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An Archaeological Evaluation and Excavation at Moor Street, Birmingham City Centre 2000 Post-Excavation Assessment and Research Design

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An Archaeological Evaluation and Excavation at Moor Street, Birmingham City Centre 2000
Post-excavation Assessment and Research Design

By
Catherine Mould
With contributions by Lynne Bevan, Marina Ciaraldi, Erica Macey, Emily Murray and Stephanie Ratkai and illustrated by Nigel Dodds.

For further information please contact:
Simon Buteux or Iain Ferris (Directors)
Birmingham University Field Archaeology Unit
The University of Birmingham
Edgbaston
Birmingham B15 2TT
Tel: 0121 414 5513
Fax: 0121 414 5516
E-Mail: BUFAU@bham.ac.uk
Web Address: http://www.bufau.bham.ac.uk

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1.0 Summary

Moor Street, together with Edgbaston Street and Park Street represents part of the historic centre of Birmingham. The moated manor house and the smaller Parsonage Moat lie to the southeast and southwest respectively. Their associated watercourses and Edgbaston Street, which was one of the earliest streets to be laid-out in the town, lie to the southwest. Evaluation trial-trenches established that surviving medieval deposits at Moor Street were limited to a discrete area within the footprint of the former Ship Ashore public house where they were well-preserved and were located within 1.60-3m of the modern ground level.

The results of archaeological investigation at Moor Street are presented here in two parts. The first part details the results of the evaluation that identified largely 20th-century deposits and features (Trenches 1-4, 6-9). The second part details the excavation of medieval deposits below the former Ship Ashore public house (Area A).

The archaeological excavation at Moor Street identified five phases of activity. A single prehistoric flint flake, two Roman pottery sherds and one sherd of possibly Saxon pottery indicates that there was some activity in this area prior to the medieval settlement. The first distinct phase, Phase One, dated to the 12th - 14th centuries, when a large southeast-northwest aligned ditch, a series of intercutting pits, a gully and a post-hole were cut. The ditch, which represented the boundary between town and deer park in the 12th century, was also recorded during excavation at Park Street to the southeast. Analysis of the pottery assemblage from this phase suggests that local Deritend pottery production was based within the deer park during the 13th century, prior to Moor Street and Park Street being added to the town-plan. Evidence from excavation at Park Street supports this.

Phase Two is dated to the 15th and 16th centuries and is represented by a series of pits, some of which cut the backfill of the Phase One ditch. A period of inactivity is suggested by the accumulation of a dark layer of silty-clay-sand with a high concentration of charcoal towards the end of Phase Two.

This period of inactivity continued into Phase Three, dated to the 17th – early 18th century. Only one pit was recorded, along with a deep layer of organic 'cultivation soil'. This layer has also been identified at Edgbaston Street and at Park Street and appears to mark a lull in Birmingham's industrial development.

Phase Four is dated from the mid-18th century to the late 19th century and is represented by a series of brick-built walls representing structures and boundaries extending back from Moor Street. A well was also recorded cutting through one of the earlier Phase Four boundary walls.

Phase Five is dated to the 20th century and is represented by a brick-built wall along the northeastern limit of Area A, which formed part of the Hennebique Building associated with Moor Street station, and by the concrete foundations for the former

Ship Ashore public house.

Approximately 500 sherds of well-preserved pottery, including two Roman and one possibly Saxon sherds, along with local medieval Deritend ware and imports from Spain, were recovered during the excavation. The majority belong to Phases One and Two, with the largest group coming from the Phase One town-boundary ditch infill. The presence of wasters and furnace lining suggests production sites close to the core of the historic town, in addition to one identified by the River Rea in Deritend.

With the exception of one undated flint flake, the largely fragmentary small finds assemblage dated to Phases Four and Five. No medieval Phase One or Two small finds were recovered. A small glass assemblage has some potential for comparison with that recovered from the Edgbaston Street and Park Street sites.

The preservation of the animal bone was similarly poor, especially for Phase One. The frequency of horncores was a noticeable feature in Phase One and is in line with the tanning evidence found at the Edgbaston Street, Hartwell Garage and Custard Factory sites.

The potential of the environmental data is limited, though, very interestingly, analysis found that coal and charred peat frequently occurred in the Phase One samples and that this, along with the presence of hammerscale, is significant in the context of domestic and industrial land use within the medieval town.

Recent research and excavation elsewhere within the city centre has indicated that Birmingham was an important example of an industrially-based medieval town which enjoyed sustained growth up to and including this century due to its additional trading facilities. This success has, to a large extent, been responsible for the destruction of a great many historic buildings. The below-ground archaeology of the city centre has the potential to further an understanding of the chronology and form of Birmingham's growth and to provide the evidence to resolve vitally important questions concerning Birmingham's early development.

2.0 Introduction (Figs. 1 and 2)

2.1 Background to the Project

The Site (Fig.1) is located in Birmingham City Centre and at the time of evaluation and excavation was bounded by Bull Ring, Moor Street, Moor Street Station and Park Street. Prior to evaluation a series of octagonal units was located along the Bull Ring street frontage. Set back from these was a multi-storey office block and carpark. The Hennebique Building, which was associated with Moor Street station, occupied the northeastern half of the Site (Fig. 2).

2.2 Archaeological Background (Fig. 3, Maps 1-3)

Some examination of surviving below-ground archaeological deposits at the manorial moat site was carried out in the early 1970s, during development of the present-day Wholesale Market (Watts 1980). However, this development preceded Planning Policy Guidance Note 16 (Department of the Environment 1990) and, although much relevant information was recovered, the work resembled more of a present-day watching brief than an open-area excavation. In this instance, Lorna Watts and a small team from the University of Birmingham monitored groundworks. Despite

difficult conditions, this watching brief clearly demonstrated the survival, not just of the manorial moat-ditch, which was itself waterlogged and contained preserved wooden stakes, but also of substantial dressed-sandstone footings and walls belonging to 14th-century structures on the moat platform.

In 1995 the Field Archaeology Unit was commissioned to carry out desk-based assessment of the proposed development site at Moor Street (Litherland and Mould 1995). The assessment demonstrated the site's importance and its close proximity of the manorial moat, the smaller Parsonage Moat and a series of associated watercourses, along with the church, market place and Edgbaston Street which was one of the earliest streets to be laid out in the town (Maps 1 and 2). Moor Street, along with Park Street, was laid out in the 13th-14th century, as part of a deliberate town-planning episode to expand the thriving historic town and to enhance the highly-successful Bull Ring market facilities. The assessment highlighted the high potential for survival of archaeological deposits on the Site itself whose modern-day boundaries, particularly along Moor Street, reflected those of the earlier historic town.

The Site was evaluated by trial-trenching in 2000 (Fig. 3, Trenches 1-9). Trial-trenches were located to test survival of archaeological deposits close to the street frontage, across historic boundaries, and within backplot areas (Map 3). The majority of the Site (Trenches 1-4, 6-9) had been truncated by 20th century activity relating to construction of the Hennebique Building and of a 1960s-multi-storey office block and carpark. These had truncated all earlier deposits down to the sandstone bedrock.

Well-preserved medieval deposits and features were recorded in Evaluation Trench 5, within the footprint of the former Ship Ashore public house. More extensive excavation was undertaken within this area in 2000 (Area A).

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

In 1999, evaluation immediately to the east of the Row Market found small-scale medieval survival between later 19th-century cellaring (Hovey 1999). Subsequent watching briefs were carried out in 2000 at The Row Market (Ramsey 2000) and during construction of a new road, The Row. This recorded further survival of the moat ditch (Patrick 2000). Evaluation and excavation of sites at Edgbaston Street (Mould *et al.* 2001) and Park Street (BUFAU forthcoming) has been carried out, along with an assessment of a site at Upper Dean Street (Litherland and Watt 2000). Excavation at St. Martin's Church was completed in November 2001 (BUFAU forthcoming).

2.3 Aims

The aims of the evaluation and excavation work were to:

- preserve any surviving medieval and post-medieval features by record.
- contribute towards an understanding of the early development of Birmingham.
- define the morphology of the settlement and of any industrial remains, and to determine their character, development and chronology.
- examine the pottery chronology.
- contribute to the understanding of domestic and industrial activity within medieval

and post-medieval Birmingham, with particular reference to other sites of similar date investigated within the city.

2.4 Method

The modern overburden and concrete surfaces were removed by a 360 degree excavator, with a toothed and toothless bucket, under archaeological supervision. Spoil was stockpiled on site. The uppermost horizon of archaeological features and deposits revealed by machining was hand-cleaned and a base plan of features was prepared. The excavation sampling strategy for Area A was decided following a meeting with the Planning Archaeologist.

In Area A, machining was carried out in two stages, firstly down to the Phase Three 'cultivation soil' - any features cutting this layer were to be excavated, and secondly through the 'cultivation soil', to the top of surviving Phase Two deposits and features.

In Area A, sampling by hand excavation comprised not less than 50% of discrete features. A higher percentage of discrete features was excavated where more information was required to achieve a full understanding of the date, character and function of an individual feature or group of features. Features of probable industrial function were fully excavated, whilst linear features not associated with settlement were sampled to determine their form, function and date, and to determine the stratigraphic sequence. Excavation of linear features associated with settlement comprised a minimum of 25%. All datable features were sampled for environmental analysis.

Recording was by means of pre-printed pro-formas for contexts and features, supplemented by plans (at 1:20 and 1:50), sections (at 1:10 and 1:20), monochrome print and colour slide photography. Subject to the permission of the landowner, it is intended to deposit the paper and finds archive in an archive store approved by the Planning Archaeologist for Birmingham City Council.

Evaluation trenches were positioned in such a way as to try and avoid deep cellar activity associated with the buildings that would have fronted Park Street. Trench 8 was divided into three (Trench 8a, 8b and 8c), to avoid disturbing a fibreoptic cable.

3.0 Results (Figs. 3-8, Plates 1-5)

The results of the archaeological work at Moor Street are presented here in two parts. The majority of the Site (Trenches 1-4, 6-9) contained no remains earlier than the 20th century, and these results are presented as an evaluation report. No further analysis will be carried out on these trenches.

One evaluation trench (Trench 5) did contain deposits dating from the 12th century through to the present day, and this was subsequently excavated as Area A. A medieval well was also recorded in Trench 8c. The assessment of Trench 5, the well in Trench 8c and Area A is presented in this report. These deposits and features will be subject to further analysis and publication.

3.1 Evaluation Results (Plates 1 and 2)

Trench 1
(1.8 x 28m, aligned northeast-southwest, excavated to a depth of 0.25-1.00m)

The red sand and clay subsoil (1002) was exposed immediately after the removal of the brick and concrete floor surface (1000) and a layer of general brick and concrete rubble (1001). It was recorded at a depth of 0.25m in the eastern and central areas of the trench. At the western end of Trench 1, the subsoil (1002) was cut by two parallel brick walls, approximately 6.50m apart and 0.5m wide. They were aligned east-west and were visible directly below the floor surface (1000) and rubble (1001). Between these walls was a series of linear brick footings that were also aligned east-west. These footings had a flat surface and were of varying width, identified at a depth of 1m. Sealing them between the two walls was a deposit of bricks and rubble that was also directly under the concrete and brick floor surface (1000). At the eastern end of the trench, an east-west-aligned drain was identified.

Artefacts : No artefacts were recovered from Trench 1.

Trench 2
(1.8 x 21.7m, aligned east-west, excavated to a depth of 0.35m)

The red clay and sand subsoil (2002) was exposed immediately after the removal of the overlying brick and concrete floor surface (2000) and a layer of general brick and concrete rubble (2001). These layers were 0.35m-deep over the whole length of the trench. A drain was located at the western end, aligned north-west-south-east. No other features were identified in this trench.

Artefacts : No artefacts were recovered from Trench 2.

Trench 3
(2 x 20m, aligned north-south, excavated to a depth of 0.08-1.00m)

The red clay sand subsoil (3002) was exposed immediately after the removal of the overlying brick and concrete floor surface (3000), at a depth of 0.08-0.15m. The subsoil was cut at the northern end of Trench 3 by a series post-medieval features similar to the ones identified in Trench 1. Two parallel brick walls, aligned east-west and approximately 6.5m apart, were identified directly beneath the floor surface (3000). Between these walls was a series of linear brick footings, also aligned east-west and exposed at a depth of 0.9m below the ground surface. They supported metal and wood girders, identified as possible tram lines (3001). A modern drain was also located in this area. To the north of this was a concrete support, 2.3 x 2.7m in size. No other features were identified in this trench.

Artefacts : Post-medieval pottery fragments were recovered from the northern end of Trench 3.

Trench 4a
(2.5 x 26m, aligned northeast-southwest, excavated to a depth of 0.7-1.8m)

The red clay sand subsoil (4006) was revealed at a depth of 0.65-1.1m below the ground surface. Overlying the subsoil at the southern end was a dark brown silty clay

sand layer (4007), approximately 0.15m deep. Cutting this layer and the subsoil (4006) was a sub-circular feature (F401), 2m wide and 0.5m deep and with steeply-sloping sides and a slightly-rounded and irregular base. It continued beyond the eastern edge of the trench, and contained a single dark grey brown silty clay sand fill (4005) with flecks of charcoal and fragments of wood. The feature (F401) was truncated on its northern side by a post-medieval drain cut and on the west by post-medieval disturbance. A levelling layer of mid-grey brown silty clay sand (4004), similar to a cultivation soil, sealed this feature. Overlying this layer in the southern end of Trench 4a was a series of layers of ash, concrete and brick. The uppermost layer over the whole of the trench was a brick and concrete floor surface (4000). At the northern end of Trench 4a the subsoil (4006) was cut by a brick cellar wall (F400), aligned northeast-southwest and visible at a depth of 0.55m below the brick and concrete floor surface (4000). It was approximately 0.4m wide and 1.1m in depth, and extended 15m from the northern end of the trench. It was mostly removed by machine. Another wall (F403) was located 6.5m from the northern end of Trench 4 and was aligned northwest-southeast and corresponded to the cellar wall at the northern end of the trench. This wall was approximately 0.9m wide and at least 1.8m deep, and was visible from 0.15m below the floor surface (4000). Other partial remains of walls and post-medieval drains were also identified in this trench.

Artefacts : The fill of F401 (4005) produced occasional pieces of tile and brick. Layer 4004 contained a moderate amount of post-medieval pottery fragments and animal bone.

Trench 4b
(3.25 x 23m, aligned northwest-southeast, excavated to a depth of 0.5-1.05m)

The red sand clay subsoil (4006) was revealed at a depth of 0.5-0.7m below the ground surface under levelling layers (4001) and a brick and concrete floor surface (4000). A sub-circular pit (F402), containing a single fill (4008) of mixed red brown silty clay sand with frequent flecks of charcoal, brick, tile and tarmac fragments, was cut into the subsoil. The pit was 0.9m in diameter and 0.5m deep, with steeply-sloping and a flattish, irregular base. It was sealed by the levelling layers (4001). Also identified in Trench 4b were deposits of post-medieval building rubble and a drain, aligned north-south, to the east of pit F402.

Artefacts : The fill of F402 (4008) contained tile, brick, and post-medieval pottery fragments.

Trench 6
(2m x 19m, aligned northwest-southeast, excavated to a depth of 2.10m)

The southeastern end of the trench was excavated to a depth of 2.10m below the concrete floor surface (6001), where the reddish orange sand subsoil (6005) was exposed. The subsoil had been overlain by a substantial levelling layer (6009), approximately 1.70m in depth and comprising a dark grey-brown silty clay sand with frequent small stones and a moderate quantity of red brick fragments. This layer was, in turn, overlain by a modern greyish brown hardcore make-up layer (6017), 0.40m in

depth and extending along the course of the trench. The levelling layers had been truncated by a series of modern concrete walls (F601-F604), relating to a period of building development in the 1960s. The concrete walls were aligned east-west and extended to a depth of at least 2.20m below the concrete floor surface (6001). Any possibility of discovering medieval archaeological remains along most of the trench was, therefore, remote. The area in the middle of the trench between concrete walls F601 and F602 was occupied by a levelling layer of redeposited reddish brown sand (6007),which was excavated to a depth of 2.20m below the concrete floor. The subsoil was not exposed at this point, due to the unstable nature of the sides.

However, the reddish orange sand subsoil was exposed to the north of F601, at the northwestern end of the trench, where the absence of modern building foundations enabled excavation to proceed. The subsoil (6005) was revealed at a depth of 1.60m below concrete surface 6001, being sealed by a series of levelling layers (6002-6004), the earliest of which, layer 6004, was approximately 0.80m in depth and which comprised building rubble containing a small number of sherds of brown-glazed post- medieval pottery.

The reddish orange sand subsoil at the northwestern end of the trench had been truncated by a wall (F608), made up of machine-cut red bricks, orientated northwest-southeast, approximately 0.60m wide, and extending beyond the limit of excavation. Feature F608 had been cut by a drainage trench (F606), following the same alignment and which was 0.20m wide and 0.07m in depth. It contained a sherd of post-medieval pottery and clay pipe fragments within the mottled silty sand matrix (6015). The subsoil at the extreme northwestern end of the trench had been truncated by a circular pit (F600), the southeastern half of which was excavated. It contained post-medieval glazed pottery, frequent pieces of iron and glass slag, animal bones and a bed. Feature F600 was sealed by a concrete floor surface (6001), which was 0.10m in depth and extended along the length of the trench.

Artefacts: A small amount of post-medieval pottery, tile, clay pipe, glass, slag, and animal bone was recovered. A glass bead (SF1) is noted in the small finds summary below.

Trench 7
(2.4m x 15.75m, aligned north-south, excavated to a depth of up to 3.6m)

The red sand subsoil (7002) was exposed immediately after the removal of the overlying concrete and ash rubble layer (7000) at a depth of 0.1-0.2m. It was subsequently excavated to a depth of 2.6m at the northern end of the trench. Two features were identified at the southern end of Trench 7; a well (F700) and a north-east-southwest-aligned brick wall (F701). The well was 1.5m in diameter, had vertical sides, and was fully excavated to a depth of 3.6m. It was noted that the original excavation tool markings, possibly caused by picks or mattocks, were visible on the inside of the well. It was truncated on the southern edge by wall F701, which was 1m wide, 2.4m deep and leant slightly to the north. The base of the wall corresponded with the top of the subsoil exposed in this area, and both features were directly beneath a concrete and ash rubble layer (7000). Overlying the subsoil and abutting the wall to the south was a possible demolition deposit, 1.25-1.5m deep, consisting almost entirely of bricks (7003). On top of this, and again abutting F701, was a series of

levelling deposits (7001) which were 0.65m deep and included thick layers of red sand and compact black brown silt and rubble. These were also sealed by 7000.

Artefacts: No artefacts were recovered from Trench 7.

Trench 8a
(1.20m x 9.40m, aligned northwest-southeast, excavated to a depth of 1.40m)

The red sand subsoil (8002) was exposed at a depth of 0.12m below the concrete floor surface. It became evident that the ground had been levelled and that there were no surviving archaeological features cut through the subsoil. The red sand subsoil was overlain by a 0.10m thick layer of greyish-brown ash and small stones. This provided a levelling layer for the concrete floor surface and had been truncated by a modern service trench.

Trench 8b
(1.20m x 13m, aligned north-south, excavated to a depth of 0.36m - 2m)

The trench was taken down to a depth of 0.36m at the northern end, where a cellar wall (F800) was uncovered. Consequently, due to the cellar activity, excavation ceased and resumed 2.50m from the northern end of the trench. The red sand subsoil (8002) was exposed at a depth of 1.40m below the modern concrete floor surface. The remainder of the trench was cut to a depth of 2m, where the natural sand could be seen in section. At a depth of 1.05m below the concrete floor surface a cut was exposed (F805), situated approximately 7.15m from the northern end of the trench and 3.50m wide and 0.75m in depth. Feature F805 had been infilled with post-medieval building rubble and was overlain by a layer of red machine cut bricks (8004). The layer of bricks had been truncated by a series of brick walls (F800, F801, F802, F803, and F804). Features F802, F803 and F804 represented east-west-aligned retaining walls, approximately 0.50m wide and extending to a depth of 1.40m below the concrete floor surface. Features F800 and F801 were walls associated with a cellar which had been infilled with post-medieval spoil (8003) which comprised crushed red bricks, ash and charcoal, 0.50m in depth and overlain by a levelling layer (8001). The orange-brown make up layer was approximately 0.35m in depth, extending across the entire length of the trench and sealed by a greyish-brown layer of ash and small stones (8000). The layer was 0.10m in depth and provided the support for the concrete ground floor surface of the car park.

Trench 8c
(2m x 16m, aligned northwest-southeast)

The red sand subsoil (1503) was exposed at a depth of 111.69m AOD at the south-eastern end of the trench where it had been truncated by a number of features. A sub-circular pit (F181) was exposed, truncating the subsoil and situated 6m from the southeastern end of the trench. It had been backfilled with a brown sandy silt (1501), with post-medieval building rubble with frequent red bricks, fragments of coke, clay pipe and blue and white glazed pottery sherds. Approximately 0.30m to the west of F181 a second feature (F182) was uncovered, measuring 1.50m in diameter and 2.20m in depth. This proved to be a stone-lined well which had been infilled with a series of medieval deposits (1502,1510,1509 and 1508). Context 1508 was a thin red

clay lining at the base of the well, overlain by a series of seven courses of large sandstone blocks (1509), approximately 0.40m by 0.30m in size. The stones were sealed by a reddish brown silty sand with patches of red clay (1510), which had large stone inclusions and contained seven medieval pottery sherds, notably a piece of green-glazed ware. Context 1510 was overlain by a reddish brown silty clay sand (1502), which contained 38 medieval pottery sherds, a piece of copper alloy and a small number of fragments of animal bone. Features F181 and F182 had been truncated to the southeast by the cut for a post-medieval wall (F180), a linear feature aligned northwest-southeast and approximately 0.30m wide. Feature F180 had been infilled with a brown silty sand (1500) with post-medieval demolition rubble. The remains of modern brick and concrete structures were visible at the extreme northwestern end of the trench. Feature F184 represented the cut for a post-medieval walled structure (F183) which was rectangular in shape, approximately 2.80m by 1.30m in plan, and which was not excavated due to its modern date. It was evident that any further potentially surviving medieval archaeology would have been truncated by the post-medieval brick and concrete walls. The modern building foundations which occupied the northwestern end of the trench were sealed by a reddish brown levelling layer between 0.60 and 0.75m in depth and made up of crushed building material.

Artefacts: Medieval pottery sherds, animal bone and a copper alloy artefact were recovered from Trench 8.

Trench 9 (Plate 2)
(10m x 16m, aligned northeast-southwest)

The red sand subsoil (1309) was revealed at a depth of between 0.30 and 0.40m below the tarmac ground level (1307). The subsoil had been truncated by a series of post-medieval features (F150-F152 and F154-F157) situated along the southern edge of the excavated area. Feature F151 was a sub-circular pit, visible in the southwest corner of the trench, filled with a dark brown silty sand (1301) which contained frequent post-medieval pottery sherds and general demolition material backfill. Feature F151 had been truncated by feature F154, a pit filled with redeposited reddish sand (1304) which contained flecks of charcoal but no datable finds. Pit F154 had, in turn, been truncated by F150, another pit containing frequent post-medieval pottery sherds and general demolition rubble in a mid-grey sandy silt matrix (1300). The red sand subsoil had been further truncated by a series of seven post-holes. extending east-west across the trench and regularly spaced approximately 1m apart. Three of these sub-rectangular features were half sectioned, namely F155, F156 and F157. The post-holes varied in size between F157, which was 0.78m by 0.50m and 0.24m in depth, to F156, which was 0.36m by 0.20m and 0.08m deep. Each post-hole contained a dark silty clay sand with flecks of charcoal and occasional pieces of post- medieval pottery or clay pipe. Towards the middle of the trench a sub-rectangular pit (F153) was exposed, truncating the red sand subsoil. The pit was approximately 0.76m by 1.28m and extended to a depth of 0.68m. It was backfilled with a dark grey brown silty clay sand containing post-medieval pottery, brick, tile and animal bones. Towards the northeastern edge of the site a rectangular-shaped pit (F158) truncated the subsoil. This pit had been infilled with a series of deposits (1314, 1315 and 1316) containing a mixture of post-medieval pottery, slag, brick and demolition rubble. Two other small

circular features were observed. These contained post-medieval pottery, clearly visible on the machine exposed surface. These were plotted but not excavated.

Trench 9 had been truncated by modern concrete building foundations which ran north-south and east-west across the middle of the excavated site. In common with the previously-described post-medieval features the foundations were sealed by a levelling layer of reddish brown silty clay sand (1308), between 0.25 and 0.30m in depth, providing the support for the tarmac ground surface (1307).

Artefacts: No artefacts were recovered from Trench 9.

3.2 Discussion of Evaluation Trenches

Trenches 1-4 and 6-9 were situated in areas previously occupied by the 20th-century Hennebique Building, a multi-storey office block and car-park. Ground levelling during this earlier development and the periods of intense building activity typified by deep cellarage in the 18th and 19th centuries had truncated all earlier archaeological deposits. Modern levelling layers, (1506) in Trench 8c and (1308) in Trench 9 directly overlay the red sand subsoil.

With the exception of the medieval well in Trench 8c and those artefacts recovered from its fill, no further analysis of Trenches 1-4 and 6-9 will be undertaken.

3.3 Excavation Results (Figures 3-8, Plates 3-5)

3.3.1 Phasing

The results of evaluation in Trench 5, the well in Trench 8c and excavation in Area A can be grouped into six phases of activity on the basis of the date of the pottery and the principles of archaeological stratigraphy.

Phase 0	Prehistoric, Roman and Saxon activity
Phase 1	12th, 13th & 14th century
Phase 2	15th -16th century
Phase 3	17th - 18th century
Phase 4	18th - 19th century
Phase 5	20th century

The southern end of Area A corresponded with evaluation Trench 5 and was excavated to a similar depth, exposing the red sand subsoil (5106). A series of features was revealed cutting the subsoil, some of which had been identified in the evaluation At the northern end of Area A, and in a small area closest to its southern edge, the subsoil was not initially exposed, in order to investigate and sample later layers and features which sealed the subsoil.

Phase 1 (Fig. 4, Plates 3-5)

The cut of a large linear ditch (F537) was aligned northwest-southeast. It had already been partially excavated as F516 in the evaluation. The ditch was 1.65m deep and 4.40m wide, with sloping sides to a flat base, with two fills of redeposited subsoil. The upper fill (5129) was a light red brown sand, with a lower fill (5195) of much

cleaner red sand. This first ditch-cut was only visible in the section against the southern edge of the excavation. It was recut by a ditch (F538) that was also excavated in two other sections (F561, F568). The recut (F538) had again been partially excavated in the evaluation (F515).

All three sections of the later ditch were of a similar width and profile, being approximately 3.80m wide and 1.40-1.60m deep, with sloping sides and a flat base, although the fills within each section showed significant differences. The southernmost section through the ditch (F538) revealed two fills; the lower fill (5130) was a soft grey brown silty sand that contained fragments of coal and some stones, the upper fill was a more compact red brown sandy silt that also contained some stones and fragments of coal (5194).

The middle section through the ditch (F561) showed a more complicated sequence of deposition. At the base of the ditch there was a 0.20m-thick layer of red redeposited subsoil (5166). Overlying this, against the northeast edge, was another deposit of red brown redeposited subsoil containing flecks of charcoal (5161). Against the southwest edge was a similar layer of redeposited subsoil (5165), approximately 0.20m thick. The main bulk of the fill of the ditch (F561) was characterised by a series of deposits ranging from 0.05m to 0.40m thick. These included (from bottom to top); a brown grey silty clay, 0.18-40m thick, with some stones, burnt peat and coal (5158); a grey silty clay, 0.34m-thick with stones, burnt peat, charcoal and coal (5155); and a brown red sandy silt, 0.20m-thick, with occasional stones and charcoal flecks. All other contexts were less substantial and identified only in section.

The northernmost section through the ditch (F568) also contained a layer of red brown redeposited sand subsoil on the northeast edge, approximately 0.40m thick (5191), and substantial deposits of grey brown sandy silt with stones and charcoal flecking (5190, 5187, 5186), 0.20-0.40m thick. There was no evidence for a bank on either side of the ditch.

To the north of ditch section F537/F538 was a series of intercutting pits and a post-hole. Cut into the ditch (F538), and visible in the ditch section, was a circular pit (F545). It was 1.80m in diameter, with sloping sides to a depth of 1.10m, then vertical sides for another 0.65m to a flat base 0.80-0.90m in diameter. The fill of the pit was a mid-dark brown silty sand, with redeposited red sand subsoil and occasional coal and charcoal flecks (5128). The fill also contained discrete lenses of white/yellow mortar and coal in bands, and had a higher clay content towards the base of the feature. The pit (F545) was truncated slightly on the southern side by a Phase Three 19th-century wall (F552), and was cut by another Phase One pit (F565) to the west. Pit F565 was not clearly visible in plan and was heavily truncated by a modern concrete pillar. In section, the feature had gently-curving sides to a round base, and was filled with a dark brown sandy silt with occasional charcoal flecks (5179) to a depth of 0.52m. Pit F565 also cut a layer of reddish brown silty clay sand which was largely made up of redeposited sand subsoil with occasional charcoal flecks (5176), and, in turn, was cut by a sub-circular pit (F551) which had steeply-sloping sides to a flattish base. Pit F551 was 1.10m wide and 0.22m, deep and was filled by a medium grey brown silty clay sand which contained occasional small stones and flecks of coal (5133). It was also heavily truncated by a modern concrete pillar. Truncated by pit F551 and cutting layer 5176 was a post-hole (F564), 0.40m in diameter and 0.14m

deep. It was filled with a mid-grey sandy silt with occasional charcoal flecks (5178).

The layer of redeposited sand (5176) overlay the upper fill of the ditch F538 and was cut by a series of pits, the earliest of which was circular, 1.20m in diameter and 0.64m deep, with steeply-sloping sides to a flat base (F556). It was truncated by a Phase Five concrete pillar to the north and was cut on the west and south sides by a Phase One pit (F534) and a Phase Two pit (F536). F556 was filled with a very dark grey brown silty clay sand, with frequent flecks of charcoal and occasional small and very small stones and coal (5122), and, in turn, cut a pit on the northeast side that was cut directly into the subsoil (5106). This pit (F558) was sub-circular in plan and was heavily truncated to the northwest by a modern drainage ditch. The edge that was undisturbed showed a steeply-sloping side to a flat base, at a depth of 1.08m. F558 contained three fills. The lowest fill (5181) was a dark grey brown silty clay sand with frequent flecks of charcoal and occasional small stones, and was 0.20m in depth. Over this was a light reddish brown silty clay sand with occasional small stones flecks of charcoal which was largely made up of redeposited red sand subsoil (5172). The upper fill was a dark grey brown silty clay sand with occasional small stones and frequent flecks of charcoal (5146), and was 0.60m in depth.

To the southwest of pit F556, and cutting it slightly on the eastern side, another pit (F534) was identified cutting through the layer of redeposited sand (5176). Pit F534 was circular and had quite-steeply-sloping sides to a slightly rounded base. It was approximately 0.74m wide and 0.50m deep, and contained a single fill, a medium grey brown silty clay sand with occasional patches of redeposited orange sand and a small amount of stones and charcoal flecks (5107).

Pit F536 also cut a small pit (F539 and identified as F513 in the evaluation) which was itself cut by a larger pit (F535, identified as F500 in the evaluation). Sealing the features in this area was a dark grey silty clay sand with a high concentration of charcoal (5132). It was approximately 0.30m deep and was situated directly beneath a grey brown silty clay sand with frequent flecks of charcoal (5108). To the east were the heavily truncated remains of a small pit (F544).

Next to the southeast edge of the excavation, a layer of red brown sandy silt (5135), approximately 0.15m deep, overlay the subsoil (5106). A sequence of intercutting features was investigated within an area approximately 1.5m x 2m. Due to the intensity of activity in this area most of the earliest features were severely truncated by later ones and were identifiable only as cuts in section. The earliest feature (F562) cut the subsoil (5106) and was cut by a Phase One pit (F548) and a Phase Two pit (F547). Pit F548 was sub-circular, with a rounded profile and single sandy fill (5140). It was cut by the Phase Two pit F547, as well as by Phase One pit F550 and a linear feature (F555). The pit F550 was a shallow sub-circular feature with a brown sandy silt fill (5141) which, in turn, was cut by pit F547 and feature F549. The linear feature F555 was aligned northeast-southwest and had a dark brown sandy silt fill (5145). It was 0.38m deep and was truncated by pit F547.

In Evaluation Trench 8c, a stone-lined well (F182) was recorded close to the Bull Ring frontage. It measured 1.50m in diameter and 2.20m in depth and had a thin clay layer over its base. The lining was made up of seven courses of large sandstone blocks (1509), approximately 0.40m by 0.30m in size. The well was backfilled with

deposits (1502,1510) containing Phase One pottery.

Phase 2 (Fig. 5)
A series of pits characterises Phase Two activity. The largest of these pits were located within the northern half of Area A.

A circular pit (F570) was identified cutting the Phase One ditch (F568) on its eastern edge. This pit was approximately 2m in diameter and 0.40m deep, with steep sides and a flat base. Its fill (5175) contained a large amount of brick, tile and charcoal.

The upper fills of the Phase One ditch (F561) were cut by three other Phase Two pits (F559, F560 and F567). F559 was a shallow 'U-shaped' feature, approximately 0.50m in diameter and 0.35m deep, with a single fill of red sand and clay (5147). To the east was a circular pit (F567), approximately 2.00m in diameter and 0.50m deep, with a single fill of grey sandy silt with frequent coal and burnt peat flecks (5182). Cutting F567 on the western side, and cutting both the upper fills of the ditch (F561) and the subsoil (5106), was F560 which contained two fills, the lower fill being a dark grey clay silt (5149), the upper fill being a brown sandy silt (5148).

Further to the southeast, a pit (F536, originally identified in the evaluation trench as F501) cut the upper fill of the Phase One ditch (F537). It was 1m in diameter and 0.90m deep, with vertical sides and a flat base. The lower fill was a light brown sandy silt (5111) and the upper fill was a grey brown sandy silt with fragments of tile and charcoal flecks (5112).

In the east corner of Area A, pit F556 was truncated by a later Phase Two pit (F530, originally identified in the evaluation as F517) to the south and by a Phase Five concrete foundation to the north. The fill of F566 was a dark grey brown silty clay sand with a moderate amount of charcoal flecks (5180). The later sub-circular pit F530 had a dark grey brown charcoal flecked silty clay sand fill (5103).

Further Phase Two activity was recorded at the southeastern limit of Area A. Pits (F542, F547, F549 and F557) cut earlier Phase One features. F549 was a sub-circular feature with an irregular profile. It had an eastern edge cut nearly vertical and a western edge that was concave with an overhang which suggests that it may originally have been lined or else rapidly backfilled. It contained two fills (5142,5143), and may relate to an industrial process. Sealing this feature (F549) was a later Phase Two layer of medium grey brown sandy silt (5144).

Pit F557 was sealed by a layer of grey brown sandy silt (5139), approximately 0.15m deep. Both were cut by pit F547, whose full extent was unknown, as only its northern edge was visible, but it was at least 1.5m in diameter and 0.5m deep. with near-vertical sides and a flat base. The lower fill was a medium grey brown sandy silt with a high concentration of charcoal (5137). The upper fill was a dark red brown sandy silt (5138).

A layer of very dark grey brown silty clay sand with a very high concentration of charcoal, (5119) which may be the result of industrial activity built up over this area towards the end of Phase Two.

Phase 3 (Fig. 6)
One feature is dated to Phase Three, a heavily-truncated pit (F572) which was shown in section to be 0.90m by 0.50m. It contained a single fill, a grey sandy silt with large amounts of tile and charcoal (5203).

Pit F572, along with the Phase Two features and layers, was sealed by a Phase Three backplot or 'cultivation soil' layer (5105) which was removed from the whole of Area A.

Phase 4 (Fig. 7)
A series of brick-built walls representing Phase Four structures and boundaries was recorded. One of the walls (F552), and its foundation cut (F553), was similarly aligned with but not parallel to the Phase One ditch. It cut through the ditch to a depth of 1.80m. The wall was 0.4m wide and constructed from bricks, with footings visible at the base. The foundation trench (F553) was 0.90m wide and was filled with clean red sand (5199) and crumbly black silt with coke and brick rubble (5196). A second wall (F531) was made up of 15 courses of red bricks (5205). It ran northwest-southeast across the site and was visible directly under the modern concrete surface. The cut for this wall (F532) was also visible in section and had a fill that contained building rubble and post-medieval pottery (5100). A well (F546) was recorded close to the northeastern boundary of Area A.

Phase 5 (Fig. 8)
The Hennebique Building was constructed in the early 20th century. It demarcated the northeastern extent of the excavation area.

Seven concrete foundations for the former Ship Ashore public house were recorded.

Unphased
All of the features and deposits in Evaluation Trench 5 and in Excavation A have been securely phased either by pottery dating or by stratigraphic relationships. There are no unphased features or deposits.

3.3.2 Discussion of Excavation Results
No prehistoric, Roman or Saxon features were identified. One prehistoric flint flake, two Roman sherds and a possible late Saxon pottery sherd were recovered, indicating that there had been some activity in the area prior to the medieval settlement.

Moor Street, together with Edgbaston Street and Park Street, represents a key historical part of Birmingham. The moated manor house and the smaller Parsonage Moat lie to the southeast and southwest respectively. Their associated watercourses and Edgbaston Street, which was one of the earliest streets to be laidout in the town, lie to the southwest. Evaluation trial-trenches established that surviving medieval deposits at Moor Street were limited to a discrete area within the footprint of the

former Ship Ashore public house. Here, they were well-preserved and were located within 1.60-3m of the modern ground level.

The archaeological excavation at Moor Street identified five phases of activity. The earliest, Phase One, dated to the 12th - 14th centuries, when a large southeast-northwest-aligned ditch, a series of intercutting pits, a gully and a post-hole were cut. The ditch, which represented the boundary between town and deer park in the 12th century, was also recorded during excavation at Park Street, to the southeast. Analysis of the pottery assemblage for this phase suggests that local Deritend pottery production was based within the deer park during the13th century, prior to Moor Street and Park Street being added to the town-plan. Evidence from excavation at Park Street supports this.

Excavation at Edgbaston Street demonstrated that by the 13th century Birmingham was a thriving market and industrial centre. This success resulted in an increase in demand for land close to the markets and in the 13th century the lord of Birmingham initiated an enhancement of the thriving Bull Ring market and the creation of additional trading and market frontages. This resulted in the abandonment of the deer park to the northeast of the markets and the creation of Moor Street and Park Street. Baker has suggested that Moor Street and Park Street were cut through an already built-up frontage on the northeast side of the Bull Ring and that their purpose may have been to extend settlement behind that axial route (Baker 1995). Both Holt and Baker conclude that much of the central area of Birmingham, including the Moor Street, Park Street and Bull Ring area, was probably laid out sometime before c.1400. Excavation at Moor Street and at Park Street has confirmed this.

Phase Two is dated to the 15th and 16th centuries and is represented by a series of pits, some of which cut the backfill of the Phase One ditch. A change of use is suggested by the accumulation of a dark layer of silty-clay-sand with a high concentration of charcoal towards the end of Phase Two.

This period of inactivity continued into Phase Three, dated to the 17th – early 18th century. Only one pit was recorded in this phase, along with a deep layer of organic 'cultivation soil'. This layer has also been identified at Edgbaston Street and at Park Street and appears to mark a lull in Birmingham's industrial development. Further analysis of this soil, which marks a major episode in Birmingham's historical development, is needed to establish whether this organic material was imported into the town centre. Further study of this apparent lull in Birmingham's industrialisation is also needed.

Phase Four is dated from the mid-18th century to the late 19th century and is represented by a series of brick-built walls representing structures and boundaries extending back from Moor Street. A well was also recorded cutting through one of the earlier Phase Four boundary walls.

One of the walls roughly follows the alignment of the earlier Phase One town-boundary ditch. This, in addition to evidence recorded at Edgbaston Street, demonstrates that an earlier premise of Dr Nigel Baker who has carried out extensive historic town-plan analysis for Birmingham that property boundaries surveyed in the early 18th century had probably not moved significantly since the area was first laid

out for settlement in the medieval period, is correct.

Phase Five is dated to the 20th century and is represented by a brick-built wall along the northeastern limit of Area A which formed part of the Hennebique Building associated with Moor Street station, and by the concrete foundations for the former Ship Ashore public house.

Approximately 500 sherds of well-preserved pottery, including local Deritend ware and imports from Spain, were recovered during the excavation. The recovery of two Roman sherds is important, as Roman pottery was also recovered during the Park Street excavation. The majority belong to Phases One and Two, with the largest group coming from the Phase One town-boundary ditch infill. The presence of wasters and furnace lining suggests production sites close to the core of the historic town, in addition to one identified by the River Rea in Deritend.

With the exception of one undated flint flake, the largely fragmentary small finds assemblage dated to Phases Four and Five. No medieval Phase One or Two small finds were recovered. A small glass assemblage has some potential for comparison with that recovered from the Edgbaston Street and Park Street sites.

The preservation of the animal bone was similarly poor, especially for Phase One. The frequency of horncores was a noticeable feature in Phase One and is in line with the tanning evidence found at the Edgbaston Street, Hartwell Garage and Custard Factory sites.

The potential of the environmental assemblage is limited. Analysis found that coal and charred peat frequently occurred in the Phase One samples and this, along with the presence of hammerscale is significant in the context of domestic and industrial land use within the medieval town, particularly as coal has been found in medieval deposits at Hartwell Garage, to the south, in Digbeth.

3.4 Statement of Potential

The Moor Street site represents an important part of the secondary medieval development of Birmingham and its archaeological potential cannot be emphasised too highly. It lies to the northeast of the key historical sites of the moated manor house, the smaller Parsonage Moat and associated watercourses, together with Edgbaston Street, which was one of the earliest streets to be laid out in the town. Moor Street and Park Street were laid out in the 13th-14th centuries as part of a deliberate enhancement of the town centre and in response to intense pressure on land.

The Moor Street site was the second of a series to be excavated as part of the new BullRing development. Edgbaston Street, the first site to be excavated in 1999, demonstrated extensive survival of medieval settlement and industrial features. Since 1999, evaluation immediately to the east of the Row Market has found small-scale medieval survival between later 19th-century cellaring (Hovey 1999). Subsequent watching briefs have been carried out at The Row Market (Ramsey 2000) and during construction of a new road, The Row. This recorded further survival of the moat ditch (Patrick 2000). Evaluation and excavation of Park Street (BUFAU forthcoming) has been carried out (2001), along with an assessment of a site at Upper Dean Street

(Litherland and Watt 2000). Excavation at St. Martin's Church was recently completed in November 2001 (BUFAU forthcoming). Collectively, these sites will make the most significant contribution to our understanding of Birmingham's historic development since the recording of the moated manor house by Lorna Watts in the early 1970s. The evidence will demonstrate that Birmingham was not only founded in the 12th century but that it rapidly expanded into a thriving trading centre by the 13th century when Moor Street and Park Street were inserted into the town's street plan.

4.0 Assessment

4.1 Stratigraphic data

As described above, the features and deposits on site can be divided into five phases, dating from the 12th century through to the 20th century. All of these features and deposits have been dated either by chronologically-diagnostic artefacts recovered from their fills or by their archaeological stratigraphic relationship. Following completion of the Park Street post-excavation assessment report, Phase One may be sub-divided into the ditch and contemporary features and the infilling of the ditch. No other analysis and definition of the stratigraphic sequence is needed.

4.2 Artefactual data

[NB Iain Ferris writes **Post-excavation assessment of the archaeological data from the Moor Street site was undertaken as a single site assessment and specialists have prepared their reports and recommendations for further work on this basis. However, subsequent to the assessment being completed, it has been decided to study and publish the Moor Street site along with the larger Edgbaston Street site and the Park Street site. An integrated post-excavation programme for all three sites will be produced once all three individual assessment reports have been completed. Specialists, authors and illustrators will then be asked to focus their research programmes to take on board this integrated approach and the need to avoid duplication of research effort. However, for the purposes of this report the specialist task allocations as submitted specifically for Moor Street on its own have been presented.]**

4.2.1 Medieval and Post-Medieval Pottery *by Stephanie Ratkai*

All the pottery was examined macroscopically. The medieval pottery was divided into broad groups, e.g. grey ware (gw), sandy cooking pot (cpj), white ware (ww), buff or iron-poor ware (ip), Deritend ware etc, as in the Edgbaston Street and Park Street assessments. Late medieval early post-medieval pottery was divided between late medieval transitional/early post-medieval wares (lmt), Midland purple ware (mp), Tudor Green type ware (tg) and Cistercian ware (cist). The post-medieval pottery was divided into ware categories e.g. coarseware (cw), blackware (blw), yellow ware (yw), slipware (slpw), English stoneware (estw), tin glazed earthenware (tge) etc. Eighteenth-and-nineteenth-century factory-produced wares were categorised as modern glazed wares (mgw) in the absence/presence tables, apart from white salt-glazed stoneware (wsg) and creamware (crw) 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.

About 500 sherds were recovered. Of these the majority pre-date the 16th century. The pottery was in good condition, consisting mostly of large unabraded sherds. The range of fabrics was similar to that from Edgbaston Street and Park Street. Most of the pottery was from local sources, but there were some regional imports e.g. Boarstall-Brill ware, Oxford type ware and Nettlebed ware. There was also a Spanish tin-glazed earthenware sherd decorated with manganese and copper bands (producing purple and turquoise tones respectively) from (5100) F532.

The largest group of pottery (roughly half the assemblage) came from the infill of ditch F537/F561/F568. The pottery within the ditch fills appeared to be predominantly 13th century. The presence of whiteware, Deritend ware and ?Chilvers Coton C ware indicates that some of the infill dates to the later 13th century and possibly early 14th century. However, there were some curious features in some of the fills. Fill 5150 (F561) contained an overfired rim-neck sherd from a ?Deritend jug, a few other overfired sherds or spalled sherds, a body-base sherd with patchy surface colour and a "semi-wastered" bowl sherd. This type of material was a common component of the ditch infill at Park Street, where it was interpreted as possible kiln waste. Fill 5189 (F568) contained a substantial part of the base and lower half of a jug with a sandy orange fabric, which was somewhat sandier than the usual Deritend fabrics. The strange thing about this vessel was that it was completely covered internally and externally with a thick white slip. Even the external base was slipped, which is extremely unusual. There was no trace of any glaze on the vessel. Does this represent evidence for biscuit firing of vessels? Could this vessel have been broken before it was glazed and fired a second time? Even this interpretation begs several questions, and the dating of the vessel is insecure. Fills 5190 (F568) and 5158 (F561) were composed mainly of reduced ware sherds. A heavily-thumbed handle closely resembled Thetford ware (see Hurst 1957 fig 4.2). This ware dates from the late Saxon period to the early 12th century and, if correctly identified, would be one of the earliest fabrics found in Birmingham. However, it is well outside its normal distribution area which lies in East Anglia and the Fens. Another fill 5158 (F561) contained two small Severn Valley tankard rim sherds, two very coarse unparalleled cooking pot sherds and two early Oxford type sherds. One of the reduced cooking pots from this same fill appeared to be straight-sided, strengthening the argument that some of the fill material is early. A small crucible fragment came from fill 5165 (F561), the only example of metal-working ceramics from the site. The fills were generally free of any pottery of the late medieval or post-medieval period. The only exception to this was fill 5187 (F568) which contained a late oxidized ware sherd and a ?Nettlebed sherd of 15th-16th-century date and 5171, a cleaning layer over the infilled ditch, which contained three post-medieval coarseware sherds and 15 medieval sherds.

There were parts of the same vessel, an unusual corrugated jug (possibly a Nottingham product), in fills 5186 (F568) and 5161 (F561). This is notable for the spread of the fill material, since the two ditch sections were at some distance from each other.

The remainder of the assemblage came mainly from pit fills. The majority of these seemed to be more or less contemporaneous with the ditch fill material. Indeed some

of the pit fills e.g. 5128 (F545), which also contained a small piece of fuel ash slag or furnace lining, 5133 (F551) and 5107 (F534) may have derived from the ditch fill, that is, it may represent disturbance of the underlying ditch layers. Another pit of similar date 5122 (F556) contained a charcoal rich fill (5122) and some badly-burnt sherds from a Deritend jug and a Boarstall-Brill biconical jug decorated with red slip. The biconical jug form has been fairly tightly dated by Mellor (1994) to the late 13th or early 14th century. The pit fill suggests that Boarstall-Brill and Deritend wares were probably in contemporary use.

A small number of pits was of late medieval or post-medieval date. There was no particular pattern to their distribution across the site. The fills of F557 and F530 were of 14th or possibly 15th century date. Fills 5138 (F547), 5182 (F567), 5101 (F530) and 5111 and 5112 (F536), and charcoal layer 5119 dated to the 15th or 16th centuries. All contained late oxidized wares and 5119 also contained a badly-burnt Cistercian ware cup. Fill 5111 contained a waster, possibly derived from the ditch fill. Fill 5115 (F542) contained a Tudor Green type sherd (15th-16th century), the only example of this fabric from the site, although several sherds had been recovered from Park Street. There was little, if any, residual material in the 15th-16th-century contexts. There was a single pit fill 5100 (F532) of ?mid-17th century date, which contained the ?Spanish tin glazed earthenware sherd mentioned above. Pit fill 5203 (F572) was of 17th-century date, as was layer 5200. Layer 5105 appeared to be of 18th-century date, although in keeping with its interpretation as a cultivation soil, only two sherds were present.

Pottery from the well in Trench 8c was spot dated only at assessment stage , and will be included in the next stage of analysis.

Discussion

There was some pottery which could be dated to the 12th century but, as with Edgbaston Street and Park Street most of the pottery seemed to belong to the following two centuries. Nevertheless, the Moor Street assemblage differs from those of the other two sites. There appeared to be a greater quantity of reduced wares. The ditch infill date was broadly similar to that at Park Street. However, there was much more grey ware at Moor Street (and a number of unglazed greyware pitchers - the largest *pro rata* number from the Birmingham sites) and the ditch infilling looked as though it could have taken place a little earlier than at Park Street. Deritend ware is a consistent component at both Park St and Moor St. A number of wasters and misfires appear at both sites but they were more common at Park Street. The evidence from Park Street and Moor Street is enough to be fairly confident that pottery production extended along Digbeth and up to the historic centre of Birmingham.

The question of the ditch is now very interesting. At Park Street, wasters and kiln waste were found in the infill, but in greater quantity than at Moor Street. The question of where exactly the Deritend ware kilns were sited is now of particular interest. It is possible that some of the kilns were located within the park which gives Park Street its name.

There was little evidence of late medieval or post-medieval activity. It was rather better represented within the evaluation trenches but was never as plentiful as at Park Street or Edgbaston Street. The most likely explanation is that this area has been

heavily truncated, since Westley's plan of Birmingham in 1731 shows this area to have been very built up.

4.2.2 Medieval and Post-Medieval Small Finds *by Lynne Bevan and Erica Macey*
With the exception of one prehistoric flint flake, the assemblage is post-medieval in date, with the majority dating mainly to the 19th-20th centuries (Phases Four and Five). Due to the fairly recent dating and largely fragmentary nature of much of the material, only a small proportion of the assemblage is worthy of further research, cataloguing and illustration. The only material groups with any potential for publication are the clay pipes and some of the glass. Recommendations for further work are listed in the relevant sections below.

Flint
Prehistoric finds comprised only one flint flake of indeterminate date (5155).

Stone
One stone roof tile fragment with nail holes (5147) was recovered.

Lead
A fragment of folded lead sheet (5122), a small piece of piping (5134) and an amorphous fragment (unstratified) were recovered.

Copper Alloy
A copper alloy object came from the fill (1502) of well F182 in trench 8c.

Iron
Seven iron nails were recovered, one each from the following contexts: 5105, 5112, 5119 (with mineralised wood attached), 5128, 5130 and 5153.

Glass
Of most interest in the collection was a decorated light red glass base from a possible lamp (5131).

Vessel glass consisted of a light blue base from a medicine bottle (5131), the stem/partial base from a clear wine glass of modern appearance (5131), a complete modern condiment bottle (unstratified), a complete beer bottle (5131) and the shattered remains of at least 48 glass bottles, almost all of which came from a Phase Four well (F546, context 5131) which appears to have been a bottle dump dating to the early 20th century. Bottle glass is listed below by colour.

Clear bottle glass: the bases of ten clear drinks/condiment bottles, some of which had maker's marks, four base fragments, five necks, four neck fragments and 42 body fragments.

Green/brown bottle glass: bases and base fragments from 34 wine or beer bottles, 24 bottle necks and 10 bottle neck fragments and 129 body fragments.

Recommendations
Full cataloguing, illustration and further research is recommended for the decorative red glass base. A summary listing by context only will be required for the bottles and the undiagnostic glass fragments.

Clay Pipe
Nine stem fragments came from the following contexts.

Stems: 5030 (1), 5119 (1 with partial heel), 5130 (1), 5131 (5) and 5200 (1).

No maker's marks or stamps were noted in the small collection.

Recommendations
Only a summary listing by context will be required for the stem fragments.

Miscellaneous Finds
Miscellaneous finds comprised two fragments of plaster (unstratified), one fragment of mortar (5000) and two fragments of oyster shell (5130, 5131).

In addition, small quantities of coal were recovered from the following contexts: 5107, 5112, 5115, 5132 and 5150. The occurrence of coal will be checked against the phasing of these deposits.

No further work will be required on any of this material.

Assessment of Slag *by Erica Macey*
A small assemblage of slag, comprising 92 fragments, weighing 28,693g, was recovered. These fragments were quantified by count and weight and examined macroscopically for the purposes of assessment.

The assemblage consisted mainly of large, sub-rounded fragments of slag, measuring 110 – 150mm in length. A quantity of tap slag was also noted (5107, 5150 x 5, 5155 x 2, 5186). The assemblage was notably smaller than the assemblage at the neighbouring Park Street site (Macey forthcoming). The small size of the assemblage, particularly the amount of tap slag present, does not indicate that large-scale metalworking was taking place on site. Further research by a specialist in the material may determine the likely one-time presence or absence of hearths and furnaces on the site, as well as reveal the origin and quality of the ores in use at the time.

Tile and Brick *by Erica Macey*
A small assemblage of 265 fragments of ceramic tile, weighing 24,398g, was recovered. The tile was counted and weighed by context and then examined macroscopically for the purposes of assessment. The assemblage was largely unabraded, despite its fragmentary condition, and no complete examples were noted.

Macroscopic analysis of the assemblage noted two distinct fabric types. One fabric dominated the assemblage, with the other appearing only sporadically (5105 x 1, 5107

x 1, 5148 x 1, 5150 x 2). Both fabrics appear to have been used to make flat tiles, probably for roofing purposes – a nail hole was noted in one example (5141). A few glazed fragments were also recovered from the site (5113, 5137, 5149, 5150, 5171, 5175, and 5201), all made from Fabric One. Other fragments of minor interest were a fragment showing the maker's fingerprints (5107) and two possible waster fragments (5107 and 5182).

The small and fragmentary nature of the assemblage means that no further work other than a description of the fabrics and a summary listing by context is required for the unglazed material. The glazed examples, however, may be useful for dating purposes and could repay a small amount of further research, possibly in comparison with pottery from the relevant contexts.

4.2.3 Animal Bone *by Emily Murray*

Quantity & phasing
Two boxes of hand-collected animal bones were recovered from excavations at Moor Street. The phased bone, weighing a total of *c.* 7kgs, has being assigned to four phases of activity (Phases One-Four), and one intermediate phase (Phase One/Two), based on the pottery assessment. The majority of the faunal material (70%) dates to the earliest phase (Table 1), followed by material from Phase Two (15%) and Phase One/Two (10%).

State of preservation
The state of preservation overall was extremely poor especially for the Phase One material. The cortices of the post-cranial bones were severely exfoliated which made the identification of certain specimens difficult and, with the exception of the horncores which were not so badly affected, precludes the taking of any reliable measurements. Animal bone from later phases was in a much better state of preservation.

Methods of assessment
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, but were counted as 'measurable' where suitable criteria prevailed (after von den Driesch 1976, 29-31).

All of the stratified animal bone was assessed. The unstratified material was given a cursory examination to note the presence of any unusual species or deposits.

Range and Variety
The range of species represented is cattle, sheep/goat, pig, horse and dog (Table 2) and no bird or fish bones are represented. The main aspect of interest of the assemblage is the frequency of cattle horncores, from short-horned breeds, which dominate the Phase One (12th-14th century) assemblage. The other cattle elements represented were primarily bones of the lower limbs and skull, and, coupled with the frequency of horncores, would suggest that this material represents primary butchery

waste, or possibly waste associated with industrial activities. The other species are only represented by occasional specimens.

Recommendations

It is recommended that only the Phase One material receives further study, the principal aim of this analysis being to recover the metrical data from cattle horncores. Relatively large assemblages of horncores have been recovered from other Birmingham sites, including Edgbaston Street (BRB99) and the Custard Factory (CFB00). The horncores from these sites are principally post-medieval in date. However, the Edgbaston Street excavations produced a small medieval horncore assemblage and the horncores were shown to be significantly different in size and shape from those dating to the later period. It will therefore be of interest to see how the Moor Street assemblage compares with this material. It is also recommended that the rest of the Phase One assemblage is recorded, to see if the impression given that there was a bias towards peripheral elements is in fact the case. The industrial activities represented by the assemblage are probably tanning and hornworking.

The recovery of age/slaughter data for the main domesticates is too limited to provide any meaningful information, while the potential of measurable data is principally confined to cattle horncores (Table 3). The quantity of material from Phases Three and Four is also negligible and includes specimens from modern breeds. The rest of the assemblage is therefore of little archaeological interest and does not require any further analysis.

Phase century	**Phase 1 12th-14th**	**Phase 1/2 12th-16th**	**Phase 2 15th &16th**	**Phase 3 17th &18th**	**Phase 4 mid 18th-late 19th**	Total
Weight	5001	724	1083	86	233	7127
%	**70**	**10**	**15**	**1**	**3**	

Table 1 MSBOO: Distribution of animal bone by phase (g).

Phase	**Cattle**	**Sheep/goat**	**Pig**	**Other mammals**	**Total**	**%**	**Notes**
1	15	7	1	2	25	**47**	horse, dog*
½	5	-	-	1	6	**11**	horse
2	9	3	1	3	16	**30**	horse, dog
3	-	1	1	-	2	**4**	-
4	-	3	1	-	4	**8**	-
Total	**29**	**14**	**4**	**6**	**53**		
%	**55**	**26**	**8**	**11**			

Table 2 MSBOO No. of countable specimens (hand-collected) by phase. The species listed in the 'comments' column are those inferred by the 'other mammals' column.
* represented by 'non- countable' specimens.

Phase	AgeableMandibles				Measurable elements				
	Cattle	Sheep/goat	pig	total	Cattle	sheep/goat	pig	other mammals	total
1/2	1	3	-	4	24	1	1	2	28
	1	-	-	1	3	-	1	1	5
	-	-	-	-	2	1	-	1	4
	-	1	-	1	-	1	-	-	1
	-	-	-	-	-	-	-	-	-
Total	2	4		6	29	3	2	4	38

Table 3 MSBOO. Number of 'ageable mandible' elements. Mandibles are considered ageable where there are two or more teeth present with recordable wear stages in the dP4/P4-M3 row.

4.2.4 The Plant Remains *by Marina Ciaraldi*

During the excavation at Moor Street, a total of 22 soil samples was collected by the excavator from various pits, ditches and a well. Five phases were identified. However, the samples examined here belong exclusively to Phase One (12th – 13th and 14th century) and Phase Two (15th and 16th century). Twelve samples were processed in order to assess the preservation of the plant remains.

Recent archaeological investigations in the area of the Bull Ring have uncovered evidence of industrial activities during the medieval and post-medieval periods (Litherland and Mould 1995; Mould 2001; Burrows forthcoming). Preliminary assessments of the biological remains have shown that tanning and hemp retting (Litherland and Mould 1995; Ciaraldi 2000; Ciaraldi forthcoming; Hall forthcoming), as well as metalworking, were carried out during the medieval and post-medieval periods.

The research questions addressed with this assessment draw largely on preliminary evidence and aimed at establishing:

1. the nature of occupation during the medieval and post-medieval periods, particularly in respect to the presence of industrial processing, and domestic or agricultural activities.
2. the potential for reconstructing the environment surrounding the site during its occupation.

Methodology

The soil samples were processed by bucket flotation. The flot was recovered on a 0.5 mm. Mesh, while the residue was recovered on a 1mm. mesh. The residue was left to dry, and was quickly sorted and scanned with a magnet, in order to recover hammerscale. The flots were scanned under a low-power microscope. Plant remains were identified without the use of a reference collection and therefore the identifications have to be taken with caution.

In the case of samples F337/5129 and F545/5128 a 2-litres sub-sample was wet sieved, for the purpose of observing the presence of coal.

Discussion

All the samples examined had a silty-sandy matrix, with the exception of sample F182/1502, collected from a well, which had a sandy-clay sediment. Plant remains were preserved mainly by charring, although modern or waterlogged elder seeds (*Sambucus nigra* L.) were present in a few cases (Table 4). Only one waterlogged sample was recovered, from ditch F568/5188.

The samples were mainly formed by what appears to be burnt fuel. All the samples contained coal (with the exception of sample F537/5129) and charred peat, and, in a few cases, charcoal was also present (see Table 4). Charred seeds were found only sporadically in some of the samples, the only exception being sample F568/5184 where cereal grains and seeds were abundant. The plant assemblage from this sample included some weed species (e.g. *Anthemis* sp.), as well as grassland species (e.g. *Plantago lanceolata* L.), suggesting that it might represent charred hay rather than crop-processing waste. The waterlogged sample F568/5188 contained species already observed in similar waterlogged contexts from ditches found in other excavations in this area of Birmingham (Ciaraldi forthcoming), The plant assemblage included mainly plants from disturbed grounds (e.g. common nettle (*Urtica dioica* L.) and *Solanum* sp.). Finally some hammerscales were found in samples F568/5184 and F551/5133.

Recommendation for further work

The result of the assessment shows that the potential of the plant assemblage from Moor Street is not great, as it can only provide limited information on the activities that took place on site. Some of the samples seem to contain mainly wood charcoal, while others contain mainly coal, a situation that could reflect a difference in the type of occupation (e.g. domestic versus industrial). It will be important to interpret this aspect in conjunction with the rest of the archaeological evidence from the same contexts. It is recommended that the plant assemblages from samples F568/5184 and F568/5188 are fully analysed, as these might provide some information, however limited, on site activities, particularly relative to the presence of animals on site (sample F568/5184) and hemp retting (F568/5188). It is suggested that the remaining sub-sample of F568/5184 is fully processed and that a small sub-sample (500 ml) of sample F568/5188 is wet sieved on a 0.3mm mesh and fully sorted and identified. No processing of the remaining samples is required. The waterlogged sample (F568/5188) has the potential for the preservation of pollen and/or insect remains. This sample will be looked at with regard to these aspects.

Feature	SU	Feature type	Phase	Volume processed	Flot vol (% assess.)	Notes
F537	5129		1	2	-	Sample wet- sieved. No coal
F545	5128	pit	1	2	-	Sample wet-sieved. some coal and charcoal
F561	5150	ditch	1	5	10 (100%)	Burnt peat. Residue: coal
F561	5155	ditch	1	10	100 (50%)	Burnt peat and some charcoal and coal. Residue: large pieces of coal
F561	5158	ditch	1	10	100 (50%)	Burnt peat and a few fragments of coal. Waterlogged *Sambucus* sp. seeds, *Vicia/Lathyrus* (ch). Residue: large pieces of coal and 1 tooth
F568	5184	ditch	1	5	60 (50%)	Oats, bread wheat, barley, *Anthemis cotula*, Labiatae, Compositae, *Chenopodium* sp., *Plantago major*. Residue: charcoal and a few **hammerscales**
F568	5188	ditch	1	10	50ml (100%)	**Waterlogged sample**. Contains seeds of *Sambucus* sp., *Rubus* sp., *Lychnis* sp., *Solanum* sp., *Ranunculus* sp., Labiatae, *Urtica dioica*, *Conium* sp.. Residue: coal and charcoal
F551	5133	pit	1	5	10 (100%)	Barley, *Vicia/Lathyrus*. Residue: coal and a few **hammerscales**
F556	5122	pit	1	10	200 (50%)	Bread wheat, Cyperaceae. Lots of large pieces of charcoal and a few fragments of burnt peat. Residue: coal and a few fragments of burnt bones
F182	1502	well	1	10	90 (50%)	Burnt peat, *Vicia/Lathyrus*. Residue: coal
F530	5177	pit	2	5	20 (100%)	Coal and charcoal, *Pisum sativum*. Residue: coal
F567	5182	pit	2	10	70 (30%)	Burnt peat. Waterlogged *Sambucus* sp. seeds. Residue: coal

Table 4: List of soil samples assessed for plant remains

5.0 Updated Project Design

5.1 Introduction

The excavated evidence has demonstrated the survival of a sequence of domestic and some industrial activity at Moor Street primarily dating to the 12th-14th centuries. Further domestic activity was recorded for the 15th-19th centuries.

5.2 Updated Research Aims

This site offers a good opportunity to study a sequence of activity from the 12th century onwards. The information gained from this site will complement and enhance understanding of excavation sites elsewhere within the city centre.

It should be possible – by means of comparison with published and unpublished sites within the immediate locality and within the broader regional sphere – 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.
- determine the character, development and chronology of the archaeological remains.
- place evidence of pottery production within its local and regional context.
- contribute to the understanding of industrial activity within medieval and post-medieval Birmingham, with particular reference to other sites of similar date recently excavated within the city.
- reconsider the role of industry in the city, in both the medieval and post-medieval periods.

6.0 Publication Synopsis

[NB Iain Ferris writes **Post-excavation assessment of the archaeological data from the Moor Street site was undertaken as a single site assessment, and specialists have prepared their reports and recommendations for further work on this basis. However, subsequent to the assessment being completed, it has been decided to study and publish the Moor Street site along with the larger Edgbaston Street site and the Park Street site. An integrated post-excavation programme for all three sites will be produced once all three individual assessment reports have been completed. Specialists, authors and illustrators will then be asked to focus their research programmes to take on board this integrated approach and the need to avoid duplication of research effort. However, for the purposes of this report the specialist task allocations as submitted specifically for Moor Street on its own have been presented.]**

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

<u>(Moor Street Site Only)</u>
by Bob Burrows, Catharine Mould and Eleanor Ramsey
with contributions by Lynne Bevan, Marina Ciaraldi, Erica Macey, Emily Murray and Stephanie Ratkai and specialist notes by Justine Bayley, Alejandra Guttierez, Gerry Mc Donnell and David Williams.
illustrations by Nigel Dodds

Text
Summary (250 words).
Introduction by Catharine Mould (500 words). 1 figure.
Aims and Method. The site and its context (500 words). 2 plates.
Results by Bob Burrows, Catharine Mould and Eleanor Ramsey (2500 words). 7 figures, 5 plates 1 table.
Description and interpretation of the evidence by phase.
Finds.
Pottery by Stephanie Ratkai (3500 words). 2 figures, 1 table.
Small Finds by Lynne Bevan and Erica Macey (750 words). 1 figure.
Environmental Material.
Animal Bone by Emily Murray (1200 words). 5 tables.
Plant Remains by Marina Ciaraldi (750 words) 2 tables
Discussion and conclusions by Catharine Mould (2000 words).

Figures

1 Location plan
2 Plan of all excavated features
3 Phase 1 plan
4 Phase 2 plan
5 Phase 3 plan
6 Phase 4 plan
7 Phase 5 plan
8 Feature profiles
9 Pottery
10 Pottery
11 Small Finds

TOTAL 12,000 words; 9 tables; 11 figures, 7 plates.

7.0 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.

1) Stratigraphic Analysis
No further analysis of the site records is needed.

2) Pottery

Aims/proposals
The pottery from Moor Street contributes further to the understanding of the growth of Birmingham in the medieval period. Several factors contribute to its importance.

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

Recording/Quantification
All the pottery from contexts pre-dating the 19th 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.

Dating/chronology
The pottery should be compared with the assemblages from Edgbaston Street and Park Street, with a view to a better understanding of the growth and topography of Birmingham in the medieval period.

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. It is recommended that the Spanish tin glazed earthenware sherd is examined by a relevant expert (Alejandra Guttierez, University of Durham). It is also recommended that a small number of thin sections is undertaken by Dr David Williams on the possible Thetford ware handle, the two unidentified sherds from 5158 (F561) and on two or three reduced ware sherds, to see if they were produced in Birmingham.

Status/function
The small assemblage size precludes detailed study of possible status and function analysis. However, the crucible fragment from within the ditch fill 5165 (F561) should undergo scientific analysis, since its form and date are considerably earlier than the crucibles from Park Street. The pottery should be examined to see if there is any correlation between industrial activity and vessel form. These data could then be usefully compared with data from Edgbaston Street and Park Street, to see if any patterns emerge.

Taphonomy
The small assemblage size is not suitable for detailed taphonomic examination.

The pottery assemblage comprises:- 2 boxes of pottery, approx 500 medieval or post-medieval sherds

Tasks		days
1	Sort medieval pottery into fabric groups, process, record etc;	3.5
2	Data entry	0.5
3	Analysis/manipulation of data	0.5
4	Research	1.0
5	Write report	3.0
6	Edits/proofing	0.5
7	Sort pottery for drawing	0.25
8	Check drawings (No of drawings required - c. 20-25)	0.25
9	Admin/liaison	0.5

Total	10 days

(Stephanie Ratkai)

Additional specialist work

Thin sections
To be undertaken by Dr D.Williams, University of Southampton
Thin section coarse unidentified pot from ditch fill
Thin section on ?Thetford ware handle
Thin sections on a sample of reduced ware sherds (including RS01).

Analysis of crucible
To be undertaken by Dr Justine Bayley (English Heritage)

3) Small Finds

Task	Number of days
Research, cataloguing/listing and report compilation:	2 days (LB)
Illustration and mounting:	0.5 day
Slag: Scientific analysis and preparation of report	0.5 day (G. McDonnell)
Brick: Research:	1 day (EM)

4) Animal Bone

Task	Number of days
Quantification of analysis of Phase 1, hand-collected assemblage	1.5
Total	1.5

(TBA)

5) Plant Remains

Task	Number of days
Processing of 2 samples	0.5 day
Sorting and identification of 2 samples	1.5 days
Writing up of report	1 day
Total number of days	3 days (MC)

+ Pollen (J. Greig), insect (D. Smith) work on sample from F568

6) Preparation of drawing roughs (C. Mould 0.25 days)

7) Preparation of illustrations (N. Dodds 3 days)

8) Preparation of first draft of introduction and results (C. Mould 1 days)

MONITORING POINT (1) ****
Preparation of results text and first draft of specialist reports (C. Mould 0.5 day)
Background historical research (S. Litherland)
9) Editing/correction to specialist reports (I. Ferris).

10) Preparation of first draft of discussion. (C. Mould 1.5 days).

11) Editing of first draft (BUFAU) (I. Ferris 0.25 day).

12) Corrections to first draft (C. Mould 0.25 days).

13) Corrections to illustrations (N. Dodds 0.25 days).

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

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

15) Preparation of excavation and research archives (K. Muldoon 0.25 day).

16) Final corrections to text/illustrations (C. Mould 0.25 day).

17) Submission of text to Oxbow (I. Ferris 0.25 day).

18) Corrections to text/proofs (I. Ferris).

19) Deposition of archive (K. Muldoon 0.25 day).

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9.0 Acknowledgements

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The project was monitored by Dr Michael Hodder for Birmingham City Council. This report was edited by Iain Ferris. The illustrations were prepared by Nigel Dodds.

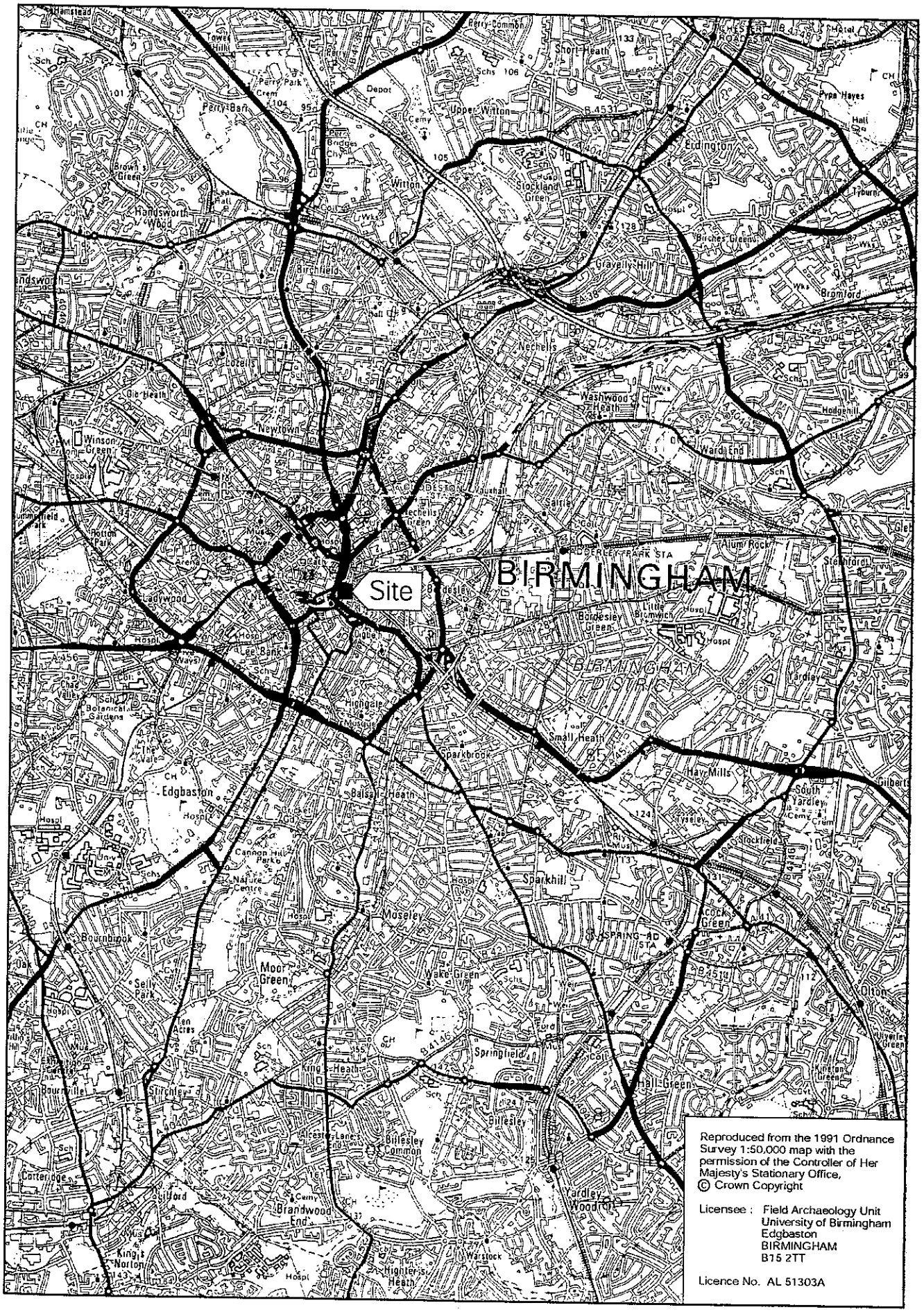
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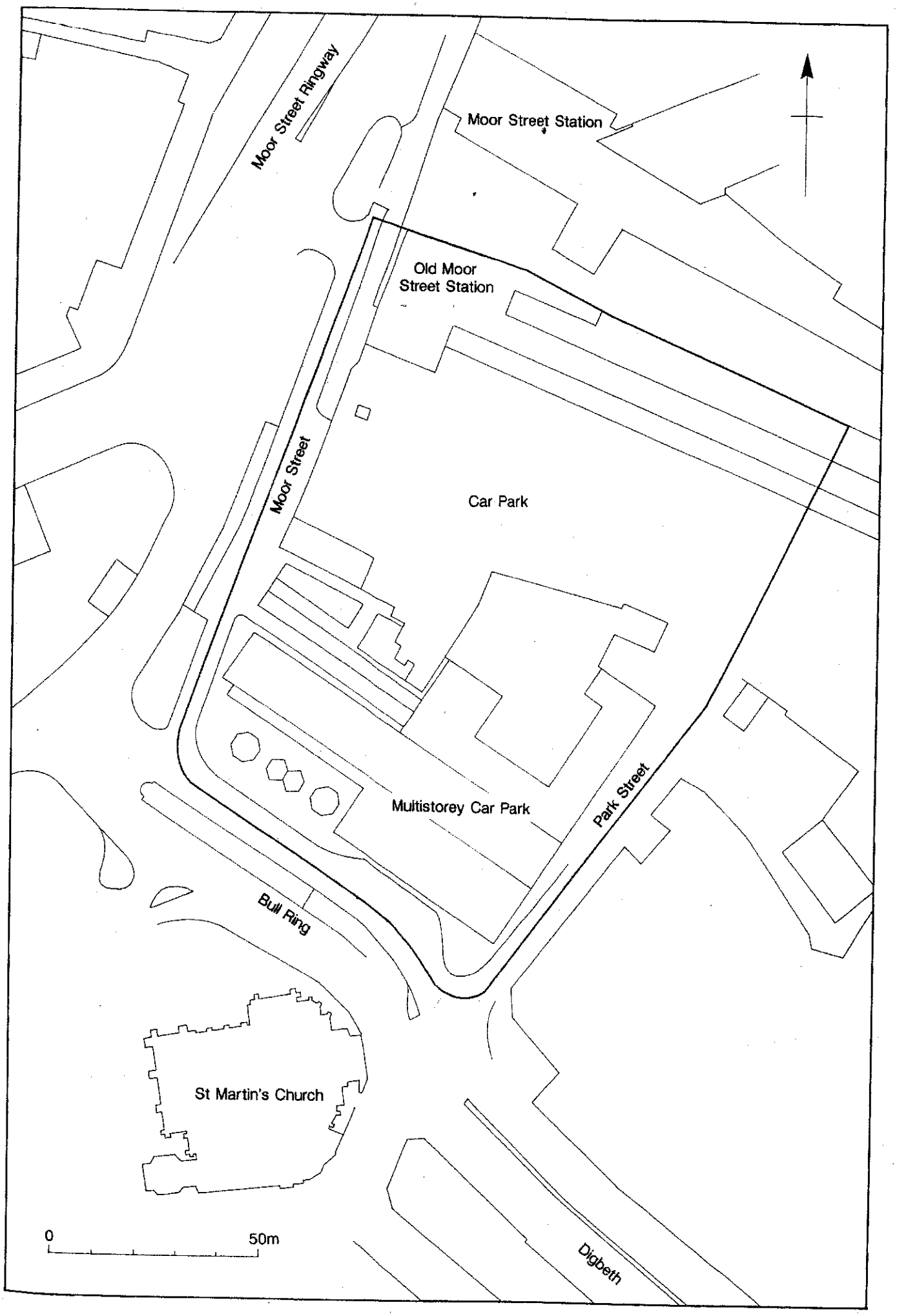
Fig.1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Bull Ring
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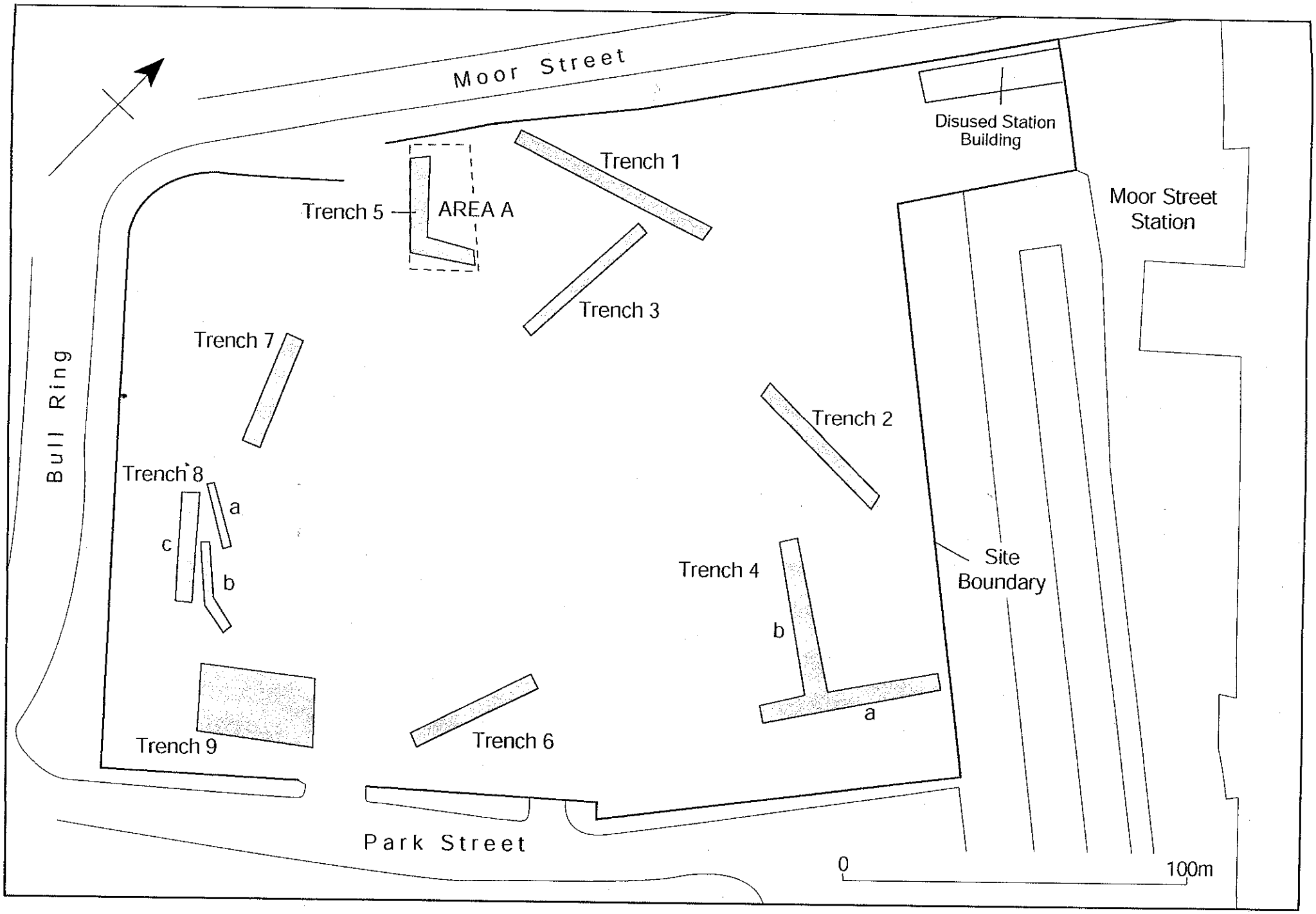
Digbeth

Fig.2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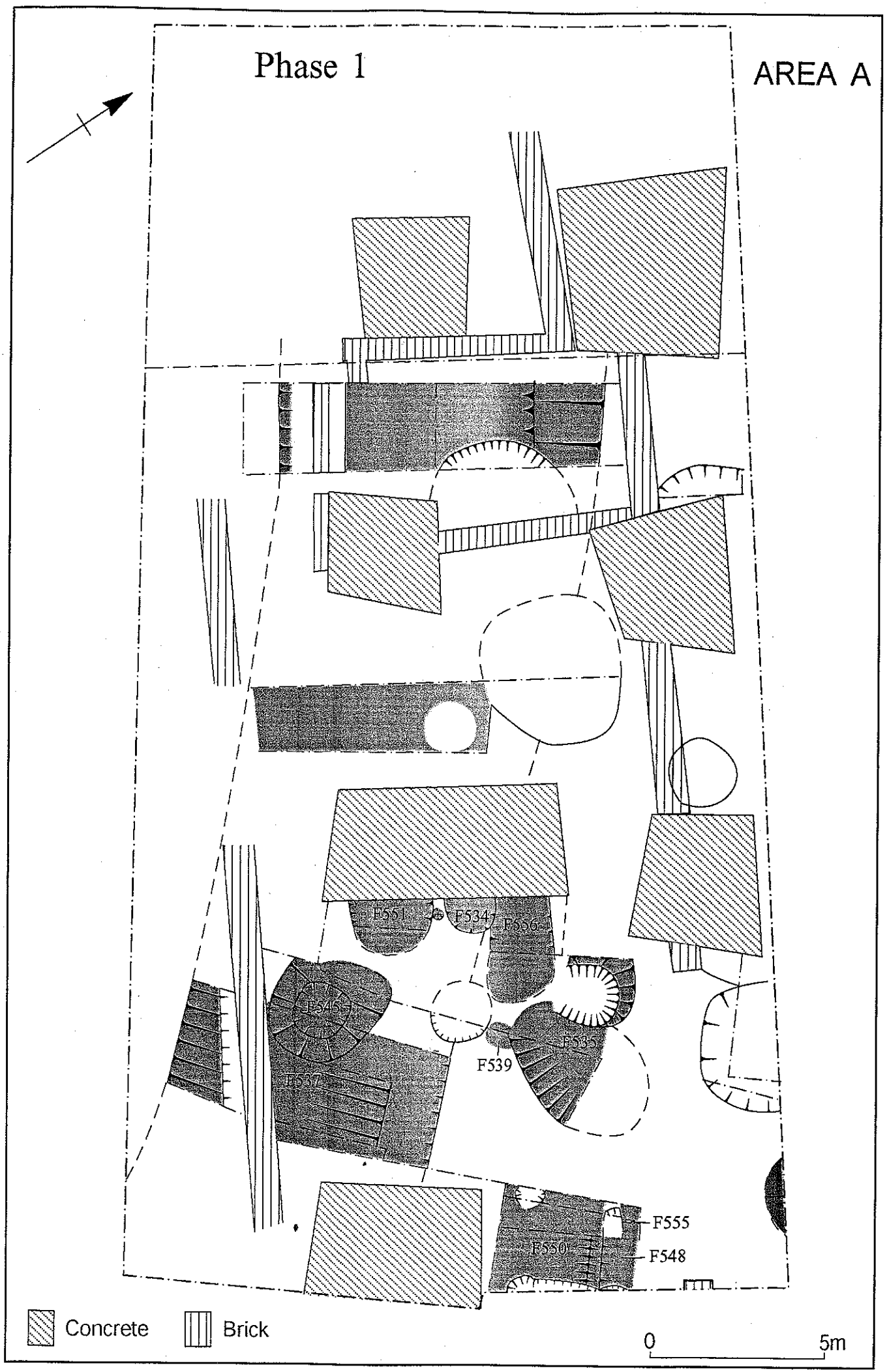
Disused Station Building
Trench 1
Trench 5
AREA A
Trench 3
Moor Street Station
Trench 7
Bull Ring
Trench 2
Trench 8
a
c
b
Trench 4
Site Boundary
b
a
Trench 9
Trench 6
Park Street
0
100m

Fig.3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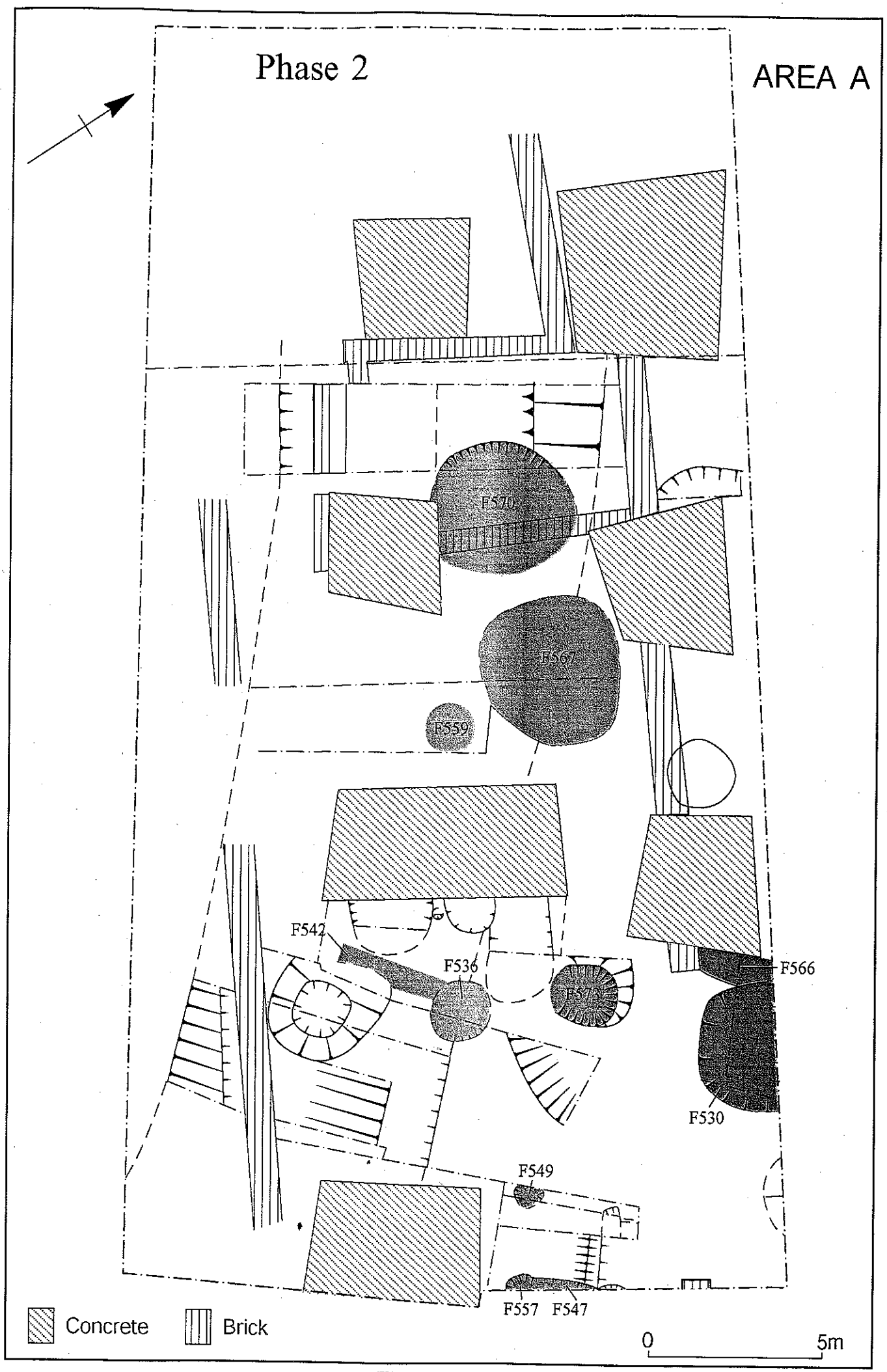
AREA A
F551
F534?
F556
F545
F537
F539
F535
F555
F550
F548
Concrete
Brick
0
5m

Fig. 4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F542
F536
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F566
F530
F549
F557
F547
Concrete
Brick
0
5m

Fig. 5

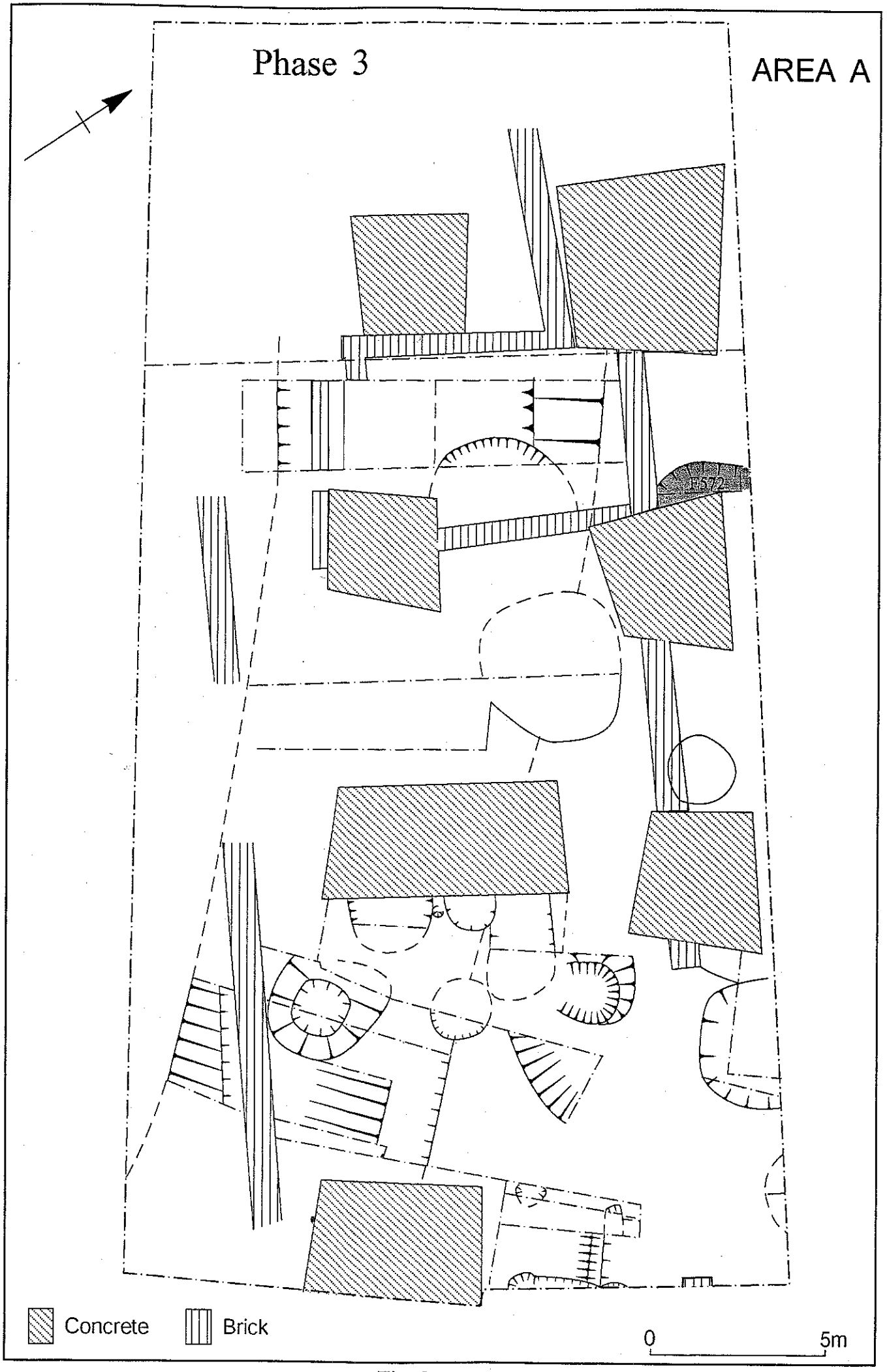


Fig.6

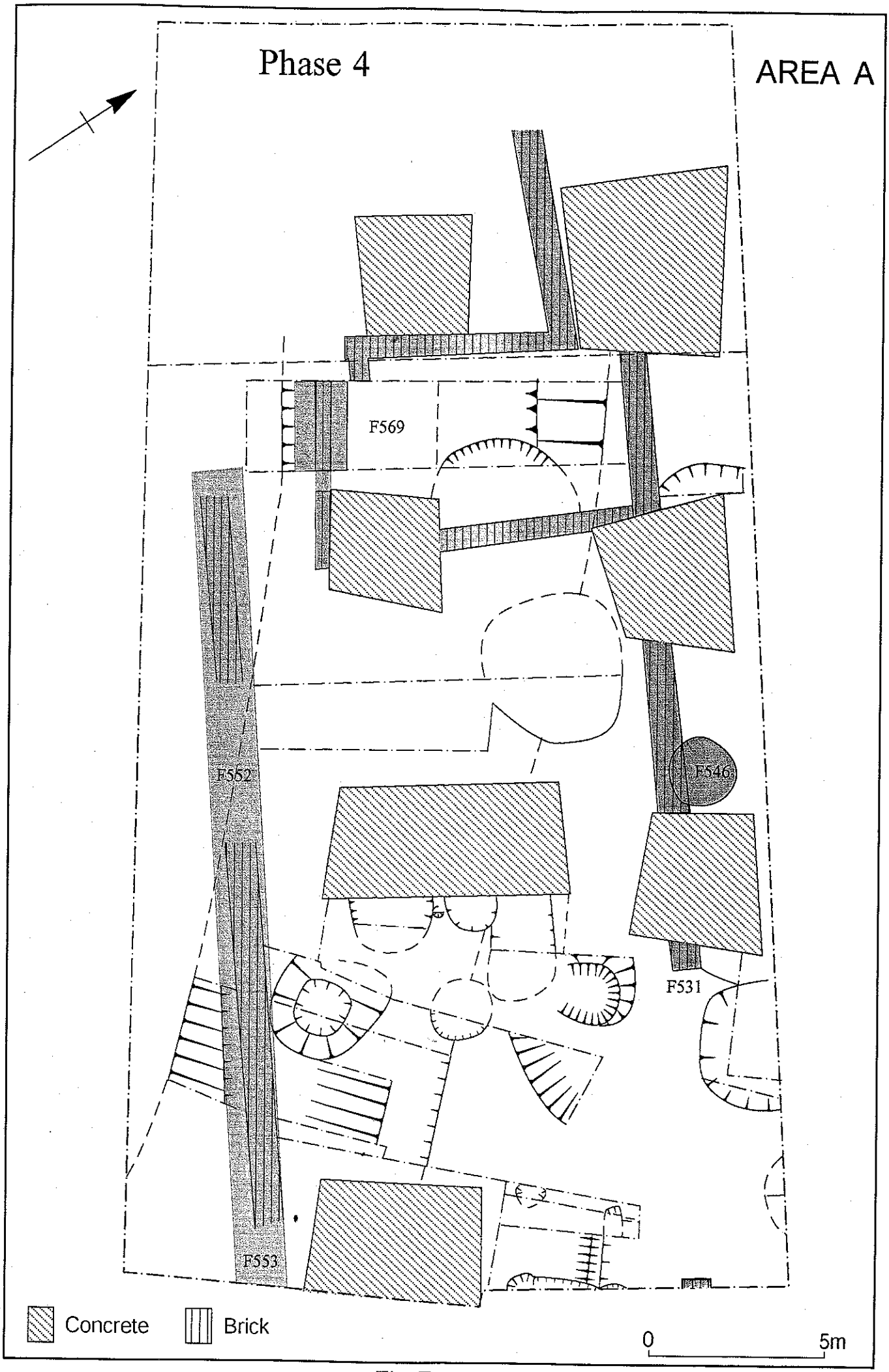


Fig. 7

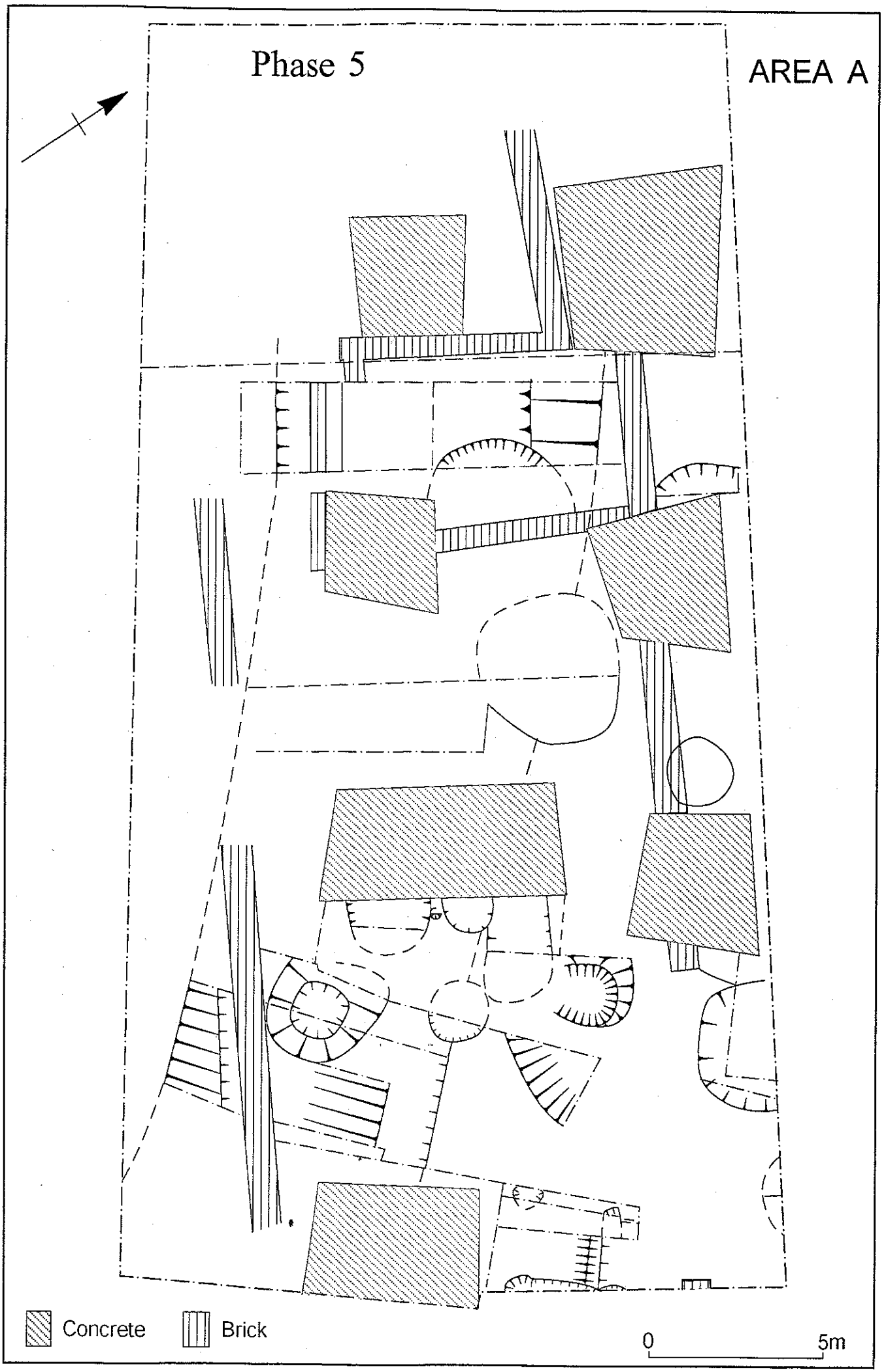
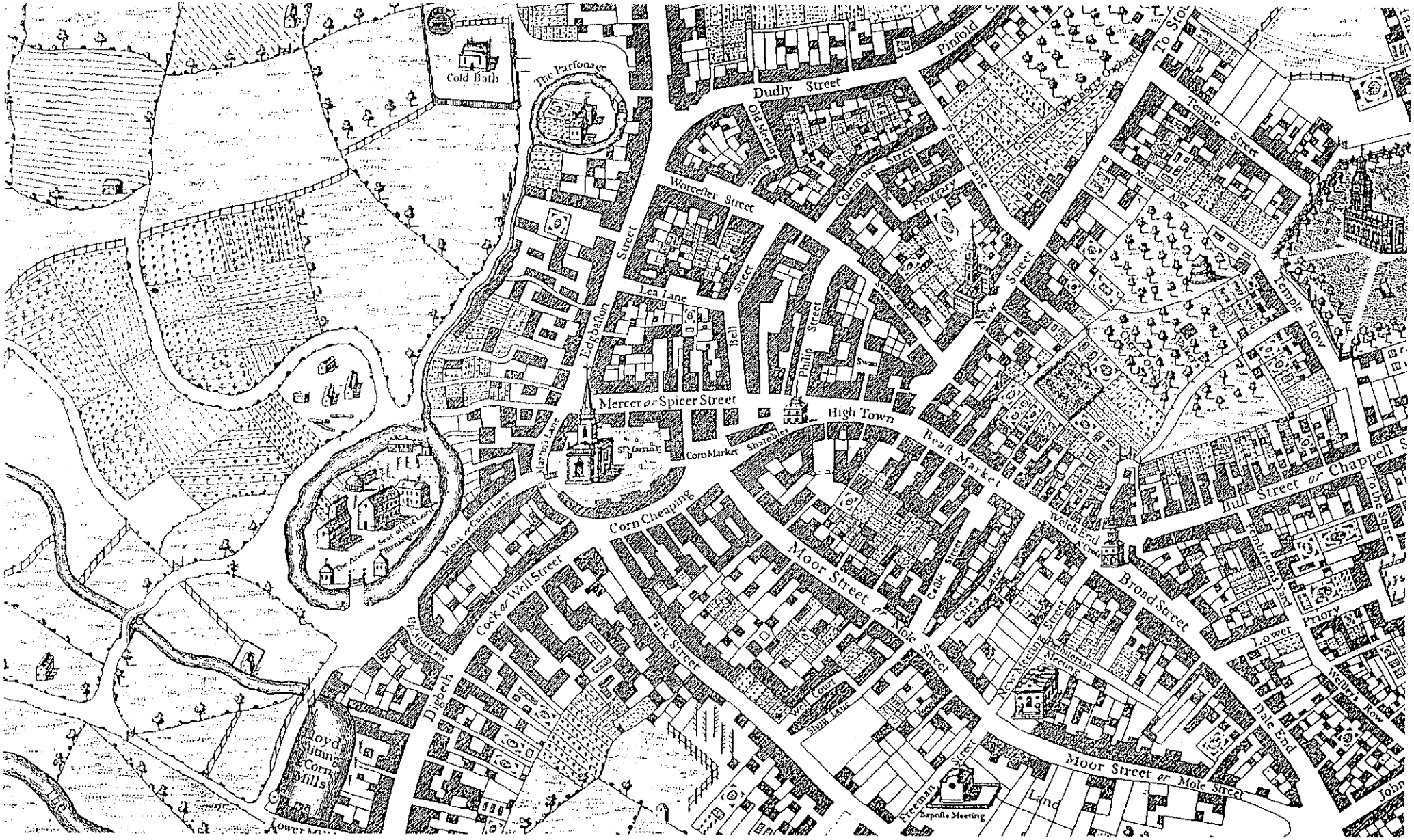
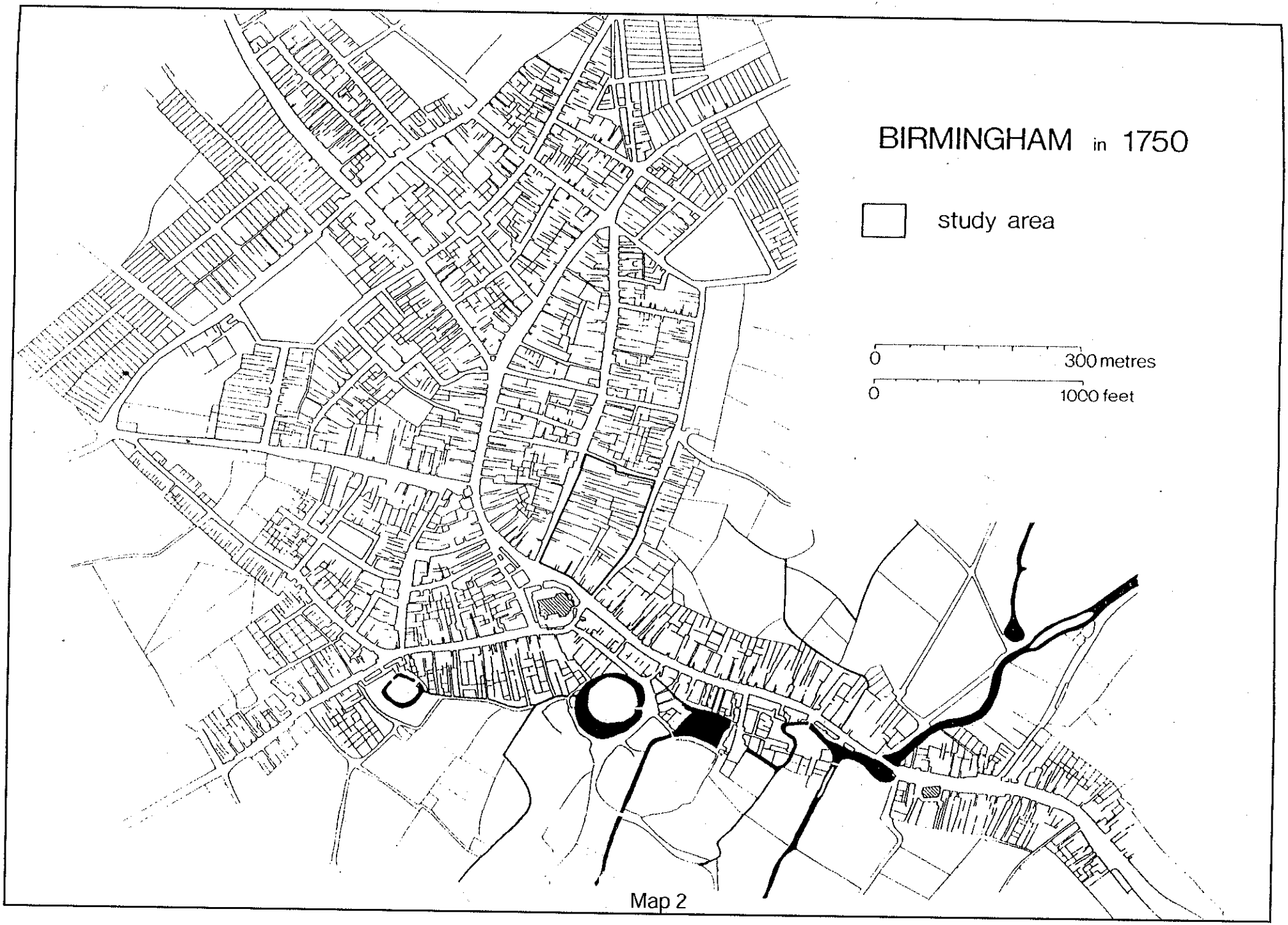


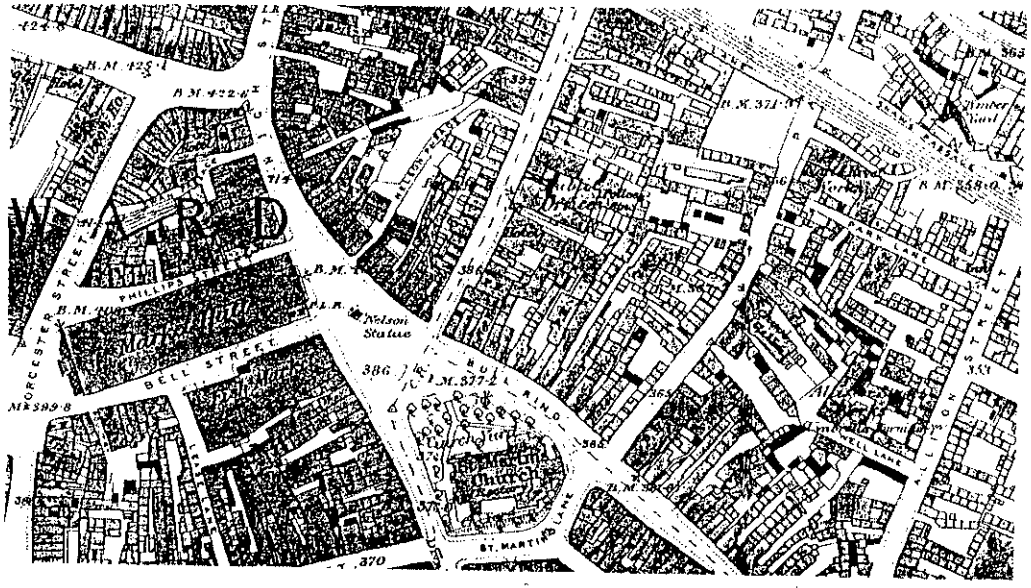
Fig. 8



Map 1 **Westley, 1731**



Map 2



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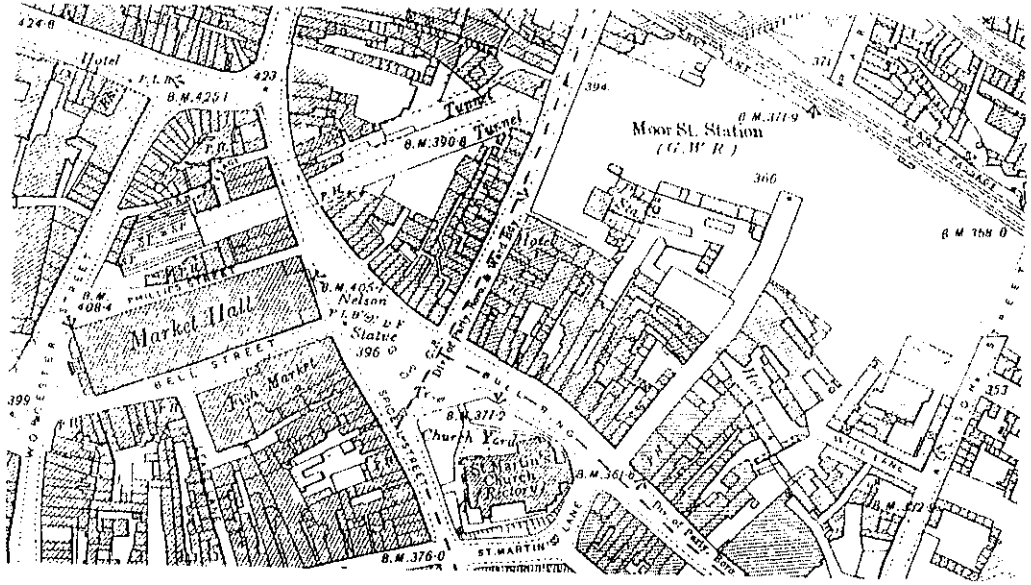

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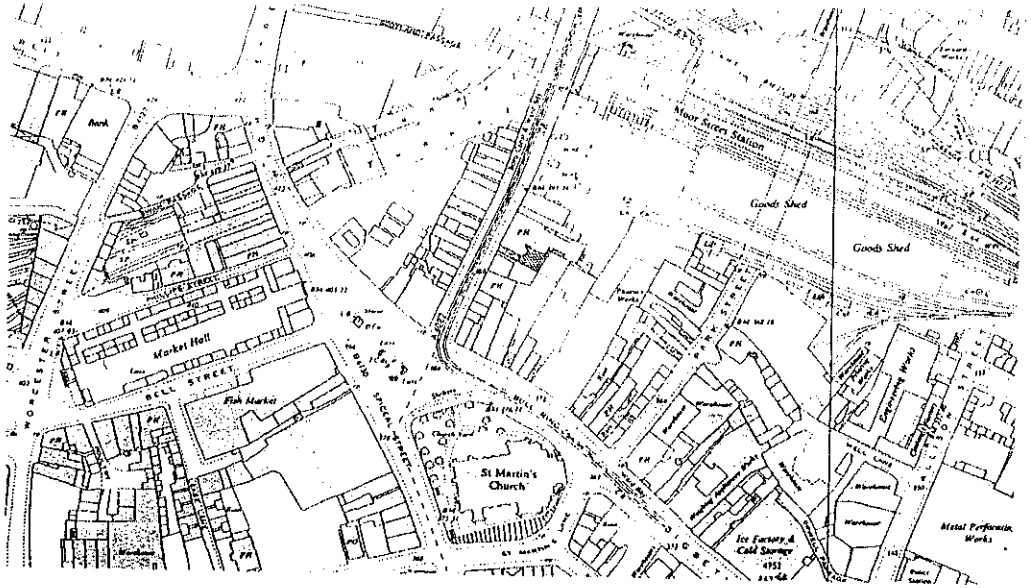
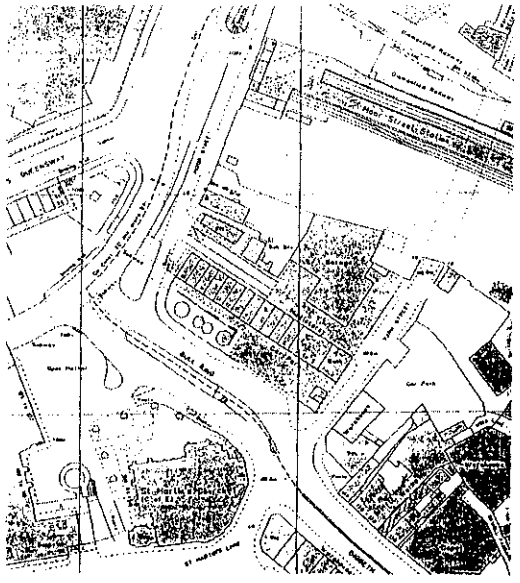


1952



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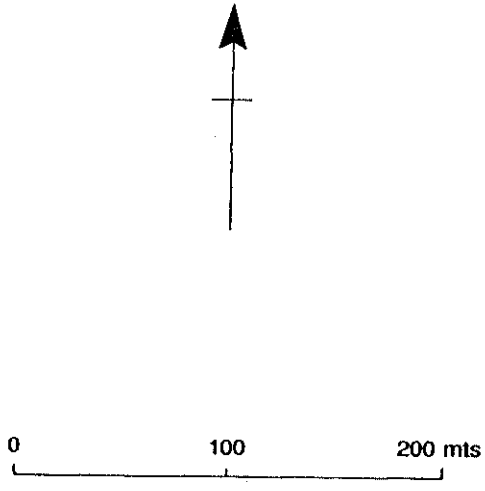

Map 3

Plate 1

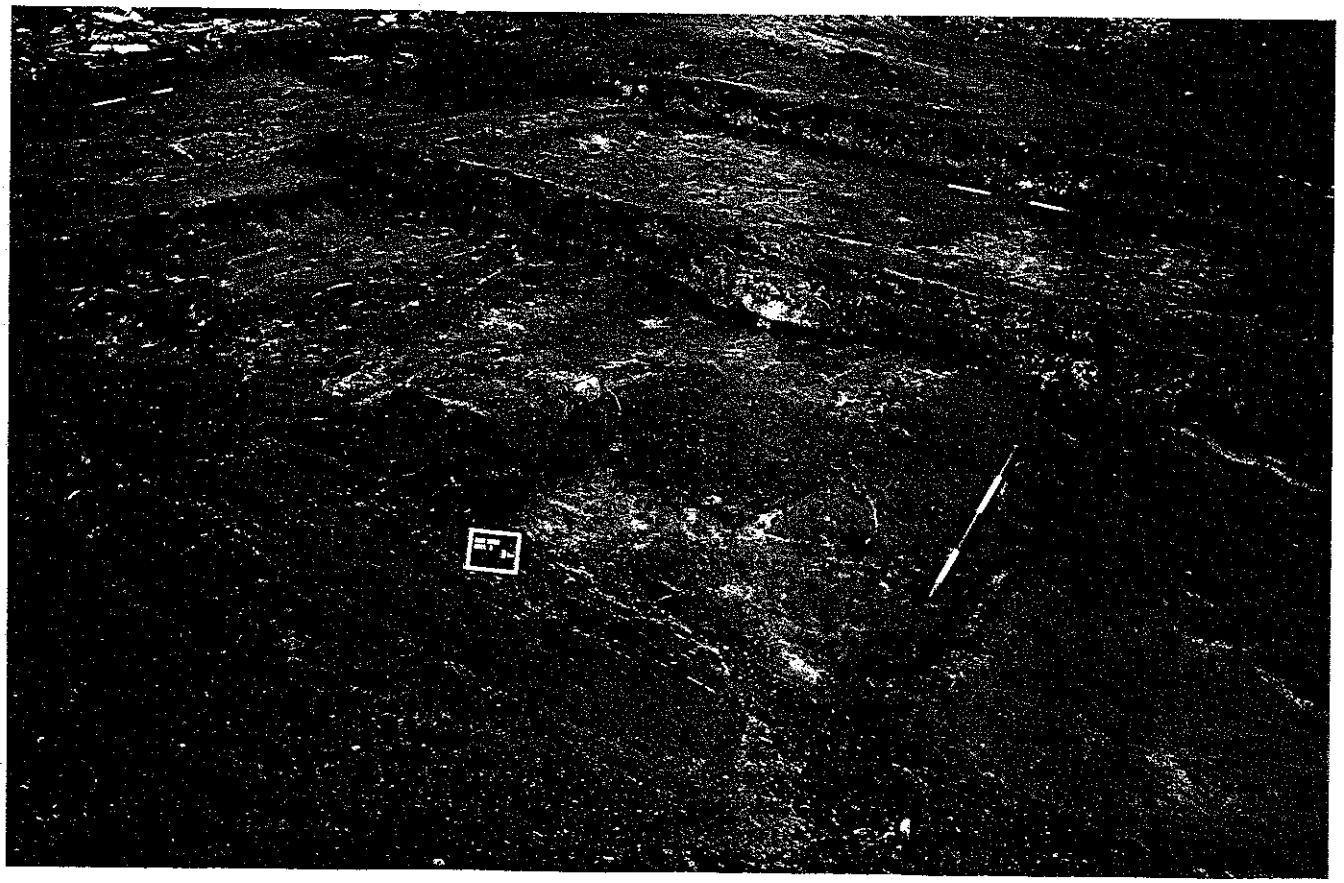

Plate 2

Plate 3

Plate 4

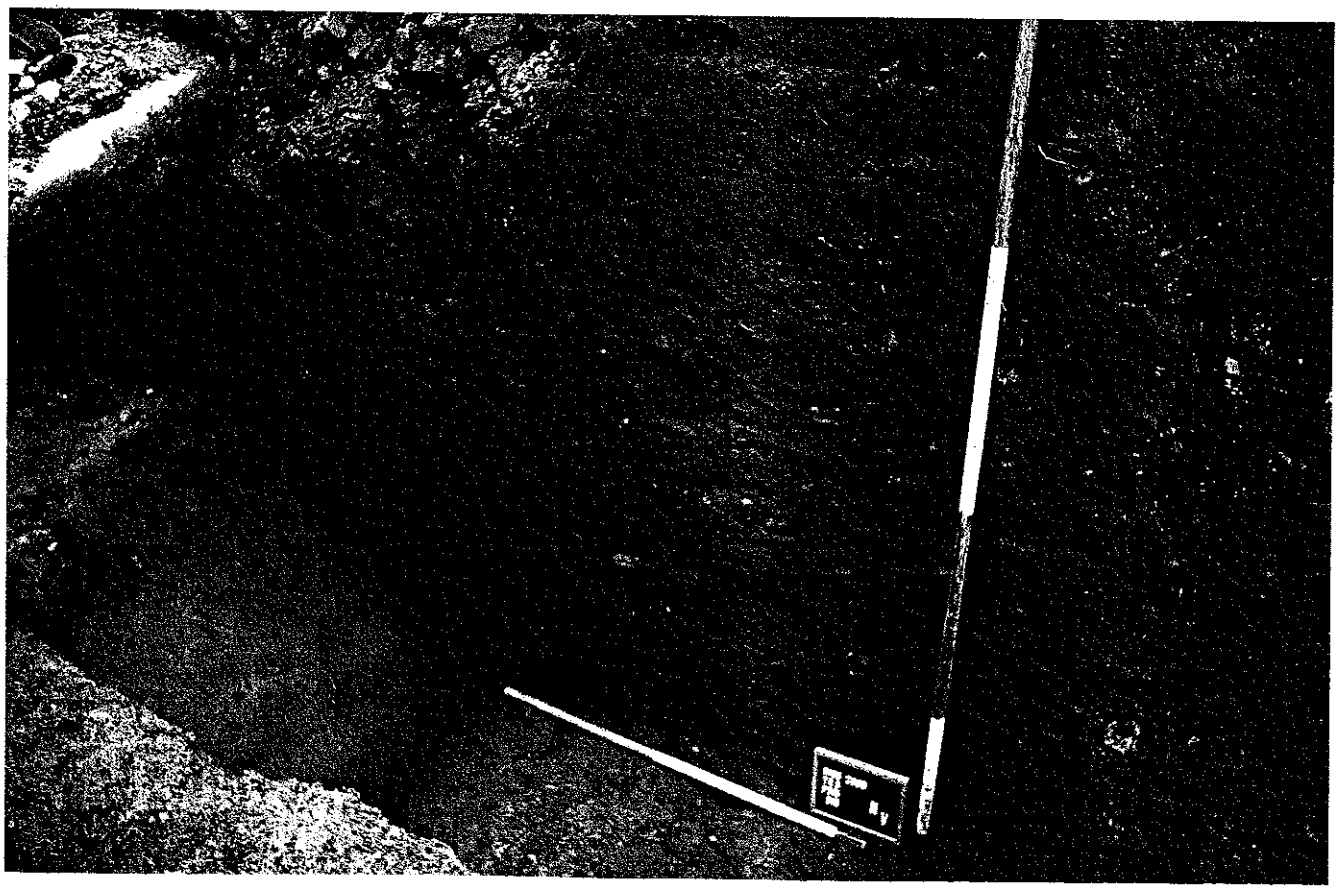

Plate 5