignment was detectable at the subsoil interface. The underlying deposits consist of fluvio-glacial gravel and sand. The site lies on relatively level ground 400m to the west of the River Esk.

4.2.2 Strategy

Excavation took place during October and November 1994, after the crop had been harvested. Intensive sampling of the road corridor was also undertaken elsewhere in the field in the vicinity of the known cropmarks, owing to the archaeological sensitivity of the area surrounding the pit alignment and in order to detect any archaeological features present. Topsoil was stripped by mechanical excavator over a substantial corridor 15m wide either side of the pit alignment, in order to expose the pit alignment and any associated features adjacent to it (such as the remains of an upcast bank). The entire length of the pit alignment within the road corridor was then excavated by hand. A further evaluation carried

Table 4.1 Dimensions and characteristics of pits 1–9 at Castlesteads

Pit	Length (m)	Width (m)	Depth (m)	Distance apart (m) (centre–centre)	Cut by	Finds (context)
1	4.0 (exposed)	3.0	1.0	1–2 : 5.7	furrow (022)	2 frags med pot (072)
2	5.0	2.5	0.8	2–3 : 5.3	–	–
3	5.0	2.5	0.75	3–4 : 5.4	furrow (002)	pot rim (076)
4	4.5	2.75	0.8	4–5 : 5.2	–	–
5	4.95	2.8	0.9	5–6 : 5.2	–	med pot sherd (024)
6	5.0	2.5	0.6	6–7 : 5.0	–	med pot lid (094), chert (098)
7	4.0	2.2	0.6	7–8 : 3.9	–	med pot rim (134)
8	3.5	2.8	0.65	8–9 : 5.2	–	–
9	3.7 (exposed)	2.5	0.7	–	drain	med pot sherd (081)

out at Castlesteads in 2006 revealed no additional archaeological remains associated with the pit alignments.

The site lies on the same soil formation, fluvio-glacial deposits, as the pit alignment excavated at Eskbank Nurseries by Barber (1985), and the expectation that similar conditions of preservation of organic remains would prevail underpinned the excavation strategy. The principal objectives were to recover secure evidence of the date and function of the pit alignment wherever possible, and to record the basic dimensions and spatial arrangement of the pits. Full allowance for possible contradictory indications as to function was, however, maintained in the field programme – especially in relation to the palaeoenvironmental strategy, which necessarily formed a central concern.

All identified features within the trench were fully excavated and bulk soil samples were taken from each context within each pit. On-site dry-sieving of significant material excavated from the components of the pit alignment was conducted in order to identify, within the limitations of the dry-sieving technique, the presence of artefacts and plant macrofossil remains. Palaeoenvironmental work was conducted with a view to reconstructing the nature of the local environment and land use.

4.2.3 Archaeological results

4.2.3.1 Pit alignment

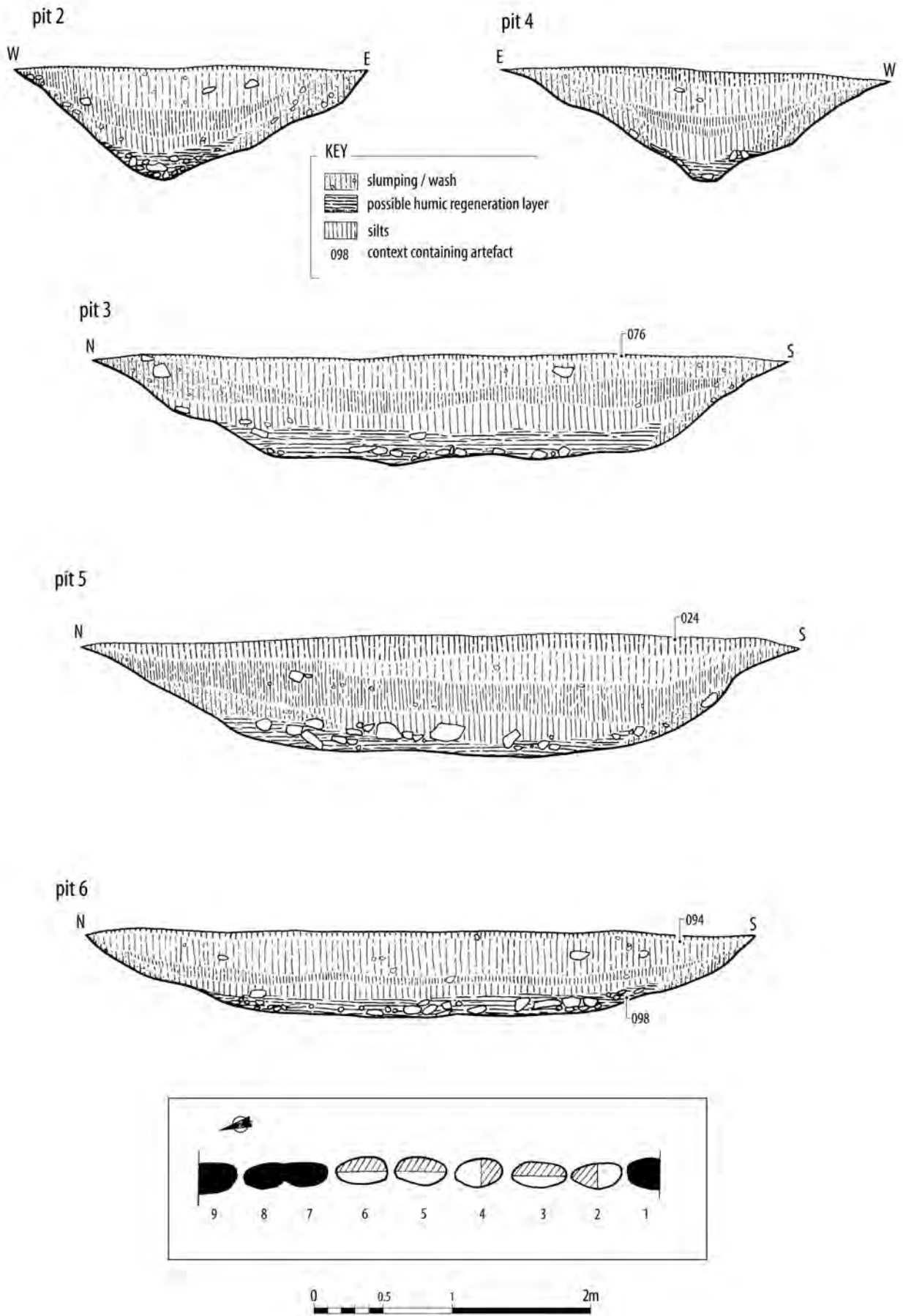
The main trench was *c* 50m long and 30m wide, orientated approximately north to south, with the pit alignment running centrally along its long axis (illus 4.3). Each pit in the alignment was numbered sequentially from 1 to 9, running south to north. Within these pits, every fill was allocated an individual context number (shown in parentheses in the following descriptions), although most of the pits displayed deposits of very similar character. Initial cleaning following topsoil removal revealed that two linear features, running diagonally from south-west to north-east, intersected pits 1 and 3 respectively,

thus obscuring their edges. Pits 1 and 9 were not fully exposed in the trench.

On plan the pits were of a slightly elongated oval shape. The pit cuts were all steep-sided along their longer sides, giving a V-shaped profile across their width, and more gently sloping along their shorter sides which, with the flat bases, formed an elongated ‘boat-shaped’ profile lengthwise (illus 4.4 and 4.5). The dimensions and basic characteristics of the excavated pits are shown in Table 4.1; depths are cited from the top of the features as exposed below ploughsoil. All pits were orientated with their long axis along the primary direction of the alignment. Pit 8 was considerably smaller than the other excavated examples in the alignment, and abutted the adjacent pit (7). All other pits were *c* 0.3 to 0.5m apart at the uppermost surviving level.

A basic sequence of fills within the pits was consistently found (illus 4.4) and can be summarised as follows. Large sub-rounded stones were consistently found at the bottom of the pit within a grey silty matrix, possibly a humic regeneration deposit (although it was not confirmed as such by soil micromorphology, and alternative explanations, such as a waterborne sediment, remain possible, as at Langside pit alignment, Section 4.3.4.4). The stones lined the flat bottom of each pit (to a depth of 0.1–0.2m) and were similar to the larger stones visible within the surrounding subsoil. No post setting was discernible in the base of any pit. There was no evidence for re-cutting of the pits. Slope-wash and slumping had subsequently occurred around the sides of the pit cuts. Overlying the basal stones were generally two layers of grey silt, with the lower fill containing a higher percentage of grit and small stones. These fills underlay a deposit of brown silt which formed the topmost fill and which on occasion produced fragments of medieval pottery. The brown silt was overlain by a shallow spread of ploughsoil occupying any residual basin of deposition.

Two fragments of medieval pottery were recovered from the top fill of pit 1. Pit 3 contained a rim fragment of Roman or medieval pottery in the upper fill (illus 4.7). A single fragment of medieval pottery



Illus 4.4 Selected pit sections



Illus 4.5 Photograph of section through pit 5, with pit cluster behind

was recovered from an upper fill of pit 5. A complete pottery lid was recovered from an upper fill (094) in pit 6 and a chert flake was found within another fill (098). A medieval pottery rim was recovered from an upper fill of pit 7 (134). A medieval pottery sherd was retrieved from the main upper fill (081) of pit 9, which was cut by a modern field drain to a depth of 0.5m.

A number of other features were identified in the vicinity of the pit alignment. Many of these could not be related stratigraphically to the pit alignment. There was no archaeological trace of a bank running parallel to either side of the pit alignment, such as survive as earthworks in a very few cases (eg [Strong 1988](#)) or as was detected as residual plough-truncated remains nearby at Thornybank ([Rees 2002](#)), although if such a feature had been present it may have been eliminated entirely by ploughing. The original form of the pit alignment is returned to in [Section 4.4](#).

4.2.3.2 Pit cluster

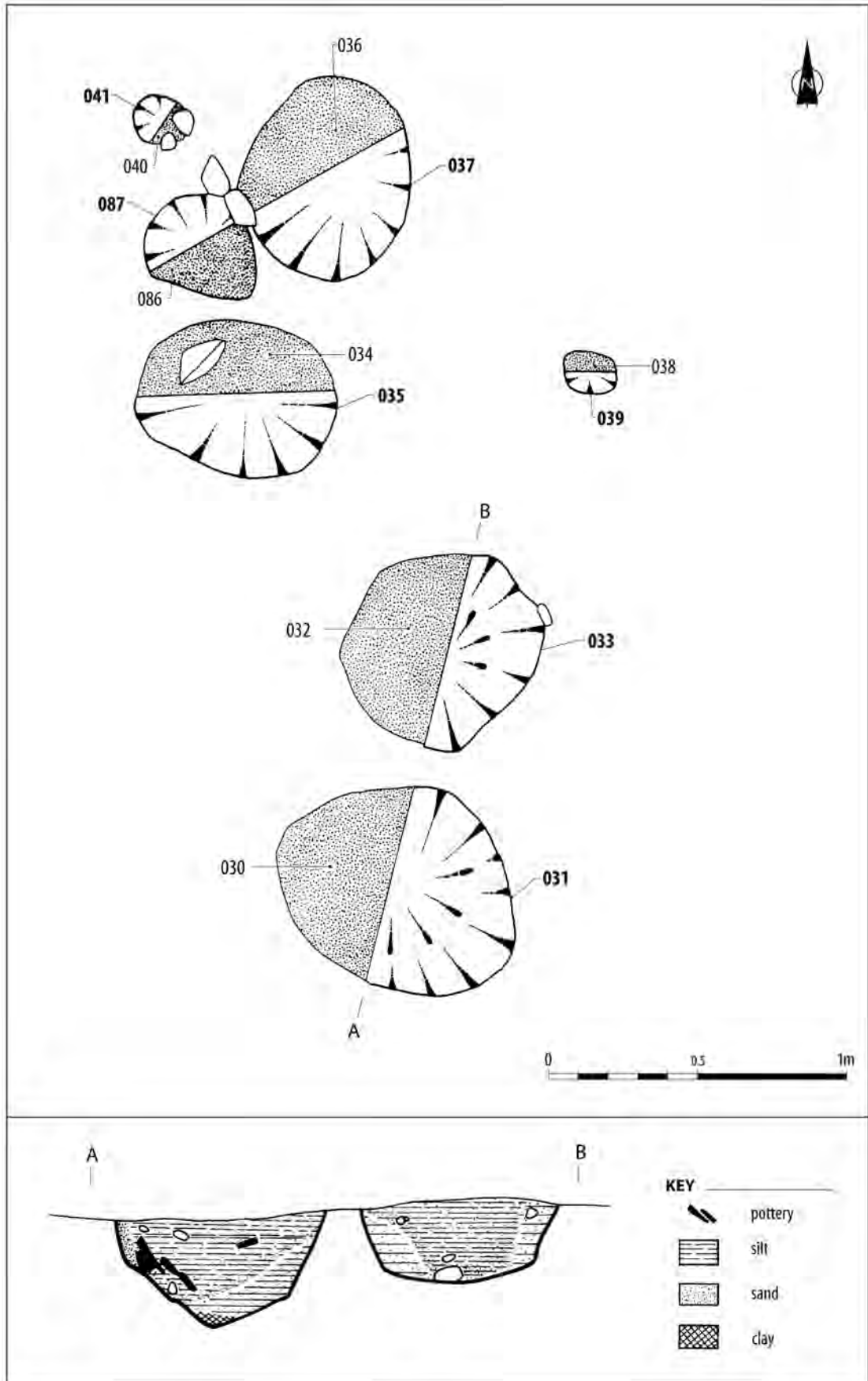
Seven small pits or post-holes were identified in a cluster ([illus 4.6](#)), c 2m to the east of pit 5. These seven pits were filled with charcoal-flecked sandy soil and had rounded profiles. Three of them (031, 033, 035) contained fragments of prehistoric pottery. Burnt organic residues on two sherds from 035 were subject to radiocarbon dating (see [below](#)). These features, which were spread over an area of

roughly three square metres, do not form a recognisable pattern. Despite their proximity to the pit alignment, there was no stratigraphic association with it. The broad range of dates ascribed to the pottery assemblage as a whole has simply provided a *terminus post quem* for the infilling of the pits ([Johnson below](#)).

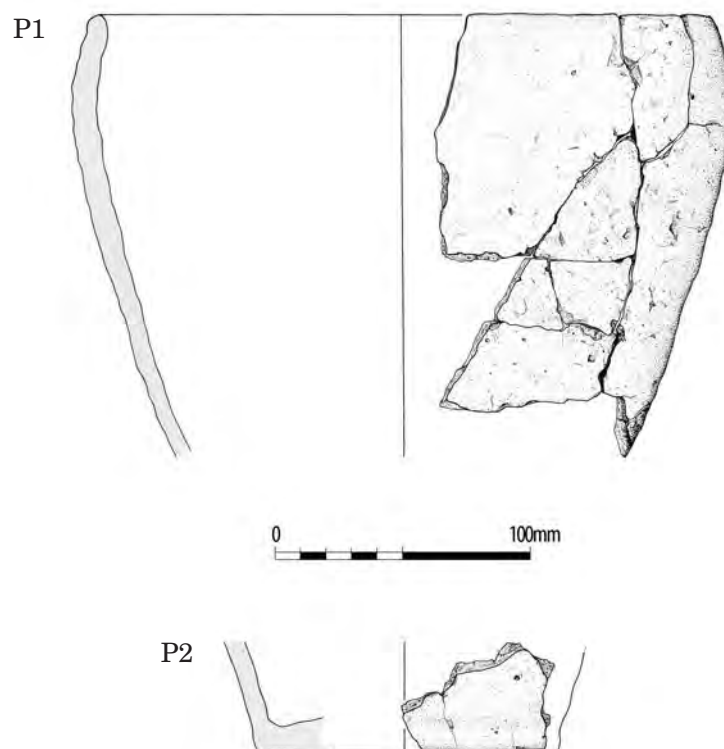
4.2.3.3 Rig and furrow

Two further, narrow excavation trenches were positioned in order to explore the area to the east and west of the pit alignment. In these trenches a number of cultivation traces were located ([illus 4.3](#)). These took the form of shallow furrows, corresponding to the eroded remains of a rig-and-furrow landscape. These furrows were irregularly spaced and proved to be no more than a few centimetres deep at maximum where they cut into the subsoil. They were seen to be aligned differently: towards the east of the field they ran on a south-west to north-east axis, roughly parallel with the current land divisions and relatively narrow, whereas to the west the axis was north to south and appears to be a broad rig of more than 10m wavelength.

Rig-and-furrow cultivation did not respect the pit alignment, as is witnessed by the crossing of pits 1 and 3 by two such furrows (022 and 002, [illus 4.3](#)). These furrows were not visible in the pit sections as, owing to their shallow nature, they had not penetrated below the top fill of residual ploughsoil and



Illus 4.6 Plan and section of small pit cluster, showing pottery in situ



Illus 4.7 Iron Age vessel(s) from pit cluster

Table 4.2 Radiocarbon dates from Castlesteads pit 035

SUERC Lab No BP	Material	Lab age BP	$\delta^{13}C$	Cal date 1 σ	Cal date 2 σ
22074	carbonised residue	3990 \pm 30	-26.5‰	2565–2470BC	2580–2460BC
22078	carbonised residue	3940 \pm 30	-26.6‰	2490–2340BC	2570–2300BC

their fills only served to obscure the pit edges at the outset.

Another possible furrow, 004, ran on a different alignment and was extremely shallow, with a maximum excavated depth of 0.05m; it was the easternmost of a series of parallel furrows located to the west of the pit alignment. This feature appears on plan to terminate immediately west of the alignment, however, due to its shallow nature it is likely that it did extend across the pit alignment, but was entirely removed during surface cleaning. It is apparent that these furrows represent a different, later pattern of land-use from that illustrated by the pit alignment, and also that the differences in alignment and spacing may indicate different land plots and/or differences in age.

4.2.3.4 Other features

Isolated features identified include two very shallow pits (132 and 048, [illus 4.3](#)) located to the east of the pit alignment. Neither of these produced any finds. A shallow, oval-shaped stony spread (008) of uncertain function was located running under the centre of the

western baulk; and a large stone-filled pit (046) with dimensions of 1.2m by 1.1m and a depth of 0.35m was identified to the east of pit 3.

4.2.4 Dating

No organic material suitable for radiocarbon dating was recovered from the pit alignment. However, the burnt residues on sherds of prehistoric pottery from pit fill 034 (from pit 035 beside the alignment) were considered suitable for sampling, and were submitted for radiocarbon dating in December 2008. The results are shown in [Table 4.2](#).

4.2.5 The finds and environmental evidence

4.2.5.1 Prehistoric pottery, by M Johnson

Prehistoric pottery, comprising 24 sherds weighing 733g, was recovered from the fills of three of the pit cluster pits (031, 033 and 035), and represented a maximum of five different vessels.

The remains of a substantial portion of the upper

part of a vessel (P1) were recovered from pit 031 (illus 4.7). Eighteen sherds were recorded, weighing 591g, representing just under a quarter of the total rim circumference of a barrel-shaped vessel with rounded, slightly inturning, rim. All of the sherds, except one, join. Its rim diameter was 250mm and the height of the section of vessel recovered is 180mm. The fabric is coarse and hard, slightly crumbly, sandy, and with stone inclusions up to 10mm in size. A few organic impressions are also present but are unlikely to represent a deliberately added material. The vessel is brown to orange-brown on the exterior, with a dark grey core and grey to dark grey interior. The vessel is generally about 9mm thick and has some evidence for laminar fracture; it has also broken along a coil join at the bottom of the section. Both surfaces are fairly well smoothed, with some finger-marking, wiping and protruding inclusions to give uneven surfaces. There is light sooting on the exterior towards the upper part of the body, and light sooting all over the interior.

A base sherd (P2), which may not be from the same vessel as that above, was also found in this pit (illus 4.7). It is a flat, slightly footed base with a diameter of 120mm and thickness of 11mm, weighing 41g. Its fabric is not sandy and it is better finished than P1, suggesting a different vessel. It was, however, also brown on the exterior, with a grey core and interior. It was well smoothed on the exterior and smoothed and wiped on the interior. There was sooting on the interior. A crack along the interior at the base of the wall suggests the sherd has separated along the manufacturing joint.

The shape and fabric of vessel P1 make it difficult to pinpoint a date with any degree of accuracy, as such simple undecorated vessels, of so-called flat-rimmed ware type, have a currency from at least the mid second millennium BC to the pre-Roman Iron Age. There are at present few certain typological or chronological distinctions in such assemblages. A lone vessel is also harder to pinpoint with certainty than those coming from larger assemblages where more general themes can be established.

In the Mid-Late Bronze Age, the pottery has parallels with vessels from sites such as the unenclosed platform settlements at Lintshie Gutter, Lanarkshire (Terry 1995), Ormiston Farm hut circle, Fife (Sherriff 1988) and Green Knowe, Peebleshire (Jobey 1980). During the Iron Age in the local area, bucket-shaped plain coarse vessels were found at Broxmouth hillfort (Cool 1982), St Germain's (Alexander & Watkins 1998), Dryburn Bridge (Cool 2007) and Fisher's Road, Port Seton (Cowie 2000), all likely dating from around the middle of the first millennium BC and into the first century or two AD.

The final sherd recovered from this pit (P3) was an abraded, decorated body sherd of an entirely different date, weighing 10g. It had a fairly fine fabric, with dark red stone inclusions and a corky fabric. It had a brown exterior and grey core and interior. Both surfaces were well smoothed and it was 6mm thick. It had impressed decoration and,

although the overall motif was unclear due to heavy wear, it included a double row of stabs, a single row of stabs or possible comb impression, and two perpendicular/slightly diagonal lines of stabs or possibly comb or twisted cord. The apparent design of the decoration and the corky fabric lead to the suggestion that this is a sherd of Beaker pottery.

A single vessel (P4) represented by two joining sherds was recovered from pit 033, weighing 43g. They were plain body sherds of a coarse, sandy fabric, measuring 8mm thick. The exterior was orange-brown in colour, with a grey core and interior. The exterior surface was very abraded, and slightly pitted, while the interior was sooted. Both surfaces had been smoothed, with some finger-marking on the exterior and some protruding inclusions on the interior. It is very difficult to ascribe a period to such featureless sherds; however, the fabric has some similarities with that from pit 035 and so may be considered to be of comparable date.

A single vessel (P5) represented by two joining sherds was recovered from pit 035, weighing 48g. The fragments were body sherds of a coarse sandy fabric, decorated with probably four parallel lines of impressed twisted cord on the exterior. The outer surface is very abraded. The sherds have an orange-brown exterior and grey core and interior. Both surfaces were well smoothed. The sherd measured 7mm thick and had a thick charred residue adhering to the interior surface and possibly across a sherd edge. The presence of twisted cord impressions in parallel rows strongly suggests this sherd to be Late Neolithic Impressed Ware or Beaker. Residue taken from each sherd has been radiocarbon dated (Table 4.2) and application of the chi-squared test confirms that these dates are statistically the same; when the dates are combined they provide a range of 2570–2450 BC. This date is on the very earliest end of the range for Beaker pottery and so it may be more likely that it is Impressed Ware.

Discussion

The pottery provides a *terminus post quem* for the infilling of the pits. Pottery of two different dates has been identified, and it seems likely, given the small sherds and highly abraded nature, that the earlier, Late Neolithic/Beaker sherds were not deposited freshly broken into the pits (031 and 035) but were incorporated into the fills some time after their primary period of use and were re-deposited from elsewhere. As such, they are a poor indicator for the date of infilling for the pits and cannot be used at all to date the excavation of the pits.

The presence of a substantial portion of a single vessel in pit 031, and the angle of rest of the sherds as illustrated on the section drawing (illus 4.6), suggest that this vessel was deposited in a single act during the backfilling of the pit, and may well have broken upon deposition. It is unlikely that a sherd of that size would have been introduced into the pit through natural processes and so could have been



Illus 4.8 Roman / medieval jar rim

incorporated into the fill simply as a component of the soil used to fill the pit or as a deliberate intentional deposition. It is unfortunate that the vessel is not of a more strongly diagnostic type, and may only be dated to a broad range of *c* 1500 BC to *c* 100 AD.

4.2.5.2 Roman/medieval pottery, by D Alexander

The Roman or medieval rim sherd (illus 4.8) was from a wheel-thrown jar with a slight depression on the inner side of the rim forming a seat for a possible lid. It was recovered from the upper fill of pit 3, and was likely to be in a re-deposited context. The rim diameter was between 80 and 100mm. The fabric was grey in colour, hard, with very common medium-sized (0.25–1.0mm) dark stone grits. The wall of the vessel just below the neck was *c* 3mm thick. The sherd weighed 4g. Parallels for the vessel form have been recovered from the civilian settlement outside the Roman fort at Inveresk (G D Thomas, pers comm). This sherd does, however, bear some resemblance to the fabric of medieval East Coast White Gritty Ware, which has a date-range of 12th–15th centuries AD (G Haggarty, pers comm).

Other sherds of White Gritty Ware were recovered from upper fills of several pits (pits 1, 3, 5, 6 and 9) and have been dated to the 13th–14th centuries AD (G Haggarty, pers comm).

4.2.5.3 Chipped stone, by B Finlayson

This small collection of chipped stone is dominated by chert derived from sources in the Southern Uplands. There are chert pebbles and blocks occurring naturally within the local soils, and because of the fracture properties of this chert it is not always clear when the material has been worked. Some of the chert collected from the topsoil here is probably unworked, but has been damaged by ploughing.

There are six definitely worked pieces, of which four were collected during cleaning following topsoil removal. Two flint flakes were collected from stratified contexts: one from pit fill 030 and an abraded example from the lowest fill of pit 6. The only significant item is a bipolar core from the topsoil, which may indicate a Neolithic, or conceivably early Bronze Age date. Certainly this technique was rarely used in the Mesolithic to work chert.

4.2.5.4 Pollen analysis, by Robert McCulloch

A preliminary assessment of the macrofossil content and the presence and state of preserva-

tion of palynomorphs in two soil samples from pit 4 indicated the presence of identifiable pollen grains and the potential for a detailed palynological analysis of a putative humus regeneration band within the pit (Clarke 1996). Pollen analysis of a similar band in a pit alignment, also in the Dalkeith area, permitted an environmental reconstruction and a hypothesis of the function of the pit alignment (Barber 1985).

Ten 0.5cm³ sub samples were taken from Kubiena tins across the proposed humus regeneration band in the base of pit 4. These samples were processed for pollen content using standard laboratory techniques (Moore et al 1991). In addition the samples were treated with HF acid and heated in a boiling water bath for a total of 1 hour 15 minutes, with the HF acid changed at 30-minute intervals. Eucalyptus tablets were added to enable the estimation of pollen concentrations. A complete slide was counted for each sample using an Olympus BX40 microscope at $\times 400$ magnification. Identification was made with reference to type material and photomicrographs (Moore et al 1991).

Due to the low concentrations of pollen and, as a result, the low total land pollen sums, it was not reasonable to calculate percentage abundances except for the upper two samples, although with the caveat that even the percentage figures for these samples are unreliable.

The herb taxa of *Gramineae*, *Compositae tubuliflorae* and *Liguliflorae* dominate the pollen assemblage, with the addition of pasture/ruderal taxa and polypod ferns. The species diversity declines with depth and conversely total abundances increase upwards. There are no cultivars and an almost complete absence of arboreal taxa (although due to the similarity between eucalyptus pollen and degraded *Betula* pollen, the latter may be under-represented in the results).

The pollen assemblage of pit 4 indicates a grassland with ruderal components common to open pasture. However, further interpretation of the vegetation is constrained by taphonomic processes. The degraded state of almost all pollen grains, the increase in taxa diversity and pollen concentrations upwards and the dominance of palynomorphs more resistant to deterioration (eg *Polypodiaceae* and *Compositae*) suggest that there has been oxidation and secondary decomposition of the profile. This interpretation is consistent with the apparent lack of macrofossils from the same profile.

The Castlesteads and Eskbank pollen profiles suggest similar open pasture grassland, although the latter record indicated a level of surrounding arboreal and shrub vegetation local to the site. The Eskbank pollen assemblage and its degree of preservation also suggest that the site was wetter than Castlesteads. The pits subsequently infilled through natural slope processes. It is likely that the free-draining substratum led to the deteriorated state of the pollen at Castlesteads.

An important reservation on comparing the two

Table 4.3 Dimensions and characteristics of pits 1–6 and 8–9 at Langside

Pit	Length (m)	Width (m)	Depth (m)	Distance apart (m) (centre–centre)	Cut by	Finds (context)
1	2.5	2.0	0.70	1–2: 5.5	–	–
2	2.2	0.6	0.35	2–3: 2.1	–	–
3	2.0	1.2	0.45	3–4: 15.5	clay drain	–
4	2.0	1.0	0.50	4–5: 7.5	clay drain	–
5	2.0	1.0	0.50	5–6: 3.0	clay drain	Flint scraper (503)
6	2.2	0.9	0.60	6–8: 2.9	–	Coarse stone, flint (603)
8	2.3	0.9	0.50	8–9: 2.8	clay drain	Microlith (802), flake (804)
9	2.1	1.3	0.50		clay drain	Flake fragment (902)

profiles is that the samples prepared by B Moffat were 7.0cm³ and subjected to 36 hours of treatment with HF acid (Barber 1985). The samples prepared for this study by R Kynoch were initially 0.5cm³ and treated for 1 hour 15 minutes. The respective preparations could account for the differences in pollen concentrations and percentage abundances, as the longer treatment time may have resulted in fewer surviving grains.

In summary, the pollen assemblage from the putative humus regeneration band at the Castlesteads pit alignment indicates open pasture and the absence of arboreal vegetation. However, edaphic processes have led to the deterioration of the pollen profile, which prevents a more detailed environmental reconstruction.

4.3 Langside, by S Mitchell

4.3.1 Introduction

The site was located on an open north-west facing hillside, to the south-west of Langside Farm. Trial trenching evaluation undertaken during 2005 revealed the remains of an alignment of three pits, sealed beneath ploughsoil and cut into plough-scored stiff sandy clay subsoil containing numerous field drains. A subsequent excavation revealed an alignment of six pits (pits 1–6), and a later watching brief exposed a further two pits (pits 8 and 9) forming part of the same alignment (illus 4.9). The alignment has affinities with the later prehistoric pit alignments identified elsewhere within the Esk Valley, of which examples have been excavated within the road corridor and ancillary works areas at Castlesteads and Thornybank (Rees 2002).

4.3.2 Strategy

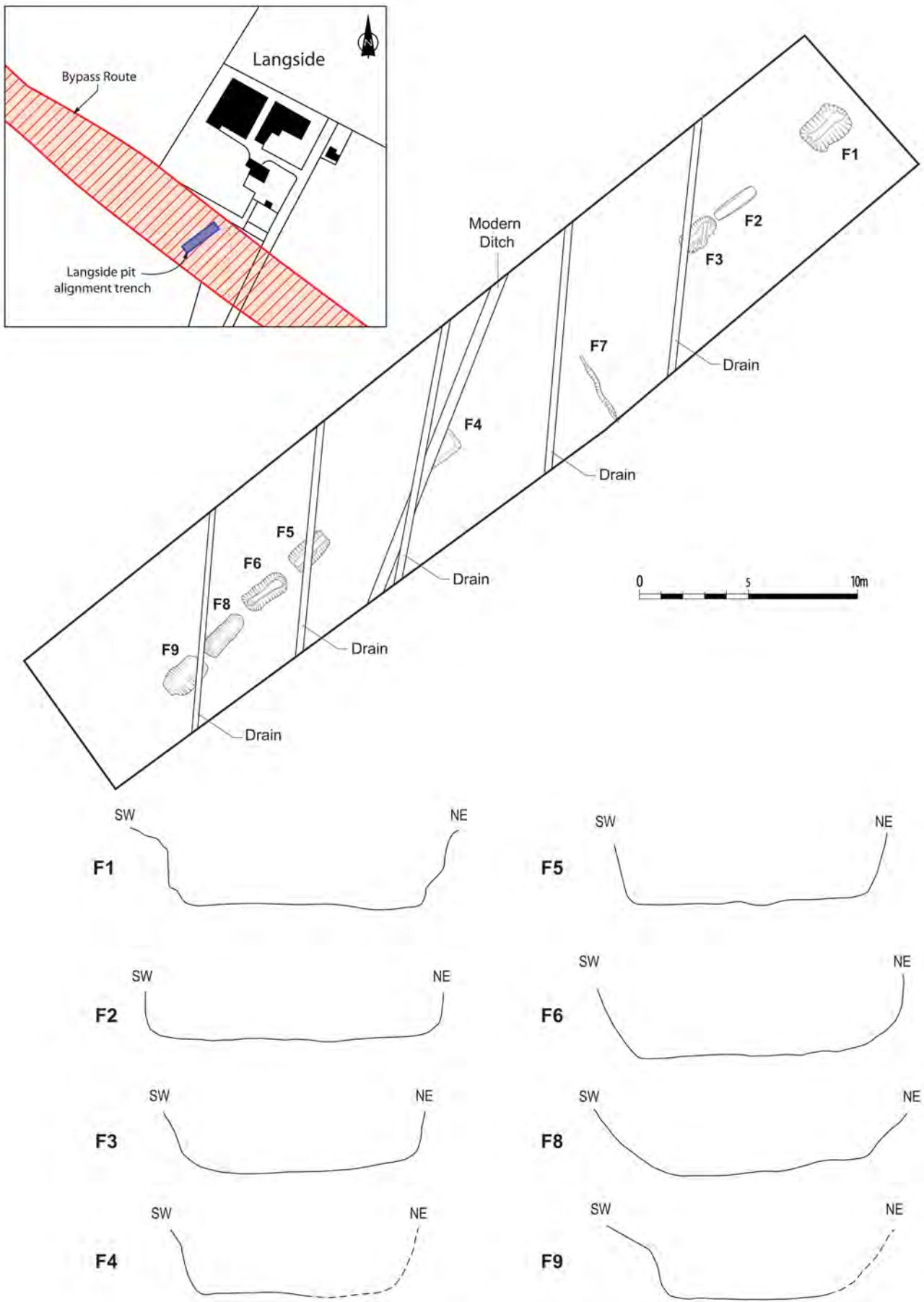
Topsoil was removed from the site using a tracked mechanical excavator fitted with a smooth-bladed ditching bucket under constant archaeological supervision. All pre-modern archaeological features

cut into the subsoil (ie excluding a modern ditch and land drains) were fully excavated. Bulk soil samples were taken of all archaeological deposits, for wet-sieving to recover charred plant wood and plant remains. Kubiena samples were taken to allow the formation processes of the fills of certain pits to be established (ie to address whether filling was gradual or sudden, a result of natural or direct human agency etc), and to allow the taphonomy of wood charcoal potentially suitable for radiocarbon dating to be better understood. The spoil heaps, fills of linear features and surrounding area within the road corridor boundary were scanned by members of the Scottish Detector Club.

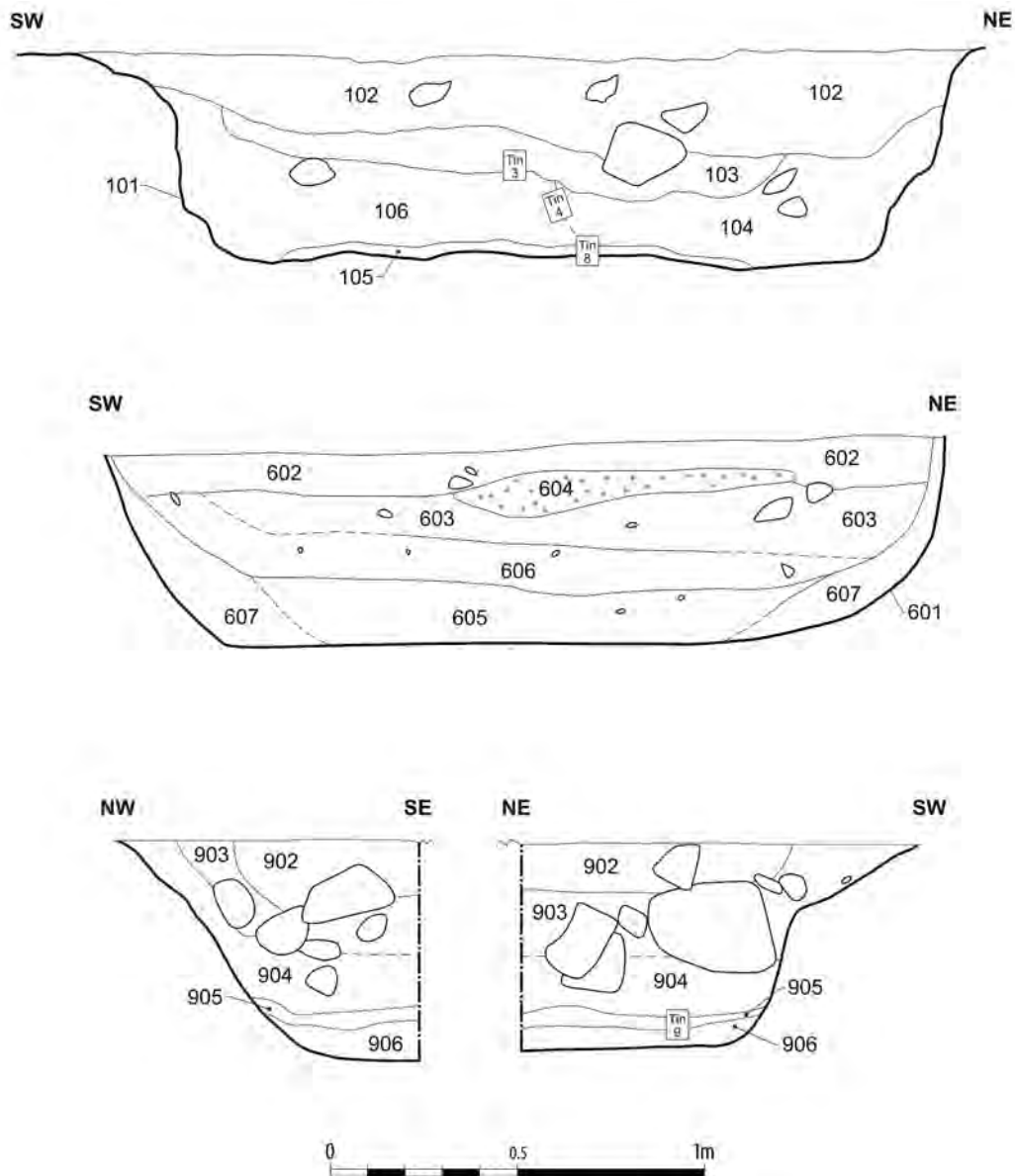
4.3.3 Archaeological results

The excavation trench was 35m long and 7.5m wide, orientated roughly north-east to south-west, with the pit alignment running centrally along its long axis (illus 4.9). Each pit in the alignment was assigned a feature number running sequentially from 1 to 9. Feature 7 was found to be an ice wedge. The depth of the topsoil (001) was up to 0.35m, below which was a deposit of plough-disturbed, dense silty clay varying in depth between 0.2m and 0.3m (002), which sealed a number of field drains and the features. Four of the pits had been cut by 20th-century field drains. The natural subsoil, into which all the archaeological features were cut, varied from sandy clay at the north-east end of the trench to clay in the rest of the trench.

Eight sub-rectangular pits were revealed, of similar size and form. The dimensions and characteristics of the individual pits are shown in Table 4.3; depths are cited from the top of the features as exposed at the surface of the natural subsoil. All were orientated with their long axis along the primary direction of the alignment. There was significant variation in the spacing of the pits. Pits 5, 6, 8 and 9 and pits 2 and 3 were roughly equidistant, set c 0.35m from each other, while a gap of c 6m lay between pits 4 and 5. A gap of c 13.5m lay between pits 3 and 4, and pit 2 was separated from pit 1 by a gap of c 3m.



Illus 4.9 Plan of site with longitudinal profiles of pits



Illus 4.10 Longitudinal sections of F1 and F6, and quadrant sections of F9, showing positions of Kubiena tins

All the pits had steep sides and flattish, irregular bases, with no indications of post-settings. They measured approximately 2–2.3m long by 1.3m wide and 0.45m deep, with the exceptions of pits 1 and 2. Pit 1 was notably larger than the others, measuring 2.5m by 2m and 0.7m deep, and pit 2 was narrower, measuring 2.2m by 0.6m and 0.35m deep. The sequence of fills (illus 4.10) was broadly consistent in all the pits and can be summarised as follows: the basal fills comprised firm orange-grey clay; overlying the basal deposit were generally three to four layers of mixed clay matrices. Medium to large stones were contained within the fills of pits 3 and 9, but had no structural indicators and did not form a lining to the base of the pits. Slope-wash and slumping had occurred around the edges of some pits. There was no evidence for re-cutting of any of the pits. Charcoal was recovered from deposits in pits 1, 2, 5, 6, 8 and

9, and samples from contexts 105 (pit 1), 604 (pit 6) and 905 (pit 9) were radiocarbon dated (Section 4.3.5). A coarse stone artefact was recovered from pit 6, and lithic artefacts were recovered from fills within pits 5, 6 and 9.

4.3.4 The finds and environmental evidence

4.3.4.1 The lithic assemblage, by T Ballin

Six lithic artefacts were recovered, comprising three pieces of debitage (two flint and one agate/jasper flakes), one chert core, and two tools (an agate/jasper obliquely blunted point, and a chert side-scraper).

A number of different raw materials were identified, namely fine-grained grey, black or mottled chert, fine-grained red flint, medium-grained brown flint, white/pink agate and red jasper. The

chert corresponds to what is generally known as Southern Uplands chert and is most likely to have been procured from the local Carboniferous bedrock (Ballin & Johnson 2005). Flint was probably procured from the nearby shores of the North Sea (Saville 1994), whereas agate may have been obtained from sources in volcanic bedrock in the Edinburgh or North Berwick areas (eg Pentland Hills and Blackford Hill; Heddle 1901, 76). Jasper is basically a red chalcedony (Pellant 1992, 88), where agate is banded chalcedony, and jasper and agate may therefore have been obtained from the same geological formations.

The debitage includes two flakes, one of which was a hard-hammer flake. Only one certain core was recovered. It is a small fragment of a disintegrated, now indefinable core type. At one end, a small proportion of an original flaking-front survives, whereas all other faces are irregular and based on frost-induced disintegration. The tools are one obliquely blunted point (microlith) and one side-scraper on a flake.

The evidence does not allow a more detailed characterisation of the industry(-ies). Flakes were manufactured by the application of hard percussion. The lack of blades or microblades could simply be the result of random statistical fluctuations, as the assemblage is exceedingly small. No preparation flakes or definable cores were retrieved from the excavations. The side-scraper has a trimmed platform-edge, but mostly the recovered flakes have untrimmed, plain or faceted platforms.

The collection only includes one diagnostic piece, namely the obliquely blunted point. In Clark's classification schema (1934), this microlith form belongs to Type A, whereas in Jacobi's schema (Jacobi 1978), it belongs to Type 1a (for an overview, see Butler 2005, 90). Obliquely blunted microliths are generally perceived as dating to the Early Mesolithic period. In principle, all other lithic finds could date to any part of the period between the Mesolithic and the Bronze Age. Usually, complete absence of blades indicates a date after the first stages of the Late Neolithic period (Pitts & Jacobi 1979; Ballin forthcoming a), but as hinted at above, the small numerical size of the assemblage prevents unequivocal technological characterisation and, thereby, certain dating of the material.

Based upon date range proposed above, and the radiocarbon dates obtained from organic material recovered from the pits, the lithics from the Langside pits are surely in secondary, residual contexts of deposition.

4.3.4.2 Coarse stone, by A Jackson

A basalt grinder from feature 6, fill 603, shows slight evidence of grinding use at both poles and slight polishing on one face, possibly the result of handling. The object is of otherwise unmodified natural form. Grinding stones of this expedient type are not chronologically sensitive as they are commonplace on Scottish sites of all periods.

4.3.4.3 Miscellaneous finds, by S Anderson

All miscellaneous finds were collected during a metal detector survey and were unstratified. They include a short section of lead pipe, a brass screw, eighteen copper alloy or silver coins, a colliery check token, a fragment of shoe buckle frame, sixteen buttons, three lead dress weights, a finger ring, a medal (uninscribed, laurel wreath border), a strap fitting, a large iron buckle (horse tack), a lock tumbler, terminals from two spoon/fork handles, lead melt waste, various fittings such as hinge plates and straps, a possible ramrod tip, lead shot, a lead soldier, a conical weight and a sack seal. All of these finds were of 18th- to 20th-century date. A possible late medieval or early post-medieval spoon handle was also found. Two clay pipe stems, a ceramic marble, a marble in clear glass with white glass swirls, and half a small green glass bead were also recovered during the metal detector survey.

4.3.4.4 Charcoal, by M Cressey

Charcoal was recovered from wet-sieving of samples recovered from several deposits in six pits (1, 2, 5, 6, 8 and 9). The assemblage comprises 25g of identifiable charcoal made up of five species. Hazel attained the highest frequency (n=53; 11.3g), followed by oak (n=28; 11.3g). Alder, birch and pine are present but are extremely low in frequency (0.5g, 0.8g and 1.5g respectively). Overall the assemblage is poor and low in frequency. A full report and data table is included within the site archive. No plant macrofossils were identified during post-excavation.

4.3.4.5 Soil micromorphology, by C Ellis

Three Kubiena samples from a single pit section in pit 1, and a further Kubiena sample from pit 9 were analysed. Positions of the tins are shown in *illus 4.10*. The summary results are given below and full descriptions of methodology and results are available in the site archive.

The pit fills comprise various combinations of clay, silt and sand. All the contexts, except 905, were compact, with the porosity ranging from around 1 to 10%, whilst the charcoal layer 905 exhibited a porosity of around 20%. Although a small sample, the microstructure of the natural subsoil appears to comprise peds or clods. The upper pit fills are dominated by a channel microstructure which is a product of bioturbation. The microstructure of the lower and upper fills of pit 9 were predominantly massive while that of the charcoal layer was vughy.

Colloidal organic matter was generally not observed. Very few fragments of charcoal occurred in every context from pit 1, but charcoal was disseminated within the matrix and biogenic silica was only observed within the uppermost sampled deposit. Very few roots occurred in every context. The charcoal of the lower and upper examined fills of pit 9 was also very rare but the central fill (905)

was dominated by large fragments and clasts of cellular charcoal.

Mode of formation and deposition

The fills of pits 1 and 9 are of a similar composition and share similar modes of deposition; they are clearly derived from a similar source. The general lack of observed amorphous organic matter is perhaps partially due to the masking effects of the sesquioxides of iron but is also likely to be a consequence of the source of the fills, potentially the upcast from the excavation of the pits and eroding natural subsoil.

The natural silty clay appears to have been disturbed during the original excavation of pit 1 and the newly exposed surface may have dried out immediately following this, resulting in the formation of peds or clods of sediment. The boundary between the natural subsoil and the overlying silt (105) is prominent and sharp but slightly wavy. Its sharpness is a consequence of the lack of iron impregnation within the silt of 105, rather than a dramatic change in sediment type or presence of linear arrangement of voids etc. This silt and dusty clay of 105 also extends down between the clods of the natural subsoil, with the long axis of the larger sand-sized mineral grains arranged about the vertical, demonstrating that it was rapidly incorporated by a combination of gravity and infiltration. The silty clay (906) of pit 9 shares similar sedimentary characteristics with the natural subsoil and also exhibits planar voids which are infilled with silt and fine sand-sized material; it seems likely that 906 is also a disturbed natural subsoil. Consequently the basal fill of pit 9 appears to be the layer of charcoal and ash 905. However, the lack of a basal silt layer (eg 105 in pit 1) overlying the natural, the truncated nature of the planar void infills and the sharpness of the boundary between the two contexts requires explanation. It is possible that pit 9 was deliberately re-excavated, ie cleaned out, prior to the rapid deposition of the charcoal layer and upper ash band.

The inter-bedded silts and clays of basal fill 105 in pit 1 were produced by differential settlement-out-of-suspension. Soon after initial pit construction runoff introduced silt and clay, the silt settled first while the clay gradually accumulated, falling out of suspension from still rainwater trapped within the pit. Occasional pulses of addition runoff are evident in the presence of silt microlaminations. This clay is overlain by a laminated sequence roughly comprising 2mm wide silt, 1mm wide clay, 1mm wide silt, 1mm wide clay, 1mm silt and then 20mm of clay; a sequence that could have readily accumulated during the course of a few months of changeable weather, or perhaps over a year.

The prominent, sharp but wavy boundary between the upper clay 105 and the overlying moderately sorted sandy clay 104 is a consequence of a sudden change in the depositional environment, namely a sudden influx of silt- and clay-laden runoff. However,

it is also a consequence of the post-depositional compaction in which the softer waterlogged clay has been compacted and differentially forced up into the context above. This also demonstrates that there was no hiatus in sedimentation between the two contexts in which vegetation within the pit could have accumulated or the clay surface dried out.

The sequences of accumulation of 104 and 904 are very likely to have been similar to that described for 105, but the laminated fabric characteristic of 105 has been destroyed in 104 by post-depositional bioturbation. The two contexts, 104 and 106, were not readily distinguishable in thin section, perhaps because they are not fundamentally different sediment types but identified in the field as such due to differential mottling/gleying (S Mitchell, pers comm), or perhaps because bioturbation has blurred the boundary to such an extent that the difference between the two is only observable over a large section face.

The silty clay 103 also lacks an internal micro-fabric, but given its grain-size it is likely that this too was washed into the pit by episodic run-off. The homogeneity of 103 is also a consequence of post-depositional bioturbation.

Anthropic indicators

Anthropic indicators in pit 1 are minimal. The very few charcoal fragments indicate some form of organic combustion taking place within the general locality of the pit; it is unclear from its size and distribution through the profile whether this took place prior to pit construction and was incorporated in the upcast, or whether fires were intermittent during the silting-up of the pit and the charcoal was periodically blown and/or washed in. However, the uppermost sampled context (103) appears to be partially composed of the surviving remnants of ash, comprising charcoal and fragmentary biogenic silica (Carter 1998). The burning did not take place within the pit; rather the ash has been incorporated through natural processes. The concentration of ash indicates a localised source.

Localised burning is also evident from the basal charcoal layer in pit 9 (905). The rounded and vaguely sorted nature of the charcoal clasts, the presence of rounded clasts of ash and the existence of an upper ash band indicates that this material is not in situ, but has been incorporated into the pit by natural forces such as runoff and wind, possibly over a short period. However, given the concentration of charcoal and the relative purity of the in-washed ash band it is very likely that the burning event(s) took place adjacent to the pit, and is therefore a reasonable means of dating the context from which it derives.

Post-depositional processes

Sesquioxides of iron mottles, which are common to dominant in all but the uppermost sampled context, developed under oxidising conditions, where soluble

iron is absorbed by clay minerals (Courty et al 1989). These mottles occurred juxtaposed with grey zones of sediment (pseudo-gley) or in laminations of grey silt and grey clay (eg 105), and provide evidence for periodic reducing and periodic oxidising conditions. The natural subsoil had been subject to damp but largely oxidising conditions, resulting in the formation of mottles prior to the deposition of the overlying silt which remained unaffected by mottling. In pit 1 the overlying silt and clay laminations appears to have been laid down relatively rapidly in largely reducing conditions, although subsequent and limited root penetration and degrading of organic matter resulted in isolated pockets in which sesquioxides of iron accumulated. The movement and accumulation of fine particles through the sediment profile within porewater (a process known as illuviation) is testified in the frequent to common infilled channels, voids and pores with silt and dusty clay within 906, 905, 904, 103 and 104.

Post-depositional bioturbation is evident throughout the sampled pit 1 profile, but is especially marked in the upper contexts. The concentration of biological activity in the upper deposits is probably due to the domination of oxidising and less water-logged conditions and probably a slower rate of sediment accumulation. The channel microstructure of 104 and 103 is a product of bioturbation. The homogeneity of the convoluted fabrics of 104 and 103 is interpreted as a consequence of the mixing and reworking of the sediments by soil biota, the original depositional fabric having been destroyed. Stacks of sand grains and thin accumulations of silt within these deposits are also indicative of the activities of soil biota.

Evidence for post-depositional bioturbation is more limited in the sampled contexts from pit 9. The very few clasts of mixed charcoal and mineral grains in 905 appear to be the by-product of bioturbation. The infilled channels of the upper fill 904 are interpreted as products of bioturbation.

Summary conclusions

The fills of pits 1 and 9 comprise clay, silt clay, silt and poorly to moderately sorted sandy clay; these fills are likely to be derived from pit upcast and localised erosion. Pit 9 also contains a layer (905) dominated by cellular charcoal.

- The pit fills accumulated under natural forces (run-off and gravity).
- Rates of sedimentation were relatively rapid; the lowermost fill of pit 1 could have accumulated over the course of a few months to perhaps a year.
- No hiatus in sedimentation was observed, although rapid changes in localised conditions of deposition were evident.
- Pit 9 appears to have been re-excavated prior to the deposition of the charcoal-dominated layer 905.

- Anthropogenic inclusions were limited to the charcoal and ash layer 905 in pit 9 and a very few minute pieces of charcoal and the remnants of ash in the uppermost sampled context 103 of pit 1.
- The charcoal and ash of 905 and ash of 103 were not burnt in situ but appeared to have been deposited rapidly by natural forces from immediate, local sources.
- The pit fills have been subject to post-depositional processes including periodic wetting and drying and illuviation.
- All the sediments in pit 1 had been affected by bioturbation. The level of bioturbation intensified in the uppermost contexts. The sediments of pit 9 were less affected by bioturbation.

4.3.5 Radiocarbon dates, by A Dunwell

Paired samples of charcoal from three features across the site were submitted to SUERC for radiocarbon dating. The results are presented in [Table 4.4](#).

The radiocarbon dates give a range from 800 to 510 cal BC for pit 1 (basal fill 105), 360 to 40 cal BC for pit 6 (upper charcoal fill 604) and 390–200 cal BC for pit 9 (basal fill 905). The radiocarbon dates from the basal fill of pit 1 are indubitably earlier than those from pits 6 and 9 ([illus 4.11](#)). Whilst those from pits 6 and 9 do share some overlap in their ranges, they fail a chi-squared test when combined as a group, as do the earliest and latest of the four when combined (GU-15886 from pit 9 and GU-15884 from pit 6), and are therefore statistically significantly different (although GU-15887 from pit 9 and GU-15885 from pit 6, which are the closest together, pass a chi-squared test, and therefore could relate to the same event). However, the probability is that the pairs of dates from each context, while internally consistent, are the residues of three separate burning events. The fact that in each case the paired dates are in agreement suggests that this was not the result of mixed material being washed into the pits; and this, combined with the soil micromorphological evidence, indicates that some faith may be placed in the material as dating the formation of the deposits from which the dated samples were recovered.

Micromorphological analysis suggests that 105 was deposited rapidly and that no re-excavation of the pit down to the original cut (101) was undertaken, thus the dates for this feature may reflect a fairly accurate date for its construction. The dates from the fill 905 of pit 9 are significantly more recent than those from the basal fill of pit 1, but of interest is that the soil micromorphological evidence suggests that fill 905 may have been deposited in pit 9 after an episode of cleaning out or re-cutting. Fill 604 was deposited relatively high in the sequence of fills within pit 6 ([illus 4.10](#)). The dates from this fill may therefore be the result of the incorporation of material burnt either within or close to the pit some considerable time after the original excava-

Table 4.4 Radiocarbon dates for Langside

Lab code	Context	Sample	Lab age BP	$\delta^{13}C$	Calibrated dates	
					1 σ	2 σ
GU-15882	105	Charcoal: <i>Quercus</i> sp.	2505±35	-25.7‰	770–540BC	800–510BC
GU-15883	105	Charcoal: <i>Quercus</i> sp.	2520±35	-24.8‰	780–550BC	800–520BC
GU-15884	604	Charcoal: <i>Corylus avellana</i>	2125±35	-27.8‰	210–90BC	350–40BC
GU-15885	604	Charcoal: <i>Corylus avellana</i>	2140±35	-28.1‰	350–100BC	360–50BC
GU-15886	905	Charcoal: <i>Quercus</i> sp.	2235±35	-25.7‰	380–210BC	390–200BC
GU-15887	905	Charcoal: <i>Quercus</i> sp.	2225±35	-26.2‰	370–200BC	390–200BC

tion of the pit, by which time the part of the pit that survived was nearly filled with sediment and must have been a less prominent landscape feature than when first excavated.

There is a good case to be made that the Langside pit alignment was an Early Iron Age construction. It is notable that the singleton date obtained from a lower fill of a pit forming part of an alignment at Eskbank (Barber 1985; GU-1632) is contemporary with the latest pair of dates from Langside, from the upper fill of pit 6 (the two sets of radiocarbon dates pass a chi-squared test). This might indicate that the Eskbank pit alignment is a more recent construction than the Langside example, and hence that the dividing of the lands along the Esk Valley was not a single event. The apparent difference in form between the Langside pit alignment and those excavated at Castlesteads, Thornybank and Eskbank may therefore have some chronological

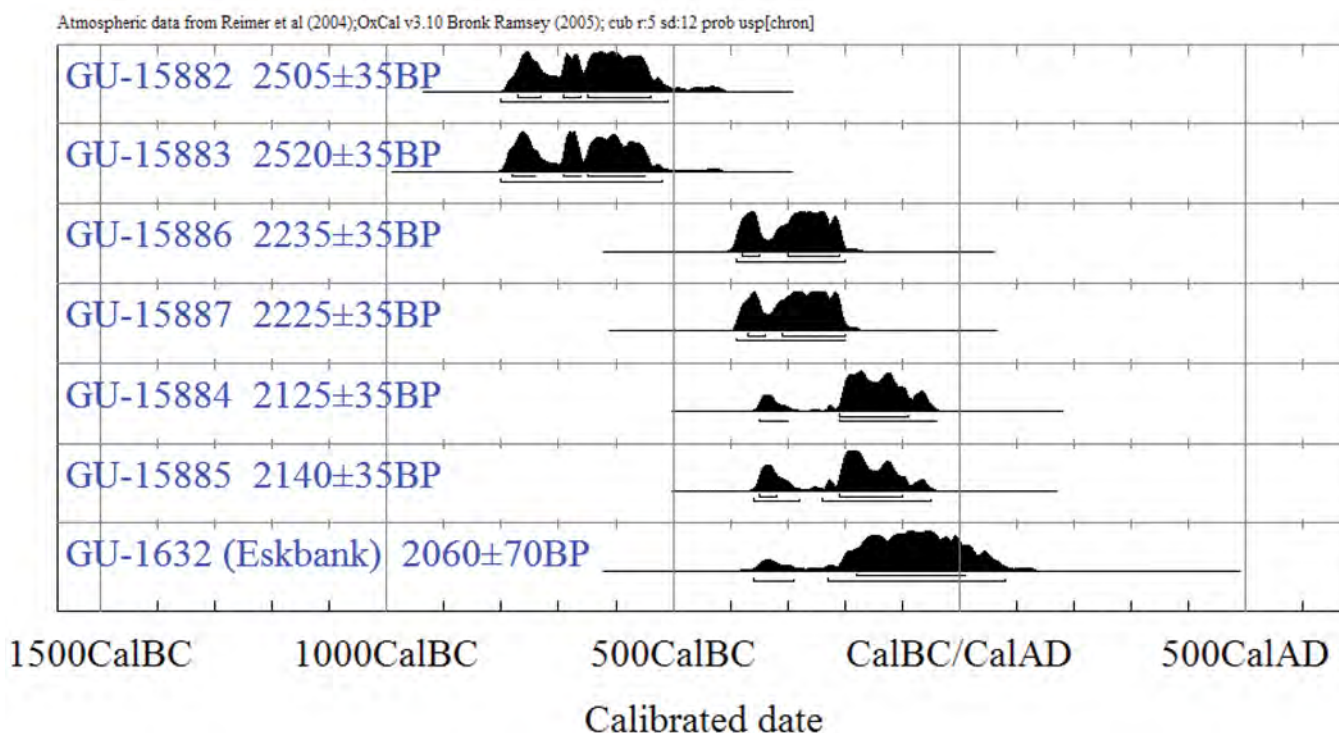
explanation. However, we should perhaps be wary of asserting this on the basis of the limited radiocarbon evidence currently available, and the different approaches taken to establishing the taphonomy of the dated samples.

4.4 Discussion

4.4.1 Pit alignments in general

The interpretation of pit alignments is problematical. Owing to variations amongst the remains that are described as pit alignments, it is perhaps unsurprising that different investigations have produced a range of claims as to their derivation and function, and that at least as many questions as answers have arisen.

Earlier approaches generally focused on either



Illus 4.11 Plot showing calibrated radiocarbon dates (using OxCal v. 3.10 (Bronk Ramsey 2005))

a functional explanation or a symbolic and ritual perspective. The function of pit alignments is not self-evident. Unlike ditches or banks, the discontinuous nature of pit alignments does not appear to offer any effective qualities either as a boundary or a drain. Excavation of a series of pits is also significantly more arduous than digging a linear ditch, thus it is unlikely that they were dug as segmented ditches on the grounds that it involved less work. The lack of any conclusive indicators to their purpose invites the theory that they were primarily ritual or symbolic. Earlier interpretations of postulated symbolic and ritual attributes have not, however, provided any conclusion on what content and meaning the ritual or symbolism might have (Pollard 1996; Waddington 1997).

The distance between neighbouring pits is considered to be a useful criterion in the estimation of their function. The prevailing hypothesis at the time of the excavation at Castlesteads was that the role of the pit alignment related to the subdivision of an agricultural or pastoral landscape (Halliday et al 1981; Halliday 1982; Barber 1985; Pickering 1992). Halliday (1982) proposed, on the basis of map-based study and a consideration of the few surviving upstanding examples, that pit alignments formed parts of a more extensive series representing 'pitted boundaries' associated with a pastoral landscape. The pitted features in the Castlesteads/Newton area formed a major element of his hypothesis. If pit alignments were associated with a functional boundary, regular maintenance might be expected to have been required in order to prevent slumping. Halliday (1982) has also suggested that pit alignments may have functioned as a boundary and stock deterrent, although without an additional structure, it is difficult to envisage how the pit alignment alone would function as such, the regular causeways allowing easy crossing of the line.

Strong (1988) excavated a pit alignment at Marygoldhill, Berwickshire, which he suggested were post-holes for a palisade or similar structure related to a nearby Iron Age Enclosure. However the Marygoldhill pits were different from the Castlesteads and Langside pits in that they were round, rather than rectangular, and were smaller, the largest having a diameter of 1.5m tapering to a depth of 0.87m with a basal diameter of 0.85m.

Miket (1981) proposed that pits in the Milfield Basin, Northumberland had formerly held posts set at their terminal ends, although the stratigraphic evidence supporting this argument cannot be seen as definitive. The presence of posts was clearly demonstrated for the pit alignment excavated at Meldon Bridge (Burgess 1976; Speak & Burgess 1999), but this feature was dated by radiocarbon to the late third millennium BC and, given its different character, need not have been constructed with the same intent as that dug probably two millennia later at Castlesteads and Langside; indeed, the Meldon Bridge arrangement seems to belong to a special series of pit-defined enclosures, also known

for example in the Earn Valley at Forteviot (Burgess & Miket 1984). There was no evidence that posts had been set into the Castlesteads or Langside pits.

While there are similarities between pit alignments containing post-settings and those without, Rylatt and Bevan (2007) argue that these two types of pitted alignment should not be *a priori* considered together as a single feature type, as they represent differing functions, the addition of posts indicating a basis for a solid and continuous physical boundary.

An alternative interpretation is that they were quarry pits, possibly for clay or building material. Halliday (1982) has suggested that pit alignments are a by-product of soil extraction for bank building, and there is evidence for a possible plough-truncated bank adjacent to the pits at Thornybank (Rees 2002).

Barber's excavations and soil and pollen analyses at Melville Nurseries at Eskbank near Dalkeith produced no evidence for posts having been set in the pits, which were thus interpreted as being quarry pits for an adjacent ploughed-out bank (Barber 1985). A radiocarbon determination of 360 cal BC to 90 cal AD (GU-1632; calibrated using OxCal 3.10) was obtained from charcoal within a lower fill in one of these pits. A pre-Roman, Iron Age pastoral landscape was proposed in the immediate vicinity of the Eskbank example on the basis of pollen analysis, although Barber wisely pointed out that it is not possible to generalise about the land-use patterns around all pit alignments from one case study.

The pit alignments at one of the few recognised upstanding remains of this type in south-east Scotland, at Marygoldhill Plantation, Berwickshire (Strong 1988) ran beside banks, thereby corroborating Barber's interpretation, but Strong argues that the deep and narrow profile of those pits excavated at this site must raise doubt as to whether they were excavated simply to extract materials for the adjacent bank. At one point the pits lay between segments of a shallower and wider ditch – an arrangement which Strong (1988) believed more likely to have provided material quarried for the bank. Barber (1985) suggested that the construction of banks from segmented ditches has a long tradition which cannot be tied to any particular period. Claims for the former presence of a marginal bank have been advanced on the basis of the partially-excavated fill of three pits in an alignment at Chesters, Drem, East Lothian (Mackay 1980, 36); in these examples the presence of substantial cobbles within the pits was taken as an indication of deliberate infilling, in contrast with the evidence for more gradual silting indicated at Castlesteads and Langside.

More recent approaches have sought to interpret the alignments within the context of their wider landscape. Powlesland (1986) has defined a later Bronze Age pit alignment at Heselton, North Yorkshire as an initial landscape division serving as a focus for open settlement, transforming through later phases into a part of later prehistoric enclosed field systems and possibly forming a

significant component of the Yorkshire Wolds dyke system.

Rylatt and Bevan (2007) have proposed that while the pits functioned as boundaries, they may have formed visual conceptual boundaries as opposed to physical utilitarian boundaries. Evidence from pit alignments at Kilvington, Nottinghamshire and Gardom's Edge, Derbyshire suggests a relationship with natural watercourse boundaries; a flood level in the case of Kilverton and a watershed in the case of Gardom's Edge. They argue that water is of key significance to understanding pit alignments' significance, as many have been either dug in poorly drained clayey soils, such as at Langside, where the basal sediments within pit 1 formed through the settling of sediment suspended in rainwater trapped in the pit, or deliberately lined with puddled clay, as at Gardom's Edge, in order to retain water. The Castlesteads pits were cut through free-draining sand and gravel, and would not have retained rainwater without the presence of a clay lining, for which there was no evidence. Rylatt and Bevan (2007) suggest the pits as a long-term landscape feature which through visibility, changing seasonal water levels and the engagement necessitated by walking between pits via the causeways, would attain significance and meaning to the people who created, maintained and lived with them. Thus the pit alignments are interpreted as representing a visible landscape feature forming both a conceptual and a physical boundary demarcating two or more separate entities and reflecting a conscious cultural relationship with the wider landscape and possibly other perceived supernatural dimensions.

4.4.2 Castlesteads and Langside

The excavations at Castlesteads and Langside have revealed pit alignments of potentially significant archaeological interest. They extend the distribution of these features east of the Esk and onto the clay subsoils, where they are less likely to be revealed as cropmarks. Their shared similarities were a north-east to south-west alignment and multiple fills suggestive of natural silting processes rather than deliberate backfilling. They appear to represent the remains of later prehistoric pit alignments related to those excavated at Thornybank (Rees 2002).

Pit alignments are generally dated between the Neolithic and the early Roman period, although credible evidence for a massive Mesolithic pit alignment has been identified at Warren Field, Crathes, Aberdeenshire (Murray & Murray 2006). No secure dates are available from Castlesteads, whilst radiocarbon dates from Langside range from *c* 800 to *c* 50 cal BC. Dates from pits 1 and 9 were both derived from basal fills, and the dated material from the basal fill of pit 1 may well have entered the pit very soon after the original excavation of the pit, based upon soil micromorphological evidence. Assuming all pits were created synchronously, the

radiocarbon dating evidence tends to suggest that the Langside pit alignment was first constructed before 400 cal BC, and that the pits had become substantially choked by sediment before the end of the millennium, by when they would have appeared as less prominent surface depressions. One could speculate that by the end of the first millennium BC the pit alignment was either disused or its meaning/function had changed.

While Castlesteads shares many fundamental attributes with Thornybank, Langside differs in that the pits were irregularly spaced. It is more likely that the irregular spacing reflects design rather than truncation, as the surviving pits were of significant size and depth, and the natural subsoil surface was uniform and undisturbed aside from the cutting of field drains. One could suggest that the pit alignment in this area had originally been created across land with very localised height variations, which was subsequently planed flat by ploughing (with the higher ground reduced by at least the depth of the surviving pits), eliminating those pits that had occupied the elevated ground and producing the irregular spacing revealed by excavation. It is alternatively possible that shallower pits had been present between those surviving and were removed by ploughing. Both these explanations require some special pleading, however, and it is notable that the cropmark evidence around Castlesteads appears to show short and apparently discontinuous lengths of pit alignment to be present (illus 4.1). However, only a relatively small area exposing eight pits was excavated at Langside, which necessarily affords a restricted perspective and dataset for analysis and comparison.

It seems unlikely that the original excavators of the Langside pits were extracting clay, as although the subsoil is clay, it is of such poor quality, with sand and stone inclusions, that it would be of no use for pottery. There would also have been no need to excavate quarry pits in a regular linear arrangement. In addition, a better source of clay can be found in the valley bottom in and around Smeaton, where there has been industrial extraction of quality clay used by the Smeaton brick and tile works.

The less regular nature of the shapes and spacing of the pits encountered at Langside is possibly more supportive of quarrying for bank material being one of the motives for their excavation, however this may be a reflection of the medium the pits were dug into; the heavy clay subsoil being significantly less accommodating of large-scale excavation than the sands and gravels found elsewhere. The probable maintenance of pit 9 suggests a level of upkeep that would exclude quarrying as a single cause for excavating the pits, although quarried clay could have been a complementary by-product of the pit digging.

No traces of an upcast bank were found at Castlesteads or Langside, although had one once existed, subsequent ploughing could have removed it given the relatively shallow topsoil depth and the presence

of ploughmarks in the surface of the natural subsoil. Residual evidence for a flanking bank was found roughly 1km away from Castlesteads at Thornybank (Rees 2002). It is likely that the spoil removed from pits of the dimensions encountered in pit alignments – though a considerable amount – would in any case only have been sufficient to have formed a relatively slight bank. Material considered by Ellis (above) to be redeposited upcast was present in the fills of pits 1 and 9 at Langside.

However, it seems unlikely that the pit alignments at Castlesteads and Langside were designed simply as a series of quarry-pits for the construction of a bank – the strikingly regular profiles and depths of the pits suggest that their shape as originally dug out was integral to their function and their regularity may have been the main feature of the line. It would have been difficult to manoeuvre within the pits, but they are of a size that suggests that the original excavator worked within the cut. One of the requirements for excavation is space for movement, the use of tools and the extraction of hardcore (Barber 1985). The form of these pits thus suggests that they are unlikely to be the result of mere quarrying activity, since they would represent a very inefficient means of extracting materials for bank construction. A more likely by-product of quarrying would be a ditch or a series of much larger pits. The occasional known instances where a pit alignment continues its course as a ditch are not helpful, as these seem to be indicative of re-cutting (eg Marygoldhill, Strong 1988). Assuming some degree of plough truncation, it appears that the pits at Castlesteads could have been conjoined at levels now eliminated by ploughing, although even if touching they would have remained very separate entities and are unlikely to have had the appearance of a continuous, regular ditch from the ground surface.

The uniformity of the pits in the alignment is perhaps significant; it could be that the holes themselves were important in terms of function and appearance. The regular spacing and size could have been used as a rough visual guide to measurement and areas of land, not as a universal measurement but as one common to this particular set of features. It must, however, be noted that the pits in the nearby alignment at Thornybank (Rees 2002) were slightly smaller, with average sizes of $c 4\text{m} \times 2\text{m}$; and at Eskbank (Barber 1985), like Langside, the pits were considerably smaller at $c 2\text{m} \times 1.5\text{m}$.

Two pits in the excavated portion of the alignment at Castlesteads (pits 7 and 8, illus 4.1 and 4.3) were markedly shorter than the other pits and intersected at the level of the subsoil surface. It is possible that this is a result of the pit alignment having been dug not one pit at a time sequentially in a single direction, but rather in a series of segments. These two pits may reflect the joining of two such segments where the gap left was too small to excavate two ‘standard-size pits’, and too large for just one pit to be excavated. This phenomenon was also noted

at Thornybank (Rees 2002), where a smaller pit had been dug within a gap, and at St Ives (Pollard 1996), where it was suggested as evidence of gang construction, whereby segments of pit lines were allocated to specific individuals or teams. Evidence of this method of construction can be inferred from studying the alignment on plans and aerial photographs (illus 4.1 and 4.2). It can be seen that the pit alignment is not ruler-straight and the slight wobbles and alignment changes could reflect construction segments such as have been hypothesised here.

One of the pit alignments in the Castlesteads series, to the east of the excavated example (illus 4.1), appears to respect the natural boundary of the River Esk – the curve of the pit alignment is paralleled in a river meander. The river certainly represents a physically efficient barrier and the proximity of these two different boundaries may give credence to the idea that pit alignments were not intended to be physically restrictive, but rather to symbolise the landscape itself by mirroring its configuration, as well as organising it into specified areas (cf Rylatt & Bevan 2007).

The cluster of small pits to the east of the pit alignment at Castlesteads poses some interesting questions. The inclusion of pottery in these small pits is noteworthy – the pits are at least 200m from the nearest known settlement of probable Iron Age date (see Section 5). There is some evidence (Hingley 1991) for structured deposition close to boundaries in the Iron Age and the deliberate deposition of freshly broken pottery here may represent a similar act. It is possible that the pits may have underlain a bank that accompanied the pit alignment, perhaps dug to hold a foundation deposit. Alternatively, the pit cluster may post-date construction of the alignment and simply respect the line.

The fine, silty and clayey nature of the pit fills at Castlesteads suggests a process of gradual infilling, as might the putative vegetation regeneration layer at the bottom of the pits. It is clear that the pits were left open after their initial excavation. There was no evidence at Castlesteads for re-cutting of pits, but neither is there evidence that they were deliberately infilled, other than the possibility that the stones near the bases represent minimal field clearance from the area immediately around the pit alignment soon after its excavation, that is, before slopewash and slumping occurred. The upper brown silt fills of pits in the alignment contained medieval pottery fragments that were likely incorporated as a result of ploughing, suggesting that the pits were still visible on the ground until this time.

Although there was no in situ burning evidence at the Langside pits, it is likely that burning occurred close by and the charcoal and ash were blown or washed into the open pit 9. There was also evidence of charcoal within pits 1, 4, 5, 6 and 8. This may be directly connected to the function of the pits, but it seems more likely that it simply reflects cooking, small-scale industrial activity or a simple fire for

heat having occurred coincidentally close to an open pit.

In the cases of Castlesteads and Langside, evidence for distinctive land-usage has not survived. Many reasons have been sought to explain what appears to be an 'illogical earthwork' (Pollard 1996) and the efficiency of a simple pit alignment as a physical barrier has been doubted. It would be easy to dismiss the pit lines with a simple interpretation as a by-

product of quarrying, or as sockets for holding posts, but the evidence in these cases does not support that view. The evidence from Castlesteads suggests that pit alignments may have had a symbolic as well as a functional purpose. Nevertheless, this like other pit alignments points to the use of pit lines as territorial divisions or boundaries, demarcating large blocks of land and possibly reflecting a trend towards a more organised landscape in later prehistory.

5 CASTLESTEADS RING-GROOVES SITE, by A Rees

5.1 Introduction

This site was located on the edge of an alluvial river terrace 150m south of Castlesteads House and 200m north of the confluence of the South and North Esk rivers (*illus 2.1*). It was located within a field bounded on three sides by woodland at 34m above OD (NGR: NT 3397 6936). The site lies within the system of pitted boundaries considered in Section 4 (*illus 4.1*), although it is not visible on the aerial photographs which reveal the pitted boundary cropmark complex.

5.2 Methods

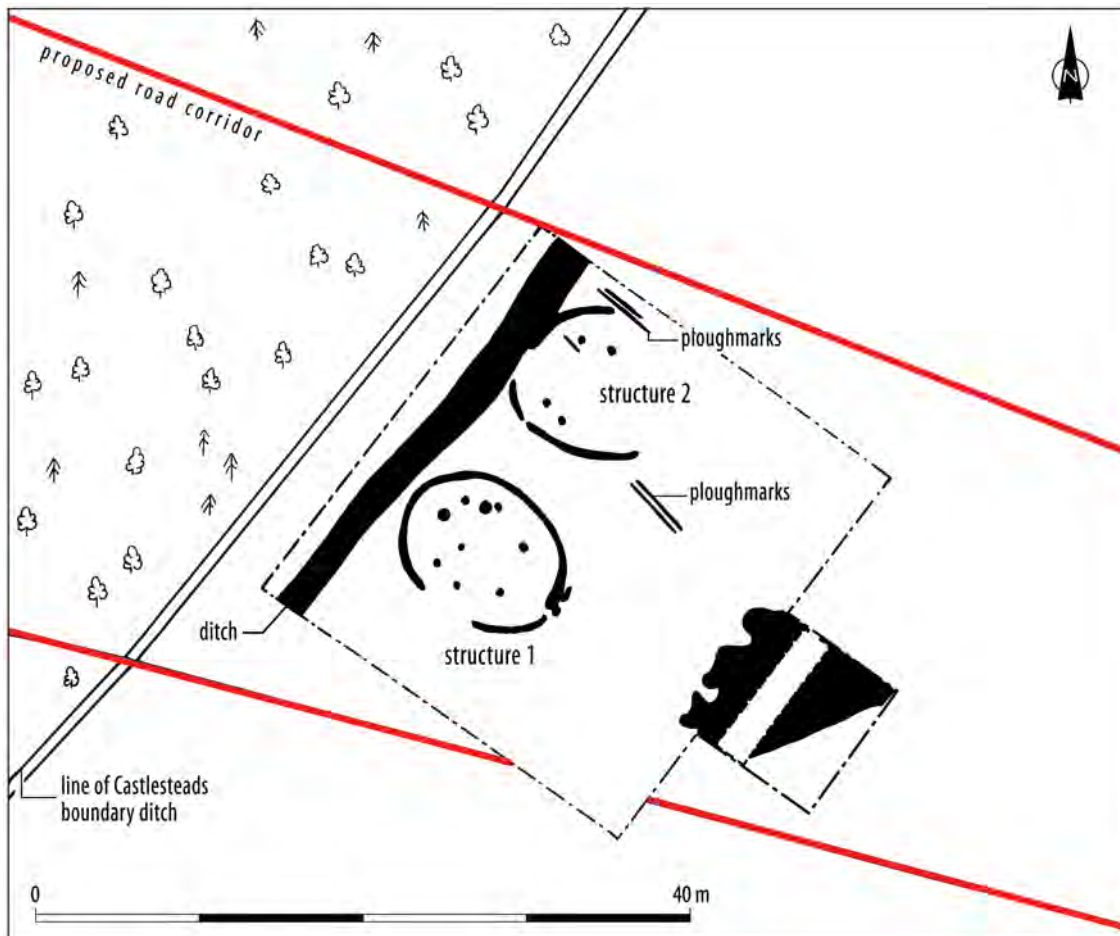
The site was identified during the route evaluation in 1994, when fieldwalking located a small number of flint and chert artefacts. The excavation of a series of trial trenches and test pits was then undertaken at this location, and one of these

(Trench A) uncovered a small section of ring-groove slot. Small scale trenching then revealed a further section of the ring-groove (Trench B). Following recommendations made to Historic Scotland, a larger trench 30m × 30m was opened to investigate this discovery (*illus 5.1*). This trench revealed two ring-groove structures and a group of intercutting pits to be present within the proposed road corridor. The trench was subsequently extended further, adding a small section to investigate the large pit group further.

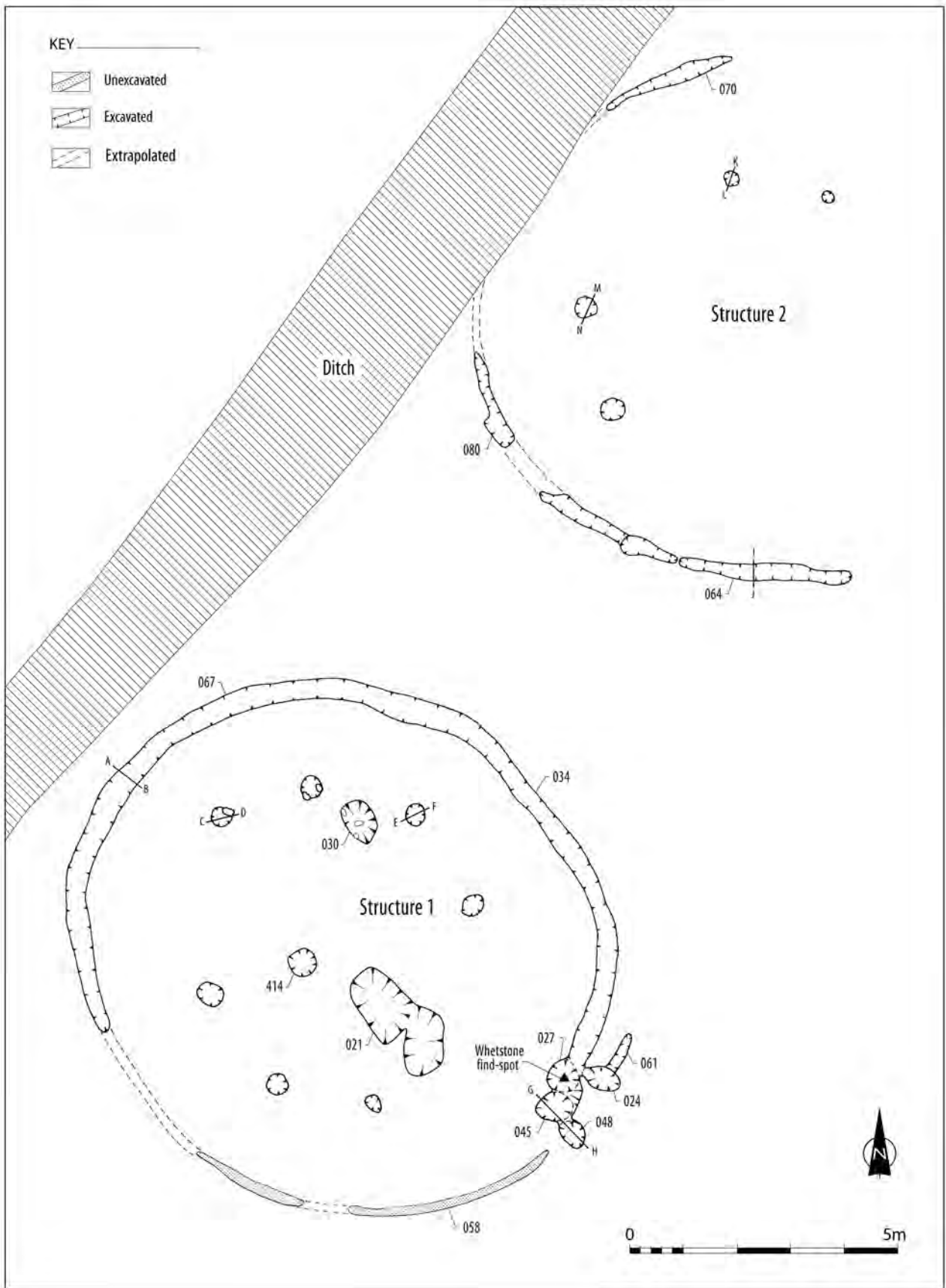
5.3 Archaeological results

5.3.1 Structure 1

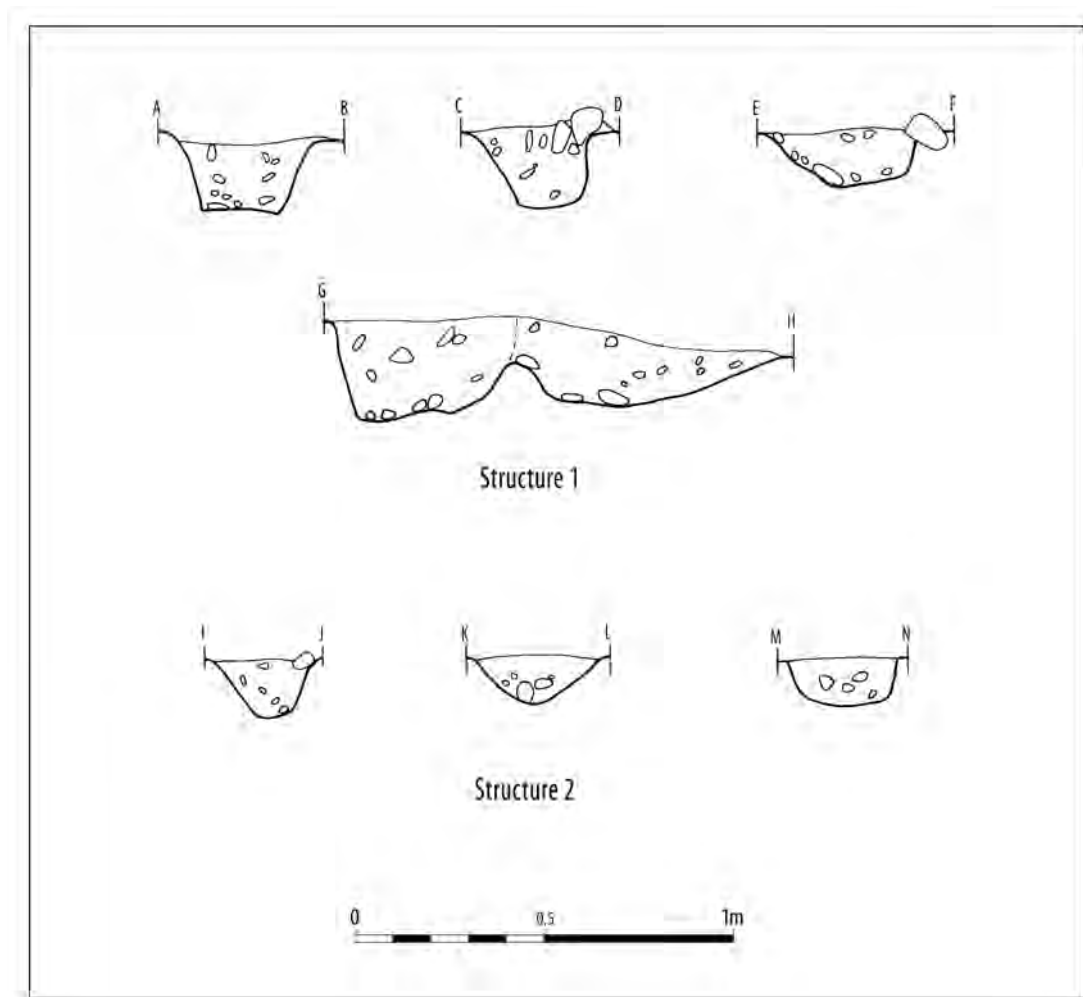
This sub-oval structure was defined by a ring-groove slot, measuring 10.4m across its north-west to south-east axis and 9.4m wide on the north-east to south-west axis (*illus 5.2*). The slot was typically



Illus 5.1 Overall site plan



Illus 5.2 Plan of the ring-groove structures



Illus 5.3 Sections

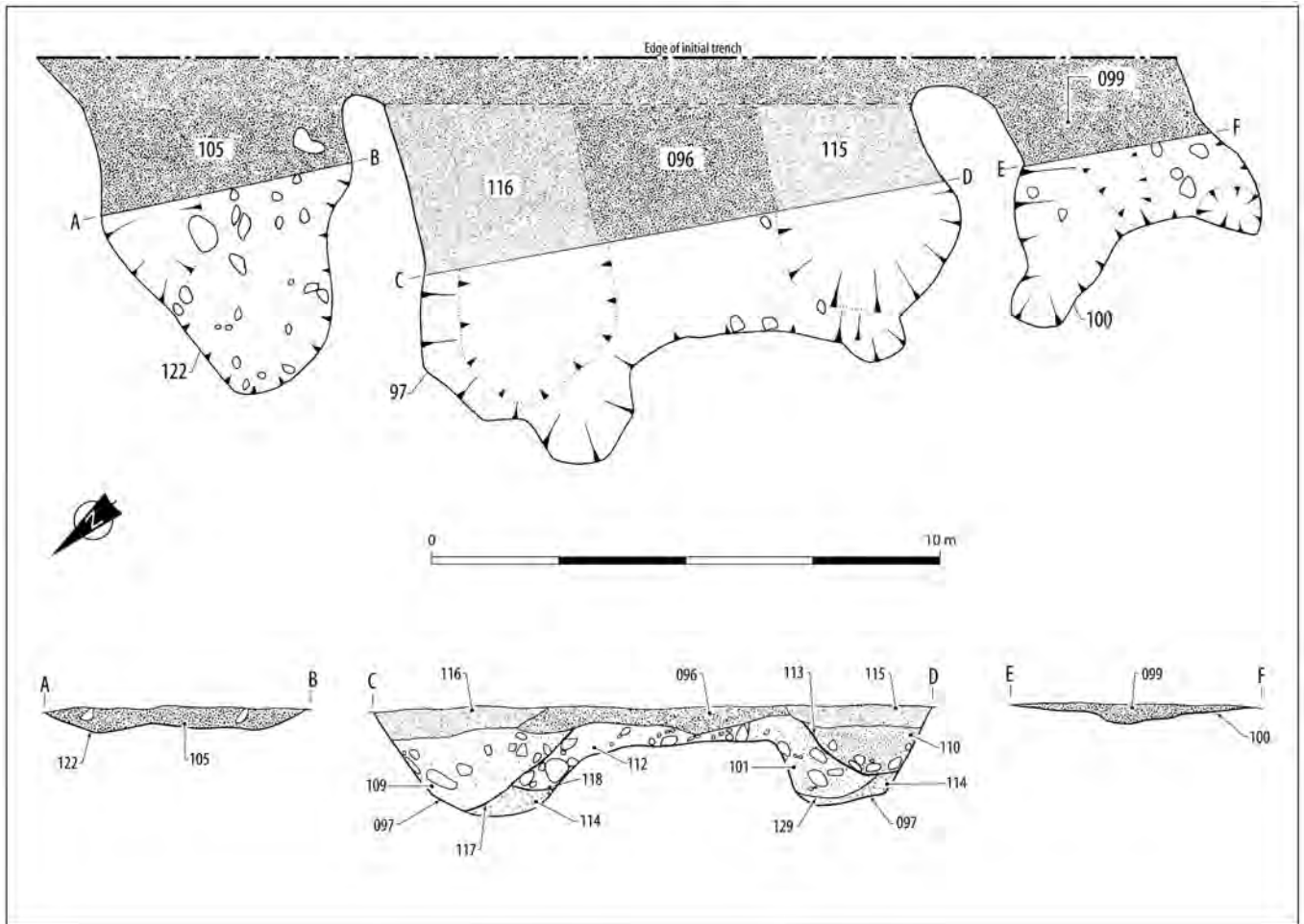
from 0.4m to 0.5m wide and 0.25m to 0.35m deep with steep sides and a level base (*illus 5.3, A-B*). In the south-western sector of the ring-groove the slot (058) decreased in size, measuring as little as 0.25m in width by 0.1m deep, and was absent in places due to differential plough truncation. No post-holes, post-pipes, stone packing, or impressions of posts were located in the ring-groove slot, either within the fill or as impressions in its base. One quartz and three chert flakes were recovered from the ring-groove fills, along with four pieces of charcoal.

At the south-east section of the slot, a series of four pits/post-holes (024, 027, 045 and 048; *illus 5.2*) was located, probably indicating the position of the entrance to the structure and representing the foundations of a doorway. All four pits appeared to intercut one another, although this was due mainly to the difficulty in ascribing different contexts to uniform fills. The pits measured from 0.3m to 0.45m in diameter and from 0.3m to 0.4m in depth with generally sloping sides and flattish bases (*illus 5.3, G-H*). There were no packing stones within the features. The four pits may represent two constructional phases of the entrance or two adjacent sets of

entrance posts, the uniformity of the fills suggesting the latter is more likely. A whetstone was recovered from the most northerly post-hole (027).

In addition to the four pits, a small slot (061), measuring 0.7m in length and 0.15m deep, ran parallel to the ring-groove for a distance of 0.7m. When the curve of this section of slot was extrapolated, it appeared to continue the line of the southern section of slot (058), forming a continuous arc cut by the entrance pits. It is unclear what the function of this ring-groove extension was.

Within the area circumscribed by the ring-groove slot was a concentric ring of seven post-holes, measuring from 0.3m to 0.5m in diameter and 0.15m to 0.4m in depth (*illus 5.2; illus 5.3, C-D and E-F*). All were filled with a uniform, gravelly sand/silt with occasional packing stones. The post ring measured 5m across and the posts were spaced at fairly regular intervals approximately 2m apart. The spacing suggests that one post was missing to the west. Three other features were identified within the ring-groove, a sub-oval feature (021) approximately 2m long and 1m wide, which contained a relatively clean sand fill, in which was found a chert flake, and two shallow pits (030 and 414).



Illus 5.4 Re-cut features plan and sections

5.3.2 Structure 2

Almost 50% of a second ring-groove structure was identified *c* 4m to the north of Structure 1 (*illus 5.2*). The ring-groove slot comprised three separate heavily plough-truncated sections (064, 070 and 080). The largest (064) measured 6m in length by 0.3m in width by 0.15m in depth (*illus 5.3, I-J*). To the north-west of this, the next section (080) measured 3m long by 0.2–0.4m wide by 0.1m in depth. The northerly end of this section of ring-groove had probably been cut by a later ditch (*illus 5.2*). Beyond this to the north-west, a further section (070) measured 2.75m long by 0.05–0.2m wide by 0.1m deep. This section had probably also been cut by the ditch on its western side and truncated by deep ploughing on the eastern side. When extrapolated, the diameter of Structure 2 would have been similar to Structure 1, at approximately 10m. No post-holes, stone packing, or re-cuts were identified within the ring-groove slot.

Within the area bounded by the fragmented ring-groove, four post-holes of a concentric inner ring survived. These had been heavily truncated by deep ploughing and measured from 0.27m to 0.4m in diameter by 0.1m to 0.15m in depth (*illus 5.3, K-L*

and M–N). The eastern side of Structure 2 had been removed by ploughing. Evidence of the ploughing could be seen in plough scores cut into the surface of the subsoil. No other features were located and no artefacts were retrieved within the general area of Structure 2.

5.3.3 Ditch

Parallel to the current field boundary ditch and truncating Structure 2 was what appeared to be the traces of an earlier version of the boundary ditch, 1.5–2.5m wide and 0.3m in depth. The fill comprised a dark, gravelly soil. No artefacts were recovered from the excavated sections. The ditch cut Structure 2 and ran parallel to the current boundary ditch, so in the absence of any dating evidence it has been assumed that it represents a recent precursor to the modern ditch.

5.3.4 Re-cut features

To the east of Structures 1 and 2, a group of three adjoining pits was noted when topsoil stripping was

Table 5.1 Flint from ring-grooves site excavated contexts

Stone	Object	Type	Re-cut Pits No.	Ring-grooves No.
Flint	Flakes	Inner Regular	44	
		Inner Irregular	33	
		Secondary Regular	7	
		Secondary Irregular	10	
		Primary	1	
	Chunks	Inner	4	
		Secondary	1	
Chert	Flakes	Inner Regular	4	1
		Inner Irregular	11	2
		Secondary Regular	1	
		Secondary Irregular	2	
		Primary	1	
	Blades		1	
	Chunks	Inner	2	1
	Cores		1	
Quartz	Flakes			1
Chalcedony	Pebbles		3	1
Total			126	6

taking place (illus 5.1 and 5.4). The central feature (097) of the three measured 4m across by 3m in exposed length by 0.85m in depth, and appeared at first to be the terminus of a ditch, as the features extended beyond the limits of the trench. The feature appeared to have been re-cut, probably on at least two occasions. To either side of this central feature were two shallow, smaller features. The feature on the northern side (122) measured 2.25m across by 2m in exposed length by 0.25m in depth; one small abraded sherd of prehistoric pottery and several chipped stone artefacts were recovered from the upper levels of its fill (105). Upon full excavation, numerous flint and chert flakes were recovered from the fills of these features, in particular 097 produced a large number of flint blades, scrapers and debitage from the fills 109, 112 and 114.

The trench was extended to the south-east (illus 5.1) in the hope of ascertaining the extent of these features, but this proved not to be possible owing to time restrictions and the lack of any traceable edge to the features on the surface. The plan marks the excavated extent of the features but, with the agreement of Historic Scotland, the area to the east was not fully examined to work out the sequence.

5.4. The finds

5.4.1 Lithics, by B Finlayson

An assemblage of chert and flint with a small quantity of quartz and chalcedony was recovered by a variety of techniques. It comprised an excavated

sample of 132 pieces (the majority from the re-cut features), a test-pitting sample of 57 pieces, a gridded fieldwalking collection of 40 pieces, and a collection of 110 pieces from the surface. With the exception of the excavated material the samples were all dominated by chert, but this included a significant proportion of unworked pebbles and angular blocks. What remained of these samples after discounting the unworked material was a low-density, undiagnostic distribution of artefacts which cannot be directly linked to the excavated features and will not be discussed further. Differences between the excavated sample in proportions of raw materials and types of chert indicate that the material recovered from the excavation was probably not from a recycled flint scatter incorporated into the features, but did relate specifically to the activity around the features.

The sample from the excavated contexts was small (Table 5.1), but a number of points can be made. The raw material was imported. This is obvious for the flint material, being a non-local stone type, although insufficient cortex was present to state reliably whether the bulk of the material came from a secondary (perhaps beach pebble) source, or whether it was from a primary chalk context. It would not be so clear that the chert was imported if it were not for the comparative material supplied by the other collections. These included numerous angular blocks and rounded pebbles, suggesting two natural mechanisms for the chert's transportation to the site, but both pebbles and blocks were mostly of a grey chert, full of fissures and flaws and generally coarse in texture. The excavated, worked

chert included a higher proportion of red and purple cherts of generally finer texture. The limited analysis of chert sources so far undertaken does indicate that there may be some variation in colour and texture at individual source spots, but the selection process evident in the assemblage suggests that this material was specifically selected, and not from the material locally available.

Only one core was present amongst the excavated sample, and only two primary flakes; indeed, inner flakes massively dominated the flint part of the assemblage. There were also very few chunks compared with most complete chert assemblages. These aspects suggest that little knapping was undertaken in the area of the excavation, and that the lithic material did not enter these contexts as part of a generalised waste disposal. The material may therefore indicate that specific tasks were undertaken here, or that waste disposal from a limited number of tasks was made here.

Technologically the material was all from a hard-hammer flake-based industry, with only one blade present. There was some invasive shallow retouch present, and there was one well-made scraper. These factors all suggest that the material fits into the broad late Neolithic/Bronze Age flint-working tradition. With such a small sample it is impossible to provide any more close chronological estimate.

5.4.2 Prehistoric pottery, by M Johnson

A single sherd of undecorated prehistoric pottery was recovered from context 105 (SF 12) in re-cut feature 122, weighing 11g and measuring 8–9mm thick. It was very abraded, with rounded edges and most of its surfaces were missing. It had a dark grey core and interior and a light brown exterior. There were fine cracks all over its surfaces, possibly indicating that it had been burnt. The fabric was coarse, slightly corky with a hackly fracture, and contained about 2% small quartz inclusions. The sherd perhaps was a flat-topped rim but the abrasion was so severe that this identification was uncertain. There was some iron pan adhering to the inner surface. The sherd cannot be dated.

5.4.3 Coarse stone

A fine-grained sandstone whetstone was recovered from one of the entrance post-holes to Structure 1. This object is currently missing.

5.5 Discussion

5.5.1 The re-cut features

The three adjoining pits to the east of the site produced a relatively large assemblage of worked flint and chert, as well as one sherd of prehistoric

pottery. The lithics are dated to the Late Neolithic/Bronze Age, indicating that the features most likely pre-date the ring-groove structures. Scattered, isolated pits of this date are not uncommon on sands and gravels. They may simply be rubbish pits related to settlement activity, the structures of which have been lost or were located beyond the limits of the excavated area.

5.5.2 The ring-groove structures

Due to the high density of aerial photographic and cropmark sites in the vicinity of Castlesteads, there has been intensive map-based study of the prehistoric landscape. Halliday (1982), and more recently Brown (2002, 8) have pieced together the aerial photographic evidence and reconstructed the concealed relict landscape of pitted boundaries, ring-ditch houses, a palisaded homestead, enclosures and enclosed homesteads around Castlesteads. Excavations 1km to the south-east of Castlesteads at Thornybank (Rees 2002) have revealed a ring-groove structure of similar size and type to the Castlesteads examples, found in close association with a pit alignment, traces of an associated bank and a parallel palisade. The Lamb's Nursery and Melville Nursery sites in Dalkeith (Cook 2000; Raisen & Rees 1995) also produced structures of this type. Further afield, many examples of ring-groove type have been excavated in the Lothian plain area, such as those at Broxmouth (Hill 1982), Dryburn Bridge (Dunwell 2007) and St Germain's (Alexander & Watkins 1998).

The Castlesteads structures were heavily truncated, making reconstruction of their superstructure and interpretation of their function even more difficult than usual. Nor could it be established stratigraphically whether or not the two buildings on this site were contemporary. It may be that each individual structure would have fulfilled separate functions and concerns, such as settlement and/or stockholding, although this is very difficult to confirm. No artefactual or environmental evidence was available, nor any material suitable for radiocarbon dating, so the structures could not be dated. Comparisons with other sites may provide more clues.

The Castlesteads structures were presumably of ring-beam construction, with the main weight of the roof being taken on the inner post-rings. The outer wall would not have been load-bearing and could therefore have been relatively slight. The doorway to Structure 1 was perhaps up to 0.5m in width and was flanked by offset timbers forming a shallow porch. No evidence of a hearth was found in either structure, but such features could have been lost through plough truncation.

Ring-groove roundhouse construction is evidenced in the Lothians in the first millennium BC at sites such as Melville Nurseries (Raisen & Rees 1995, 770–400 cal BC; GU-2888) and Dryburn Bridge (House 9; Dunwell 2007, 770–410 cal BC, AA-53704).

However, the Lamb's Nursery structure was dated approximately 750 years earlier than that at Melville Nurseries (Cook 2000, 103), suggesting this architectural type was already in use rather earlier in the Bronze Age, and Ashmore (2001) argues for the appearance of this structural type in the first quarter of the second millennium BC. Presumably the Castlesteads structures belong somewhere in this very broad date range.

Perhaps of significance in the choice of location of these types of settlement is the subsoil type. The easily worked sand and sandy gravels found at Castlesteads and Thornybank could have been chosen for settlement due to the physical ease with which structures could be built, together with a need to locate these sites on ground free from drainage and flooding problems.

Recently excavated examples of these structures at Castlesteads, Thornybank, Lamb's Nursery, and a partially excavated example at Inveresk (Neighbour 2007) have often been recognised as very vestigial features sited on sandy subsoils. Of these, one was revealed during trenching evaluations (Castlesteads) while the other two were identified during the excavation of unconnected separate sets of features, specifically a long cist cemetery at Thornybank and Roman features at Inveresk. These chance discoveries suggest that there are likely to be many more of these structures lying undiscovered along the Esk Valley.

5.6 Conclusion

The Castlesteads ring-groove structures add two further examples to the growing corpus of knowledge concerning this building type. Unfortunately, evidence for their date and use was not forthcoming, but limited interpretation of their above-ground appearance is possible from their plan and by using evidence from nearby sites.

The slight physical remains of these structures means that many of these sites are not detected by non-invasive archaeological techniques such as aerial photographic survey, in comparison with ring-ditch houses, which are more readily identifiable in this type of survey due to the much broader surrounding ditch. This point is borne out if the aerial photographs of the Castlesteads site are studied with hindsight – the ring-groove structures and the pit complex are not visible even though their locations are clear. This is in sharp contrast to the obvious presence of two nearby examples of probable ring-ditch houses. Although occasionally visible on aerial photographs, ring-groove structures tend not to be as easy to identify as ring-ditch types. This demonstrates the incomplete nature of the information which can be gleaned from even the best aerial photographs.

6 CASTLESTEADS STONE-PAVED AREA, by A Rees

6.1 Introduction

A scatter of chert and flint flakes noted during the fieldwalking component of the 1994 evaluation (Strachan & Rees 1995) led to the discovery of a stone-paved area as a result of subsequent trenching. Two further trenches excavated in 2006 increased the numbers of recorded lithics but added little to the earlier analysis. This site was located in an arable field approximately 100m west of the River Esk and 270m SSE of Castlesteads Farm on an alluvial river terrace 4m from the crest of a slope at 31m above OD (NGR: NT 3412 6931; *illus 2.1* and *6.1*).

6.2 Methods

In order to assess the artefact content of the topsoil in the area of the lithic scatter, ten 1m² test pits were hand-excavated within the limits of the site, and a further five 50m to the east on a wooded river terrace. The material excavated from the pits was passed through a 5mm mesh sieve and several chert and flint artefacts were recovered. Following this, mechanical excavation of a total area of 375m² was undertaken, and features cut into the gravel subsoil were exposed by hand-cleaning.

Dr Richard Tipping of Stirling University made a site visit and established that the top 0.2–0.3m of sand within the test pits on the terrace comprised slopewash which overlay Holocene deposits. From this it could be assumed that the material retrieved from these test pits had originated from the area of the site itself, and had thereafter been sealed by inwashed material. As a result, trial trenching was carried out and a number of negative features cut into the subsoil were located, as well as an area to the south of the site which appeared to comprise a layer of buried ploughsoil. Hand-excavation of a small sondage into this layer revealed several large stone slabs, and the excavation area was extended by 225m² using a mechanical excavator. The stone-paved area revealed was hand-cleaned, sectioned using a slot trench, and a profile was drawn at right-angles to the section.

6.3 Archaeological results

6.3.1 Paved area

A substantial irregular area of stone paving measuring 14m by 11.5m was revealed sealed below a deposit of reddish-brown, possibly wind-blown

silty loam, 0.2m to 0.4m thick. The southern extent of the paved area was not revealed as it underlay the field boundary and a track, and the western extent was cut by a later feature (see below). The paving (*illus 6.1* and *6.2*) comprised variously sized slabs and flattish boulders, measuring up to 0.6m in length by 0.5m wide by 0.3m in depth. The paving was sited within a slight hollow, defined by a gently sloping cut visible only on the northern and eastern sides of the paving. Various types of stone had been used, including large flaky sandstone slabs and what appeared to be a small, broken saddle quern. At the northern edge of the paved area, eight slabs, each approximately 0.8m by 0.3m in size, had been laid edge to edge on their long axis. These slabs sloped down into the main paved area in a fashion similar to an entrance or passageway (*illus 6.1*).

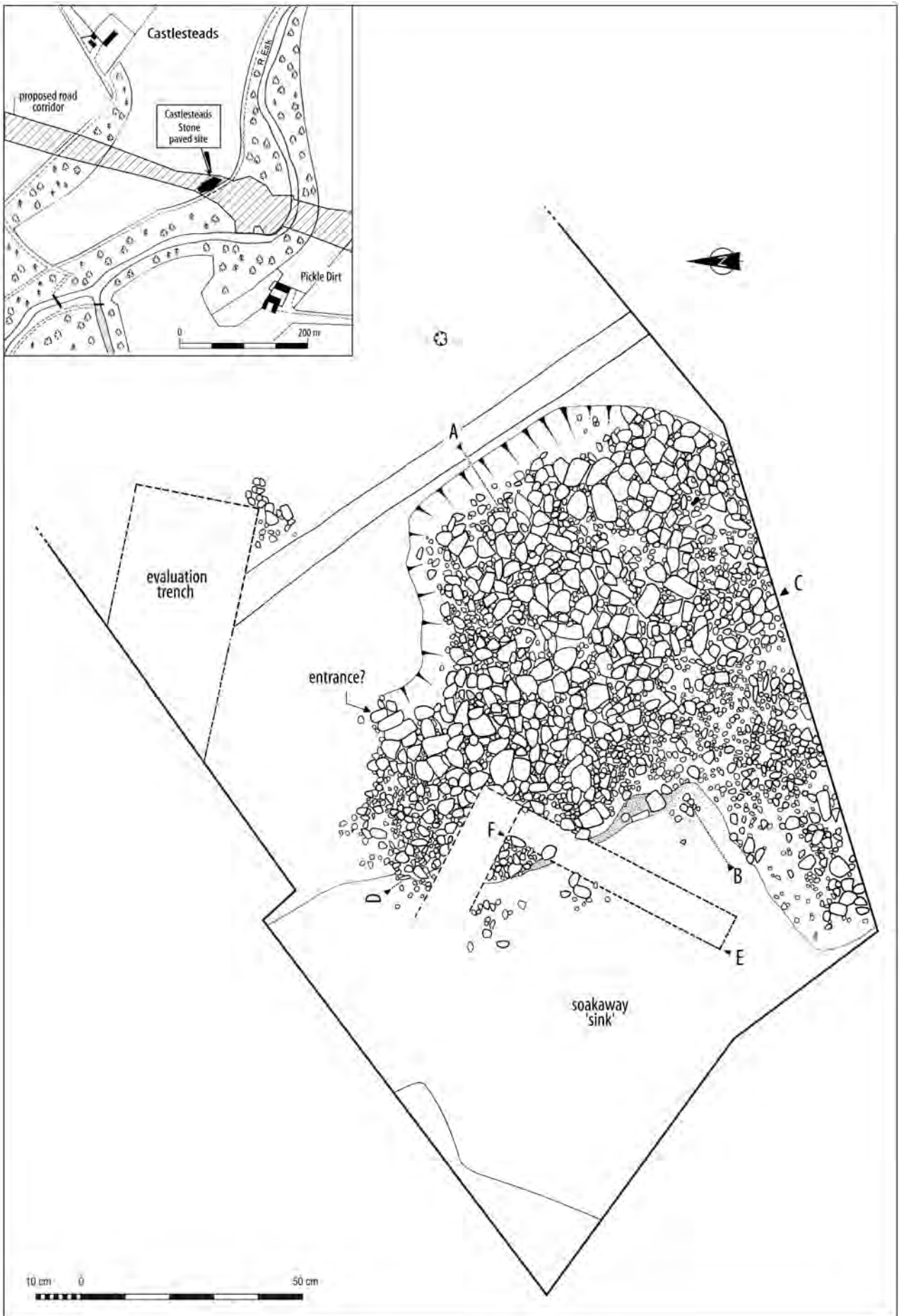
While in several places the slabs appeared to have been carefully laid and levelled as if to make a floor, no occupation deposits were located above or between the surface slabs. In other sections of the paving however, the slabs were more irregularly fitted and placed with less regard for creating a level, floor-like surface. This seems to be at odds with the insertion of many small packing stones into any small gaps between the stones, which ensured that there was an extremely secure positioning of the slabs forming the paved surface. Further evidence of the concern for a secure base was seen in the presence of a 'levelling' deposit, which comprised medium, sandy gravel, and appeared to provide a 'bed' for the paving.

A trench was hand-excavated across and through the paved area (*illus 6.1* and *6.2*, A–B) in an attempt to locate any negative features below the paving which might have been obscured by the slabs, with most of those remaining then lifted by mechanical excavator. No such features were discovered in the trench. Although no evidence was found of post-holes positioned either through or below the paving, the possibility remains that posts could have been founded directly upon the paved surface, using the stones as post-pads.

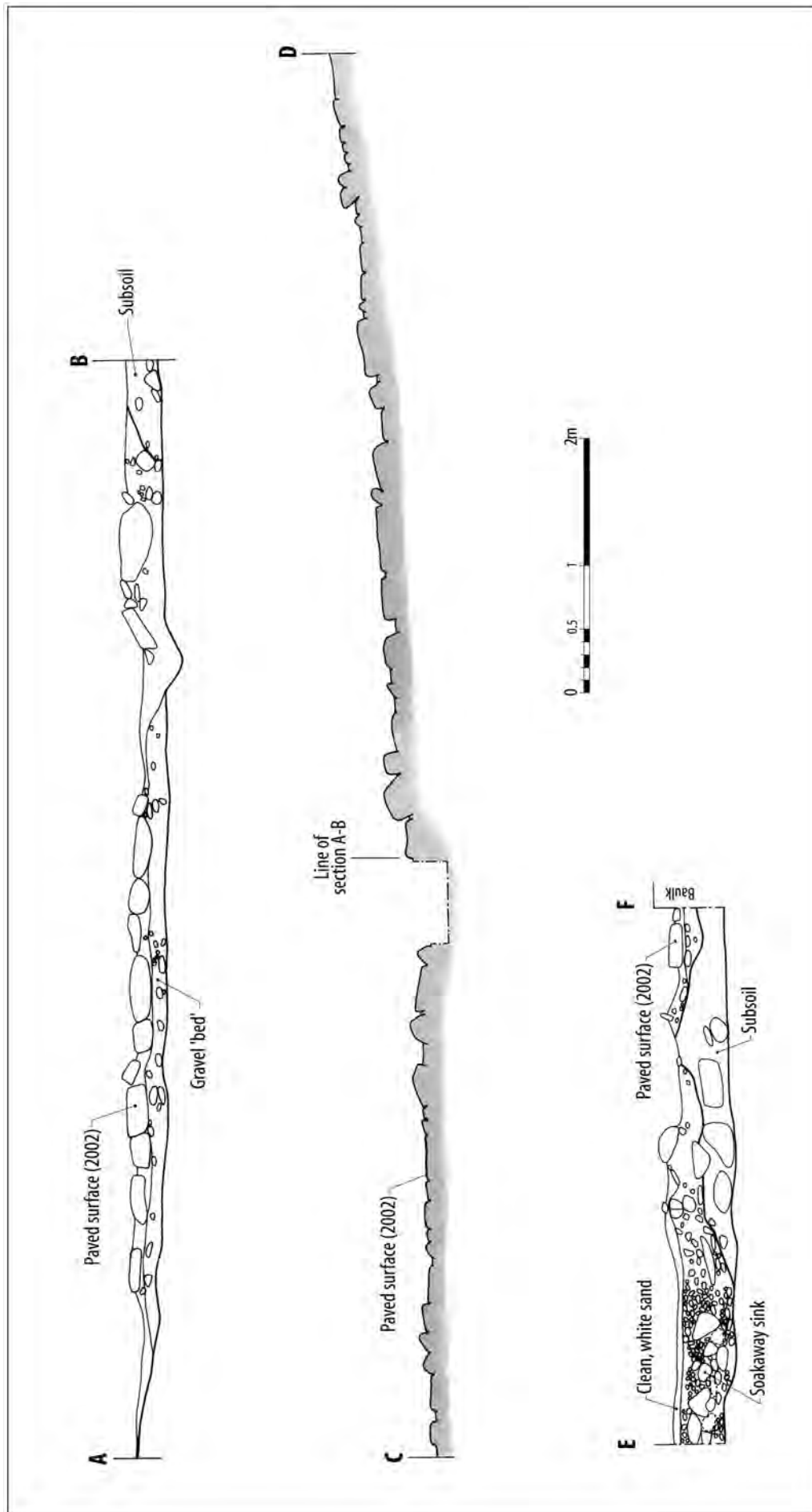
Several small flakes of flint and chert were recovered from the surface of the paved area. In addition to this, as noted above, a fragment of a well-worn saddle quern had been re-utilised within the paving but did not appear to be in situ.

6.3.2 Soakaway 'sink'

Immediately to the west of, and cutting, the paved area was a feature which is interpreted as a soakaway 'sink' (*illus 6.1* and *6.2*). The feature was a shallow



Illus 6.1 Plan of paved area and soakaway 'sink'



Illus 6.2 Sections and profiles through paved area

Table 6.1 Lithic finds from excavated contexts at the stone-paved area

Context	Quantity, Material and Diagnosis
Layer over paved surface	Broken, irregular flint flake, 15 × 13 × 2mm Quartz flake, secondary, from prepared platform core on rolled pebble, 23 × 22 × 9mm Unworked chert chunk Two chunks of unworked chalcedony Secondary, burnt flint flake, white/red
Layer over soakaway	Flint flake, inner regular, very burnt, 20 × 15 × 4mm Chert flake, inner irregular, blade like, hinge termination, 28 × 15 × 6mm Chert chunk, inner, dark grey, 18 × 13 × 11mm Secondary irregular grey flint flake, 38 × 20 × 4mm

scoop, its exposed area measuring 10m by 7m, and 0.6m in depth. Within it were 0.5m deep deposits of large rounded boulders and pebbles with frequent voids between them. These deposits were sealed by a layer of clean cream-coloured sand, 0.1m to 0.15m in depth. Roughly central to the exposed part of the sink feature, a number of sandstone slabs lay upon the sand and directly upon the rubble deposits below. It is likely that both the sand layer and the stone slabs were laid to prevent choking of the sink by the leaching of silt and topsoil. At the western side of the feature was a well-defined, straight-edged cut for a soakaway drain. This was filled with medium-sized riverborne stones, and emptied into the main 'sink' feature. The feature continued beyond the edges of the trench.

The soakaway and the associated drainage features may be fairly recent and associated with the Castlesteads formal garden shown on an estate map of 1753 (NAS RHP93522) or, more likely, related to agricultural activity.

6.4 Finds and environmental evidence

6.4.1 Lithics, by B Finlayson, with additions by T Ballin

The lithics assemblage, 193 pieces, consisted largely of chert and flint with a few pieces of quartz and chalcedony. Only 11 pieces were recovered during the excavation, the majority being from test pits (98 pieces) and surface/topsoil cleaning (84 pieces). With the exception of the excavated contexts, the samples were dominated by chert, but this included a significant proportion of unworked pebbles and angular blocks. Most of these pebbles were too small to work and were not of the same colour or texture as the worked pieces. The majority of worked pieces were flakes, but two chert blades were recovered from test pits. Nine additional unstratified lithics, including a short end-scraper and an edge-retouched piece but excluding any of diagnostic value, were recovered from Trenches 82 and 83 in 2006.

The 1994 excavated assemblage (Table 6.1) consisted of five flint flakes, a blade-like chert flake, a quartz flake, chert and chalcedony chunks and a chert pebble. Two of the flints were heavily burnt. The sample was too small and undiagnostic to suggest a date range.

6.4.2 Coarse stone, by A Jackson

Two coarse stone finds were studied, namely: a rim fragment of a saddle quern of dolerite (SF2 from layer 2001 over the paved surface) and a small perforated sandstone pebble (SF6, from 2014).

The saddle quern fragment (L 213mm, W 98mm, T 45–69mm) reveals evidence of heavy wear on one face, however there is no evidence of any attempt to deliberately modify the shape of the original natural boulder from which it was formed. Saddle querns of this type – and in general – are commonplace on Scottish prehistoric sites of Neolithic and later date. The fragment from Castlesteads was clearly broken in antiquity; it is therefore probable that it was reused as a paving stone, and its use predates the construction of the paving at the site.

Like the saddle quern fragment, the perforated pebble (57 × 39 × 32mm, perforation 5–13mm diameter) shows no evidence of modification other than a single perforation that passes at an angle through the stone. This perforation was drilled from one face as indicated by its slight V-shaped profile. The purpose of this object is uncertain but given its crude natural exterior it is probable that it served a utilitarian function as a weight of some sort (eg for net or loom).

6.4.3 Palynological assessment, by C Clarke

A series of ten soil samples was taken from above and between the slabs of the paved area. No artefactual or macrofossil remains were recovered, so attention was focused on the microfossil level, and a preliminary assessment was carried out to check

for the presence of pollen grains or other organic-walled microfossils which might provide a clue as to the use of the structure. A method statement is available in the archive.

All samples yielded some pollen, although most of it was in a very corroded and/or crumpled state. Fungal palynomorphs were also present; these too were in a state of considerable degradation. A cursory glance suggested that neither pollen nor fungal spores were particularly abundant (although absolute data were not calculated). Further, all of the samples were rich in mineralic debris despite treatment with hot hydrofluoric acid. In brief, these samples were unsuitable for further, more detailed, palynological analysis.

6.5 Discussion

Interpretation of the stone paving at Castlesteads is problematic for a number of reasons, most notably the small size of the artefact assemblage recovered from the immediate site and the lack of any close parallels for the structure. These factors, together with problems of truncation, lack of full exposure and limited dating evidence, make any proper evaluation of the site and its function very difficult. It was hoped that environmental analysis of the deposits sealed below the paving would reveal some information about possible functions for the enigmatic feature. However, the results were very disappointing and although all samples yielded pollen and fungal palynomorphs, they were in a state of considerable degradation.

The large quantity of struck flint and chert artefacts recovered from the topsoil overlying the paving and from the terrace down-slope from the paved area suggests that a certain amount of chert- and flint-working occurred in the immediate vicinity of the site during prehistory. However, the paucity of artefacts and occupation deposits recovered from the surface of the paved area itself does tend to rule out any stratigraphic connection between the two site components. The broken saddle quern reused in the construction of the paving appears simply to

reflect the reuse of an artefact present within the immediate environs, not an artefact deposited *in situ*. It thus provides only the most basic *terminus post quem*.

Documentary evidence in the form of a crude map of 1753 in the care of Dalkeith House (NAS RHP93522) has revealed that there was a formal garden to the east of Castlesteads House during the 18th century, and shows paths and flowerbeds. The features described within this report do not bear any resemblance to garden features such as these, although the possible soakaway may be part of a crude drainage scheme. However, it is located some distance from the position of the garden.

The possible soakaway probably comprised a certain amount of material robbed from the stone-paved feature, suggesting that a much more substantial structure originally existed there. However, most of the stones within the sink feature are much larger, rounded boulders which would appear to be unsuitable for wall construction so they may in fact have been brought from elsewhere.

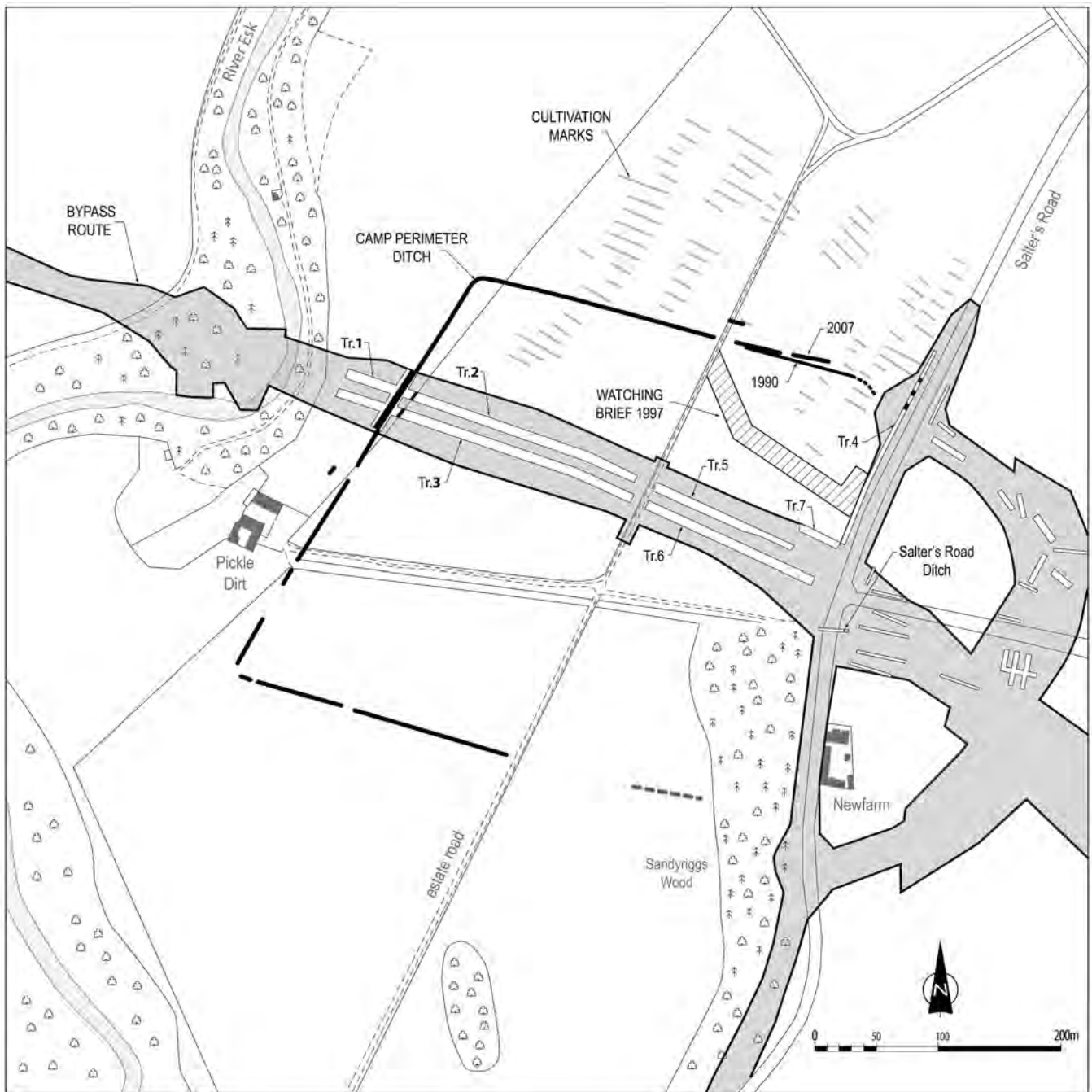
In the absence of occupation deposits, walls, post-holes or artefacts, it remains very difficult to ascribe a function to the paved feature. Similar difficulties of interpretation beset Barclay and Russell-White (1993) in relation to a paved area set within a hollow excavated at Balfarg, Fife. Possible interpretations for the Castlesteads feature include a slightly sunken floor of a prehistoric building, but if so, the dimensions of this truncated area of paving would mark this out as a 'substantial' structure (cf Hingley 1992). A non-domestic purpose seems more likely, for example as a working hollow (as at eg Wardend of Durris, Aberdeenshire; Russell-White 1995) or a yard or hardstanding (as at eg Phantassie, East Lothian; Lelong & MacGregor 2007). The Castlesteads structure is not convincingly dated, however, and although it has affinities with prehistoric settlement-related features, a more recent origin cannot be ruled out. In conclusion, until a similar feature or features are excavated which reveal further information, the Castlesteads paved feature and the soakaway remain enigmatic.

7 SMEATON ROMAN TEMPORARY CAMP, *by A Dunwell and I Suddaby*

7.1 Introduction

On arable land immediately to the east of the River Esk, and c 300m north-east of the confluence of the North and South Esk rivers, at approximately 35m above OD, the road corridor intersected the site of

Smeaton Roman temporary camp (NGR: NT 345 692 area). Prior to these investigations the camp had been recorded only as cropmarks visible on aerial photographs to the west of Salter's Road (NMRS Refs: NT36NW 33 & 54; *illus 7.1, 7.2*). In crossing the three fields between Salter's Road and the river,



Illus 7.1 Location map showing camp perimeter ditch and cultivation furrow cropmarks, and road corridor and excavation trench positions (based upon maps supplied by Historic Scotland and plotted cropmark information produced by RCAHMS)



Illus 7.2 Aerial photograph (Crown Copyright: RCAHMS; Ref: SC973256, 1979)

the corridor generally varied between 45m and 70m wide, and covered an area of *c* 2.5 hectares. Prior to road construction the ground within the corridor fell gently westwards from Salter's Road to an estate road, then was relatively level until descending into the wooded gorge of the River Esk a little to the west of the Roman temporary camp.

This account brings together several phases of investigation of the Roman camp, conducted both in advance of and during road construction. An excavation was conducted across the threatened portion of the camp within the road corridor west of Salter's Road between November 1994 and January 1995. A watching brief was conducted in May 1997 during topsoil-stripping operations within the camp along the line of a gas main re-route. The western perimeter ditch of the Roman temporary camp was re-examined in May 2006. Evaluation trenching and watching briefs were also conducted on various occasions between 1994 and 2008 across and to the east of Salter's Road; some of the more recent interventions were targeted specifically to locate the

eastern perimeter of the camp, which was not found west of Salter's Road in 1994–95.

7.2 Cropmark evidence, and the morphology and date of the camp as understood prior to the investigations

No upstanding remains of the camp survive and, prior to these investigations, details of its nature and extent were restricted to a partial outline plan of its perimeter ditch, recorded as cropmarks on aerial photography (eg [illus 7.2](#)). The camp was first detected in the early 1960s by St Joseph (1965, 80), when a *c* 290m length of its northern perimeter was located, including the probable position of an entrance protected by a *titulus*. Its north-west angle and a *c* 180m length of its west side, including an entrance with *titulus*, were subsequently identified (St Joseph 1973, 216). Uncommonly for one of the many camps discovered by St Joseph, the aerial evidence does not appear in this instance to have

been confirmed on the ground by test excavations. Further linear cropmarks identified subsequently to the south of Pickle Dirt were proposed as a continuation of the western perimeter ditch alignment and part of the southern side of the camp (RCAHMS 1988, 26, no. 109). The resistance to detection of the remainder of the perimeter ditch was assumed prior to the initial archaeological excavation to reflect the varying susceptibility of different ground and subsoil conditions to produce cropmarks. There are no traces on the aerial coverage that can be proposed realistically as relating to internal features of the camp. An extensive spread of cultivation furrows orientated north-west/south-east is visible on this aerial coverage (eg *illus 7.2*).

Rectified transcriptions of the cropmarks of the camp and cultivation marks were produced by RCAHMS in 1990 (Ref: MS 840/371) and 2007, and form the basis of the cropmark positions included on *illus 7.1*. The west side of the camp is c 380m long, with the entrance sited centrally. Approximately 230m of the south side has been identified, although no entrance position has been confirmed. Of the north side, a c 310m length of perimeter ditch has been confidently identified, with the entrance located c 205m from the north-west corner. The 1990 RCAHMS cropmark plot records the northern perimeter alignment as veering south-eastwards at its east end, as if approaching the north-east corner of the camp: this feature is included on the transcription published by Brown (2002, 8). However, the aerial photographic coverage held by RCAHMS is not clear in this regard (it is annotated as a dotted line on *illus 7.1*): indeed this potential alignment was omitted from the 2007 RCAHMS transcription of the Roman temporary camp. The north and south perimeter ditches run almost parallel to each other, although neither meets the west side at right angles, the north-west angle being obtuse (c 108 degrees), and the south-west acute (c 74 degrees). There are no evident topographic reasons to explain this particular morphology, or why a more regular card-shaped enclosure was not constructed.

It was not possible to be certain about the overall size and shape of the camp, based upon the cropmark evidence. If it were assumed that the overall form of the camp could be extrapolated regularly from the visible part, and that the northern entrance was located centrally within that side of the camp perimeter, then it would be possible to envisage the camp as a parallelogram with an area of c 15.5 hectares. However, the results of the investigations detailed below, combined with the lack of evidence for a centrally placed southern entrance, do not bear this out, and preclude accurate estimation of the camp's size and shape. The minimum area of the camp, based upon cropmark evidence, was c 12 hectares.

Prior to the investigations, there was no archaeological evidence with which to date Smeaton camp precisely. Moreover, its location within the local distribution of recorded Roman military instal-

lations did not assist in dating it. Smeaton camp lies roughly midway along the River Esk between two clusters of Roman military settlement (*illus 7.3*). Approximately 3km to the south-west are the Flavian fort at Elginhaugh (excavated in the mid-1980s; Hanson 2007) and nearby temporary camps at Eskbank and Lugton. Previous small-scale excavations of the two overlapping camps at Eskbank (Maxfield 1975; Barber 1985, 30–1) revealed no evidence of their date, although Maxfield (1975, 149) tentatively suggested that the morphology of the later camp indicated a Severan origin. To the north are the Antonine fort and settlement at Inveresk (see eg Bishop 2002) and at least two nearby temporary camps at Monktonhall. The largest camp was posited as being of Severan date on the basis of its morphology (Maxwell & Wilson 1987, 36–7), whereas more recently both Antonine (Hanson 2002, 53) and potentially Flavian (Cook 2004, 153) dates have been advanced on the basis of circumstantial evidence recovered during excavations. The former claim was based upon Antonine samian pottery found near the camp ditch and the latter upon radiocarbon dates obtained from what was interpreted as a field oven within the camp.

The isolation of Smeaton camp from other Roman sites suggested that it was more likely to have been a marching camp than a construction camp accommodating troops building a fort (cf Maxwell 1980, 26).

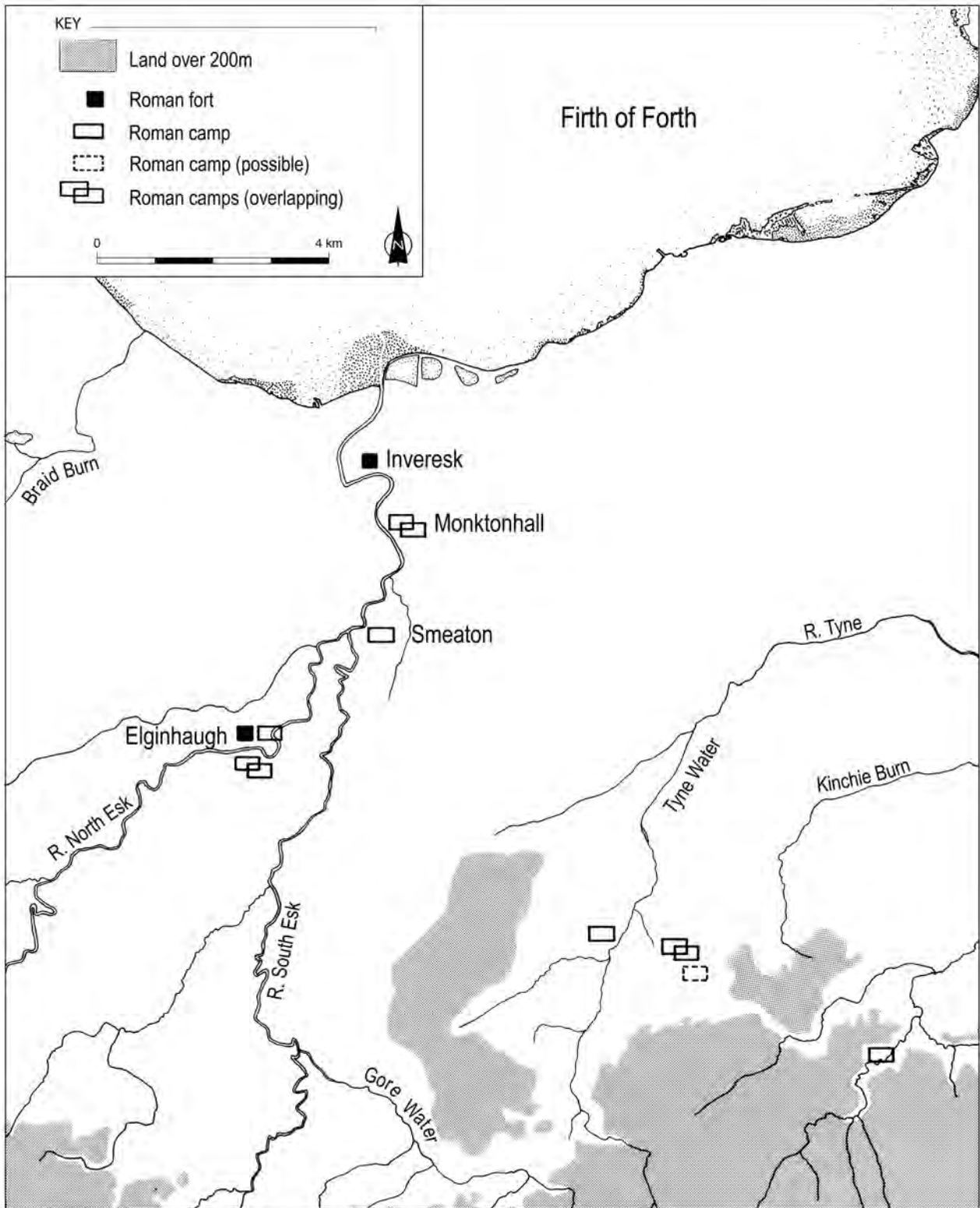
7.3 Investigation strategy and methods

7.3.1 Project design

The road corridor made available for study a substantial transect through the camp (*illus 7.1*). In recognition of this, the Project Design for the initial excavation (1994–95) proposed the investigation of the whole length of the western perimeter ditch present within the road corridor and a substantial sample of the road corridor between the River Esk and Salter's Road, within which area it was anticipated the eastern perimeter ditch might also have been located. This large-scale intervention was felt to be justified in order to address three specific objectives:

- 1) to examine closely the structural characteristics of a length of perimeter ditch;
- 2) to identify the eastern perimeter ditch, and thus the east/west dimension, of the camp;
- 3) to identify the nature, date and patterning of any features revealed within the camp.

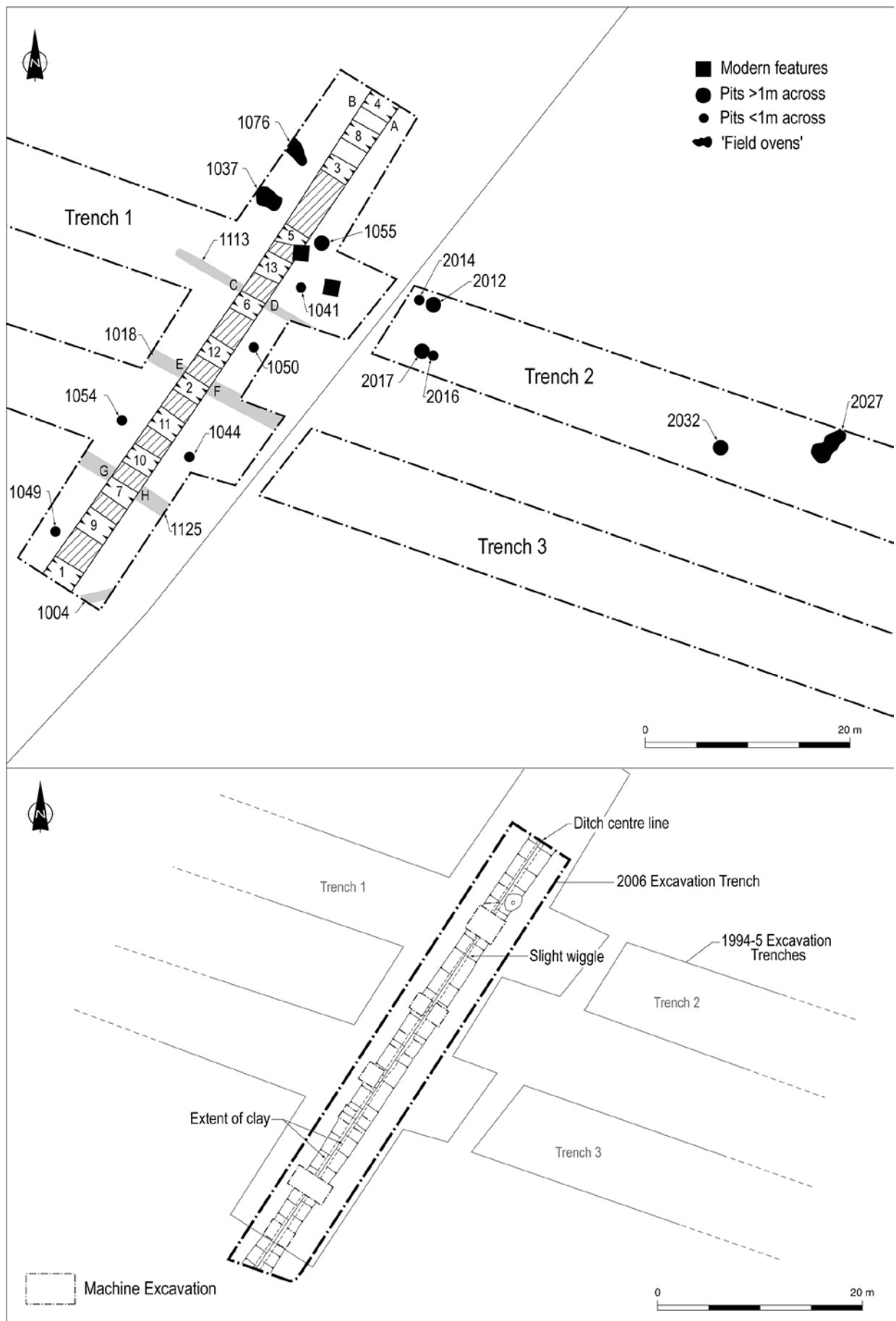
The Project Design placed particular emphasis upon detecting the nature and patterning of activity within the camp. It is generally assumed that the interiors of temporary camps were laid out in a regular or semi-regular pattern, similar to the internal organisation of permanent forts, with



Illus 7.3 Location map showing Smeaton camp and other forts and camps in the Esk Valley and surrounding areas

occupation in tents and the building of structures restricted to ovens and latrines (Welfare & Swan 1995, 21–2). This belief is based principally upon the evidence of Roman literary sources, such as Hyginus Gromaticus (eg Maxwell 1989, 41–43), rather than the results of archaeological field research.

Other camps have provided scant evidence for ordered internal layout, although until relatively recently, as Welfare & Swan (1995, 21) noted, excavations tended to avoid examination of interiors due to the belief that little would be found. Prior to the 1990s the great majority of investigations of Roman camps



Illus 7.4 Upper, summary excavation plan 1994-95, showing camp western perimeter ditch, pits and 'field ovens'; lower, full excavation plan of western perimeter ditch 2006

involved limited exploratory work, mostly confined to the perimeter defences and supplementing aerial survey, designed to trace the extent and form of the camp, to examine entrance morphologies, to recover datable artefacts, and to test stratigraphic relationships between overlapping camps (eg Keppie's work at Dullatur camps, [Keppie 1978](#)). These investigations were conducted within a research framework designed to classify camps into chronological groups, in order to study the history of Roman military campaigns within northern Britain (eg [Hanson 1978](#); [Maxwell 1980](#)). Such pursuits did not require a consideration of the physical characteristics of camp interiors. Increasingly in the last two decades, excavations and watching briefs have been conducted in response to specific development proposals, although only in a few cases (eg Monktonhall, [Hanson 2002](#); Kintore, [Cook & Dunbar 2008](#); and [Spiller & Leslie 1994](#)) have larger-scale investigations, of a scale comparable to (or in the case of Kintore exceeding) the work at Smeaton, been undertaken.

There is some cropmark evidence for the layout of camp interiors. Parallel lines of pits identified from the air as being present within a small number of camps (eg Inchtuthil, [Maxwell 1982](#); [Pitts & St Joseph 1985](#), 223–44; Lochlands, [Maxwell & Wilson 1987](#), 39) have been interpreted as the results of rubbish disposal, and hint at patterned activity. Archaeological excavations have to date encountered little success in identifying coherent patterns of occupation: scatters of pits (eg Annan Hill, [Keppie 1988](#)) and stake-holes (eg Rey Cross, [Welfare & Swan 1995](#), 57–60) have been detected, and more complex features interpreted as hearths and ovens are recorded at several sites (reviewed by [Cook & Dunbar 2008](#), 17). The notable exception is the camp at Kintore, where several separate investigations in recent decades ([Shepherd 1986](#); [Alexander 2000](#); [Cook & Dunbar 2008](#)), and mostly since the initial excavation at Smeaton took place, have amassed considerable evidence of internal features, mostly field ovens but also rubbish pits.

7.3.2 Investigation strategy

Seven trenches, with a combined area of approximately 7,500m² ([illus 7.1](#)), were stripped of topsoil using earth-moving machinery. Five of these (Trenches 2–3, 5–7), generally 8m wide, provided two transects 8m apart across the interior of the camp. Trenches 5 and 7 were staggered in order to avoid the route of a gas pipeline. Trench 1 was opened to expose the western perimeter ditch and ground immediately to either side of it, and to continue the two excavation transects across the camp through to its exterior. Finally, as topsoil stripping and initial cleaning in Trenches 5–7 did not reveal the alignment of the eastern perimeter ditch, Trench 4 was opened in a further attempt to define the extent of the camp, ie by determining whether or not the northern perimeter ditch extended that far east.

Due to the narrowness of the road corridor and the proximity of the Dalkeith Park estate wall, Trench 4 was only 2m wide.

The full c 57.5m length of the threatened section of the western perimeter ditch was exposed in 1994 ([illus 7.4 upper](#), [7.5](#)), in order to detect any variations in its character and to confirm that an entrance did not lie within the road corridor. Intensive sample excavation of c 50% of this length of ditch was undertaken, to record the character of the ditch and its fills, and to recover artefactual material by which the camp might have been dated. Thirteen sections were excavated across the ditch, eight by hand and five aided by earth-moving machinery ([illus 7.4 upper](#)). Ditch sections 3, 4 and 8 were subsequently run together to form a single excavated length of c 9m.

An opportunity to excavate the remainder of the ditch fills in the same area arose in 2006 ([illus 7.4 lower](#)). The rationale for further investigation had been provided by the successful results of the strategy adopted for the investigation of substantial lengths of the perimeter ditches of the Roman camps on the Antonine Wall at Dullatur, North Lanarkshire ([Lowe & Moloney 2000](#)). At that site the primary fills of the ditches were fully excavated following the removal of the upper fills by machine, with the specific intention of recovering stratified datable artefacts.

Much of the re-investigation at Smeaton was conducted by machine, involving the re-exposure of the ditch, the removal of the backfill from the 1994–95 trenches opened across the ditch, and the removal from unexcavated areas of the ditch those upper fills identified in 1994–95 as ploughsoil-derived (see [7.4.2](#) below). The remaining lower ditch fills were then excavated by hand, with a c 50% sample dry-sieved using a 10mm mesh sieve. All material within the ditch was scanned by metal detector by members of the Scottish Detector Club both prior to, and following, its excavation.

As neither the 1994–95 investigation nor the 1997 watching brief to the west of Salter's Road, nor the 1994 evaluation trenches excavated to the east of Salter's Road (before the excavation took place), had located the eastern perimeter ditch of the camp, the opportunity was taken in 2006–08 to further investigate where its alignment might lie. Additional evaluation trenches opened in 2005–06 to the east of Salter's Road, were placed to detect, *inter alia*, the ditch alignment, albeit that the distribution and orientation of those trenches were significantly constrained by the presence of services. As this additional trenching again proved unsuccessful in locating the east side of the camp, in early 2008 a trench was excavated under archaeological supervision across the carriageway and verge of Salter's Road by the road construction contractor, once that section of the road had been closed to traffic during road construction works (the trenches are depicted on [illus 7.1](#)).

The opening and cleaning of trenches forming two transects across the interior of the camp was carried out to seek evidence for patterning of occu-



Illus 7.5 Ditch as initially cleaned, showing its intersections with linear features

pation activity. As part of the 2006 re-investigation of the camp ditch, the Scottish Detector Club metal-detected the whole of the road corridor between Salter's Road and the River Esk.

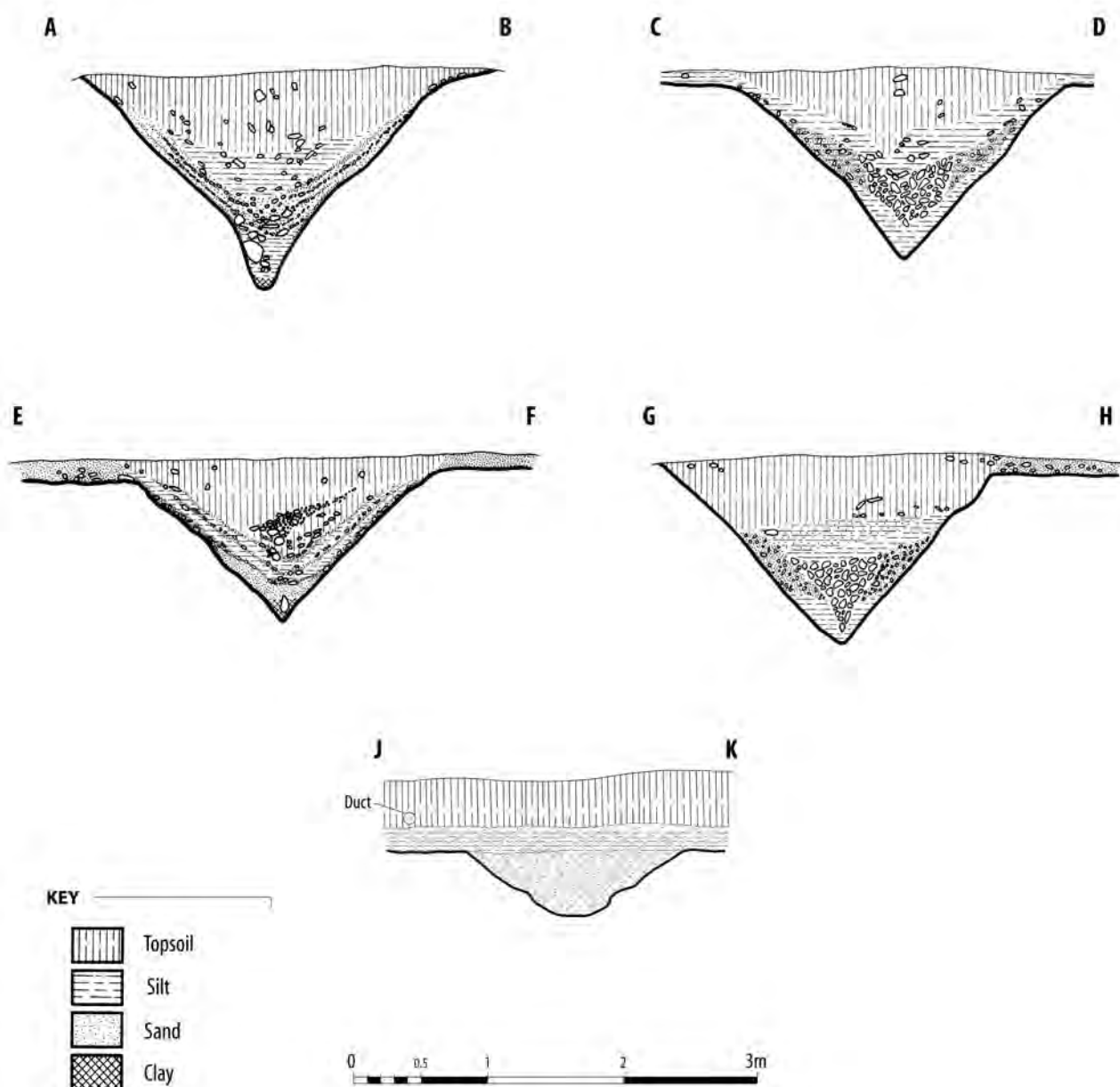
7.4 Archaeological results

7.4.1 Introduction

The investigations revealed evidence of prehistoric, Roman, Early Historic, post-medieval and modern activity. Features of demonstrably pre-medieval date were concentrated in areas of sand and gravel subsoil in Trench 1 and the western halves of

Trenches 2 and 3 ([illus 7.4 upper](#)). To the east of this, where heavy clay subsoil was present, almost all identified features were apparently of post-medieval or modern origin. The combined effects of the cutting of dense networks of land drains and cultivation furrows within this clay subsoil zone were that only a limited proportion of the exposed subsoil surface was undisturbed, thus substantially reducing the opportunity for the survival of earlier features.

The 1994–95 excavations identified the western perimeter ditch of the camp and a scatter of pits and linear features to either side of it. Of these pits, two large examples containing burnt seeds and charcoal were provisionally identified as 'field



Illus 7.6 Camp perimeter ditch, sections A–B, C–D, E–F, G–H. Surface width and maximum depth: A–B, 3.10 × 1.62m; C–D, 2.61 × 1.31m; E–F, 2.49 × 1.22m; G–H, 2.60 × 1.39m. Also shown J–K is a section of the ditch identified beneath the verge of Salter’s Road.

ovens’ (illus 7.4 upper, 2027, 1037), and a third pit of similar form, but not containing plant macro-fossil remains, was recorded as a further possible example (illus 7.4 upper, 1076). Other remains included cultivation furrows and land drains. The eastern limit of the camp was not located during any phase of work.

7.4.2 Western perimeter camp ditch (illus 7.4–7.7)

The exposed surface width of the ditch varied from c 2.5m to c 3.35m, generally widening to the north (see

illus 7.6, and captions). No evidence was identified for any structural complexity, such as entrances or other breaks and deliberate constrictions (illus 7.4 lower). The ditch was preserved to between c 1.1m and 1.7m deep, this dimension also generally increasing to the north (illus 7.6, and captions). The inconsistencies in dimensions are likely primarily to reflect differential truncation to the ditch, both by ploughing and during topsoil removal for the excavation. The subsoils cut by the ditch are sand and gravel overlying clay. No trace of a camp rampart survived, although one can be expected to have been constructed immediately east of (inside) the ditch alignment.



Illus 7.7 Excavated length of camp perimeter ditch in 2007, looking north

The ditch for the most part had a regular V-shaped profile characteristic of Roman military constructions (illus 7.6 and 7.7), with occasional localised irregularities in the smoothness of the edges representing the results of erosion. A roughly squared slot *c* 0.3m deep, of a type commonly referred to as a cleaning channel or ‘ankle-breaker’, ran along the base of the ditch (eg illus 7.6 A–B), and was the only part of the ditch to have been cut through the natural clay; this was perhaps intentional, but there is no way of being certain. The excavators observed that their movement along the clay base of the ditch rapidly distorted the sharp profile of the basal slot as first exposed, producing a flatter, trampled base. This suggests that there was little Roman or later movement along the base of the ditch, as might have been expected had the ditch been cleared out periodically. A localised wiggle in the alignment of the basal slot was identified *c* 13m from the northern end of the trench, but it did not signify a change in the overall alignment of the ditch.

The sequence of ditch fills was broadly consistent along the excavated length of the ditch, although it varied laterally in detail. The lower fills comprised

inwashed deposits of silts, sands and gravels lining the edges of the ditch and in some cases sealing a primary clay deposit, with larger stones collecting in the centre of the ditch (see illus 7.6 for details). In some sections (eg illus 7.6 A–B) sequences of individual inwash deposits could be discerned, and demonstrate a process of incremental infilling of the ditch (although at an unknown rate) rather than deliberate backfilling. By contrast, the upper fills in each section comprised ploughsoil-derived sandy and silty loams. The orientation of the fills suggests that material was entering the ditch from both sides and in approximately equal amounts, and not simply from the degradation of the adjacent rampart.

Finds recovered from the Roman ditch consist of a sherd of samian ware pottery and the lug of an undated earthenware vessel; fragments of a perforated stone weight and a carved stone; six chert items of early prehistoric origin; parts of a shale or cannel coal bangle; a decorated cast bronze object; and the shaft of an iron nail. The stone weight, nail shaft, two chert flakes and a chert blade derived from secondary inwashed fills of the ditch, and all the rest

from the ploughsoil-derived upper fill. Nothing was found in the basal fills, within the ‘ankle-breaker’.

7.4.3 Eastern perimeter ditch

No convincing evidence was identified for the alignment of the eastern side of the camp within the areas of investigation (*illus 7.1*). The only feature that conceivably could be related is a ditch identified running on a north–south alignment beneath the wide grassy verge on the east side of Salter’s Road, and parallel to the road to the west and a fence-line to the east. Where a full section of the ditch was exposed, it was *c* 1.5m wide and 0.5m deep, with a U-profile, and was filled by clay silt containing a lens of fine sand towards the base (*illus 7.6*, J–K; annotated ‘Salter’s Road ditch’ on *illus 7.1*). Its scale, profile and alignment do not suggest it was related to the Roman construction, and a more recent origin as a relict post-medieval field boundary ditch is considered a more likely explanation for this feature. Six fragments of a large mammal scapula (cow or horse) were recovered from the upper part of the ditch fill – similar material was recovered in comparable contexts in a medieval or later ditch excavated nearby at Newfarm (*Section 8.3.2*).

7.4.4 ‘Field ovens’

Two elongated pits with a notable bulge at one end and with similar filling deposits were identified (*illus 7.4 upper*, 2027, 1037; *illus 7.8*). One lay 1m outside the western camp ditch, and measured *c* 2.85m long, up to 1.45m wide and 0.33m deep (*illus 7.8*, 1037). The second, with a more pronounced bulge, lay 52.5m within the western camp ditch, and was *c* 2.7m long, up to 1.5m wide and 0.55m deep (*illus 7.8*, 2027). Both pits contained charcoal-rich deposits on their bases, within which charred cereal grains were present; the edges of the pits showed some evidence of baking or scorching, suggesting that the charred material was burnt in situ. Magnetic susceptibility tests conducted within the pits tended to support this latter contention (*Clarke 1995*). A patch of clay on the northern side of feature 2027 may indicate the former presence of a clay lining to that feature. The burnt deposits in both pits were sealed beneath deposits of sandy silt soil. A chip of flint was recovered from the upper fill of feature 1037.

The initial field interpretation of these bipartite pits, based upon their physical characteristics, was as Roman ‘field ovens’ associated with the occupation of the camp. Such features (sometimes referred to as ‘dumb-bell-shaped’, eg *Gibson & Taverner 1990*; *Hanson 2002*, 55) have been recorded at a range of sites in southern Scotland, including Roman temporary camps and native settlements (*Section 7.3.1*; and see *Raisen & Rees 1995*, 44, for a brief review of non-Roman occurrences). In order

to evaluate the date and function of the Smeaton examples, samples were taken from the burnt primary fills of features 1037 and 2027 for radiocarbon dating and palaeobotanical analysis (see *Sections 7.6* and *7.7*).

A third feature of similar form, *c* 2.1m long and up to 1.25m wide and 0.5m deep (*illus 7.4 upper*, 1076), was located *c* 3m north-east of ‘field oven’ 1037 and immediately outside the Roman ditch. Whilst that feature may have had the same function as its neighbour, it contained no evidence of burning within it.

7.4.5 Other pits and linear feature

Several other pits were identified during the excavation, located principally in the areas of sandy subsoil in Trenches 1 and 2, and clustering around the western perimeter ditch (*illus 7.4 upper*). Four pits appeared to form a rough alignment running *c* 1m inside the Roman ditch (*illus 7.4 upper*, 1044, 1050, 1041, 1055), and coinciding with the presumed former position of the rampart of the Roman camp.

The pits were typically oval or sub-circular in plan, measuring generally between 0.5m and 1.5m across and less than 0.5m deep (*illus 7.9* and *7.10*). They were typically filled by root-penetrated sand and silt soils. Conjoining pits 2016/2017 had been truncated by a cultivation furrow (see *Section 7.4.6*), and contained over a dozen sherds from a single coarse, handmade pottery vessel of probable Neolithic character (see *Section 7.5.3*).

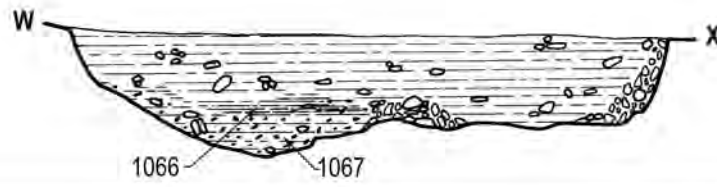
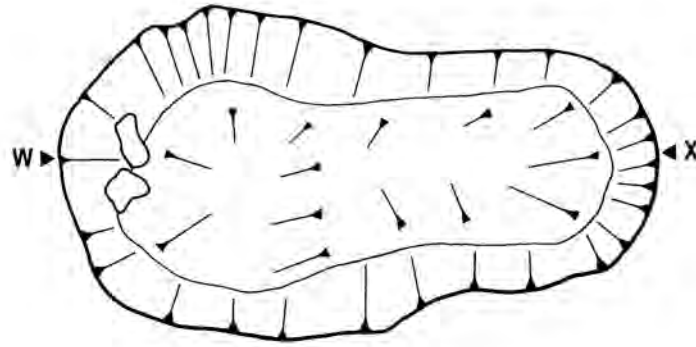
A length of a narrow linear feature running north-east to south-west, *c* 0.6m wide and 0.15m deep and with a brown sandy fill, was revealed in the extreme south-east corner of Trench 1 (*illus 7.4 upper* and *7.11*; 1004). Its alignment was notably different from that of the cultivation furrows (see below) but, owing to its partial exposure and the absence of datable artefacts or observed stratigraphic relationships to other features, its date and function remain undetermined.

7.4.6 Cultivation furrows and land drains

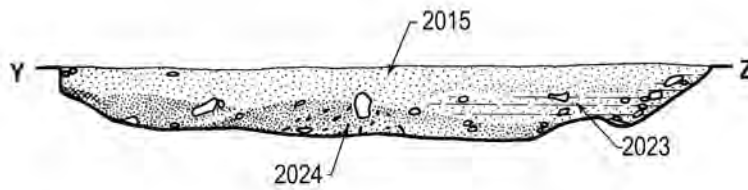
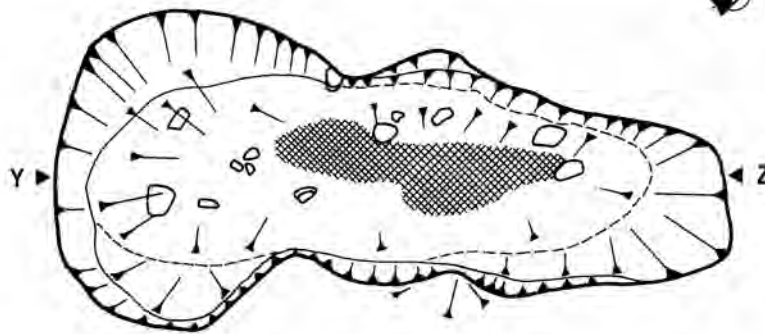
The trenches west of Salter’s Road contained the remains of a regular system of broad cultivation furrows orientated approximately WNW/ESE. They were typically 3m wide and 0.2m deep, with sandy fills, and those identified were spaced at least 7m apart. The furrows were present in both the areas of clay and gravel subsoil, and represent an extension of those traces previously recorded as cropmarks on aerial photographs (*illus 7.1*).

Three near-parallel shallow linear features intersected the alignment of the camp perimeter ditch in Trench 1 (*illus 7.4 upper*, 1018, 1113, 1125). These features were up to *c* 0.2m deep and between *c* 0.5m and *c* 2m wide (eg *illus 7.11*, 1018), and were filled by sandy soil. They terminated at each side

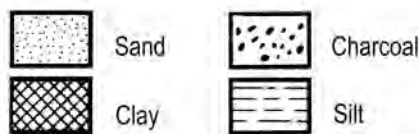
1037



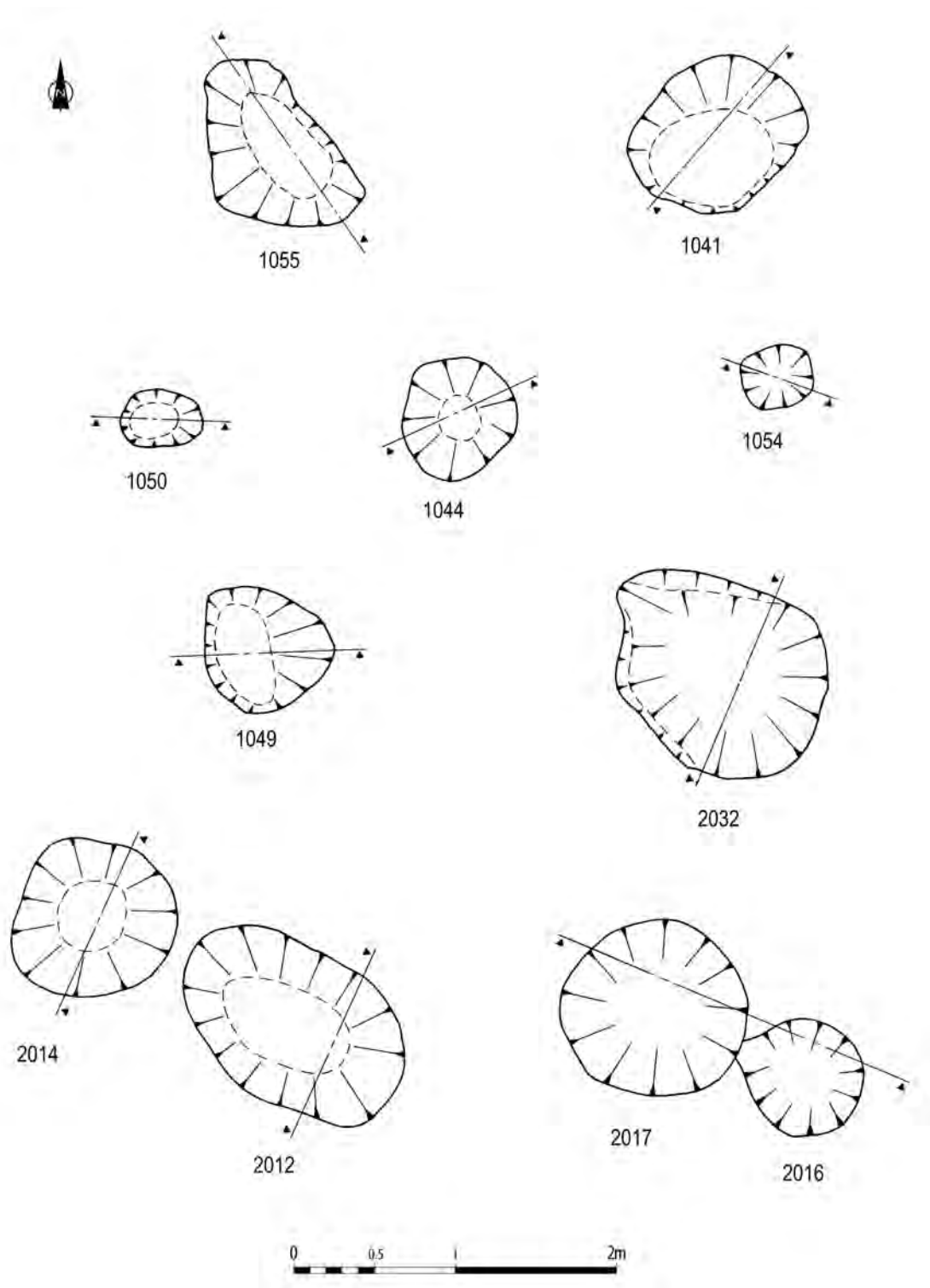
2027



KEY



Illus 7.8 Plans and sections of 'field ovens'

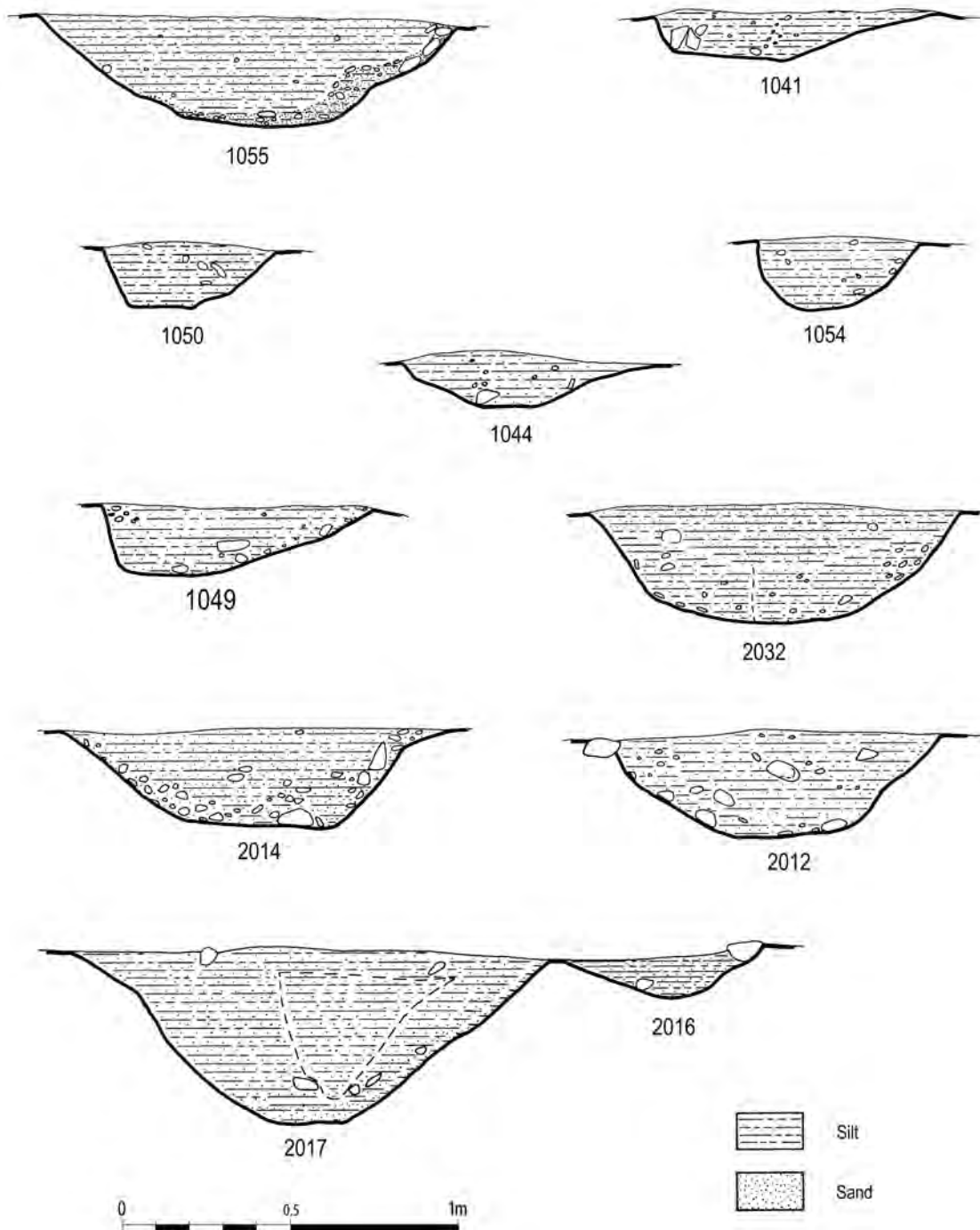


Illus 7.9 Excavated plans of selected pits

of the western camp ditch (eg [illus 7.6](#), E–F, G–H). A medieval or later origin for the rig-and-furrow cultivation system (cf [Halliday 2003](#)), incorporating within it the still partly open Roman ditch, appears the most plausible explanation for this arrangement. The possibility that the cutting of the Roman ditch truncated features of this character appears inherently unlikely: the furrows are not character-

istic of prehistoric cord rig ([ibid](#), 70). No artefacts were recovered from these features.

Three more substantial cultivation furrows, spaced at c 7m intervals and apparently surviving to 0.5m deep or more, were identified in Trench 4, adjacent to Salter’s Road. These features were cut into heavy clay subsoil, and permanent waterlogging prevented their full excavation. Fragments of clay pipe stem were recovered from the fill of the southernmost



Illus 7.10 Sections of selected pits

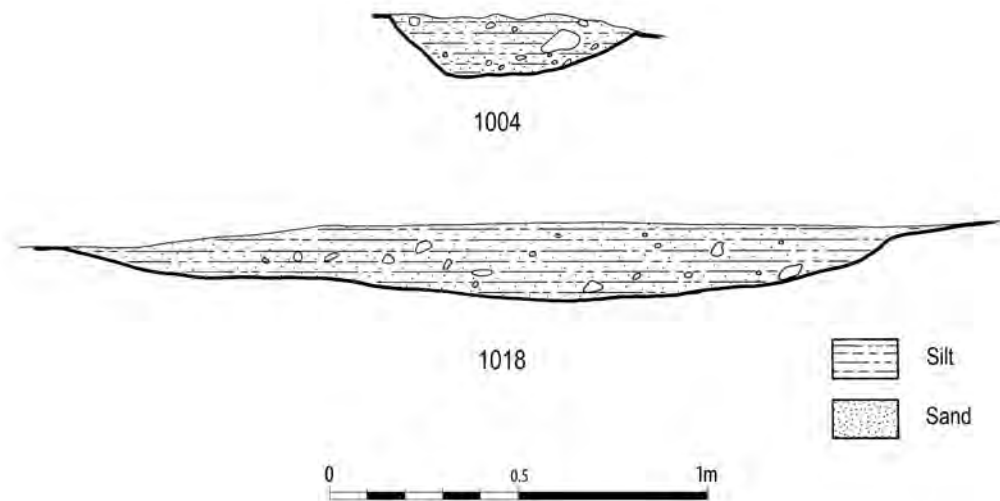
furrow. The alignments of the furrows corresponded with cultivation furrows recorded as cropmarks to the west (*illus 7.1*). None of these features could be interpreted as the northern perimeter of the Roman camp ditch which, if it had extended across Trench 4, would have been expected to run on a different alignment.

The poor drainage qualities of the clay subsoil were demonstrated by the density of tile and rubble land

drains present. These land drains did not extend into the areas of well-drained gravel subsoil.

7.4.7 Modern features

Two deep pits with near-vertical sides were located in Trench 1, one truncating the Roman ditch (*illus 7.4 upper*). Their fills contained pieces of concrete,



Illus 7.11 Sections of linear features 1004 and 1018

one lump shrouding a metal post, indicating a modern origin. They may be the sockets for the legs of a former electricity tower.

An isolated pit, containing a substantial part of the torso and limbs of a sheep, was located c 20m east of 'field oven' 2027 in Trench 2. The burial appears to have been damaged by ploughing. The good quality of bone preservation, combined with the absence of such material elsewhere on the site, suggests that the sheep burial was of relatively recent origin. A report on the animal bone, by Dr Nicola Murray, is included within the project archive.

7.5 Finds reports

7.5.1 Introduction

The few artefacts recovered during the investigations are residues of activity in the vicinity stretching from early prehistory into the 19th century. A sherd of samian ware pottery is the only item definitely of Roman date. Other finds include late Mesolithic or early Neolithic chipped stone; early Neolithic pottery; a fragment of sculpted stone and part of a cast bronze object, both of Roman or later date; and a collection of post-medieval pottery, clay pipe and metal items, mostly unstratified or metal detecting finds.

7.5.2 Samian ware sherd, by F C Wild (illus 7.12)

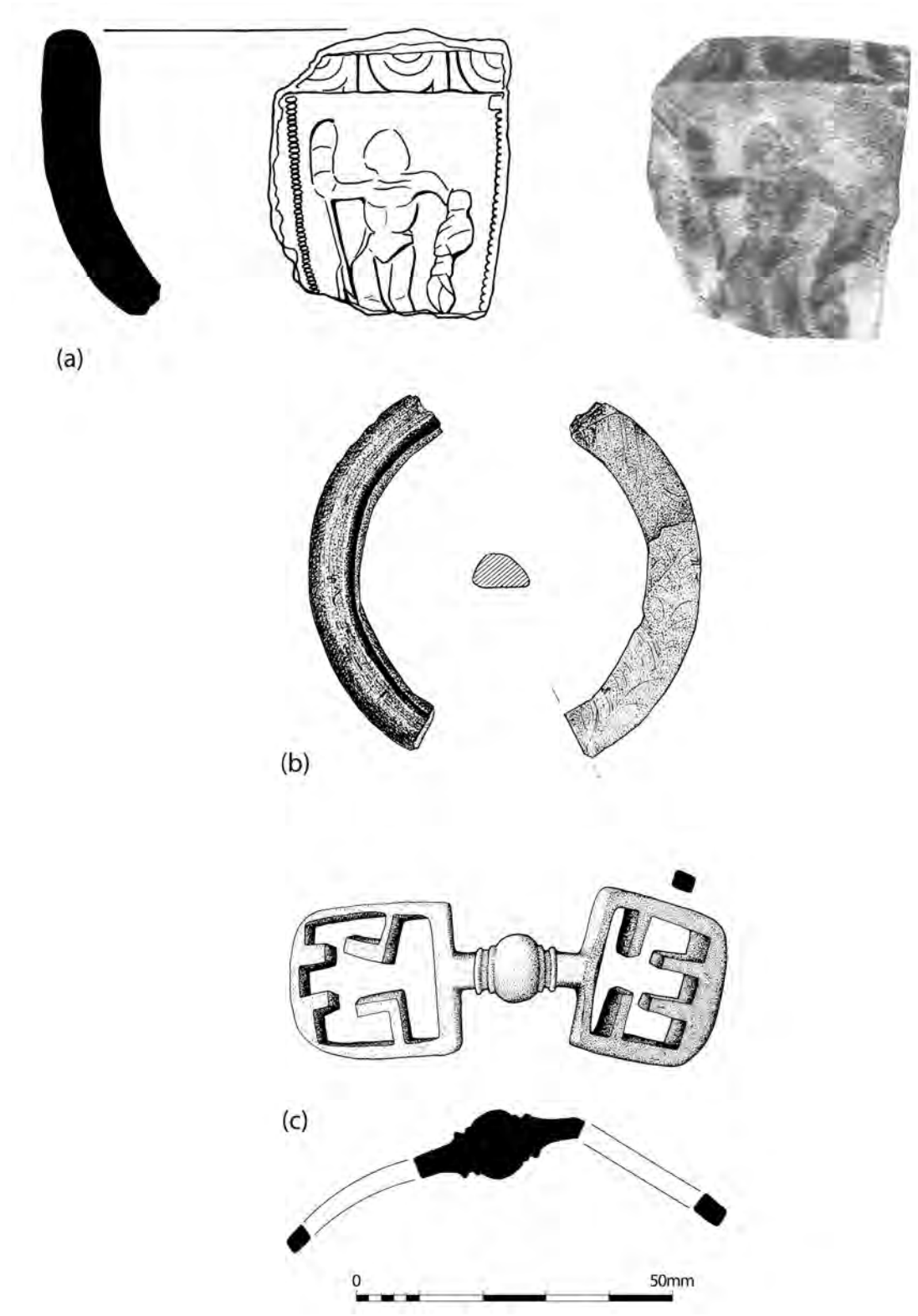
A sherd from a fairly thick bowl, possibly trimmed after breakage, was recovered from context 201, the uppermost fill of the western perimeter ditch. It is from a Form 37, Central Gaulish vessel dating to c AD 150–170. The ovolo (Rogers 1974, B223) was used, as here, with a straight guide-line beneath it and vertical bead rows without a junction-masking

motif, on bowls in the style of Secundus v* (Stanfield & Simpson 1958, pl. 154, 14, 16). This Lezoux potter was clearly a contemporary of Cinnamus ii, as he shared two of Cinnamus' ovolos, this one and, more commonly, Rogers B143 (1974), though, in both cases, normally with a solid guide-line beneath it rather than a bead row. His work was attributed to Pugnus by Stanfield and Simpson (1958, pl. 154–55), though Hartley subsequently redefined this rather distinctive style (1961, 102–3) noting the occurrence of a mould-stamp SECVND[]F on a bowl from Great Chesterford (Rogers 1999, pl 108, 2). The figure in the panel, Mars (Oswald 1936–37, O.143), although used at Lezoux by the Hadrianic–early Antonine potter Drusus ii, is not attested for Pugnus or Secundus, either by Stanfield and Simpson or by Rogers (1999, 232). Oswald (1936–37, 25) notes its occurrence on Form 37 in 'Secundus style' in the Oswald–Plicque collection, but this cannot be checked, and Secundus was a very common name. The type does not occur on either of the two bowls in Secundus v style from that collection illustrated by Rogers (1999, pl. 108, 1, 4). Work in Secundus and Pugnus/Secundus style is well known on Antonine sites in Scotland (Hartley 1961, fig. 5, 4 for a bowl from Mumrills; Hartley 1972, 33 for overall percentages).

* Note: Lower-case Roman numerals after potters' names denote homonyms, as used in Brian Hartley and Brenda Dickinson's forthcoming *Leeds Index of Potters Stamps on Samian Ware*.

7.5.3 Prehistoric pottery, by D Alexander

A total of 66g of ceramic material was recovered from the excavations. All ten sherds and four fragments came from the fills of two conjoining pits (2016 and 2017), and are probably from the same vessel. This assemblage, which includes two pairs of joining wall sherds, includes some sherds exhibiting fresh breaks,



Illus 7.12 Samian sherd, shale or cannel coal bangle, and key

and in general all are roughly abraded. The small size of the assemblage and the lack of diagnostic sherds such as rims or bases has prevented a fuller interpretation. A number of sherds are of varying thickness (sometimes apparent on single sherds) and suggest that the wall of the vessel may have

had a thinned or tapered side. The surfaces of the sherds have smooth finishes but are not burnished, and have no residues adhering. It appears that the interior and exterior of the sherds were formed from two separate pieces of clay, as there is a vertical join down the core of some of them.

The only sherd which provides a clue to the form of the vessel is one with a slight angle on the exterior, perhaps suggesting a shoulder or carination. The orientation and curvature of a number of the sherds suggest a small vessel with slightly flaring sides and rim. The wall thickness varies between 5mm and 10mm. None of the sherds is decorated.

On the basis of the above characteristics the sherds are most consistent with the interpretation that they came from a small, carinated, and flared/open, Early/Middle Neolithic bowl or cup. However, due to our lack of knowledge of the early prehistoric pottery types current within the surrounding area, coupled with the nature of the assemblage, this interpretation should be treated with caution. Little early Neolithic pottery has been published from sites in Midlothian and East Lothian; the assemblage of finds from Hedderwick Sands, East Lothian, being mainly dominated by later Neolithic decorated Impressed Wares (Callander 1929, 67–72), although there are some exceptions (*ibid*, fig. 47, 26, 27). A small bag-shaped pot, probably of early Neolithic date, was found at Roslin in Midlothian (McInnes 1969, 20, no 3). Two sherds with simple rolled rims from early Neolithic bowls were recovered from the excavations at the Catstane, Midlothian (Cowie 1978, 197–8). If indeed the sherds from Smeaton are of early Neolithic date then they are a welcome addition to a small but growing assemblage of similar finds from the area; perhaps a review of sherds from other excavations and unpublished material, as produced recently for eastern and central Scotland (Cowie 1993), is required.

7.5.4 Lithics, by B Finlayson (1995) and T Ballin (2006)

Four undiagnostic chipped stone items were recovered during the 1994–95 excavation – a flake of a grey chalcedony; an inner irregular flake of red-brown flint; a primary flake of grey flint; and a broken fragment of a chert flake, possibly burnt. Only the last of these was recovered from a stratified context, the upper fill of ‘field oven’ 1037. All others derived from the topsoil. All appear to be residual material within their contexts of recovery. A full catalogue is included within the project archive.

A small assemblage of sixteen lithic artefacts from the 2006 re-excavation of the western camp ditch embraces nine pieces of debitage, four cores, and three tools (Table 7.1). A full catalogue is included within the project archive, and the artefacts in this report are referred to by their number (CAT no.) in the catalogue. The pieces were mostly unstratified, but some were recovered from the upper and lower (not primary) fills of the camp ditch (CAT 10–12 from the upper ploughsoil derived fill, context 201; CAT 13–15 from a secondary fill, context 202).

A number of different raw materials were identified, namely:

- 1) fine-grained grey chert (12 pieces);
- 2) fine-grained red and grey flint (CAT 1, 2);
- 3) red jasper (CAT 4);
- 4) black jet or lignite (CAT 16).

The chert corresponds to what is generally known as Southern Uplands chert. As mentioned in Ballin and Johnson (2005, 62), this chert form is particu-

Table 7.1 Summary of 2006 lithic assemblage

	Chert	Flint	Jasper	Jet/lignite	Total
<i>Debitage</i>					
Chips	1				1
Flakes	4	1			5
Microblades	1				1
Indeterminate pieces				1	1
Crested pieces	1				1
<i>Total debitage</i>	7	1		1	9
<i>Cores</i>					
Single-platform cores			1		1
Irregular cores	1	1			2
Bipolar cores	1				1
<i>Total cores</i>	2	1	1		4
<i>Tools</i>					
Short end-scrapers	1				1
Pieces w edge-retouch	2				2
<i>Total tools</i>	3				3
TOTAL	12	2	1	1	16

larly common in Carboniferous Limestone, but it also occurs in some earlier and later sedimentary formations, such as, in Scotland, Ordovician and Silurian formations. At Dalkeith, the chert is most likely to have been procured from the local Carboniferous bedrock. Flint was probably procured from the nearby shores of the North Sea (Saville 1994), whereas jasper may have been obtained from sources in volcanic bedrock in the Edinburgh or North Berwick areas (Lacaille 1937; Saville 1994). Jet, or lignite, is exotic to the Dalkeith area and may have been acquired through trade links with north-east England, or from sources near Brora in Sutherland (Shepherd 1985). In 1864, a jet slider was found during excavations at Balgone near North Berwick, approximately 20km from the present site (Struthers 1868).

The debitage includes one chip (CAT 9), five flakes (CAT 2, 3, 12, 13, 15), one microblade (CAT 11), one indeterminate piece (CAT 16), and one crested blade (CAT 14). Most unmodified and modified blanks are technologically definable, with one being a small bipolar flake (CAT 2), and one a soft-hammer microblade (CAT 11); the remainder were all detached by the application of hard percussion. Apart from one flake in flint (CAT 2), and one indeterminate piece in jet/lignite (CAT 16), all debitage is in chert.

The cores are one single-platform core in jasper (CAT 4), one irregular core in chert (CAT 10) and one in flint (CAT 1), and one bipolar core in chert (CAT 8). All cores are small, with greatest dimensions between 18mm and 33mm. The tools are one short end-scraper on a flake (CAT 6), and two flakes with edge-retouch (CAT 5, 7). All tools are in chert.

The presence of a highly regular, slender microblade (CAT 11) suggests that the assemblage may be the product of a blade or microblade industry. The individual flakes may be either discarded blanks from parallel flake production, or waste flakes from the preparation of the industry's blade/microblade cores. Most likely, blades/microblades were manufactured by the application of soft percussion, whereas flakes may generally have been produced in more robust techniques. The crested blade (CAT 14) indicates that careful core preparation took place *prior to* commencement of blank production. Proximal blank attributes reveal that preparation in the form of platform-edge trimming took place *during* blank production. In technological terms, the chert-dominated assemblage from Smeaton corresponds closely to that of the chert assemblage from Glentagart in South Lanarkshire (Ballin & Johnson 2005).

The collection includes no strictly diagnostic pieces, but the general size of debitage, cores, and tools indicates a date for the bulk of the material around the transition of the Mesolithic/Early Neolithic periods. Traditionally, microblade assemblages have been dated to the Late Mesolithic period, but the composition of indisputably Early Neolithic assemblages suggests that microblades may also be a feature of that period. Pitchstone microblade

assemblages from pits have been radiocarbon dated to the beginning of the Early Neolithic period (eg, finds from Fordhouse Barrow in Fife and Carzield in Dumfries: Ballin forthcoming b; Maynard 1993), and microblade assemblages in flint, associated with carinated pottery, have been radiocarbon dated to the same period (eg, Garthdee Road in Aberdeen: Ballin forthcoming c). The Smeaton assemblage is therefore likely to date to either the Late Mesolithic or the Early Neolithic.

The cores are all fairly small, suggestive of a Late Mesolithic or Early Neolithic narrow-blade industry. Although the collection's solitary end-scraper (CAT 6) is metrically defined as a thumbnail-scraper, it was modified by plain retouch and not pressure-flaking, and the working-edge is steep and not acute. It is therefore unlikely that the implement dates to the Early Bronze Age, and a Mesolithic or Early Neolithic date is more probable. Most prehistoric jet/lignite (eg CAT 16) appears to have been mined and traded during the Late Neolithic and – in particular – the Early Bronze Age periods (Manby 1974, 98; McInnes 1968; Shepherd 1985).

7.5.5 Perforated stone weight, by A Jackson

A large but fragmentary perforated stone (1.376kg; 209 × 112 × 48mm) was recovered from context 203, a secondary deposit of gravel and cobbles within the western Roman camp ditch. It is probable that the stone was used as a weight; possibly tied up and used as a counterbalance, thatchweight or similar. The central perforation was formed by drilling/grinding from both sides to form an hourglass profile. The irregular large flat sectioned cobble original was broken in antiquity, as evidenced by weathering and smoothing of broken edges. Objects of this form, manufactured from locally available raw material (in this case diabase), are impossible to date but they are commonly found on prehistoric and later sites, including those of broadly Iron Age date. It is clear that this example was broken in antiquity and consequently discarded. Although it might have been accidentally deposited in the ditch with other fill material, it is equally possible that it was deliberately thrown in once it became defunct and is therefore of broadly contemporary date.

7.5.6 Sculptural fragment, by F Hunter

A damaged sandstone block (illus 7.13) bearing the remains of decoration was found in the uppermost fill of the camp perimeter ditch (context 1002). The surviving fragment is roughly cuboidal (height 220mm; width 165mm; thickness 90mm), suggesting it was deliberately dressed for reuse in a building or dyke. On the front are four low-relief half-columns and part of a fifth. Above them lies a slightly angled horizontal groove, part of a rounded moulding of uncertain form which is seen most clearly in section.



Illus 7.13 Carved stone (copyright Trustees of the National Museums of Scotland)

Behind and above this again are the remains of another, more substantial, rounded moulding, at about 45 degrees to the columns, visible on the front face only as a roughly-chiselled groove but surviving somewhat better in section and on the rear, where the toolmarks have not been smoothed. Another rounded moulding is developed below this on the rear, but is largely truncated. The groove separating

and defining these two mouldings has been finished with a saw. Most of the rear has been lost in the later dressing.

The presence of horizontal and angled mouldings at the top of the stone implies this is close to the original top edge. It is not possible to reconstruct the design in detail, but it appears to have included an angled capital decorated with mouldings, with the face bearing columnar decoration.

If this stone had been found on a Roman fort as opposed to a temporary camp there would be little hesitation in accepting it as Roman: similar fragments are common from Roman sites in Scotland (eg [Keppie & Arnold 1984](#), nos. 33–38, 52, 74), and the combination of columnar edging and angled capitals can be paralleled on dedication slabs and gravestones (*ibid.*, nos. 109–110, 156–7). The use of a saw in the decoration is rare in Roman masonry, but is not entirely unknown ([Blagg 1976](#), 155). However, its context in a temporary camp would be a highly unusual one for decorative stonework, and the fragment is not sufficiently distinctive on its own to say it is Roman rather than a post-medieval classically inspired piece. As it appears to have been reused it may of course have been brought in later times from a Roman site elsewhere: the area around the nearby fort at Inveresk has produced sculptural fragments in the past ([Keppie & Arnold 1984](#), no. 59), and Roman bathhouse stonework had been reused within long cist graves at Thornybank, less than half a kilometre from the current excavations ([Rees 2002](#)).

In summary, this fragment is too damaged to claim it as definitely Roman, although the possibility is intriguing.

7.5.7 Bangle fragment of shale or cannel coal, by F Hunter

A bangle fragment ([illus 7.12](#)) was found in the uppermost fill of the camp perimeter ditch (context 1082). It was originally D-sectioned and polished to a low lustre all over, with no surviving toolmarks. Its outer faces are scuffed and worn. Analysis of the composition by standard X-ray fluorescence and X-ray techniques ([Hunter et al 1993](#)) indicates that the material is a cannel coal or organic shale. The evidence of some slight lamination in the structure suggests it is a shale, but destructive analysis would be required to confirm the identification. There has been little work to date on the sources exploited in prehistoric and early historic times for such materials in the Lothians, but as the area is rich in oil shales and Coal Measures deposits ([Cameron & Stephenson 1985](#)), raw materials were readily available.

Such bangles are notoriously undiagnostic to period. Their floruit stretches from the Late Bronze Age (with some earlier examples) through the remainder of the first millennia BC and AD; they do not occur in medieval deposits. There are occasional finds from Roman sites in Scotland (cf [Frere](#)

Table 7.2 Charcoal identifications

Feature	Context	Type	Wt/g	Note
1037	1067	<i>Betula</i> sp.	4.55	
		<i>Pinus</i> sp.	0.33	
		Indeterminate	3.62	
2027	2015	<i>Betula</i> sp.	8.90	
	2024	Indeterminate	21.28	
		<i>Corylus avellana</i>	0.02	submitted for radiocarbon dating

& Wilkes 1989, 154, no.s 103–4), although they are far more common in indigenous contexts.

7.5.8 Decorated cast bronze fragment, by F Hunter

A heavily corroded curved bronze fragment (length 41mm; width 24mm; thickness 3–4mm) was found in the uppermost fill of the camp perimeter ditch (context 1002): extensive corrosion bubbles and lamination make detailed identification impossible. No original surfaces survive, and it is unclear if the curved form is intentional. The convex surface bears probable cast decoration: a linear groove with two small curvilinear features in relief to one side, perhaps part of a larger arcaded pattern. It derives from a cast object – the composition (leaded bronze with some zinc) is typical for casting alloys. No identification or date can be proposed, but the presence of zinc in the alloy implies a date no earlier than the Roman period.

7.5.9 Other metalwork, by S Anderson

The only stratified find was an undatable iron nail shaft (67mm long) from ditch fill 202. All other finds were from topsoil or were unstratified. They included two worn discs (possibly coins), two buttons, a belt slide, two lead musket balls, lead waste including possible ingots (one plano-convex) and melt fragments, binding rings and other fittings, a lead washer, a fragment of a bail handle for a drawer or similar, and a slide key with two bits (illus 7.12). All objects which could be dated were post-medieval or modern. The key is perhaps the most interesting find as published parallels generally only have one bit (Egan 1998, 102–3; 2005, 74). Keys of this type were in use from the 14th to the 19th centuries, but this example is likely to belong to the latter part of this date range.

7.6 Environmental evidence

7.6.1 Wood charcoal identification, by M Cressey

Wood charcoal from the ‘field ovens’ was submitted for identification prior to submission for radiocar-

bon dating. Charcoal pieces greater than 4mm were suitable for identification; pieces below this size were generally deemed unidentifiable. The finer sieved fractions below 4mm were hand sorted for smaller fragments of roundwood and other charred macroremains. Analyses were carried out on fractured charcoal samples using reflective light microscopy ($\times 10$ – 400 magnification) examining the transversal sections and, where necessary, longitudinal surfaces. Comparisons were made against in-house anatomical wood reference material and relevant keys listed in Schweingruber (1990). Attention was given to the possibility of contaminants such as coal, cinders and shell, of which none were present. The results of the identifications are summarised in Table 7.2.

The upper fill of feature 2027 is dominated by charcoal from *Betula* sp. (birch) and comprises mainly small sub-rounded branch-wood fragments. The primary fill of feature 1037 contained *Betula* sp. with *Pinus* (pine) in trace amounts (0.33g). In general the charcoal was observed to be very abraded as a result of post-depositional factors.

7.6.2 Archaeobotanical analysis, by R Pelling and M Hastie

Eight bulk soil samples were taken from two bipartite pits 1037 and 2027, provisionally identified as ‘field ovens’ during the excavation. A sub-sample of each (approximately 7 litres) was processed for the assessment of archaeobotanical remains. Each sub-sample was processed using a Siraf style flotation tank; flots collected on a $300\mu\text{m}$ and 1mm mesh. The samples were air-dried and scanned for carbonised remains, revealing the presence of abundant cereal grains within the primary fills of the two pits.

On the basis of the assessment five samples were submitted for full analysis. The plant remains were scanned using a low-powered microscope (magnification $\times 10$ to $\times 20$). Identifications were based on morphological characteristics and by reference to Oxford University Museum’s comparative modern collection. The results are summarised in Table 7.3.

The majority of charred cereal grains and weed seeds were recovered from the primary fills of each pit, the largest concentration of grain being recovered from pit 2027. Grains of barley (*Hordeum*

Table 7.3 The botanical remains

Latin name	Plant part	Common name	Pit 1037	Pit 2027	2024	2023	2015
			Primary fill	Burnt lens			
<i>Raphanus raphanistrum</i>	seed	wild radish	–	–	2	–	–
Cruciferae indet.	siliqua	charlock	–	–	1	–	–
<i>Chenopodium album</i>	seed	fat hen	2	–	–	–	–
<i>Atriplex</i> sp.	seed	orache	–	1	–	–	–
Chenopodiaceae indet.	seed	fat hen family	3	2	–	–	–
<i>Prunus spinosa</i>	fruit	sloe	1	–	–	–	–
<i>Polygonum aviculare</i>	nutlet	knotgrass	–	–	1	–	–
Cyperaceae indet.	seed	cotton-grass	2	–	–	–	–
Seed indet.	seed	indeterminate	–	–	1	–	–
<i>Triticum</i> sp. (hulled)	caryopsis	hulled wheat	–	–	1	–	–
<i>Triticum</i> sp.	caryopsis	wheat	–	–	2	–	–
<i>Hordeum vulgare</i>	caryopsis	hulled 6-row barley	1	–	16	–	–
<i>Hordeum</i> sp. (hulled)	caryopsis	hulled barley	11	2	150	12	2
<i>Hordeum</i> sp. (hulled – ST)	caryopsis	hulled barley	5	–	24	7	–
<i>Hordeum</i> sp.	caryopsis	barley	10	4	26	–	–
<i>Avena</i> sp.	caryopsis	oat	–	–	1	–	–
Cereal indet.	caryopsis	indeterminate	2	3	29	–	1

sp.) dominated the plant assemblages, in some cases fragments of hulls were still attached indicating the presence of the hulled variety. A few asymmetrical lateral grains attest the presence of six-row barley (*Hordeum vulgare*). Three grains of wheat (*Triticum* sp.) and one grain of oat (*Avena* sp.) were also recovered from the primary fill of pit 2027. One grain of wheat still had hulls attached suggesting that it was either emmer or spelt wheat.

Seeds of wild species were very scarce, but comprised common arable/ruderal species including wild radish (*Raphanus raphanistrum*), fat hen (*Chenopodium album*) and knotgrass (*Polygonum aviculare*). A single charred fruit of sloe (*Prunus spinosa*), complete with flesh, was recovered from the primary fill of pit 1037.

Evidence from other Iron Age/Roman Scottish sites suggest that hulled six-row barley was the principal cereal cultivated in the first millennium AD with some oat and wheat probably emmer as secondary crops (summarised in Boyd 1988; Greig 1991; Dickson & Dickson 2000).

The almost pure assemblages of grain recovered from the pits at Smeaton suggests that they represent a late stage in cereal processing, the finer weed seeds and chaff having been sieved from the grain. Hulled barley, if used for human consumption, requires a processing stage in which the tightly attached hulls are removed. While this stage

can simply involve drying the grain naturally, then rubbing it to remove the hulls (Hillman 1981), in wetter climates, or following a wet harvest, it may be necessary to parch the grain in order to render the hulls sufficiently brittle.

Burnt grains, in varying quantities, are commonly recovered from Scottish prehistoric and later sites and in most cases are interpreted as grain burnt during corn drying/parching activities, carried out either next to the hearth or in kilns. The presence of cereal grains within the two pits at Smeaton, particularly from burnt in situ deposits, could therefore imply that the pits were used for this purpose. If the rubbing of the parched grain took place by the edge of the pit, any spoiled/burnt grain could have been discarded onto the fire.

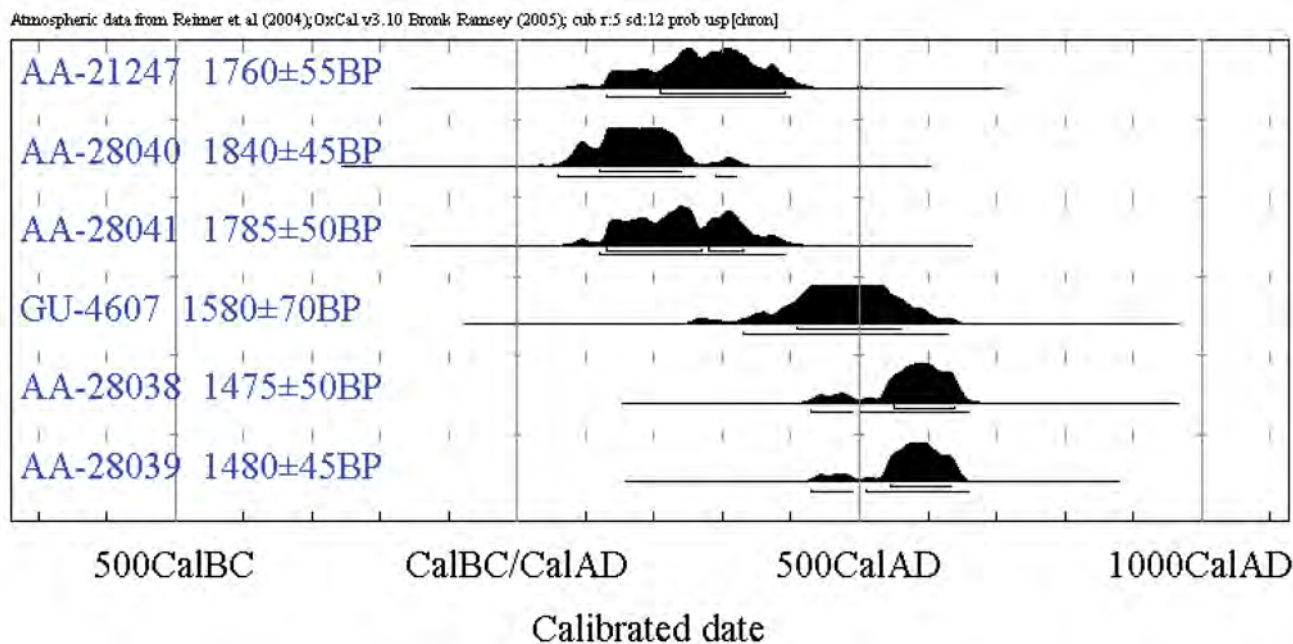
Of note is the recovery of a single sloe fruit from the primary deposits in pit 1037. The fruit of sloes do have culinary uses, generally as flavouring, although a single charred fruit recovered from the pit is more likely to have been brought to the site along with wood collected for fuel.

7.7 Radiocarbon dates

Six radiocarbon dates were obtained from the primary fills of the two ‘field ovens’ (contexts 1067 and 2024). Samples were submitted to the Scottish

Table 7.4 Radiocarbon determinations, calibrated using OxCal version 3.10

Lab No.	Context	Material	Years BP uncal	Calibrated date range 1σ (AD)	Calibrated date range 2σ (AD)	σ13C
GU-4607	1067	Betula sp.	1580 ± 70	410–560	330–630	–25.4
AA-28038	1067	Triticum sp.	1475 ± 50	550–640	430–660	–24.3
AA-28039	1067	Betula sp.	1480 ± 45	545–635	430–660	–25.6
AA-21247	2024	Hordeum sp.	1760 ± 55	210–390	130–400	–24.0
AA-28040	2024	Triticum sp.	1840 ± 45	120–220	60–320	–24.0
AA-28041	2024	Corylus sp.	1785 ± 50	130–330	120–390	–25.5



Illus 7.14 Plot showing calibrated radiocarbon dates (using OxCal v. 3.10 (Bronk Ramsey 2005))

Research and Reactor Centre (SURRC) for radiocarbon analysis.

Initially, two samples were submitted, comprising bulk samples of wood charcoal from context 1067 and *Hordeum* sp. from context 2024 (GU-4607; AA-21247). The dates from these samples did not conclusively establish whether the features were of Roman military origin, and also suggested that the two burnt deposits were not contemporary.

However, it was recognised once the dates had been obtained that dating multiple entity samples may be misleading, since such samples may contain entities of different ages, thus potentially providing ‘average’ radiocarbon determinations (Ashmore 1999). In consultation with Patrick Ashmore of Historic Scotland, therefore, four further samples were selected for dating in order to clarify the ambiguities arising from the initial determinations, comprising single entity samples of wood charcoal and *Triticum* sp. from the primary fills of each pit. The results are shown in Table 7.4 (and graphically in illus 7.14).

The single entity dates from context 2024 (AA-28040-1), the pit within the Roman temporary camp, have an approximate 2σ range of AD 60–390; whereas those from context 1067 (AA-28038-9), the pit outside the camp, fall within the range AD 430–660. This evidence demonstrates that the burnt deposits are chronologically distinct, and thus that the two pits are most likely of different ages. Chi-squared tests (cf Shennan 1988, ch 6) conducted on OxCal version 3.10 (Bronk Ramsey 2005) demonstrated that the single entity dates from fill 2024 form a statistically coherent group. A T-value of 1.4 indicates a strong probability that the dates reflect a simultaneous event (which can in any case be considered likely on taphonomic grounds); a T-value of 6 or more would have suggested that the dates securely reflected (to a probability of 95%) different episodes of burning. Similarly, a chi-squared test for the dates from 1067 produced a T-value of 1.8, again reinforcing the evidence of excavation to suggest that those dates represent a single episode of burning. However, it is not appropriate to combine

the determinations within each context group since the dates from each context were obtained from separate entities (cf [Ward & Wilson 1978](#)). Despite this, these results are of interest, in that they demonstrate that the primary deposit inside pit 2027, within the Roman temporary camp, lies within the known range of Roman military activity in northern Britain and encompasses the date of the samian ware pottery recovered from the Roman camp ditch. Conversely the primary deposit of pit 1037, which lies immediately outside the camp, cannot relate to Roman military occupation within the temporary camp.

Two possible hypotheses can thus be constructed to explain the radiocarbon dates:

- 1) that pit 2024 relates to Roman military activity and pit 1037 to post-Roman activity;
- 2) that both pits reflect indigenous activity, one event during and the other after the period of Roman influence in north Britain.

These hypotheses are discussed further below.

7.8 Discussion

7.8.1 Introduction

The interpretation of the excavated remains requires a consideration of patterns of archaeological survival. The distribution of remains identified during the investigations was quite discrete, with few archaeological features present on the areas of heavy clay subsoil apart from likely medieval or later cultivation furrows and more recent land drains. This may be at least partly explained by the truncation of earlier features, potentially even larger examples such as the eastern Roman camp ditch (assuming that a complete circuit was once present, discussed further below), as a result of medieval or later agricultural activity. However, it may be that these heavy clay soils, much more poorly draining than the sand and gravel subsoil to the west, were deliberately avoided as activity areas. The results of the route evaluation appear to demonstrate this dichotomy at a broader scale along the route corridor.

The result of this bias in the distribution of archaeological remains, whether reflecting past behaviour or a product of archaeological survival, is that the majority of identified features lie in proximity to the western perimeter ditch of the Roman camp. It cannot be assumed that these features relate to the camp purely on spatial evidence. Indeed, the limited datable evidence from the excavation indicates activity around the site from early prehistoric times.

7.8.2 Prehistoric activity

Two conjoined pits contained several sherds of pottery from a single vessel of probably Neolithic

character. They are likely to have been incorporated in the pits as sherds of a broken vessel, but the level of abrasion and quantity of the sherds suggests that the vessel had been smashed in the immediate vicinity of their context of recovery. This does not prove that the pits themselves were of prehistoric origin, although it seems highly probable. No definite evidence of associated prehistoric features was identified in the vicinity, although other undated pits (see below) were recorded ([illus 7.4 upper](#)).

Other artefacts point to prehistoric activity in the area later occupied by the Roman camp, although they were found in more recent contexts such as the topsoil, Roman camp ditch or one of the 'field ovens'. A small assemblage of chipped stone artefacts, in a range of materials but mainly of locally available chert, is testament to a Late Mesolithic or Early Neolithic presence, although a piece of worked jet or lignite would not be out of place in a Late Neolithic or Early Bronze Age context ([Ballin, Section 7.5.4](#)). Fragments of a shale or cannel coal bangle are not closely dateable, but are likely to be of broadly later prehistoric or Early Historic origin.

The indications of prehistoric activity at this location are not surprising given the dense spread of sites recorded by excavation and aerial reconnaissance along the Esk Valley (this report; see also [eg Hanson & Breeze 1991](#), 73–4, fig. 4.3). As such, the finds may reflect as 'background noise' intensive prehistoric occupation and land use in the valley, and potentially relate to further archaeological sites present close to but outside the areas investigated.

7.8.3 Construction of the Roman camp – perimeter defences

The investigations provided no additional information regarding the overall size and shape of the camp (a parallelogram at least 12 hectares in area; discussed further in [Section 7.2](#)), as the northern and eastern alignments of its perimeter ditch were not located. The arrangement of investigation areas was such that had a complete circuit of the perimeter ditch survived, either the northern or eastern ditch alignment should have been intersected at least once. The two most likely potential reasons for the failure to locate either ditch alignment are that, a) the camp defences were never fully constructed to form a complete circuit or b) the camp ditch has been entirely truncated at locations where it would formerly have crossed the investigation areas. Further site investigations or additional aerial photographic evidence would be necessary to determine which, if either, of these explanations is correct.

The excavation of the western perimeter ditch provided some information both about its character and about the structural history of the camp. The dimensions of the ditch varied where examined between *c* 2.5m and 3.35m in surface width, and *c* 1.1m and 1.7m in depth ([illus 7.6](#)), increasing in scale to the north. These variations can be explained

largely as differential survival resulting from ploughing and topsoil removal for the excavation. The V-shaped profile with basal ‘ankle-breaker’ is common for Roman military ditches of this type.

The absence of re-cuts within the perimeter ditch may suggest that the camp was occupied only on a single occasion, although some caution is necessary based upon the evidence from the excavation at Dunning camp, where more than one occupation was inferred despite the absence of ditch re-cuts (Dunwell & Keppie 1995) and indicates that structural evidence alone provides less than definite proof. The perimeter ditch at Smeaton silted up incrementally, although over an unknown timespan, and was not deliberately backfilled by the Roman army upon its abandonment.

7.8.4 ‘Field ovens’ and other features

A range of archaeological features was identified both inside and outside the Roman temporary camp. Some demonstrably were not contemporary with the occupation of the camp, such as the cultivation furrows. The pits containing Neolithic pottery are also unlikely to be associated with the Roman camp. The remaining features consist of a scatter of undated pits and two (possibly three) complex pits that appear to be associated with crop processing, one of which contained a primary burnt deposit of post-Roman date.

The majority of undated pits lay immediately to either side of the western camp ditch. Four of these formed a rough alignment running parallel to the ditch, where the rampart of the camp would have been located. Whilst this coincidence of alignment is of interest, and the pits could reflect the sockets of stakes driven through the rampart (cf Maxwell 1989, 48, fig. 3.4), the pits cannot be proposed definitively as part a structural element of the camp on that basis. At best the alignment can be proposed as Roman or later in origin – the ditch is likely to have acted as a land boundary long after its abandonment by the Romans, and may have defined the courses of other constructions, such as fences. A similar alignment of pits was recorded in the 1996 excavations at Kintore Roman camp and was beset with the same interpretative problems (Alexander 2000, 31). Indeed, the western camp ditch at Smeaton appears to have been still a surface feature when it was incorporated into a medieval or later rig-and-furrow cultivation system. No recognisable trace of it remained by the middle of the 19th century, as it is not recorded on the first edition Ordnance Survey map (1854).

What had been interpreted in the field as ‘field ovens’ associated with the occupation of the Roman camp must be interpreted in a different light with the results of palaeobotanical analysis and radiocarbon dating. Pit 1037 (illus 7.4 upper), which lay outside the camp, contained a primary burnt deposit dating to between the fifth and seventh centuries cal AD.

The burnt deposit thus cannot be of Roman military origin. A second pit of similar character (1076, illus 7.4 upper) lay adjacent to it, but contained no evidence of burning. Pit 2027, within the Roman camp, was of similar character to pit 1037, and contained a primary burnt deposit comparable to that from pit 1037. The similarity of pit 2027 and its contents to that of 1037 suggests a common design. Yet the radiocarbon dates suggest that burning in pit 2027 took place considerably earlier, probably at some point within the first four centuries cal AD. Again, the primary nature of the fill suggests the pit had been opened not long before burning had taken place. Whilst the date for pit 2027 spans the period of Roman military influence in north Britain, the identification of the cereal assemblage as comprising mainly barley tends to argue against a Roman military origin: the Roman soldier preferred wheat to barley as a staple, with the latter used only in times of shortage or as punishment (Groenman-van Waateringe 1989, 99), or to feed horses (Hanson 2007, 613, 671).

On balance, it is easier to explain both ‘field ovens’ as reflecting episodes of activity unrelated to the short-lived presence of a Roman temporary camp at this location. As such, the features would appear to be isolated and without contemporary structural or settlement associations, at least within the excavated areas. In some cases similar features have been located in native settlement contexts without evidence of Roman activity, such as Melville Nurseries, Eskbank (Raisen & Rees 1995) and Dundee High Technology Park (Gibson & Taverner 1990). However, pit 2027 certainly cannot be ruled out as being of Roman military origin on the basis of the excavated evidence, an ambiguity of interpretation contributed to by a lack of secure evidence for the functions of those excavated ‘ovens’ that can be more securely associated with Roman temporary camps.

The foregoing discussion reveals that, apart from the western perimeter ditch, no archaeological feature can be unequivocally associated with the construction and occupation of the camp. Many of the identified features are undated, and whilst it is conceivable to link them to the camp on spatial grounds alone, equally they could be associated with activity of almost any other period from early prehistory onwards, to judge from the range of dated features and artefacts encountered. The lack of coherent internal features of the camp may be explained to some extent, in particular in the areas of clay subsoil, as a result of plough-truncation and related variations in patterns of archaeological survival. However, within the sand and gravel subsoil areas, where archaeological survival of negative features was tolerably good, it is argued that the absence of substantial features of Roman date indicates that none were ever cut. The absence of intensive activity does confirm the results of most other excavations of Roman camp interiors within northern Britain, with the notable exception of Kintore (Cook

& Dunbar 2008). It is clear that patterns of likely truncation and archaeological survival should be considered in any future strategies proposed for the examination of camp interiors. It is likely that the results from the excavation of cropmark sites can be calibrated by investigating the interior of one of the few remaining upstanding camps surviving in uncultivated land.

7.8.5 The date and associations of the Roman camp

A reasonable case can be made for dating the camp to the Antonine occupation, based upon the recovery of a decorated sherd of a samian ware bowl from the Roman camp ditch. The dating of *c.* AD 150–170 advanced for this potsherd (Wild, Section 7.5.2) might further suggest that the camp was not a marching camp associated with the initial Antonine re-conquest of southern Scotland, but may have been built for some other purpose, once the nearby centre at Inveresk had been established following the invasion (Breeze 2002).

There are taphonomic factors that caution against uncritical acceptance of this dating for the camp. Firstly, the potsherd may have been trimmed after breakage (Wild, Section 7.5.2), suggesting reuse and potentially an extended use-life. Secondary use of reshaped samian sherds for alternative purposes

has been attested for pottery found at several native settlements across Scotland (Hunter 2001, 301), although of course this does not preclude the possibility of Roman military reuse of the sherds of a broken vessel. Secondly, the potsherd was recovered from the uppermost ploughsoil-derived fill of the camp ditch, which was deposited at this location long after the abandonment of the camp as a Roman military construction, and which also contained artefacts of prehistoric origin. Neither this tertiary fill deposit nor the residually occurring artefacts recovered from it directly date the construction of the camp. Thirdly, Hunter (Section 7.5.6) has raised the possibility that a reused fragment of Roman carved stone, recovered from the same context as the samian sherd, was imported to the site as a consequence of its reuse, since the presence of sculptured stonework is not readily reconcilable with a temporary military occupation site. A local source for such material, and indeed the stonework reused in the nearby Thornybank long cist cemetery (Rees 2002) could have been Inveresk, Elginhaugh, or another as yet undiscovered Roman settlement or bathhouse closer to hand beside the River Esk.

Ultimately, none of these factors fatally undermines a working hypothesis that Smeaton is a Roman temporary camp that belonged to the Antonine occupation, a reasonable conclusion which provides a starting-point for any future investigations of the site.

8 NEWFARM, by I Suddaby

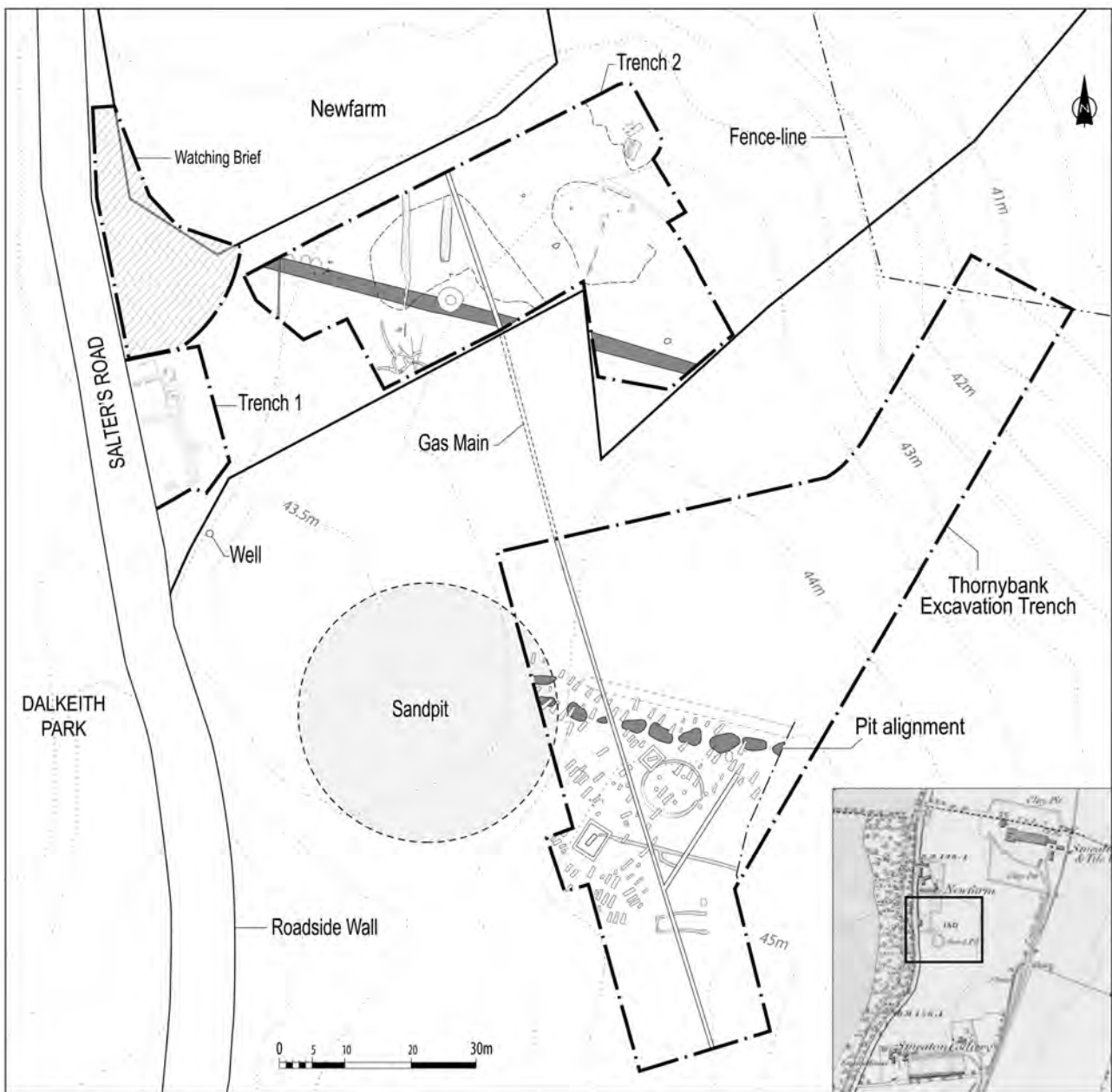
8.1 Introduction

8.1.1 Overview

The Newfarm site lies on the slip-road linking the Dalkeith Northern Bypass to the A6094 Dalkeith to Whitecraig road, known as Salter's Road (illus 2.1, 8.1). Archaeological evaluations of the slip-road were undertaken in 1994 (Strachan & Rees 1995)

and in 2005–06 (Suddaby 2006), the latter including a programme of metal-detecting. The subsequent area excavations comprised two trenches. Trench 1, alongside Salter's Road, revealed a post-medieval building and Trench 2 revealed multi-period features.

To the south of the site, the Thornybank cemetery (Rees 2002) occupied the summit of a low north to south ridge at 40m above OD, and



Illus 8.1 Plan showing the relationship between the 1996 Thornybank excavation and the 2006 excavations at Newfarm



(Crown Copyright:RCAHMS; Ref. A69191)



Illus 8.2 Newfarm aerial photograph and view from the north

the slip-road cuts through this ridge on a north-east to south-west alignment. The River South Esk runs through Dalkeith Park to the west and the Smeaton Burn passes to the east, beyond which the land rises towards Langside. Although sandy around Newfarm, clay appears to the north, where extraction pits associated with the Smeaton brick and tile works are depicted on early maps and were recorded during the 2005 evaluation. Salter's Road forms the boundary between a series of roughly east-west-aligned fields, through which run the slip-road and the designed landscape of Dalkeith Park. The area of the slip-road to the north-east of the excavation has been mined in recent years.

An oblique aerial photograph of the Smeaton brick and tile works includes the Newfarm area (illus 8.2) and clearly shows the pit alignment and the circular shadow of the 19th-century sand-pit between it and Salter's Road. It also shows a second linear feature parallel with the pit alignment, and a number of nearby anomalies, representing possible archaeological features. The clarity of the image is a result of the freely drained sand subsoil present on the ridge.

8.1.2 Previous work

In 1994, a desk-based assessment of the slip-road was followed by evaluation with a coverage of close to 5% (Strachan & Rees 1995). The 1994 evaluation of the slip-road recorded no significant remains but this in part stemmed from the mistaken identification of the material underlying the modern ploughsoil as natural subsoil. It may be that the mis-identification of ridge and furrow under the ploughsoil led to the assumption either that such features were cut into natural subsoil or that an archaeological horizon preventing further machine excavation had been reached.

The 1996 excavations 60m to the south (illus 8.1) at Thornybank long-cist cemetery (NT36NW 5), revealed that ploughsoil overlay a heavily bioturbated yellow-brown sand, which although sealing prehistoric features and cut by Early Christian graves, contained post-medieval artefacts (Rees 2002, 317). Analysis of this deposit revealed that it had no palaeoenvironmental potential and although described as a buried soil in the report, it may be a layer of illuviation or B horizon.

The excavations at Thornybank also revealed prehistoric features. A single pit produced Late Neolithic Impressed Ware and sherds of Grooved Ware were recorded nearby. An undated but possibly Bronze Age rectilinear feature with associated pit, a ring-groove structure and a pit alignment completed this pre-cemetery feature group. The pit alignment was parallel to the linear ditch recorded at Newfarm but, overlain by the cemetery, it was clearly abandoned by the mid 1st millennium AD (Rees 2002, 316).

8.1.3 Strategy and methods

The 2005–06 evaluation investigated 580m² and raised the coverage to around 15%, the increase reflecting modern standards in archaeology. This work revealed several additional sites of archaeological interest including three features incorporating red sandstone similar to those forming the Thornybank cists, a substantial linear ditch, several more ephemeral curvilinear ditches and a pair of parallel cobble-filled ditches.

Proposals for the further investigation of these sites were made by CFA Archaeology and were accepted by Historic Scotland. Trench 1, adjacent to Salter's Road, covered a well-defined post-medieval building, whereas the much larger Trench 2 on the ridge to the east included a linear ditch and a number of isolated stone features, tentatively associated with the long-cist cemetery.

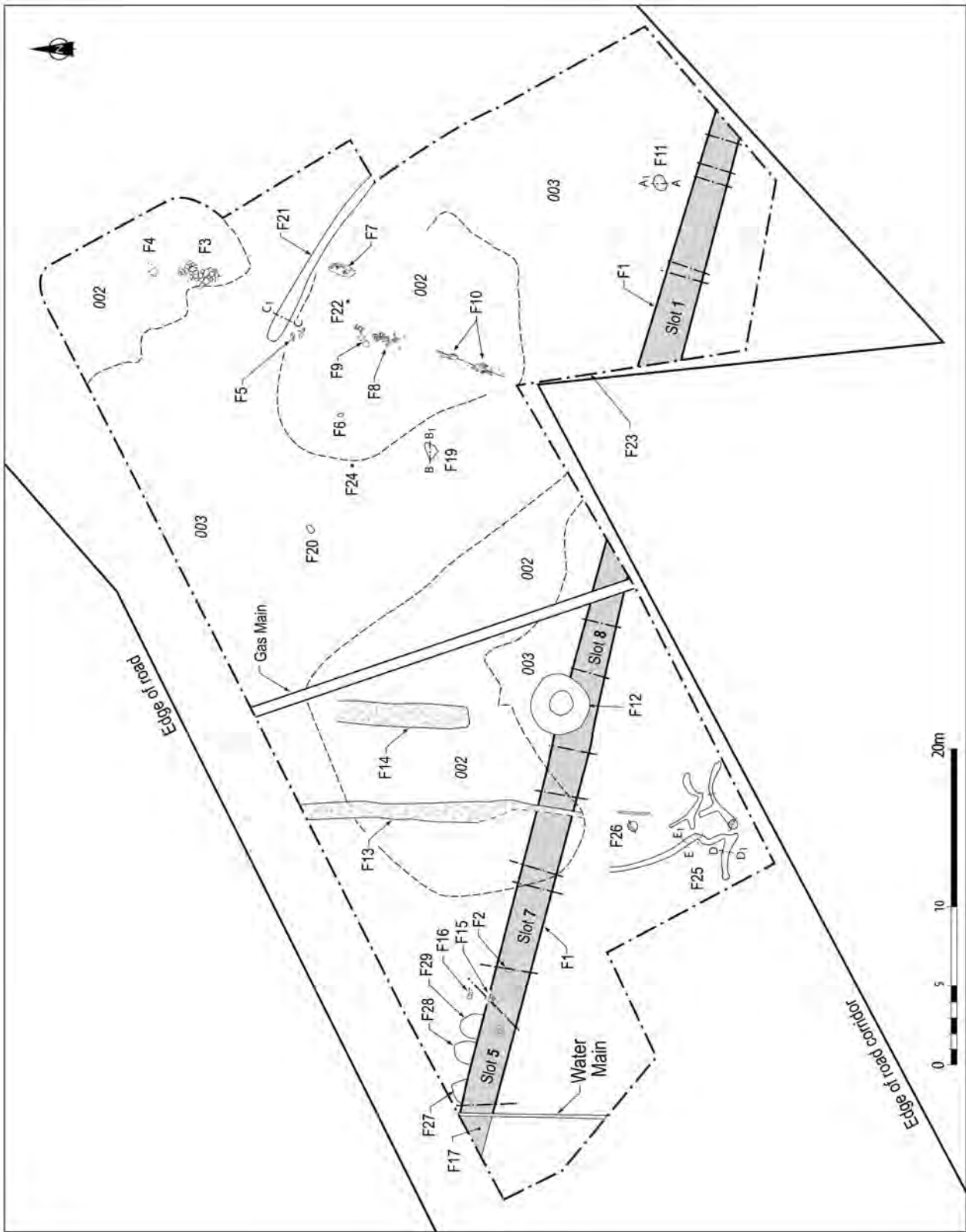
The excavation of the building in Trench 1 aimed to establish its date and function, as well as any association with Newfarm. Within Trench 2, all prehistoric features and the linear ditch were fully excavated, with all artefacts being retained and soil samples taken. Other features were excavated sufficiently to establish their nature.

The methodology employed was approved by Historic Scotland and was standard practice for work in arable land. Ploughsoil was removed using a tracked excavator and stored in bunds. It was apparent that the underlying yellow-brown sand did not itself constitute an archaeological horizon and over most of the slip-road, machine excavation continued until natural subsoil was revealed. Stones were not a component of the yellow-brown sand and where they appeared, the surrounding sand was left in situ. Following the cessation of machine work, the exposed surfaces were cleaned by hand to identify features prior to any excavations.

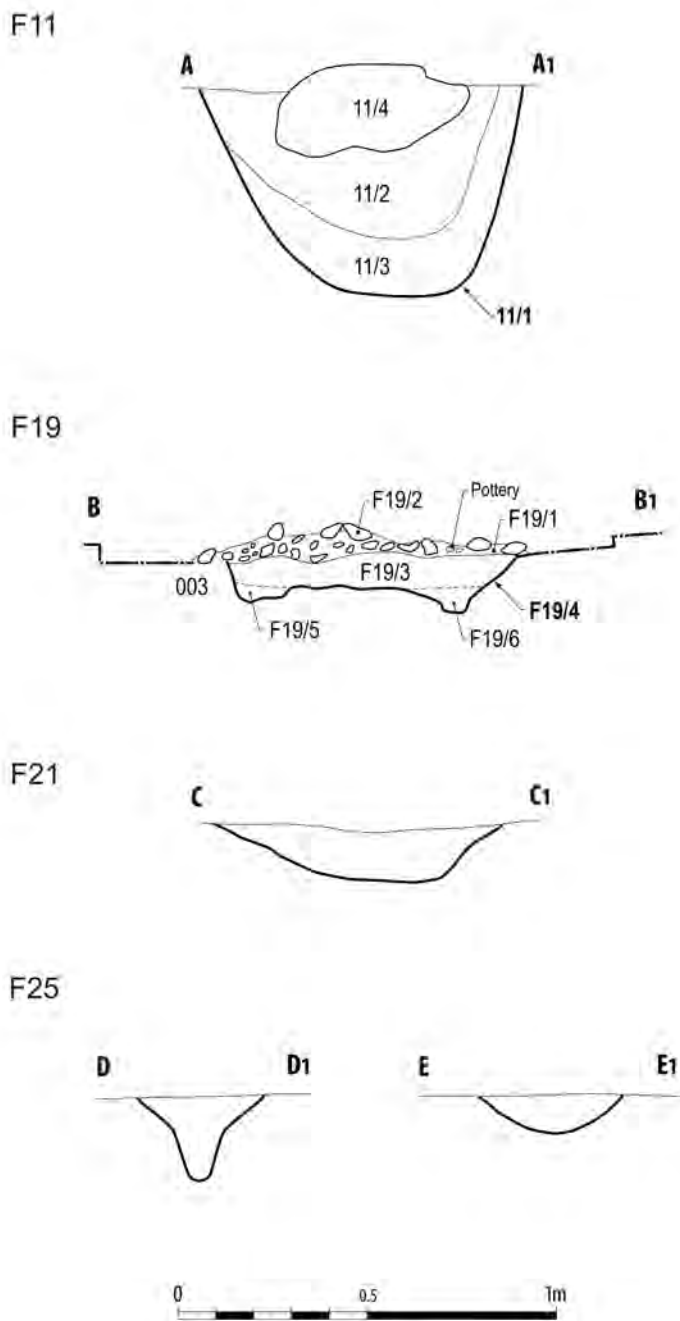
This methodology was entirely successful in preserving features with a stone content but as is often the case on sandy sites, some features only later became visible in plan through differential drying of the exposed surface and, where the layer had been removed by machine, they would appear in section.

The near-black sandy silt ploughsoil (001) had a depth of 0.35m and overlay a light yellow-brown sandy layer (002) with an average depth of 0.15m. Close to Salter's Road, and to the east of the building in Trench 1, a shallow coal-rich deposit (004) lay between layers 001 and 002. The natural subsoil (003) comprised soft yellow sand which, with depth, turned increasingly compact and became laminated with lenses of silt and clay. Compact impermeable clay was seen in the base of one feature (F12) at a depth of 2m.

Once the topsoil and as much as practical of layer 002 were removed, 26 features (F1–F26) were revealed in Trench 2 (illus 8.3). As stones were not naturally present, all were assumed to represent archaeological remains and were allocated feature numbers.



Illus 8.3 Plan of Trench 2 showing features and slot locations in F1



Illus 8.4 Selected sections (F11, F19, F21, F25)

8.2 Early site use

8.2.1 Prehistoric features

Two features, F11 and F19, can be confidently ascribed to the prehistoric period on the basis of the artefacts they contained. Others (F3–F10, F20–F22, F24 and F25) may be prehistoric on the basis of their alignment, morphology and/or finds.

F11 (illus 8.4) was sub-circular, with a width of 0.85m and a depth of 0.6m. It was cut (11/1) into soft sand and contained three fills. Two of these consisted of a brown or yellow-brown sand from

which two undiagnostic pottery sherds and four lithics were recovered. The latter included three that are foreign to the area, one of which was a flake of Arran pitchstone (Ballin below). A large, exfoliating and plough-scored whinstone boulder occupied much of the feature's upper fill.

F19 (illus 8.4) consisted of loose brown sand (19/1) around a deposit of broken, discoloured cobbles (19/2) which contained amongst them a cobble tool and 42 sherds of handmade pottery representing 20 vessels. On excavation this feature was revealed to be a somewhat irregular but sub-circular pit measuring 0.7m by 0.75m with a depth of 0.1m. The cut (19/4) had been affected by animal activity but was filled with a dark brown sand (19/3) which contained part of a perforated stone and a further six pottery sherds representing five additional different vessels (Johnson below). Overlying 19/3 were the broken stones within which was a matrix of brown sand.

F20 and F24 were similar to F19 in that they consisted of cuts containing sand-based primary fills under quantities of broken, probably heat-affected cobbles. A prehistoric pottery sherd was recovered from F20.

F10 lay within the yellow-brown sand and may in excavated retrospect consist of two features but prior to excavation they appeared in the field to be linked. Measuring a slightly curving 5.6m in length and with a maximum width of 0.7m, F10 was characterised by red sandstone orthostats in a circular setting, and patches of compact, mottled sand flecked with discoloured clay. Although no finds were recovered, the presence nearby of occasional pieces of burnt bone and lithics suggest this may have been a disturbed prehistoric cist.

Features F3–F6 and F8–F9 were all either individual large flat stones or areas of paving. Where apparent, these were aligned north-east to south-west, the same as F10. Machine excavation in this area solely removed the ploughsoil and none of these features were truncated.

F21 (illus 8.4) was similar in form to F25 (illus 8.4) and both were invisible prior to the removal of the yellow-brown sand. Both consisted of stretches of curvilinear ditches, strikingly dissimilar from the formality of F1 (see below). F21 was exposed for 12m and extended beyond the excavated area. A width of 0.8m and a depth of 0.1m were recorded. It was filled with mottled brownish yellow sand from which no finds were recovered. F25, in the south-west corner of the trench, took the form of a series of rather incoherent, meandering ditches with profiles ranging from U- to V-shaped. Their sinuous nature suggests these ditches may be multi-phase, notwithstanding that none cut others in the area. They do, however, appear to be cut by the disturbance associated with ditch F1. Two chert lithics were recovered from 25/3. It is conceivable that both F21 and F25 are the remains of ancient burrow systems, perhaps of creatures larger than rabbits.

F22 was allocated to a group of four flint lithics

Table 8.1 Summary of prehistoric pottery assemblage

Context	No. of sherds	Weight (g)	No. of vessels
F11/2	1	4	1
F11/3	1	16	1
F19/1	42	285	15
F19/3	6	149	5
F20/6	1	20	1
002	5	89	4
Unstratified	8	104	7
Totals	64	667	34

and a single pottery sherd which were within the yellow-brown sand, but excavation showed these were not within a cut feature.

8.2.2 Possible early medieval long cist

F7 consisted of a fragmented setting of red sandstone orthostats aligned north-east to south-west. An overall length of 1.2m and a width of 0.5m were recorded. The feature was clearly cut through the yellow-brown sand as it barely extended into the natural sand below. Neither bones nor any apparent body stain were present at the interface between the fill and the sterile natural sand below.

8.2.3 Undated features

F23 was a shallow U-section feature recorded following differential drying in the section at the edge of the trench. F26 was a circular pit with a width of 0.6m and an uneven depth of 0.15m. The light brown mottled fill contained coal flecks, but lenses and lumps of natural shaley coal were recorded within the laminated sands in this area.

8.2.4 Prehistoric pottery, by M Johnson

A small assemblage of pottery comprising 51 sherds and weighing 474g was recovered from just three features, all within Trench 2. These have been catalogued as a maximum of 23 separate vessels, represented by only a few sherds each. The assemblage comprises rim sherds and body sherds, a number of which are decorated.

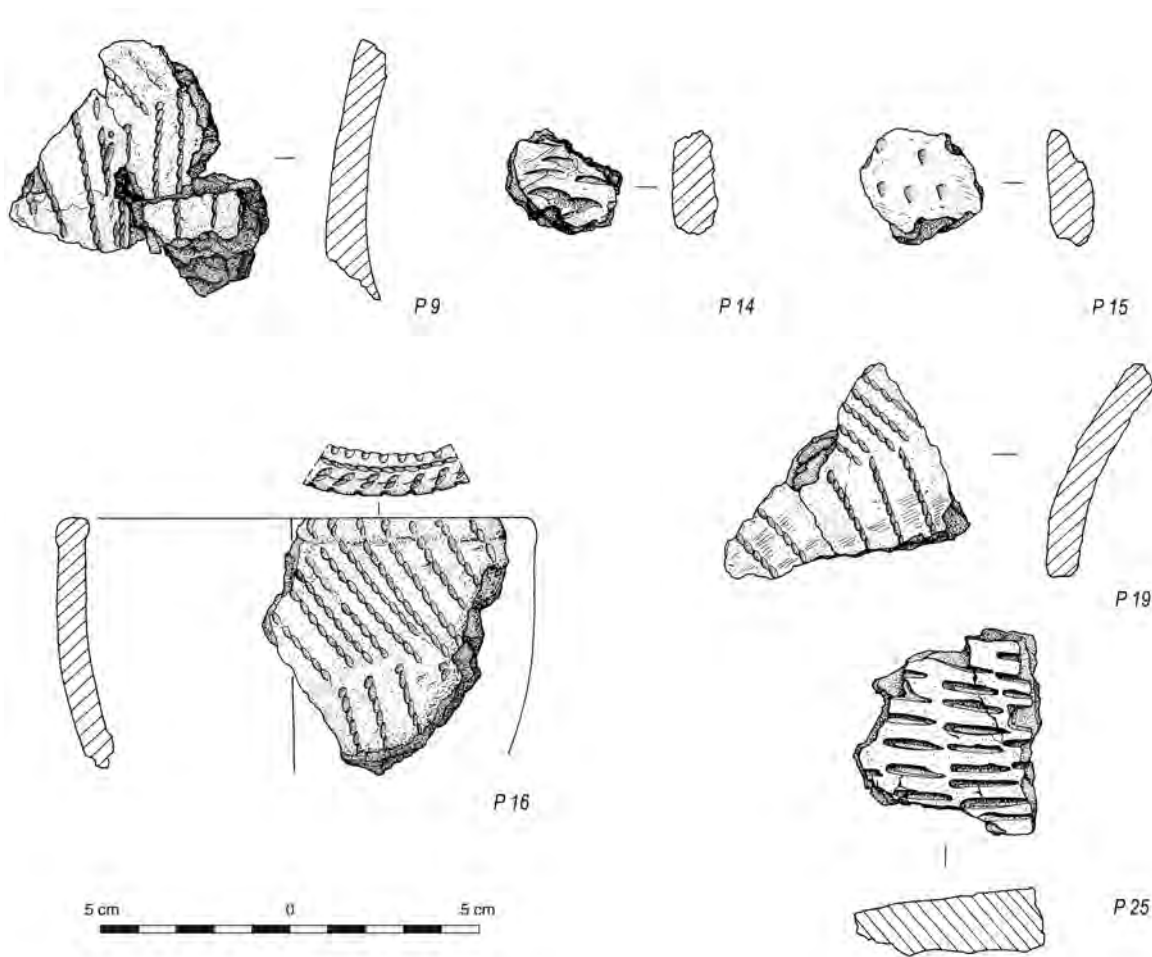
The majority of the sherds were recovered from the fill of F19, a deposit of stones (19/1) with a deposit of dark brown sand sealed beneath this (19/3). A single sherd was found in context F20/6, the stony fill of a pit. Two sherds were recovered from the fills of pit F11. Sherds were also recovered from a layer (002) and from other unstratified locations. The assemblage is summarised in [Table 8.1](#).

The sherds were sorted into sherd families and catalogued, according to dimensions, fabric, surface

finish, decoration, and morphology in accordance with the guidelines of the Prehistoric Ceramics Research Group (1995). A full catalogue has been prepared for the site archive.

Sherds were found in contexts 19/1 and 19/3 and the majority of the vessels were decorated with incised or impressed motifs. There was no apparent difference between sherds from the two different contexts in terms of either fabric or decoration. The assemblage from this pit comprises sherds of a relatively small size (average sherd weight 9g), which are generally abraded, and has a high number of individual vessels represented (20). Five rims were recorded (P8, P10, P12, P16, P20), all from F19/1, and the forms comprised upright flat-topped rims with slight necks (eg P16), bevelled rims (eg P10) and simple rounded rims (eg P20). Sherds range between 6mm and 20mm in thickness, suggesting that some were substantial vessels. The decoration comprises stabbed motifs (eg P15), incised lines, twisted cord (eg P9, P19), impressed fingernail (eg P14), and deeply incised short lines (eg P25); these can be found in combination with each other and can be found on the body exterior and on the rims. Often the sherds were too small to discern the overall motif. However, it is clear that the assemblage from this pit was decorated in a tradition familiar to the Late Neolithic. The fabrics are generally similar; mostly hard, and fine to coarse with hackly fractures. Stone inclusions were recorded at up to 20mm in size, and are present in low quantities in all of the sherds (up to 10% but usually 1–2%). There is no evidence for organic temper. Several sherds appear to contain grog (P10, P16). The sherds range from orange to brown to grey in colour, indicating a range of firing conditions. This is typical of handmade prehistoric ceramics and is indicative of being fired in a simple clamp kiln or open fire, resulting in a variety of firing temperatures and conditions, both within each individual firing and between firings. Very little is visible in the way of production techniques; several coil joins are present. Surface finishes comprise principally wet smoothing. The condition of the pottery is generally abraded, with some surface loss. Very few of the sherds have any remaining evidence for use in the form of sooting or charred deposits adhering to the surfaces.

Two featureless sherds (P1, P2) were recovered



Illus 8.5 Prehistoric pottery

from the fills of pit F11, and a single, abraded, featureless body sherd (P27) was recovered from context F20/6. The sherds had different fabrics but little further can be said of these vessels.

A small undiagnostic assemblage (P3–6) was recovered from layer 002. Sherds were also recovered from other unstratified locations (P28–34) and include an everted rim decorated with deep diagonal parallel slashes on the exterior neck angle and bevel (P31); an upright rounded rim decorated with whipped cord and incised chevrons (P32); and a flaring rim decorated with crudely incised, roughly horizontal lines (P34). Little further will be said about these sherds except to note that they also belong to Late Neolithic traditions.

The only part of the assemblage which can be used to discuss date and parallels is that from F19; the remaining features produced only undiagnostic body sherds. The character of the assemblage from F19 suggests that it belongs within the Impressed Wares tradition of the later Neolithic, generally dating to the first half of the third millennium BC, though an earlier date cannot be discounted (Cowie 1998). Good parallels for the forms and decorative motifs can be found at a number of other sites in the south of Scotland, for example at Biggar Common, South Lanarkshire (Sheridan 1997), Blairhall Burn, Dumfries &

Galloway (Cowie 1998), and Meldon Bridge, Scottish Borders (Johnson 1999; MacSween 1999). The assemblage does not contain the heavy bevelled rims and cavetto necks seen at Meldon Bridge, but this assemblage is much smaller and more fragmentary.

It has been noted elsewhere (MacSween 1999) that Impressed Ware, where found in context, is generally found in pits, for example at Brackmont Mill, Fife (Longworth et al 1967), where the excavator interpreted the material as not deriving from prosaic rubbish deposition, and Grandtully, Perthshire (Simpson & Coles 1990). At Meldon Bridge (MacSween 1999) some of the pits appeared to have been lined with broken sherds. The purpose of this more structured deposition is unclear but perhaps the pit at Newfarm is another example of this type of activity in the Late Neolithic.

Catalogue of illustrated sherds (illus 8.5)

- P9 F19/1. Body sherd decorated with twisted cord.
- P14 F19/1. Body sherd decorated with fingernail impressions.
- P15 F19/1. Body sherd decorated with impressed stab marks, possibly made with the end of a bird bone.

Table 8.2 The Newfarm lithic assemblage

	Flint	Chert	Quartz	Pitchstone	Total
Chips	3				3
Flakes	15	1	2	1	19
Blades	1				1
Microblades		1			1
Indeterminate pieces	1	2			3
<i>Total debitage</i>	20	4	2	1	27
Bipolar cores	1				1
<i>Total cores</i>	1				1
Chisel-shaped arrowheads	2				2
Backed knives	1				1
Short end-scrapers	1				1
Double-scrapers	1				1
Scraper-edge fragments	1				1
Pieces w edge-retouch	3	1			4
<i>Total tools</i>	10	1			11
Total	30	5	2	1	39

- P16 F19/1. Bowl with flat-topped rim with a slight neck, decorated with impressed cord on the rim and body.
P19 F19/1–F19/3. Body sherd decorated with twisted cord.
P25 F19/3. Body sherd decorated with deeply incised short lines.

8.2.5 Lithics, by T Ballin

In total, the assemblage includes 38 lithic artefacts (Table 8.2). Twelve were found in stratified contexts – F1 (one), F11 (four), F12 (one), F22 (four), and F26 (two) – whereas the remainder are unstratified. Of the latter, three were recovered as part of cleaning around F3, and two from cleaning around F10. A detailed report and catalogue is included in the site archive.

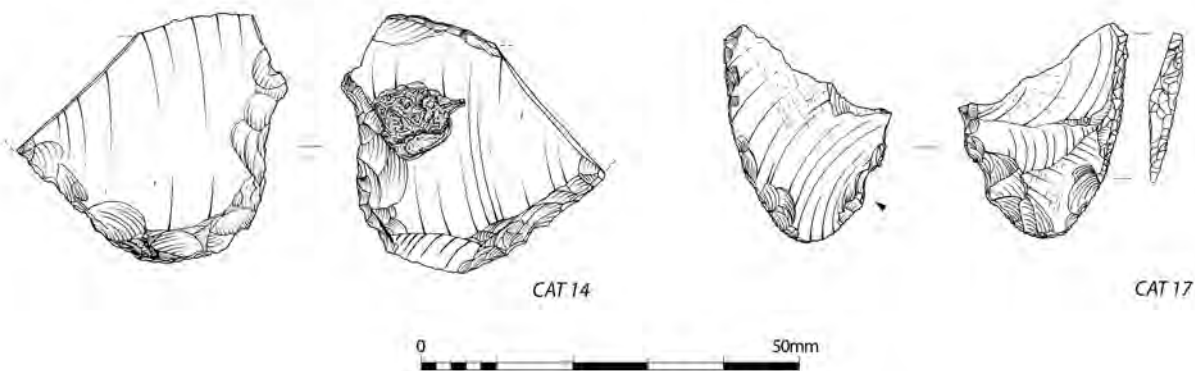
Most of the finds are in flint (80%), supplemented by small numbers of chert, quartz and pitchstone artefacts. The flint is a combination of local pebble flint, probably procured from the nearby shores of the North Sea, and exotic dark-grey chalk flint (four pieces). The chert and quartz were obtained from local sources, whereas the pitchstone was imported from the Isle of Arran in the Firth of Clyde.

The debitage includes three chips, nineteen flakes, one blade, one microblade, and three indeterminate pieces. The blanks were mainly detached by the application of hard percussion (44%) and bipolar technique (37%), supplemented by limited use of soft percussion (13%). The latter may indicate intrusion of older material. Only one core was recovered, namely a small bipolar core. The absence of platform cores may suggest that preventative maintenance took place (Binford 1983, 189), and that these large pieces of lithic waste were ‘tossed’ out of the excavated parts of the Newfarm site.

The tool category comprises eleven pieces, embracing two arrowheads (illus 8.6), one backed knife, three scrapers, four pieces with edge-retouch, and one gunflint. Both arrowheads are chisel-shaped points, and the scrapers include one short end-scrapers, one double-scrapers, and one scraper-edge fragment. Generally, the tools were shaped by the application of relatively plain edge-retouch, but the two chisel-shaped arrowheads and the double-scrapers were modified by a combination of simple edge-retouch and pressure-flaking/semi-invasive retouch. Apart from one blade-based edge-retouched piece, all tools are based on flakes.

It is thought that most of the assemblage was produced by the application of the distinctive Late Neolithic Levallois-like approach (Ballin forthcoming a). With their broad, relatively flat flaking-fronts, Levallois-like cores are particularly suited for the detachment of squat flakes for chisel-shaped arrowheads, whereas slender blades for cutting implements were detached from the cores’ narrow flanks. The flakes from these cores frequently have finely faceted butts. Most probably, the site’s bipolar waste represents the final stage of this approach. The soft percussion blanks are likely to be residual early prehistoric pieces.

Several factors indicate that the Newfarm assemblage is largely Late Neolithic, supplemented by a small number of intrusive Late Mesolithic or Early Neolithic pieces. Diagnostic Late Neolithic elements include the site’s chisel-shaped arrowheads (illus 8.6), technological attributes indicative of the Levallois-like approach (finely faceted platform remnants), and the collection’s raw material composition (dominance of flint, substantial numbers of exotic flint). The chert artefacts are thought to



Illus 8.6 Lithics: chisel-shaped arrowheads

be residual older pieces. This is suggested by the raw material composition of other, mainly Late Mesolithic/Early Neolithic, assemblages from the Dalkeith Northern Bypass project, such as the chert-dominated collection from Smeaton Roman Temporary Camp (Section 7.5.4).

8.2.6 Coarse stone, by A Jackson

Eight stone objects were studied. The assemblage was largely unstratified or from contexts that produced pottery evidence of Late Neolithic/Early Bronze Age date.

A single large but weathered and fragmentary boulder quern was set into the paving (F6) in Trench 2, and was not associated with other finds. Only a small area of the heavily worn grinding surface survives. Saddle and boulder querns of this form are known from sites of Neolithic through to Iron Age date.

Two cobble tools were recovered, namely a hammerstone/pounder from an unstratified (surface) context and a hammerstone/pounder/grinder from F19 (19/2). Such expedient tools are commonly found on Scottish sites of prehistoric and later date and probably served a variety of functions, including preparation of foodstuffs. However, their occurrence in Trench 2 accords well with chronological evidence of LNeo/EBA occupation.

A single fragmentary perforated stone was recovered from F19 (19/3). Broken and discarded in antiquity, this artefact would probably have functioned as a weight of some type and would have been suspended by its perforation on rope. Weights of this form, manufactured from cobbles and unmodified in shape except for the drilling of the perforation, are commonplace on prehistoric and later Scottish sites. Perforated stones of this type have been variously interpreted as loom weights, counterbalances, thatch weights or sinkers (Batey 1987, 79; Clarke & Sharman 1998, 147–49; Henshall 1950, 142).

Three small pieces of cannel coal and/or shale were unstratified. Of these, two have clearly been worked and it is possible that all three pieces are wasters. Of the clearly worked finds, one has been

deliberately flaked around the edges at both sides and, at one end, there is a straight edge that was deliberately cut or sawn. The second object is fragmentary, but enough survives to indicate that it was chipped to a circular shape with a central perforation drilled from one face. It is probably a roughout for a perforated disc (or possibly a ring) that was broken during manufacture and consequently discarded. Without recourse to compositional analysis (see for example Hunter et al 1993; Hunter 1998, 47; Sheridan & Davis 2002, 812–25) definitive raw material identification has not been possible. It should be noted however that cannel coal/oil shale deposits are found in a number of locations through the central belt (eg they both occur in Carboniferous deposits on the coast south of Dunbar (Gibson 1922, 51–2; Greig 1971, 83, fig. 14). Although not chronologically sensitive, they could quite possibly date to the Late Neolithic/Early Bronze Age as suggested by the pottery finds from Trench 2. Artefacts manufactured from black lithic materials (and the debris from their manufacture) are recorded from prehistoric (for example, Sheridan & Davis 2002, 812–25; Hunter 1998, 45; Hunter 1999, 333), Early Historic (Craw 1930, 120) and later sites.

Finds from Trench 2, including the shale/cannel coal discards, the quern, the perforated stone and cobble tools, are broadly indicative of prehistoric occupation at the site. In other words, although the coarse stone is not chronologically sensitive, these finds are consistent with pottery evidence of LNeo/EBA activity at the site. Of these, the pieces of cannel coal/oil shale are particularly interesting as they suggest craft-working activity at the site.

The raw materials used in the manufacture of coarse stone objects include sedimentary (eg sandstone), igneous (eg granite and diabase) and metamorphic rocks (eg shale/cannel coal), all of which were locally available.

8.2.7 Palaeobotany, by M Hastie

Seventeen bulk soil samples, ranging in size from 5 to 20 litres, were collected during the excavation and processed using a system of flotation and wet-

sieving. The quantity of finds recovered from the flots was extremely low and consisted only of a small quantity of wood charcoal, occasional carbonised cereal grains and hazelnut shell. The wood charcoal was very abraded and only present as extremely small fragments. Occasional carbonised cereal grain was recovered from four samples taken from deposits in Trench 2 within F10 and F19. The grain was very abraded and identification was limited to species level. The majority of grain was identified as barley (*Hordeum* sp.) with three grains of possible wheat (*Triticum* sp.) being recovered from F10/2. The material comprised small and very abraded fragments which were not considered suitable for providing a reliable radiocarbon date.

8.2.8 Discussion of the prehistoric and other features

Interpretation of this site is hampered by agricultural truncation, a lack of in situ organic deposits suitable for radiocarbon dating, few stratified finds and by the detrimental effects of soil processes which have translocated both finds and environmental evidence. Below the ploughsoil, the deposits are the same as at Thornybank, where they were found to have no archaeological or interpretative potential due to the presence of post-medieval finds in a layer cut by Early Christian graves. Once this layer was removed, prehistoric features were revealed. This is important, but it is not clear from the Thornybank report whether the dug graves were similarly hidden and that it was only the stone linings of the cists that suggested they were cut through this deposit. It appears likely that, although the exact interpretation of this layer has not been ascertained through depositional analysis, it is in fact an illuviated soil or B horizon.

Prehistoric finds were recovered from pits F11, F19, F20 and F25, of which the first two were visible under the ploughsoil due to their stone content. They were also recovered rarely as residual finds in more modern deposits and from the B horizon. These artefacts provide an insight into the nature of the prehistoric activity on the site.

The importance of the site in prehistory may best be illustrated by the lithics, where the tool ratio, notwithstanding the under-representation of chips and debitage, is firstly abnormally high, and secondly includes an unusually large proportion of imported raw materials. These include material from either Yorkshire or East Anglia and from Arran. The pitchstone in F11 is a further addition to the corpus of such artefacts from eastern Scotland. The presence of lithics in the overlying layer contrasts with the situation at Thornybank where, in spite of the removal by hand of extensive areas of this layer and the recovery from it of a number of coins and nails (Rees 2002, 317), no lithics were recorded.

An isolated pit at Thornybank contained Late Neolithic Impressed Ware but had none of the appar-

ently heated stones present in F19 at Newfarm. Pits of this period occur elsewhere in the Dalkeith area (eg Henshall 1966). The small quantities of numerous, different Impressed Ware vessels in F19 recalls pits excavated as far afield as Angus (White & Richardson forthcoming) and East Anglia (Garrow 2006). Impressed Ware dates to the second half of the third millennium BC (Johnson above). F20 may be prehistoric on the basis of morphological comparisons with pit F19, which again recalls both East Anglia and Angus, where spatially or morphologically related pits contained very variable quantities of pottery, inviting speculation over the ideas behind such deliberate structured deposition.

F19 is spatially associated with both the possible cist F10 and the paved areas but neither can be dated or associated by stratigraphy. All that can be said about the patches of paving is that, if linked, an area of around 20m by 10m was paved. The inclusion of a boulder quern in the paving may support a prehistoric date but it could have been discovered and reused at any date.

The solitary possible long-cist (F7) is reminiscent in its alignment and use of red sandstone of those at Thornybank, but a greater antiquity is suggested by its spatial association with the above features and the Thornybank excavation did appear to have defined the northern extent of that cemetery.

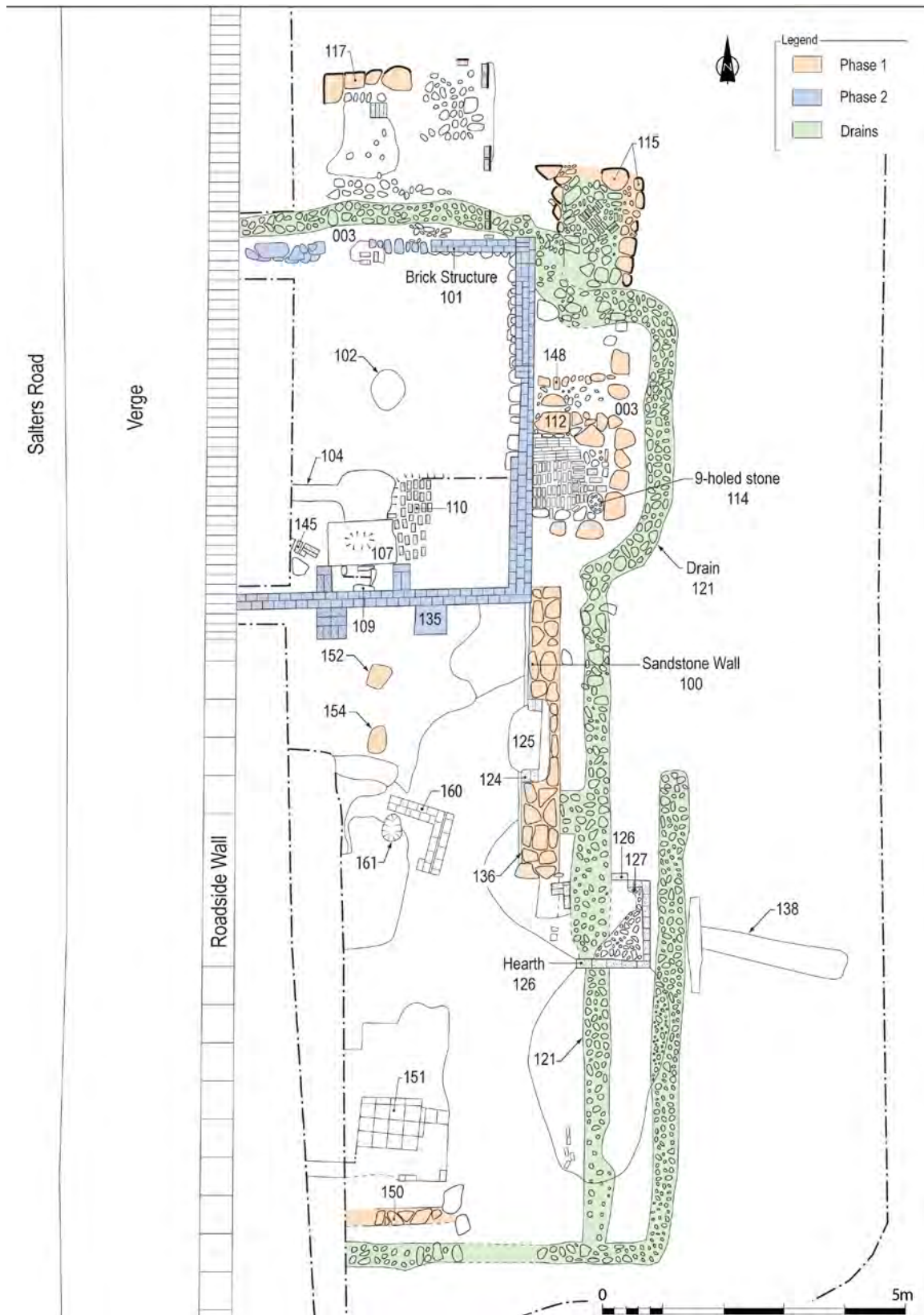
8.3 The post-medieval site

8.3.1 The post-medieval structure

Trench 1 was excavated parallel with, and immediately to the east of the mortared sandstone wall that runs along the eastern side of Salter's Road (illus 8.1), and exposed a post-medieval structure (illus 8.7). The sandstone wall now continues south to the point where, on the first edition map, the track from the sand-pit met Salter's Road (illus 8.1). However, the map appears to show a break in the solid line of the wall coinciding with the building.

The building was formed from several types of building material (illus 8.8, partially exposed from the south), with mortared and unmortared sandstone and brick alongside drains filled with small cobbles. It is interpreted as having two main phases.

Phase 1 comprised two short stretches of mortared sandstone wall (contexts 100 and 150). Although these remains were vestigial, a length of around 10m survived, and a width of 6m may be suggested on the assumptions that the roadside wall approximates to the position of the building's western wall and that two internal pits (152, 154) occupied the centre of the structure. The assumed northern edge of this Phase 1 structure was marked by a change in the construction of the roadside wall, with a capping of large flat slabs giving way to much smaller flat slabs to the north. Cobble-filled drains (121) skirted around the perimeter of the structure. Finds which may provide a construction date in the late 18th



Illus 8.7 Plan of Trench 1 showing phasing and selected contexts mentioned in the text

century comprised abraded glass shards, which were recovered from the Phase 1 wall's foundation slot (136).

Within the Phase 1 structure, features included

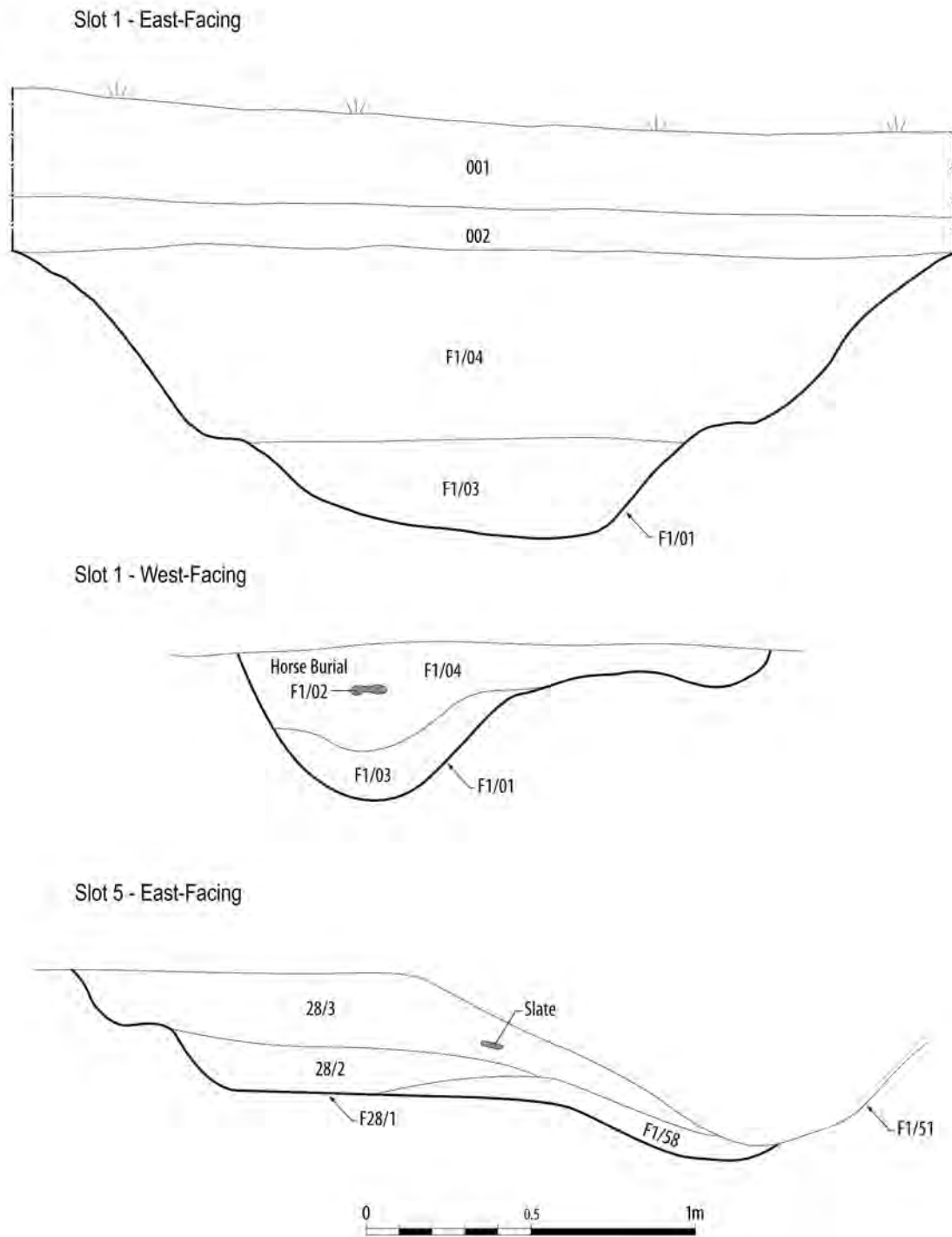
the internal pits (152, 154) which may once have contained the concrete-filled bases of metal roof supports, an L-shaped brick structure (160) associated with a pit (161), and a paved area formed



Illus 8.8 The post-medieval building from the south



Illus 8.9 The nine-holed stone in situ



Illus 8.10 F1 east- and west-facing sections at slot 1 and east-facing section at slot 5

from square quarry tiles (151), all truncated and of unknown purpose.

Wall 100 had been modified on its eastern side by the insertion of an opening (125) with a brick edging (124) and by the construction of a brick and cement hearth (126) containing intensely reddened broken bricks (127). This overlay the drain 121 and may be associated with a shallow slot outside the building (138), which contained 19th-century pottery, glass and clay pipe stems.

Three or four square or sub-rectangular paved

features (112, 115, 117 and perhaps 148) to the north, each measuring 2–3m in length, have also been assigned to Phase 1. These had an outer border of sandstone blocks, in three cases surrounding an interior containing edge-set re-used unfrogged bricks. A deposit of lime mortar or render was present within 117 and this may have been used either for mixing or recycling this material. A sandstone block (114, [illus 8.9, Section 8.3.9](#)) with nine crudely gouged pits in its smooth surface was incorporated within the southernmost feature (112).



Illus 8.11 The horse burial in F1

In Phase 2, a more coherent brick-walled structure with a stone foundation (101) was added to the north of the Phase 1 sandstone building. This measured 5.5m north/south and at least 5m east/west. The suggestion that brick wall 101 was later than Phase 1 wall 100 rests on the fact that 101 appears to cut drain 121.

A narrowing of the wall on the eastern side may mark the site of a window and the southern wall featured buttresses on both sides which probably supported a chimney. A small extension trench over the southern part of wall 101 up to the roadside wall demonstrated that the brick wall ran through the roadside wall.

The building contained a stone-built hearth (109), filled with ashes and a few iron nails (108), which was located between two brick abutments in wall 101. This hearth lay adjacent to a very large sandstone slab (107) with a depression worn through use in the centre. To the west a diagonal brick alignment (145) ran into the baulk, and to the east lay the remains of a brick surface (110).

Within the structure, but possibly earlier than the other features, was a shallow pit (102) which contained no finds. North of the hearthstone, and below the level of the brick surface, was a second pit and channel (104), which contained two sherds of

a late 18th-century Staffordshire white stoneware vessel, as well as a pantile fragment and three iron hooks or latches.

The few datable finds directly associated with the structures indicate an 18th- to 20th-century date for the use of the structure as a whole. Of most significance for providing an 18th-century date for the original construction were the pottery from pit 104 and the glass from the construction trench for Phase 1 wall 100. Phasing and interpretation of the building will be discussed further below.

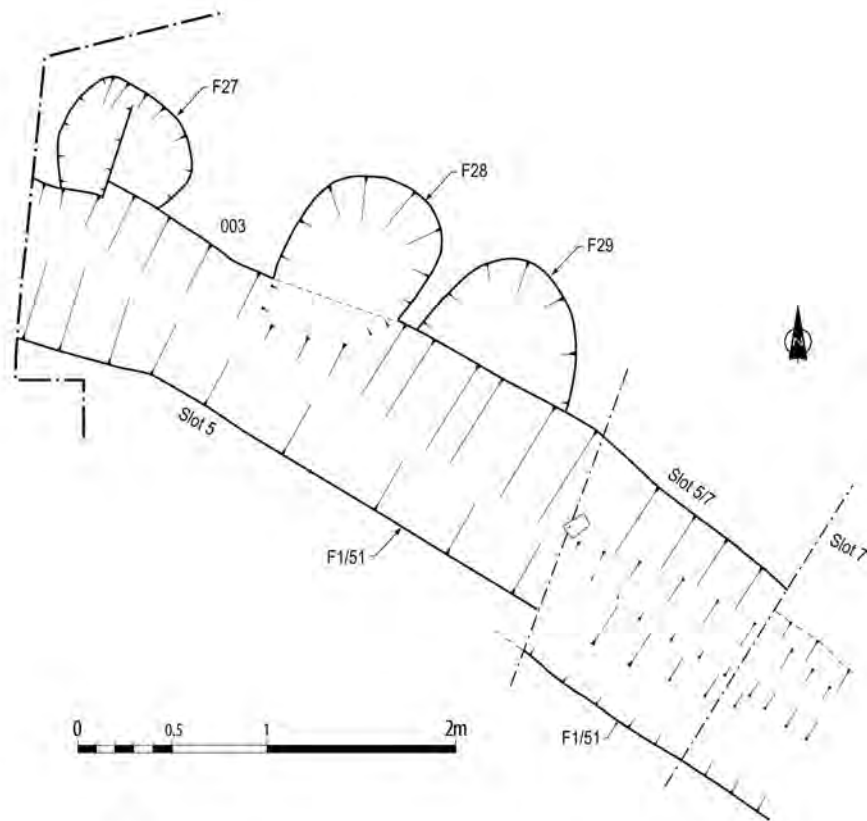
8.3.2 Other post-medieval features

The most visible and substantial feature within Trench 2 was a linear ditch (F1). This was aligned ESE–WNW and ran from Salter’s Road, obliquely across the slight ridge towards the Smeaton Burn, at 90 degrees to the natural contours. This feature ran parallel to, and 55m north of the Thornybank pit alignment.

The ditch was cut through the yellow-brown sand but its edges were not clearly defined. Only faintly visible initially, the increased silt content induced differential drying that aided excavation. The ditch was initially sectioned in a series of slots (*illus 8.3, 8.10*), then fully excavated within the confines of the excavated area. The feature had a surface width of 2–2.5m, and depth from the top of the yellow-brown sand of up to 1m, becoming increasingly truncated towards Salter’s Road, where a width of 0.5m and a depth of only 0.2m were recorded. Although some layering was recorded in the ditch, all fills consisted of a friable, light yellowish-brown slightly silty sand, almost devoid of stones. Within them, quantities of late/post-medieval pottery, glass, metalwork, ceramic building material (CBM) and a single lithic were found. Diagnostic pieces range in date between the 15th and 17th centuries. An unusual find was a gun-stone, dating between the early 15th and the mid 17th centuries, which was recovered from near the base of the ditch in Slot 8. A series of discrete bone deposits was a feature of the ditch excavation. The most complete of these was located mid-way up the fill sequence in the baulk at the east end of Slot 1 (*illus 8.11*), where part of a horse was identified. A second deposit of horse bones was recovered from Slot 7 next to a red sandstone block (F2, *illus 8.3*). All appear to represent dumping of partial or complete carcasses within the partially infilled ditch.

Three features (F27–F29, *illus 8.12*), of similar width but of variable depth and morphology, were present in the northern face of the ditch. In the case of the central (*illus 8.10*, slot 5) and eastern features, these appeared to pre-date the excavation of the ditch. The western feature’s relationship was ambiguous. Post-medieval finds were recovered, similar in date to those in the ditch. The interpretation of these features is obscure.

The ditch was cut by a large circular feature (F12, *illus 8.3*) with a width of 3.9m and a depth



Illus 8.12 F1, Plan of ditch slot 5 showing intercutting features in the northern edge

of 1.2m. Upper fills of creamy sand and brown silty sand overlay a brown sandy silt (12/4) which may represent decayed wood, and this overlay sandy primary fills. Finds included a dressed sandstone block with mortar adhering, iron items including a nail, residual late medieval pottery and other ceramics including moulded field drain tiles dating to the late 18th and 19th centuries. This feature is interpreted as a well or sump. There was no trace of a lining which may have been present to retain the soft natural sand through which it was cut. The base coincided with the level at which the underlying compact silts and clays were reached.

Overlying the ditch in Slot 2 was a linear ditch (F13), and a second parallel ditch (F14) was recorded 5m to the east. The intersection between F13 and ditch F1 suggests that although F1 was infilled prior to the excavation of F13, it must have been visible, as F13 terminates at this point. The fills of both F13 and F14 were brown sand into which was incorporated large quantities of building stone, bricks and metalwork. Both features appear to coincide (illus 8.1 – 1854 map extract) with a land boundary around Newfarm which is shown in 1854, but why they should be separated by 5m is uncertain. Most easily interpreted as robbed out wall-lines, there were nevertheless no structural remains present in either to confirm this.

Other post-medieval features include F15–F17 (illus 8.3), all of which were located at the western

side of the excavation trench. F15 was a deposit of stones in the surface of ditch F1 that had no apparent function, whilst F16 and F17 were, on the basis of their morphology, both post-holes containing coal-flecked sandy fills which could not be associated with other features in the trench.

8.3.3 Historical evidence, by F Oliver with I Suddaby

The name of Newfarm exists to this day though it has not functioned as an independent farming entity for some 200 years. The earliest recorded reference to the farm of Newfarm was found to be in 1749 among tacks of the Buccleuch Estates (GD 224/379/10). These records indicate progressive consolidation of the farm into larger units. The latest reference in the estate papers to the farm of ‘Newfarm’ occurs in 1791 (GD224/731/1). While Newfarm as an entity continued to appear in maps as well as the census enumerator schedules and the valuation rolls, this referred to the small group of houses. Maps in the 19th century, both those drawn up by the estate and by the Ordnance Survey, refer to Smeaton Farm only, which seems to have been formed out of the pre-existing farms of Wester and Easter Smeaton as well as Newfarm.

Besides the agricultural potential of the land, the mineral resources of this area had long been appre-

ciated. In the case of Newfarm, a tack for a period of five years beginning in 1763 articulates in great detail the proprietor's rights to 'set down shafts, sinks and coal pits and set up Ginns and other engines within any part of the ground of the hail respective lands during the space of this present tack and to make ways, roads and passages to and from the said sinks, shafts and coall pitts'.

By the middle of the 19th century, Newfarm consisted essentially of a group of houses occupied by a mixture of agricultural labourers, brick and tile workers and coal miners. The remains in question, therefore, were most likely part of the industrial development, which was promoted in this area by the Duke of Buccleuch in the 19th century, and are likely to have been directly linked to the nearby 'manufactory' known as 'Smeaton brick and tile works'. The brick and tile works (see [Section 10](#)) was a 19th-century enterprise which lasted some 40 years.

The excavated structure by Salter's Road at Newfarm does not appear to have been of great antiquity or of great longevity. The archaeological evidence suggests a late 18th- or early 19th-century construction and it first appears in two maps: the First Ordnance Survey of 1854 and an estate plan of 1860. In neither is the structure identified other than simply being part of the small 'Newfarm' complex of buildings or 'steading' as it is described in the estate plan (RHP9598; [OS first edition, Edinburghshire, sheet VII, 1854, illus 8.1](#)). A search of both estate papers and valuation rolls failed to discover any specific reference to the structure.

A map by John Lawrie dated 1766 appears to depict a roughly east-west-aligned field boundary crossing the slip-road corridor. Although parallel to other, still extant field boundaries running east from Salter's Road up to and beyond the Smeaton Burn, this feature was abandoned by the time of the OS first edition map ([1854](#)).

The Ordnance Survey of 1854 provides the following description of 'Newfarm': 'a number of irregularly built cottages with small gardens attached situated on the east side of the road leading from Inveresk to Dalkeith. They are chiefly occupied by labourers, employed in the neighbouring works, Proprietor: His Grace the Duke of Buccleuch' (RH4/23). The first edition map ([Edinburghshire, sheet VII, 1854](#)) shows a roofed building adjacent to Salter's Road and around 75m to the south of Newfarm. This structure lies within the Newfarm boundary and just to the north of the access track leading from Salter's Road to the sand-pit where, in around 1839, graves were reported as having been found. It remains unchanged on the 1898 second edition and on the 1904 third edition. On the 1926 'popular' edition, the structure is not shown and local memory (Somerville. pers comm) indicates it was invisible by the mid 1940s.

Apart from the brick and tile managers, the people inhabiting Newfarm between 1841 and 1901 were primarily drawn from the surrounding area. They

were predominantly manual workers employed in farming, the tile works, and in nearby collieries. While there was a handful of skilled tradesmen, almost half the male workforce was listed under the category of labourer. As regards specific industries, agriculture was the strongest thread running throughout this period, accounting for 24 of the 102 recorded male occupations, and seven of the fifteen female occupations. Other significant industries were the brick and tile works with fifteen of the total male occupations, coal mining with twelve, and the railway with four. Mirroring the lifespan of the brick and tile works, the population of Newfarm increased from fifty-five inhabitants in 1841 to a high of seventy in 1861, thereafter declining until only eight individuals remained in 1901. Of these, five had an occupation listed; one was a laundry man and the others (two men and two women) worked in agriculture.

Although not mentioned by Heather Holmes in her review of 19th- to 20th-century itinerant agricultural workers in the Lothians ([Holmes 2000](#)), Newfarm continued to be occupied by agricultural workers, many Irish, continuing the Achill workers tradition of employment in the potato trade. Finally, changing accommodation standards for such workers led to its sale, in 1976, to its present owners (G McClung, pers comm).

A full report forms part of the site archive.

8.3.4 Post-medieval and modern pottery, by S Anderson

A total of 228 sherds of pottery weighing 2,471g was collected from 27 contexts. [Table 8.3](#) shows the quantification by fabric. The 228 sherds represent a minimum of 202 vessels.

Quantification was carried out using sherd count, weight and estimated vessel equivalent (eve). Form terminology follows MPRG ([1998](#)). Recording uses a system of letters for fabric codes together with number codes for ease of sorting in database format.

A small quantity of pre-industrial post-medieval pottery was recovered, including red-firing earthenwares with lead and iron glazes (GRE, IGBW) which are probably non-local, fragments of tin-glazed earthenware (TGE), and the typical green-glazed Scottish post-medieval reduced/oxidised wares (SPMR/O). The GRE included one small sherd with orange glaze on both surfaces (F1/802), and five sherds of a thin-walled mug of probable 17th-century date (F1/04). A small fragment of a blackware vessel was found during cleaning. Six sherds of a decorated TGE plate were also recovered from ditch F1 (F1/10); it shows a rustic scene and is likely to be an Anglo-Netherlands product of 18th-century date. Sherds of Scottish post-medieval ware were found in layer 002, ditch F1 and as unstratified finds. One everted rimsherd was from a handled jar or pipkin, and there was a jug sherd with a cordon at the base of

Table 8.3 Post-medieval pottery quantification by fabric.
(NB Percentages are for period groups, except those in italics, which are for the whole assemblage.)

Description	Fabric	Code	No	% No	Wt/g	% Wt	eve
Iron glazed blackwares	IGBW	6.11	1	4.0	1	0.3	
Glazed red earthenware	GRE	6.12	6	24.0	9	2.3	0.10
Tin glazed earthenware	TGE	6.30	6	24.0	35	8.8	0.05
Scottish post-medieval reduced/oxidised ware	SPMR/O	6.50	3	12.0	115	29.0	
Scottish post-medieval reduced ware	SPMR	6.52	9	36.0	237	59.7	
<i>Total post-medieval (15th–18th c.)</i>			25	11.0	397	16.1	0.15
Staffordshire white salt-glazed stonewares	SWSW	8.41	4	2.0	39	1.9	0.23
Creamware	CRW	8.10	21	10.4	107	5.2	0.08
Refined white earthenwares	REFW	8.03	93	46.3	452	21.9	1.18
Industrial slipware	INDS	8.02	3	1.5	16	0.8	0.08
‘Yellow ware’ (buff industrial slipwares)	YELW	8.13	1	0.5	2	0.1	
Refined red earthenwares	REFR	8.04	18	9.0	452	21.9	
Late slipped redware	LSRW	8.51	34	16.9	412	19.9	0.43
Late glazed red earthenware	LGRE	8.50	1	0.5	8	0.4	
Late blackware	LBW	8.52	4	2.0	74	3.6	
Late post-medieval earthenwares	LPME	8.01	7	3.5	195	9.4	0.11
Porcelain	PORC	8.30	6	3.0	94	4.5	0.17
Red stonewares	RDSW	8.42	2	1.0	64	3.1	
Black stonewares and basaltes	BLSW	8.43	1	0.5	7	0.3	
British stoneware	BRSW	8.20	6	3.0	146	7.1	0.28
<i>Total modern (L.18th–20th c.)</i>			201	88.2	2068	83.7	2.56
Unidentified	UNID	0.001	2	0.9	6	0.2	
Total			228		2471		2.71

the neck; all other sherds in this ware were undiagnostic body and base sherds. Their presence in the ditch may indicate that they were in use towards the end of their date range.

Most of the assemblage consisted of industrially-produced ceramics with a broad date range of late 18th- to early 20th-century, although most probably belong to the 19th century. The main exception is the white salt-glazed stonewares (two cups and a bowl), which are of early to late 18th-century date. Also relatively early were the creamwares, which included plates and bowls, a few of which were decorated with green shell-edging, hand-painting or simple banding.

Refined whitewares (including pearlwares) were the most common type and identifiable vessels included cups, mugs, tankards, plates, bowls, dishes and preserve jars. They were decorated using a variety of techniques, including transfer-printing, sponging, lustre, relief-moulding, over-glaze enamelling and hand-painting. All decorated sherds were different and there was no evidence of any ‘sets’ in the group. ‘Industrial slipwares’ and the related ‘yellow wares’ (buff earthenwares with yellow glaze and slip bands) were represented by

only one vessel each, the former a bowl and the latter undiagnostic.

The redwares were represented by several types. Refined redwares consisted largely of dark brown-glazed sherds, some of which were probably teapots. Four unstratified sherds of a single vessel with a handle were limed internally and may have been from a chamber pot. Slipped redwares, mainly bowls with plain white slip or slip decoration internally, were relatively common. One of these was very similar to the waster sherds found recently at Prestongrange (Haggarty 2009a). One redware sherd with orange glaze internally was probably a late version of post-medieval GRE. There were four sherds of a single blackware vessel, similar to Jackfield Ware. Seven unglazed post-medieval redware (LPME) sherds were probably plantpots.

Six sherds of porcelain or ‘bone china’ included a probable Chinese porcelain hand-painted cup with enamelled blue, red and green decoration, a saucer with a gold band on the rim, a slip-moulded pedestal base from a vase or similar, an undecorated body sherd, the arm of a figurine, and a small hand which may be from a doll.

English stonewares included both decorative table-

Table 8.4 Pottery from stratified contexts

Context	Description	Fabrics	No.	Spotdate
106	Fill of feature 104	SWSW	2	18th c.
108	Fill of hearth 109	LSRW	1	L.18th–19th c.
139	Fill of linear cut 138	SWSW, REFW	4	L.18th–19th c.
9203	Fill of land drain 9205	LSRW, REFW	3	L.18th–20th c.
9219	Fill of Phase 2 structure	LSRW, REFW	2	L.18th–20th c.
<i>Total Trench 1</i>			<i>12</i>	
002	Layer	SPMR, REFW, LPME, UNID	10	L.18th–20th c.
F1/04	Secondary fill of ditch F1	GRE	5	17th c.
F1/10	Top fill of F1 in slot 2	TGE, CRW, REFW	8	L.18th c.
F1/302	Fill of F1 in slot 3	SPMR, REFW	2	L.18th–19th c.
F1/50	Upper ditch fill in slot 5	SPMR	1	15th–18th c.
F1/701	Sole fill of F1 in slot 7	SPMR/O, REFR, REFW	5	L.18th–19th c.
F1/802	Sole fill of F1 in slot 8	GRE	1	17th–18th c.
7907	Fill of linear ditch (=F13)	REFR	1	L.18th–19th c.
8903	Fill of ditch (=F1)	REFW	1	L.18th–19th c.
F2	Animal burial	REFW, LPME	2	L.18th–19th c.
F11/2	Fill of pit F11/1	BLSW	1	L.18th–19th c.
F12/1	Secondary fill of possible well	REFW	2	L.18th–19th c.
F12/2	Primary fill of possible well	SPMR, REFW	3	L.18th–19th c.
F16/2	Fill of post-hole F16/1	REFR, REFW	2	L.18th–19th c.
6603	Fill of irregular mottled feature 6604	SPMR, YELW	2	L.18th–19th c.
8905	Fill of irregular feature 8904	LSRW, REFW	2	L.18th–19th c.
<i>Total Trench 2</i>			<i>48</i>	

wares in red and black stonewares, and utilitarian storage vessels. The red stonewares consisted of a dry-bodied footring base with moulded decoration, and a brown-glazed base with lathe-turned incised decoration which had the appearance of basket-weave. The black stoneware sherd was a fragment of a teapot spout with moulded decoration. Other stonewares were fragments of brown-glazed bottles and clear-glazed jars.

Amongst the refined whitewares recovered during cleaning there was a footring base fragment of a biscuit-fired flatware. Two other sherds, from topsoil and layer 002, may also have been biscuit-fired, although one of these could also be an unidentified import. The presence of at least one waster could be taken to indicate that a kiln was located somewhere nearby, but the wide variety of types represented in this assemblage, together with its dispersal largely in the topsoil, suggests that some of the pottery may have been imported to the site along with other rubbish or composted waste for manuring.

Pottery recovered from topsoil, surface, cleaning, spoil and as unstratified finds amounted to 168 sherds (1,809g), or 74% of the assemblage by count.

Table 8.4 shows the quantities and fabrics of pottery collected from stratified contexts.

Only nine sherds were directly associated with the structures in Trench 1. Two of these, including one from feature 104, were of 18th-century date, which potentially indicates a construction date of this period for Phase 2 or, more likely, the underlying Phase 1 feature.

Most of the stratified sherds were recovered from sections of ditch F1. The fills of this ditch contained some of the earliest pottery to have been found on the site suggesting that it may have been dug as early as the 17th century, presumably being filled in the late 18th or early 19th century. The upper fill of the ditch was cut by animal burial F2 and well/sump F12, both of which contained 19th-century pottery, and the ditch had been cut through pit F29 which contained a 17th-century clay pipe stem (see below). Other small features (F11, 6604, 8904) also produced pottery of later 18th- to 19th-century date.

The very wide variety of pottery types, which also contains apparent wasters, is similar to another large middened group found at Jack's Houses, Kirkliston, where it was suggested that the material was brought onto the site specifically to add to the

Table 8.5 CBM by fabric and form.

Key to forms: CP – chimney pot; RT – plain roof tile; PAN – pantile; LB – late brick; FT – floor tile; DP – drainpipe; FD – field drain; UN – unidentified.

Fabric description	Code	CP	RT	PAN	LB	?FT	DP	FD	UN
Fine sandy, few other inclusions	fs			19		1		1	
Fine sandy with clay pellets	fscp				10			2	1
Fine sandy with ferrous inclusions	fsfe		1	1	4	8			
Fine sandy with grog	fsg		1		2	1			
Fine sandy with grog and ferrous inclusions	fsgfe				5	1			
Fine sandy micaceous	fsm			1					
Medium sandy, few other inclusions	ms			2			2		
Medium sandy with ferrous inclusions	msfe		1	1					
Compressed shale, machine-made	comp	1							2

soil and break it up (Haggarty 2009b). Whilst the soil at Newfarm is not clayey and would not benefit from such treatment, it nevertheless provides one example of the use of ‘nightsoil’ in the region at this period.

In summary, the earliest post-prehistoric pottery from this site consisted of green-glazed Scottish post-medieval reduced wares, which were produced for at least three centuries. They are most likely to be contemporary with the small quantity of 17th-century finds from the site, and would therefore pre-date the construction of the buildings fronting Salter’s Road. The buildings produced a small quantity of 18th-century material, which, if used in the structures, may indicate the date for their earliest occupation. The 19th-century pottery, which was recovered largely from the upper levels of the site to the east of the buildings, although apparently contemporary with occupation, is likely to have been brought to the site with organic waste for manuring. This is based on the very wide range of pottery types and the large number of vessels represented by only single sherds. Some exotic material, such as the tin-glazed earthenware and the glazed red earthenwares, was present here in the 17th/18th centuries, but it is not possible to link this directly with the Salter’s Road cottages.

8.3.5 Ceramic building material (CBM) and mortar, by S Anderson

Sixty-eight fragments of CBM were recovered, some as samples from the brick walls within the structures. The assemblage was quantified (count and weight) by fabric and form. Fabrics were identified on the basis of macroscopic appearance and main inclusions. Table 8.5 provides a summary of fabrics and forms present in the assemblage.

Roofing material was represented by 28 fragments. One of these was a compressed, shale-yellow chimney pot fragment with heavy sooting on the inner surface. Three fragments of plain peg tile were

present, one with a circular peg hole; two of these were overfired and poorly made. Most of the roof tile consisted of pantile, generally in fine fabrics which were probably machine-made and 19th-century or later in date.

Twenty-one fragments of handmade red brick were recovered. Fragments in fabric ‘fscp’ (see Table 8.5) were generally soft and heavily abraded, whilst those in the ferrous and grog-tempered fabrics were well-fired, dense and hard. Of the fragments for which at least one dimension was measurable, most were in the range 215–233 × 103–117 × 60–72mm (8½–9 × 4¼–4¾ × 2½–3”). Bricks of this size were generally produced in the 17th–19th centuries. One smaller brick was heavily overfired and cracked; it measured 100 × 55mm, but was probably a waster. An unusually large brick with a cant corner was collected from boundary ditch F13; this measured >323 × 170 × 72mm. Bricks sampled from Phase 2 wall 101 and Phase 1 surface 113 (within the stone-setting 112) were 60mm thick and likely to be slightly earlier than the larger, thicker bricks associated with hearth 126 (a later addition to the Phase 1 structure).

Ten fragments, representing three objects, were recorded as floor tile as they were the same size as post-medieval unglazed quarry tiles (225–237mm wide/long). However, they were unusually thick (52–70mm) and closer to bricks in appearance. They may be ‘stop end’ bricks, which are sometimes used at the end of a wall as a capping terminal, but it seems likely that they were used or re-used as paving within the Phase 1 structure, as one was recovered from a surface (151). One small fragment (unstratified) had a knife-trimmed edge and was likely to be a true floor tile.

Two fragments of drainpipe were recovered. Both were in medium sandy fabrics, one with a reduced core. Three fragments of possible moulded or slip-cast field drains were recovered from F12 and as an unstratified find; the latter provided a half-section and showed that these objects were U-shaped with a

Table 8.6 Glass fragments from stratified contexts

Feature	Context	Description
Fill of cut for wall 100	137	Two green body shards of bottle, weathered surfaces. 18th c.?
Fill of linear feature 138	139	One green body shard of bottle. 19th c.?
Ditch F1	F1/02	Two shards, body and base, of one bottle, weathered, green. 18th c.
	F1/03	Bottle base fragment, deep kick, weathered, green. 18th c.
	F1/40	Six bottle body fragments, green, weathered. 18th c.
	F1/50	Twelve shards, mainly one bottle, string ring, rim diameter 30mm, weathered surfaces. 18th c.
	F1/53	One green body shard of bottle. 19th c.
	F1/302	Seven shards of ?one bottle, string ring, rim diameter 27mm, weathered surfaces, green. 18th c.
	F1/701	Two weathered green body shards of bottle. 18th c.?
	F1/10	Two weathered green body shards of bottle. 18th c.?
	F1/10	One brown bottle body shard, slightly weathered. 19th c.
	F1/10	One uncoloured, corrugated ?neck of jar, moulded. 19th/20th c.
Well F12	7909	One bottle base with dome-shaped kick, weathered. 18th c.
	F12/1	One thin uncoloured ?wineglass bowl fragment. Undated.
Ditch 5705	5706	One small green body shard of bottle. 19th/20th c.
Cut 8904	8905	One bottle base, deep kick, heavily weathered and abraded. 18th c.
	8905	One green body/base angle frag of squat wine bottle. 18th c.

flange running along the centre of the side, and with an opening at the base.

Two fragments of a large unidentified compressed shale or stoneware dark brown salt-glazed 'tile' with an integral bowl or basin-like feature on one surface were collected from F16. This is probably a ceramic vessel for use in an industrial process. A small abraded fragment in fabric 'fscp' was also unidentified.

Fragments of lime mortar were recovered during cleaning and as samples from some of the wall foundations of Phases 1 and 2. Fragments from Phase 1 walls 100 and 150 contained moderate sand and calcareous fragments. A spread of mortar within 117 was sampled, but contained no obvious aggregates. None of this material is intrinsically datable and the pieces were all undiagnostic in terms of form and function.

8.3.6 Clay pipes, by S Anderson

Twenty-nine fragments of clay pipe (five bowls, twenty-two stems, two partial bowl/stem) were collected from the two trenches. Bore diameters were measured where possible, and compared with a sample from Edinburgh (Lawson 1976). In that group, bores of larger diameter (>2.5mm) tended to be of early date (17th/18th century), with narrow bores generally belonging to the 19th century. On this basis three pieces could be assigned to the 17th century, three to the 17th/18th century, two to the 18th/19th century, and seventeen to the 19th

century. One of the latter (Trench 1 cleaning) was also datable by its maker's mark, a stem mark for Thomas White of Edinburgh (1829–67). Four other fragments had complete or partial marks. A fragment of bowl with an oval containing a letter 'T' could be a 'T W' pipe (also from Trench 1 cleaning). Trench 2 spoil produced a fragment of bowl with 'R D' in a cartouche. From 002 (near F13/14) was another bowl with a poorly formed mark which appears to be 'J B' in a cartouche. A stem from 002 near F8 had a partial stem mark 'JEFFR . . . / . . . SELL'.

A piece from fill 139 of linear feature 138 in Trench 1 appeared to have a shallow sprig of leaves on the small piece of remaining bowl, but all other bowl fragments were plain. Two stem fragments were glazed yellowish-brown, suggesting that they were close to the mouthpiece.

The majority of fragments were collected during cleaning and from layer 002. A few came from stratified contexts. Two stems of ?18th- and 19th-century date came from linear feature 138. In Trench 2, ditch F1 produced a stem of 17th-century date, with a second in the earlier pit F28, animal burial F2 was associated with a 19th-century glazed stem fragment, and well F12 contained 19th-century stems in its primary fill, with a redeposited 17th/18th-century stem in a secondary fill.

8.3.7 Glass, by S Anderson

The 74 fragments of glass consisted largely of green bottle fragments, although fragments of jars, other

vessels and window glass were also recovered. A few fragments, including a machine-made brown beer bottle base and a white screw-top jar, were of 20th-century date, but the majority of objects belonged to the 18th/19th centuries, including several squat wine bottles with deep kicks at the base and string rings at the rim. One moulded cut-glass style bottle fragment had a British Registration Diamond on the base, which allowed it to be dated to 2 November 1852. A cobalt blue glass bottle base had moulded maker's mark, 'Y/G/Co' in a hexagon, probably made by York Glass Co, who were makers of chemists' bottles in the 19th century. Most fragments were unstratified or collected during cleaning. Fragments collected from stratified contexts are shown in [Table 8.6](#); most were from ditch F1.

8.3.8 Metalwork, by S Anderson

A total of 105 metal objects were recovered from the two trenches, but 78 of these came from topsoil, cleaning contexts, or were unstratified metal-detecting finds. The finds have been catalogued in full and a list is available in the archive.

Four contexts in Trench 1 produced metal finds. Pit 104 contained three iron hooks or latches. Hearth fill 108 contained five burnt nails with coal ash deposits adhering to the corrosion products. A small unidentified ferrous lump was recovered from the cut for wall 100 (fill 137). A large looped spike was found in linear feature fill 141.

In Trench 2, most iron objects in stratified contexts came from fills of ditch F1. These included a staple, three nails, a square buckle, a small rotary key and an unidentified object. A spade or fork handle came from F13. From well fill F12/2 there were one nail and one heavily corroded, unidentified flat object. Four nails were recovered from F2, the large sandstone block and associated animal remains in the top of F1. Single nail fragments were also collected from pit fill F29, post-hole fill F16/2 and 5712 (evaluation).

The majority of metal-detected finds were non-ferrous. They included three aluminium cow tags, at least fifteen iron nails, two small domed furniture studs, a ?bolt, two coins (George III Irish halfpenny; Victoria farthing), a square buckle, thirteen buttons, a wire pin, a spoon bowl, nine lead melt fragments, a copper alloy sheet offcut, various fittings of uncertain function, a brass finial, a lid, a suspension ring, two lead musket balls, a thimble, a toy wagon wheel and a large lead sack seal. All were likely to be of 19th-/20th-century date.

8.3.9 Coarse stone, by A Jackson

The large nine-holed object (114) which was found set within the brick and stone feature 112 is a fascinating piece. Roughly oval in plan, it has been crudely shaped at sides and base but more carefully

chiselled on one face to create a single flat surface within which nine shallow circular depressions of roughly equal size and depth have been carved using a metal chisel and/or pick. The depressions have a rough symmetry in their arrangement forming an oval (like the stone) and there is a central depression ([illus 8.9](#)).

The object is of uncertain function but two very different uses present themselves. The first is that the stone is a crude cresset lamp and that the depressions formed small open wells for oil, each with an individual wick. Square cresset lamps with multiple shallow depressions and wicks are known from medieval contexts; however, none take the same form as that from Newfarm. There is also no evidence of burning and blackening. If this artefact originally functioned as a lamp it is likely that it was simply reused as floor material. Although it is quite possible that the stone was reused in this way an alternate interpretation of function can be found that uses the context of recovery.

The second possible function is that this unusual stone was used as part of a game, possibly the marble game, 'Nine Holes'. Popular in the 19th century, there is more than one form of this game recorded in the literature ([Gomme 1894](#), 413). One version involves making nine holes in the ground (eight symmetrically arranged around a central hole), which are used as a target for marbles, although it should be noted that these are often set out in a square formation. Similar games were played using buttons or coins and the location of the target holes (the stone) set into a floor against a wall resembles descriptions of these games. There are no references to stones with nine carved holes being used in the literature; however, this object's context of recovery lends additional credence to this or a similar interpretation. It follows that, rather than being a reused stone, it could well be contemporary with the 19th-century date of the surrounding structures and recovered from its primary context of use.

A number of constructional stones were recovered. These include roofing slates (only one intact), a fragment of a sandstone tile and a coping or plinth/cill stone. All are likely to have come from a relatively modern (?19th-century) context. The one example of an intact roofing slate has been deliberately cut at a diagonal from the upper left to lower right. This is consistent with it having been cut into a roof valley, eg around a dormer window. A nail hole for fixing the slate to roof battens survives intact and is worn. The assemblage also includes a fragmentary sandstone roofing tile; inferior to slate, this tile possibly predates the other roofing slates. The coping or plinth/cill stone was recovered from primary deposit (12/6) in the possible sump F12. It is crudely formed – chiselled rather than sawn – with one bevelled edge. Its underside is rough. Some mortar adheres to the bevelled face, indicating that this stone was reused. The stone will

have been used in construction of late medieval or later post-medieval/modern date.

8.3.10 Gun-stone, by D H Caldwell

The find consists of a well-rounded, complete stone ball, worked from igneous rock, probably a gabbro (P Davidson, pers comm), and can be dated to the early 15th to mid 17th centuries. It measures 76mm (3 inches) in diameter. It was recovered from the fill of ditch F1 (1/802).

The most likely explanation is that this is a gun-stone. Pieces of shot made of stone were fired from wrought iron, breech-loading guns since they were not strong enough to take the larger charges necessary for propelling metal shot. Such guns were in use throughout the 15th and 16th centuries. Similar gun-stones may also have been fired from the 'leather guns', light pieces of field artillery used by the Scottish army in the campaigns of 1650 and 1651 (Stevenson & Caldwell 1977). There are no outcrops of gabbro in the vicinity of Newfarm and so this is not a locally resourced material.

A yellowish stain on the surface of the ball was subjected to XRF analysis, but proved to be largely composed of iron.

8.3.11 Gunflint, by T Ballin

A gunflint was recovered during site cleaning. Gunflints are usually subdivided into spall gunflints and blade gunflints. The former are based on flake-like blanks, and they are generally dated to the period before c 1800, whereas blade gunflints are based on blade segments, and they are dated to the period after c 1800. The Newfarm example is a blade gunflint, it is most likely to post-date the year 1800. It was made in first-class English flint, and it is likely to have been produced at the Brandon gunflint workshops in East Anglia (Skertchley 1879).

8.3.12 Animal bone, by J Thoms

A total of 563 fragments were retrieved, the majority of which (416) derived from F1, the large ditch. Trench 1 produced only one fragment, of unidentifiable bird bone, which may have been deposited through natural processes. The lack of bone from Trench 1 suggests that soil conditions may not have been suitable for bone preservation.

The majority of identifiable fragments (41) in F1 derived from horse (*Equus caballus* L.) with only three bones from cattle (*Bos taurus* L.) and five from sheep (*Ovis aries* L.) or goat (*Capra hircus* L.). There are at least two horses present in the assemblage, as indicated by duplication of certain elements, including two complete left calcanea; two complete right metacarpals; complete acetabula

from two right and two left pelves and two complete right tibiae.

A large quantity (144) of ribs and vertebrae from a large mammal (cow-/horse-sized) were retrieved from F1. Seven of the vertebrae had been fused together in life. This is a common phenomenon in horses, where the repeated pressure induced on the spine by riding the horse can cause extra bone growth and fusing of the vertebrae. Another example of pathology was noted in several vertebrae that displayed signs of extra bone growth. This indicates a fully mature, or even elderly animal, again suggesting the vertebrae derive from horse, rather than cattle (which are generally killed for meat before reaching the stage of full skeletal maturity). Two further sets of articulating bones from F1 were the left and right astragalus, calcaneus, metatarsals III and IV; and all three phalanges of a horse. The right tibia was present also. These bones comprise the lower hind legs of the horse. From the size of the two metatarsals the horse appears to have been a small animal, a pony of around 11½ hands high (1.18m). The presence of two sets of articulated bones indicates that at least one of the horses had been placed in the ditch as a complete carcass.

F2 contained 50 fragments of dog and horse, in association with 19th-century pottery. The four dog bones may have come from a single individual. A mandible, containing two permanent teeth in wear, indicates that it was a mature animal (over one year old). The other dog bones present were parts of the foreleg of a mature animal (over fifteen months of age). The horse bones comprised a femur and tibia from a mature animal (over 42 months), and there were additional large mammal bones which may be horse. Other dog and horse bones were retrieved during cleaning, possibly the same as those in F2, suggesting that it was a disturbed or plough-truncated burial. One other species was represented in F2, by a complete maxillary premolar of cattle. This was in better condition than the other bone fragments in this context and is likely to represent an intrusive find.

Other features (F10, F11, F12, F16, F19) and finds from evaluation trench 57 included fragments of indeterminate bone, some of which had been burnt.

The animal remains from Trench 2 are unusual in that most of them derive from animal burials. Most archaeological assemblages of animal bone consist of waste material from domestic or industrial food production processes. Horses and dogs are generally under-represented in the archaeological record, their role in human society not usually being involved in provision of food. Consequently their carcasses tend to be dumped whole, either in purpose-built grave pits or in pre-existing cuttings, such as the ditch (F1) in Trench 2. The bones from such burials will not normally carry any butchery marks, nor any signs of burning. The apparent occurrence of dog and horse burials together may

represent a deliberate or accidental placing of the animals, but the disturbed nature of the soils in the area means there is insufficient stratigraphic evidence present to determine whether they were buried at the same time.

8.3.13 Shell, by S Anderson

Thirty-eight fragments of shell were recovered from Trench 2. With the exception of one common land snail shell (*Helix aspersa*) collected during cleaning, all fragments were of edible marine molluscs (oyster, scallop and mussel). Most fragments came from layer 002 and probably relate to post-medieval occupation of the site. One small piece of oyster came from F16/2, also of post-medieval date.

8.3.14 Discussion: post-medieval land use and occupation, by I Suddaby and S Anderson

The building by Salter's Road was severely truncated, with no substantial floor surfaces being preserved inside. Two phases have been suggested based on the constructional methods and intercutting of some features, but it is likely that the Phase 2 brick structure was an addition to the Phase 1 stone building, or a replacement for an earlier part of that building. The southern half of Phase 1 certainly appears to have undergone minor alterations, with the addition of brick features which may be of later date than Phase 2.

The remaining fragment of east wall in Phase 1 contained a narrowed area with brick jambs which may represent either a window or a door, and a similar narrowing in the east wall of Phase 2 may also indicate an opening. To the south, a narrowing of the drain could indicate the position of an access. However, in keeping with similar structures in the region, the main door may have been located on the road side of the structure.

Late 18th-century finds were recovered from sealed contexts associated with both the stone and brick phases of the building, and it is likely that it was originally constructed around this date. Internal features like the brick and quarry tile surfaces and the hearth would have been common in the 19th century, and may be later insertions. The rectangular area delineated by brick buttresses and the hearthstone was the perfect size (c 1 × 0.5m) to house a small kitchen range of the period, and the buttressing to the south of this wall probably represents the base of an associated chimney.

External features consisted primarily of the stone and brick surfaces which may represent small bordered yards, of the type which can be seen in many contemporary photographs of small 19th-century cottages. One contained mortar/render and may have been used to recycle this material, suggesting that these areas were functional too. A second incorporated the stone with its nine crude gouge marks.

This remains an enigma as one suggested use, for a marble-related game, might have been difficult in view of the uneven brickwork forming the adjacent surface.

The overall finds assemblage from Trench 1 is sparse, but comprises items which would have been readily available to a household of the period. Much more of the post-medieval assemblage came from the upper layers of the site and from features in Trench 2. Whilst much of this material may have originated in the buildings or from the households at Newfarm itself, some of it may have reached the site through manuring or the movement of night soil from urban areas.

Structures of this type are rarely reported in the archaeological literature, so the Newfarm excavation is not easily paralleled. However, a strikingly similar structure which included analogous discontinuous mortared sandstone walls, square features with a drystone sandstone border enclosing edge-set brick interiors and the extensive re-use of industrial bricks and tiles, was recently recorded at Old Coalburn, near New Cumnock, Ayrshire (NMRS: NS51SE 37, Suddaby 2007). That site also lay in close proximity to landowner-led coal-mining and quarrying activities.

Whilst excavated evidence is not easy to find, this basic form of small, single-storeyed worker's cottage survives as standing buildings in most parts of lowland Scotland. The typical stone-built structure, often with brick extensions, is also the subject of many late 19th-century photographs which provide evidence for living conditions, external and internal features, roofing and fenestration. The archaeological evidence from this site has provided limited evidence for the construction techniques, plan and layout of such a cottage, as well as providing some information on the material culture available to its occupants.

The other features of post-medieval date at Newfarm comprised several pits and post-holes of uncertain function, some deposits of animal bones, and a large boundary ditch. The latter was on the same alignment as narrow parallel fields shown on early 19th-century maps to the east of Salter's Road. Probably excavated in the 17th century or later, abandonment by the mid 19th century is evidenced by the finds and by the fact that field boundaries shown on the first edition map of 1854 overlie it. Notwithstanding the unreliable nature of the stratigraphy, the recovery of 17th-century pipe stems in both a pit cut by the ditch, and the ditch itself may further refine the dating, as may the gun-stone which, if 17th-century, may be associated with General Monk's occupancy of Dalkeith House between 1654 and 1659 whilst commanding Cromwell's army in Scotland.

By 1854, Newfarm had been enclosed by an irregular field boundary within which small plots are visible. This reorganisation may have anticipated the Inclosure Act of 1857 and developed from the landowner-led industrialisation of the area, with

the Duke of Buccleuch exploiting the local resources of coal, clay, sand and stone. The building in Trench 1 alongside Salter's Road may be a manifestation of this process, probably simply representing the remains of a cottage occupied by workers in one of

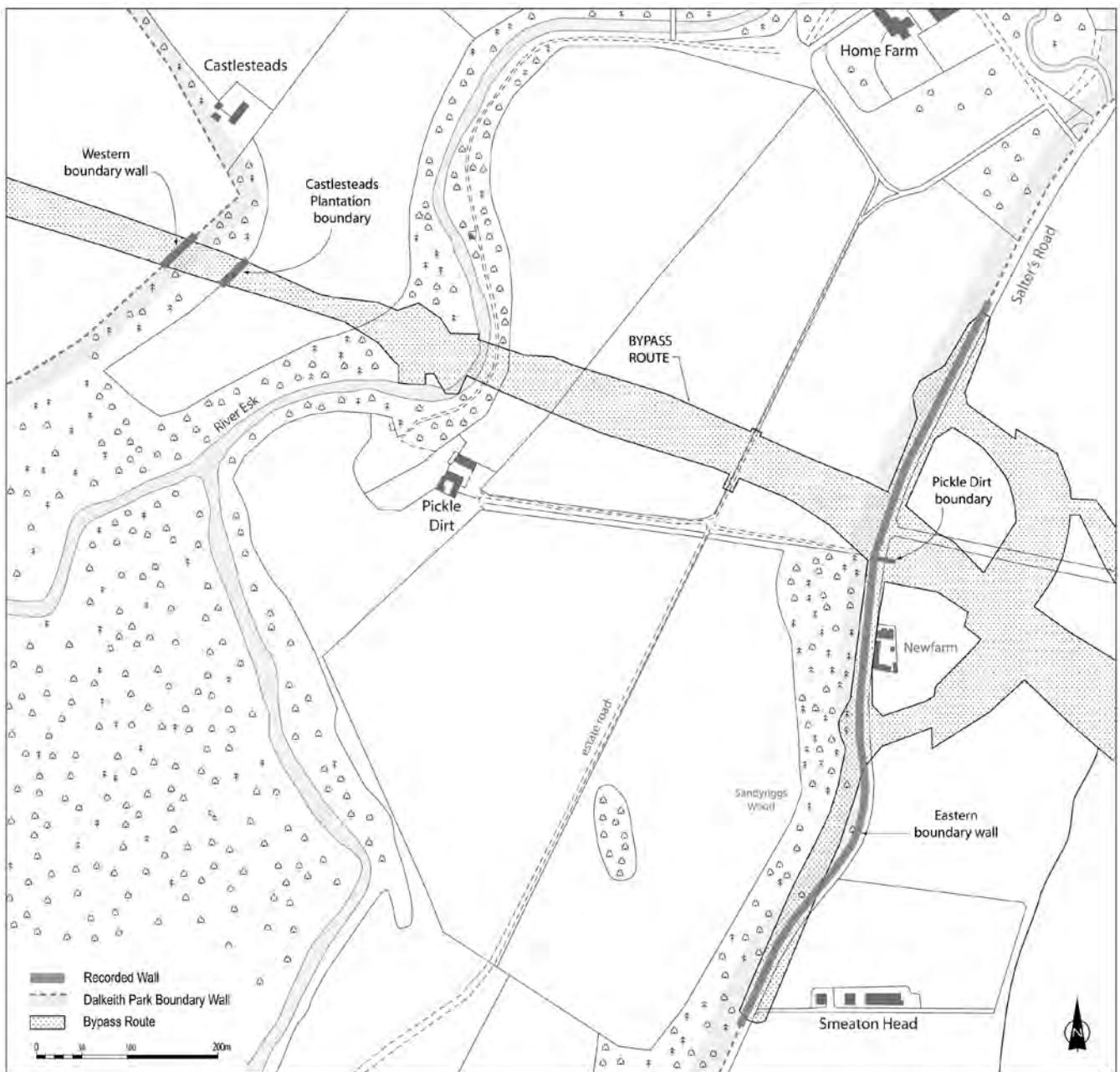
these industries or employed as agricultural labour. It may have been linked to Smeaton brick and tile works, as, for a period, was the rest of Newfarm, but there were other Buccleuch Estate industries nearby.

9 AN 18TH-CENTURY DESIGNED LANDSCAPE: PERIMETER BOUNDARY WALL SURVEYS AND BOUNDARY EVALUATIONS, *by M Cressey, I Suddaby and S Mitchell*

9.1 Introduction

Dalkeith Park, formerly the formal gardens and grounds of the 18th-century Dalkeith House, is bounded by a stone wall approximately 10km long.

Within this area, the chief characteristics of the landscape are predominantly wooded zones between two tributaries, the rivers North and South Esk. The eastern boundary wall follows Salters Road, the A6094 from Dalkeith to Musselburgh. The western



Illus 9.1 Location map with park wall sections highlighted



Illus 9.2 Disused entrance in the eastern perimeter wall (recording point 1)

boundary skirts agricultural land and faces the Edinburgh City Bypass. The park wall is a Grade B-listed structure and of historical interest as it is part of the 18th-century layout of the park's designed landscape (Peter McGowan Associates 2005).

During June 2006, prior to the construction of the bypass through Dalkeith Country Park, a programme of building survey and archaeological evaluation was carried out to examine the architectural history of surrounding perimeter walls and other boundaries, and to make a basic record of them prior to demolition. The surveys were restricted to producing a Level 1 (English Heritage 2006) comprehensive photographic record of the wall sections that would be affected by the works. The photographic record was supported by a written description of the character of the building fabric. Subsequent visits during demolition of the wall were made to photograph the exposed sections of the walls. The two sections of wall that were examined are located at the following:

- south-east alongside the A6094 road between Dalkeith and Whitecraigs, NGR points NGR NT 34572 68581 and NGR NT34773 69285
- north-west along the boundary wall between NT 33898 69366 and NT 33890 69355

Two other boundaries were recorded prior to their

destruction where they were cut by the road corridor, namely the county boundary at Pickle Dirt and Castlesteads Plantation boundary ditch and the findings from this fieldwork are also summarised. The areas examined are shown in *illus 9.1*.

9.2 Survey results

9.2.1 Method

A recording system based on regular intervals for both sides of the wall was adopted. Thirty-one recording points were established at 50m intervals. Photographs of the elevations were taken using a Nikon D100 SLR digital and 35mm camera. Six-figure National Grid Reference points were obtained using a hand-held GPS with an accuracy of $\pm 3\text{m}$. A summary description of the wall fabric found on the roadside and within the park is available in the site archive.

9.2.2 Dalkeith to Whitecraig, south-east boundary wall

The roadside wall was uniform in its construction, comprising both randomly coursed and formally coursed cream-coloured sandstone bonded by lime



Illus 9.3 Disused doorway in the eastern perimeter wall (recording point 13)

mortar. The coping stones were hewn semi-circular blocks 0.4m wide. The ground on the park side of the wall is lower, giving rise to higher elevations (mean 3m) on this side of the wall in comparison with the roadside, against which the wall is more uniform, with an average height of 2.3m. A gateway and two door openings were the only features of architectural interest (illus 9.2–9.3), and these were designed to provide easier access to Salter’s Road, the nearest formal access being Smeaton Gate, some 200m to the north towards the village of Whitecraig. The doors are 20th-century in date but the moulded surrounds are original 18th-century features with chamfered ashlar mouldings and droved margins on the quoins.

Patchwork repairs to the wall have been extensive throughout much of its length over the years as part of estate maintenance and in those areas where damage has occurred through structural failure (as a result of road salt at the base of the wall) and occasional car accidents. A break in the height of the wall was also seen. Some of the rectangular blocks found with stugging (a form of rustication made by mason’s chisel) represent the re-use of material salvaged from other buildings for use in the construction the wall. Re-used material was recorded at NT 34669 68730 along the roadside section and comprised two sets of reused voussoirs originating from a segmented arch. These are not carried

through onto the park side of the wall, dismissing their use as a drain or culvert.

Examination of the wall during take-down operations confirmed that it was constructed using a double-skin technique with dressed stones laid in random order on the outer elevations and a core of rubble laid within the interior cavity. This was identified throughout the breaches examined during the wall take-down. The wall thickness was constant throughout its length at 0.45m.

9.2.3 Western perimeter boundary wall

Ivy and other masking vegetation was cleaned away by hand to reveal three sections of walling forming panels about 5m wide (sample areas 1–3). Included within the group was a recessed area that is suggested to have been an ornamental seating area (illus 9.4). It is highly probable that this position afforded panoramic views over the River Esk towards Carberry Hill and the landscape beyond during the late 18th or early 19th century. A 20th-century plantation restricts this view today.

The wall is uniform in construction and is constructed of random rubble sandstone with square coping stones. The wall stands to a height of c 1.8m. There was no evidence of re-used stone within the sections of wall selected for survey. Observa-



Illus 9.4 (above) Curving feature in the western perimeter wall



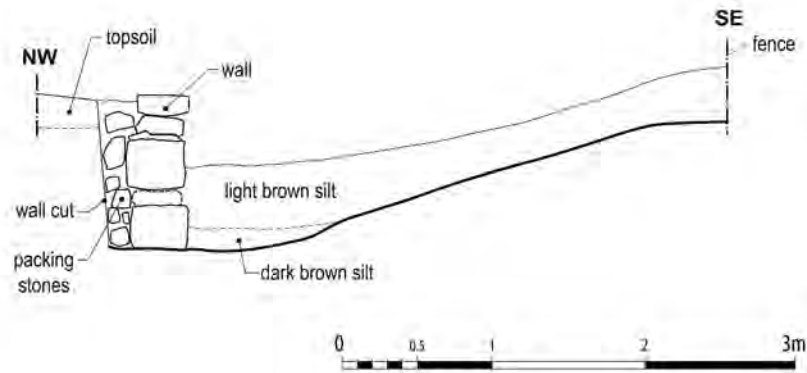
tions made following the demolition of the western boundary wall confirmed a double-skin construction with rubble-filled cavity (*illus 9.5*). Measurements obtained from the wall stubs confirmed that the wall was slightly wider at the base (0.55m), in comparison with the wall heads that were uniformly 0.4m. cursory examination of the foundations exposed when the wall was demolished confirmed that the foundation depth was 0.5m deep with rubble resting directly on top of subsoil.

9.3 The county boundary at Pickle Dirt

A substantial boundary feature runs from Pickle Dirt eastwards towards Salters Road. Its alignment intersects the development corridor just west of Salters Road, although it is not visible as a surface feature in that area (*illus 9.1*). To the west it appears as a broad ditch with a south-facing wall retaining its north side.

The predicted intersection, based on its alignment, of the feature with the current park wall alongside Salter's Road was identified as a potentially significant location in assessing the historical development

Illus 9.5 (left) Section through the western perimeter boundary wall showing double skin with rubble core



Illus 9.6 Section drawing of the Castlesteads boundary

of Dalkeith Park, as the boundary could represent part of the original medieval park boundary (T Addyman, pers comm). The boundary is shown on a plan of 1718 (Peter McGowan Associates 2005, 11), although there is nothing on it to distinguish it from other land boundaries in the area. It is also shown by Roy (c 1750) on his military map of the area, and is depicted in bolder print than nearby field boundaries (Peter McGowan Associates 2005, 12), suggesting a more substantial, or at least different, land division. Roy's map clearly shows this boundary continuing up to Salter's Road, as does the OS first edition map of a century later (1854) although neither depicts the particular form of the boundary.

Currently, the visible remains of the boundary end some 30m short of the eastern park wall alongside Salter's Road. The line of the boundary was not visible within the road corridor, possibly due to prior infilling. This putative infilling roughly coincided with the start of Sandyriggs Wood, which borders Salter's Road as far south as Smeaton Head. Several recent service trenches have been excavated in the infilled area and the current work aimed to establish both the former existence of the boundary, and the extent of any surviving structure.

Two trenches were opened by machine (illus 9.1). One (Trench 1) was within the bypass carriageway corridor, with the other (Trench 2) being within the realigned corridor for Salter's Road. Only Trench 1 revealed archaeological features. A spread of stones in the southern part of the trench appears to form a linear feature on the same alignment as the boundary as depicted on Roy's map (c 1750), whereas a linear V-shaped cut was more recent and is likely to be the remains of a slightly curving field boundary shown on the first edition OS map of 1854.

9.4 Castlesteads plantation boundary

This boundary feature (illus 9.1) consists of a ditch with a well-built wall face revetting its west

edge. It is depicted on maps published by Thomson (1821) and on the Ordnance Survey First Edition (1854), the latter showing what may be a path or track immediately to the north-west. It forms the boundary between the woodland on the edge of the park and the fields to the south-east. Although sharing structural traits with a ha-ha (a sunken wall with its top at ground level, bounded with a ditch on the outer side, designed to keep livestock from entering formal gardens), in this case a sunken boundary was installed to protect the woodland plantations established between this boundary and the park wall. Vistas over the open parkland were still maintained and upstanding walls here would obstruct the views from the putative seating area by the boundary wall (Section 9.2.3).

The plantation was felled in the road corridor prior to fieldwork commencing. Vegetation and arboreal debris from the felling and removal of the woodland to the north-west, was removed from the ditch by earth-moving machinery using a flat-bladed bucket, under constant archaeological supervision. Trenches were then excavated in order to evaluate the ditch and the wall. Once completed, the fill of the ditch over the width of the road corridor was removed, and the wall face was cleaned, photographed and representative portions were drawn and described. Much of the remainder of this boundary is obscured by vegetation or fallen stones so the opportunity to clear and record a section is a useful addition to the Designed Landscape Recording.

The wall and ditch attained a width of 4m and a height of 1m (illus 9.6). The upper stones protruded slightly above the level of the topsoil to the north-west. The sandstone forming the wall was similar to that used in the perimeter wall but the size of the blocks was larger and they were more regular in their shape (illus 9.7). The wall width was 0.4m and the vertical face was built in front of a packing deposit of smaller stones which filled the sloping cut and assisted drainage. The ditch contained two silty fills from which no finds were recovered.



Illus 9.7 General view of the Castlesteads boundary

9.5 Discussion

Within the sections of wall examined it was clear that there was uniformity in its design. A double-skin construction with rubble inner core was used throughout its length and was found to be unchanging at a standard 0.45m. Variability in height was also minimal. Re-used stone was prevalent but non-architectural (ie not moulded or modified), comprising uniform blocks of dressed sandstone, some of them studded with chisel marks. The results also confirm that the Salter's Road boundary has been the subject to periodic repairs as a result of salt-spray that had effectively weakened the lower courses. During the programme of take-down works it was confirmed that the Salter's Road and Castlesteads walls rest directly on top of subsoil, and the ground levels on each side of the walls vary according to the nature of the surrounding landscape. Cartographic evidence shows that the ditch and wall boundaries were created by the mid 18th century and probably relate to earlier land parcels on the edge of the original medieval park. During the 18th

and 19th centuries the ditches and revetment wall would have been maintained, effectively containing livestock yet allowing unrestricted views across the open parkland.

It is recognised that by the 1750s there was a greater emphasis on agricultural improvement than on the maintenance of massive formal gardens, many of which were swept away with the Landscape Movement (Buxbaum 2003). The ideal became the villa in subtle parkland with animals kept at a distance by means of ha-has, and the scene changed as one moved around. Formal emparkment also included the erection of boundary walls not only to enclose livestock and restrict the movement of game but, importantly, to differentiate between ground held in private estate and the surrounding common land.

The programme of wall-recording achieved its objective in recording the two Grade B-listed park walls prior to their take-down. The excavation work confirmed that the boundaries examined were also part of the 18th-century layout of the park's designed landscape.

10 INDUSTRIAL SITES, *by M Cressey, R Strachan and I Suddaby*

10.1 Introduction

Two 19th-century industrial sites were located and excavated as part of this project (illus 2.1). The former estate brick and tile works at Smeaton (NGR: NT 3693 6743) and the engine house associated with Fuffet coal pit, Cousland (NGR: NT 3693 6743) were excavated between October 1994 and March 1995.

10.2 General historical background

The expansion of coal extraction in East Lothian stimulated widespread economic changes leading to the development of numerous local ancillary industries which relied heavily on a regular supply of fuel. By the late 18th century these included salt makers, brewers, smiths, lime manufacturers and brickmakers. The first half of the 19th century witnessed an ever-increasing demand for coal brought about by the use of steam power and the huge demand of an expanding domestic market (Whatley 1994). Local industrial developments ran parallel alongside large-scale land improvement and innovations in farming techniques. The spread of the new ‘under-drainage’ techniques stimulated the adoption and wider use of ceramic drainage tiles and pipes (also called ‘tiles’ (Fenton 1976; Douglas & Oglethorpe 1993)). Earlier drainage techniques had been crude, usually in the form of ditches or simple trenches containing stones or brushwood and box drains that were usually capped with stone.

Estate brickyards arose in great number throughout the mid 19th century owing to the increasing demand for bricks, and importantly, drainage tiles and pipes. By the 1840s land drainage programmes were common, owing to the removal of the tile tax in 1839 and Peel’s Land Drainage Act of 1846. In 1839 the new Tweeddale Patent Drain Tile and Brick Company offered a new tile-making machine under licence to any Scottish estate where the consumption of tiles was sufficient to justify the capital outlay entailed in building drying sheds and kilns. Further legislation allowed Scottish landowners to raise capital for land improvement (Fenton 1976).

10.3 Smeaton brick and tile works, *by M Cressey*

10.3.1 Introduction

Smeaton brick and tile works was situated at the foot of a fluvio-glacial terrace that slopes to the north-east away from the modern dwelling of Newfarm (illus

2.1). Clay was excavated from the base of the terrace and processed for brick and tile manufacture.

The brick and tile works are first recorded on an engineer’s plan dating to *c* 1840 (NAS RHP23122) depicting subterranean splint coal deposits. The site is also shown on the 1854 Ordnance Survey first edition, 6 inches to the mile, map. This shows the brickworks and a tram road that linked the site to Smeaton colliery approximately 500m to the south. Aerial photography (RCAHMS, A69191, 1984; illus 8.2) provides further evidence for the overall layout of the brickworks. The cropmarks show the two kilns, with enclosure walls and the position of their respective drying sheds. The latter appear as four-aisled arrangements aligned east–west. Commonly these were timber-built, with shelving arranged in bays and enclosed by louvre shutters (Hammond 1977). Documentary evidence for the works is considered below (Section 10.3.3).

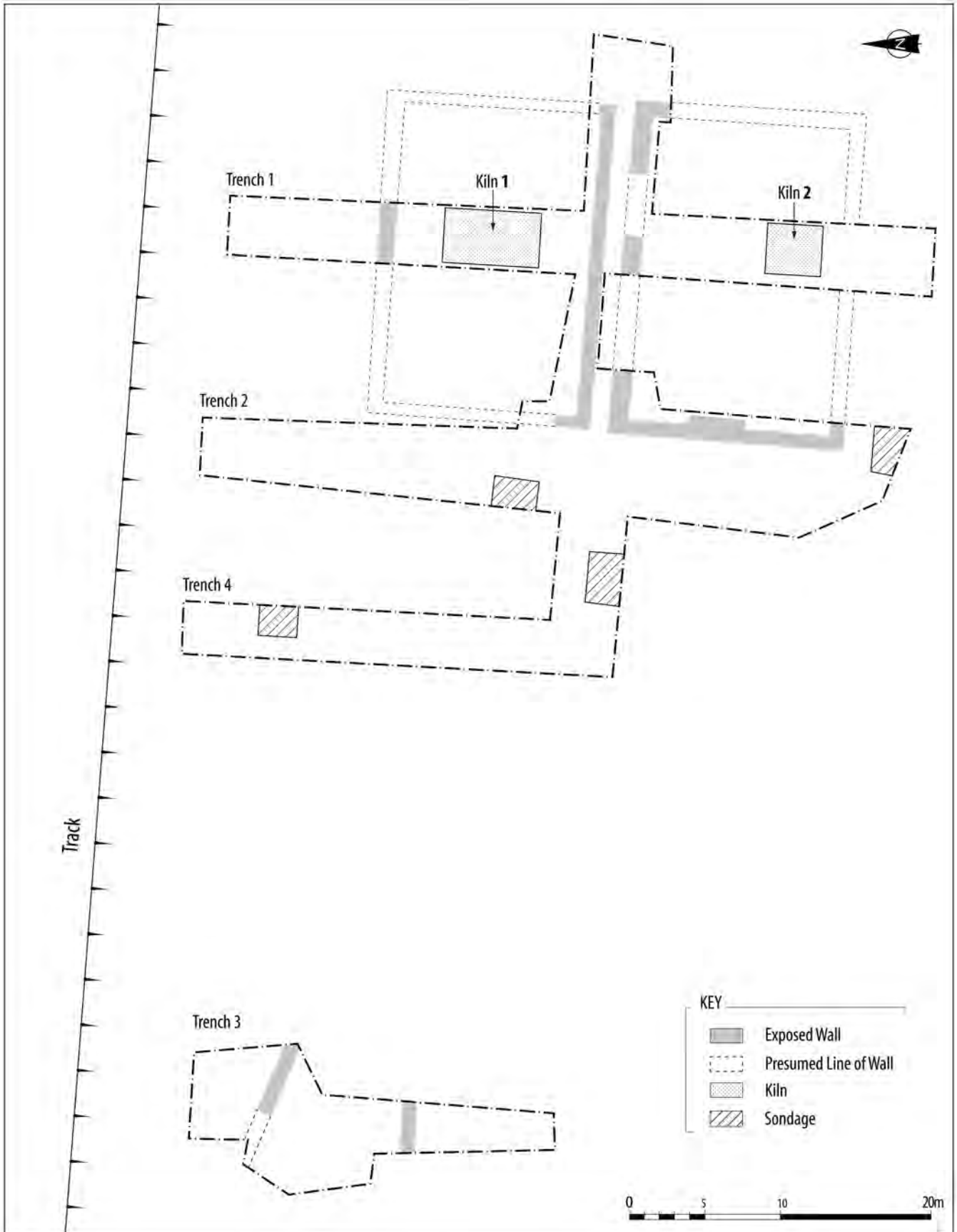
10.3.2 Aims and methodology

At the outset of this work, two aims were proposed: (a) to define the type, location and surviving remains of the kilns in operation; and (b) to determine the range of products that were produced. Although many upstanding and documented brickworks in Scotland have been extensively surveyed and recorded by the Scottish Industrial Archaeological Survey 1977–85 (Douglas & Oglethorpe 1993), archaeological investigations of early brickworks such as the type encountered at Smeaton have been lacking.

The archaeological remains of kiln 1 and kiln 2 were located in Trenches 1 and 2 and in a transecting trench opened to link the two. Trench 3 was placed to investigate a feature, observed on an aerial photograph, which was thought to be related to coal mining, clay milling, coal storage or some other ancillary process connected with the brick and tile manufacture. Trench 4, to the west of Trench 2, was placed to identify any other building remains such as milling sheds or machine shops, but contained no structural remains. Generally the preservation of the site was good, but in some parts the structures had been severely disturbed when the site was levelled.

10.3.3 The Smeaton brick and tile works, *by F Oliver*

Smeaton brick and tile works was described by the Ordnance Survey of 1854 (RH4/23) as ‘an extensive



Illus 10.1 Smeaton brick and tile works: trench location plan

brick and tile works on the lands of Smeaton'. The necessary raw material, clay, was in close proximity: 'an extensive bed of clay is found in the alluvial formation at Newfarm, and on the town-common near Gallowshall, where both bricks and drain-tiles are made. At the former place the bluish clay, seven feet thick, is seen lying beneath laminated sand, and passing into a reddish pebbly or stony clay, seventeen feet thick, which rests on sandstone' (*NSA Vol 1 1845*, 457).

Thanks to the *New Statistical Account*, the entry for Dalkeith being written in November 1844, we know exactly when this enterprise was opened: 'The brickfield at the north-eastern extremity of the parish was begun to be wrought in 1837: it yields an ample supply of bricks and tiles, which are formed with astonishing rapidity by a very ingenious machine, contrived by the present Marquis of Tweeddale' (*NSA*, Dalkeith, 501).

Tweeddale had invented his machine just the year before, in 1836. Since Tweeddale's lands were in Haddingtonshire, he was a near neighbour of the Buccleuchs and, as both families had a long-standing interest in agricultural improvement, it is hardly surprising that Buccleuch ordered one of the new machines more or less immediately, especially as it was reputed to be capable of producing up to 10,000 tiles per day. We know that the original patent was for a steam-powered machine which 'employed two leather-covered cylinders to compress the clay to the required thickness and width. The slab was carried over another cylinder to bend it to the curved form of a drainage tile, and then through a series of vertical rollers and hoops to further refine its shape. Finally, the clay was halted and cut into tile lengths by a wire suspended above the machine' (*Watt 2002*, 48).

As indicated by the above description the main purpose of the machine, and we assume of the Smeaton works, was the production of drainage tiles. This was not exclusively so, as there is evidence that bricks and other articles such as paving, flue covers, etc were produced (see GD224/ 552/2). It was, however, the high demand for clay tiles in order to promote the further drainage of agricultural land that provided the impetus both to Tweeddale's invention and Buccleuch's decision to build his works at Smeaton.

It is generally held that the development of machinery in the brick industry was held back by the excise tax imposed between 1784 and 1850. Since the tax was levied on all bricks produced whether or not they were actually usable, producers stuck to hand methods rather than experiment with costly machinery, which was bound to create large numbers of dud bricks before the process was perfected. Drainage tiles, however, were exempt from the duties as early as 1794, and it was the demand from the agrarian sector which led to the invention of various machines which could manufacture clay tiles in rural locations. Extrusion machines, which created shaped tiles in a single operation, became the most popular with landown-

ers. Tweeddale's was such a machine, as was that of John Ainslie, a Scottish farmer. In an interesting twist on mechanical development, both were criticised for being too large and being dependent upon steam; both responded by adaptations which made them suitable for manual operation. Smaller, hand-powered versions were what the landowner most needed; they were relatively inexpensive and more reliable (*Watt 2002*, 50).

The 19th-century authority on brickmaking, Dobson, explained the need of the agricultural community in making drain tiles a 'home manufacture'. 'What is wanted is a good and cheap method of making drain tiles without much plant and without erecting an expensive kiln, as the works will not be required after sufficient tiles have been made to supply the immediate neighbourhood' (*Dobson 1850*, pt 1, 45; see also *Watt 2002*, 50).

It would appear that this was just the sort of works that existed at Smeaton. The *New Statistical Account* promoted the system of the Duke of Buccleuch as a model to be emulated. Drainage was 'the groundwork of all improvement in farming', but was a significant cost to the individual farmer. However, having built his 'extensive manufactory' Buccleuch provided the drainage tiles to his tenants 'free of cost'. It is not clear just how 'free' this system was, as we are told also that 'the tenant drives the materials, and pays interest for the outlay at the rate of five per cent per annum'. While the leases on the Dalkeith farms at this time were only 14 years, which would elsewhere be seen as too short, this was justified on the grounds that 'the most expensive operation, that of draining, is originally performed at the cost of the landlord' (*NSA*, Dalkeith, 56-7).

The location of the brick and tile works at Newfarm made perfect sense, as it was almost literally on top of a clay pit which provided the basic raw material and was adjacent to the Smeaton colliery. The mix of agrarian and industrial activity in this immediate area is particularly well illustrated in two maps: the first OS map of 1854 and an estate map of 1860. Together these reveal the steadying of Newfarm, where the workers were housed, the arable field which was part of Smeaton Farm, the clay pits, the sand pit, the coal works, the brick and tile works and the railway (*Ordnance Survey, first edition, 1854*; RHP 9563). The Edinburgh-Dalkeith railway, opened in 1831 and originally operated by horses, was intended for the carriage of 'coal and other minerals, farm produce, manure, etc' (*NSA*, Dalkeith, 512). Shortly after, a three-mile section was built by the Duke of Buccleuch to service his coal mines. When the Edinburgh-Dalkeith railway was purchased by the North British railway company in 1845, this branch line, known as the 'Dalkeith Tramway', continued to be operated privately by the Buccleuch estate. While one section went to the Cowden pit, the main line ran to the Dalkeith colliery, and later sidings were added at the Elmfield ironworks and the Smeaton brick and tile works (*Hajdicki 1993*, 5).

The demand for the final product from the brick

and tile works was Buccleuch's own desire further to improve his estates and their agricultural output. While of local significance, the Smeaton works was relatively small-scale, despite the description of it as 'extensive'. The best overview we have of its significance is an entry in the 1871 census enumerator schedule against the name of one Kenneth McKenzie, who was living in a three-roomed house at Newfarm. Under occupation it was stated that McKenzie was 'manager of brickwork employing 12 labourers, 7 boys and 5 women'. This hardly compares to the largest brick and tile manufacturer in Scotland, the Garnkirk Fire-Clay Company, which was located in six acres of ground six miles to the east of Glasgow and employed 300 men and boys (Bremner 1869, 399).

The census of 1871 marks the last occupational link between the inhabitants of Newfarm and the brick and tile works. Examination of the valuation rolls for Dalkeith supports the view that the works had closed by 1881. The valuation given to the works in 1855 was £150 and this rose to £304 in the 1860s before falling back to £150 in the 1870s; the last appearance of the works in the valuation rolls occurred in 1877/78. In the list of irrecoverable debts in the Dalkeith colliery ledgers for 1876 is a reference to £18 2s. against the 'Smeaton tile work' (GD224/536/230). Moreover, the only Ordnance Survey map on which the brick and tile works appears is the first edition of 1854; by the time of the second edition of 1894 it is no longer there. In addition, the railway lines to many of the nearby collieries and the brick and tile works had also stopped operating by the end of the century (Hajdicki 1993, 8). What the immediate cause of the closure was we do not know: possibly the clay deposits had been exhausted, cheaper products could be got from elsewhere, or the demand for drainage tiles had been met. Whatever the reason, the Smeaton brick and tile works had played its short, but not insignificant, role in the agricultural and industrial development of Dalkeith and the Buccleuch estates. In the absence of documentary evidence, we are led to assume that the fate of the structure uncovered in the excavation at Newfarm was linked to this brief burst of industrial activity, spanning perhaps no more than 40 years.

10.3.4 Excavation

The removal of the topsoil exposed widespread demolition layers consisting of ash, kiln debris, brick and drainage pipe fragments to a depth of 0.8m and covering some 95% of the area of the trench. The two square enclosures formed the lower courses of walls enclosing firing floors where coal was loaded into the kiln fire boxes. The firing-floors associated with kilns 1 and 2 (illus 10.2 and 10.3) had enclosing walls standing to a height of 0.8m with a width of between 0.5 and 0.65m and comprised mortared dressed sandstone.

10.3.5 Kiln 1

The base of kiln 1 (illus 10.2) consisted of bricks resting on a level bed of fire clay. The fire clay formed a capping layer over the kiln's primary foundations, which consisted of three courses of mortared sub-rectangular sandstone blocks that measured on average $c 0.3 \times 0.4$ m. The sandstone blocks rested on grey-brown natural clay.

Two metres north of the kiln floor, three brick columns formed the remains of a line of flues at the base of the kiln's northern wall. The flues were constructed from blocks of dressed sandstone and were approximately 1m thick. The flue to the east was lined with seven courses of quality fire brick. The bricks were mortar bonded and one bore the stamped name of 'SMEATON' with the N in reverse (illus 10.5, No. 7), providing evidence for an earlier brick manufacture at the site, possibly the one mentioned in the *New Statistical Account*. The base of the flue had a brick hearth that measured 0.57×0.15 m and rested directly on natural clay. The flues were abutted to the north by a brick firing floor that measured 2.73m from the flue columns to the enclosure wall (illus 10.1) towards the northern end of the trench.

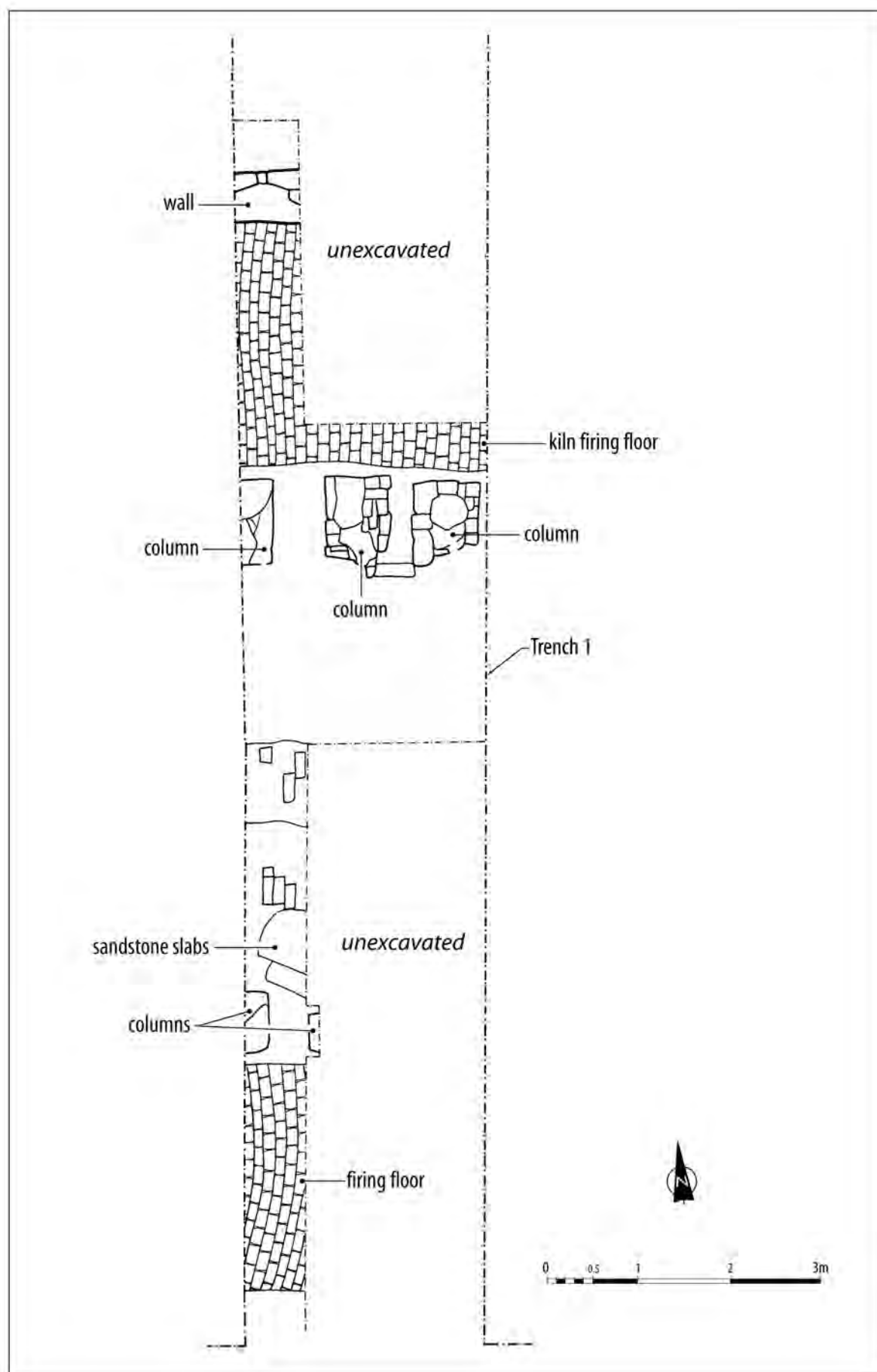
Two further columns were revealed in the trench that was placed to locate the southern half of kiln 1. The flue was seen to be of the same construction as that between the two eastern columns to the north, and comprised rough dressed sandstone lined with fire bricks. Although only partly recorded in section, its position confirms that the width of kiln 1 was 4.74m, based on the distance between the internal face of the juxtaposed flues. The flues on the southern side of the kiln rested on a brick-laid floor that ran 6m further south to meet the southern enclosure firing floor wall. This wall comprised roughly dressed mortar-bonded sandstone and stood to a height of 0.6m with a width of 0.53m. This wall rested on natural grey clay. No construction trenches could be identified on the southern side of this wall.

10.3.6 Kiln 2

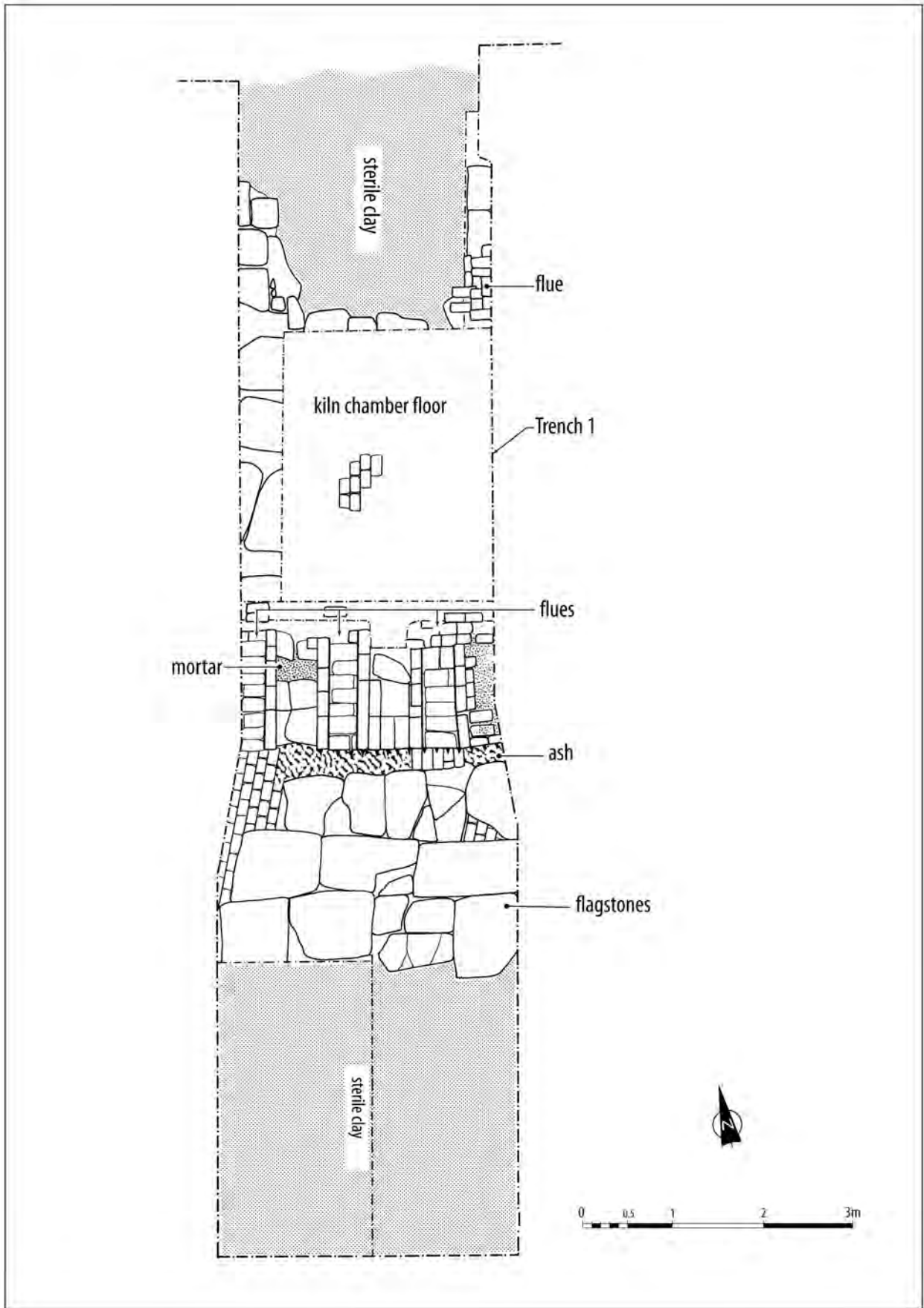
The distance between the southern enclosure wall of kiln 1 and the northern of kiln 2 was 0.88m and they were separated by natural undisturbed grey-brown clay (illus 10.1).

Kiln 2 (illus 10.3) was sealed by a loose brick rubble demolition layer to a depth of 0.65m. When this demolition layer was cleared the internal floor of the kiln was revealed. Six bricks were all that remained of the internal floor of this kiln. As with kiln 1, this floor was laid on a bed of refractory clay 0.1m thick. This layer sealed sub-angular blocks of mortared sandstone that formed the foundation of the kiln.

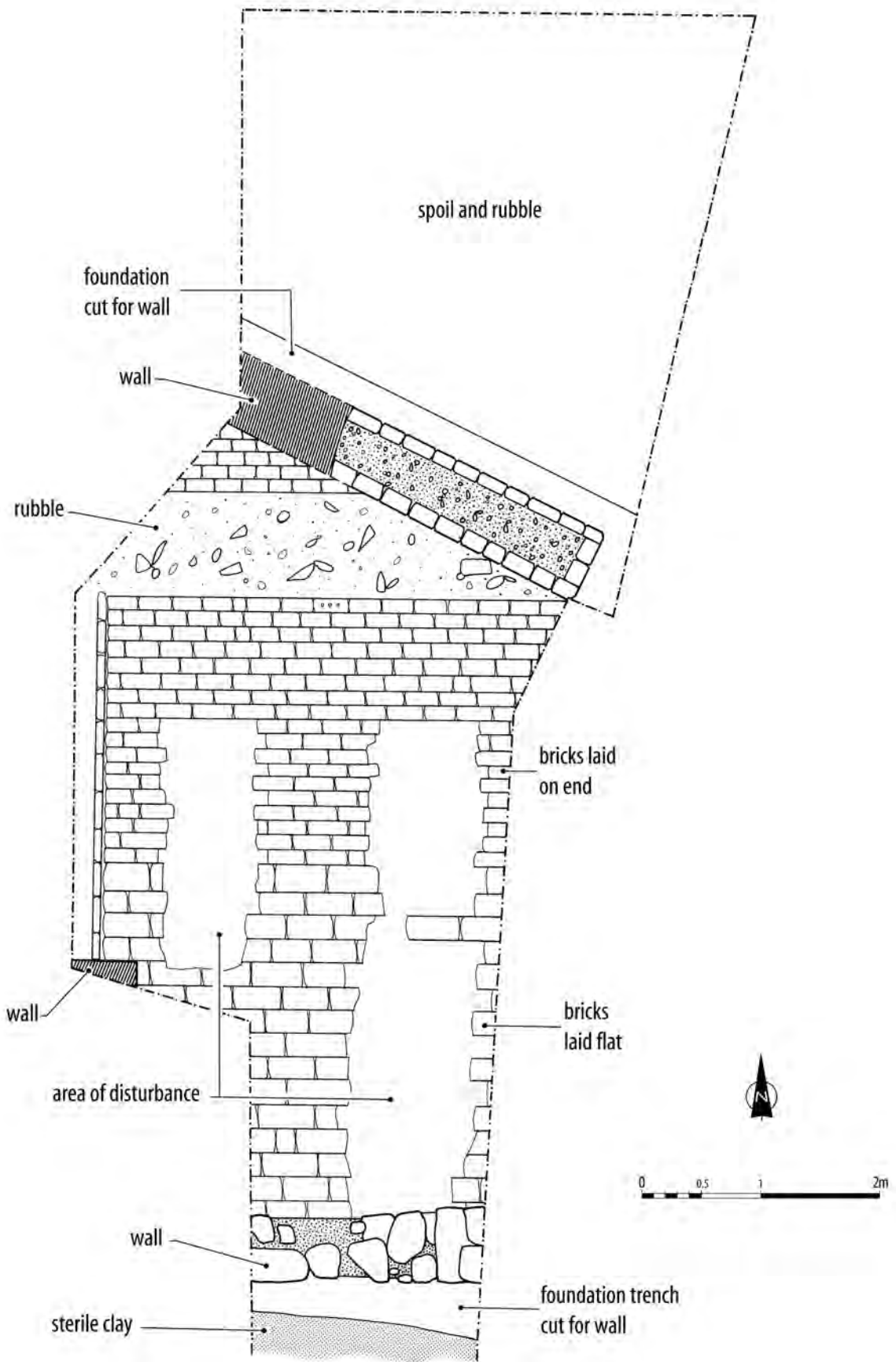
Although heavily disturbed by the demolition of the site, the remains of a flue were recorded in the eastern section. This was built entirely of brick and lacked the



Illus 10.2 Smeaton brick and tile works: plan of kiln 1



Illus 10.3 Smeaton brick and tile works: plan of kiln 2



Illus 10.4 Smeaton brick and tile works: plan of Trench 3

composite arrangement of sandstone and brick of the northern flue columns in kiln 1. The remains of the flue protruded from the section and rested on large dressed sandstone blocks measuring 0.5 × 0.15m. These were of a single course which in turn was mortared onto flagstones that formed the northern firing floor of the kiln. Although the floor was only partly exposed in section, its presence elsewhere confirmed that unlike kiln 1, kiln 2 had firing floors constructed from large sandstone flags. The corresponding southern flues were the best preserved on the whole site. These were constructed exclusively of red brick comprising three upstanding columns and equidistant hearths. The columns stood to a height of 1m. The rectangular ash-filled hearth bottoms comprised seven bricks and measured 1 × 0.3m. The hearths were on the same level as their associated firing floor and consisted of large rectangular and square sandstone flagstones, including laid red brick. The flagstones and bricks rested on natural clay.

Using the distance between the juxtaposed fireholes either side of the kiln, the internal width of the kiln is established as 3.2m. The exact length of the kiln cannot be established from the excavated evidence.

The kiln enclosure wall to the west (*illus 10.1*) was revealed in Trench 2, running on a north–south alignment.

10.3.7 Clay pits

A circular anomaly was identified on the aerial photograph towards the south of the site (*illus 8.2*). Excavation of this area resulted in the identification of a large deposit of blown brick and pipe wasters, confirming that the edge of the clay pit had been used as a dump. This collection provided a sample of the range of products that were being produced (*illus 10.5*). In addition, evaluation trenching in 2006 to the north of Old Dalkeith Colliery Road revealed what may be clay extraction pits which had also been backfilled with brick and pipe wasters.

10.3.8 Possible coal store

Trench 3 was placed to investigate a rectangular feature observed on the aerial photograph (*illus 10.1*). A large deposit of demolition rubble was removed to expose the upper surface of the walls (*illus 10.4*). The wall at the northern end of the trench was 0.65m wide with a length of 2.4m and stood to a height of 0.94m on a WNW–ESE alignment. It was composite in construction with seven courses of roughly dressed sandstone used to face its southern side, whilst the northern face of the wall was constructed of waster bricks. The other wall crossed the trench on an east–west alignment and stood to a height of 0.8m, with a width of 0.4m. It was constructed of mortar-bonded dressed sandstone and incorporated large square blocks and smaller sub-angular pieces. The demolition layer sealed a substantial layer of coal. Both the

demolition layer and the coal were confined between the two walls. The floor of this building comprised red brick in a Flemish style bond laid end on in a bed of clean yellow sand. The floor had recently been disturbed by a mechanical excavator undertaking gas pipeline evaluation work.

The limited amount of archaeological data recovered from this trench makes it difficult to establish precisely the function of this building, but given the amount of coal that was still in situ, and its proximity to the kilns, we have interpreted the building as a coal store.

10.3.9 The finds

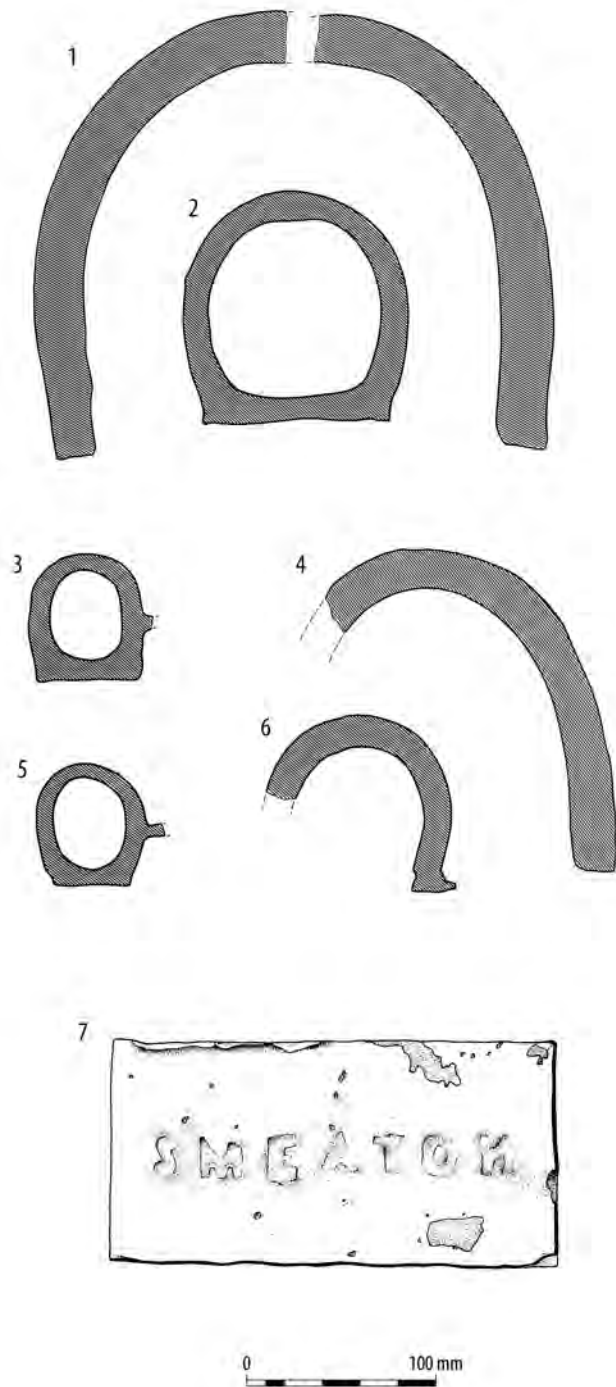
A selection of the finds is shown in *illus 10.5* and they are catalogued below. Most of the bricks and drainage pipes drawn were recovered from waster dumps. The stamped brick was recovered in situ from a flue in kiln 1. Various other pieces of kiln fabric and a cast-iron arch support were also recovered from demolition deposits. Included in the inventory of finds are two common horseshoe or ‘mug’ tiles with an internal span of 250mm and 95mm respectively. Three drainage pipes with different internal dimensions, roofing tiles and both hand-made and mould-made bricks were recovered from demolition deposits and waster dumps. Flowerpot rims and base sherds were recovered from kiln 2.

Illustrated (*illus 10.5*)

1. Large ‘mug’ drainage tile.
This is a mould-made tile that is 370mm in length and 240mm high with an arch spanning 270mm.
2. Large drainage pipe (waster).
This pipe is 370mm in length with a width of 117mm. The bore is sub-circular at 90 × 90mm standing on a flattened base that is 100mm wide.
3. Common drainage pipe.
Machine-made drainage pipe measuring 350mm in length and 60mm in width. The internal bore is oval and measures 50 × 40mm. The base of the pipe is flat and measures 55mm.
4. Common drainage pipe.
Machine-made drainage pipe measuring 360mm long and 60mm wide. The bore is oval and measures 50 × 43mm.
5. Intermediate sized ‘mug’ tile (fragment).
The length of this object is unknown. The height and width are each 180mm.
6. Small ‘mug’ tile (fragment).
The length of the tile is unknown but its height is 90mm, with a span estimated at 110mm.
7. Stamped brick recovered from a fire box in kiln 1.
A machine-made brick of good quality fire-clay and stamped SMEATON on its widest face. The brick measures 240 × 125 × 75mm.

Not illustrated

8. Kiln furniture (spacers).
Three items of hand-moulded clay, conical in shape, possibly used as spacers between the kiln products.



Illus 10.5 Smeaton brick and tile works: tiles and brick. Sections of tiles: 1 large 'mug' tile; 2 large drainage pipe; 3–4 common drainage pipes; 5 intermediate sized 'mug' tile; 6 small 'mug' tile; 7 brick with SMEATON stamp

9. Roof tile (dental ?), incomplete.
A fragment of a dental-type roof tile with a peg hole at its centre and measuring 100mm wide and 15mm thick.
10. Cast-iron arch support.
A recessed arching support made of cast iron 620mm in length.

11. Refractory kiln liner brick.
This is a highly fired fire-clay voussoir brick with a square profile of 130 × 130mm. The length of this item is unknown.
12. Base sherds from two flowerpots.
13. Mould-made brick.
A waster brick measuring 230 × 120 × 70mm.

10.3.10 Discussion

Kilns are normally classified according to the direction of draught and their method of operation (Hammond 1977; Douglas & Oglethorpe 1993). The Smeaton kilns were of a type known as 'Scotch' kilns which were of the *intermittent* type that had to be filled, heated, cooled and emptied at each firing. These were one of the most common types of kiln in Scotland as they were relatively cheap to build and could be run on solid fuel. Parallels for the Smeaton kilns can be seen in an illustrated survey by Hammond (1977, 172, kilns 1 and 2). Normally, Scotch kilns were rectangular, with opposing flues, and had the capacity to produce about 40,000 bricks in each firing episode. The Smeaton brickworks would have operated on a seasonal basis (to limit the effects of frost damage on drying products) and were situated close to ready supplies of raw materials, such as clay, water and, importantly, coal.

The range of products being manufactured at Smeaton is not unique but is in keeping with many other estate brickyards that were established to meet the need of land improvement and associated activities. The occupiers of Newfarm on the same estate were experimenting with different land drainage techniques, and this may well account for the wide range of drainage pipes and tiles that were recovered at the site.

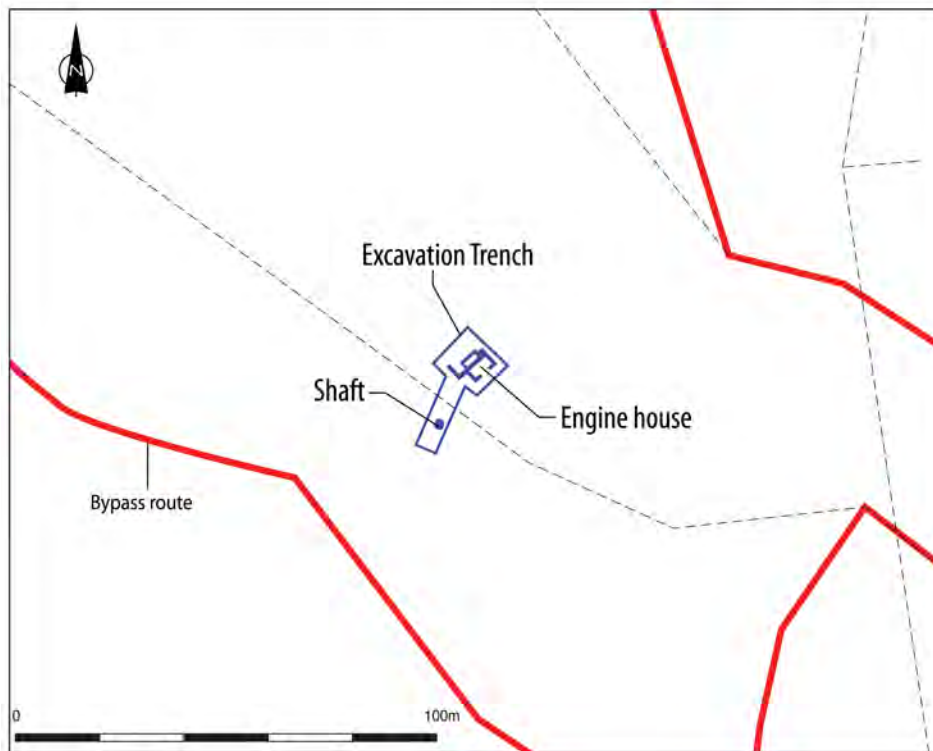
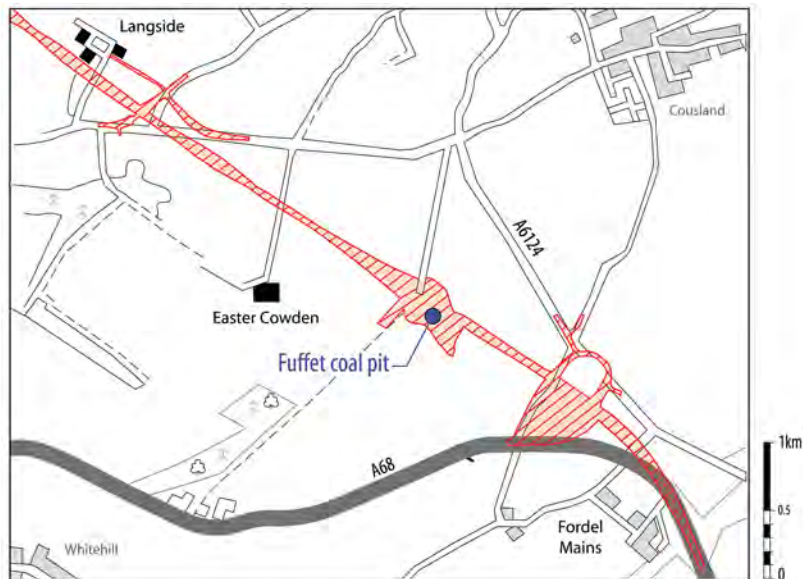
The works are typical of many early estate brickyards that emerged in the first half of the 19th century only to be phased out during the latter half of the century as the surrounding landscape was steadily improved. Brick manufacture became increasingly mechanised and industrialised by the turn of the century, which hurried the decline of the surviving, by then unprofitable, small-scale brick and tile works.

10.4 Fuffet engine house

10.4.1 Introduction

Fuffet engine house was located c 350m south of the A6124, south-east of Cousland and north of Fordel Mains Farm (illus 2.1 and 10.6). It was revetted into the northern slope of a V-shaped gorge, east of the Bellyford Burn. The burn appears to have been canalised – the land on either side of the burn consisting of an expanse of waterlogged wood, presumably associated with the mine workings and quarrying in the surrounding area.

Initial evaluation of the area identified two



Illus 10.6 Fuffet coal pit: trench location plan

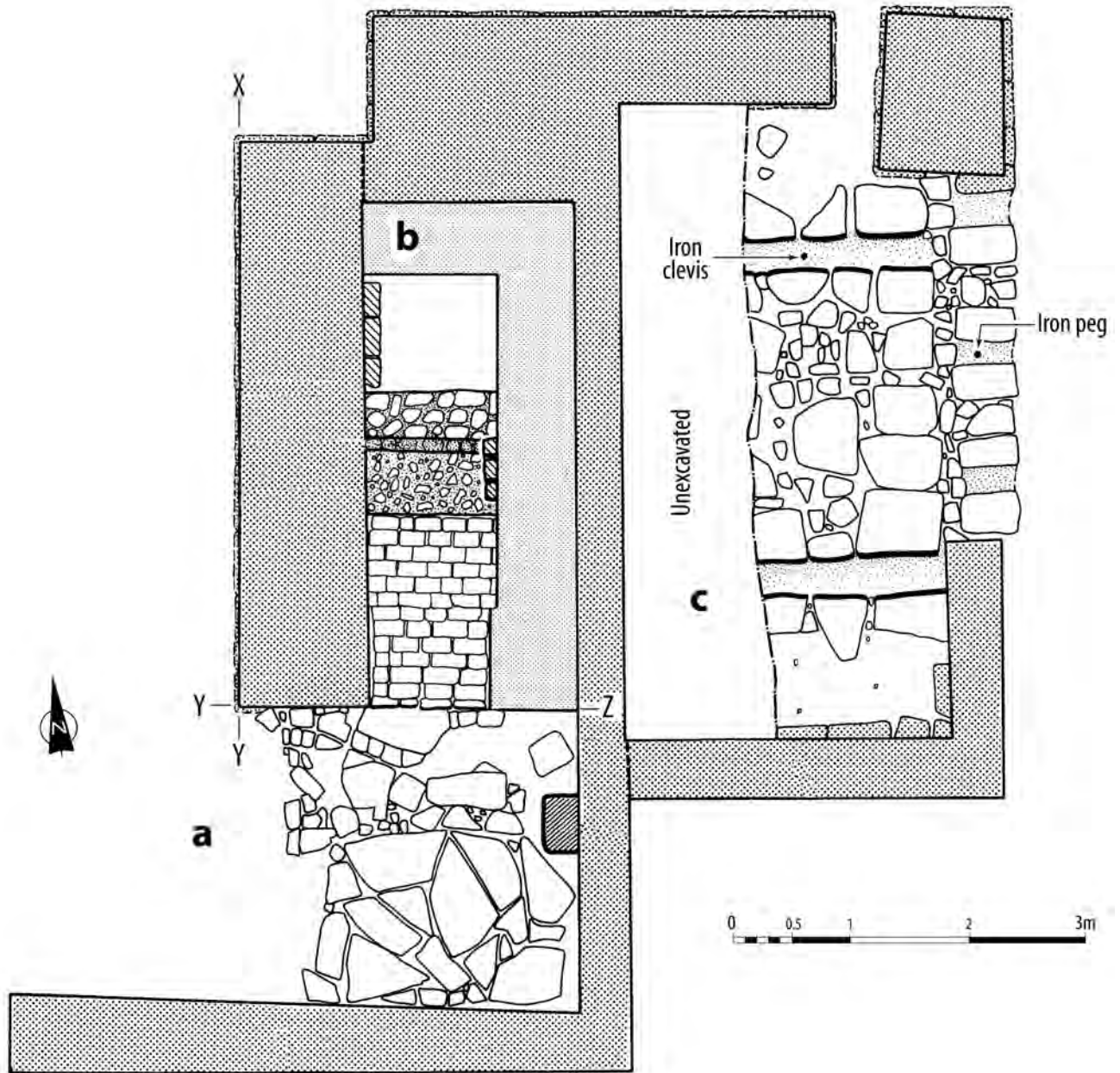
lengths of wall upstanding to 1.2m to 1.5m, located on the site of the engine house of Fuffet coal pit, present on the Ordnance Survey first edition 6" map (*Edinburghshire, sheet VII, 1854*). These walls were revetted into the hillside, overlain by industrial waste materials and were not visible on the ground surface.

Although the walls were located on the site of the engine house, the area is known locally as 'Potters' Brae' and was reputedly the site of clay extraction and possibly ceramic works, as the name implies (*Sinclair 1975, 179*). The purpose of further excava-

tion was therefore to identify and record the nature and extent of the building located during the evaluation, and to determine whether the building was related to the mine workings or was associated with manufacturing ceramics.

10.4.2 Methods

A single rectangular trench was opened over the known extent of features identified during the evaluation. A strip trench *c* 4m wide was also extended



Illus 10.7 Fuffet coal pit: plan of Fuffet engine house showing (a) coal depository; (b) boiler house; (c) engine compartment

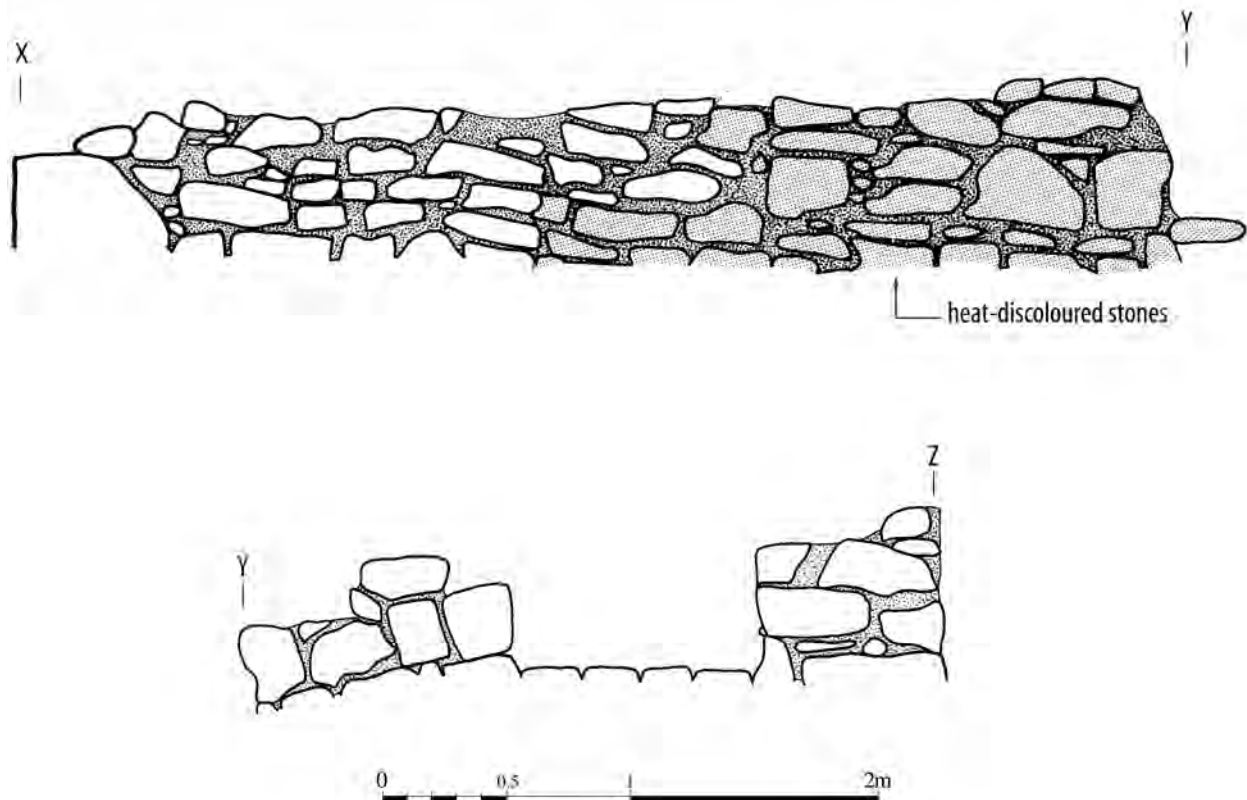
southwards from this trench across an oval depression, thought to be the plug for the shaft present on the Ordnance Survey first edition map (*Edinburghshire, sheet VII, 1854*). Neither this shaft nor any other remains associated with the engine house are depicted on the 1896 or 1909 Ordnance Survey second edition maps, indicating that they had been removed by late Victorian times.

10.4.3 Archaeological results

The engine house was found to be buried beneath dump deposits of industrial waste material. The structure was built with walls of mortared stone,

upstanding to 1.2–1.5m high. The burial of the structure by industrial waste and the redeposition of most of the artefacts means that the artefact assemblage is largely secondary, and interpretation therefore relies on the structural and cartographic evidence. The structural elements appear to define three compartments (*illus 10.7*):

- a) a coal depository, which consisted of a bowl-shaped flagged floor enclosed on two sides by a revetting wall, and an entrance to the west;
- b) the boiler house, consisting of a rectilinear compartment with an internal unbonded wall, floating partitions, a possible fire-box, and a brick floor;



Illus 10.8 Fuffet coal pit: sections: X–Y western elevation of boiler house wall; Y–Z southern elevation of boiler house entrance

- c) the engine compartment, consisting of a rectangular compartment with a large opening in the eastern wall and a roughly flagged floor. Two channels and three rectangular slots were located within the floor, presumably for mounting the steam engine and/or fly-wheel.

The boiler house was rectangular in plan and orientated approximately north to south. An internal mortared, unbonded wall abutted the eastern and northern walls, and a mortared, unbonded partition/supporting wall further sub-divided the interior into two compartments. The southern compartment contained the base of a probable fire-box lined on the south and east by internal brick facings, and a bricked floor led from this to the stoking entrance (illus 10.8). The coal depository, which consisted of a bowl-shaped flagged floor enclosed by a revetting wall on the eastern and southern sides, was located to the south of, and adjacent to the stoking entrance.

The deposits located within the boiler house appeared largely to relate to this compartment's use, with individual layers of ash and coal fragments surviving in situ. The two unbonded partition/supporting walls located within the boiler house most likely represent the remains of supports for the boiler. This archaeological evidence suggests a separate hearth under a 'haystack' type boiler, which would have been of low pressure (J Mitchell, pers comm).

The internal unbonded wall within the boiler house appears to have acted as an insulator, protecting the western wall of the engine compartment from the intense heat created in firing the boiler. This was supported by the evidence of the external western wall of the boiler compartment, which showed signs of exposure to intense heat with associated stone discolouration and fracturing of the wall (see illus 10.8). Such discolouration and fracturing was also visible on the abutting (insulating) wall, but not on the western wall of the engine compartment.

The Engine House itself was located adjacent and east of the boiler house. This structure was rectangular in plan and orientated north to south, with a large opening in the eastern wall. The floor of the engine house was flagged with large roughly shaped blocks, apart from two channels running east to west in the northern and southern ends of the room which appear to represent the remains of foundation beds, presumably for mounting the steam engine. An iron clevis (securing device) was located within the northern channel, along with iron bolts located in situ in three square unflagged areas of the floor within the eastern opening. The clevis was probably connected to a timber beam (J Mitchell, pers comm). The iron bolts probably provide the best indication of engine size (Bick 1968). The engine installed would have been an early type of beam engine, either winding or pumping, but probably the latter (J Mitchell, pers comm).

The engine compartment and the coal depository both contained large dump deposits of industrial waste materials including coal ash and slag-like concretions, as well as rubble and broken tile, which appeared to have been deliberately used as a levelling deposit. The flagged floor of the coal depository would have been bowl-shaped to aid the shovelling of coal by keeping it away from the walls and letting it gravitate it towards the stoking entrance of the boiler compartment.

Discolouration and fracturing were noted on the northern face of part of the revetting wall of the coal depository which appear to have been caused by the continued dumping of red-hot ash from the boiler house.

The shaft entrance was located approximately 9m to the south, but was not excavated for safety reasons.

10.4.4 The finds

The majority of the finds recovered were from the backfilled deposit burying the structure and cannot therefore be assigned to the structure itself. These consisted largely of broken tiles, nails, an iron plate and modern glazed pottery. A large quantity of slag and cinder was present, representing waste material from firing the boiler.

10.4.5 Conclusion

The excavations have confirmed that the site was occupied by an engine house, not by the suggested ceramics works. The plan of the structure has been exposed and this has enabled interpretation of the types of machinery used, including the boiler, and suggested that power was probably obtained from a pumping, rather than winding, engine.

The Fuffet coal pit site appears to lie on the boundary between the land owned by the Duke of Buccleuch and the Marquis of Lothian, just falling into the ownership of the latter. It is therefore

possible that the pit belonged to the Lothian Coal Company, but had such a short lifespan that it was not documented. The archaeological evidence is thus all that survives of this example of small-scale industrial coal-working in East Lothian. It has shown that the structure was more complex than that shown on the Ordnance Survey first edition map, and has offered an opportunity to examine a site with a considerable degree of preservation that was hitherto thought to have been destroyed.

10.5 19th-century industrial landscapes

This study has presented an opportunity to examine a series of sites of similar age and part of the same industrial landscape, although not all are directly related. In two cases the quality of preservation was considerably better than anticipated as the buildings had been buried under rubble during their demolition, thus preserving a considerable depth of structural evidence. The excavation of Smeaton and Fuffet therefore offers a cautionary note against discounting areas of potential industrial archaeological significance on the basis of desk-based assessments or field-walking studies.

One of the issues that sometimes arises in the planning of appropriate responses to such sites is how much information can be added to the record by excavation, as it is often assumed that 19th-century industrial features will have been well documented. In this case it proved hard to find many records that dealt directly with the sites. The excavation of the brick and tile works and the Newfarm Trench 1 building in particular produced in the former case a considerable amount of detail that desk-based research had not revealed and in the latter an unrecorded building. In all cases the excavations have shown a considerable amount of local expedience, for example in the insertion of the insulating wall in the boiler house, and in the rapid development of these industries, as shown by the evidence for two rapidly successive phases of works at Smeaton.

11 GENERAL DISCUSSION AND CONCLUSIONS,

by S Anderson

11.1 Introduction, by R Strachan

The evidence produced by the evaluation illustrated the survival of sites of differing periods to varying extents. It revealed information on the land use of this area from prehistory to the present day, both in terms of positive and negative archaeological evidence. The evidence appears to show a preference for early settlement on sands and gravel terraces by the River Esk, with much less settlement on the hard, compact clays to the east. However, the eastern half of the route has been subject to intense exploitation in terms of industrial extraction of coal and lime, industrial processing and modern farming techniques that may have truncated settlement evidence. It is therefore difficult to state how biased the archaeological record is, and whether the evidence demonstrates a preference for settlement on more forgiving subsoils such as sand and gravels or is just a result of selective evidence survival.

11.2 The prehistoric landscape

11.2.1 Neolithic and Bronze Age evidence

The earliest features identified on the route of the bypass were two pits which contained the sherds of a single, probably early, Neolithic pottery vessel. They were found on the site of the Roman temporary camp at Smeaton; other pits at this location could not be dated but may have been contemporary. Isolated pits of Neolithic date are a common finding in lowland eastern Scotland (Barclay 2003), although they were relatively infrequent within this transect.

Three re-cut features adjacent to the ring-grooves site contained a large assemblage of chipped stone, broadly dated to the late Neolithic or Bronze Age, which was not thought to have been re-deposited from surrounding soil. A heavily abraded sherd of handmade pottery was also recovered, unfortunately undatable.

On the opposite side of the valley at Newfarm, prehistoric finds were collected from four cut features and other contexts. Neolithic and Bronze Age lithics were recovered, mostly from unstratified contexts. Fragments of cannel coal objects may belong to the same period. One feature there contained an assemblage of Neolithic Impressed Ware pottery, and other undiagnostic prehistoric pottery was recovered from two other features. Although limited, this finds assemblage and the presence of pits does provide some evidence for settlement of Late Neolithic/Early Bronze Age date in this area.

A 'background scatter' of chipped stone flakes and

tools was seen in several areas, suggesting that the landscape was far from empty in this early period.

11.2.2 Later prehistoric sites

The three larger prehistoric sites excavated during this project were located to the west of the River Esk, in the area around Castlesteads, on gently sloping land with an underlying sand and gravel subsoil. Although dating evidence was generally lacking, parallels suggest that the main features would fit most readily into the first millennium BC.

The ring-groove structures are assumed to belong to an unenclosed settlement – no enclosure ditch or palisade trench was identified within the excavated area, nor in the evaluation trench to the west of the structures, and nothing is visible on aerial photographs. Other apparently unenclosed settlements containing structures of similar type have recently been excavated to the south of Newfarm (Thornbank, Rees 2002), some 2km further south at Eskbank (Lamb's Nursery, Cook 2000), and approximately 3.5km to the north at Inveresk (Neighbour 2007), but ring-groove structures also occur in small enclosed sites such as those at Fishers Road, Port Seton (Adams & Philip 2000) and St Germain's (Alexander & Watkins 1998), although these cover a wide date range.

About 150m to the east of the ring-grooves site, a large area of stone paving was uncovered, perhaps 14m in diameter, although the full extent was not exposed and later truncation had occurred. Unfortunately the only dating evidence for the paving is a fragment of saddle quern which could have been reused at any period from prehistory onwards. This feature has parallels in other slightly hollowed or 'sunken-floored' features, lined with flags or cobbles, which have been identified on Iron Age sites in the region and further afield. An example at Brixwold (Crone & O'Sullivan 1997, fig. 7) was oval, less than half the size of Castlesteads, lined with cobbles and appeared to contain a central hearth. An oval 'floored scoop' at Ironshill, Angus (Pollock 1997, 354) was closer in length to the Castlesteads example, floored with small pebbles and repair patches of larger stones (including a saddle quern) and, despite a lack of any post-holes in the excavated area, was interpreted as the possible remains of a ring-ditch house. An oval, cobbled, 'sunken-floored structure' at Fishers Road East, Port Seton (Haselgrove & McCullagh 2000, 20), measuring 11 × 5.3m, had a shallow slot containing packing stones for small posts which may have supported a roof; it was suggested that the processing of animal carcasses or drying

of skins could be possible functions, but that the feature most likely served some specialist function which was invisible in the archaeological record. The authors commented that it is 'best regarded either as a relative of the ubiquitous scoops and working hollows frequently encountered on Iron Age sites or as a variant on the regional tradition of scooped circular buildings with stone floors' (Adams & Philip 2000, 124). The same observation can reasonably be applied to the Castlesteads feature, although it is a fairly simple construction and a later date cannot be ruled out.

These structures, whether closely contemporary with each other or not, are likely to have formed part of a landscape which, over the course of the millennium, became more structured and controlled. The pollen evidence indicates that there was an expansion of cultivation in southern Scotland around 500 BC (Tipping 1994, 33) and this ties in with aerial survey, which suggests that 'evidence for an ordered and complex system of land division in south-east Scotland is considerable' (Brown 2000). Certainly the dates obtained from the Langside pit alignment suggest that it was extant at around this time. Such structured landscapes are not confined to the lowlands of Scotland, occurring for example in the north-east of England, on the Yorkshire wolds and in the fens of East Anglia. While acknowledging the regional differences, overall their complexity is thought to have increased as the first millennium BC progressed (Gosden 1997). Analysis of the dyke systems in the Yorkshire wolds has suggested that boundaries there probably had the expected functional uses – such as separating the herds of different communities or demarcating different areas of land use – but also had a broader significance, proving a social and symbolic aspect to the landscape, a sense of community identity, control of rights of access to and use of the land, and a feeling of stability (Bevan 1997). The presence of probable rights of way, in the form of trackways delineated by boundaries, also implies that some people may have been denied access to enclosed parts of the landscape. Pit alignments at Maxey in Cambridgeshire are thought to have been constructed in relation to other places, such as earlier ceremonial monuments, and Taylor (1997) points out that viewed from these places, an alignment would have appeared as a single linear boundary, the elements of which would not be individually discernible. In terms of function, it may be significant that pits of this type would form a barrier to cattle, but would be less impenetrable to sheep and humans. The large gaps within the short stretch of alignment at Langside would not fit with this theory, unless these areas represented passage-ways or 'gates' within the wider system. The theories of Rylatt and Bevan (2007), that such pits may be more a conceptual than a physical boundary, may be more relevant here.

A considerable amount of archaeological effort, in terms of aerial reconnaissance and interpretation, field survey and excavation has gone into the study

of the later prehistoric landscape in this broad area of the Esk Valley to the north of Dalkeith in recent years. It has indicated the remnants of a substantial system of pit alignments and several enclosed and unenclosed settlements (Halliday 1982; Brown 2002). In terms of the future, as Gosden has suggested, 'more needs to be done in relating the broader land boundaries to the topography, and in looking at the size and shape of fields and enclosures over time' (Gosden 1997, 305). It will also be important to obtain closer dates for settlements of this period, in order to provide a much tighter chronological framework for the development of the landscape and patterns of land use and settlement in this period (cf Haselgrove et al 2001, 31).

11.3 Roman temporary camp

The excavation at Smeaton Roman camp provided information on the character of the western perimeter ditch of the Roman camp. The ditch appears to have been cut and then allowed to silt up naturally, with no recorded evidence for re-cutting that might provide evidence of a secondary reoccupation of the camp. Evidence in the form of pottery has now tentatively suggested that the camp may be related to the Antonine occupation. It was not possible unambiguously to link any of the archaeological features identified within or adjacent to the camp with its occupation, although it was demonstrated that some of those features were variously of prehistoric, Early Historic, medieval or later and modern origin. The lack of archaeological evidence for intensive or even patterned internal activity associated with the occupation of the camp is naturally disappointing, but may be at least partly the result of truncation caused by post-Roman cultivation regimes.

11.4 Early Historic and medieval evidence

The only confirmed evidence for Early Historic activity found during this project was the probable corn-drying kiln of mid first millennium AD date located just to the west of the Roman camp at Smeaton. A similar feature, though without any evidence for burning, was located just to the north and may belong to the same period, as discussed above (Section 7.8.4). The Early Historic cemetery site of Thornybank, however, lay very close to the road corridor, and was extensively investigated in advance of realigning a gas main to permit the construction of the bypass (Rees 2002). Its northern limit was defined by the excavation and shown to be outside the road corridor.

Small quantities of medieval pottery were recovered from topsoil during fieldwalking, from the upper fills of some of the prehistoric features and from the upper layers of the Roman camp perimeter ditch. They are likely to be related to manuring

activity and demonstrate that the land continued in agricultural use during this period.

Lines of pits which appear to respect the line of the western Roman ditch at Smeaton could well belong to this broad period of activity, although none produced any dating evidence and they could be of any date from the Roman period onwards.

11.5 *The post-medieval landscape*

Study of the documentary evidence was carried out as part of the 2006 excavations to provide a historical background to the Salter's Road area of Newfarm and the Smeaton brick and tile works. This has shown that the 18th- and 19th-century landscape in this part of Midlothian was intimately connected with the large-scale improvements, garden design and industrial entrepreneurship of the local aristocracy, most notably the Duke of Buccleuch.

The parkland associated with the 18th-century Dalkeith House was not directly investigated as part of this project, but parts of the surrounding walls affected by the road construction were recorded. The study revealed areas of patched and rebuilt walling showing continued maintenance since their original construction. An ornamental seating area was uncovered, which would have provided panoramic views across the park. Management of livestock was provided by the wall itself, but also by structures such as the Castlesteads Plantation boundary, which was shown to be similar to a ha-ha in construction.

An association between the possible soakaway which cut the stone-paved area at Castlesteads and the formal gardens at Castlesteads House has been suggested. However, the plan of 1753 shows that the house and gardens were located further to the north than the present house and, based on the position of the river, the stone-paved area lay close to or within a trackway which separated the Castlesteads estate from 'Edmundstoun Ground' to the south. It could well have been a post-medieval drainage feature, but is unlikely to be directly associated with the formal gardens and perhaps had an agricultural function. The original Castlesteads was marked on a map of 1828 (Sharp, Greenwood & Fowler 1828), as was the new building, but by the Ordnance Survey map of 1854 the former was just a clump of trees, and the latter was marked as Castle Steads.

A ditch identified at the ring-grooves site may be part of a field boundary of post-medieval date. The line of the present boundary appears to have been established at some point in the early 19th century, based on map evidence, and this may well be the original ditch delineating an area of woodland to the west.

Traces of rig and furrow were identified at both the pit alignment site and the Roman camp. At the pit alignment it was clear that the furrows ran on a different axis, respecting the present land divisions rather than the earlier ones. Conversely, at the

Roman camp, it appeared that the perimeter ditch remained as a hollow when the furrows were cut, and that it had continued in use as a boundary for many centuries. The continued use of Roman ditches within late and post-medieval field systems has been demonstrated at other sites, and lines of trees shown on 18th- and 19th-century maps of the area suggest that this phenomenon may also have occurred at Smeaton.

A small building excavated at Newfarm was shown to have two phases of construction. Historical evidence suggests that it was probably inhabited by a string of workers providing labour for agricultural or industrial concerns in the vicinity. Nearby was a large boundary ditch which contained finds contemporary with the occupation of the building.

Nineteenth-century industry around Smeaton and Fordel Mains was represented on the bypass route by Smeaton brick and tile works and Fuffet coal pit. Neither site was well documented at the time of excavation and work as part of this project has shown that archaeological investigation can add significantly to our knowledge of sites like these. Their presence illustrates that the land use in the area, although still largely agricultural in nature, now included small-scale extractive and manufacturing industries, most of which declined within a relatively short period of their establishment.

Post-medieval pottery, glass and clay pipe fragments were recovered from several areas along the route of the bypass during the evaluation. Like the medieval wares, these are most likely a background scatter related to manuring.

11.6 *Conclusions*

Fieldwork along the proposed route of the Dalkeith Northern Bypass has provided us with a sample of the historic environment in this part of Midlothian, albeit in a narrow and not necessarily representative transect which was chosen through mitigation to avoid as much potential archaeology as possible. It has shown that there was activity in the area from the Neolithic period onwards. The greatest concentration of remains was to the west side of the River Esk, where there appears to have been intensive activity during the first millennium BC, including establishment of enclosed and unenclosed settlements and organisation of the landscape for agricultural – and possibly less prosaic – purposes. Onto this structured landscape, the Roman army imposed a large camp on a new alignment. Although temporary in nature, it was to determine the orientation of field boundaries in the immediate area for many centuries to come. Despite this, knowledge of the site had been lost by the 19th century and it does not appear on any maps. By this time the largely agricultural and estate-managed landscape was developing to incorporate new industries, still largely under the control of the local landlords,

generally small-scale and ultimately doomed to failure. By the 20th century, the area was once again predominantly arable and pastoral land, thus allowing the discovery of prehistoric and

Roman remains through aerial photography and, subsequently, furthering our knowledge of archaeology in Midlothian through these and other recent excavations.

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