

**Floodgate Street,
Deritend Island, Digbeth
Birmingham;
Archaeological Excavations 2002**

**Post-Excavation Assessment
and Updated Research Design**

Birmingham University Field Archaeology Unit
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**Floodgate Street, Deritend Island, Digbeth, Birmingham;
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by J. Williams

with contributions by
M. Ciaraldi, A. Hammon, S. Litherland, E. Macey, I. Tyers and S. Ratkai

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1.0: SUMMARY

An urban archaeological excavation was undertaken by Birmingham University Field Archaeology Unit (BUFAU) on a plot of land encompassing most of the street block defined by High Street Digbeth, Floodgate Street, Milk Street and Moore's Row, in Digbeth, Birmingham. The work was carried out in advance of an extension to the grade II listed former Birmingham Education Board school fronting Moore's Row, that is now part of the South Birmingham College. The excavation was commissioned by Nicol Thomas Limited on behalf of Marcity Developments, and followed a desk-based assessment and archaeological evaluation. The fieldwork identified four main periods of activity across the site, medieval, which may be further broken down into earlier 12th and 13th century, and later 13th and 14th - sub-phases of activity, earlier post-medieval (15th/16th-17th century), later post-medieval activity in the 18th century, and 19th-century and modern build up and levelling.

Now a relatively undifferentiated central part of the city, the site lies in the bottom of the Rea valley at the boundary between two districts, Digbeth, in the former manor of Birmingham, and Deritend in the parish of Aston. The River Rea has traditionally marked the boundaries between these two districts, but until the 18th century it meandered in several channels along the valley floor here, and to this day it remains very difficult to say with certainty exactly where Digbeth ends and Deritend begins. In fact, this street block was called 'Deritend Island' because it was virtually surrounded by river channels on three sides, and one of the primary medieval routes into and out of Birmingham on the other. The 'island' itself is a natural gravel knoll that made an easy crossing point of the river. Water management, both as a positive resource, and, more negatively in terms of drainage, played an important part in the earlier history of the site. Fortunately, man-made changes of ground level, and natural agencies such as soil creep down the valley sides and the deposition of alluvium by a river that regularly flooded, have combined to seal and preserve significant archaeological deposits beneath over two metres of ground - so that this site can, with some justification, be called Birmingham's historic waterfront.

There was an initial colonisation of the island probably in the 12th century and an apparent rationalisation of this plot pattern in the later 13th century. This was followed by the progressive exploitation of the water resources by industries such as tanning, and possibly metal-working, certainly from the 16th to later 18th centuries and possibly slightly earlier. Later, all of this activity was sealed under an extensive leveling episode to prevent continued flooding in the 19th century.

The medieval activity was mainly focussed upon the High Street frontage. A large ditch, parallel and adjacent to this road, may have been cut to aid drainage for a causeway across the island to the Deritend Bridge. Ditches and gullies possibly representing a fence and property boundaries for buildings along the High Street were found, some having a clearly altered alignment. Traces of this apparently domestic occupation were also found in the form of post holes for structures together with small pits. The pottery assemblage for this later medieval activity was mainly 13th to 14th century in date, including a good representation of the local Deritend ware known to have been produced nearby in the vicinity of the grade II listed Old Crown.*

Post-medieval industrial activity was concentrated around a large pool, or tank, fed and drained by two wood-lined drains of later 16th date. Evidence for tanning was provided by a large quantity of leather and horncores, and tanning and lime pits in and around the backfilled pool. It would appear, on present evidence, that this change of use took place some time in the later half of the 17th century. Other features from this period included two ditches, that were possibly property boundaries, and a number of refuse pits and post holes.

Several brick walls, mainly located on the southern and eastern fringes of the site, are likely to be 17th and 18th century in date. The southern walls were part of the sunken ground-floor of two pubs, called The Old Leather Bottle and The Three Crowns, that appear from 19th-century illustrations to have been 17th century in date with 18th-century alterations. Five wells - one of which was begun but never finished - and two small brick structures, one containing a large quantity of glass, were also located and were associated with the on-going tanning activity here which had become more rationalised and ordered. The whole site was later covered by 19th and 20th-century cellars and building foundations cut into the 'made ground', but, fortunately, these had not truncated the earlier archaeological deposits to any great extent.

2.0: INTRODUCTION (Fig. 1)

2.1: Background by Steve Litherland

This report describes the results of an archaeological excavation at Floodgate Street, Digbeth, Birmingham (centred on NGR SP 407800 286380, Fig. 1, hereafter referred to as the site). BUFAU were commissioned to undertake the archaeological excavations by Nicol Thomas Limited on behalf of Marcity Developments, in accordance with guidelines laid down in Planning Policy Guidance Note 16 (Department of the Environment, November 1990) and Policy 836 of the Birmingham Plan produced by the City Council. The archaeological fieldwork was undertaken in advance of the construction of an extension to South Birmingham College, and was carried out in accordance with a Design Brief prepared by the Council (Hodder 2001), and a Specification prepared by BUFAU (BUFAU 2001), and approved by Dr Mike Hodder, the Birmingham City Council Planning Archaeologist. This assessment report has been

prepared in accordance with English Heritage guidelines laid out in the Management of Archaeology Projects (MAP 2).

A desk-based assessment, undertaken as part of the Digbeth Economic Regeneration Area and the Cheapside Industrial Area, included the proposed development site (Litherland 1995). This assessment noted the presence of a rival medieval market place in Deritend, in a wider part of the High Street in the vicinity of the Old Crown Public House, built c.1500. The proximity of the market place and the important crossing of the River Rea gave weight to the potential for medieval deposits surviving in the area. The assessment also noted that the area was susceptible to flooding, and comparison with other known parallels of river valley occupation (e.g. Carver 1987, 127), this pointed towards a model of more piecemeal development of the site. It also raised the possibility of good preservation of archaeological deposits because of the need to progressively raise the ground level within the island and maintain good drainage around it.

Today the site is bounded by Floodgate Street to the southeast, Milk Street on the northwest, Digbeth High Street to the southwest and Moore's Row to the northeast (Fig. 2). The site lies just to the west of the canalised modern line of the River Rea and Deritend Bridge, and was occupied by a mix of 19th and 20th-century buildings and various car parking areas. Two of the buildings are statutory listed and were therefore retained as part of the overall design scheme. The site is situated at the bottom of the Rea valley in an area that until comparatively recent times was prone to severe flooding, mainly caused by excessive run-off from the impervious Mercia Mudstones that in general line the valley floor. However, pockets of better-drained sands and gravels are also found within the valley floor and the site is situated on one of these. These better-drained areas were important because they often provided a readier means of fording the Rea. The Deritend ford was one of only three in the Birmingham area and so several routes clustered around this local bottleneck from the prehistoric period onwards.

Before canalisation the Rea was a much broader river, with many channels and meanders here. One such channel used to run down what is now the line of Milk Street, until it silted up in the late 17th or early 18th century. Therefore this 'island' of ground was completely surrounded by watercourses of one type or another, and because the boundary between the manor of Birmingham and the parish of Aston was defined by the Rea at this point in the medieval period, this was the reason that it was called Deritend, rather than Digbeth, Island. The Rea formed the south eastern boundary of the Lord of Birmingham's two deer parks, the Holme Park to the south west and the Little or Over Park to the north east, and the place name 'Deritend' may even have derived from Deergate-end. The river also provided two particularly valuable resources for the medieval manor, power to drive a mill, later called the Heath Mill, and hay meadows for feeding cattle. However, the river was not the only source of water in this area. In addition, a series of streams drained down the south east-facing slope of the Rea valley, fed by water emitting from the junction of the porous sandstone and the impervious Mercia Mudstone along the line of the Birmingham fault. These watercourses, of which the Hersum's ditch was probably the best documented from the 14th century until the 17th century, were progressively culverted and controlled in order to supply various industries, which we

know from excavations elsewhere in the town included fulling, tanning, hemp retting and blacksmithing (Burrows *et al.* 2000; Burrows and Martin 2002; Litherland *et al.* 1994, Mould 2000 and 2001; Watts *et al.* 1981).

Therefore, the topography of 'Deritend Island' would have looked very different throughout the medieval period and into the post-medieval period. Firstly, while lower lying than it is today (it was necessary to remove up to 2m of 19th century and later overburden before excavations could begin), it was still a recognisable knoll within the surrounding floodplain. The water of the River Rea would have lapped up against the south eastern and north western sides of the island, while to the front of the island was the 'cawsey' or main road carried over the Rea by two fords or later bridges over the channels of the River Rea on each side of the island. This road had probably always been slightly raised on a causeway, possibly with ditches on either side, and the place name 'Digbeth' may have been derived from the topographic term dyke path.

A more detailed desk-based assessment of the site was carried out as the first stage of a specific archaeological response to the proposed development of South Birmingham College (Watt 2001). This found that two public houses had occupied plots on the frontage of the High Street from the 17th to the late-19th century. It also indicated that part of the site had been used as a tanyard during the 18th century. However, it was also noted that this may have been the continuation of a much older tradition of skin-working in the district, dating from as early as the 15th century. By the 19th century a forge was in operation on the site. The assessment predicted the classic urban pattern of islands of archaeological survival being likely where cellaring did not exist. Subsequent evaluation of the site by means of trial trenching by BUFAU demonstrated that below-ground preservation was generally even better than anticipated across the majority of the site, with particularly well-preserved 17th-century waterlogged deposits surviving (Williams 2001).

2.2: Aims

The aims of the excavation were to:

- (1) contribute towards an understanding of the early development of Digbeth and Deritend.
- (2) define the morphology of the archaeological remains and determine their character, development and chronology.
- (3) examine the pottery chronology.
- (4) contribute to the understanding of domestic and industrial activity within medieval and post-medieval Birmingham, with particular reference to other sites of similar date recently investigated within the city.

3.0: METHODOLOGY

Due to the physical constraints of the site a succession of three areas were opened (Fig. 2). Area A was located in the northern part of the site; Area B the centre, and Area C covered the southwestern part of the site. The total area excavated was approximately 1100 square metres. All overburden and backfill from cellars was removed by mechanical excavator, under direct archaeological supervision, to expose the uppermost level of the archaeological deposits (Plate 1). The edges of excavation were battered for safe working.

Sampling by hand comprised:

- a) not less than 50% of discrete features. A higher percentage was excavated where more information was required to understand the date, character and function of an individual feature or group of features.
- b) 100% of features with a probable industrial function.
- c) not less than 25% of linear features associated with settlement.
- d) hand dug sections across other linear features to determine their form, date, function, and to determine the stratigraphic sequence.
- e) samples for environmental analysis were collected from datable feature fills and waterlogged deposits. Sections of timber found were sampled for analysis and dendrochronological dating.

Recording employed separate running numerical sequences for contexts (four digit numbers) and features (three digit numbers, prefixed by an 'F') in each of the three areas:

Area A – Features from F100, contexts from 1000

Area B – Features from F200, contexts from 2000

Area C – Features from F300, contexts from 3000

Linear features which had more than one section excavated through them were assigned a structure number (L1-L11). Features include negative features such as ditches, pits and post-holes as well as positive features such as walls. Contexts include feature fills, discrete layers and the make-up of positive features. Recording was means of pre-printed *pro-formas* for contexts and features, which were supplemented by plans (1:50), sections (1:20 and 1:10), and monochrome, colour slide and colour print photography.

Subject to permission from the landowner, it is proposed to deposit the finds and paper archive with the Birmingham City Council approved archive store. The finds and paper archive relating to the evaluation stage of the project are presently held at BUFAU.

4.0: RESULTS (Fig. 3)

The results from the excavation have been provisionally divided into four phases, defined according to the finds spot-dating and stratigraphic data, as follows:

- Phase 1* *Medieval (12th-13th century)*
- Phase 2* *Early Post-Medieval (16th-17th century)*
- Phase 3* *Later Post-Medieval (18th century)*
- Phase 4* *19th-20th century*

In each area the natural subsoil, a yellow-brown gravel (1004, 2011, and 3035), was revealed 2.5m to 3.5m below the modern ground surface. A natural channel (F229) was discovered cutting the gravel in area B, but underlying a yellow-brown silty clay alluvium (1008, 1061, 2013, 3001) between 0.2m and 0.5m deep, which covered the gravel across the whole site. There was also a layer of grey silt (3007) which was observed towards the northern end of Area C. No dating evidence was recovered from it, however it was cut by one of the earliest Phase 1a gullies (L9).

Phase 1: Medieval (12th-13th century)

Evidence for this phase of occupation survived only in the south western part of the site. It has been possible to divide this period into two sub-phases based on the alignment of ditches, and the initial pottery spot dates. The pottery evidence suggests that the first phase of occupation occurred some time in the 12th century (Phase 1a), with later redevelopment taking place in the mid-13th century.

Phase 1a occupation appears to have been based on, and laid out to the north of, a large ditch (L11) which was orientated northwest-southeast. The ceramic evidence suggests that these features were contemporary and that they were related to domestic occupation of the site during this period. The large ditch (L11) may have been associated with the causeway over the River Rea, with two small pits or large postholes (F318 and F319 situated in the ditch) being part of a timber revetment associated with the causeway. Unfortunately no datable material was recovered from their fills, however, stratigraphically they were either earlier or contemporary with linear L11.

Ditch L11 ran along the southern edge of excavation, thus the main area of excavation targeted occupation lying to the north. This comprised a series of ditches; L9 and L10 were parallel to L11, with F209 at right angles to them. There appeared to be a terminus at the western end of L10, but it was truncated by cellar walls to the east. Other features of the same date included two postholes that also appear to follow the line of L11. Posthole F315 contained stone packing with the remains of a post surviving in-situ, and pottery dating to the first half of the 13th century was recovered from its fill. A second posthole (F308), to the east, was truncated by a Phase 1b linear (L6). They may represent the remains of a fence following the line of the causeway and ditch.

The second medieval phase (Phase 1b) was laid out on a true north-south-east-west alignment, and had a ditch (L6) running up the centre of the site at right angles to the modern street frontage. New plots were laid out the east of the central property boundary, which were further sub-divided by two gullies (L7 and L8) on an east-west alignment. The eastern end of gully L8 appeared to terminate, but the western side was truncated by a Phase 2 channel so that the exact relationship with the main ditch could not be ascertained.

Phase 2: Early Post-Medieval (16th-17th century)

Between the 13th century and the 16th century the site took on a much more industrial character. In fact, Phase 2 occupation can also be divided into distinct phases, with the division being based on changes in usage. The type of occupation also differed between the backplot area of the site and its frontage onto the High Street. The only surviving remains of this date along the frontage were the very truncated remains of several postholes (F307, F309 and F322), that may have been related to two 17th-century public houses for which there is documentary evidence.

In contrast, features dating to this period within the backplot area were much more substantial. The principal, and earliest, feature was a large tank, or pool (L1), orientated north-south. It was approximately 9m wide, c.1m deep, and contained large quantities of wood, 16th-17th century pottery, tile, leather, animal bone and horncores. A gravel bank (L5), immediately overlying the alluvium, had been constructed along the western edge of the pool, and was probably made from the upcast generated from digging the pool. A smaller channel, or leat (L2), fed into the north-western corner of the pool. The western end of the drain was closed and had a cover, the eastern end was narrower where a wooden drain (F137) set with upright timbers had been constructed. Below the eastern end of the drain was a small pit (F139), containing gravel and slag, that appeared to have been cut through the gravel bank (L5). At the southern end of the pool a second leat (F210) ran off from the southeastern corner. This channel also contained a covered timber drain (F227), and, once again, slag was recovered from the eastern end.

To the east of the tank, or pool, ditch L3 followed the same north-south alignment, and may have acted as a run-off channel when the sluice gates were closed. This ditch was later replaced by a much straighter channel, on the same alignment (L4), that contained degraded wood. The wood may have been the robbed-out, or cleaned-out, remains of a wooden drain similar to those discussed above.

Following the abandonment of this complex of features the area was used as a tannery, and a large pit (F117/F218), containing horncores and pottery dating to the mid-late 17th-century, was cut through the backfilled pool. Other features associated with the tannery included a cluster of sub-circular lime pits, pits, and postholes (F105, F111, F112, F115, F116, F123 and F211), at least one of which (F112) was lined with wooden barrel staves. Pits F115 and F123 had been cut through the gravel bank, and F211 cut through a Phase 1b ditch. Rectangular pit F228, and sub-square pits F119 and F120 may also have been associated with the tanning complex, as the combination of circular pits alongside

rectangular ones is usual in tanneries of this date (Shaw 1996, 80). Another, larger, pit (F306) containing leather, slag and residual medieval pottery was also dated to this period. Although the pit lay nearer to the street frontage, the industrial nature of its contents suggests that it was associated with the tanning complex, rather than domestic occupation.

Phase 3: Later Post-Medieval (18th-20th century)

This period was once again dominated by industrial activity across the site, with tanning and leather production at the fore. Towards the end of the 17th century, or more probably, in the early 18th century the tanning complex was rebuilt in brick. A possible boundary wall (F121, F122, and F134), associated with two square brick structures (F108 and F109) and a small channel (F135), were constructed along the eastern side of the site. F108 contained significant amounts of 17th-century glass (including two near-complete onion bottles (Macey below) as well as late 17th-18th century pottery. F109 contained pottery dating to between 1720 and 1760. The orientation of the wall suggests that the plot boundaries continued to reflect those laid out in the medieval period.

Later in the 18th century the tanning operation was scaled up and modernised, with a new brick-built complex being laid out fronting directly on to Floodgate Street. Structure 1 was orientated east-west and was probably the southern wing of a complex of buildings ranged around an open yard. It was identified as a probable tanhouse because its internal features; the bases of a series of sunken brick vats (F202, F203, F204, F205, F214, F219 and F220) were arranged down the sides of a centrally aisled building. The structure also incorporated two wells (F206 and F213), and two more (F107 and F129) were located further north in the tanyard itself. A pit (F226), that cut a phase 2 pit may also date to this period. A second pit (F128) that contained 18th century pottery underlay Structure 2, and had been truncated by a later pit. Closer to the frontage of the High Street there was the remains of an unfinished well (F311), almost certainly associated with domestic backplot activity, as well as two walls that abutted each other (F320 and F321) and were orientated at right angles to the frontage.

Phase 4: 19th-20th century

Several small pits and shallow scoops near to the frontage of the High Street (F310, F313, and F314) probably date to the demolition of the Public Houses in the 19th century. Other late-19th-century developments included the construction of commercial buildings along the eastern side of the site, once again fronting on to Floodgate Street. The remains of a cellar (F124 and F126) belonging to one of these buildings (Structure 2) was excavated in the northeastern corner of the site. Other fragments of wall dating to this period include F130, F132, F133, F136 and F217 to the south of the cellar. A gully (F216) may also date to this period. Further cellar walls and cellar backfill were removed by machine, a context number was assigned for the overburden in each of the 3 areas (1000, 2077 and 3000).

5.0: DISCUSSION

Evidence for activity in the Medieval period was largely concentrated towards the frontage of Digbeth High Street. A large ditch roughly parallel with the south boundary of the site may have been associated with the causeway-carried main road into Birmingham across the River Rea. A series of other ditches and gullies set at right angles to this ditch probably represent property boundaries and possibly even buildings along the High Street. These features were generally represented by postholes and small pits and were dated to the 12th and 13th century by the pottery in their fills. Later medieval features, particularly a long and straight boundary ditch, were on a different alignment which was more perpendicular to the present day road frontage than the earlier ditch. This realignment may have been the result of the solidifying of the road line following the construction of a more permanent pair of bridges over the Rea. This later medieval activity was dated by 13th-14th century pottery, including Deritend ware, which is known to have been produced further along the High Street, close to the Old Crown pub in Deritend, and elsewhere in Birmingham as well.

Post-medieval activity was far more industrial in character and tended to be concentrated in the centre of the site in what would have been the backplot area. Here a large centrally-positioned tank, or pool, was either fed by the branch of the River Rea to the north of the site, or a culvert running down the rear of the building plots fronting Digbeth. This feature appears to have had an industrial function and may have been used for tanning. Although the evidence is equivocal further environmental analysis may help to clarify this point. The pool and sluices appear to have been operational during the 16th century, although they may have been constructed as early as the 15th-century. Two smaller culverts, one located at the north west or upper corner, and the other one at the south east or lower corner of the pool, contained wood-lined drains and must have been for feeding and draining the pool respectively. The dendro-chronological dates for the drains were later 16th century. While the exact function of the pool remains unknown at present, it clearly acted as a large silt trap - akin to a flotation tank used in archaeological environmental processing - for the upper channel contained good evidence of plant remains that had probably collected here when the sluice was shut off, while the lower channel contained a quantity of slag and heavier clay deposits carried off when the pool was drained. While the metal slag may point to metal-working on the site, equally, and perhaps more probably, it may have been carried by the kinetic energy of the stream from much higher up the hill. Preliminary dates from the pottery suggest that the pool had fallen into disuse by the late 16th century and was being deliberately backfilled upto the mid 17th century. A large quantity of leather, horncores and animal hairs was also found in the backfill of the pool, which points to a phase of tanning activity after the pool fell into disuse some time in the late 17th century.

Following the backfilling of the pool several features associated with tanning was cut through it. These features included lime pits, barrel-lined pits, and rectangular pits, as well as pits containing the by-products of leather making; horncores and fragments of leather. No evidence for any structures associated with this phase of tanning was recovered from the site, but this may have been due to truncation. However, it has been

noted (Shaw 1996, 77) that pits located within structures were more often all circular, whilst those in the tanyard itself were generally mixed, with circular pits lying alongside rectangular pits, as was the case at Floodgate Street. In the tanyard at the Green, Northampton, at least one pit contained well preserved barrel staves, similar to F112 here. It is interesting to note that the dendrochronological analysis of the barrel from Floodgate Street identified the wood as deriving from western France and dated it to the mid-16th century. It is tempting to see the barrel being imported containing wine from Bordeaux and its re-use in a tanning complex of the 17th century being due to the proximity of the tanyard to the public houses on the High Street.

Along the High Street frontage two boundary ditches and a number of refuse pits and postholes may have been associated with substantial timber-framed buildings constructed sometime in the 15th or 16th century. These were later replaced by the brick-built 'Old Leather Bottle' and 'Three Crowns' public houses which were demolished in the late 19th century. Due to the continual need to make up ground within the river valley these buildings had protected the earlier archaeological horizons beneath their respective footprints.

A number of brick features including walls, brick-lined wells, and platforms or bases of brick vats were associated with the later development of the 18th century tanyard depicted on the **** Prospect of Birmingham in 1732. These buildings were associated with the cutting and subsequent development of Floodgate Street itself. The whole site was overlain by 19th and 20th century cellars and associated demolition layers. These were mostly removed by machine during the excavation, however, remarkably, these disturbances had also not destroyed earlier archaeological horizons to any appreciable degree.

6.0: ASSESSMENT

6.1: Stratigraphic data

As described above, the features and deposits recorded on site can be divided into four phases, dating from the 13th-14th century through to the 20th century. The majority of these features and deposits have been dated, either by chronologically diagnostic artifacts recovered from their fills or by their archaeological stratigraphic relationship. Further analysis and definition of the stratigraphic sequence will contribute to the research aims stated in Section 2.2 and revised in Section 6.2 below.

6.2: Quantification

Tables 1-2 quantify the evaluation and excavation archive.

Record	Quantity
Contexts	206
Features	94
Assemblage summaries	94
Colour prints	41
Colour slide	206
Black and white prints	146
Drawings	41
Env. Sample record files	1
Survey file	1

Table 1 Quantification of paper archive

Material type	Quantity
Ceramic: tile	322
Ceramic: brick	43
Mortar	3
Medieval pot	432
Post-medieval pottery	538
Clay pipe	4
Crucible/mould	3
Other ceramic	1
Iron nails	1
Other iron	16
Copper alloy	1
Other metal	2
Slag	12
Bottle glass	76
Window glass	2
Other stone	1
Worked bone	1
Animal bone (g)	43528
Shell	11
Leather	70
Wood	5
Slate	2
Coal	3

Table 2: Quantification of excavation finds archive

6.3: Artefactual data and statement of potential

6.3.1 Pottery by *Stephanie Rátkai*

Introduction

The pottery was examined macroscopically and divided into ware groups, using a similar system to that employed in assessment reports for Edgbaston Street and Park Street, Birmingham. The medieval wares are broad generic groups which generally contain more than one fabric. The pottery was quantified by sherd count and each context was spot dated. A total of 970 sherds were recovered, of which 432 were medieval, 524 post-medieval, and 14 modern.

Phase 1

A small number of medieval wares were present. The dominant ware with 153 sherds was greyware. The greywares were hand-formed and wheel-finished and consisted almost entirely of rounded cooking pots with angular everted rims. A macroscopically identifiable sub-group of reduced wares was made up of Warwickshire County Type Series fabric RS01: Warwickshire medieval blackware. This sub-group was represented by only 13 sherds in Phase 1. The second largest group was iron-rich sandy cooking pots. There were few diagnostic sherds in this group. A number of fabrics were discernible with the naked eye. One of these was quite coarse, micaceous, with oxidized surfaces and prominent grits. Some of these were quartzitic but others appeared to be igneous and sedimentary. There were very few glazed wares. These fell into three main groups. The best represented was Deritend Ware, with only three iron-rich glazed wares and one iron-poor glazed ware. There was a single whiteware sherd.

All these ware groups were identified at Edgbaston Street, Park Street and Moor Street, Birmingham. However, the relative proportions of the ware groups at Floodgate Street is markedly different. The dating of the reduced wares is as yet uncertain. Fabric RS01 was in use in the 13th century and is often associated with wheel-thrown glazed wares of c.1250-1325, but there is some evidence to suggest that it may have been in use in the earlier 13th century and possibly the late 12th century. Vessel and rim forms in RS01 are much the same as those found in the reduced wares so a 13th century date is probable for them also. Deritend ware dates to the 13th-early 14th centuries. The similarity of Deritend ware forms, manufacture and decoration to London type ware is clear, which suggests that Deritend ware may have been first produced in the first half of the 13th century. The remaining sherds in Phase 1 are not closely datable. It is, however, significant that there was only one whiteware sherd in Phase 1 and only five whiteware sherds overall. Whitewares are generally well represented in the second half of the 13th and 14th centuries. Their near absence from Floodgate Street suggests that most of the medieval activity occurred before c.1250 and certainly before 1300.

There were three intrusive sherds (two coarseware sherds and one cistercian ware sherd) in the Phase 1 pit F209, which presumably represented trample into the upper surface of the backfill.

Phase 2

There was a small amount of residual medieval material in this phase, largely caused by post-medieval pit digging into backfilled medieval features. However, the residual material fell into two groups; that which was derived from Phase 1 occupation i.e. dating to the 12th or 13th centuries and a second group of late medieval early post-medieval transitional wares i.e. dating to the 15th-16th centuries. These consisted of cistercian ware, late redware (lrw), iron-rich and iron-poor transitional, and Midlands Purple ware.

The coarsewares which formed the bulk of this phase group contained a number of vessels with a sandy well-mixed brick-like orange fabric. This seems to be an early coarseware fabric dating to the 16th (and early 17th) century and is quite different from the coarse poorly prepared and streaky clay bodies seen in coarsewares of the mid-late 17th century. In addition, some of the iron poor sandy coarsewares with olive-tan glazes can be paralleled by material found in the construction trenches of Building A at Dudley Castle, dated to the 1530s (pers inspection by the author). On balance it seems most likely that Phase 2 activity dates from the 16th century and continues into the 17th century. This then limits the residual material in this phase purely to that disturbed from Phase 1.

Several 17th century wares are noticeable by their absence. There were no slipwares or manganese mottled wares, which are normally ubiquitous in the second half of the 17th century, which suggests that there may have been an hiatus in occupation. There was one feature tanning pit F117/F218 which contained what appeared to be mid-late 17th century pottery. Even then this was in fill (1033) whilst the second fill (2034) contained pottery dating to the first half of the century including a Frechen Bartmann bearing the Coat of Arms of Amsterdam (directly paralleled by Hurst *et al* 1986 Plate 44, middle vessel) and dated 1625-50.

Three Phase 2 features may belong to a later phase. Feature F310 contained only industrial slipware and pearlware sherds dating to the early 19th century. Features F100 and F101 from boundary ditches L4 and L3 respectively contained 18th century pottery. F100 had white-salt-glazed stoneware, porcelain and creamware sherds and F101 had creamware sherds. In the case of F100 the other sherds were blackwares and coarsewares which could be contemporary with the 18th century material, and it is by no means certain (although not impossible) that the creamware sherd in F101 is intrusive.

Phase 3

Only five features F108, F109, F128, F204 and F311 produced pottery datable to this period. F311 contained residual 17th century material only, F128 a coarseware sherd, and F204 a blue transfer printed pearlware sherd. F108 and F109 were two related square brick built structures. F109 contained four white-salt-glazed stoneware sherds dating to c.1720-1760/70, twenty nine coarseware and blackware sherds and two medieval sherds. The medieval sherds suggest that at least some of this material must have been redeposited. Some of the blackware sherds from this feature were of poor quality and almost had the appearance of wasters. One blackware mug base contained a thick grey burnt deposit. The fill of F108 contained a group of forty unglazed coarseware wasters. These were all from large bucket shaped flower pots with a central hole in the base and

three holes spread equally around the lower wall of the vessel c.2cm above the base. The pots were decorated with a thumbled cordon 2-3cm below the everted right-angled rim. There was a roughly equal number of black-glazed coarseware sherds. These were generally poor quality and may also have been wasters. At this stage it is difficult to date the pottery from F108 very closely but a date range of late 17th-early 18th century seems likely.

Phase 4

The pottery from this phase comprised mainly post-medieval coarseware and blackware. There were two medieval sherds of 13th century date. The lack of 14th and 15th century pottery in the overburden reinforces the idea that there was an hiatus of occupation in the medieval period.

Discussion

Although the assemblage from Floodgate Street was comparatively small it has the potential to increase our knowledge of the early development of Birmingham and its industries. The site appears to contain a group of quite early medieval pottery and is significantly different in character from assemblages from other sites recently excavated in Birmingham.

The post-medieval pottery appears to represent, in part, the earliest examples of this tradition dating to the ?mid 16th-mid 17th centuries and, as such, is somewhat earlier than assemblages from Edgbaston Street, Moor Street and Park Street. It therefore fills a gap in our knowledge concerning the transition from the medieval tradition to the post-medieval tradition in Birmingham. The pottery when compared to other Birmingham assemblages has very good potential for refining both medieval and post-medieval chronologies not just on a local level but regionally.

The post-medieval assemblage has also revealed a hitherto unknown phase of pottery production in Digbeth. This throws new light on the substantial clay pits discovered nearby during excavations at the Custard Factory. It was assumed that these were associated with brick making in the absence of any evidence of post-medieval pottery production in the area. Clearly, references to cartographic sources would be helpful in determining the likely date of the clay pits and by inference the date of the wasters and possible wasters from F108 and F109. It may also be useful to have the deposit within the blackware mug from F109 analysed.

Both the medieval and post-medieval assemblages appear to be strongly utilitarian in nature. There were few glazed sherds in the Phase 1 pottery despite the evidence of glazed Deritend ware production close by. There is scope here for assessing whether the make-up of the pottery was determined by chronology, function or status especially when compared with other Birmingham city centre sites. This holds true of the post-medieval pottery also. Is the lack of slipware and manganese mottled ware chronologically significant? Is the range of pottery found at Floodgate Street determined by the industries sited there? There were a few bifid or flanged rimmed vessels including a particularly large coarse Midlands Purple jar from F201. These were sometimes used for distilling but

there was no evidence that the bifid vessels from Floodgate Street had served a specific function. However, a large proportion of the coarsewares were heavily sooted. In this they closely resembled the coarsewares from Edgbaston Street, where there seems to have been a fairly long standing tradition of tanning and allied leather working trades as at Floodgate Street. However, industry in itself does not seem to have prohibited the use of a wide range of ceramics since at Park Street there were plentiful examples of slipwares, manganese mottled wares and tin-glaze earthenwares.

In addition to the industrial aspect of the site there is also the effect of two later post-medieval inns by the site to consider. It is tempting to see the large quantities of glass recovered from one of the brick structures as somehow connected with the inns and it would be interesting to see if there is anything within the assemblage which might link to the function of these two buildings.

Fabric/Phase	1	2	3	4	U/S	Total
Greyware	173		16			189
Fabric RS01	13	2				15
Iron rich cpj	75	15	1	1	12	104
Iron rich glazed	3	3	1			7
Iron poor cpj		1				1
Iron poor glazed	1					1
Deritend ware	25		3		1	29
Whiteware	1	4				5
Late med/early post-med		7				7
Late early post-med iron poor		7				7
Late red ware		20				20
Late red ware/coarseware		1				1
Late red ware/Midlands Purple		6				6
Midlands Purple		5				5
Cistercian ware	1	2				3
Cistercian/blackware		5				5
Blackware		119	18	5	1	143
Blackware/Midlands Purple		1				1
German stoneware		2				2
Coarseware	2	233	103	12		350
Coarseware iron-poor		6				6
Yellow ware		27	6			33
Stoneware				1		1
White salt-glazed stoneware			8	4		12
Creamware		3		2		5
Pearlware		1		1		2
Porcelain		1				1
Industrial slipware		1		1		2
Modern yellow ware			2		2	4
Transfer printed wares			1	2		3
Total	295	500	134	27	14	970

Table 3: Ware types by phase (quantification by sherd count).

Aims/proposals

The pottery from Floodgate Street is extremely valuable in illuminating the growth of Birmingham in the 13th century and in the early post-medieval period. Several factors contribute to its importance.

- The pottery is in good condition and well stratified.
- It is possible to relate the pottery to industrial activities taking place in Floodgate Street.
- The pottery assemblage is different from that recovered from Edgbaston Street, Park Street and Moor Street and, as such, provides further useful data for chronological and functional analysis.

Recording/quantification

The assemblage consists of 970 sherds. All the medieval pottery should be examined under x 20 magnification. Pottery fabrics and wares should be matched to the type series used at Edgbaston Street, and Park Street, Birmingham. Pottery to be quantified by sherd count, sherd weight, rim count and rim percentage (*eves*). Details of decoration, glaze, wear patterns, sooting and deposits should be noted.

Dating/chronology

The pottery should be compared with other Birmingham city centre assemblages e.g. from Edgbaston Street, Moor Street and Park Street and the site placed in its local and regional setting.

Status/function

The pottery should be examined to see if there is any correlation between industrial activity and vessel form. This data could then be usefully compared with data from Edgbaston Street, Park Street and Moor Street to see if any patterns emerge.

Pottery sources

It is not proposed that there is much detailed work on the sources of the pottery since this information will have been largely determined by the pottery reports for Edgbaston Street and Park Street. However a sample of cooking pot sherds with possible igneous inclusions should be sent for petrological analysis to try to determine their source since they do not appear to match either the granodioritic wares of North Warwickshire nor the igneous tempered wares of the Malvern Chase area.

6.3.2 Small Finds *by Erica Macey*

Introduction

A large assemblage of other small finds was recovered from the site. These included ceramic tile and brick, clay pipe, glass, glass crucible, slag, metal, worked horn, slate, a ceramic wheel, shell, worked stone, mortar, coal and waterlogged wood and leather. A quantity of unworked animal bone was also recovered; this is dealt with elsewhere. The finds were quantified by count and weight, and examined macroscopically for the purposes of assessment; the results appear below.

Ceramic tile

A collection of 322 fragments of ceramic tile, weighing 34kg 649g was recovered from the site. No complete examples were recorded among the assemblage, which displayed a high degree of fragmentation, although individual fragments were relatively unabraded. Initial inspection of the material noted a similar uniformity of fabric (a dense, hard-fired orange material) to that noted in comparable assemblages at nearby sites, including Park Street (Macey 2002). Tile occurred in both the medieval (Phase 1) and post-medieval (Phases 2 – 3) phases of the site, and at least one fragment of glazed medieval floor tile was noted (F309). This item was almost complete and is worthy of illustration.

The assemblage will require further examination, including comparison with the material from Park Street, to determine the extent of the uniformity of the fabrics, both across the site and in the local area. It will also be necessary to compile a summary listing by context for this group.

Brick

The high incidence of brick features on the site means that a large number of brick samples were recovered. The assemblage consists of 43 pieces of brick, weighing 45kg 865g. Most of the pieces are complete bricks, dating principally to the 17th and 18th Century phases of the site, although closer examination of the design and form of the samples could provide a more specific date. A summary listing of the material by context will also be necessary.

Clay pipe

A small assemblage of 19 fragments of clay pipe were recovered. No complete examples were noted. The assemblage consisted of 15 stem fragments (1000 x 7, F109 x 2, F129 x 1, L1 x 2, F310 x 3) and 4 bowls (1000 x 1, F111 x 1, F216 x 1, F310 x 1). The bowls were provisionally dated to the late 17th Century using Oswald's type series (Oswald, 1975 p37-38). Three of the bowls were also stamped. One of these marks (F111) was indistinguishable, the others consisted of a star (1000) and the initials AU or TU (L1). Further research into these marks may determine whether they are from local manufacturers or from further afield. Besides this, the small size of the assemblage and its fragmentary nature means that no further work is recommended beyond a summary listing by context.

Glass

The glass assemblage consisted mainly of bottle glass, with the exception of three fragments of window glass (1000 x 1, F213 x 2). The bottle glass was almost all recovered from contexts in Area A, (1000 x 3, F105 x 5, F108 x 62) the only exception being three sherds in a 17th Century pit in Area C (F310). Most of the glass from Area A was recovered from a brick structure (F108) dating to the 18th Century. The glass from this feature, however, appeared to be mainly of 17th Century date; this was supported by the recovery of two near-complete 17th Century onion bottles from this context. The other base and neck fragments from this context are of a similar form, and can reasonably be assumed to be from the same type of bottle. The similarity is also evident in base and neck fragments from a 17th Century pit in Area A (F105).

The small size of the assemblage means that little further work beyond a summary listing by context is recommended, although a short report detailing the chronological range and scope of the more complete pieces in comparison with other urban assemblages in the local area will be necessary. The near-complete bottles are worthy of illustration, and a catalogue of these will be required.

Crucible

Glass crucible fragments were also recovered from the site (1000 x 1, F129 x 2), although not in sufficient quantities to suggest that large-scale glassmaking was taking place on the site. A summary listing by context is recommended.

Slag

Slag was evenly distributed across all areas of the site, and 39 pieces weighing a total of 18kg, 765g were recovered. Documentary evidence notes that a forge was in operation on the site by the 19th century (Watt 2001). However, it seems likely that the slag is intrusive on the site, brought in by the watercourses draining into the site. Given the small quantities of the assemblage no further research is recommended.

Metal objects

A few metal items, predominantly iron objects, were recovered from the site. Most of the items were in a generally poor state of preservation and were badly corroded. The most interesting identifiable item was an iron knife blade (F115) from a 17th century lime pit in Area A. The knife was complete, measuring 222mm from handle to tip. The blade was 13.5mm thick at the handle end, tapering along its bottom edge to 3mm at the tip. Other identifiable pieces recovered included iron nails (F206 x 1, F218 x 1, 3007 x 1), a screw (F206), a section of iron pipe (F206), a possible metal punch (F206), an ear-ring (L1), a copper alloy button (F310) and a thin plaque, possibly brass (L1). The remainder of the assemblage was unidentifiable, consisting of two bent iron strips (F206), some fragments of a thin iron bar (L6 x 7) and two U-shaped iron strips, which were of modern appearance.

The small size of the assemblage, together with the poor state of preservation of most of the material suggests that the only further action required for this group will be a summary listing by context, although the knife blade may be worthy of illustration.

Worked horn

A single fragment of worked horn was recovered from a 17th century pit in Area C (F218). This fragment measured 49mm in length and was semi-circular, sawn at both ends, and polished on the outer surface. The function of this item is unclear, and it may be merely an offcut from a larger fragment. No further research is recommended.

Slate

An 18th century well (F206) in Area B produced two incomplete roofing slates with nail holes. No further research is recommended.

Ceramic wheel

A small glazed ceramic wheel was recovered from a 17th century pit in Area B (F218). No further research is recommended.

Shell

An 18th century well (F213) in Area B produced the only shell recovered from the site. The eleven fragments of shell were unworked, but were remarkable for the size of the individual pieces (one of which measured 123mm across its length), they appear to be Indian Ocean types (Ciaraldi pers. comm.). No further research is recommended.

Worked stone

A well produced the only fragment of worked stone to be recovered from the site. This circular piece of stone appears to be an architectural fragment, possibly from the central pillar of a spiral staircase (Dr. Malcolm Hislop, pers. comm.). No further research recommended.

Mortar

Samples of mortar were taken from 17th century pits in Area A (F115) and Area C (F310). No further research is recommended.

Coal

A Medieval ditch in Area C (L6) produced three small fragments of coal. No further research is recommended.

Waterlogged leather

The leather assemblage was quite large, although most of the items recovered seem to be from domestic refuse. This is evident from the fragmentary state of the recovered items. The nature of the items recovered does not appear to indicate that large-scale leatherworking was taking place on the site, despite the presence of large quantities of horn-cores (F117, F128). All of the identifiable pieces recovered were shoe soles or fragments thereof (1001 x 2, L4 x 1, F117/F218 x 12, L1 x 26, F306 x 1, u/s x 1), including one near-complete shoe (F218). No further work is recommended.

The rest of the assemblage was comprised of undiagnostic offcuts and scraps of leather; the only piece of any substantial size was a large rectangular sheet of thin leather 59cms long and 30cms wide, although this did not appear to have any functional shape. No further work is recommended.

Waterlogged wood

A small collection of wooden items was recovered from the site. The largest pieces recovered were two sections of wooden drain (F137, F227) which were probably associated with metalworking. Other items recovered were an offcut with possible saw marks (2027), part of a small bowl (2030), a sawn branch section (2034) and two halves of a short wooden handle (2034). No further work is recommended.

6.3.3 Animal Bone *by Andy Hammon*

Introduction

The following report assesses the mammal and bird bone assemblages, it follows MAP 2 guidelines (Gill 1991), and comments on the quantity, quality and potential of the material. No interpretation or synthesis has been attempted at this juncture.

Recovery

All the bone fragments considered in this assessment were hand-collected. Hand retrieval may result in a recovery bias being introduced into an assemblage as it can lead to the preferential collection of the larger skeletal elements from large mammalian species at the expense of the smaller elements, and smaller species of mammal, birds and fish. It was reported that the samples did not contain any great number of additional bone fragments (Marina Ciaraldi pers. comm.), and are subsequently unlikely to affect the findings and recommendations of this assessment. Based on these observations, and the fact that the bone assemblage derives from specialised industrial activity (see overview below), there appears to be no recovery bias affecting the Floodgate Street assemblage.

Residuality and contamination

Estimating the residuality of animal bone is notoriously difficult. Various methods have been employed, such as indices based on bone colour and surface abrasion, however, all have their own methodological problems (for example see Dobney *et al.* 1996; Dobney, Kenward and Roskams 1997). One of the most common methods used to infer animal bone residuality is to employ pottery residuality levels as a baseline, although there may be no direct correlation, as different categories of artefact usually have different depositional pathways Evans & Millett 1992; Tomber 1991.

Initial results suggest that pottery residuality should not present a problem for the Floodgate Street assemblage. Additionally, features were generally discreet and quite distinct from one another, clearly denoting specific activities.

Despite the problematic use of bone colour and abrasion indices it was noted that the Floodgate Street material demonstrated considerable homogeneity within individual deposits, thus supporting the pottery and archaeological evidence. A very low level of gnawing was observed on the material. It is not uncommon for a third British vertebrate assemblages to be gnawed, and the Floodgate Street material was well below that threshold. This suggests that the vast majority of animal bones were recovered from their original anthropogenic place of deposition, rather than from secondary deposition caused by scavenging dogs and pigs. No intrusive burrowing species, such as rabbit or rat, were noted during the assessment.

Context

The animal bones derived from a number of deposit and feature types; layers, pit fills, drain fills and linear fills. The vast majority of bone derives from the Phase 2 large channel (L1).

Preservation

The preservation of bone surfaces (cortical integrity) within individual contexts demonstrated considerable uniformity throughout the Floodgate Street assemblage. The material considered in this assessment was mostly well preserved, this was characterised by bone surfaces that had suffered little exfoliation and abrasion.

A small number of fragments were poorly preserved, and had suffered a reasonably high rate of attrition. These all appear to have derived from waterlogged deposits (Contexts 1026, 1017, 2016 & 2052), which normally preserve bone well. Fluctuating moisture levels (probably due to changes in the water table) or chemical degradation, caused by residues left from industrial processes, may have caused this.

Consistency of preservation within individual deposits also suggests that they have not been subject to extensive re-working.

Fragmentation

Fragmentation throughout the Floodgate Street assemblage was negligible, and this again is principally due to the specialised industrial activities taking place on the site (see overview below).

Storage

The Floodgate Street mammal and bird bone assemblage is contained in 13 museum boxes (measuring 460 x 200 x 260mm), and is currently held by BUFAU.

Method

The mammal bones were assessed following a modified version of the method described by Albarella and Davis (1994), and Davis (1992). This system considers a selected suite of anatomical elements as countable (diagnostic zones); it does not include every bone fragment that is identifiable. In brief, the skeletal elements considered are all the mandibular teeth; horncore (complete transverse section); the skull (zygomaticus); scapula (glenoid articulation/cavity); distal humerus; distal radius; proximal ulna; carpals 2-3; distal metacarpal; pelvis (ischial part of the acetabulum); distal femur, distal tibia, calcaneum (sustentaculum), astragalus (lateral part), naviculo-cuboid/scafocuboid; distal metatarsal; proximal phalanges 1-3. At least 50% of the specified area has to be present to be countable.

Horncores are normally considered as non-countable elements using this system, however, bearing in mind the particularities of this assemblage the system would require modification, for instance horncores could be substituted for the zygomaticus as the countable cranial zone.

The following skeletal elements were considered countable for birds: scapula (articular end); proximal coracoid; distal humerus; proximal ulna; proximal carpometacarpus; distal femur; distal tibiotarsus; distal tarsometatarsus.

All fish bone fragments were considered to be countable.

For the assessment no attempt was made to separate sheep (*Ovis aries*) and goat (*Capra hircus*). Neither was any attempt made to fully speciate the equids (*Equus caballus* and *E. asinus*).

Mandibular fragments were considered to be ageable when there were two or more teeth present with recognisable wear.

Von den Driesch (1995) defines the majority of measurements that should be taken. Additionally, pig measurements should follow the definitions of Payne and Bull (1988). Humerus 'HTC' and 'BT' and tibia 'Bd' would be taken for all species, as defined by Payne and Bull (Ibid). Measurements 'BatF', 'a', 'b', '1', '3' and '4' for cattle and sheep/goat metapodials would be taken using the criteria described by Davis (1992).

Overview

The methodology described above has been modified slightly for the purposes of this assessment, and horncores have been treated as countable elements.

Using the above system the Floodgate Street hand-retrieved mammal and bird bone assemblage produced 249 countable elements, the vast majority of which belong to Phase 2 (Tables 4 and 5). The assemblage divides accordingly by phase:

Phase	Number	Percentage	Notes
1	3	1.2%	(including 1 horncore)
2	239	96.0%	(including 69 horncores)
3	2	0.8%	
Modern	5	2.0%	

Table 4 Summary of Animal Bone by phase

Context	Feature	Preservation	Phase	Cattle*	Sheep/Goat*	Pig	Other	Bird	Total	Comments	Comments
2020	F209	mod-good	1	(1)	2				3		
1001		good	2	2(1)	4		1		7	inc. horse	1 EQ & O all metapodia
1002	L4	good	2		9				9		metapodia
1010	F105	good	2	2(1)	1		3		6	inc. horse	3 EQ (2 MD same ind)
1024	L1	good	2	8(6)	3				11		
1025	L1	good	2	4(1)	15(1)		10		29	inc. horse & dog**	1 EQ & 9 CAF (part skele) & O majority metapodia (inc young)
1026	L1	poor-mod	2	1	1		1		3	inc. horse	inc. 1 EQ
1027	L1	good	2		1				1		
1030	L4	good	2	1	1				2		
1031	F115	mod	2		1				1		lime feature
1033	F117	good	2	27(26)	2		1		30	inc. horse	2 EQ & B inc occip perforations, thumbprint & butch (sawn & cut at base for horn removal) & large ribs
1034	L1	good	2	4	17				21		B cranial & lower limb & O mostly metapodia (some path)
1035	L1	good	2	4(3)	3(1)				7		inc O young
1045	L4	good	2	(2)					2		
1047	L4	mod-good	2	(1)			1		2	inc. horse	1 EQ
1048	L4	mod	2	1					1		
1056	L1	good	2		1				1		metapodial
2001	L1	good	2		4				4		metapodia
2002	L1	good	2	4(2)	8(1)		1		13	inc. dog	inc. 1 CAF & O mostly metapodia
2003	L1	good	2		2(1)				2		metapodia
2016	L1	poor-mod	2	(1)	1				2		O metapodia
2027	L1	mod-good	2	2(1)	10	1			13		O cranial frags & majority metapodia (inc young)

Context	Feature	Preservation	Phase	Cattle*	Sheep/Goat*	Pig	Other	Bird	Total	Comments	Comments
2028	L1	mod-good	2	9(1)	9(1)		1		19	inc. horse	1 EQ & O majority metapodia & large rib frags & vert
2029	L1	good	2		16				16		O majority metapodia
2030	L1	good	2	2	5		2		9	inc. dog	2 CAF
2034	F218	mod-good	2	23(18)			1		24	inc. horse	1 EQ & B inc occip perforations & butch (sawn & cut at base for horn removal) & large ribs & vert
2052	F227	poor-mod	2		2				2		
3020	F310	good	2					2	2	inc. goose	2 ANS
1017	F109	poor-mod	3	2					2		
1000		good	4	3	2				5		
Total				104(65)	120(5)	1	22	2	249		

* figures in brackets represent number of horncores present

** includes partial dog skeleton

Table 5 Number of 'countable' (Albarella & Davis 1994, Davis 1992) fragments (NISP) by context

The assemblage was dominated by cattle and sheep/goat, but also included small numbers of pig, equid, dog and goose. The proportion of dog was inflated by the presence of a partial skeleton from Context 1025, which comprised 9 countable fragments. The Phase 2 cattle remains clearly relate to the industrial activities taking place on site at this time. Sixty-five percent (64 of 98) of the Phase 2 countable cattle fragments were horncores. The majority were of a large longhorn breed. Many of the cranial fragments still attached to the horncores demonstrated a pathological condition usually referred to as occipital perforations. There may be a number of causal factors, but their presence may be used to infer something of the husbandry practices favoured at the time.

Large accumulations of horncores are usually interpreted as a by-product of the tanning industry, as cranial elements were often left attached to hides intended for leather working. Horncores, once removed, were often soaked in water to facilitate the removal of the horn, and this appears to be the case at Floodgate Street. The deliberate removal of the horn from the core at Floodgate Street is also attested to by the presence of concentric cut-marks running around the core base of many fragments. Horn has a number of conceivable uses, but button production may have been the primary motivation, as documentary evidence indicates there was a button factory in the vicinity (Hodder pers. comm.).

The sheep/goat remains are equally interesting, as a large proportion consisted of complete metapodials. Sheep and goat skins were not especially favoured for leather production, so the obvious implication is that carcass reduction was taking place on or near to the site, and the metapodials were being collected together for working. Sheep/goat metapodials make excellent knife handles for example.

Table 6 summarises the number of ageable mandibles from the major domesticates that the assemblage would produce. The low number reflects the specialised nature of the assemblage, but does not detract from its potential, as the main focus of interest is obviously the craft utilisation of the cattle and sheep/goat remains.

Context	Phase	Cattle	Sheep/Goat	Total
1024	2	1		1
1025	2	1		1
1034	2		2	2
2002	2		1	1
2029	2		1	1
2030	2	1	1	2
2052	2		1	1
3020	2			
Total		3	6	9

Table 6 - Number of 'ageable' (Albarella & Davis 1994; Davis 1992) mandibles by context.

Just over seventy-five percent of the countable elements would produce measurements (Table 7). Again, this high proportion is a direct reflection of the specialised nature of the assemblage, and its negligible fragmentation. The majority of measurements would come from either cattle horncores, or, sheep/goat metapodials, which means biometrical analysis of these two species and elements could be very informative. These measurements may be used to investigate husbandry practices and the breeds of animal utilised.

Context	Phase	Cattle	Sheep/Goat	Other	Total
2020	1	(1)	1		2
1001	2	(1)	4	1	6
1002	2		8		8
1010	2	(1)	1	9	11
1024	2	(6)	3		9
1025	2	2	7(1)	11	20
1026	2	1	1	1	3
1027	2		1		1
1030	2	1	1		2
1033	2	25(24)	1	1	27
1034	2	2	14		16
1035	2	4(3)			4
1045	2	(2)			2
1047	2	(1)			1
2001	2		4		4
2002	2	3(2)	7	1	11
2003	2		2(1)		2
2016	2	(1)	1		2
2027	2	(1)	4		5
2028	2	3(1)	6	1	10
2029	2		9		9
2030	2	1	3	1	5
2034	2	22(17)		1	23
2052	2		1		1
1017	3	1			1
1000	4	2	1		3
Total		81(61)	80(2)	27	188

Table 7. Number of 'measurable' (Albarella & Davis 1994; Davis 1992) fragments by context.

Potential

The Floodgate Street mammal and bird bone assemblage has considerable potential despite its small size. Its overall good state of preservation, the lack of fragmentation and highly specialised nature means that very specific and definite statements can confidently be made regarding species utilisation, and the nature of activity on site.

Due to the extensive redevelopment of central Birmingham there are several other contemporary analogous assemblages, such as Edgbaston Street (Murray 2001a), Park Street (Murray 2002) and The Custard Factory (Murray 2001b). By combining the results from these sites it will be possible to advance our understanding on the post-medieval industrial development of Birmingham. As previously stated by Murray (2001b, 11), the post-medieval animal bone assemblages from central Birmingham should be compared with other assemblages that have been interpreted as deriving from tanning and leather working (Albarella forthcoming), and include sites such as The Green, Northamptonshire (Shaw 1996), Oxford Road Watermill, Aylesbury (Baxter 1999) and Hertford Castle, Hertford (Armitage 1978).

Recommendations

Phases 1, 3 and 4 should be ignored in favour of the Phase 2 material, as it clearly has the greatest potential. The final analysis should only take place once the phasing has been finalised, and the samples processed and sorted.

6.3.4 Environmental Analysis *by Marina Ciaraldi*

A programme of sampling for environmental analysis was implemented during the excavation, with several bulk soil samples collected, together with samples of waterlogged wood for dendrochronological analysis, and a column sample. Four phases of activity were identified on the site, but soil samples were collected only from deposits of Phase 1 (13th – 14th centuries), Phase 2 (17th century) and Phase 3 (18th century). This assessment will discuss the results of the preliminary analysis of the plant remains and will provide recommendations for future work.

Aims

Previous archaeological investigation in this area of Birmingham had already uncovered evidence of industrial activities during the medieval and post-medieval periods (Burrows and Martin 2002, Litherland and Mould 1995, Mould 2001 and 2002), particularly tanning (Burrows and Martin 2002, Ciaraldi 2000 and 2002, Litherland and Mould 1995, Mould 2001) and hemp retting (Ciaraldi 2000, Hall 2001).

This evidence, and the nature of the archaeology uncovered at Floodgate Street, provided a useful background on which to design an appropriate sampling strategy in order to understand the economy of the site as well as the palaeoecology. Also, on a wider level, it is important for the reconstruction of the development of industry in Birmingham as a whole during the medieval and post-medieval periods.

Sampling strategy

Most of the deposits excavated were waterlogged, with the exception of the shallower features. Samples of twenty – thirty litres were collected whenever possible. A column sample was taken from the north section that cut L1, in Area A (F113). The section presented a well-stratified sequence of organic deposits clearly related to the main tanks

or pool. Waterlogged wood was collected from various features throughout the site and were submitted for dendrochronological dating (see Section 6.3.5 below).

Method

Nine samples, collected from well-dated key-features, were processed in order to assess the range of preservation of the organic remains. Small sub-samples (300cc.) were taken from waterlogged samples and wet sieved on a 0.3mm mesh. The fraction caught in the sieve on the 0.3mm sieve was then quickly scanned under the microscope, these plant remains were identified without the use of a reference collection and therefore must be considered provisional.

Discussion of the results (Table 8)

Wooden Drains

Samples from the two wooden drains (F137 and F227) contained very different types of material. In the case of F227/2049 the deposit consisted of a sandy clay. It did not contain any organic material, only mineral concretions and droplet-shaped slag.

Sample F137/1065, on the contrary, contained numerous waterlogged seeds, insects, and the remains of caddis fly cases. Seeds included species from wet environments, such as buttercups and sedges, as well as species preferring disturbed ground, such as spurge and nightshade. The presence of caddis fly cases also indicates the presence of water.

Tanning pits/tanks

Tanning activity was certainly one of the industrial activities that took place on site. This was particularly evident not only from the abundance of leather off-cuts and deposits of homcores, but also from the presence of thick, silty, organic deposits, found in various parts of feature L1 (figs 4 and 5). Some of the layers in the deposits contained large amounts of animal hair, clearly visible by the naked eye during excavation (e.g. F113 and F215).

Four samples recovered from such deposits were assessed. They contained well preserved organic remains including seeds, insects, wood, animal hair and shells (Table 8). The presence/absence of hair and shells, the variation in the plant assemblage and the presence/absence of ecological indicators of water deposits (e.g. Cladocera's ephippia or pondweed seed) suggests that, even though the deposits were all related to tanning, they probably represented different parts of the process. Analysis of the differences between the composition of the organic remains in the various deposits may aid in understanding the type of tanning processing being undertaken on the site, and the different stages that were carried out.

Some of the questions that may be answered through further study of the biological remains in the waterlogged deposits are:

- (1) What type of animal hide was processed on site (from the hair and animal bones).
- (2) What type of organic and inorganic material was used in the tanning process? (e.g. bark, lime, other organic additives).

- (3) Was water present in the tanks (e.g. biological indicators such as insects, pollen and seeds).
- (4) Could the different tanning stages be identified spatially across the site.
- (5) Were the animals from the locality or imported from further afield (animal bones).
- (6) What was the level of disturbance/pollution in this part of the town generated by the tanning industry (seeds, pollen, insects).

Pits and a well

Three more samples complete the list of deposits assessed in this report. Two samples F105/1010 and F306/3014 were collected from two post-medieval pits. Sample F105/1010 did not contain waterlogged or charred remains, while sample F306/3014 had some charcoal and a single pear/apple seed. The third sample, F311/3012, was taken from a well. It consisted purely of charred remains, mainly of herbaceous material. The charred material was not identifiable and no seeds were observed in the deposit.

Sample	Feature	Context	Area	Phase	Feature type	Further analysis	Notes
1	F105	1010	A	2	pit		No organic material
8	F137	1065	A	2	Wooden Drain	Plant macrofossils, insects, pollen	Sandy soil. Waterlogged sample. Plants: Bramble (<i>Rubus</i> sp.), buttercups (<i>Ranunculus acris/repens/bulbosus</i>), sedges (<i>Cyperus</i> sp. and <i>Carex</i> sp.), <i>Polygonum</i> sp., fig (<i>Ficus carica</i>), nightshades (<i>Solanum</i> sp.), spurges (<i>Euphorbia</i> sp.), Cyperaceae. Wood fragments, probably from the wooden drain. Other: small fragments of coal, a few insects, caddis fly cases
5	F113	1025	A	2	Pool/Tank LI	Plant macrofossils, insects, pollen, wood	Wood/bark layer. Waterlogged sample. Plants: germander (<i>Teucrium</i> sp.), thistles (<i>Carduus/Cirsium</i>) Cyperaceae, Mayweeds (<i>Tripleurospermum</i> sp.), buttercups (<i>Ranunculus acris/repens/bulbosus</i>), alder (<i>Alnus</i> sp.), knapweeds (<i>Centaurea</i> sp.), docks (<i>Rumex</i> sp.). Other: wood fragments and twigs, a few insects

24	F113.02	1056	A	2	Pool/ Tank L1	Plant macrofossils, insects, pollen	Fine silt – very organic. Waterlogged sample. Plant: water plantain (<i>Alisma plantago-aquatica</i>), buttercups (<i>Ranunculus</i> sp.), pondweed (<i>Potamogeton</i> sp.), hop? (<i>Humulus</i> sp.), Willow? leaves Other: Lots of Cladocera's ephippia, few insects
25	F131	1035	A	2	Pool/ Tank L1	Plant macrofossils, insects, pollen, hair, shells	Fine silt very organic. Waterlogged sample. Plant: water plantain (<i>Alisma plantago-aquatica</i>), sedges (<i>Cyperus</i> sp.), nettle (<i>Urtica dioica</i>), entire leaves Other: Very, very abundant Cladocera's ephippia, abundant animal hair, degraded leather, snails, insects, caddy fly's cases
12	F215	2029	B	2	Pool/ Tank L1	Plant macrofossils, insects, pollen, hair	Fine silt – very organic. Waterlogged sample. Plant: Labiatae, docks (<i>Rumex</i> sp. And <i>Polygonum</i> sp.), <i>Conium</i> sp., elderflower (<i>Sambucus nigra</i>), entire leaves, twigs Other: Some Cladocera's ephippia, abundant animal hair, insects
23	F227	2049	B	2	Wooden Drain		Sandy clay. No organic remains. Mineral concretions and small slag droplets
20	F306	3014	C	2	Pit	Plant macrofossils	Sandy silt. Some charcoal and a seed of pear/apple (<i>Pyrus/Malus</i>)
21	F311	3021	C	3	Well		Pure charcoal, mainly consisting on charred herbaceous material. Probably modern deposit

Table 8 – Summary of Environmental results

Recommendations for further work

The biological remains recovered from Floodgate Street represent an important source of new evidence which will aid in the understanding and reconstruction of industrial activities that took place in this area of Birmingham. Their study may provide insight into the post-medieval tanning process, and on the impact these industries had on the urban environment. The waterlogged deposits associated with tanning activity are particularly well preserved. The presence of animal hair in some of the deposits may allow us to identify particular stages of the tanning process carried out on site. Therefore, the evidence provided by the biological remains represents an important assemblage, one which can be used as comparative material for sites with poorer preservation.

More specifically aims will be to:

- (1) Further analyse the biological remains from the waterlogged samples indicated in Table 8.
- (2) Identify other securely datable samples and process them by flotation or by wet-sieving, and analyse the plant remains.

6.3.5 Dendrochronological Dating by Ian Tyers

Summary

A total of 13 samples from timbers were submitted for spot-dating. The samples came from a variety of contexts, predominantly the linings of drains. Nine of the samples had sufficient rings for attempting tree-ring dating. Standard dendrochronological methods were applied to the suitable samples (for details of methodology see e.g. English Heritage 1998). A total of three of the samples were successfully cross-matched with externally dated site masters and regional chronologies, indicating usage dates in the 16th century. The six other samples were not found to cross-match with either each other or with regional chronologies and thus could not be dated. A summary of the results is provided below. It is important to appreciate that although the absolute dendrochronological dates will not change, the interpretations of the results are of necessity preliminary and liable to change, particularly as aspects of re-use and repair are revealed by further excavation and post-excavation analyses.

Dendrochronology

Three types of dating result are usually obtained by dendrochronological analysis. Firstly, where a sample is complete to bark-edge a precise year of felling is obtained directly from the date of the last ring on the sample. Secondly, where a sample has some sapwood, but is not complete to the bark-edge a felling date range is obtained by applying the maximum and minimum numbers of rings of sapwood normally seen in English oaks, to the relevant samples. A range of 10 - 46 is used throughout this report for local oak, this estimate is based on modern and excavated timbers from England (Tyers 1998). Finally, where no sapwood survives a *terminus post quem* (*tpq*) date is obtained by adding the minimum number of sapwood rings likely to have been lost to the date of the latest surviving ring. This type of date is very much less useful than the other two types since a very great number of rings could have been lost either through ancient carpentry practise, or poor site preservation, and thus the felling date of such material may be considerably later than the tree-ring date.

The Floodgate Street Samples

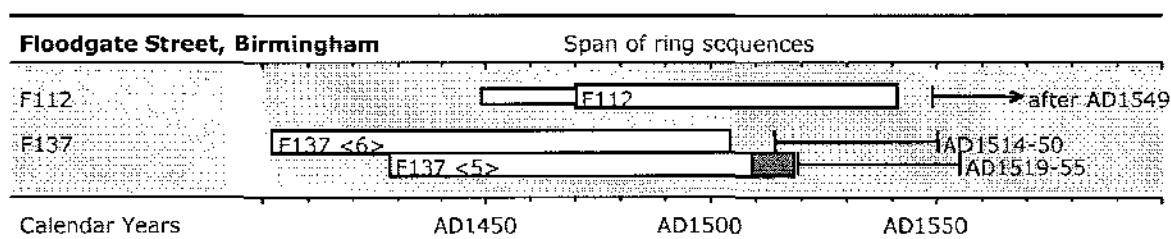
Thirteen samples were submitted, twelve of these were oak (*Quercus* spp.), and nine of these were suitable for tree-ring analysis. A summary is presented in Table 9.

Context	Dimensions (mm)	Type	Rings	Sapwood and Bark	Growth Rate (mm/year)	Dates of sequence	Interpretation
F112	120 x 15	Oak	21h+72	-	1.03	AD1470-AD1541	after AD1549
F113.02	100 x 100	?	-	-	-	Unidentified wood	-
F131 <1>	185 x 160	Oak	67	?h/s	2.02	Undated	-
F131 <2>	270 x 105	Oak	74	-	2.02	Undated	-
F131 <3>	370 x 230	Oak	-	-	-	Not measurable	-
F137 <4>	250 x 15	Oak	67	-	3.10	Undated	-
F137 <5>	190 x 50	Oak	91	9	2.01	AD1428-AD1518	AD1519-55
F137 <6>	260 x 180	Oak	103	h/s	1.61	AD1402-AD1504	AD1514-50
F201.02 <10>	110 x 85	Oak	65	20	1.63	Undated	-
F201.02 <11>	285 x 55	Oak	56	-	4.29	Undated	-
F215 2030	-	Oak	-	-	-	Not measurable	-
F227 <12>	195 x 45	Oak	-	-	-	Too few rings	-
F227 2049	290 x 285	Oak	57	16+?B	3.47	Undated	-

KEY: ?B possible bark-edge, h/s heartwood/sapwood edge, ?h/s possible heartwood/sapwood edge.

Table 9. Sample details from Floodgate Street

Three of the analysed samples were successfully dated (bar diagram below). Two of the dated samples are probably derived from a single tree (Table 10).



Bar diagram showing the relative and absolute positions of the dated samples. Plain bars represent heartwood, hatched bars represent sapwood. The interpretation calculated for each dated sample is also shown.

	F137 <6>
F137 <5>	9.12

Table 10 Correlation *t*-values (Baillie and Pilcher 1973) between 2 of the samples, showing these are derived from a single parent tree.

The geographical pattern of cross-matching this data indicates this tree may have been originally derived from the English midlands (Table 11) and felled sometime between AD1519 and AD1550.

	F137 <5>+<6> 1402-1518
East Midlands regional master (Laxton and Litton 1988)	6.12
Gtr Manchester Stayley Hall Stalybridge (Nayling 2000a)	5.09
Herefordshire Bromyard Lower Brockhampton (Nayling 2001)	5.93
Herefordshire Pembridge Village (Tyers 2002)	5.12
Herefordshire White House Vowchurch (Nayling 1999)	6.43
Shropshire St. Marys Church Bromfield (Nayling 2000b)	5.32
Staffordshire Black Ladies nr Brewood (Tyers 1999)	6.08
Staffordshire Sinai Park nr Burton (Tyers 1997)	5.82
Staffordshire Lichfield St Johns (Worthington and Miles 2002)	5.95
Welsh Border (Siebenlist-Kerner 1978)	6.99

Table 11 Correlation *t*-values (Baillie and Pilcher 1973) for the planks from drain F137

The final dated sample is derived from the base of a barrel, the tree-ring evidence shows that this is a French sourced barrel and since the sample is composed only of heartwood it is evidently no earlier than mid-16th century (Table 12), but we cannot provide a more precise date. Of course the date of its re-use as a lining cannot be determined. The best matches that can be found for this data indicate it is from western France.

One timber was not oak, and it has not been possible to identify this using identification keys to common British wood species, it is a diffuse porous hardwood, with differentiated heartwood/sapwood, 3-5 seriate rays, and does not obviously have either spiral thickenings or scalariform plates. It could have lost some keyable feature, it could have aberrant anatomy or it could be something uncommon.

	F112 1470-1541
France Brittany (Guibal pers comm.)	6.98
France East (Lavier <i>et al</i> pers comm.)	3.45
France Normandy (Trenard pers comm.)	3.36
France Northern (Pilcher 1994)	3.77
France Paris (Trenard pers comm.)	3.20
France West (Lavier <i>et al</i> pers comm.)	7.36

Table 12 Correlation *t*-values (Baillie and Pilcher 1973) for the barrel bottom F112,

7.0: UPDATED PROJECT DESIGN

It is possible to restate, enhance and refocus the research aims as to being to:

- complete the characterisation of the site dating and function.
- define the morphology of the settlement remains, and determine their development and chronology, particularly in respect to the presence of industry and the growth of Birmingham in the 13th century and the early post-medieval period.
- analyse the distribution pattern of all industrial activities taking place on site during its occupation.
- reconstruct the environment surrounding the site and identify the impact that industry had upon it.
- examine the pottery chronology and compare the assemblage with others in the city centre, and source new fabrics.
- further analyse the pottery in an attempt to identify possible relationships between specific industries and vessel form.
- undertake full analysis of the Phase 2 bone assemblage.
- further study a small group of finds.

8.0: PUBLICATION SYNOPSIS

Floodgate Street, Deritend Island, Digbeth, Birmingham; Archaeological Excavations 2002.

By Josh Williams

With contributions by Marina Ciaraldi, Andy Hammon, Steve Litherland, Erica Maccy, and Stephanie Ratkai.

Illustrations by Nigel Dodds and Bryony Ryder

Introduction by JW

500 words 1 figure

Aims and methodology by JW

200 words

The Site and its Context by JW and SL

600 words 2 figures

Description of Results by JW

500 words 4 figures 4 plates

Interpretation of the Evidence by Phase by JW

2000 words

Medieval and Post-medieval Pottery by SR
2500 words, 2 tables, 2 figures

Charred Plant Remains by MC
1000 words, 2 tables

Animal Bone by AH
500 words, 2 tables

Small Finds by EM
500 words, 1 table, 1 figure

Discussion and Conclusion by JW
1500 words

Bibliography

TOTAL 9800 words, 7 tables, 9 figures, 4 plates

It is proposed to publish the report in either BAR or the Transactions of the Birmingham and Warwickshire Archaeological Society.

9.0: TASK LIST

The task numbers below give the names of the individuals responsible for the completion of the task, and the number of days allocated.

	Person	Days
Overall project management	SL	0.5
Integrate archives/check phasing	JW	1
Phasing database	JW	1
Figure roughs for site narrative	JW	0.5
Draught figures for site narrative -plans	ND	4
Preparation of first draft of introduction and results	JW	3
Pottery		
a) Record pottery	SR	6
b) Data entry	SR	1
c) Manipulation of data	SR	0.5
d) Research - comparanda/parallels	SR	0.5
e) Report writing	SR	3
f) Sorting vessels for illustration	SR	0.5
g) Checking pottery drawings and final edit/emendations	SR	0.5
h) Illustration of pottery	BR	7
Animal Bone		
a) Data collection	AH	2.5
b) Data correlation and analysis	AH	1.5
c) Writing of report	AH	2
Charred Plant Remains		
a) Processing samples not yet assessed	MC	3
b) Sorting of flot and residue	MC	5
c) Plant identification	MC	2.5
d) Writing of report	MC	2
Shorter specialist reports		
a) Production of summary of all categories by context	EM	1
b) Further research on certain categories	EM	1
Illustration	BR	1
Editing/correction to specialist reports	SL	0.5
Preparation of first draft of discussion	JW	3
Editing of first draft (BUFAU)	SL	1
Corrections to first draft	JW	1
Corrections to illustrations	ND	0.5
Final proof reading	SL	0.5
Final corrections to text/illustrations	JW	0.5
Deposition of archive	EH	1

KEY:

AH Andy Hammon,
BR Bryony Ryder

EH Emma Hancox,
JW – Josh Williams,
MC Marina Ciaraldi,

ND Nigel Dodds
SL Steve Litherland
SR Stephanie Ratkai,

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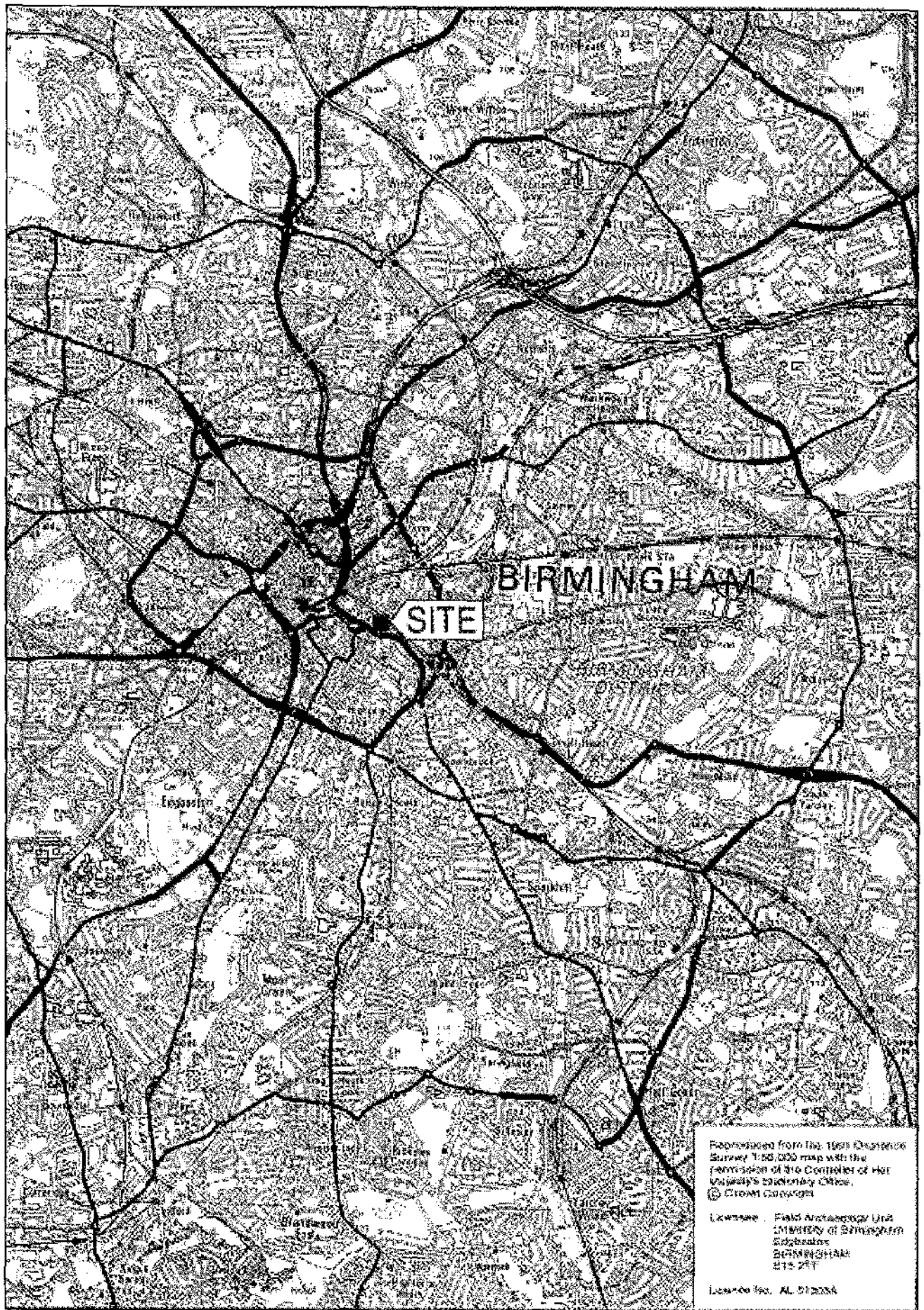


Fig.1

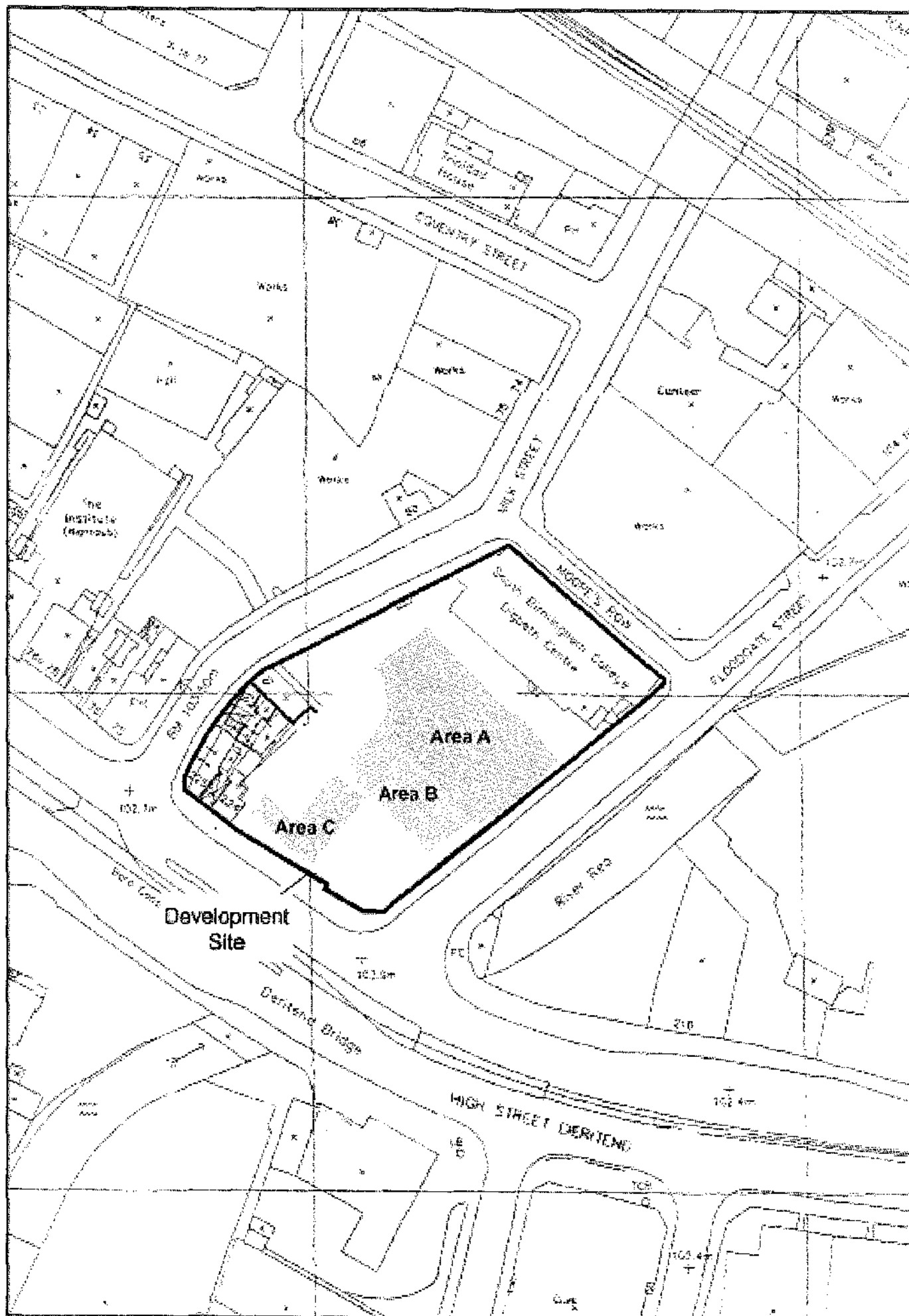


Fig.2

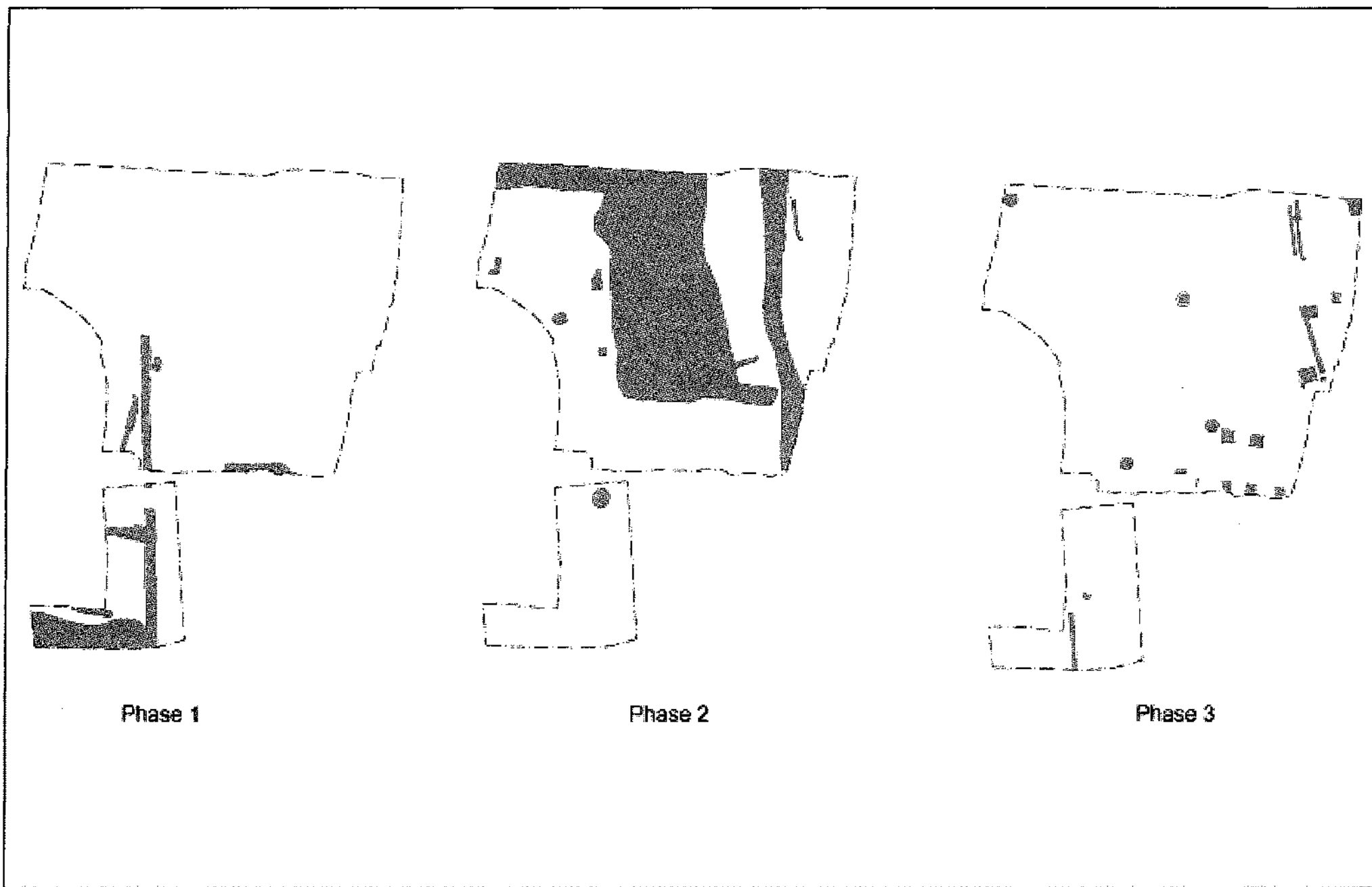


Fig.3

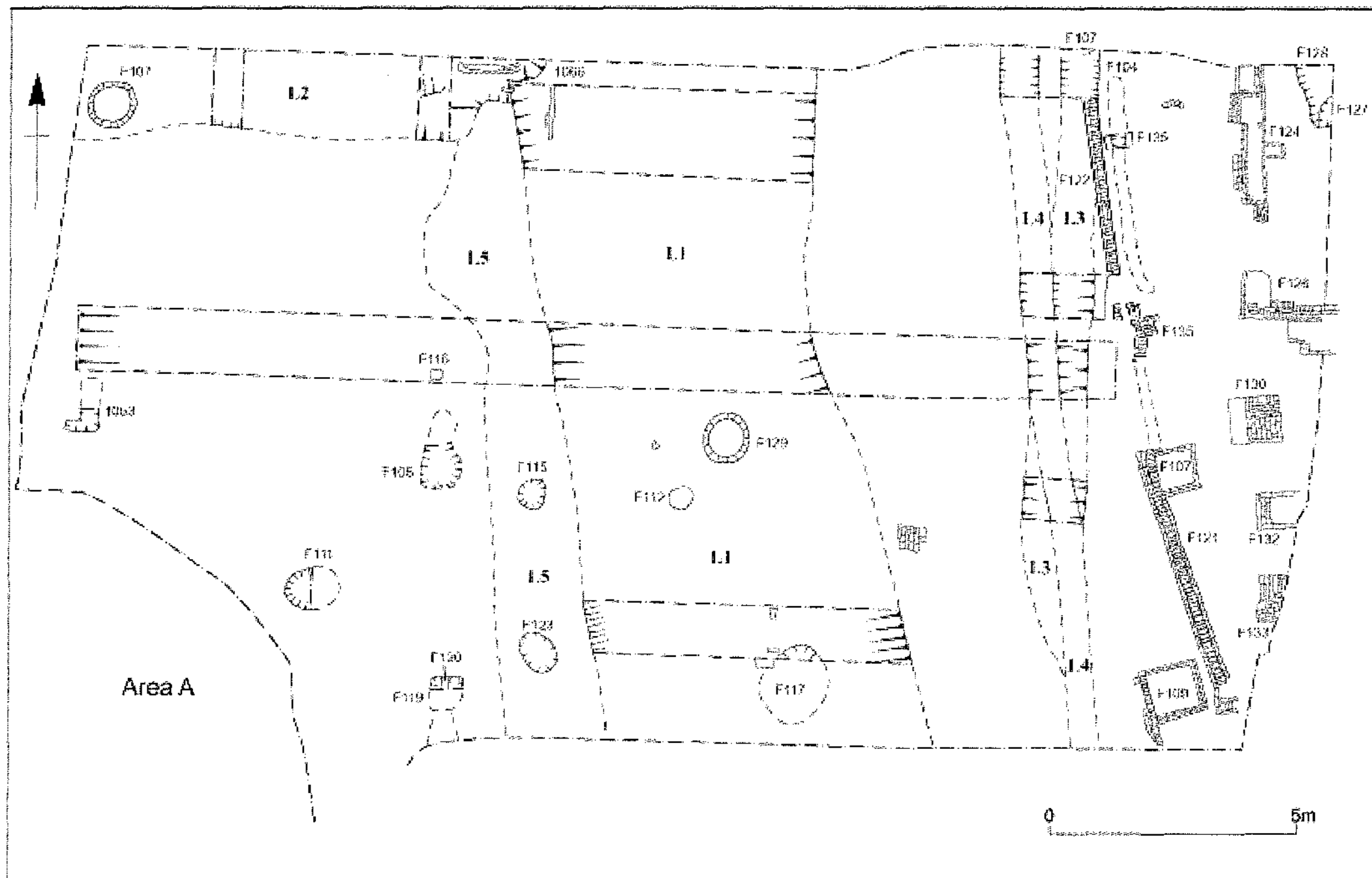


Fig.4

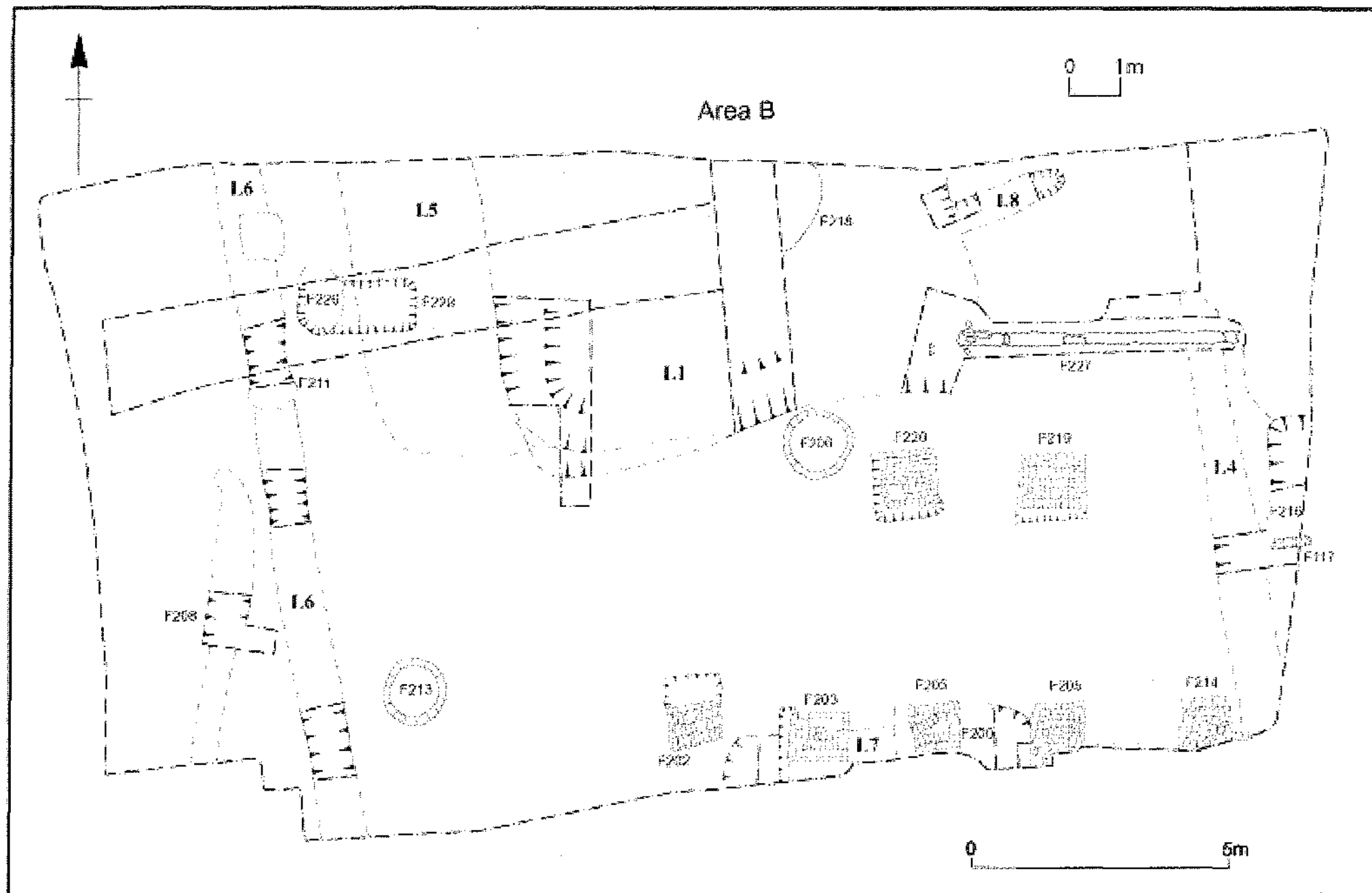


Fig.5

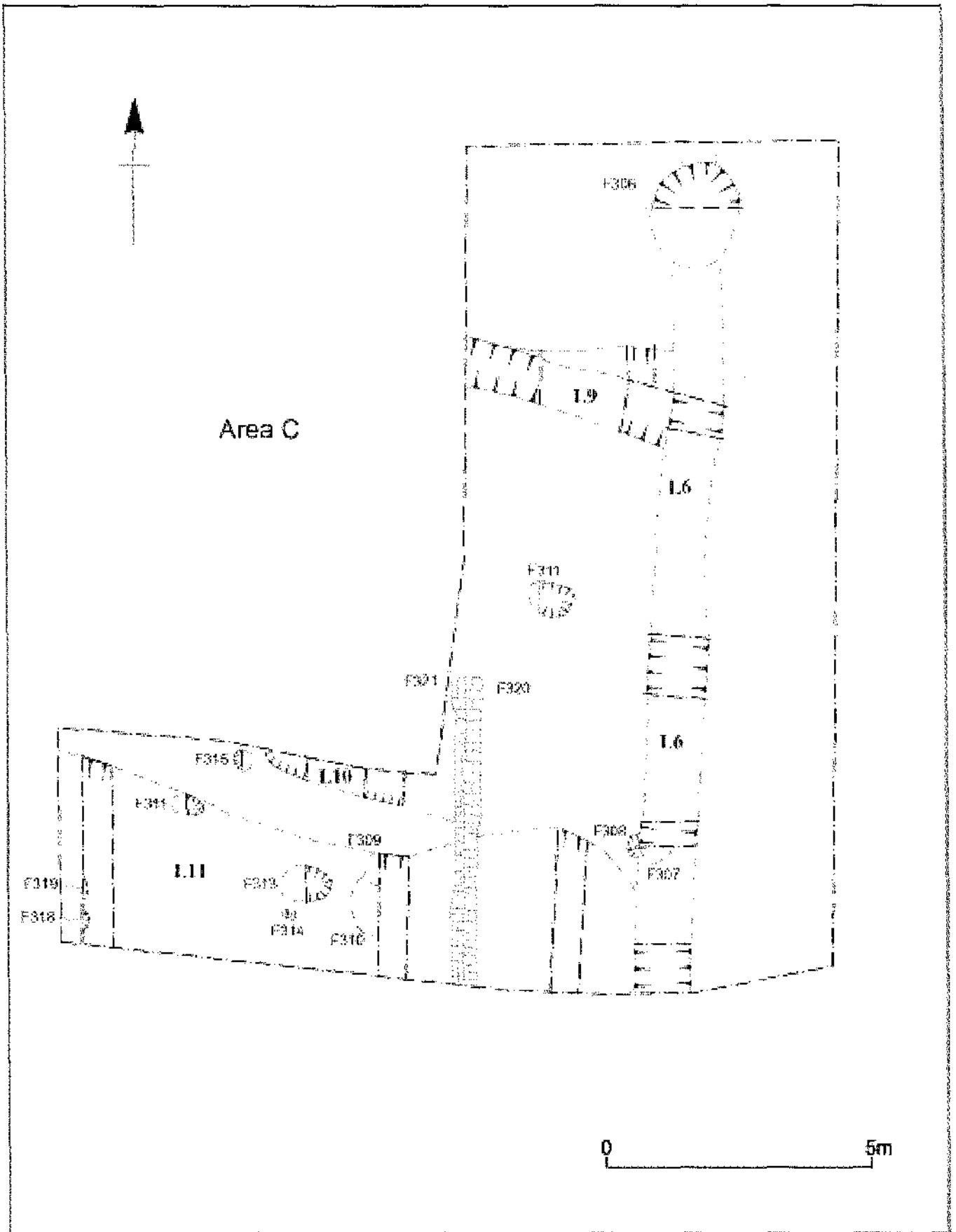
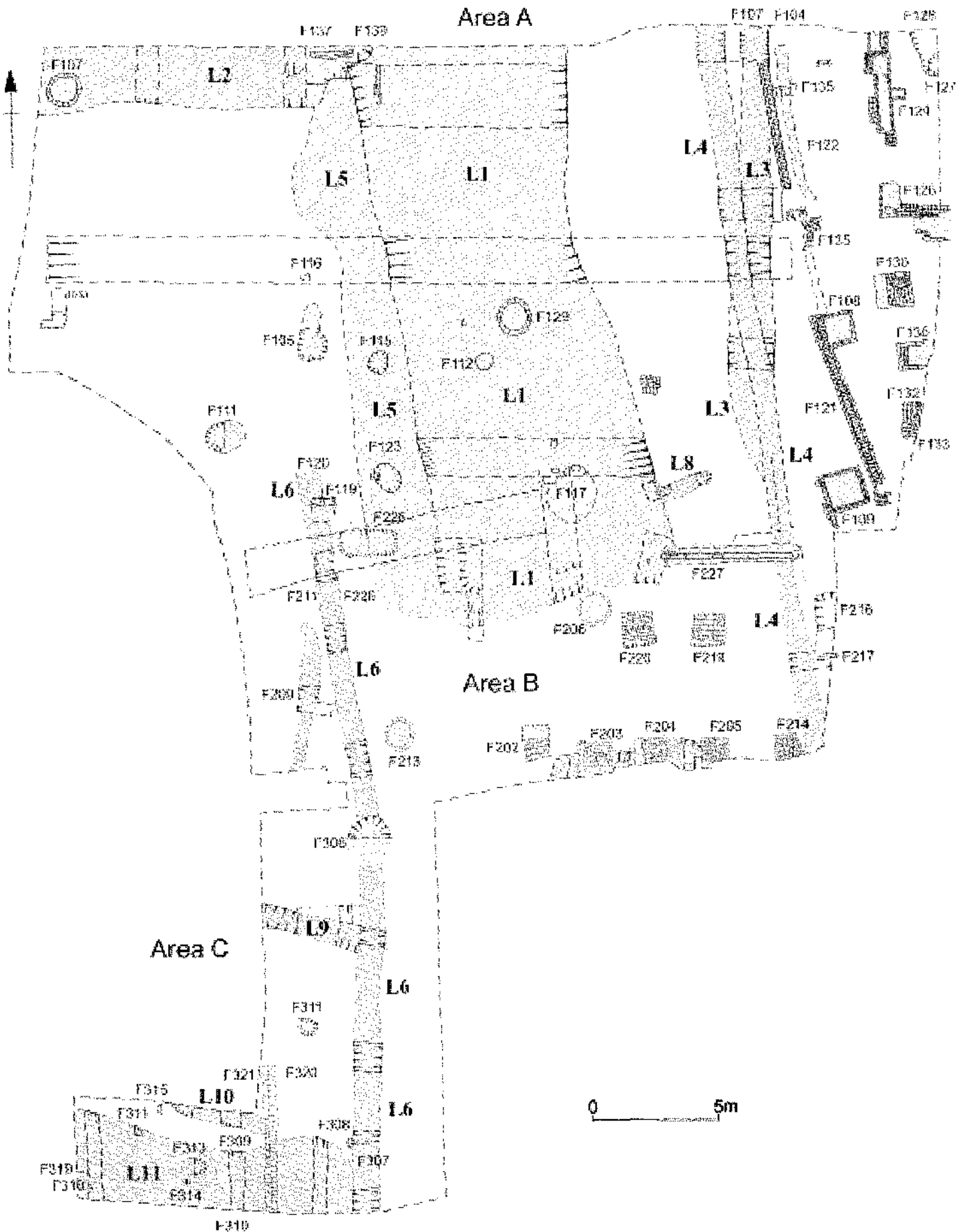


Fig.6



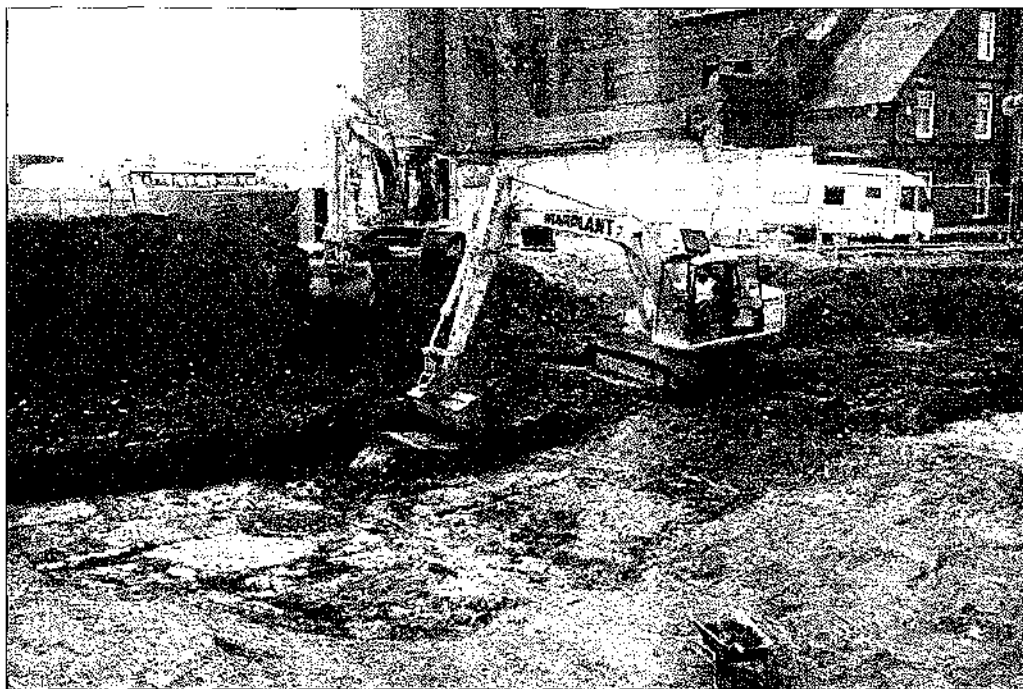


Plate 1: Machining in Area A.



Plate 2: Working shot, Area A.

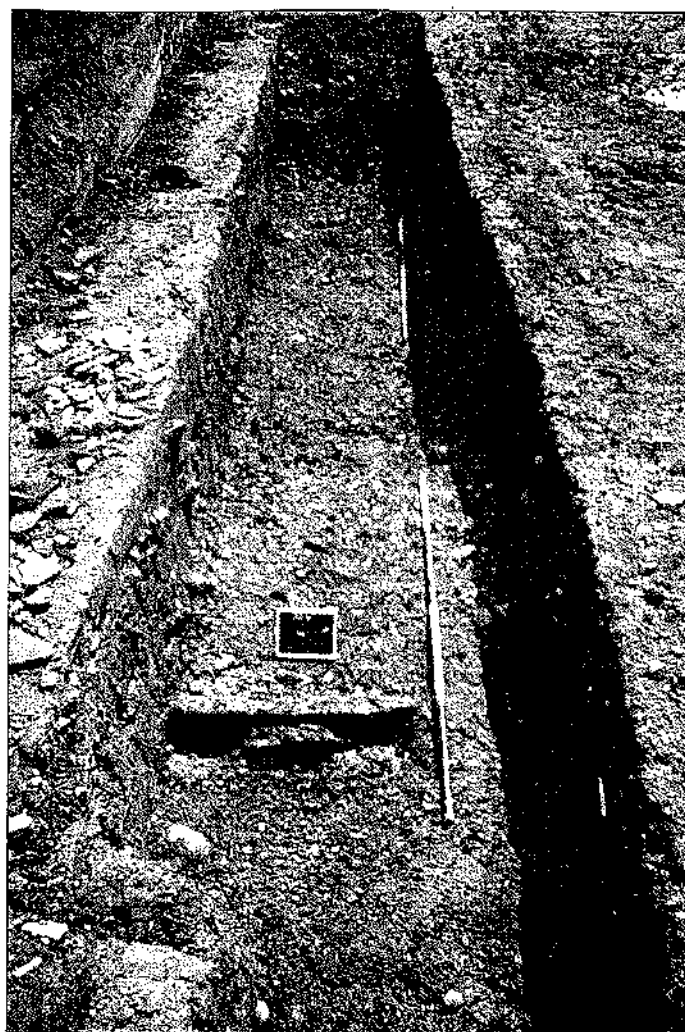


Plate 3: Section through S1 in Area A.



Plate 4: Barrel lined lime pit F112, Area A.

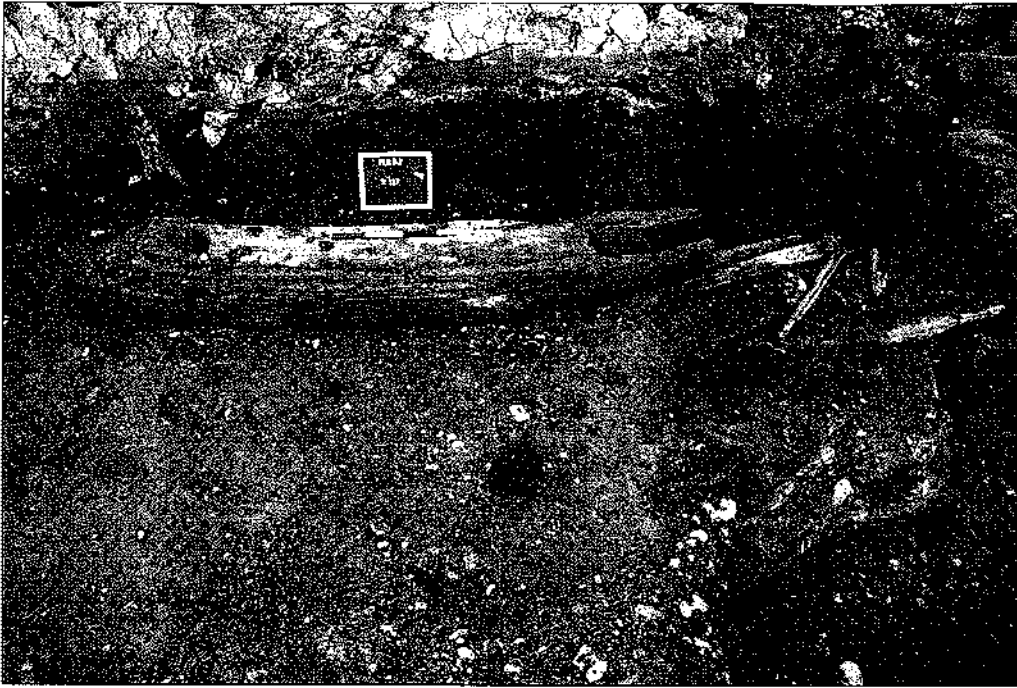


Plate 5: Wooden drain F127, Area A.

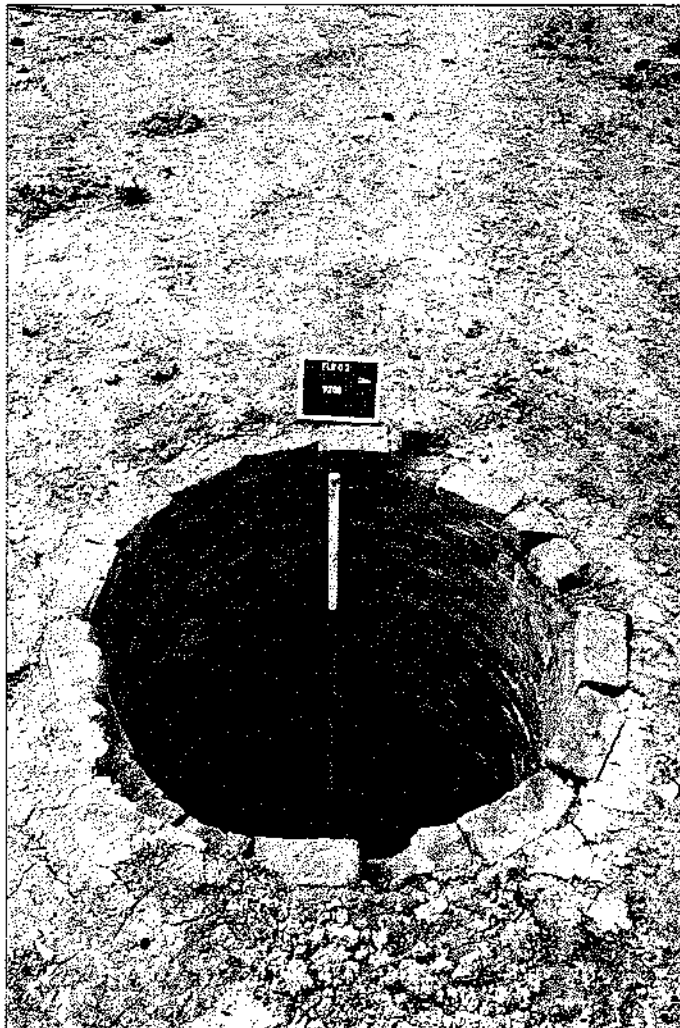


Plate 6: Well F206, Area B.



Plate 7: Wooden drain F227, Area B.



Plate 8: Working shot, Area B.