

**Park Street, Birmingham
City Centre:
Archaeological
Investigations 2001
Post-Excavation
Assessment and Research
Design**

Birmingham University Field Archaeology Unit

Project No. 776

March 2002

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Archaeological Investigations 2001**
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Post-Excavation Assessment and Research Design

by

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1.0 Summary and Introduction (Figs. 1 and 2)

Following evaluation, an archaeological excavation at Park Street Birmingham (NGR SP 075 868) was carried out on behalf of CgMs acting on behalf of the Birmingham Alliance. The work was undertaken by Birmingham University Field Archaeology Unit (B.U.F.A.U.) from February to July 2001, in advance of the construction of a multi-storey carpark.

In addition to residual Roman finds, a sequence of occupation and activity on the site dating from the twelfth and thirteenth centuries up to the present day was recorded and three phases of activity were identified. The earliest deposits (Phase 1) dated from the twelfth to the fifteenth centuries and it was during this period that large property boundary ditches were established. The first phase also included a sequence of medieval layers with associated pits, post holes, a possible kiln, and two grave cuts containing articulated skeletons. The large ditches appear to have silted up and been backfilled during the fourteenth century and were, in common with the other medieval features and deposits, truncated by a large number of post-medieval, intercutting pits (Phase 2) and building foundations of the nineteenth and twentieth centuries (Phase 3).

Phase 2 activity, dating from the beginning of the sixteenth century to the end of the eighteenth, was characterised by the presence of a cultivation soil across the site and the extensive digging and re-excavation of pits over much of the site. The pits were associated with industrial processes and contained large quantities of iron slag, coke, brick and tile, as well as concentrations of glass, clay pipes and post-medieval pottery. A number of rectangular pits that may relate to the tanning process was also identified, concentrated along the southern edge of the site. Small building structures and sandstone walls of eighteenth-century date were exposed which may have been built to respect existing property boundaries.

The intense building development which took place during the nineteenth and twentieth centuries serves to characterise the third phase of activity (Phase 3). During the 1960s and 1970s, for example, the majority of buildings along Park Street were demolished and the demolition material used to level the site for a car park. This period of activity was clearly reflected within the site stratigraphy.

2.0 Location and Background to the Site

The site is located in Birmingham City Centre and is bounded by Park Street, Bull Ring, Well Lane, and the Hennebique Building of Moor Street Station. The site was proposed for development, and planning permission was granted (application number C/05538/98) for the construction of a multi-storey car park.

The geology of the area consists of sands and gravels which underlie silty sandy clay. The site is situated to the east of the conjectural Birmingham Fault, towards the top of a sandstone ridge, overlooking the Rea Valley (110m-120m AOD).

Two archaeological assessments were conducted for the Digbeth/Deritend area as a whole (Litherland 1995, Mould 1999) and one specifically for the proposed development site (OAU 1997). The historic maps reproduced in these reports have not been duplicated here. Each assessment identified the site as potentially providing important information on the historical development of Park Street from the medieval period onwards. The site's location, in close proximity to the medieval focus of Birmingham, near to St. Martin's Church, implied that the Park Street excavation was likely to uncover deposits relating to medieval and post-medieval industry, commerce and settlement.

Earlier excavations which had taken place near to Park Street, at the Bull Ring Market, Moor Street and in Edgbaston Street (Mould 2001), showed that the site had been laid out by the thirteenth century. This, in addition to the continuity of property boundaries from the medieval period onwards in this area, suggested good potential for the survival of archaeological deposits and features. However, it was recognised that some of the areas within the confines of the excavation would be likely to have suffered heavy truncation from nineteenth and twentieth-century cellaring and the digging of building foundations.

Evidence for medieval pottery production was found in the excavations in the Digbeth/Deritend area (Sherlock 1955, Watts *et al.* 1986, Litherland 1994, Mould 2000). Further excavations at Edgbaston Street identified the substantial remains of thirteenth and fourteenth-century tanning pits, as well as evidence of settlement during these periods (Mould forthcoming). An excavation at the Row Market also uncovered remains belonging to the same periods, surviving between later cellar walls (Hovey 1999, Patrick 2000, Ramsey 2000). An excavation at Moor Street revealed archaeological deposits dating from as early as the twelfth century, most notably a vast deer park ditch (initially thought to be Hersum's Ditch). These earlier excavations around the area of the Park Street site indicated high archaeological potential for the latter. Field evaluations at Park Street did, in fact, show significant survival of deposits dating from the twelfth and thirteenth centuries, at depths of around 1m below the modern ground surface.

All archaeological work was carried out in accordance with the guidelines set down in Planning Policy Guidance Note 16 (Department of the Environment 1990).

3.0 Aims and Objectives

- The excavation aimed to excavate and record any archaeological remains within the proposed development area down to the base of the medieval strata.
- The primary objective of the excavation was to provide a detailed record of the archaeological evidence affected by development and to reconstruct the history of the use of the site.
- The following research priorities were identified:
- to investigate the remains of medieval and later industrial activity

- to investigate the morphology and development of the medieval property boundaries within the historic town plan
- to contribute to an understanding of the historic development of Digbeth and Birmingham as a whole
- The excavation aimed to establish the location, extent, date and quality of any surviving archaeological remains, in particular of the medieval period, in advance of development.

4.0 Methodology

Through necessity, the excavation was divided into three areas (A, B and C) which were excavated in turn. In advance of excavation two sets of evaluation trenches were opened up, two in Area A and two in Area C. The trenches produced medieval pottery of twelfth and thirteenth-century date. The results of the evaluation and the excavation have been conflated in this report.

Initial machine clearance of the modern overburden and levelling deposits was carried out under archaeological supervision. Machining continued down to the level of a dark grey 'cultivation' soil. A series of three 1m-square areas of this soil was hand-dug in each area, to ascertain its composition and to recover any dating evidence. Machining then continued down to the top of the medieval deposits.

The removal of the topsoil and general overburden was undertaken by machine using a wide-blade, toothless ditching bucket. Machine clearance was followed by hand cleaning to define the extent and distribution of archaeological features which were subsequently excavated. Environmental samples were taken whenever appropriate. A higher percentage of discrete features was excavated where more information was deemed desirable in order to achieve a more accurate picture of date, character and function.

Recording was carried out using pre-printed pro-forma record cards for contexts and features, supplemented by plans and sections (1:20, 1:10 and 1:50). Overall site plans were drawn by hand using tapes and the site grid pegs (1:50). Monochrome print and colour slide photography was used for all features.

5.0 Phasing

Preliminary phasing of the site has necessarily been broad, incorporating three main periods of activity. Phasing of the Edgbaston Street, Moor Street and Park Street sites will need to be rationalised across all three sites as the first stage of post-excavation analysis. They are as follows:

Phase 0 - Pre-medieval, represented by residual Roman pottery

Phase 1 – Medieval i.e. eleventh century up to the end of the fifteenth century

Phase 2 – Post-medieval i.e. from the beginning of the sixteenth century up to the end of the eighteenth century

Phase 3 – Modern i.e. from the beginning of the nineteenth century up to the present day

Phasing was based on provisional dating of the pottery and, if this was lacking, on the stratigraphic relationship between features. The seventeenth-century ‘cultivation’ layer, which covered the whole area of excavation, was also used to obtain a basic chronology for features, depending upon whether they had been sealed by it or cut through it. Detailed finds analysis will, however, result in a far more refined chronology for the site, with the likely creation of sub-phases within the main phases of activity. This will provide a more accurate and detailed picture of the development of the site within the historical and archaeological context of early Birmingham and its subsequent growth from the medieval period onwards. Phasing will also need to be regularised across the Edgbaston Street, Moor Street and Park Street sites.

6.0 The Stratigraphic Sequence

Phase 1 - Medieval

During this phase the indications were that in the medieval period there may have been a number of activities and functions taking place in different areas of the site. The southern half of the site provided evidence of possible industrial/manufacturing activity in the form of pits or tanks which had been clay-lined. Preliminary conclusions were that this may have involved processes connected with tanning or textile production. Water storage, connected with such processing, was indicated not only by the shape and dimensions of some features in this part of the site, but also by fills which appeared to have been waterlogged. Alternatively, ponding of water may have been related to the keeping of livestock in the area, a likely explanation in view of the site’s position next to the Bull Ring market (Plate 1). High temperature industrial processes were also suggested by a kiln and large quantities of slag (Plate 2). In support of this, substantial amounts of tile were found in the lower deposits of some features, in association with pottery of fourteenth-century date. If high temperature industry was taking place then regulations concerning fire hazards may have led to any buildings in the vicinity being tiled, rather than roofed with thatch or wooden shingles. Significantly perhaps, coal was also produced by some medieval contexts. The extreme north-eastern area of the site appears to have been designated for burials at some time during the medieval period (Plate 3). A provisional date based on pottery from the grave fills was the thirteenth century. The presence of only two skeletons in grave cuts may indicate the location of a graveyard on this spot from which other burials had been removed at some time. Alternatively, other burials may still exist but are underneath the eastern baulk of the site. Structural evidence for the medieval period was observed in the form of clusters of postholes in the eastern and southern areas of the site. The presence of buildings during this phase might also relate to the laying-out of property boundaries as the medieval town expanded and developed around the Bull Ring market area. Certainly, two substantial ditches on the site, which were interpreted as boundaries, could be connected to property development in the medieval period. Both produced deposits dating from as early as the twelfth century, significantly a time during which Birmingham was granted a market charter and therefore probably saw consequent town planning schemes.

At the western end of the site, a massive ditch (F174, F201) extended across the site on a north-west to south-east alignment. This ditch had steeply-sloping sides, stepped on the eastern side, a flat bottom, and measured at least 7m in width by 2m in depth. It continued beyond the northern and southern limits of excavation and possibly formed the continuation of the ditch, initially identified as Hersum's Ditch, observed in the Moor Street excavations. A large quantity of pottery was recovered from the fills of this ditch and three of the fills (1314, 1165, 1195) yielded some particularly interesting pottery which appeared to consist predominantly of kiln waste (see Ratkai below). This suggests that pottery production was taking place in an area stretching right up to the medieval town centre. Closer analysis of the pottery production waste could help to secure a more precise date for the disuse of the ditch (see Ratkai below) and that, in turn, could hold implications for the early development and layout of Park Street and the medieval town centre. The ditch had cut the natural sand (1102) and had in turn been cut down the centre by a deep, early twentieth-century wall foundation. The substantial dimensions of this ditch may result from its original use as a boundary to the medieval deer park attached to the nearby moated settlement. Visible in the upper fill of the ditch section was a recut (F234), which produced only seventeenth-century pottery. The line of this boundary was probably maintained into later periods long after its original function had been lost. Pertinent to this is the fact that the foundation and wall of an early twentieth-century building ran along the centre of the ditch, thus appearing to respect the same boundary line. This would suggest the continuation of a boundary from the medieval period up to modern times.

A slighter, curvilinear ditch (F195) ran very close to, and parallel with, the western edge of this massive ditch. One edge sloped steeply, but the feature had been heavily truncated to the east by a modern wall (F212), thus obscuring the full profile. It produced a similar range of pottery to the large ditch but its relationship to the latter, if one existed, could not be determined.

At the southern end of the site a third linear ditch (F715, F820, F821, F800), aligned east to west, was also interpreted as a possible boundary (Plate 4). It proved impossible to ascertain the complete profile of the ditch due to modern drainage and wall disturbance. However, the steep slope of the partially excavated northern edge of the ditch indicated that it was probably quite deep. This feature appeared to represent a boundary ditch relating to the same phase of activity as F174 (F201). The ditch had been recut by another east-to-west aligned linear ditch (F760, F799, F776), which also continued beyond the eastern edge of excavation (Plate 5). The recut produced pottery dating to the thirteenth century. Along the northern edge of the ditch a number of timbers was observed. Two of these were uprights *in situ*, (F777, F778) and others were substantial timbers *in situ*, aligned roughly east to west along the northern edge of the ditch. These timbers may be the remains of a fence, which followed the line of the boundary ditch.

A section (F715) across the ditch showed that it had cut a pit (F708) which contained a very dark organic fill and what appeared to be a thin, greyish-white clay lining mixed with lime. Extension of the section showed that this pit had also been cut to the north by a further pit (F709) which produced a complete leather shoe, lying within a very dark organic fill. Pit F709 was notable for the existence of an oval hole in its base, infilled with redeposited sand. The northern edge of this pit had cut a large, fairly deep feature, which appeared to be rectilinear in plan (F714). This feature

contained a number of distinct fills and produced significant amounts of medieval pottery. Initial interpretation was that this feature might have formed a pond or tank. Feature F506, at the western edge of excavation and on the same alignment as F714, was similarly interpreted. It also produced large amounts of medieval pottery with a similar date range to feature F714. One of the fills (1511) of F506 produced an iron poor jug, which had a thick internal deposit, which may have resulted from the activity associated with the tanks (see Ratkai below). Further analysis of this deposit may help to identify what that process was. The indications were that both of these features had also been clay-lined and, together, they provided substantial evidence for some form of processing taking place on the site from the medieval period onwards.

Along the eastern and southern edges of the site the preservation of medieval archaeology was particularly good. Towards the north-eastern edge a number of layers (1749,1841,1760,1761) produced large quantities of pottery dated to the twelfth and thirteenth centuries. The lowest of these layers (1761/1877) had been cut by two graves (F742, F752) which contained well-preserved, fully articulated skeletons. One skeleton was orientated north-west to south-east and the other east to west. Each of these graves had been cut through a large, sub-circular pit (F746). This may have represented an earlier grave cut from which the bones were removed, perhaps at the time the two later graves were cut into it. Feature F746 had been cut into the natural sand (1790) and most remarkably produced three sherds of Roman pottery which could be indicative of Roman occupation in the vicinity of Park Street (see Ratkai below). The graves were located in the north-eastern corner of the site. Approximately 3m to the north of F752 a grave-shaped cut (F744) was located cut into the natural sand. This feature had cut two postholes (F826 and F827). A third posthole (F756) was located in close proximity to the latter. A further three small postholes (F832, F834, F835) were located immediately surrounding one of the graves (F742). On removal of the sequence of medieval layers, further postholes were revealed, notably one with a charcoal-rich fill (F819) within a post pit (F829) which produced a good assemblage of medieval pottery. To the east of the latter, another two postholes were revealed (F785, F781). To the south of the aforementioned features, a further group of postholes (F801, F802, F830) was excavated in association with a north-west to south-east running linear gully (F767,F805,F804,F831). These postholes had cut the gully and were situated along its edge. This feature was shallow and had been cut by a small pit (F795), which contained a markedly compact orange clay fill. An oval-shaped feature (F768) was uncovered approximately 1m to the west of posthole F830. The interior of the feature had been cut into a 'keyhole' shape. It was around 2m in length and 1m in width, with vertical sides extending down to a flat base and fills that produced medieval pottery. The feature had been cut to the west by a posthole (F790), which may have been related to posthole F830. Initial interpretation was that F768 was a kiln.

Across the southern edge of the site a very dark clay layer (1816,1640,1588) was observed running in a band roughly south-west to north-east. The layer was clearly delineated and had a consistent depth of around 0.10m– 0.15m throughout, and may have represented some sort of surface. The layer produced large amounts of medieval pottery. It had been cut throughout by a series of medieval and post-medieval features. On the western edge of the site this layer had been cut by the feature previously mentioned as being a pond or tank (F506). This feature appeared to be rectilinear in shape, though its full dimensions were obscured by the western baulk of the site. The

edges sloped gently to a flatish base. It appeared that the feature had been clay-lined and contained very rich organic fills. It measured approximately 6.50m north to south and significantly contained a large amount of twelfth and thirteenth-century pottery. It had been cut by another medieval pit (F519), which also produced thirteenth-century pottery. To the east of F506, two features (F512, F508) similarly contained rich organic fills and were clay-lined. Other Phase 1 features which cut the medieval clay layer included pits (F540, F548, F562) and postholes (F544, F543).

The extensive series of medieval pits observed in the southern area of the Park Street site may relate to flax and / or hemp retting (ref. Ciaraldi) and water storage for the keeping of livestock for the Bull Ring market (ref. Burrows). Initial analysis of the bone assemblage from the medieval features has suggested evidence of animal butchery. There was a relatively high frequency of horncores from small/short-horned cattle in the Phase 1 (medieval) assemblage (pers. comm. Murray). Most of these had a portion of the skull still attached and the method used to detach them from the head appeared to be fairly systematic and similar to butchery practices recorded for post-medieval material from Chichester (Armitage 1990, fig 1a and 1b) and the Custard Factory in Digbeth (Murray 2001). Signs of butchery and gnawing were also noted on post-cranial cattle bones, also represented in Phase 1 contexts, as well as on many of the sheep/goat and pig bones. Further analysis of the organic remains, in addition to the evidence of butchery, should provide a better understanding of the use of the animals and the purpose of the pits.

Finally, in the north-western part of the site a number of medieval pits was located, one of which (F188) contained pottery and, interestingly, some medieval glazed tile. Most of these pits, however, had been heavily truncated by later post-medieval and modern activity. In the extreme north-western area of the site, where there were deep modern building foundations, survival of medieval layers or features was even sparser, with only one or two heavily-truncated, isolated pits surviving here.

Phase 2 – Post-Medieval

Evidence for the post-medieval period was overwhelmingly in the form of pits, located in clusters around the site. A number of different shapes and dimensions was represented and, as with the medieval period, the indications were that high temperature industrial activity and some sort of textile processing or tanning was taking place on the site at this time. Many of the pits had been backfilled with rubble and with deposits containing large concentrations of ash, clinker, coal and slag. Many of the bricks recovered from the rubble backfill looked crude, with inclusions like pebbles suggesting they were handmade rather than factory produced. The large amount of brick and tile present during this phase suggests possible demolition and building activities taking place in the area. One building (F814) in the south-eastern area of the site, provisionally dated to the post-medieval period, was represented by a series of rubble-filled wall trenches.

The north-western area of the site was characterised by the presence of a complex series of intercutting circular pits, some of which were large, with steep sides and flat bases (F134, F172, F162, F177, F176, F189, F192, F158, F182, F183). A number of these pits (F162, F172, F193, F194) was distinctly concave in profile, extending to

depths of between 0.50m to 1.20m and varying between 1m and 2m in diameter. A similar group of post-medieval pits was located in the north-eastern half of the site (F773, F824, F811, F816, F769, F789, F706, F713). These pits were also characterised by concave profiles and had a similar range of dimensions to those pits in the north-west. The distinctive 'bellying-out' of these pits suggests that they were being used for some sort of specialised purpose. The north-eastern cluster of pits contained substantial quantities of ash, clinker and charcoal mixed with brick and tile. One pit in particular (F769) was noticeable for the concentration of large lumps of slag, mixed with considerable amounts of charcoal and clinker in its base. Pits F158 and F811 also yielded particularly large quantities of slag. The substantial assemblage of slag from Park Street was indicative of on-site metal working and further study might help to determine the extent and nature of that metal-working during the post-medieval period (see Macey below). Pit F769 was also notable for producing the earliest occurrence of crucibles on the site (1825), most probably in the first half of the seventeenth century (see Ratkai below). Crucible fragments were also found in the fills of the intercutting pits in the north-western area and the similar group of pits in the north-eastern area. It is possible that the crucible fragments point to some sort of specialised processes taking place which could also be connected to the distinctive 'bellying-out' shape of some of the pits (see Ratkai below). Further investigation of the Park Street crucibles could help to establish what manufacturing processes were taking place here and help to establish a more closely defined chronology for such processes (see Ratkai below). Pits F706 and F713 were infilled with huge quantities of seventeenth and eighteenth-century pottery, glass, brick, and tile. Pit F808 was noteworthy, in that it did not conform to the shapes and dimensions of the others in the vicinity. It was rectangular in shape, with vertical sides and was large, measuring 2m by 3m and 1.20m in depth. This pit produced large quantities of tile, as well as post-medieval pottery. Some residual medieval sherds were also recovered. Large circular pits (F700, F702), infilled with building rubble and producing sherds of seventeenth-century pottery and clay pipe stems, were also observed in the south-eastern half of the site. A further group of post-medieval pits (F791, F803, F765) was concentrated in the extreme south-eastern corner of the site, one of which (F765) produced a mixture of medieval and post-medieval pottery.

Along the southern edge of the site two large pits or tanks (F503/F520, F510/F542) were, at first, interpreted as being associated with tanning. The identification, however, was tentative and further environmental evidence may show them to have been connected with some other process, for example, hemp/flax processing. Feature F510/F520 measured around 4m east to west by 2m north to south. The pit had a flat bottom and vertical sides and had been lined with a series of horizontally-placed wooden planks (1695) against which upright timbers, many still *in situ*, had been set. Numerous postholes inside the pit were largely restricted to the edges of the base and probably formed the holes for the upright supports for the wooden planking. The fills (1621, 1635) produced very considerable quantities of brick, post-medieval pottery, glass and slag. Another context (1622) was notable for being very organic, with large amounts of plant remains and twigs present. Feature F503/F520 was again a large, vertically-sided, rectilinear pit, approximately 3m by 2m. A number of postholes, some quite deep and shaped to take pointed timbers, was located fairly regularly around the edges at the bottom of the pit. Possibly connected with this was a well-preserved wicker canopy, which had apparently collapsed into the pit and may originally have been supported by the timbers in the postholes in the base of the

feature. As in the case of F510/F520, the vertical sides suggest that F503/F520 might also at one time have been wood lined. This pit also contained organic fills (1521,1533) which contained twigs, bark and matted, straw-like material.

Both of these features had been cut through a medieval clay layer. The sequence of deposition in pit F503/F520 indicates that the wicker canopy (1532) most likely collapsed onto fills which were already in the bottom of the pit. Of particular note was a well-preserved, almost complete chair of possible mid-seventeenth century date which had been discarded in the pit and onto which the canopy had subsequently collapsed (Plate 6). Further research, in order to determine a more exact dating for the chair (see Bevan below) could provide a more accurate sequence for the use and disuse of the pit. The dating of the use and disuse of the pit is not clear, as the lower fills (1521, 1580) both contained late eighteenth-century pottery which raises questions about the date of the deposition of the chair and even about the date of the chair itself. For example, was the chair a later replica or already very old when abandoned (see Ratkai below). The chronology of the use and disuse of the pit could be further elucidated by a more detailed analysis of the pottery (see Ratkai below). With regard to the canopy, an alternative explanation may be that it was thrown into the pit from elsewhere. The location and size of the postholes in the base of this pit, however, strongly suggest that they were intended for fairly large timbers which were used to support a superstructure of some sort and the presence of a canopy seems likely. If this was so, then this could be important evidence for both the appearance and function of the pit.

A dark grey-brown layer which may represent a seventeenth-century 'cultivation' soil (1108, 1168, 1520, 1797, 1824) was observed extending across the entire area of excavation and has been seen on all other excavated sites in central Birmingham. The layer had been seen and recorded in the evaluation trenches and subsequent excavation illustrated that it sealed the earliest phases of archaeological activity. It had in some areas been heavily truncated by modern walls and foundations, in particular in the northern half of the site where building activity was more intensive. This layer ranged from between 0.20m and 0.70m in depth, with the deepest and less disturbed levels limited to the southern part of the site. Due to the disturbed nature of this soil in places careful analysis of stratigraphic relationships will need to be carried out to clarify whether all features cutting this cultivation soil belong to Phase 3.

Phase 3 - Modern

This phase was largely represented by modern building phases, pipe trenches and layers of demolition, levelling and rebuilding. The area of the site which bordered Park Street was characterised by a number of late-nineteenth and early-twentieth-century buildings and associated foundation trenches.

The exterior wall of one of these buildings, a large, early-twentieth century warehouse (F125), was supported by a particularly deep foundation which had been sunk almost 2m along the centre of the massive boundary ditch (F201). The fact that the wall respected the line of the ditch was, perhaps, an indication of the tendency of later buildings to follow earlier property boundaries. Warehouses in this area were ideally situated to take advantage of the close proximity of the Moor Street railway line. The

remains of other smaller structures here (F212, F211) were noted for their distinctive, low arches made from moulded bricks, though their function was not apparent, though they could be industrial, linked to seatings for drive shafts for equipment. These buildings may have been residential or commercial and dated to the nineteenth century. Map and documentary research may throw light on these structures. The Victorian era was a period of building, remodelling, and of significant improvements in sanitation when new drains and wells were dug. This was particularly evident along the frontage to Park Street where a number of deep, brick-lined wells had been sunk. One of these (F127) was excavated to a depth of at least 2m.

Across the north-eastern part of the site building F722 was represented by a long, continuous wall running parallel to Park Street, with dividing walls running at right angles to it. The width of the divisions, which were fairly narrow, may well have reflected the limits of the original medieval burgage plots which once would have fronted onto the street. In contrast to the buildings in the north-western area of the site, this building had less substantial walls, with smaller, less regular bricks and could therefore be earlier nineteenth-century in date. The building could have been residential or have been used for shops/workshops. This building had clearly cut a series of medieval layers and features. To the south of this, a well-preserved brick floor surface (F786), probably of around the same date, could have been a yard belonging to a property which fronted onto Park Street. This surface was rectilinear, fairly narrow, and set at a right angle to the street, and so possibly reflects, once again, the long, medieval burgage plots which originally existed here.

A large, late-twentieth-century building (F815) in the southern half of the site was demolished during the course of the excavation but despite the building's substantial foundations, the deeper archaeological deposits had not been disturbed. It was observed that the back wall of the building appeared to respect the line of the large boundary ditch (F799, F760) which ran across the bottom of the site.

Perhaps the most important information produced from Phase 3 was evidence for the continuity of boundaries from the medieval period up to the twentieth century. This, of course, carries significant implications for reconstructing and understanding the town-plan of Birmingham, especially around the Bull Ring market area which formed the hub of the medieval settlement.

7.0 Artefactual Data

7.1 The Pottery by Stephanie Ratkai

All the pottery was examined macroscopically. The medieval pottery was divided into broad groups, eg grey ware, sandy cooking pot, white ware, buff or iron-poor ware ware, Deritend ware etc. Late medieval/early post-medieval pottery was divided between late red wares, Midland purple ware, Tudor Green type ware and Cistercian ware. The post-medieval pottery was divided into ware categories eg coarseware, blackware, yellow ware, slipware, manganese mottled ware, English stoneware, tin glazed earthenware etc. Eighteenth- and nineteenth-century factory-produced wares were categorized as modern glazed wares in the absence/presence tables, apart from white salt-glazed stoneware and creamware which were listed individually. The pottery was quantified by overall sherd count but not within ware /fabric types. Every

context from both the excavation and evaluation was spot dated. Notes were kept of unusual forms and decoration.

Roman pottery

Three oxidized Roman sherds, two of which were Severn Valley ware were recovered in the backfill of F746.

The Medieval pottery

The majority of the medieval sherds was from cooking pots. The cooking pots generally had oxidized brown or orange surfaces and grey cores. The larger group of cooking pots had rounded bodies but there were some with straight-sided cooking pots. Decoration was not common, but a small percentage of vessels was decorated with thumbed strips and a very small number with incised wavy lines. One cooking pot had a combed rim. This style of rim decoration occurred at Stafford Castle in early castle levels and may be as early as the twelfth-century in date. The other broad group of cooking pots/jars fell into the Warwickshire grey/black ware tradition (fabric 121 (F121), Ratkai 1987-8, and Ratkai forthcoming), with rounded bodies and well-formed angular rims springing from the neck.

Jugs occurred in white and other iron-poor fabrics, but the most common jug fabric was Deritend ware. Here, in addition to the typical white painted decoration associated with Deritend ware, there was also a number of sherds with more complex decoration, including, in one case, an applied face mask. This type of decoration is known from the waster pits from behind the Old Crown, Deritend but thus far has not been found (or at least recognized) elsewhere. In addition to the main jug fabrics a small number of unglazed jug handles in Warwickshire grey/black ware was found. There were some non-local jugs from the Chilvers Coton and Boarstall-Brill kilns, but these were rare, and a few sherds that appeared to be Coventry glazed ware. One or two sherds may have been in a Banbury-Brackley type ware.

There was much less late medieval pottery and the vessel forms were different, being composed in the main of wide-mouthed bowls and drinking vessels. Most of the pottery is likely to have been of fairly local manufacture, the exception to this being the Tudor Green ware and a ?Nettlebed cup.

The post-medieval pottery

The post-medieval pottery was dominated by blackware and coarseware, with a smaller amount of yellow ware. Blackware forms consisted mainly of tankards, cups and other drinking vessels. Yellow ware forms were made up of mainly table wares eg dishes, bowls and drinking vessels. Domestic utilitarian forms were found mainly among the coarsewares, where large jars, bowls and pancheons occurred. It is likely that the greater part of the yellow wares, blackwares and coarsewares was of local manufacture, presumably coming from Wednesbury.

Slipwares were not common. The best represented was feathered slipware. Both trailed slipware and impressed slipware vessels were poorly represented. A comparatively large amount of eighteenth-century table wares was present, either white salt glazed stoneware or creamware. There was also a small number of Anglo-Dutch tin glazed earthenware vessels of the later seventeenth or eighteenth centuries.

Continental imports

Very little imported pottery was found. There was a small number of Rhenish stoneware sherds, but perhaps the most interesting vessels were a Seville blue and white (sometimes known as Yayal Blue) foot-ring dish and a crude vessel in a micaceous fabric with some igneous temper which may have come from an olive jar. All of the continental imports dated to the post-medieval period.

Phase 1 (Figs. 3, 5, 7 and 9)

A large collection of pottery was recovered from the fills of ditch F201/F174. The pottery from the ditch, particularly from fills 1314 and 1165, was of great interest. These fills consisted almost exclusively of cooking pot sherds. The cooking pots were all round bodied, with variations on the same basic everted, slightly-dished rim form. Some of the vessels had been decorated with applied thumbed strips. Nearly all the cooking pots were unsooted and the external surfaces of the vessels, although generally oxidized orange, were inconsistently fired and patchy. In addition, a number of the sherds was "spalled". This group of pottery was unlike any other group from the site, although some spalled sherds were present in other features. Spalling can occur under two circumstances; during firing when impurities within the clay body cause sections of the vessel to sheer away, or during extended exposure to frost where the expansion and contraction of water/ice within the clay body causes the same sheering away of sections of the vessel. The salient features of the pottery from 1314 and 1165, namely the similarity of rim and vessel form, the lack of sooting, the inconsistent firing and the spalling, strongly suggest that this group of pottery is predominantly made up of kiln waste. Further pointers to some kiln waste being incorporated into features on the Park Street site are a wasted Deritend jug base from 1195, another fill of F174, and part of a ?kiln bar from 1326, another fill of F201. This, in turn, suggests that pottery production was taking place along a substantial section of Digbeth and Deritend right up to the medieval centre of the town. In some respects this should come as no surprise, since some of the larger pottery-producing centres such as Brill in Buckinghamshire and Chilvers Coton in Warwickshire were situated on rather poor agricultural land, as indeed was Birmingham.

Other fills from ditch F201 contained a greater variety of pottery, both in terms of fabric and form. The earliest fill (1325) contained a cooking pot sherd and an iron-poor glazed rim-neck sherd from a jug. The glazed sherd is unlikely to be earlier than the thirteenth century. Of the remaining fills, the pottery within them seems to date to the thirteenth or fourteenth centuries. The latest pottery came from the upper fill (1252) and consisted of a coarseware sherd (late sixteenth-seventeenth century) and five late medieval oxidized sherds (fifteenth-sixteenth centuries). In view of the small quantity of material of this date, it seems most likely that these sherds were trampled into the upper ditch and that the ditch had been filled by the fourteenth century.

Associated with ditch F201 was F195, a smaller curvilinear feature. The fill of F195 was very mixed. The larger part of the pottery consisted of medieval wares, but the presence of a ?Nettlebed cup base (?sixteenth century) and late oxidized ware sherds, together with an eighteenth-century brown stoneware sherd, makes the dating of this feature difficult.

Other ditches and linear features (eg F715 etc and F760 etc) appeared to have fills which were more or less contemporary with that of the main ditch F201/F174, although there was some later, almost certainly intrusive, material in some of the fills. A hint of some twelfth-century activity in this area of Park Street is given by a handmade iron-poor jug from F174 (1246) in a sand and clay pellet tempered fabric which is unlikely to be later than the early thirteenth century and which may well date to the late twelfth century, and another iron-poor glazed jug with pitted glaze and horizontal combing from F776 (1868) was similarly dated.

The clay-lined tanks F714 and F506 contained very mixed fills dating from the medieval period, the fifteenth-sixteenth centuries and the eighteenth-nineteenth centuries. There was no obvious functional bias within the fills, but an iron poor jug from F506 (1511) had a thick unpleasant internal deposit which may derive from the activity associated with the tanks, and as such, might repay closer scientific examination.

Layers 1760, 1761 and 1841 towards the north-eastern edge of the site contained pottery of thirteenth or early fourteenth-century date. A fourth layer (1749) contained similar medieval material, but also seventeenth-century sherds which were presumably intrusive. The two graves cut layer 1761/1877 which probably dates to the thirteenth century. The fills of the two graves likewise contained pottery of the same sort as that from the layers. The two graves cut a large sub-circular pit (F746), possibly a robbed-out grave, and this feature, in addition to containing the usual mix of thirteenth or early fourteenth-century pottery, also contained three oxidized Roman sherds, two of which were Severn Valley ware. The presence of Roman material in the centre of Birmingham is itself astonishing, but to find it associated with two anomalous burials makes it doubly so. Postholes and postpits possibly associated with the burials contained no pottery.

The kiln F768 again had a fill which contained mainly thirteenth or early fourteenth-century pottery, including an overfired greyware handle. There was, however, a Tudor Green handle in the fill which is either intrusive or dates the fill to the fifteenth or sixteenth centuries.

The medieval pottery appeared to indicate that there was activity from possibly the late twelfth century up until the fifteenth and sixteenth centuries. Sometimes early features had been contaminated with later medieval or post-medieval pottery which presumably had been trampled into the upper fills of the features. Pottery of the later medieval period is perhaps rather less well represented than the pottery of the preceding and following periods, but not to the extent which would suggest abandonment of the area. Indeed, late medieval pottery was found in post-medieval-cultivation layer 1108 and this demonstrates how our understanding and appreciation of a site may be distorted by the routine stripping of sites so that the bulk of information is obtained from feature fills.

Phase 2 (Figs. 4, 6, 7, and 10)

The large tanks F503/F520 and F510/F542 contained a large quantity of pottery. Medieval pottery was found in most fills, but three fills (1530, 1680 and 1694) contained only thirteenth-fourteenth-century pottery. None of these contexts is an

early fill and the pottery must therefore represent stray sherds derived from the surrounding ground surface. The dating of the use and disuse of these tanks is problematic. Clearly, the deposition of a chair here (see below) marks the disuse of the pit and the date of the chair of c1650 gives a *terminus post quem* for this event. However, the lower fills (1521 and 1580) of F503/F520 both contain late eighteenth-century pottery. The problems of the chronology of the use and disuse of the tanks could become clearer when more detailed analysis of the pottery is undertaken, allowing a careful quantification of the different pottery within the fills and the amount of abrasion, comparative sherd size, and average sherd weights of the components to be gauged

A similar problem was manifested in the series of intercutting pits in the north-western area of the site. Fill material ranged in date from the mid-sixteenth century to the nineteenth century. However, the nineteenth-century pottery was almost certainly intrusive and the bulk of the pits seems to have fills which date to the seventeenth or early eighteenth century. A similar pattern was seen in a group of concave profile pits in the north-east of the site. The evidence seems to indicate that in the seventeenth and early eighteenth century some sort of metalworking was practiced in this area of Park Street. To the south of the site was another seventeenth-century pit (F765), although this seemed to belong to the first half of the century and an earlier phase of activity.

Phase 3 (Figs. 4 and 8)

The usual range of nineteenth-century "artisanal" pottery was present in most of the Phase 3 features, the most common being industrial slipwares (eg Mocha Ware). Also present were transfer printed wares, painted ware, sponged ware and utilitarian whiteware. The interest in this pottery lies, however, in the contrast between it and the pottery from the preceding century. Further analysis may reveal that the material culture of the site demonstrates a change from sometimes prosperous industrial manufacturers living by their wares, as is documented in the eighteenth century, to the separation of the dwelling place and industrial activity which took place in the nineteenth century, with the movement of the prosperous manufacturer out into the suburbs. As Orser (1996, 198) has demonstrated "*Commodities, like all material things, carry social meaning and have socially relevant values*".

Discussion

Perhaps the most immediately striking aspect of the Park Street assemblage is that it is of a rather different composition from that at Edgbaston Street. Although the range of fabrics was broadly the same at both sites the relative proportions are different. Some of the more obvious differences are listed below. At this stage observations on the make-up of the Moor Street assemblage have not been tabulated.

Park Street	Edgbaston Street
Rounded cooking pots predominate	A mix of rounded and straight-sided cooking pots
Deritend ware more common	Iron poor glazed wares more common
Jugs predominate, pitchers rare	Mix of jugs and pitchers
Several F121 jugs	One example of an F121 jug
Tudor Green present	No Tudor Green
Later medieval pottery less well represented	Greater quantity of later medieval pottery
Limited range of post-medieval forms	Wide range of post-medieval forms

Coarsewares not abraded
Feathered slipware most common

Coarsewares highly abraded
Feathered slipware rare

Table 1 Comparison of main differences between Edgbaston Street and Park Street pottery assemblages.

Edgbaston Street was an earlier development than Park Street, and the laying-out of Park Street and Moor Street was a later extension to the town, although still well within the medieval period. There appear to be differences in the level of activity in the later fifteenth-seventeenth centuries, with more convincing mid-seventeenth century activity at Edgbaston Street but less late medieval-early post-medieval activity. The reverse is true of Park Street, although there appears to have been an upsurge in late seventeenth-early eighteenth century activity associated with metalworking

The assemblage is important for two other reasons. The first is the presence, albeit on a small scale, of Roman sherds. These do not, of course, indicate a fully-fledged Roman settlement in the area but are nevertheless evidence of some Roman occupation which fills in a gap which otherwise exists between the Roman fort at Metchley and the Roman kilns at Perry Barr.

Secondly, the assemblage has produced further evidence of medieval pottery production in Birmingham, with oxidized cooking pots not hitherto associated with the Deritend waster groups. Evidence now suggests that the industry may have been quite extensive, although not necessarily long lived, stretching from the rear of the Old Crown, Deritend, along Digbeth High Street and up to Park Street. The main ditch F174 /F201 was filled in part with pottery production waste and this may help to date more precisely when the ditch went out of use. Likewise, more thorough analysis of the pottery may help to determine on which side of the ditch the kiln or kilns were likely to have been located. This is of great importance in helping to understand the nature of the ditch eg town ditch, deer park ditch etc. Clearly if pottery production was located to the east of the ditch then the interpretation of this land as a deer park seems unlikely, unless the laying out of Park Street began *before* the ditch fell into disuse.

The post-medieval pottery takes on a greater meaning because of, not in spite of, the documented history of Birmingham, for as Orser writes "*Even in historical archaeology, where access to sources of information other than artifacts and their site contexts are common, artifacts - their points of origin, associations, and styles - still provide a significant source of information.*" (Orser 1996, 189) and "*..... archaeological data are intended to supplement already extant written records and to function as documents.*" (*ibid*, 190).

Aims/proposals

The pottery from Park Street is extremely valuable in illuminating the growth of Birmingham from the medieval period to the nineteenth century. 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 Park Street. The pottery assemblage is different from that recovered from Edgbaston Street and as such, provides further useful data for chronological and functional analysis.

Recording/Quantification

All the pottery from contexts pre-dating the nineteenth century should be recorded in detail. The medieval pottery is to be examined under x20 magnification and divided into fabric groups and the post-medieval pottery by ware type. The pottery is to be quantified by sherd count, sherd weight, minimum rim count and rim percentage and details of vessel form, decoration, sooting and abrasion should be noted. All resultant data are to be entered onto a database. The late eighteenth-early nineteenth-century pottery should not be ignored because of its relative modernity, as it may provide valuable information on the relative status or prosperity of the site's inhabitants during this important period of Birmingham's history. It is therefore proposed that the ware types and forms present and their relative frequency should be recorded, although detailed quantification other than vessel count is not recommended.

Dating/chronology

The pottery should be compared with other local assemblages eg from Edgbaston Street, Birmingham Moat, Weoley Castle and Kings Norton, Birmingham, and other industrial urban sites in the Birmingham and Black Country area 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 and Moor Street, to see if any patterns emerge.

Taphonomy

In general, there is very little residual medieval pottery in post-medieval levels. The reasons for this should be examined to see if this was caused by truncation, abandonment, or contraction on the site, change of site use, or changing patterns of rubbish disposal.

Pottery sources and trade/exchange patterns.

The pottery should be sourced where possible. This will enable a picture of trade or exchange contacts to be established, for as Orser (1996, 198) says "*The question of acquisition, no matter how hard to answer, lies at the heart of understanding the dynamics of material life*".

There is also scope for establishing to what extent trade in pottery reflects industrial trade patterns for Birmingham and whether these differ from trade patterns for non-industrial sites. As Orser (1996, 192) comments "..... *what kinds of goods were available in particular geographic regions at particular points in time suggest what market forces may have affected archaeological site inhabitants.*" Such market forces are particularly relevant when considering the origins and growth of Birmingham into a major industrial city and how the city's industrial status even in the later eighteenth and nineteenth centuries affected the consumption of ceramics.

7.2 The Small Finds by Lynne Bevan, with contributions by Erica Macey

Wooden Chair

A broken, but still articulated, wooden chair was discovered in a former tank (F503). Despite severe degradation, it was still possible to discern some impression of the original style of the chair, which appeared to be in keeping with the ceramic dating evidence. It was a heavy, solid style of chair, with turned decoration on both of the front legs and cross-piece, and would originally have had a studded leather seat. Such chairs, usually made of oak, were popular during the mid-seventeenth century. Part of the back of the chair was missing at the time of its deposition and only a small segment of the leather chair seat and back, and some traces of organic stuffing, had survived.

It is recommended that the chair should be fully cleaned, and that a complete photographic record is achieved of all surviving elements. Full illustration is also recommended, as well as further research in order to determine the exact dating and original appearance of the chair. While the extent of damage and fragmentation precludes any kind of conservation of the artefact, full recording will allow the chair to be replicated either by a furniture craftsman for incorporation in a museum display or possibly as a 3D computer image.

Other Wood by Erica Macey

A total of 57 fragments of waterlogged wood was recorded. The assemblage consisted mainly of small, undiagnostic offcuts and unworked pieces of wood, which may be useful for the purposes of species identification. A small worked wooden point was also recovered (1585, SF2), which may repay further investigation regarding its function. None of the fragments recovered was of a suitable size for dendrochronological dating. Due to the fragmentary nature of the assemblage, no further work beyond the compilation of a short report on any worked pieces, species identification, and summary listing of the unworked fragments, is recommended.

Copper Alloy Objects

The copper alloy assemblage was poorly-preserved, largely fragmentary, and contained few identifiable or datable objects. However, several items were of some interest, including a lace end (1101), a ferrule or scabbard chape (SF6/1101), two fragments from buckles (1158, 1738) and a domed stud inlaid with clear glass (1738). Other identifiable objects included a small decorative nail with a screw thread (1101), a hoop-shaped carrying with an iron post (SF23/1728), and a coin or token, now totally degraded (1101).

There was a number of items of haberdashery in the assemblage, including: a thimble (SF27/1770), a hook for clothing (SF13/1126), six buttons (1101, 1133, 1634 x 2, 1738 x 2), and 12 pins (1000 x 2, SF6, SF24/1728 x 1, SF7/1752 x 2, SF13/1768 x 2, SF25/1770 x 3, 1842 x 2). Further haberdashery items were found in a small group comprising a broken thimble, a button, three pins, a looped strip (possibly a belt slider or other fitting) and several unidentified fragments (SF28/1771).

There was also a number of fittings, including: two ferrules (1167, unstratified), a 'T'-shaped fitting or terminal (1505), a lock plate (1798), a washer (1738), a kidney-shaped fitting (1108), and three studs (1122, SF20/1678, SF31/1917). Modern finds

included a twentieth-century spoon (1738), and a fitting with chainlinks attached (1738).

Unidentified finds consisted of a hook-shaped object (1738), a tapered, triangular-shaped object (1708), a triple ring of coiled strip with tapered ends (SF 1/1101), three rod fragments, three strip fragments, 11 plate fragments, 12 wire fragments, two large lumps, one of which had mineralised wood attached to it, four lumps with a 'molten' appearance, a plate fragment with criss-cross decoration, and 12 miscellaneous fragments.

Several items in the assemblage, particularly those of potential medieval or early post-medieval date, will require cataloguing, illustration and full publication, as well as further research for datable parallels. The remainder of the assemblage will require a summary listing by context only.

Iron Objects

Iron objects were in a generally poor state of preservation, with a high incidence of corrosion products. Identifiable items included two buckles (1125,1053), a small corroded knife (1738), three decorative fittings (1738), and 213 iron nails. Other possible identifications included handle and body fragments from an iron bucket or cauldron (1771) and a possible staple (1815). Some objects, such as a doorbell (unstratified), a furniture caster (1738), and a wing nut (1753), appeared to be of very recent date.

Much of the remaining iron was fragmentary and unidentifiable. Some contexts produced large quantities of unidentifiable, corroded fragments. For example, Context 1738 produced several fragments of door furniture, a bolt and c.20 plate fragments. A hinge plate and c. 50 various fragments came from Context 1771, and a large concentration of c. 80 fragments of plate, possibly from an iron box or chest, came from Contexts 1235 and 1231.

The remaining fragmentary iron, 126 items in total, can be broken down as follows: a large circular fragment of plate, a triangular-shaped plate, a perforated plate, a curved object, three rod-like unidentified objects, six rod fragments, one wire fragment, three pointed objects, possibly tools, two fragments of rectangular-sectioned rod, 61 plate fragments, the majority of which came from two contexts (1770 x 30, 1791 x 25), two hollow tubes, seven strip fragments, and 37 miscellaneous fragments.

An initial examination of this fairly large, but poorly preserved, assemblage suggests that further research should be restricted to identifiable material, with a view to selective cataloguing, illustration and publication of c. six items. The remainder of the assemblage will require a summary listing by context only.

Bone Objects

The bone objects were in a good state of preservation and many of the items were complete and identifiable. This was one of the most interesting finds assemblages both artefactually and in terms of a possible on-site bone industry.

The most aesthetically-pleasing items were a carved fish, with incised gills and mouth and a ring-dot motif for an eye, the tail of which is missing (1728), and an incomplete

spoon with a long bowl and incised decoration on the handle (1738). Other finds included a double-sided comb with curved ends and some breakage to the teeth (1728), a knife handle with part of corroded tang visible (1755), two brushes (1738, 1770), and two buttons (1131,1798). Less identifiable material comprises a flattened fragment with a curved upper face, possibly an unfinished knife handle (1101) and a spatulate object, one end of which is wider than the other (1768).

The remaining bone items comprise 11 roughly triangular wedge-shaped pieces (1101 x 3, 1126 x 2, 1139 x 1, 1167 x 1, 1219 x 1, 1621 x 1,1819 x 1, 1839 x 1). These appear to have resulted from on-site bone-working, either as preforms for further working or as offcuts.

All of the bone objects are worthy of further research, illustration and full publication. The wedge-shaped pieces are of particular interest, in view of the occurrence of similar pieces on other Birmingham sites and further research is strongly recommended, on both a local and regional level, in order to determine the nature of the bone-working industry in early Birmingham.

Lead Objects

An ovoid lead weight with a perforation for suspension (SF 9/1756) was of potential medieval date. Other lead finds consisted of a circular, hollow, ball-shaped object with surface traces of corroded iron (1101), a spatulate object with a circular-sectioned stem (1706), a fragment of strip (1705) and small quantities of probable window leading (1739, 1752).

Further research, illustration and cataloguing is only recommended for the lead weight.

Glass

a. Objects

Decorative glass finds included a three-sided clear glass bead, the plain surface of which is very scratched. The other two surfaces bear impressed decoration, in the form of a lion rampant emerging from a crown and a Graeco-Roman-style male head (SF 30/1797). This object was intended as a seal and would have been mounted on a metal, usually gold, swivel. It is probably Victorian. Other finds consisted of an opaque square-shaped stone with a faceted top (SF1/1133) and 29 faceted stones in green, blue and clear glass (SF3/1125). None of this material appears to be earlier than the late twentieth-century. A marble, now opaque cream with a brown swirl design, was also recovered (1791).

b. Bottles, Other Vessels and Window Glass

A total of 737 fragments from wine and beer bottles, 160 fragments from other vessels and 153 fragments of window glass was recovered. There was a high incidence of fragmentation, with very few complete or near-complete items being noted among the assemblage. Many of the fragments had acquired the flaking, iridescent patina characteristic of aged glass.

The potentially earliest glass fragments, possibly early post-medieval in date, were five small window panels with grozed edges (1101, 1103,1139, 1141, 1738). A small irregular-shaped fragment from the rim of a small vessel (Area C, unstratified) was

probably also of medieval or early post-medieval date. Some other fragments of potentially early glass were also present in the assemblage, including a rim fragment from a light green bowl (1512). However, the majority of the glass consisted of wine and beer bottles fragments of seventeenth-twentieth century date, most of which were too small and undiagnostic for dating purposes. However, several broad base fragments and distinctive necks from wine bottles have dating potential. Other vessel fragments came from several blue and green medicine bottles, some Codd's bottles, and other nineteenth-twentieth century drinks bottles, as well as quantities of clear glass of modern appearance. Fancy glass included an iridescent purple and blue-green fragment from the footing base of a decorative glass bowl (1725), and fragments from wine glasses. Although very fragmentary, much of the window glass was of pre-nineteenth - century date.

Further research should be conducted upon the more complete and datable material only. This should include selective illustration, the compilation of a full catalogue of illustrated pieces and a short report detailing the chronological range and scope of the assemblage for comparison with other urban assemblages on a local and regional level. Undiagnostic fragments will require listing by context.

Clay Pipes

A total of 298 bowls and bowl fragments and 1307 stem fragments from clay pipes was recovered. Over half of the bowls were complete and some had retained sections of stem. Thirteen bowls and one stem were decorated and 95 stamps were identified, mainly on the bases of the pipe bowls.

The vast majority of the bowls have dating potential and over half of the pipe fragments came from Phase 2 (c. 1600-1899) contexts contemporary with their main period of use. While many contexts yielded a few fragments of bowl or stem, several features (such as F500 and F659) contained large assemblages, including a number of datable and stamped bowls. Further research is recommended upon the clay pipe assemblage, with a view to principally providing dating evidence, in tandem with the pottery, especially for contexts containing crucibles (see Ratkai above). Identification of makers' stamps and selective illustration is also recommended.

Worked Stone

Several items of worked stone were recovered from the site, including two complete circular stones, and one half, all of which were of similar size and shape to millstones. However, all of them exhibited grooves on their outer surfaces and their central holes were square rather than circular, suggesting that they had been used for industrial purposes in conjunction with machinery, perhaps for pressing rather than grinding. None came from a stratified context. Other finds included a cylindrical fragment of worked stone, through-drilled to hold a square-sectioned metal rod, for which an industrial use is most likely (1622), a cylindrical fragment of turned grindstone (1738), and three fragments from slate roof tiles (1110, 1738, 1931).

Further research should include the geological identification, full cataloguing of all of this material, and the compilation of a report. The illustration of the small perforated object (1622) is recommended, with a view to finding published parallels and identifying its purpose and the industry in which it was used, possibly in relation to building F212/F211 of Phase 3. Photography is recommended for the three larger

stones for comparative purposes with stone components from industrial equipment. These stones will need to also be compared to similar stones from the excavation at St Martin's.

Other Geological Material

A fragment of chalk (1515) and several fragments of poor quality coal, including some burnt pieces, were recovered from the following contexts: 1141 x 1, 1512 x 4 (including one burnt fragment), 1519 x 1 (clinker, burnt), 1512 x 30, 1515 x 2, 1621 x 1 (burnt), 1625 x 1, 1634 x 1, 1636 x 3, 1726 x 6, 1727 x 7, 1798 x 7.

No further research is recommended for this material.

The Leather by Erica Macey

A total of 292 fragments of waterlogged leather was recovered from the site. The assemblage was in a fragmentary condition and consisted mainly of undiagnostic offcuts. A quantity of shoe remains was noted (1101, 1508, 1521, 1634, 1704, 1738, 1771, 1822, 1908), and these may provide some dating evidence on further investigation. Two fragments of leather belt or strap (1822, unstratified) were also noted. A full report, including illustration, will be required for the shoe and belt/strap remains. The fragmentary condition of the remainder of the assemblage means that no further work beyond a full listing by context is recommended for this group.

The Slag by Erica Macey

A total of 830 fragments of slag, weighing 59,467 grams, was recovered. Most contexts yielded small quantities of slag, with particularly large quantities being noted in the following Phase 2 contexts: 1175 (192 fragments), 1826 (80 fragments) and 1908 (65 fragments). The assemblage contained a high proportion of tap slag, indicative of on-site metal-working. This was distributed evenly across all areas of the site.

This substantial urban assemblage is worthy of further study, in order to determine the extent and nature of metal-working during the post-medieval period, between 1600 and 1799. Further research might reveal the origin and quality of ores, as well as giving an insight into the efficacy of on-site ore extraction techniques. Additionally, further information regarding the types of hearths or furnaces in operation and closer chronological operation may be gleaned. The slag will also need to be analysed along with the hammerscale recovered through sampling, and in cognisance of the occurrence of coal by context, feature and phase.

Brick and Tile by Erica Macey

Tile

A total of 2406 fragments of ceramic tile, weighing 177,780 grams, was recovered. No complete examples were recorded among the assemblage, which exhibited a high incidence of fragmentation, but little evidence of abrasion of individual pieces. The assemblage was quantified by count and weight and examined macroscopically for the purposes of fabric identification.

The tile was evenly-distributed across the site and most tile fragments occurred in Phase 1 and 2 contexts. Tile from Phase 3 contexts (dating from the nineteenth century onwards) was almost exclusively confined to Area A.

The majority of the tile assemblage is of a dense, hard-fired orange fabric. The fabric is uniformly well-levigated and consistent in appearance and texture across the site. Modern glazed ceramic tile appeared in three contexts (1101, 1381, 1512). The diagnostically-earliest tile consisted of several glazed fragments from two medieval contexts (1220, 1705).

The medieval glazed tile will require further examination, full cataloguing and illustration. The rest of the assemblage will require a full cataloguing by context and macroscopic examination of a sample, in order to determine the uniformity of the fabric noted in the earlier examination.

Brick

A total of 171 fragments of brick, weighing 28,020 grams, was recovered. No complete bricks were noted among the assemblage which was in a very fragmentary condition. As with the tile, most of the brick fragments occurred in Phases 1 and 2, with the exception of two contexts (1107 and 1165), but was evenly-distributed across the site. Many of the fragments appeared to be of a similar hard-fired orange fabric to that of the tile, and, as such, might benefit from further macroscopic examination to determine the extent of this similarity. Apart from this, however, only a summary listing by context will be required.

Pewter Objects

The only pewter finds from the site were two distorted spoons, one of which is broken (unstratified). The style of the spoons and the acorn terminal of the complete spoon are suggestive of a mid-seventeenth-century date, although their unusually clean appearance and the close proximity to the site of a pewter workshop specialising in reproduction tablewares is more likely to indicate that the spoons are modern replicas, discarded 'seconds', deliberately planted on the surface of the site. The behaviour and demeanour of some of the workshop's employees, one of whom actually asked if any spoons had been found, strongly supports this theory, as does the appearance of exactly the same style of spoon in the workshop's current catalogue. The reproduction spoons were an inspired choice on the part of the pranksters who could not have realised how close they appeared in date to some other finds from the site, including the seventeenth-century chair.

Oyster Shells

A total of 59 oyster shells and fragments was recovered from the following contexts: 1101 x 43, 1104 x 1, 1105 x 2, 1111 x 1, 1122 x 1, 1125 x 2, 1167 x 6, 1176 x 2, 1205 x 1.

No further research is required for this material which, although attesting to the popularity of shellfish-consumption through time, was not derived in any significant quantities from stratified contexts.

Other Finds

Other categories of finds, for which no further research is recommended, were found in the following contexts:

Fired Clay: 1313, 1326 x 2, 1381.

Charcoal: 1166 x 1, 1252 x 2.

Plaster: 1180 x 2, 1181 x 2, 1708 x 1.

Mortar: 1126 x 20 small fragments, 1133, 1157, 1512 x 1.

7.3 Crucibles

Some 129 crucible fragments were found, the largest number of which (44 fragments) came from the fill (1125) of pit F133. This pit contained a mixed post-medieval fill, the greater part of which dated to the seventeenth and eighteenth centuries, the latest pottery being creamware. Some of the remaining crucible fragments were found in the fills of intercutting pits in the north-western area of the site and a similar group of pits in the north-eastern area. It was noted that a number of these pits had a distinctive 'bellying-out' profile and it was suggested that these pits had a specialised purpose. It is possible that the crucibles were associated with this activity, although crucible fragments were also found within the fills of circular pits F700 and F702 and within the two 'tanks' F503/F520 and F510/F542 and may therefore have been part of general detritus lying on the ground surface which subsequently formed part of the pit fills, rather than being associated with their use. The one exception to this is probably pit F769 (see below).

All the crucible fragments were from post-medieval contexts, and associated pottery evidence dates their use on the site from the seventeenth century to the early nineteenth century. The earliest occurrence of crucibles appears to be in the fill (1825) of pit F769. The pottery from this fill was dated c1600-1650, but further study of the clay pipe from this feature might refine the chronology. Pit F769 also contained large lumps of slag, charcoal and clinker at its base.

Crucible forms are of the larger, straight-sided types illustrated by Bayley (1992, figs 5 and 6) which were in use from the fourteenth and fifteenth centuries onwards.

Discussion/Recommendations

As early as 1991 Litherland wrote "*Part of any archaeological response to the proposed redevelopment of Birmingham City centre should include a specific research design to highlight industrial and manufacturing evidence, especially as the area of redevelopment includes a large portion of the early town*" (1991, 9) At about the same time, Bayley (1992) wrote of recent advances in the study of metalworking ceramics. However, at that time there were still large gaps in our knowledge. Subsequent work on crucibles from the Tower of London and Oxford (pers. comm. J Bayley) have helped fill in some of the gaps for the post-medieval period, but, nevertheless, information about metalworking at this date is still under-represented. On a national level, therefore, this collection of crucibles from Park Street is important.

On a regional level, they assume an even greater importance, since metal working forms such a major part of Birmingham's industrial heritage and underpins the city's growth in the eighteenth and nineteenth centuries, if not before. Leland's sixteenth-century accounts appear to refer to iron-working, and by the mid-seventeenth century Birmingham produced annually as many swords as London and of equally good quality. However, at Park Street iron was not the metal being worked and it would be of great interest to establish exactly what manufacturing processes were taking place there. Such research is helped by the presence of differently-dated groups of crucibles, the earliest of which (from pit F769) may well have been found associated with detritus from the metal-working process itself. In addition there was a number of features at Park Street which appear to have been associated with industrial processes. All this coupled with the extensive ceramic assemblage may help us to answer questions about the economic and social background to the industries carried out at Park Street.

It is therefore recommended that there is a full scientific investigation of the Park Street crucibles. This would involve the use of X-ray fluorescence to establish the nature of the metal residues in the crucibles and hence the metals being worked on site. If the crucibles were sampled from differently-dated assemblages it would be possible to establish what metals were being used in what period and whether several metals were being worked at a given time. It is vital that an interdisciplinary approach is used at Park Street to maximise the potential of the information. This should be carefully co-ordinated, so that social, economic, chronological and industrial data are combined. For example, it may not be feasible (or necessarily desirable) to study/date all the clay pipe from the site but clay pipe from those features of the seventeenth and eighteenth centuries which contain metal-working ceramics should be examined in more detail since they are likely to give a tighter chronology than the domestic pottery.

Dr Justine Bayley (English Heritage), a leading authority on metal-working ceramics, can undertake the work on the crucibles from Park Street. It is proposed that all the crucibles are sent to her and she will select and sample suitable material with reference to site and stratigraphic information and in consultation with the pottery specialist.

7.4 Human Bone

[NB Bob Burrows writes: 'two human skeletons were recovered from the site in addition to a number of disarticulated human bones. The state of preservation of the bones was good. However, they have not been assessed and will be reported on in full during the post-excavation stage.']

7.5 Animal Bone by *Emily Murray*

Quantity

A medium-sized assemblage of hand-collected animal bones, weighing 49.2 kgs in total, was recovered from excavations at Park Street, Birmingham. The material is stored in thirteen boxes (c. 45x20x25 cm) and includes a small quantity of faunal material from unstratified levels and 'cleaning layers'. Of the 99 bulk soil samples taken during the excavation, 50 were processed and assessed (see Ciaraldi for details)

and a small number of undiagnostic mammal-bone fragments and fish bones was recovered from both the flots and residues (*ibid.*).

Provenance & Phasing

Animal bones were recovered from the three main areas of excavation, Areas A, B and C, with over 50% of the assemblage coming from Area A (Table 2). The majority of the assemblage derived from fills of pits and ditches (Table 3) and less than 3% was recovered from 'layers'. A small quantity of faunal remains came from contexts that were 'unassigned' at the time of this assessment.

Three provisional phases, medieval (Phase 1), post-medieval (Phase 2) and modern (Phase 3) have been assigned to the excavated features and contexts on the basis of the provisional pottery analysis. A small number of contexts have also been assigned to an intermediate phase, Phase 1/2. Animal bone is represented in each of these phases (Table 2) but, principally Phases 1 and 2 at 28% and 64% of the total (by weight), respectively.

Area/Phase	Phase 1 (Medieval)	Phase 1/2	Phase 2 (Post-Medieval)	Phase 3 (Modern)	Total	
Date range (centuries)	12th - 15th		16th - 18th	19th +	(kg)	
Area A	9473	1	14016	1641	25.1	
Area B	2676	1703	9716	64	14.2	
Area C	1784	-	7533	568	9.9	
Total (kg)	13.9	1.7	31.3		49.2	
% by phase	28	3	64			
weight assessed (kg)	9.1	0.2	12.3		22.5	
% assessed	65	12	39			

Table 2 Park Street, Birmingham. Weight (g) and percentage of hand-collected animal bone recovered by area and phase, and weight and percentage of bone assessed by phase.

Feature/Phase	Phase 1	Phase 1/2	Phase 2	Phase 3	Total (kg)
Fill	12444	1756	30557	2273	47
Layer	825	1	565	-	1

Table 3 Park Street Birmingham. Weight (g) of hand-collected animal bone by phase and feature.

Quality of preservation

The state of preservation of bone was good for the majority of the assemblage, although the nature of preservation varies notably across the site. A large proportion of the bones was heavily stained and dark brown in colour, which is typical of material that has been exposed to waterlogged conditions. This includes material from contexts 1519 (Phase 1) and 1197 (Phase 1). The organic remains from these contexts also indicated that water was present (ref. Ciaraldi). Some of these bones were also very degraded and had woody and bark-like textures, with exfoliating cortices (outer

surfaces). This includes material from the boundary ditch F201, as well as other pits and ditches (F508, F520, F562 and F800).

A number of bones was completely or partially preserved in such a way that the cortex was white, while the internal spongy or cancellous bone was distinctly purple in colour (contexts 1205, 1721, 1771 & 1913). The preservation of bone in this way may relate to the chemistry of the soil in which the bones were deposited, to long periods of exposure, or to some other factor (U. Albarella pers. comm.).

Other less common modifications were noted, including bone concreted with stoney material (context 1811), extensive green copper-staining (context 1738) and orange lichen-like mottling on horncore fragments (context 1659). In addition, the state of preservation of bone from two contexts (1505 and 1655) was not homogenous, suggesting that the material had been mixed and redeposited at some time.

Methods of analysis

The assemblage was recorded using a modified version of a system devised by Davis (Davis 1992, Albarella & Davis 1994). This system considers a selection of anatomical elements as 'countable', while the presence of non-countable specimens of interest are also noted. Horncores were recorded, but not counted if the specimen had a complete transverse section, and were then counted in the 'measurable' category where suitable (after von den Driesch 1976, 29-31). No attempt was made to differentiate sheep and goat at this stage, although no obvious goat remains were observed.

All of the hand-collected faunal material was assessed. Six of the thirteen boxes were examined in detail (Tables 4 & 5) and this represents *c.* 46% (22.5 kg) of the total weight of bone retrieved. It was the aim of the assessment to target a representative proportion of the bone assemblage per phase. As the material is stored in boxes by context and not by phase, the selection had to be carried out in a random way and Table 2 shows the weight and percentage of bone assessed by phase. The material stored in the remaining boxes was given a cursory examination to note the presence of any unusual species or deposits.

Range of species

The range of species represented in the Park Street assemblage is cattle, sheep/goat, pig, horse, red deer, cat, dog, rabbit, domestic fowl, goose, duck (mallard size) and frog/toad (Table 4). Fish bones were present in contexts 1791 (Phase 2) and 1764 of the hand-collected material, as well as 1197 (Phase 1) from the sieved samples (Ciaraldi). In the material that was surveyed a coracoid of a dove/pigeon (*Columba* sp.) was present in a Phase 3 context (1770), as well as a small number of human bones in contexts 1780 and 1760 (Phase 1). The occurrence of the latter is not unexpected as they derive from an area of the site (Area C) that was designated for human burials during the medieval period (*ibid.*).

Ph	Area		Cattle	sheep/gt	pig	bird	other	Total	Comment
1	A, B & C	assessed	52	15	-	3	8	78	horse, cat, domestic fowl, goose (dog)
		estimated	80	23	-	5	12	120	
1/2	A & B	assessed	2	1	-	-	-	3	
		estimated	20	10	-	-	-	30	
2	A, B & C	assessed	43	22	6	2	8	81	cat, red deer, amphibian, goose, duck (rabbit)
		estimated	110	56	15	5	21	208	
3	A, B & C	assessed	4	3	3	1	1	12	dog/fox, goose
		estimated	10	7	7	2	2	29	

Table 4 Number of 'countable bones' (hand-collected) recorded by phase in the assessment with estimates of totals for the full assemblage. Species in brackets are represented by 'non-countable' elements (see main text).

The assessed and estimated values for the number of countable bones by taxon and phase suggest that cattle dominate the assemblages in all three phases, as well as the assemblage as a whole (Table 4). There was a relatively high frequency of horncores from small/short-horned cattle in the Phase 1 (medieval) assemblage. Most of these had a portion of the skull still attached and the method used to detach them from the head appeared to be fairly systematic, and similar to butchery practices recorded for post-medieval material from Chichester (Armitage 1990, fig. 1a & b) and the Custard Factory in Digbeth (Murray 2001). Signs of butchery and gnawing were also noted on post-cranial cattle bones, also represented in Phase 1 contexts, as well as on many of the sheep/goat and pig bones. However, the degraded nature of the outer surfaces of many specimens, noted above, may obscure traces of these activities. Sawn ribs, indicative of modern butchery practices, were present in contexts 1913 (Phase 2) and 1752 (Phase 3), and several Phase 2 and Phase 3 contexts included bones from modern improved breeds.

Few pathological specimens were noted, although a cattle skull with ante-mortem perforations (context 1519, Phase 1) was present. Three similar specimens were noted in the Custard Factory assemblage (*ibid.*) and both this and other skeletal abnormalities can be discussed in more detail at the final analysis stage. Recoverable ageing dating is minimal and confined to sheep/goat, although the potential to recover useful metrical data is more promising (Table 5). This is especially the case for cattle, and a large number of the measurable elements recorded in Phase 1 are horncores.

		Ageable Mandibles				Measurable Elements					
		Cattle	Sheep/goat	pig	total	cattle	sheep/goat	Pig	Bird	other	total
Phase 1	assessed	-	2	-	2	33	10	-	2	5	50
	estimated					51	15		3	8	
Phase 2	assessed	-	3	-	3	12	15	1	1	2	31
	estimated					31	38	3	3	5	
Phase 3	assessed	-	-	-	-	3	1	1	1	1	7
	estimated					7	2	2	2	2	

Table 5 Number of 'ageable mandibles' and 'measurable elements' recorded by phase in the assessment with estimates of totals for the full assemblage. There were no ageable mandibles or measurable bones present in the Phase 1/ 2 assemblage. Mandibles are considered ageable where two or more teeth are present with recognisable wear.

A full analysis of the animal bone assemblage from Park Street will provide a substantial addition to the information already gathered on the developing economy of the city of Birmingham, the status and diet of the inhabitants of this part of the city, as well as contribute to the understanding of the site itself.

An extensive series of medieval pits was found in the southern area of the Park Street site. Flax and/or hemp retting has been suggested as a possible use for some of these (ref. Ciaraldi), as has tanning and water storage for the keeping of livestock for the Bull Ring market (ref. Burrows). The frequency of cattle horncores from this period could relate to either of the latter two activities. The dominance of horncores, metapodials and phalanges, with skinning marks in bone assemblage, has usually been interpreted as being industrial waste from leather working (Albarella forthcoming), while the same elements also comprise those removed during primary butchery. A more detailed study of the frequency of elements and the evidence of butchery, combined with the analysis of the organic remains, should help in the interpretation of the animals' use and the function of the pits.

The fauna may also derive from general kitchen waste. This is indicated by some of the samples of plant remains, some of which include grape and fig seeds (Phase 2 contexts). These are suggestive of higher status occupants and, although no evidence for high status was noted in the assessment of the animal bones (O'Connor 2000, 167-9), a more detailed study of species representation and age of slaughter will contribute to identifying the diet of local inhabitants, as well as giving some indication of their status.

Unfortunately the ability to reconstruct the age-slaughter pattern for the principal species will be limited. The metrical data should be more productive and it will be of interest to compare the measurements of cattle horncores and post-cranial elements from Park Street, the Custard Factory and Edgbaston Street at the final analysis stage, to get an overview of the types of cattle exploited in Birmingham in the medieval and post-medieval periods. The shape and size of the Phase 1 horncores from Park Street are certainly very different to those found in eighteenth-century tannery deposits at

the Custard Factory site (Murray 2001). Moor Street (MSB01) could also be added to the overview if it produces a useful assemblage.

Many Phase 1 features were truncated by Phase 2 and Phase 3 activity (ref. Burrows), and it has also been noted that a number of contexts contain bones of mixed preservation, suggesting that material has been redeposited. To avoid recording residual and/or contaminated assemblages only stratified contexts that can be reliably phased should be considered for the final analysis. It is recommended that this is not initiated until the pottery report, as well as any other reports that pertain to dating evidence for the site, are sufficiently advanced to allow final phasing of the site. A record of the state of preservation and presence/absence of bones of modern breeds could also help to identify contaminated contexts and, in the case of the former, also contribute to the interpretation of the use of the features from which they derive (e.g. evidence of waterlogging). The relatively small assemblage of nineteenth-century (Phase 3) material, mainly associated with building foundations, is of limited interest and it is not recommended that it is studied further.

Unfortunately the sieved sample is too small to allow a comparison with the hand-collected assemblage and therefore to provide a meaningful evaluation of the bias of recovery. It has been recommended that a further set of bulk samples is processed at the final analysis stage to recover plant remains (ref. Ciaraldi). Given the results of samples already processed, it is unlikely that these will produce much bone, although any faunal material that is present should be recovered and recorded, especially fish bone.

7.6 Charred and waterlogged plant remains by Marina Ciaraldi

The excavations uncovered archaeological features dated to the medieval and post-medieval period, including complex structures such as wood-lined pits, as well as ditches, a pond-like structure, a kiln, various pits and postholes. A programme of soil sampling was implemented during the excavation under the direct supervision of the author. A total of 99 bulk soil samples was collected, together with samples of waterlogged wood for dendrochronology and samples for residue analysis. This assessment will discuss the sampling strategy adopted during the excavation and the results of the preliminary analysis of the plant remains.

[NB Bob Burrows writes: 'at the assessment stage of this project the presence or absence of pollen and insect remains only has been established. No full assessment regarding these matters has been undertaken on any samples at this point.]

Aims

Previous archaeological investigation in this area of Birmingham had already uncovered evidence of industrial activities during the medieval and post-medieval periods (Litherland and Mould 1995, Ciaraldi 2000, Mould forthcoming). Preliminary assessments of the soil samples from those excavations suggest that tanning (Litherland and Mould 1995) and hemp retting (Ciaraldi 2000, Hall forthcoming) were carried out during the medieval and post-medieval periods in this part of the town.

This preliminary evidence, together with the nature of the archaeology that emerged during the excavation at Park Street, provided a useful background on which to design the most appropriate sampling strategy to adopt. The following aspects were considered during the sampling of the site and also provide a useful outline of the research questions considered for the assessment of the plant macroremains, with an aim to:

- Determine the nature of occupation during the medieval and post-medieval periods, particularly in respect to the presence of industrial processing, domestic or agricultural activities.
- Analyse the pattern of distribution on site of the various activities during the two periods.
- Assess the presence of water on site and the general management of water resources in relation to the activities that took place on site.
- Reconstruct the environment surrounding the site during its two periods of occupation.

The issues mentioned above are relevant for the understanding of the site's economy and palaeoecology, but also, at a wider regional level, for the reconstruction of the role of this site in the regional trade network, the understanding of the early phases of urbanism of the site, and the industrial development of this region during the transition from the medieval to the post-medieval period.

Sampling strategy

Organic remains were preserved by charring and waterlogging. Samples of twenty litres were collected from non-waterlogged deposits, while samples of thirty litres were taken from waterlogged deposits. Smaller features such as post-holes were sampled entirely. At this stage, the deposits sampled were dated by the associated pottery or on the basis of the stratigraphy. Particular care has been paid to signs of disturbance of the deposits occurring during the later activity on site. Samples from deeply stratified deposits (e.g. ditches of pond-like structure) or large features (e.g. large wood-lined pit) were collected from different layers and from different areas.

Some waterlogged wood from the wood-lined pit (F503/F520) and from the area around the ditch F715 (Table 8), were submitted for dendrochronological dating. However, due to the small number of growth rings or to the unclear growth pattern of the rings, they proved to be unsuitable for dating (Ian Tyers *pers. comm.*). Samples from the primary deposits and the bottom cut of F503/F520 and F510/F542 were taken to be tested for chemical analysis and with the specific purpose of comparing them with samples from known tanning deposits. Sub-samples for pollen analysis were also taken from the bulk samples, in consultation with Dr. James Greig. A single sample from a section was taken from the pond-like structure, by using Kubienka boxes. Finally, the bulk samples from waterlogged deposits will also be used to recover insect remains.

Methodology

Due to the different type of preservation of the botanical remains, soil samples had to be processed with different techniques, depending on the preservation of the biological remains in the deposit. Samples which were immediately identifiable as

non-waterlogged, were floated with a York flotation machine (indicated with flot in Table 6). Small sub-samples (300cc.), instead, were taken from waterlogged samples and then were wet sieved on a 0.3 mm mesh (indicated with ws in Table 6). The flots and the fraction caught on the 0.3 mm sieve were then scanned under the microscope. The residue from the flotation was sorted by eye and systematically scanned with a magnet, in order to recover hammerscale.

Some of the samples had a sandy matrix which allowed an easy processing of the samples. Other samples had a silty-clayey matrix which hampered the processing of the samples. Those samples were soaked in a solution of hydrogen sodium carbonate and warm water before being further processed.

A total of 99 samples was collected during the excavation. However, only 50 samples were assessed. The assessed samples were chosen amongst those from features considered important for the understanding of the activities that took place on site (e.g. large pits, a kiln, industrial pits) or from contexts which appeared to have favourable conditions for the preservation of organic remains (e.g. ditches and pond-like structures).

Plant remains were identified without the use of a reference collection and therefore it has been preferred to leave identification at a genus level.

Discussion of the results

Phase I: Medieval period (eleventh to end of fifteenth century)

A total of 55 samples was collected from medieval deposits (Tables 6 and 7), 32 of which were processed for assessment (Table 6). Some of the organic remains found in the samples gave a clear indication of the presence of water in some of the features, in particular the presence of Cladoptera's eggs, caddis fly cases and plants typically associated with wet environments. These suggested that water was present in the following contexts: 1596, F174/1213, F174/1246, F201/1325, F506/1519, F561/1657 and F776/1864. In other cases, the presence of hemp seeds (*Cannabis vulgare* L.) and, possibly, flax (?*Linum usitatissimum* L.) suggested that some stages of the hemp and/or flax retting process occurred on site. This was true, for instance, for samples F174/1197, F508/1585 and F799/1871.

The presence of hammerscale and iron slags suggested that metalworking also occurred on site, as in the case of F174/1213, F188/1220, F195/1312 and F506/1515. The widespread presence of coal, most of which was burnt, meant that this was probably used as fuel during the metalworking and/or smelting process. The role of coal as a fuel during the medieval period is of particular interest, particularly since its presence on site seems to increase use during the later period. As pointed out by Macey above there will need to be a cross-correlation of those contexts and features containing slag, hammerscale and coal, as well as crucibles and charcoal.

None of the plant remains identified suggests that crop processing was undertaken on site. However, the presence of some charred grains of barley, oats, rye and wheat suggests that kitchen waste could have been thrown in some of the pits. This would seem to be the case for samples F188/1220, F195/1312 and F201/1326. The

waterlogged plant assemblage includes some species that appear in almost all of the samples as a "background noise", such as elder (*Sambucus nigra* L.) and the group of *Rubus fruticosus*. Other plant remains, instead, seem to be present only in some contexts, as for instance the rushes (*Cyperus* sp.) and *Lychnis flos-oscule*. The different composition of the plant assemblage could be important in revealing the presence of different types of environment in the different areas of the excavation.

Phase II: Post-Medieval period (to end of the nineteenth century)

A total of 40 samples was collected from post-medieval deposits (Tables 6 and 7). Nineteen of these samples were assessed, eleven of which were recommended for further analysis (Table 6). The samples examined tended to be more homogeneous than those from the previous phase. Most of the samples came from pits containing slags and hammerscale and very likely related to metalworking (particularly F134/1126, F139=160/1133, F144/1144F159/1176 and F828/1941). Kitchen waste was present in some of the samples and it is worth pointing out the presence of grape (*Vitis vinifera* L.) and fig (*Ficus carica* L.) seeds in samples F134/1126, F138/1132, F139/F160/1133 and F159/1176. Three samples contained seeds of flax (*Linum usitatissimum* L.) (F195/1245) or hemp (*Cannabis sativa* L.) (F133/1125 and F765/1822), suggesting that flax and hemp retting also took place on site during the post-medieval period.

Recommendation for further work

On the basis of the results of the assessment, it is recommended that fifteen samples dated to the medieval period are further analysed (indicated with YES in Table 6). These have been selected on the basis of their potential to answer the questions highlighted in the research aims above. In particular, they have the potential to reveal what type of industrial process took place on site (e.g. hemp/flax retting, metalworking) and might give an indication of which stage of the industrial process took place in the different areas of the excavation. They will also provide important information on the presence of water on site and, particularly, on how this was related to the industrial activities that took place on site. Finally, it will be possible to determine whether, and why, domestic waste was present in some of the deposits. Those samples which have been floated (indicated with body float in Table 6) will not require further processing and can be sorted straight away. On the other hand, waterlogged samples, which have only been assessed on the basis of a small sub-sample of the deposit (indicated as ws in Table 6), will require further processing. It is suggested that at least two litres of sediment from each sample are wet sieved and sorted. It is also recommended that eight of the unprocessed samples (Table 7) are further processed as, on the basis of their provenance and location, they might reveal important clues on some aspects of the site occupation. However, the spot dates for those samples will need to be confirmed before processing.

Ten samples from post-medieval levels have been selected as suitable for further analysis (Table 6). Their analysis will allow to clarify which industrial activity took place on site and where, and will clarify the nature of the domestic deposits present and how they related to those of any industrial nature. It is also recommended that two of the unprocessed samples (F503=520/1533 and F764/1815) should be included in the final analysis. Both waterlogged samples will need to be wet-sieved, rather than

floated. Another fourteen samples, mainly recovered from pits of a possible industrial nature, need to be scanned with a magnet to detect the presence of hammer scale (Table 7). Two samples provisionally dated to Phase 1/2 (SU 1239 and F174/1165) have also been suggested as worthy of full analysis, although it will be necessary to confirm the dates. Samples F512/1525 and F708/1722 will need to be examined further to confirm that they represent, respectively, lime and potash.

Although the samples have not been assessed for the presence of pollen and insect remains, Table 6 includes some observations on the presence of insects in the sub-samples examined. Indications of the suitability of samples for pollen analysis has also been given in the same table. The selection of samples that might require to be submitted for pollen and insect analysis has been decided on the basis of the presence of insect remains, as well as on the importance of having information as fully integrated as possible for some of the key samples, and in relation to the study of samples for pollen and insect remains from Moor Street and Edgbaston Street.

Sa	Feature	SU	Area	Phase	Feature type	Vol. proc.	Type of processing	Further analysis	Notes
55		1588	B	1	layer	0.3	ws	NO	Compact clayey soil, dark brown and very humic. Sandy matrix. Several fungal spores, a few waterlogged seeds of <i>Polygonum</i> and tiny fragments of waterlogged wood
57		1596	B	1	layer	0.3	ws	YES INSECTS POLLEN	Very dark and humic silty soil. Tiny flakes of charcoal, some fungal spores. Waterlogged seeds of <i>Conium</i> , <i>Rubus</i> , <i>Solanum</i> , <i>Sambucus</i> , <i>Urtica</i> , <i>Stellaria</i> . Some fragments of insects and caddis fly cases
61		1652	B	1	layer	0.3	ws	YES	Dark, compacted clayey silt. Fine fragments of organic materials and lots of fungal spores. Waterlogged seeds of <i>Cyperus</i> and <i>Glyceria</i> . Possible sclereids
85		1841	C	1	layer	20	flot	NO	Greyish silty sand. Lots of burnt coal and waterlogged seeds of <i>Sambucus</i>
11	F174	1195	A	1	ditch	20	flot	NO	Small fragments of charcoal. A few bones. Charred shells of <i>Corylus</i> and oats. Waterlogged seeds of <i>Conium</i> , <i>Sambucus</i> , <i>Rubus</i> , <i>Solanum</i> and <i>Galium</i> .

Table 6 Park Street, Birmingham 2001. List of soil samples processed and assessed (table continues)

16	F174	1197	A	I	ditch	20	flot	YES POLLEN	Numerous charcoal fragments and a few bones, including a few fish bones. Some shells of bivalve. A few slags also present. Insects present. Waterlogged buds and seeds of ? <i>Linum</i> (flax), <i>Conium</i> , <i>Rubus</i> , <i>Sambucus</i> , <i>Hyoscyamum</i> , <i>Carex</i> , <i>Rumex</i> , <i>Euphorbia helioscopia</i> , <i>Solamini</i> , <i>Galeopsis</i> , <i>Ranunculus</i>
18	F174	1213	A	I	ditch	30	flot	YES INSECTS POLLEN	Large pieces of charcoal and some bones. A few hammer scales. Several Caddis fly cases and some fungal spores. Insects present. Waterlogged seeds of <i>Rubus</i> (xx), <i>Sambucus</i> (xx), <i>Lychnis</i> (xx), <i>Carex</i> , <i>Polygonum</i> , <i>Viola</i> , <i>Galeopsis</i> and Labiatae
19	F174	1246	A	I	ditch	0.3	ws	YES INSECTS POLLEN	Sandy, clayey soil, light brown. Fragments of insects and water flea's eggs. Fragments of leaf and waterlogged seeds of <i>Stellaria</i> , <i>Cyperus</i> and <i>Polygonum</i>
15	F188	1220	A	I	pit	20	flot	NO	Some fragments of coal and charcoal. A few bones. Some slag and hammer scale. Waterlogged seeds of <i>Rubus</i> , <i>Sambucus</i> , <i>Hyoscyamus</i> , <i>Rumex</i> and charred seeds of vetch and six-row barley (7)
22	F195	1312	A	I	ditch	20	flot	YES	Lots of large pieces of coal and numerous hammer scales. Waterlogged seeds of <i>Chelidonium</i> , <i>Carex</i> , <i>Sambucus</i> , <i>Ficus</i> (fig), and charred seeds of barley, oats and bread wheat (2)
36	F201	1314	A	I	ditch	0.3	ws	NO	Brown sandy soil. Lots of charcoal fragments and small fragments of coal. Waterlogged seeds of <i>Sambucus</i>
35	F201	1325	A	I	ditch	0.3	ws	YES INSECTS	Sandy soil of a reddish colour. Lots of cases of caddis fly cases and insects. Waterlogged seeds of <i>Chelidonium</i> , <i>Rubus</i> , <i>Sambucus</i> (xx), <i>Silene</i> (xx), <i>Juncus</i> , <i>Rumex</i>
26	F201	1326	A	I	ditch	20	flot	YES	Some large pieces of coal and some slag. Some charcoal and a few bones. Waterlogged seeds of <i>Lychnis</i> , <i>Rubus</i> , <i>Polygonum</i> , Labiatae., <i>Sambucus</i> , <i>Conium</i> . Charred grains of rye (1), oats (5), cereals (2) and some bulbs
38	F506	1515	B	I	pond	0.3	ws	NO	A lot of hammer scale, slag and burnt coal

(Table 6 continues)

41	F506	1519	B	1	pond	0.3	ws	YES INSECTS POLLEN (from section)	Dark, humic sandy soil with lumps of clay. Leaves impressions. Lots of insects and water flea's eggs. A small tooth. Waterlogged seeds of <i>Stellaria media</i> , <i>Ranunculus</i> , <i>Urtica</i> , <i>Cruciferae</i> , <i>Polygonum</i> , <i>Rubus</i> and bud scales
54	F508	1585	B	1	pit	0.3	ws	YES	Ashy-grey clay soil. Small fragments of charcoal and coal. A few fragments of insects. Waterlogged seeds of <i>Urtica</i> , <i>Sambucus</i> , <i>Rubus</i> , <i>Ranunculus</i> and <i>Cannabis (hemp)</i>
131	F512	1525	B	1	pit	0.3	ws	TEST FOR POTASH	Sandy-silty soil of a grey colour. No organic material visible. Very small fragments of charcoal and coal. Could be potash
60	F541	1626	B	1	pit	0.3	ws	NO	Dark brown silty sand, very humic. Fungal spores, a small fragments of waterlogged wood. Waterlogged seeds of <i>Sambucus</i> and <i>Rubus</i>
62	F561	1657	B	1	pit	0.3	ws	YES INSECTS	Sandy clay. Some fragments of coal. Fungal spores. Fragments of insects and several <i>Cladoptera</i> eggs (water fleas). Waterlogged seeds of <i>Urtica</i> , <i>Stellaria</i> , <i>Rubus</i> , <i>Compositae</i> , <i>Umbelliferae</i> , <i>Labiatae</i> , <i>Rumex</i>
78, 66	F708	1704	C	1	pit	0.3	ws	NO	Dark silt with some greyish lumps of clay. Very humic. Lots of fungal spores and tiny fragments of rootlets
67	F708	1722	C	1	pit	0.3	ws	TEST FOR LIME	Light grey, clayey-sandy soil. When tested with HCl, it dissolved slightly. Needs to be investigated if it is lime
64	F714	1707	C	1	ditch/pit	0.3	ws	NO	Dark, humic sandy silt. Small fragments of coal. Waterlogged seeds of <i>Sambucus</i>
65	F714	1709	C	1	pit	0.3	ws	YES	Dark clayey soil, very humic. Some fragments of coal. Some insects. Waterlogged seeds of <i>Ranunculus</i> , <i>Rubus</i> , <i>Polygonum</i> , <i>P. aviculare</i> , <i>Carex</i> , <i>Chenopodium</i> , <i>Labiatae</i> , <i>Cyperus</i> , <i>Sambucus</i> , <i>Glyceria</i> , <i>Urtica</i> , <i>Stellaria media</i>
74	F746	1785	C	1	pit	20	flot	NO	Brown sandy soil. Lots of burnt coal and waterlogged seeds of <i>Sambucus</i>
80	F760	1811	C	1	ditch	0.3	ws	YES (Check stems)	Dark, humic sandy soil, quite compacted and with organic material well visible (stems). Waterlogged seeds of <i>Ranunculus</i>
95, 105	F768	1829	C	1	kiln	10	flot	NO	Sandy soil. Lots of burnt coal and some fragments of charcoal. Lots of waterlogged seeds of <i>Sambucus</i> and some of <i>Rubus</i>

(Table 6 continues)

108	F770	1831	C	1	pit	0.3	ws	NO	Dark, humic, silty sand. Very small fragments of coal and charcoal. Waterlogged seeds of <i>Sambucus</i> and <i>Rubus</i>
83	F776	1864	C	1	ditch	0.3	ws	YES INSECTS	Matted reddish/brown sandy soil. A few eggs of water fleas and some insects. Small fragments of charcoal and tiny fragments of coal. Waterlogged seeds of Labiatae, <i>Stellaria media</i> , <i>Sambucus</i> , <i>Polygonum</i> , <i>Anthemis</i> (ch) and <i>Rubus</i> . Some willow buds
86	F799	1871	C	1	cess/ditch	0.3	ws	YES INSECTS	Very compacted dark, silty soil. Very humic. Some insects. Waterlogged seeds of <i>Cannabis</i> (hemp), <i>Galeopsis</i> , <i>Rubus</i> , <i>Sambucus</i> , <i>Conium</i> and some fragments of leaves
112	F800	1894?	C	1	ditch	0.3	ws	NO	Sandy-silty soil. Grey colour. Very small fragments of coal
102	F826	1935	C	1	pit	3	flot	NO (id. Solanaceae seed)	Sandy yellowish soil, not very organic. Lots of burnt coal. One large seed of unidentified Solanaceae
106	F829	1940	C	1	pit	20	flot	NO	Sandy yellow/reddish soil, not very organic. Lots of burnt coal, some in large pieces. Lots of waterlogged seeds of <i>Sambucus</i> . One charred rye grain and a <i>Plantago lanceolata</i> seed
17		1239	A	1/2	layer	10	flot	YES if Medieval	Some small fragments of charcoal and some coal. Fungal spores. Some charred tubers and grains of barley (1) and club wheat (2). Waterlogged seeds of <i>Sambucus</i> and <i>Rubus</i>
9	F174	1165	A	1/2	ditch	10	flot	YES if Medieval	Small sample. Some fragments of coal. Some seeds are waterlogged (wl), others are charred (ch). Barely (1), oats (1) and tubers (3)
3	F133	1125	A	2	pit	20	flot	YES	Reddish sandy soil. Some bones from the residue. Lots of coal (some burnt). Some modern contamination in the residue (glass and modern glass gems). A few hammerscales. Slag. Some insects and two damaged fish scales. Waterlogged seeds of <i>Ranunculus</i> , <i>Rubus</i> , <i>Polygonum</i> , <i>Carex</i> , <i>Cannabis</i> (hemp), <i>Crataegus</i> , <i>Sambucus</i> , <i>Ficus</i> (fig), <i>Conium</i> , Umbelliferae, <i>Vitis</i> (Grape), <i>Hunulus?</i> , <i>Corylus</i> , <i>Prunus</i> , buds

(Table 6 continues)

13	F134	1126	A	2	pit	20	flot	YES	Large pieces of coal (also burnt) and a lots of hammerscale and slag . Waterlogged seeds of <i>Rubus</i> , <i>Polygonum</i> , <i>Carex</i> , <i>Sambucus</i> , <i>Ficus</i> (fig), <i>Viola</i> , Umbelliferae, Labiatae, <i>Vitis</i> (Grape), <i>Hyoscyamus</i> , <i>Chelidonium</i> . Charred grains of barley (2) and wheat (1)
2	F138	1132	A	2	pit	20	flot	NO	A few fragments of coal. A few hammerscales and some slag . Waterlogged seeds <i>Ficus</i> (fig), lots of <i>Sambucus</i> , Cruciferae, Umbelliferae, <i>Rubus</i> and some charred grains of barley (2), oats (1), <i>Triticum</i> (2) and cereals (3)
1	F139 = F160	1133	A	2	pit	20	flot	NO	Some coal, mostly burnt. A few bones and a lot of hammerscale . Some waterlogged seeds of <i>Vitis</i> (grape), <i>Corylus</i> , <i>Ficus</i> (fig), <i>Rubus</i> , <i>Ranunculus</i> , Umbelliferae, cereals (ch)
4	F141	1141	A	2	linear feature	20	flot	NO	Large pieces of coal, lots of charcoal, some bones. A few hammerscales and some slags . Some fish scales. Some waterlogged seeds of <i>Sambucus</i> and <i>Rumex</i> (ch)
14	F144	1144	A	2	pit	20	flot	NO	Some coal (also burnt) and lots of hammerscale . Some charcoal as well. Waterlogged seeds of <i>Sambucus</i> and <i>Carex</i>
5	F148	1157	A	2	pit	20	flot	NO	Some fragments of waterlogged wood and fragments of coal. Some slag and hammerscale . Fungals spores. Waterlogged seeds of <i>Sambucus</i> , <i>Ranunculus</i> , <i>Borago</i> and <i>Euphorbia helioscopia</i> . A charred wheat grain
23, 24	F159	1176	A	2	pit	20	flot	YES	Almost pure burnt coal. Lots of hammerscale . Some fish scales and matted vegetal fibres. Waterlogged seeds of <i>Vitis</i> (grape), <i>Ficus</i> (fig), <i>Prunus</i> (sloe), <i>Corylus</i> , <i>Carex</i> , <i>Rubus</i> , <i>Ranunculus</i> , <i>Sambucus</i> , <i>Chelidonium</i> , Labiatae and barley (ch)
20	F187	1219	A	2	pit	20	flot	YES	Some hammerscale and slag . Small fragments of coal and charcoal. waterlogged seeds of <i>Ficus</i> (fig), <i>Rubus</i> , <i>Carex</i> , <i>Sambucus</i> , <i>Urtica</i> , <i>Euphorbia helioscopia</i> and quite a few charred grains of barley and rye
21	F195	1245	A	2	ditch	20	flot	YES	Very small fragments of charcoal and coal. A lot of fungal spores. Waterlogged seeds of <i>Linum</i> (flax?), <i>Rubus</i> , <i>Sambucus</i> , <i>Lapsana communis</i> , <i>Anthemis</i> , <i>Chelidonium</i> (xx). Charred grains of barley (3), cereals (3) and oats (3)

(Table 6 continues)

29,30	F245	1367	A	2	pit	20	flot	NO	Some coal and a few hammerscales. Waterlogged seeds of <i>Rubus</i> , <i>Sambucus</i> , <i>Ficus</i> (fig), Umbelliferac and <i>Galeopsis</i>
53	F503-520	1580	B	2	pit	0.3	ws	YES POLLEN	Dark and compacted silty soil, very organic. It contained waterlogged buds of willow and a few fragments of insects
49	F510= F542	1531	B	2	pit	0.3	ws	YES	Humic sandy soil, very dark and with well visible twigs. Small fragments of coal and some slag
59	F510 =F542	1622	B	2	pit	0.3	ws	YES POLLEN	Dark, humic, silty soil. Twigs of willow
76, 114	F765	1822	C	2	pit	0.3	ws	YES	Very dark clayey-sandy soil, very humic. Waterlogged seeds of <i>Cannabis</i> (hemp), <i>Sambucus</i> , Labiatae, <i>Stellaria media</i> , <i>Polygonum</i> , <i>Euphorbia helioscopia</i> . Some small bones and insect larvae
89, 90, 77	F803	1835	C	2	pit	0.3	ws	YES INSECTS POLLEN	Very compacted silty clay. Very dark and humic and with organic material well visible (stems). Insects. Waterlogged seeds of <i>Rumex</i> , <i>Rubus</i> , <i>Stellaria media</i> , <i>Sambucus</i> , fragments of leaves, Labiatae and Gramineae
100	F808	1917	C	2	pit	0.3	ws	NO	Dark, sandy soil. Some coal fragments and some slag and hammerscale
107	F828	1941	C	2	industrial pit	0.3	ws	NO	Almost pure coal. Lots of hammerscale

Table 6 Park Street, Birmingham 2001. List of soil samples processed and assessed

Sample	Feature	SU	Area	Phase Period	Feature Type	Notes
10	F174	1194=1195	A	1	ditch	No - Four samples already processed
27	F195	1342	A	1	ditch	yes
37	F201	1252	A	1	ditch	No - three samples already processed
34	F201	1313	A	1	ditch	No - three samples already processed
33	F201	1379	A	1	ditch	No - three samples already processed
132	F501	1513	B	1	pit	no
39	F506	1511	B	1	pond	yes
40	F506	1518	B	1	pond	yes
50	F508	1508	B	1	pit	yes- hemp and clay lined pit
56	F521	1594	B	1	beam slot	no
71	F742	1780	C	1	grave	no
73	F746	1784	C	1	pit	no - one sample already processed
68	F752	1772	C	1	grave	no
75	F758	1809	C	1	pit	yes?
133	F760	1821	C	1	ditch	yes - the sample processed (table 1) has hemp stems
91	F767	1883	C	1	gully	no
84	F776	1858	C	1	ditch	yes
92	F797	1886	C	1	hearth/pit	yes? - scan with magnet first
93	F800	1891	C	1	ditch	no
111	F800	1892	C	1	ditch	no
101	F819	1939	C	1	posthole	no
103	F827	1936	C	1	pit	no

12	F131	1122	A	2	pit	scan with magnet
8	F139=F160	1177	A	2	pit	no - one already processed
7	F168	1186	A	2	cut	no
28	F233	1297	A	2	pit	scan with magnet
25	F233	1310	A	2	pit	scan with magnet
51	F503=520	1530	B	2	pit	scan with magnet
63, 52	F503=520	1533	B	2	pit	yes
58	F527	1516	B	2	pit	scan with magnet
134	F720	1757	C	2	const. trench	no
136	F755	1795	C	2	pit	scan with magnet
47, 48	F503=	1506	B	2	pit	scan with magnet
110	F789	1826	C	2	industrial pit	scan with magnet
82	F773	1848	C	2	pit	scan with magnet
42	F764	1815	B	2	pit	yes
96, 97	F789	1872	C	2	pit	scan with magnet
88	F791	1875	C	2	pit	scan with magnet
109	F806	1904	C	2	well	no
98	F808	1902	C	2	pit	no - one already processed
87	F810	1874	C	2	pit	scan with magnet
94	F810	1888	C	2	pit	scan with magnet
113	F823	1930	C	2	posthole	no
72	F836	1791	C	2	pit	scan with magnet

Table 7 Park Street, Birmingham 2001. List of unprocessed samples

Area C		1837
Area C	F778	1844
Area B	F542	from the lining of the pit (south)
Area B	F520	1580
Area B <A>	F510	margin of tanning pit
Area B	F503	edge of pit
Area B	F520	1530
Area B <P>	F510	
Area B	F520	1580

Table 8 Park Street, Birmingham 2001. Waterlogged wood sent to be dated by dendrochronology

7.7 Elemental analysis from some of the deposit by *Brendan Derham*

Introduction

Medieval and post-medieval deposits from excavations at Park Street Birmingham were thought to demonstrate evidence of a leather tanning workshop. In order to provide evidence to support this hypothesis chemical residue analyses were undertaken from fills from various deposits across the site with the aim of identifying surviving organic tannin compounds.

The conversion of animal skins from degradable rawhides into tough, resilient and fairly stable leather products is a complex chemical process. The analyses were undertaken to establish whether any of the range of chemicals remains in association with the inorganic fill recovered from pits and structures that were originally perceived to be leather-tanning pits. The results represent the preliminary stage, in

that its purpose is to ascertain whether any organic remains survived to warrant more sophisticated and expensive identification work.

Tanned leathers are those in which the structure of the collagen has been chemically altered. The predominant form of tanning is based on the use of vegetable tannins. There are two main groups of vegetable tannins; hydrolysable tannins termed pyrogallols or non-phlobatannins, the main constituents of which are esters of glucose with chebulic, ellagic, gallic and m-digallic acids and produce a pale brown leather. The pyrogallol tannins may be hydrolyzed by acids or enzymes and include the gallitannins (from plant galls) and the ellagitannins such as myrabolans, valonea. The predominant source of plant galls are those produced on the twigs of the dyer's oak (*Quercus infectoria*) in response to the deposition of wasp eggs (*Cynips tinctoria*). Dyer's oak is a shrub that commonly grows in the Near East. *Quercus robur* in Central Europe, and the English Oak also produce galls, although containing less tannin. The galls containing between 50 and 70% (dry weight) of gallotannic acid. Also present are calcium oxalate and free gallic or ellagic acids, the latter two compounds being degradation products from the tannins. The second type is the phlobatannins, termed condensed tannins or catechols and is phenolic compounds found in pinewood and larch bark. The structure of these compounds is based upon leuco-anthocyanidins. They are not hydrolyzable and are extracted from Canadian 'hemlock' (*Tsuga canadensis*), mangrove, quebracho and wattle. The condensed tannins are more astringent, i.e. they tan more rapidly, than the pyrogallols have larger molecules and are less well buffered. They yield less sediment, or lose less upon standing, but the leather they produce often tends to turn a reddish colour upon exposure to natural light.

The terms "condensed" and "pyrogallol," as such, do not mean that the tannins are respectively purely di or tri-hydric phenol based. The "tannins" derived from some plant materials, e.g. oak bark, may have characteristics of a mixture based on the two principal types. Oak bark contains both types of tannins and produces dark-red-brown leather.

Methodology

The CHN Elemental Analysis was performed by Lianne Hill in the department of chemistry using a Carlo Erba EA1110 Elemental Analysis instrument running at a furnace temperature of 1050 degrees Celcius with a 2.0M PTFE column 50/80 and a Helium carrier gas.

Results

Sample No.	%C	%N	%H	%C/ 12.011	%N/ 14	%H/ 1.008	C:H ratio	C:N ratio	Total %CHN	
1	0	0	0	0	0	0	0	0	0	blank
2	12.41	0.765	1.64	1.03	0.05	1.63	2	0.1	15	Pit bottom F510
3	13.955	0	0.745	1.16	0	0.74	1	0	15	Bark layer F542
4	6.235	0	0.435	0.52	0	0.43	1	0	7	Plank F542
5	0.47	0	0	0.04	0	0	0	0	0	Above bottom F542
6	15.725	0.585	1.01	1.31	0.04	1	1	0	17	Pit bottom F589
7	0.33	0	0	0.03	0	0	0	0	0	Bottom fill pit F520
8	5.015	0	0.635	0.42	0	0.63	2	0	6	PH bottom F520

Table 9 CHN Analysis

Discussion

The results represent the weight % of carbon, hydrogen and nitrogen in the composition of the individual samples. The atomic ratios are based upon dividing the absolute % by the atomic weight and comparing the figures as a ratio. Any 'organic' compounds present will have a C:H ratio of between 1:1 to 1:2. The C:N ratio will identify the presence of organo-nitrogen compounds. Inorganic and mineral-based samples will present figures wildly outside these ratios. That the natural (sample 2) contains some organic matter (15%) would indicate that any samples with less than this most likely represent background material.

The samples that are most likely to be worth analysing further are those with a high total %CHN and a C:H ratio of between 1:1 and 1:2 i.e samples 2,3 and 9 and possibly also 6.

Conclusion

Further analytical work based on High Pressure Liquid Chromatography- Mass spectrometry would be capable of identifying individual organic constituents in the samples. This would therefore enable the specific plant tannins to be identified, if they were present. Unfortunately, after the assessment of the plant remains, it seems very clear now that the two vats from which the samples were taken from are almost certainly structures related to hemp retting. The process of partially degrading hemp stalks to liberate the individual fibres would not give rise to any distinctive chemical debris. There would therefore seem to be little point in undertaking an extensive programme of residue analysis at this point.

8.0 Updated Project Design

8.1 Introduction

The excavated evidence has demonstrated the survival of a sequence of industrial and domestic activity at Park Street, dating from the twelfth century through to the twentieth century.

8.2 Updated Research Aims

This site offers a rare opportunity to study a sequence from the twelfth century through to the twentieth century, using an integrated and interdisciplinary approach to the three sites together. It should be possible, by means of comparison with published and unpublished sites within the immediate locality and within the broader region, to place the Site within its overall geographical, archaeological, historical, economic and political context. The quality of the data is such that it should also allow a contribution to be made to the on-going reinterpretation of earlier archaeological data and the refinement of research designs for the period and region.

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

- complete the characterisation of the site dating and function.
- relate the site data to the early development of the city and the continuity of property boundaries.

- examine the dynamics of urbanism through an examination of changing functions and varying degrees of intensity of use of the site in the medieval and post-medieval periods.
- determine the character, development and chronology of the archaeological remains and the evidence for presence or absence of buildings in the vicinity at different periods.
- place evidence of tanning/ hemp retting within its local and regional and national context.
- understand the dynamics of pottery production and consumption in Birmingham.
- contribute to the understanding of industrial activity within medieval and post-medieval Birmingham, with particular reference to metalworking, bone working, and possibly dyeing and fulling, and to other sites of similar date recently excavated within the city, and to the chronology of the use of coal.
- set the archaeological results in their historical context.
- reconsider the role of industry in the city, in both the medieval and post-medieval periods.

9.0 Publication Synopsis

It is proposed that the report will be published by Oxbow, alongside the results of excavations at Moor Street and Edgbaston Street. The title is yet to be decided. The provisional lengths of the individual contributions for the Park Street site only are given below.

(Park Street Site Only)

by Bob Burrows and Helen Martin

with contributions by Steve Allen, Lynne Bevan, David Barker, Justine Bayley, Megan Brickley, Marina Ciaraldi, Brendan Dcrham, Richard Evershed, James Greig, Rob Ixer, Alison Locker, Erica Macey, Gerry McDonnell, Stephanie Ratkai, David Smith., and D Williams

illustrations by Nigel Dodds and Mark Breddon

photography by Graham Norrie

Text

Summary and Introduction (600 words). 2 figures.

Location and background to the site (400 words).

Aims and Method. The site and its context (500 words).

Results by Bob Burrows and Helen Martin

Description and interpretation of the evidence by phase (4000 words). 16 plates, 10 figures.

Findings

Pottery by Stephanie Ratkai and David Barker (3500 words). 6 figures, 3 tables

Thin Sections by D Williams (500 words) 5 plates

Residue Analysis by R Evershed (500 words) 1 table

Small Finds by Lynne Bevan and Erica Macey (1500 words). 2 figures, 4 plates

Crucibles by Justine Bayley (500 words). 1 figure

Environmental Material.

Animal Bone by Richard Thomas (2000 words). 2 tables.

Fishbone by Alison Locker (500 words). 1 table

Human Bone by Megan Brickley (500 words). 1 plate

Charred and Waterlogged Plant Remains by Marina Ciaraldi (2000 words). 2-3 tables

Elemental Analysis by Brendan Derham (800 words). 1 table

Insect Remains by David Smith (500 words). 1 table

Pollen Analysis by James Greig (500 words). 1 table

Chemical Analysis by T.B.A. (500 words). 1 table

Discussion and conclusions by Bob Burrows and Helen Martin (2000 words). 2 plates

TOTAL 21,300 words; 14 tables; 23 figures, 18 plates.

10.0 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. In addition there will be Project Management (IF 1.5 days), Finds Management (LB 2 days) and Environmental Coordination (MC 1 day)

1) Stratigraphic Analysis

The site records will be analysed to refine and revise the sequence of activity on the site. Production of matrix

(B. Burrows 6 days, H. Martin 2 days)

2) Pottery

The pottery assemblage comprises 11 boxes of pottery, approx 6800 sherds

Tasks	Days
Sort med pottery into fabric groups, process, record etc,	16.5
Sort post-med pottery into fabric groups, process, record etc,	17
Consultation work on late 18 th and early 19 th century pottery	3
Data entry	3
Analysis/manipulation of data	3
Research	3
Work on thin sections and residue analysis	1
Write report	10
Edits/proofing	1
Sort pottery for drawing	1
Check drawings (No. of drawings required c.250)	1
Admin/liaison	1

Total **60.5**
 (Stephanie Ratkai)

3) Small Finds

Task	Number of days
Metalwork	
Cataloguing, compilation of report, listing by context (LB)	2
Illustration of Copper Alloy and Iron items (ND)	2.5
Worked Bone	
Research, cataloguing, full report (LB)	3
Illustration (ND)	2
Clay Pipes	
Research, cataloguing, compilation of a report (LB)	2
Illustration (ND)	1
Glass	
Cataloguing, report, listing by context (LB)	2
Illustration (ND)	1
Worked Stone	
Cataloguing, compilation of a short report (LB)	0.5
Geological identification (RI)	0.5
Photography (GN)	0.25
Illustration (ND)	1
Wooden Chair and Other Wood	
Research, cleaning, report (LB)	3
Illustration (ND)	2
Report, cataloguing of worked pieces, listing by contexts (EM)	1
Photography (GN)	0.25
Species identification: (SA.).	1
Leather	
Further research and the compilation of a short report (LB)	2.5
Selective illustration (ND)	0.5
Brick and Tile	
Catalogue, report, scan of fabrics and summary listing (EM.)	2
The Slag and Hammerscale	
Scientific analysis and compilation of report (GM.)	2
Crucible and Crucible Residue (JB)	5

(Lynne Bevan, Robert Ixer, Gerry McDonnell, Justine Bayley Graham Norrie and Nigel Dodds)

5) Bone

Animal Bone

Task	Number of days
Bone recording & data entry	6
Writing of Report	6
Total	12

(Richard Thomas and Alison Locker on fish bones)

Human Bone

<u>Task</u>	<u>Number of days</u>
Bone recording and data entry	
Writing of Report	
<u>Total</u>	<u>1</u>

(Megan Brickley)

6) Charred Plant Remains

<u>Task</u>	<u>Number of days</u>
Processing of 25 samples	5
Sorting and identification of 37 samples recommended for full analysis	17
Analysis and preparation of report	5
<u>Total</u>	<u>27</u>

(Marina Ciaraldi)

Insect Remains

<u>Task</u>	<u>Number of days</u>
Full identification of the insect faunas from 5 deposits (out of 9 potentials) and full report	

(David Smith)

Pollen

<u>Task</u>	<u>Number of days</u>
Analysis of 5 samples (out of 8 potentials)	
<u>Total</u>	

(James Greig)

7) Preparation of Drawing Roughs (B Burrows 1 day).

8) Preparation of illustrations (pottery and site plans) (N Dodds 20 days).

9) Preparation of first draft of introduction and results (B Burrows 5 days, HM 5 days).

MONITORING POINT (1) ****

Second draft of results text (B Burrows 2 days).

10) Editing/correction to specialist reports (I Ferris 1 day). Historical research (S. Litherland 3 days)

11) Integration of specialist data and preparation of first draft of discussion. (B Burrows 8 days H Martin 8 days).

12) Editing of first draft discussion (I Ferris 1 day).

13) Revision (B Burrows 2 days).

14) Corrections to illustrations (N Dodds 1 day).

MONITORING POINT (2) ****
Completion of first draft (edited by BUFAU)

15) Submission of text for external refereeing (I Ferris 0.25 day).

16) Preparation of excavation and research archives (K Muldoon 0.5 day).

17) Final corrections to text/illustrations (B Burrows 1 day).

18) Final edit and submission of text to OXBOW (I Ferris 0.5 day).

19) Corrections to text/proofs (I Ferris 0.25 day).

20) Deposition of archive (K. Muldoon 0.5 day).

11 Bibliography

Albarella, U. forthcoming 'Tanners, Tawyers, Horn Working and the Mystery of the Missing Goat' in *The Environmental Archaeology of Industry: Proceedings of the AEA Conference, April 2000*.

Albarella, U. and Davis, S. 1994 *The Saxon and Medieval Animal Bones Excavated from 1985-1989 from West Cotton, Northamptonshire, London, AML Report 17/94*.

Armitage, P.L. 1990 (for 1989) 'Post-medieval Cattle Horn Cores from the Greyfriars Site, Chichester, West Sussex, England', in *Circaea* 7 (2), 81-90.

Bayley, J. 1992 *Metalworking Ceramics Medieval Ceramics* 16 (1992) 3-10.

Ciaraldi, M. 2000 *Plant Remains*. In Patrick, C. *The Row Birmingham City Centre, West Midlands. An Archaeological Watching Brief*. BUFAU Report No.635: 7-8.

Davis, S. 1992 *A Rapid Method for Recording Information About Mammal Bones From Archaeological Sites*. London, AML report 19/92.

Driesch, A. von den 1976 *A Guide to the Measurement of Animal Bones from Archaeological Sites*, Peabody Museum Bulletin 1, Harvard University.

- Hall, A.R. 2001 Plant Remains from Medieval and Post-Medieval 'Tanning Pits'. In Mould, C.A. Land to the South of Edgbaston Street, Birmingham City Centre. Archaeological Investigation 1997-1999. Post-Excavation Assessment and Research Design: 29-32.
- Hovey, J. 1999 An Archaeological Evaluation at The Row Market, Edgbaston Street, Birmingham City Centre. Report No. 603.
- Litherland, S. 1991 The Origins of Industry in the West Midlands: A Preliminary Study and Research Design. Birmingham University Field Archaeology Unit Report No172 July 1991.
- Litherland, S. and Mould, C. 1995 A Preliminary Archaeological Assessment of the Area of Edgbaston Street, Pershore Street, Upper Dean Street and Moat Lane, Birmingham City Centre. BUFAU Report No. 479.
- Mould, C.A. 2001 Land to the South of Edgbaston Street, Birmingham City Centre. Archaeological Investigation 1997-1999. Post-Excavation Assessment and Research Design. BUFAU Report No. 473.
- Murray, E.V. 2000 The Bull Ring, Birmingham (BRB97 & BRB99). Assessment of the Animal Bones.
- Murray, E.V. 2001 The Custard Factory, Gibb Street, Birmingham (CFB 01): Animal Bone Report.
- O'Connor, T. 2000 The Archaeology of Animal Bones, Sutton Publishing, Stroud.
- Orser, C.E. 1996 Beneath the Material Surface of Things: Commodities, Artifacts and Slave Plantations, in Preucel, R.W. and Hodder, I. (eds) Contemporary Archaeology in Theory. A Reader, 189-202.
- Rátkai, S. 1987-8 The Medieval Pottery, in Cracknell, S. Bridge End, Warwick: Archaeological Excavation of a Medieval Street Frontage. Trans Birmingham and Warks Archaeol Soc 95 1987-8 (1990), 17-72.
- Rátkai, S. forthcoming The Pottery, in Palmer, N. Burton Dassett: a Deserted Medieval Settlement in SE Warwickshire. Soc Med Arch Monograph.
- Patrick, C. 2000 The Row, Birmingham City Centre, West Midlands. An Archaeological Watching Brief. BUFAU Report No. 635.
- Ramsey, E. 2000 An Archaeological Watching Brief at The Row Market, Edgbaston Street, Birmingham City Centre. BUFAU Report No. 603.01
- Watts, L. *et al.* 1981 Birmingham Moat, its History, Topography and Destruction. Transactions of the Birmingham and Warwickshire Archaeological Society 89 (for 1978-9), 1-77.

12 Acknowledgements

The excavation was carried out on behalf of CgMs, acting on behalf of the Birmingham Alliance. The archaeological work was carried out by Birmingham University Field Archaeology Unit and directed by Bob Burrows with the assistance of Helen Martin. The work was carried out by Kate Bain, Sabina Belim, Suzic Blac, Richard Cherrington, Melissa Conway, Mary Duncan, Nathan Flavell, Suzanne Gailey, Emma Hancox, Chris Hewitson, Mark Hewson, Roy Krakowicz, Erica Macey, Phil Mann, Charlotte Nielson, Dave Priestley, Sally Radford, Ellie Ramsey, Andy Rudge, Jon Sterenberg, Sarah Weatherall, Josh Williams, Steve Williams and Danni Wooton.

The project was monitored by Dr. Michael Hodder for Birmingham City Council, Dr Iain Ferris for Bufau and Cathy Mould, from CgMs Consulting, on behalf of the Birmingham Alliance.

Iain Ferris edited this report and Nigel Dodds prepared the illustrations and plates.

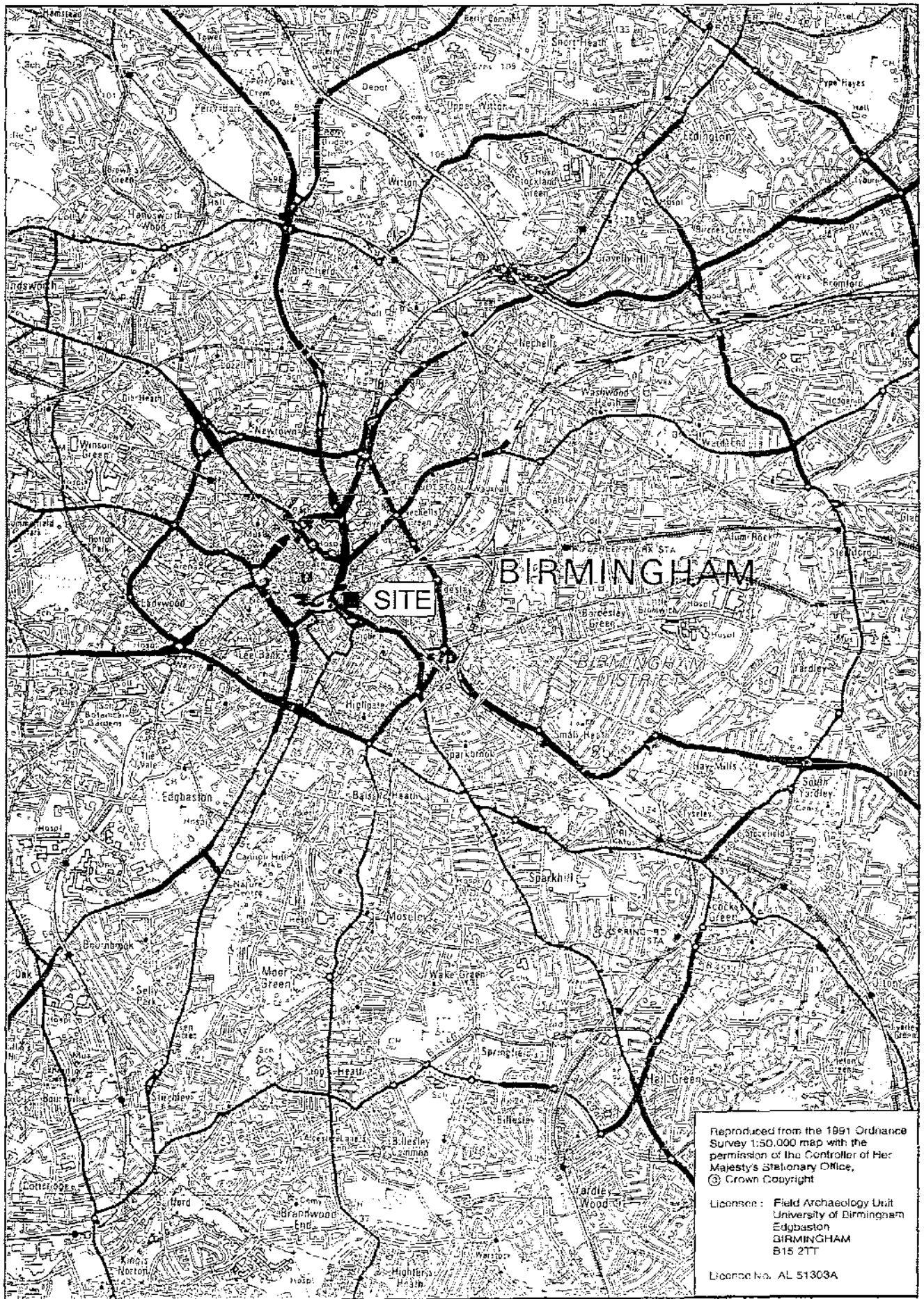


Fig.1

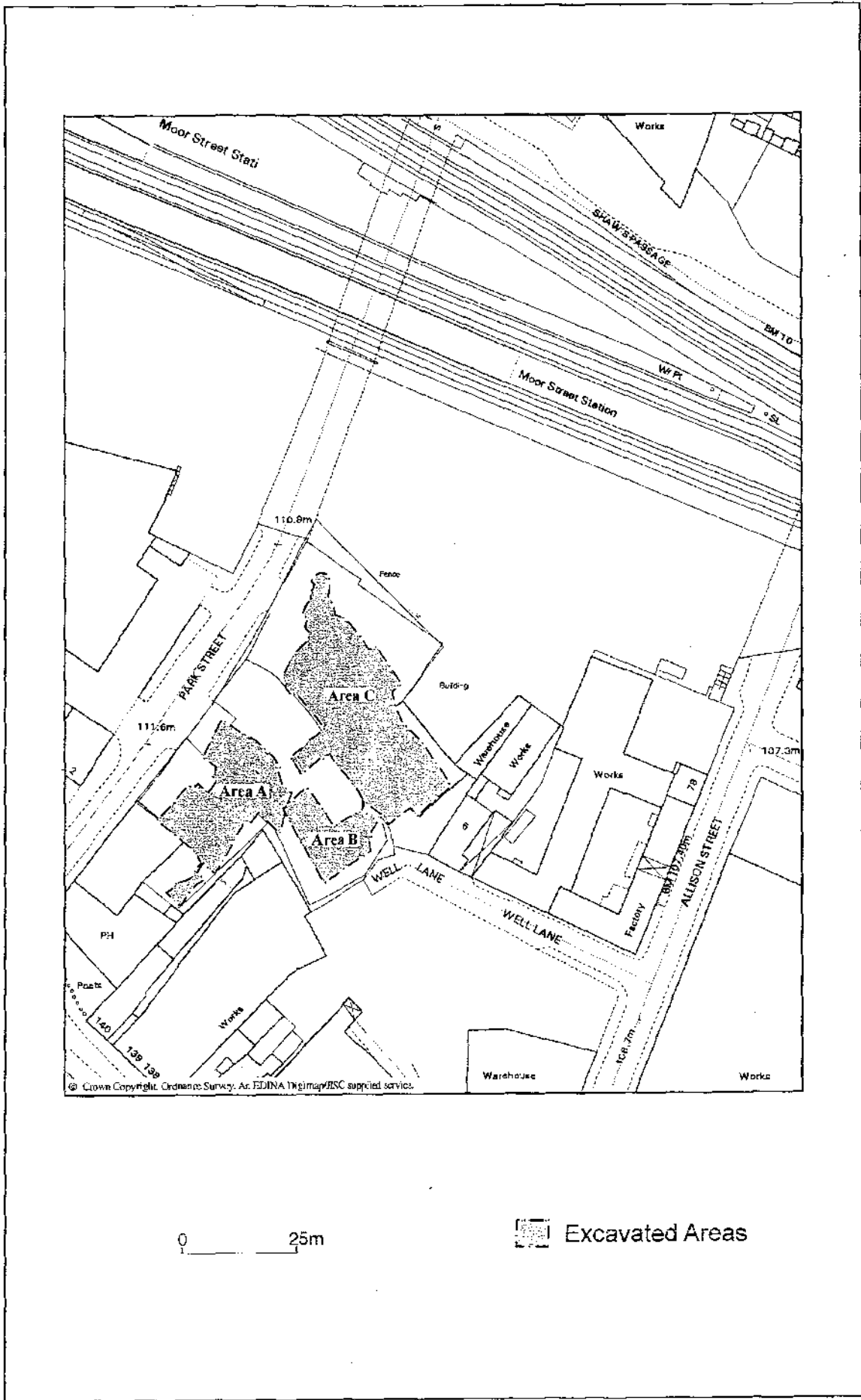


Fig.2

Medieval

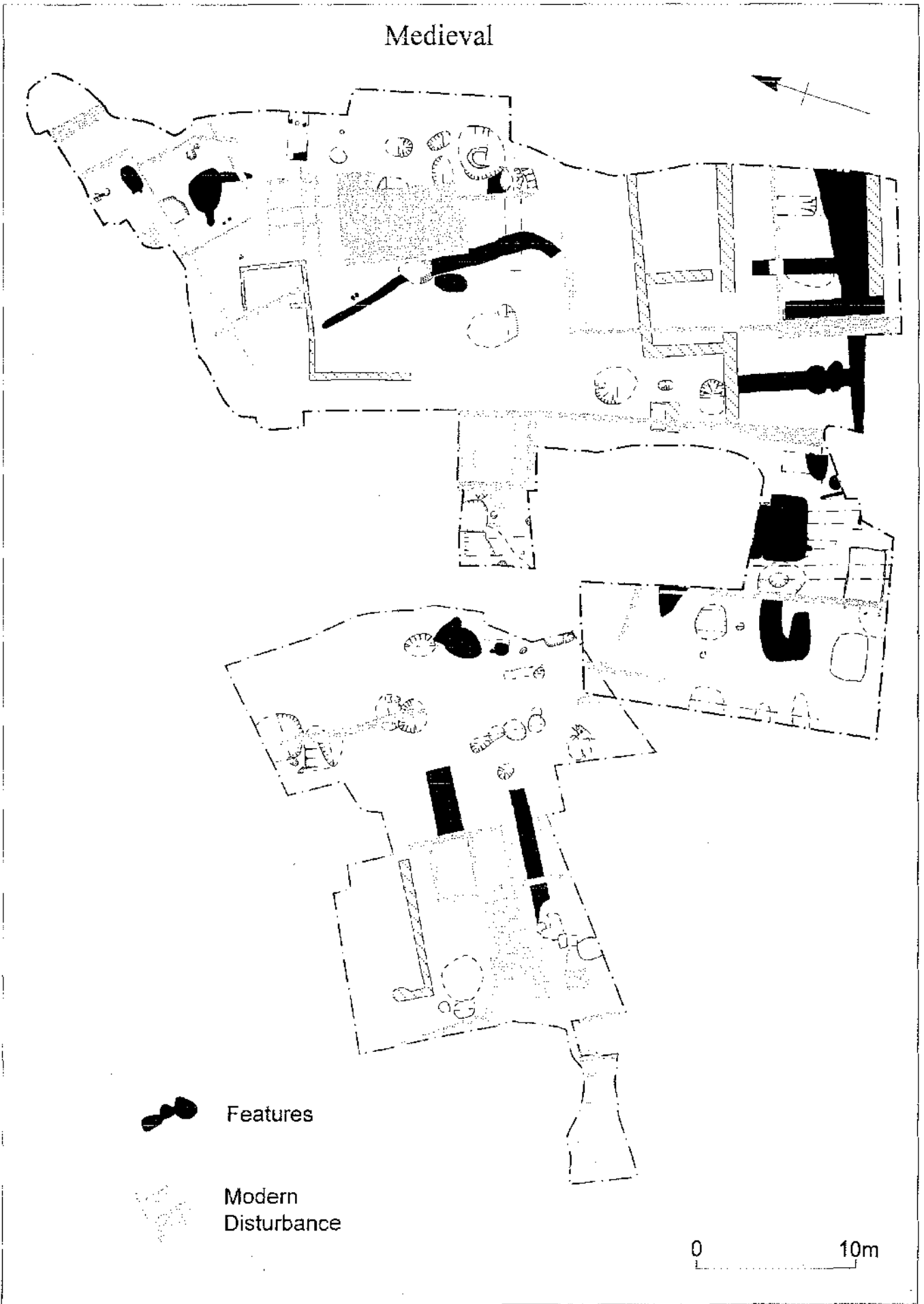


Fig.3

Post-Medieval

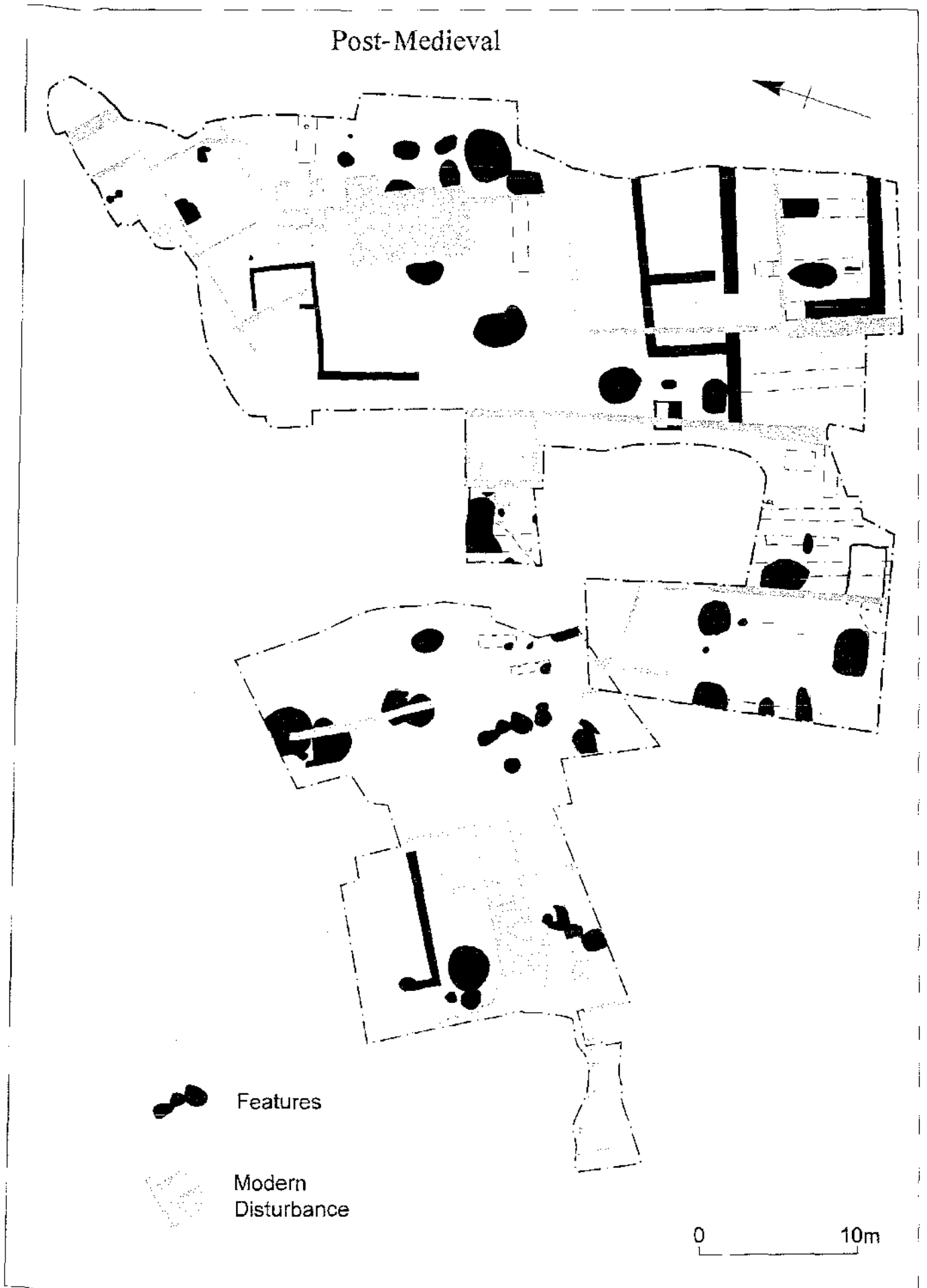


Fig.4

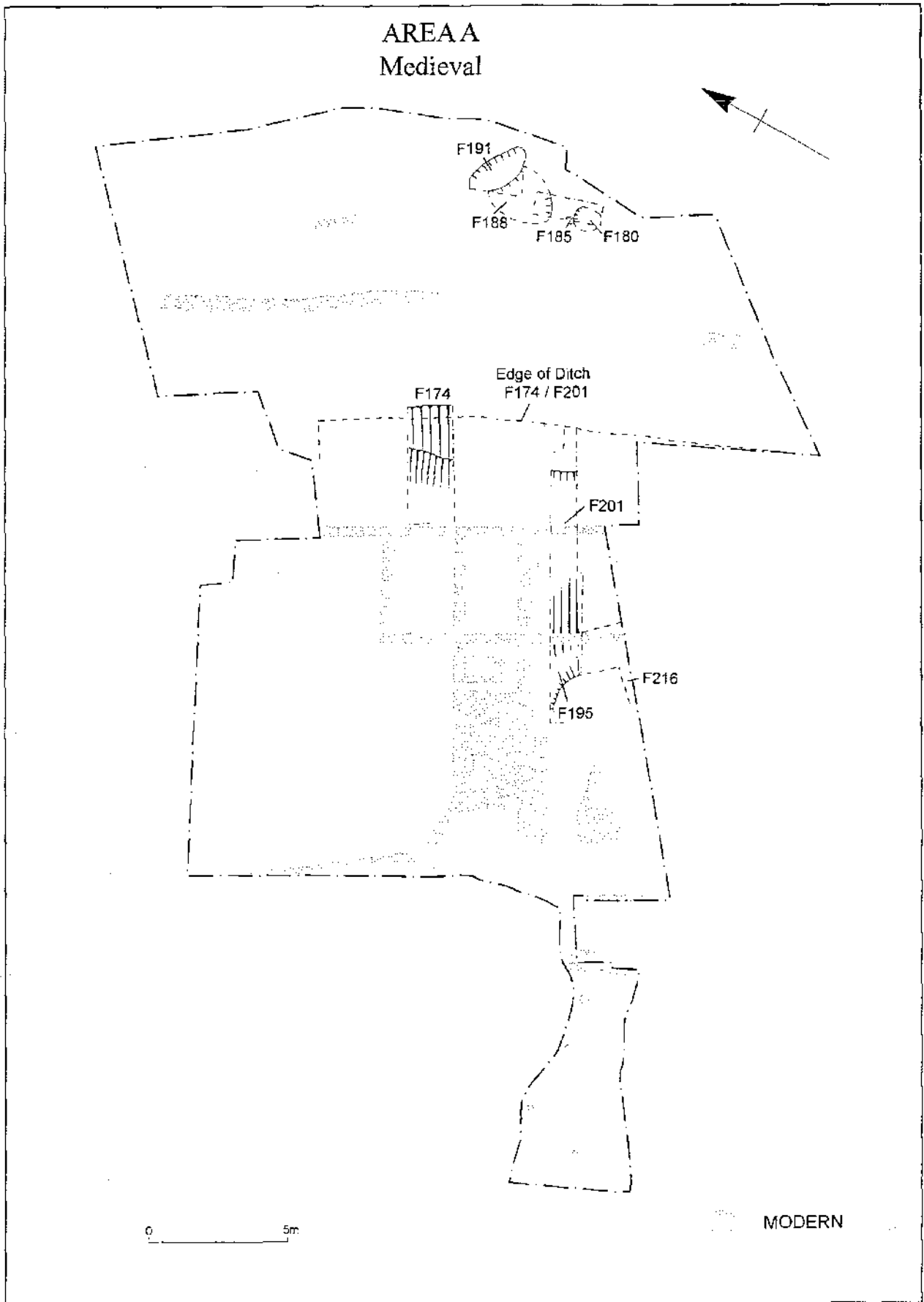


Fig.5

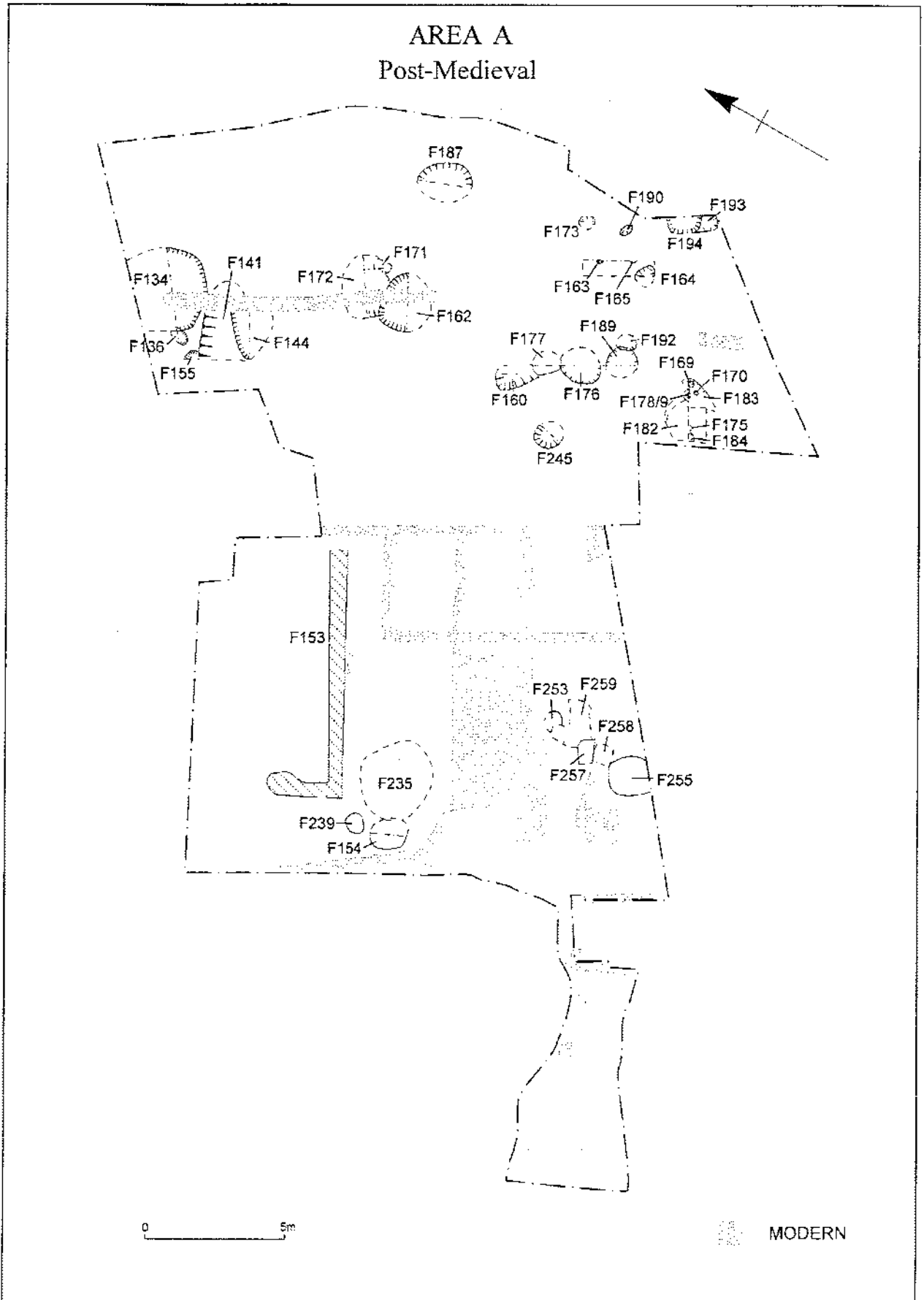


Fig.6

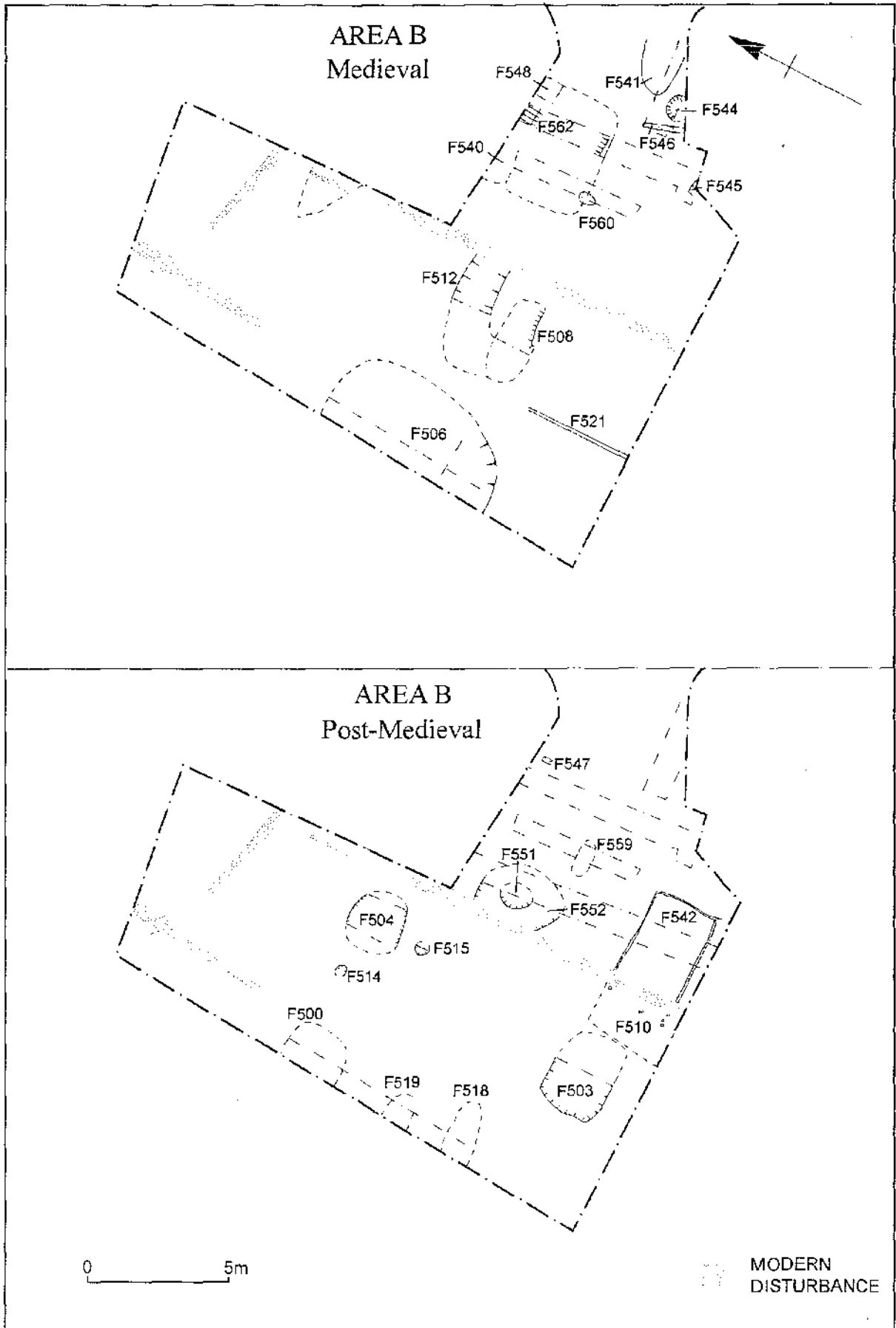


Fig.7

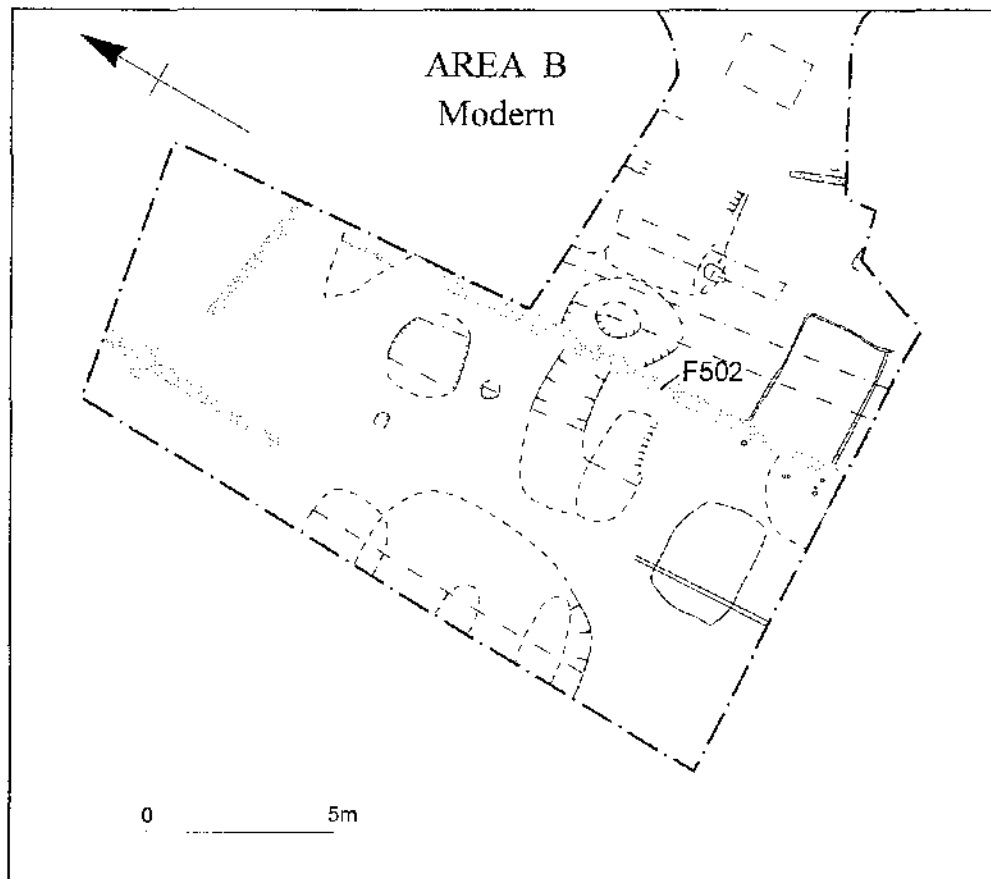


Fig.8

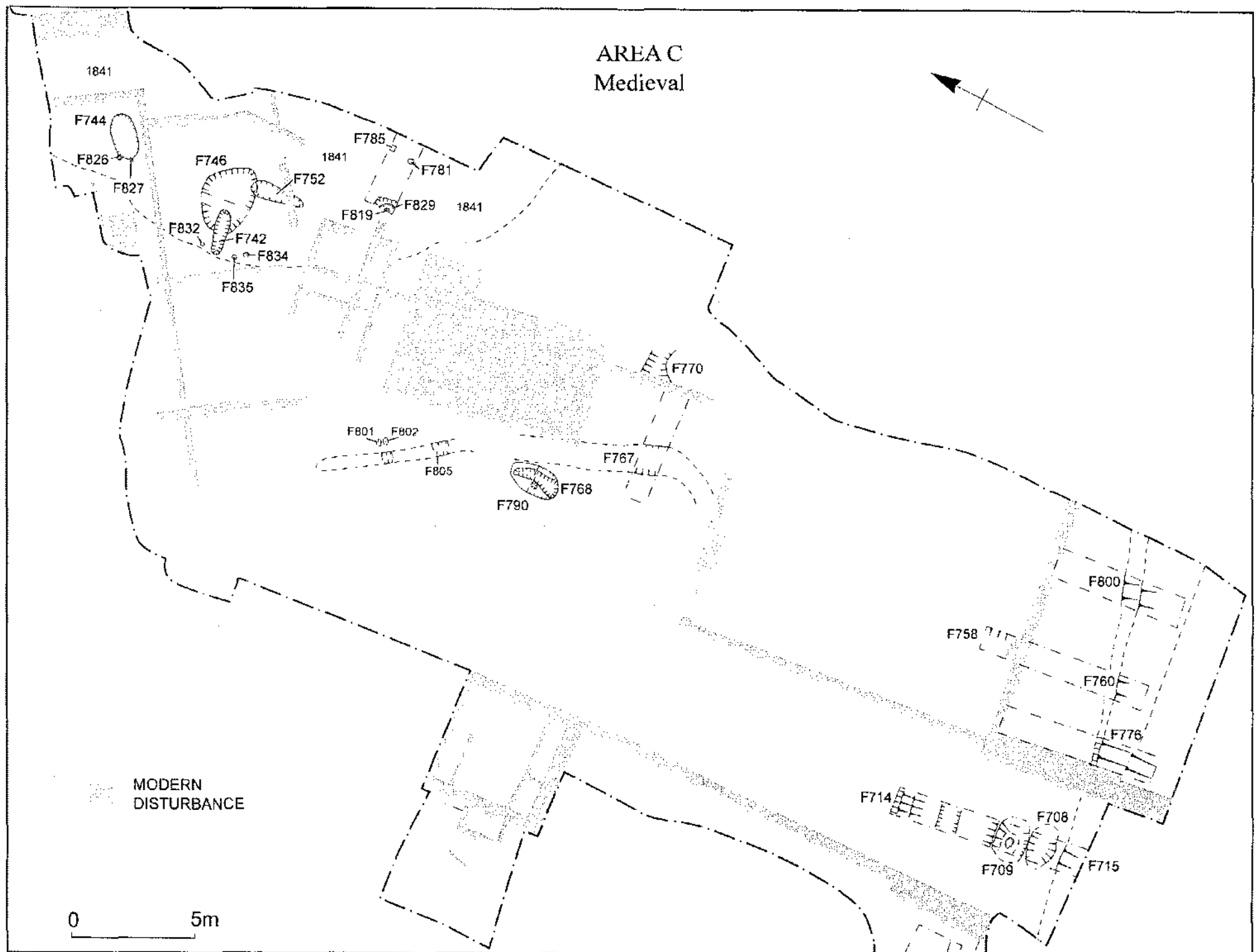


Fig.9

AREA C
Post-Medieval

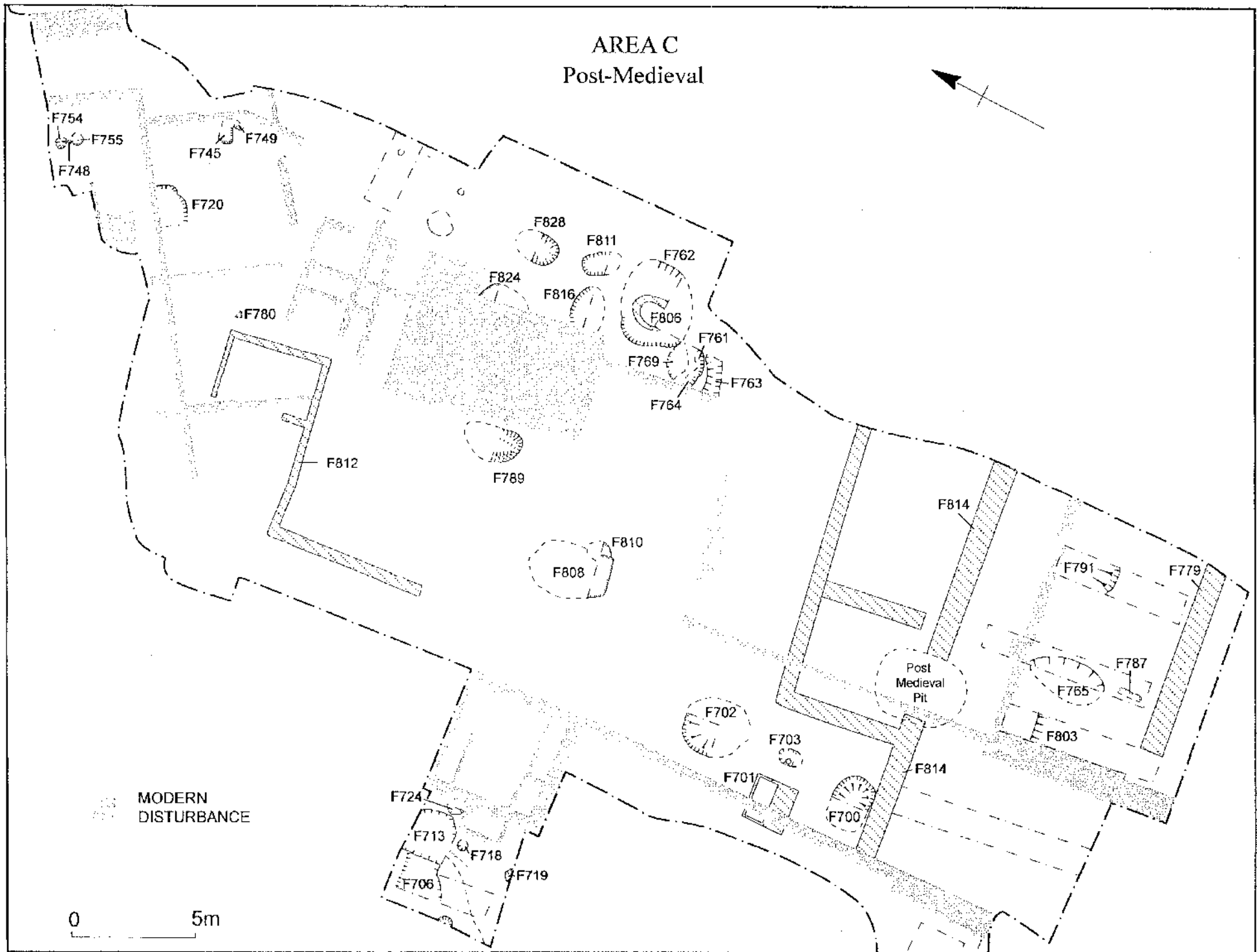
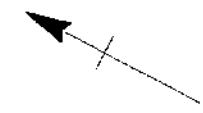


Fig.10



Plate 1 Feature F506 clay lined 'pond' (medieval in date) and post-medieval pits F500 and F509 (viewed from left to right)



Plate 2 Feature F768, a possible kiln, which contained medieval pottery

Plate 3 Grave F752,
orientated north-west-
south-east. Located
in the north-eastern
corner of the site

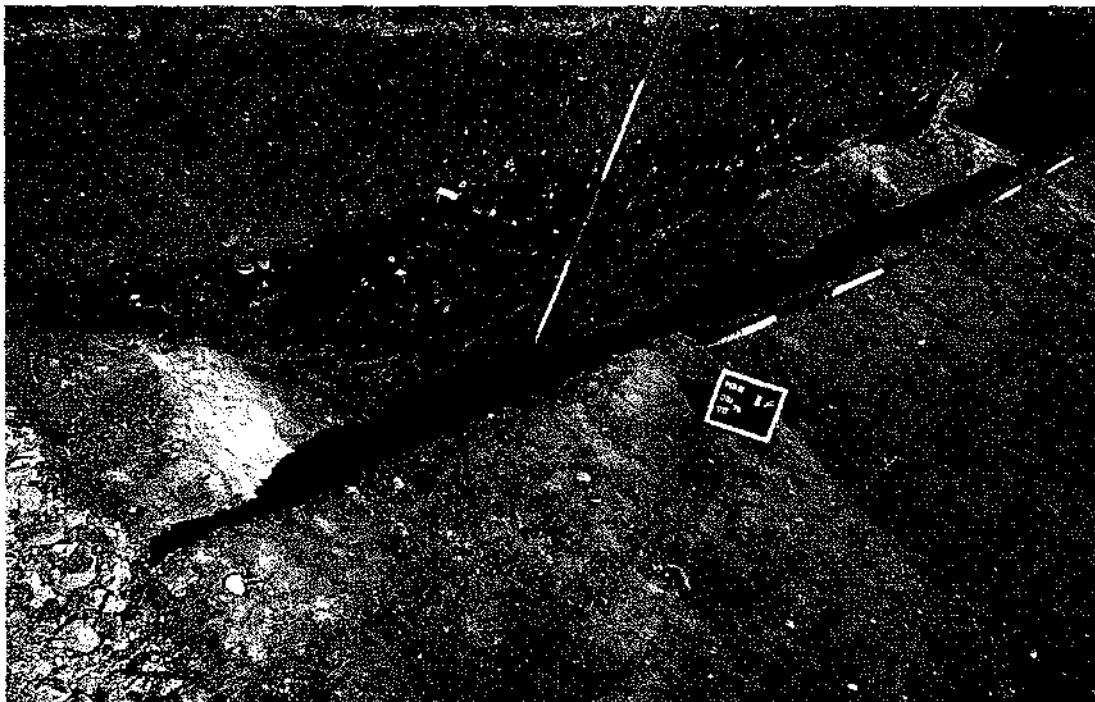


Plate 4 Linear boundary ditch F715

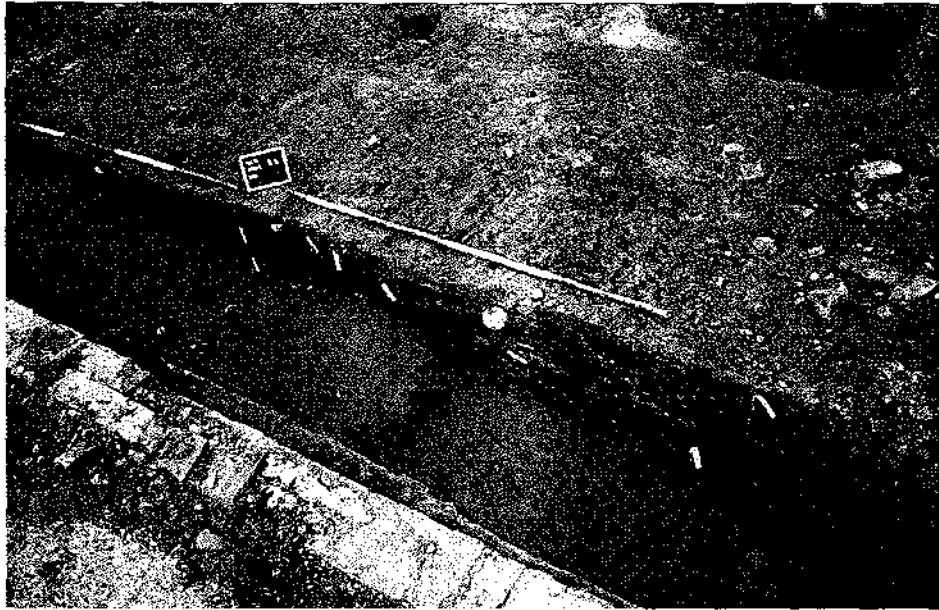


Plate 5 Post-medieval pit F803, northern edge of medieval ditch F776 and upright F778 (viewed from left to right)

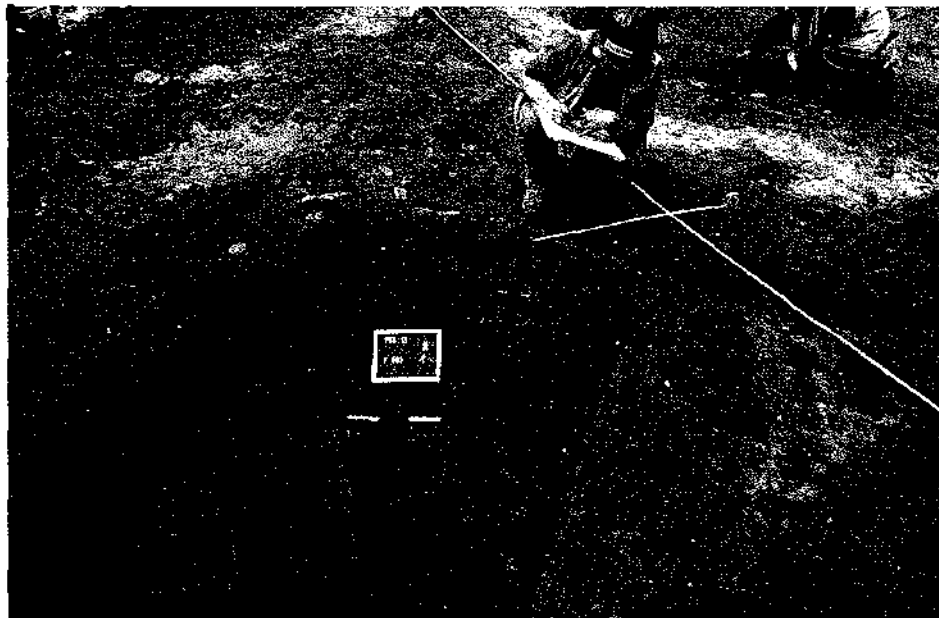


Plate 6 Feature F503/F520, industrial pit and chair *in situ* (post-medieval in date)