

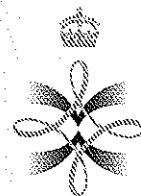


THE UNIVERSITY  
OF BIRMINGHAM

**The Row  
Birmingham City Centre  
West Midlands**

**An Archaeological Watching  
Brief  
2000**

*Birmingham University Field Archaeology Unit*



THE QUEEN'S  
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**The Row, Birmingham City Centre, West Midlands**  
**An Archaeological Watching Brief**  
**2000**

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# The Row, Birmingham City Centre, West Midlands

## An Archaeological Watching Brief 2000

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## **The Row, Birmingham City Centre, West Midlands**

### **An Archaeological Watching Brief 2000**

#### **1.0: Summary**

*This report outlines the findings of an archaeological watching brief carried out during the construction of The Row, Birmingham City Centre, West Midlands (NGR SP 0738 8645). The watching brief identified a substantial ditch that represented the northern edge of the medieval moat that once surrounded Birmingham's manorial site. Pottery recovered from the lower fills of the moat was dated to the 12<sup>th</sup> or 13<sup>th</sup> centuries. Samples of the fills were taken for waterlogged plant and pollen analysis. These added to our understanding of the formation of the environment that once surrounded the site and provided interesting comparative material for an assessment on another part of the moated site carried out twenty years earlier.*

#### **2.0: Introduction**

This report outlines the results of an archaeological watching brief carried out during groundworks associated with the construction of The Row road between Upper Dean Street and Moat Lane, Birmingham City Centre (Fig. 1, NGR SP 0738 8645).

Birmingham University Field Archaeology Unit undertook the work between 6th-31st March 2000 on behalf of Hammerson UK Properties Plc, following a brief prepared by Dr Mike Hodder Planning Archaeologist for Birmingham City Council. The watching brief was required as part of the planning permission (Application No. C/04453/96/FUL) granted by Birmingham City Council. The watching brief followed the guidelines set down in the *Standards and Guidance for Archaeological Watching Briefs* (Institute of Field Archaeologists 1999).

The line of 'The Row' cuts across the northwestern side of the moat that surrounded Birmingham's medieval manor house. The site and the extent of the moat are known from early maps, and parts of the western and southern sides of the moat and the buildings enclosed by it were exposed and recorded during construction of the wholesale markets in the 1970s.

#### **3.0: The Site Location (Fig. 1)**

The Row is located in Birmingham City Centre. It runs approximately east to west from Moat Lane to Upper Dean Street and follows the line of an earlier access to the Rag Market. The site is bordered to the north by the Open Markets and to the south by the Wholesale Market.

#### 4.0: Geology and Topography

Medieval Birmingham developed on a sandstone ridge about 1.2km wide. This ridge is part of the Birmingham Plateau, a geographical zone consisting of mainly Triassic rocks covered with glacial clays and gravels. The site of the Birmingham Moat is on an eastward-facing slope overlooking the lower lying, and wet, marl lined valley of the River Rea, (VCH 1964). The geology of the area around the moat is complex because it is crossed by the Birmingham Fault, a geological feature that occurs where the Keuper marl on the east and south-east has been let down. This is reflected in the steep slope from the Bull Ring down to Digbeth and the River Rea.

#### 5.0: Historical Background

The approximate location of Birmingham's moated site is known. Several maps from the 18<sup>th</sup> and 19<sup>th</sup> centuries show plans of the site and today street names like Moat Lane perpetuate its memory. Birmingham's Moat, along with its neighbour the Parsonage Moat, were two of thousands of similar earthworks constructed throughout England. The English Heritage Monument Protection Programme defines a moat as:

*'A wide, water-filled ditch, partly or completely enclosing one or more islands of dry ground which provided the site for one or more buildings (domestic, religious or agricultural), or for horticulture, or for both. Moats may be situated in open countryside or within rural settlements, but specifically excluded from the class of here called moats are the water-filled ditches around castles, mottes, ring-works, and towns. Moats represent a class of field monument whose function was similar to other classes of monument of rather different form.'*

The manor at Birmingham was first mentioned in the Domesday Book of 1086, when Birmingham was one of several settlements within the boundaries of the present city. It was situated on the edge of Arden; a wooded area of northern Warwickshire that had remained unpopulated until the late 11<sup>th</sup> century. The early pattern of medieval settlement in Arden was dominated by pioneer settlements of small manors and moated homesteads. The Domesday survey does not record the name of the lord at the time, but by the late 11<sup>th</sup> century the tenant was known as William de Birmingham, the family having adopted the name of the settlement. Moats tended to be the homes of the lower ranks of the medieval aristocracy imitating the residences of their social superiors which in the case of the de Birmingham family, were the feudal overlords of Dudley Castle. The two hundred years following the Domesday book was a period of massive population growth in the region. The population of Warwickshire is thought to have doubled by 1300. By this time Birmingham had grown to become one of a network of market centres distributing provisions and other goods. The first market charter was granted to Peter de Birmingham, son of William in 1166 and signaled the beginning of the gradual urbanisation of the settlement (Watts 1980). The charter refers to the market being held in the '*castrum*' and this may be the earliest surviving reference to the moat. Information from the medieval

period is minimal and no other family or estate papers, accounts or surveys from before the 16<sup>th</sup> century survive.

The de Birmingham family had a long association with the manor and the moat remained in their possession until it was forfeited to the crown in 1536. John Dudley, Viscount Lisle, acquired the moat along with several other local properties sometime between 1545-1543, before it was sold to Thomas Marrow in 1557. The moat then stayed in possession of the Marrow family until 1746.

The earliest description of the site comes from a 1529 survey of the town and it is portrayed as being in a dilapidated state. The moat is described as being overgrown with weeds and filled with rubbish and bridged by a drawbridge, while the manor house itself was said to be ruinous and that no man was prepared to rent it. The exact date of the removal of the medieval buildings is unclear but is thought to be during the 16<sup>th</sup> century when a member of the Francis family built a mansion on the moat platform. The earliest illustration of the complex is William Westley's map of 1731 (Map 1). The map shows the close relationship between the Birmingham moat and the Parsonage Moat that lay to the west with the watercourse between them. The watercourse forms the southern boundary to the town with plots running south off Edgbaston Street terminating there. The Birmingham moat appears to have a bridged entrance on to Moat Lane with a gate on the inner edge replacing the drawbridge mentioned above. The larger of the buildings is assumed to have been the manor house flanked to the north and south by out-buildings and with a circular dovecote to the rear. None of the buildings shown appears to be medieval in origin but the illustration may only be representative. The next view of the moat is a map by Bradford in 1751 (Map 2). There are several discrepancies between the Westley plan of the moat and that shown on the Bradford map. The latter seems to show the moat to be further down Moat Lane, away from the church. The buildings inside the moat are on a different alignment to that suggested by Westley. The alignments shown on the Bradford map are repeated in 1778 (Map 3). By 1767 Thomas Abney, a threadmaker, was tenant at the moat and the area had become a centre for small-scale industrial production. An advert placed after Thomas Abney's death in that year advertised the property for lease for 21 years and describes the Moat House as:

*'Containing four rooms to a floor and being three stories high, with a large back kitchen there to adjoining, and convenient warehouses, shopping and other buildings thereto, situated in the Moat yard. The premises are moated all around and are very fit and convenient for carrying on large manufactory, there being buildings which at small expense may converted to work-shops capable of employing 300 workmen'.*

Between 1769 and 1799 nails, coffin nails, ironwork, wire and various wooden products were produced on the moat site. The town also began to expand southwards and by 1778 the moat was surrounded by a triangle of streets consisting of Moat Row, Moat Lane and Jamaica Row.

In 1781 Birmingham historian William Hutton visited the moat and recorded some details of the site:

*'In one of the outbuildings is shown the apartment where the ancient lords kept their court leet'; this was held 'in what we should think a large and shabby room'; 'another outbuilding which stands to the east was the work of Edmund, Lord Ferrers' this stood on the north eastern side of the moat and bore the Ferrers arms in timbers of the ceiling'.*

This description seems to confirm the survival of some medieval structures late into the 18<sup>th</sup> century. This is further supported by William Hamper's drawing of 1814 (Fig. 2), which shows the moat from the east. Hamper shows a timber-framed house on the north-eastern side of the moat, right of the 'rebuilt' manor house. He also noted that the timbers of the structure had apparently been used in an earlier building. The moat itself still contained water at this time although Mr. John Parker commented on 14 October 1805 that:

*'The moat was in such a muddy condition, it would not be correct to call it a water mark'.*

The end of the Birmingham moat came in 1815 when the land was sold to the Town of Birmingham for the construction of the new Smithfield Market. Much of the fabric of the moat enclosure including the trees and the bridge were sold off that year. The main house was demolished in May 1816 and the moat was infilled around the same time. The new market was officially opened on the 5<sup>th</sup> April 1817 and can be seen in Ackerman's 1847 Panoramic View of Birmingham (Map 4). The curve in Moat Row clearly demonstrates the outline of the former moat's southern edge. After several extensions in the late 19<sup>th</sup> century Smithfield Market was replaced by the present structure in the early 1970s.

Parsonage Moat to the east lasted a little longer but was sold off for building land by the rector in 1826. The watercourse between the two moats was filled in to become Smithfield Passage which itself has recently disappeared under the new Bull Ring development.

## **6.0: Archaeological Background**

Prior to the 1970s virtually no archaeological work had been done on the Birmingham Moat. Construction work for the fish market in the 1880s revealed a stone passageway and chamber, while a series of objects reputedly recovered from the moated site, including a medieval ring, were published (Oswald 1951).

The most substantial piece of work carried out upon the moat was an archaeological watching brief undertaken during the construction of the present markets between October 1973 and June 1975 (Watts 1980). The most striking aspect of the project was the discovery of some fine stone masonry with a buttress dated stylistically to the first half of the 13<sup>th</sup> century. The structure was located on the extreme southern edge of the moat island and built of red sandstone blocks. A 'U'-shaped part of the structure was revealed 11m long east to west and running at least 4m to the north. The walls survived to over 2m in height with a buttress on the outside of the south wall. The function of the



structure is uncertain and no stratigraphic relationship with the moat was established. The period of the building's destruction was also uncertain, but as it does not correlate with any of the structures shown in the 18<sup>th</sup> century maps, demolition is believed to have occurred in the early post-medieval period. No further structures were identified on the moat platform due to a reduction in levels during the construction of 19<sup>th</sup>-century market.

No evidence for the date of the moat's construction was found. Most of the fills were post-medieval. Environmental evidence concerning the faunal aspects of the early post-medieval moat and its surroundings and how industrialisation gradually changed its environment was recovered (Grieg 1980).

## **7.0: Archaeological Watching Brief**

### **7.1: Objective**

The archaeological watching brief was intended to provide a record of any archaeological deposits or features which might be present below the modern ground surface, and to provide an understanding of the history and the significance of the archaeology of the site as a whole. The watching brief recorded the location, extent, date, character, condition, significance and quality of any surviving archaeological remains affected by the development works.

### **7.2: Method (Fig. 3)**

The objectives described above were achieved by a series of archaeological monitoring visits during March 2000 to observe all below ground works. These works consisted of the demolition of a large concrete wall that formed the southern boundary of the site and the excavation of a foundation trench for a replacement wall on the same east-west alignment but located approximately 5m further north (Trench 1).

Any archaeological deposits that were identified were recorded using drawing, photography, and written description. All artifacts were recovered, recorded and conserved. Environmental samples, including pollen columns, were taken from datable archaeological contexts.

### **7.3: Results (Figs. 3 and 4; Plates 1-3)**

The demolition of the wall revealed a large linear ditch aligned approximately east-west in the extreme eastern side of the site (Fig. 3). This feature was further exposed by the excavation of a foundation trench for the new wall and was provisionally identified as the northern edge of the Birmingham Moat. Section 1 (not illustrated) was south-facing and approximately 45m in length and survived to 3m in depth. Several layers of fill (1002-1006) were recorded overlying the natural sandstone. These were then sealed by a large mixed deposit of dark brown silt with sand (1007), which had been cut by a series of brick drains and other modern features. Environmental samples were taken from 1003

and 1005. Finds were also recovered, including a sherd of medieval pottery from 1003. Trench 1 was extended to the east and provided a partial cross-section of the feature (Section 2). This showed that it was curving south-east to run parallel with Moat Lane. At the other end of Trench 1 the feature appeared to turn south towards the modern Wholesale Market building.

Section 2 (Fig. 4 and Plate 2) showed the ditch (F1) to be minimum of 2.2m in width and 2.5m in depth. It was cut to the south by a construction trench (F2) for one of the buildings of the 1960s Wholesale Market (Fig. 3). Cleaning of the section revealed a series of fills corresponding with the deposits that had been observed further to the west. The lowest fill (1010) was a dark-grey sandy-silt which overlay the natural sandstone (1000). This was thought to represent the earliest period of the moats use and was sampled for environmental assessment. Context 1010 was overlain by a thick dark brown layer of decayed organic matter (1011), the equivalent of 1003 and 1005 mentioned above. Further environmental samples were taken from 1011. This dark organic layer was overlain by a medium grey-green silty-clay (1012), then by a grey-brown sandy-silt (1013). Two layers of black silty fill containing brick and pottery (1014 and 1015) built up. Context 1015 was sealed by 1016. This was a modern levelling deposit and the surface of the former road.

No structural remains from the manorial site were observed during the watching brief.

No archaeology was observed in the western area of the site owing to the previous downcutting of levels to accommodate the basement of the former Rag Market and its access road.

### **8.0: The Finds by Lynne Bevan**

The earliest pottery was a medieval rim sherd recovered from Context 1003 close to the base of the moat. The cooking pot was of a type commonly used in the 12<sup>th</sup> and 13<sup>th</sup> centuries. A further seven sherds of pottery were recovered, including part of the base from a wheel-made jug, nearly all of which had retained traces of dark brown glaze. The jug base, a further body sherd from the same vessel and a thicker fragment from another vessel came from Context 1014. A further base fragment from a jug was unstratified, and four body sherds, two with dark brown glaze, one with light brown glaze and a fourth unglazed sherd, came from Context 1006. The pottery is 18<sup>th</sup> to 19<sup>th</sup> century in date.

Other finds comprised a sheep metacarpal, part of a clay pipe stem, two tile fragments and a small piece of mortar, all of which came from Context 1006, and a fragment of slag from Context 1002. A further tile fragment was unstratified.

## **9.0: Assessment of the Waterlogged Plant Remains by Marina Ciaraldi**

Four soil samples were taken from the fill of F1 in order to carry out environmental analysis. The assessment aimed to establish the quality and quantity of the preservation of the plant macroremains in the samples and to record the presence of other organic remains.

The description of the soil profile and study of the plant and insect assemblages recovered during the 1970s watching brief provide important comparative material (Greig 1980, Limbrey 1980, Osborne 1980). The present assessment aimed to establish whether further analysis on the organic remains from the new samples could contribute to the information already available. The following research questions were taken into consideration during the assessment:

1. Was there any difference in the quantity and nature of the plant macroremains in the various fills of the moat?
2. Were there any organic remains other than plant macroremains present?
3. Was there any potential information regarding the understanding of the moat's water supply?
4. Could analysis of the plant macroremains from the new samples add significant information to our understanding of the formation of the moat fills?

### **Method**

An half litre of sediment from each sample was processed following the technique described in Kenward *et al.* (1980). A set of sieves with 0.3, 0.5, 1 and 2 mm mesh was used. The samples were then scanned using a standard low power stereomicroscope and the waterlogged plant remains were identified using modern reference material.

### **Stratigraphy**

The section of the moat sampled during the watching brief represents a similar stratigraphic sequence to that described by Limbrey (1980).

### **Description of Samples**

#### Sample 1010

This sample was taken from the primary fill of the moat. It consisted of a fine sandy-silt loam and contained lumps of dark organic material. The organic fraction of the deposit was not abundant and the mineral component was predominant.

The plant remains consisted mainly of fragments of waterlogged wood, well-preserved bud scales and seeds. Some of the identified seeds belonged to plants associated with wet environments, such as duckweed (*Lemna* sp.) and rushes (*Juncus* sp.), or with plants associated with disturbed places, such as knotgrasses (*Polygonum* sp.), fat-hen (*Chenopodium album*) and common nettle (*Urtica dioica*).

Fly pupae were observed in this sample although they were not abundant. The sample also contained caddis fly-cases. Identification of caddis flies is difficult but they can provide important information on ecological parameters of the waters in which these organisms lived. Caddis flies are generally associated with either still or flowing clean water.

#### Sample 1011

This sample was taken from the organic layer directly above 1010. It had a silty-sandy matrix with a very compact dark organic material. The organic material is the predominant fraction of the soil. This contained minute fragments of wood and a large quantity of herbaceous plant stems which were generally orientated horizontally, outlining a lamellar pattern in the deposit. Such a depositional pattern is typical of slow deposition in a water environment, as one would have expected to occur within a water-filled moat. Large waterlogged wood fragments were recovered from this level.

The plant macroremains contained in this level were more abundant than in 1010 (see Table 1). Plants from wet and disturbed environments were well represented in this assemblage. A few insect remains and some fly pupae were also observed.

#### Samples 1003 and 1005

The nature of the deposit and the plant composition of the two samples closely resembles that of Sample 1011, perhaps with a larger number of weed seeds (corncockle (*Agrostemma githago*), ragged-robin (*Lychnis flos-oscule*) and fairy flax (*Linum catharticum*). Of particular interest is the presence of some seeds of heather (*Erica* sp.). Heather also appeared in the pollen sequence taken from the moat in the 1970s (Greig 1980). Heather provides useful material for thatching and this could have been one reason for its presence on site. A few fragments of insects were also recorded.

#### **Discussion**

The plant macroremains recovered from Samples 1003, 1005 and 1011 are similar to those recorded from the samples studied from the previous archaeological investigation (Greig 1980). It is difficult to directly compare the two plant assemblages because of the absence of precise stratigraphic information from the 1970s salvage recording.

It is possible to highlight some differences, particularly the absence of seeds from aquatic species such as pondweeds (*Potamogeton* sp.), bur-reeds (*Sparganium* sp.) and yellow water lily (*Nuphar luteum*). The lack of macroremains of these species could be due either to the small size of the sample examined or, more interestingly, to a real difference in the plant assemblage of the deposit. If so, this could be an indication of different environmental conditions in the two sections of the moat, perhaps due to a different distance from flowing water.

Another important difference is the absence, in the new samples, of tree seeds. This too could be due either to the small size of the sample processed or to a real difference in the immediate surrounding of the two parts of the moat. The pollen diagram seems to suggest that trees were close by (Greig 1980).

No	Context	Description
1	1003	Same appearance as 1011. Small frags of coal, fly pupae, some fragments of insects, Ranunculus repens/bulbousus, Carex sp. (2/3 different species), Centaurea sp., Ranunculus scleratus, Chenopodium album, Urtica dioica, Cereals, flower capsule, Cruciferae, Agrostemma githago, fungi ifes?
2	1005	Same appearance as 1011. Small frags of coal, fly pupae, some fragments of insects, Ranunculus repens/bulbousus, Carex sp. (2/3 different species), Rubus fruticosus, Ranunculus scleratus, Stellaria media, Lychnis flos-osculi, Chenopodium album, Erica sp., Linum catharticum, Potentilla sp., Agrostemma githago
3	1010	Waterlogged twigs and fragments of wood. Caddis flies cases, fly pupae, bud scales, Lemna, Urtica dioica, Polygonum, Chenopodium album, Juncus, Cruciferae (siliqua), Spergularia sp., mosses
4	1011	Mainly formed by compacted straw. Fragments of waterlogged wood, some very small frags of coal, fly pupae, some fragments of insects, leaves, Luzula sp., Ranunculus repens/bulbousus, Rubus fruticosus, Carex sp. (2/3 different species), Polygonum sp., Stellaria media, Sonchus sp., Carduus/Cirsium, Brassica, Ranunculus scleratus, Sambucus sp., Lychnis flos-osculi, Galeopsis sp.

Table 1. Samples assessed for plant macroremains

### 10.0: Assessment of the Pollen by James Greig

A number of samples was collected from the moat fill. The lowest fill (<3> 1010) was submitted for pollen analysis.

#### Laboratory work

The pollen sample was processed using the standard method; about 1 cm<sup>3</sup> subsamples were dispersed in dilute NaOH and filtered through a 70µm mesh to remove coarser material, which was then scanned under a stereo microscope. The finer organic part of the sample was concentrated by swirl separation on a shallow dish. Fine material was removed by filtration on a 10µm mesh. The material was acetolysed to remove cellulose, stained with safranin and mounted on microscope slides in glycerol jelly. Counting was done with a Leitz Dialux microscope. Identification was by using the writer's pollen reference collection, seen with a Leitz Lablux microscope. Standard reference works were used, notably Fægri and Iversen (1989) and Andrew (1984).

The pollen types have been listed in taxonomic order according to Kent (1992), with names according to Bennett (1994) in Appendix 1.

#### Results

The pollen was generally well-preserved and abundant, and the assessment count

provided a good flora.

Most of the pollen (61%) was from trees and shrubs, mainly *Alnus* (alder), *Corylus* (hazel), *Fraxinus* (ash), *Quercus* (oak) and *Salix* (willow). A large range of other trees were recorded, such as *Pinus* (pine), *Ulmus* (elm), *Fagus* (beech), *Betula* (birch), *Carpinus* (hornbeam), *Tilia* (lime), *Ilex* (holly) and the climber *Hedera* (ivy). Occupied sites do not usually have abundant signs of trees, and this evidence may show that the site was overshadowed by trees.

The herbs include some crops such as *Cannabis* type (hemp or hops) which was grown for rope and canvas, and which leaves a good pollen record either if hemp was being grown nearby, or if it was either retted or processed. The cereal pollen record was rather slight and inconclusive. There was also a range of weeds and grassland plants present, including *Centaurea nigra* (knapweed) and *C. scabiosa* (greater knapweed). The latter grows on calcareous soils and would be unusual in Birmingham now, but could perhaps represent hay brought in from elsewhere.

Aquatic plants which would have grown in the moat or beside it were hardly represented.

There were records of fern spores of *Polypodium* (polypody) and *Pteridium* (bracken).

An intestinal parasite ovum of *Trichuris* was seen on the slide, but the evidence of sewage in the moat is very slight.

### **Correlation with other sites**

This moat was previously studied when exposed on the site of the present Wholesale Market in 1974 and 1975 (Watts 1980), although this was a watching brief rather than an extensive excavation.

The pollen diagram from the section then exposed has many features in common with the present sample, including signs of alder, oak, ash, hazel and a large range of other trees and shrubs, together with a range of herbs. The main difference is that the diagram has more signs of overgrown nitrogen-rich vegetation seen in large records of *Sambucus nigra* (elder) and *Urtica* (nettle). This may be a purely local difference.

The general evidence of being overgrown with trees also comes from a medieval moat at Cowick, Humberside (Hayfield and Greig 1989).

### **11.0: Discussion**

The location of Feature 1 and its substantial dimensions suggest that it represents the northern edge of the former Birmingham Moat. The location of the moat appears to be broadly correct when compared to the map sources from the 18<sup>th</sup> century. One notable aspect is that the moat's location now appears to be slightly further north towards the church than was previously thought. If so, it may suggest that the location given by the Westley map of 1731 is correct rather than the later and previously assumed more

accurate map by Bradford in 1751. If the Moat was closer to St. Martin's, church it may explain the crowded nature of the backlots shown by Westley.

The only dating evidence for the fills comes from pottery and the assumption that it is contemporary with any silting. The earliest material comes from the base of the moat, Contexts 1010, 1011 and their equivalent Contexts 1003 and 1005. The sherd of 12<sup>th</sup>-13<sup>th</sup>-century pottery from 1003 suggests that these deposits are medieval in date and the environmental analysis above gives an interesting picture of the moat and its surroundings at this time. The lack datable deposits of late medieval and early post-medieval periods can probably be attributed to the periodic cleaning of the moat that would have removed deposits leaving only pockets of earlier material. The 1975 watching brief demonstrated the poor survival of medieval deposits in the moat. Of the 166 foundation bases examined by Lorna Watts only five contained deposits that could definitely be described as being medieval in date. The stratigraphy that was recorded in March 2000 was very similar to that observed in 1975. Contexts 1010, 1011, 1003 and 1005 correspond with Watts' Master Level 2 representing the medieval phase of the moat. Contexts 1012 and 1013 correspond with Master Level 3; post-medieval, while 1014 and 1015 correspond with Master Level 4 representing the final period of the moat.

Most of the moat fills appear to be post-medieval in date. The pottery recovered from Context 1014 dates from the 18<sup>th</sup> and 19<sup>th</sup> centuries and was either deposited late in the Moat's existence or at the time of the backfilling in 1816. Although the results of the 1975 watching brief are stratigraphically very similar to the results of the 2000 project, the environmental results have produced several contrasts. These may reflect local differences between the western and southern areas of the moat exposed during 1975 and the northern side exposed in March 2000. The pollen results from 1010 confirm that trees were close by, but the lack of seeds suggest that they were not directly over the northern edge of the Moat.

The source of water supply to the moat is still not understood. It is not known if the water was flowing through the northern part of the moat or whether it was still. The presence of caddis flies in 1010 show that the moat was certainly close to a source of water and was clean. This is confirmed by the lack of sewage present in the moat. The Bradford map of 1751 (Map 2) seems to show a stream entering the moat on its western side and then exiting under Moat Lane and flowing into the mill pool. It maybe that the water flowed around either the northern or southern side of the moat, but not both. This would explain the differences between the samples taken in 1975 and those taken in 2000.

## **12.0: Acknowledgements**

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## Appendix 1

Table 1 pollen and spores in <3> context 1010

spores		
<i>Pteridium</i>	2	bracken
<i>Polypodium</i>	2	polypody
pollen		
<i>Pinus</i>	+	pine
<i>Ranunculus-tp.</i>	+	buttercup, crowfoot
<i>Ulmus</i>	3	elm
<i>Cannabis-tp.</i>	2	hemp, hop
<i>Fagus</i>	1	beech
<i>Quercus</i>	7	oak
<i>Betula</i>	+	birch
<i>Alnus</i>	27	alder
<i>Corylus</i>	7	hazel
<i>Carpinus</i>	+	hornbeam
Chenopodiaceae	2	goosefoot
<i>Persicaria maculosa-tp.</i>	+	persicaria etc.
<i>Persicaria bistorta-tp.</i>	+	bistort etc.
<i>Rumex-tp.</i>	1	docks and sorrels
<i>Tilia</i>	+	lime
<i>Salix</i>	6	willow
<i>Ilex</i>	2	holly
<i>Hedera</i>	+	ivy
<i>Fraxinus</i>	7	ash
Dipsacaceae	1	scabiouses
<i>Centaurea scabiosa</i>	1	greater knapweed
<i>Centaurea nigra</i>	+	knapweed
Lactuceae	3	a group of composites
<i>Aster-tp</i>	1	daisies etc
Cyperaceae	1	sedges
Poaceae	27	grasses
Cerealia-tp.	2	cereals
total pollen	102	(assessment level count)



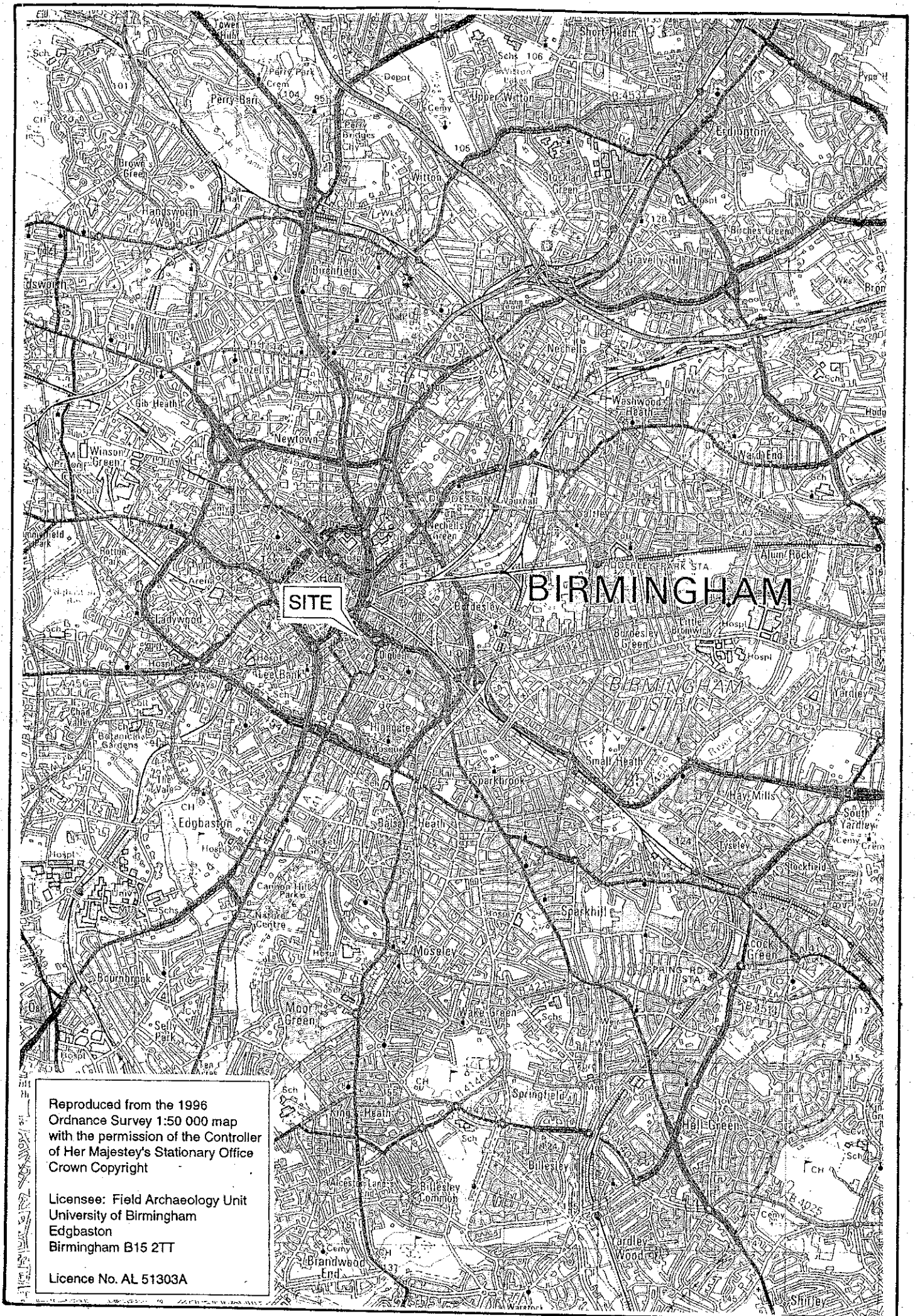


FIG.1

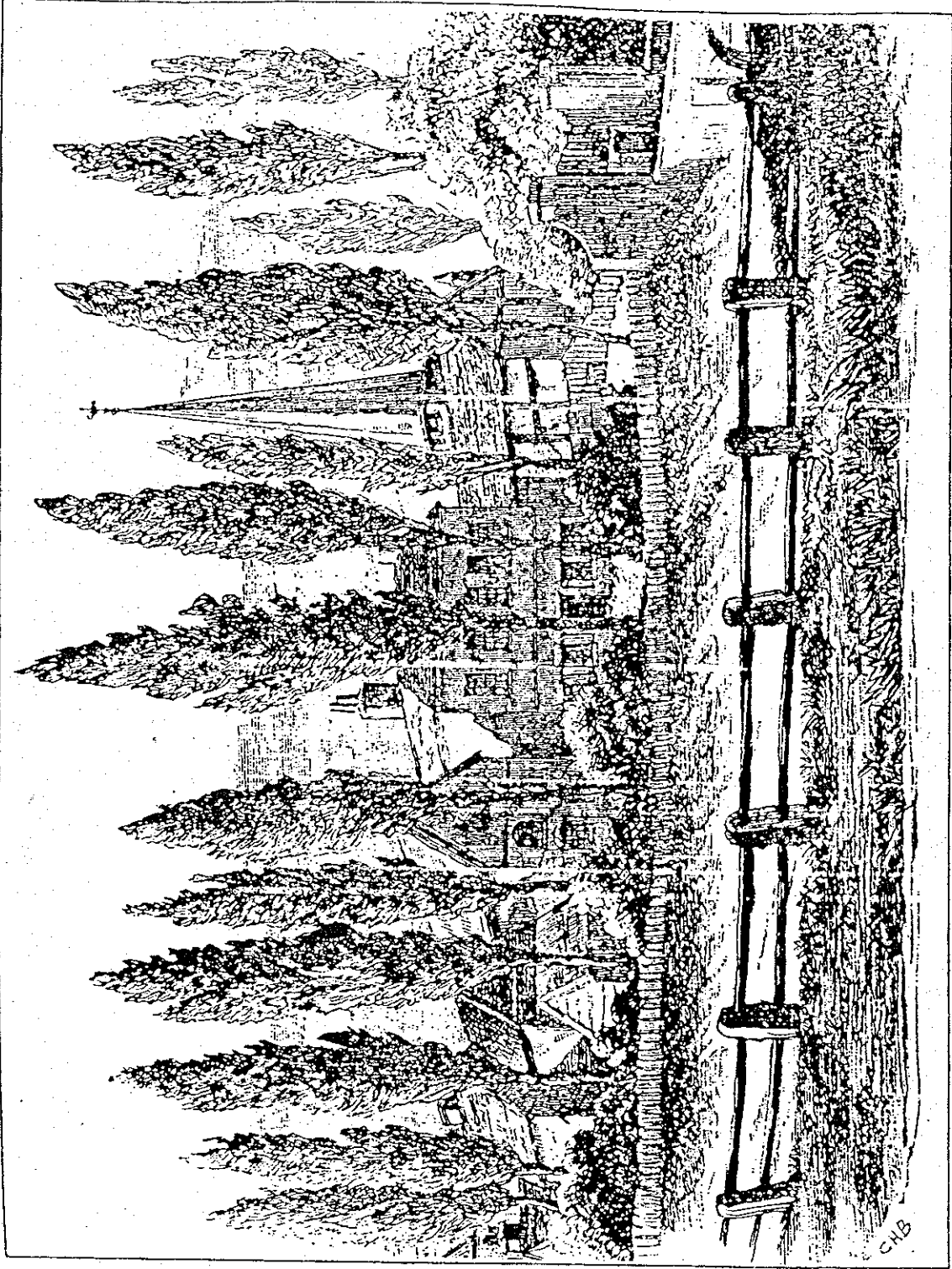


Fig.2

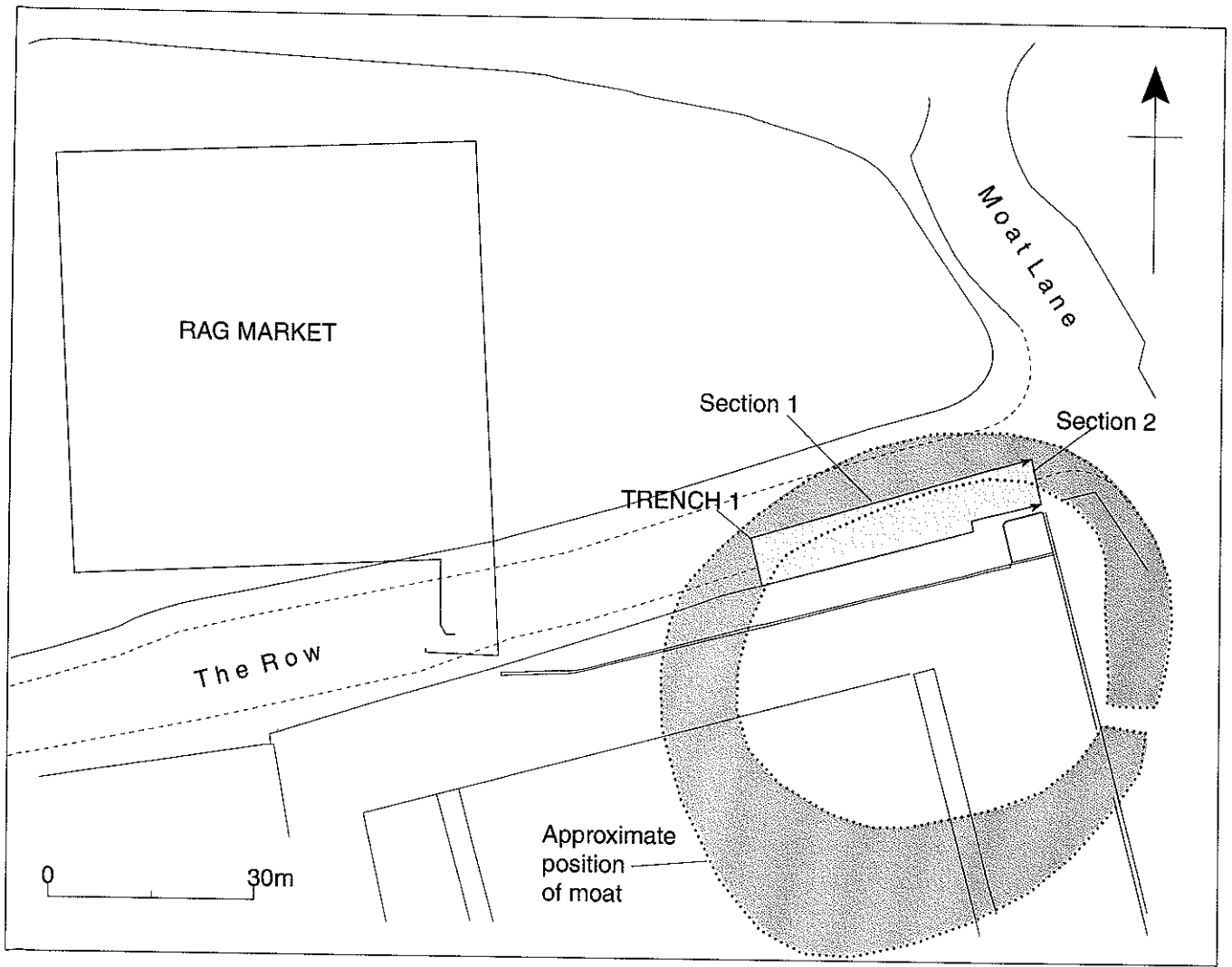


Fig.3

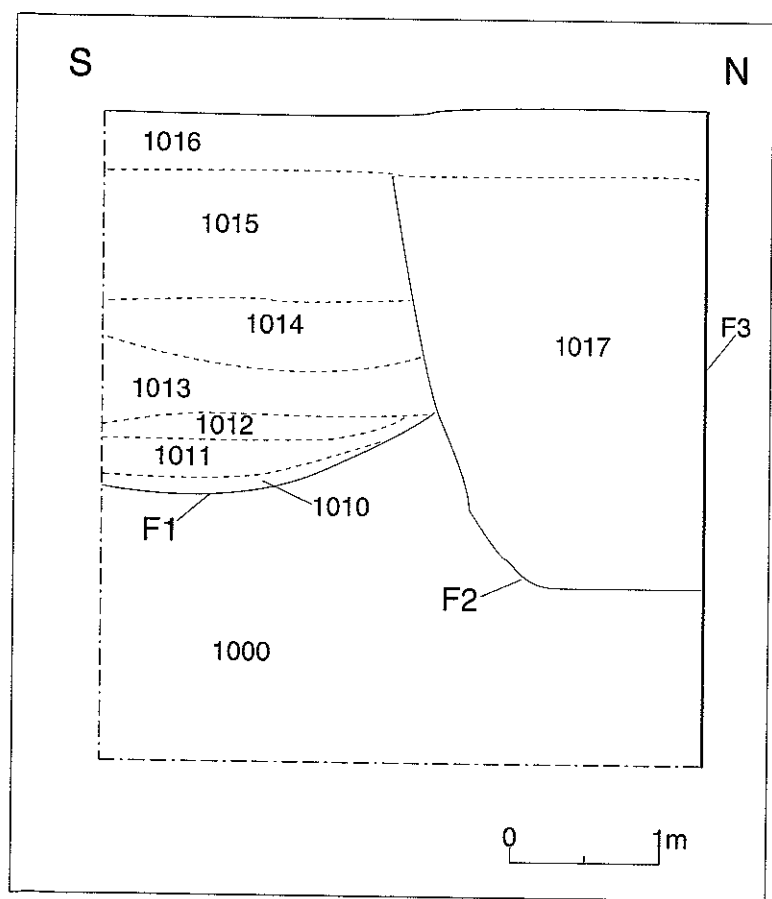
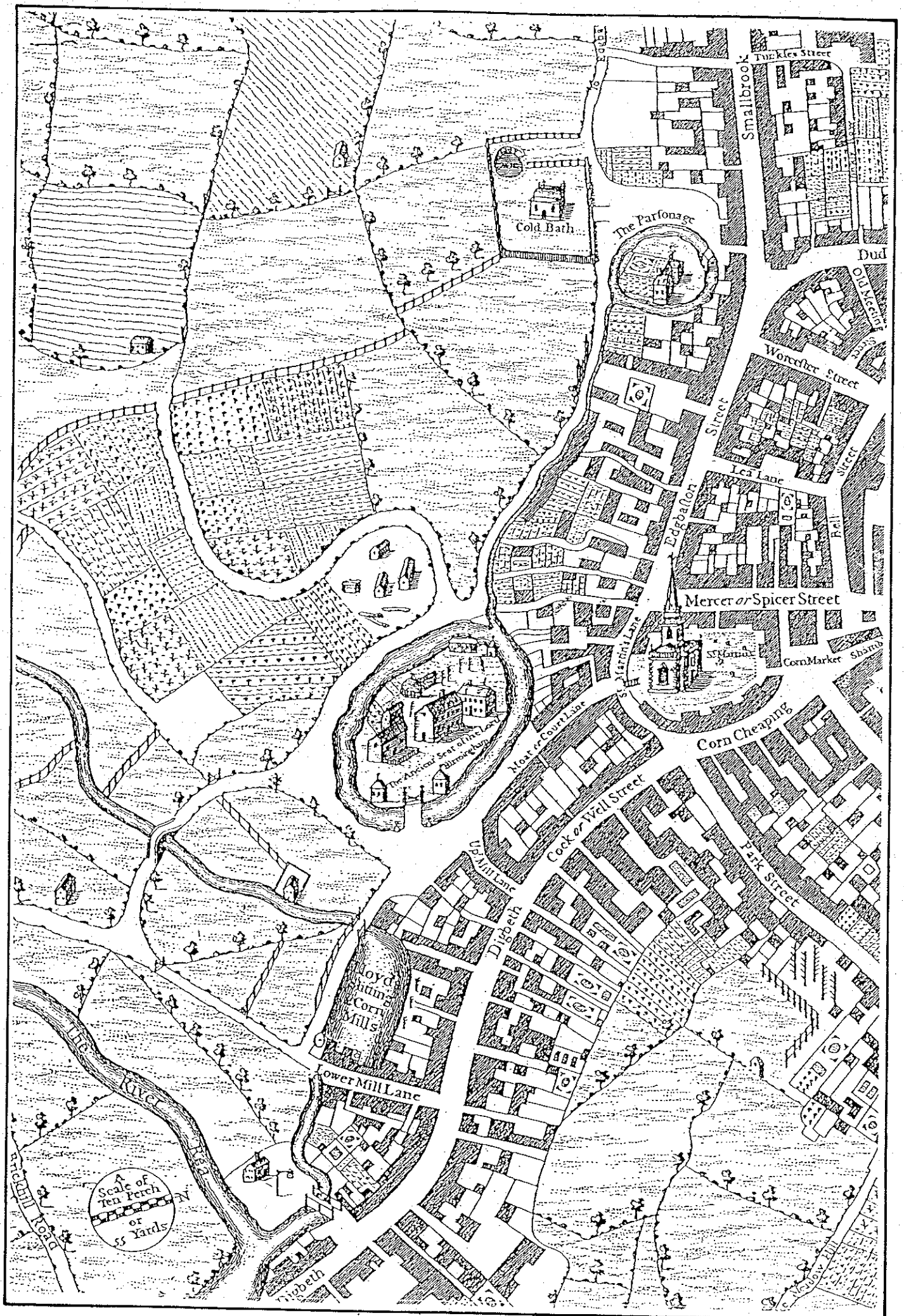
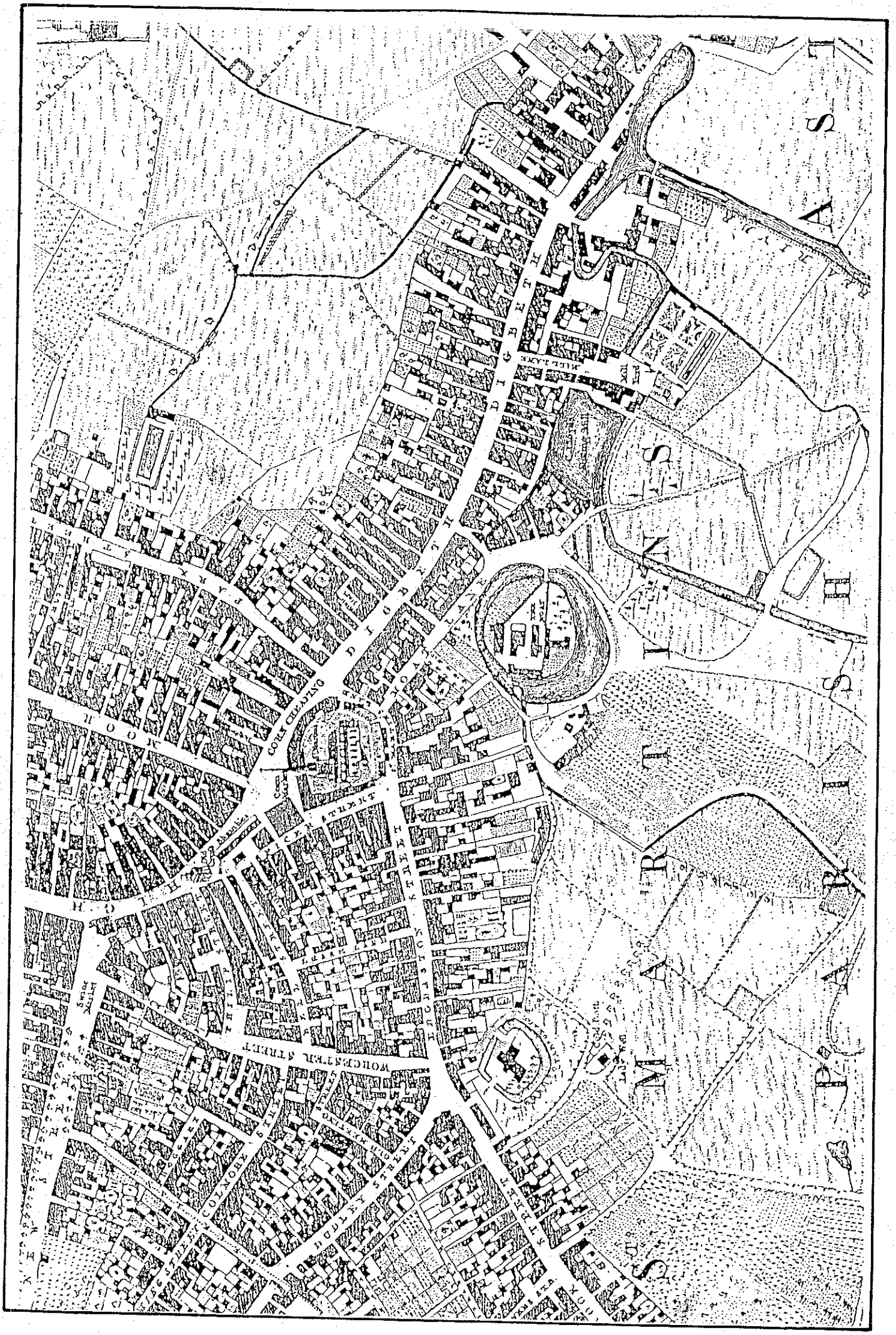


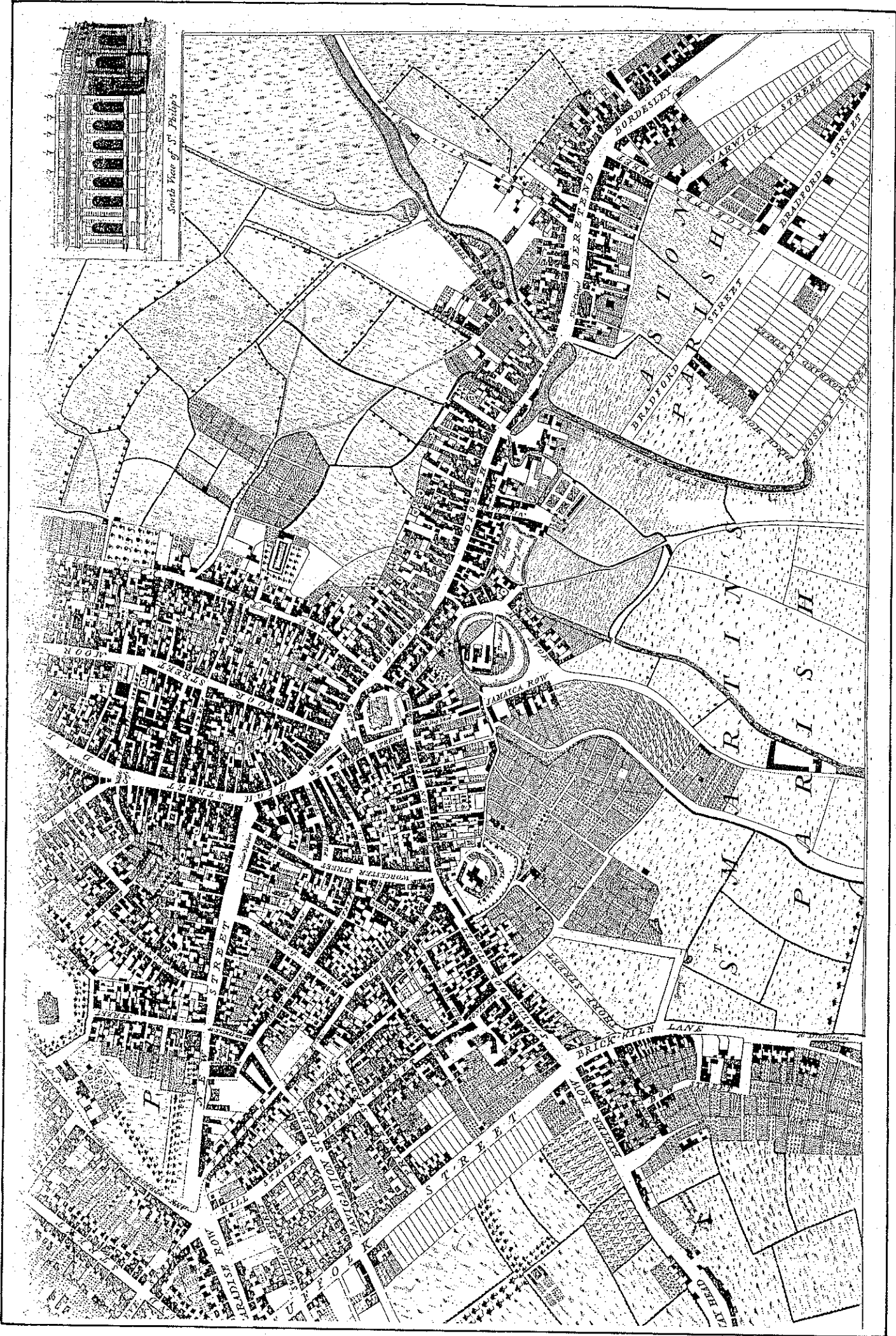
Fig.4



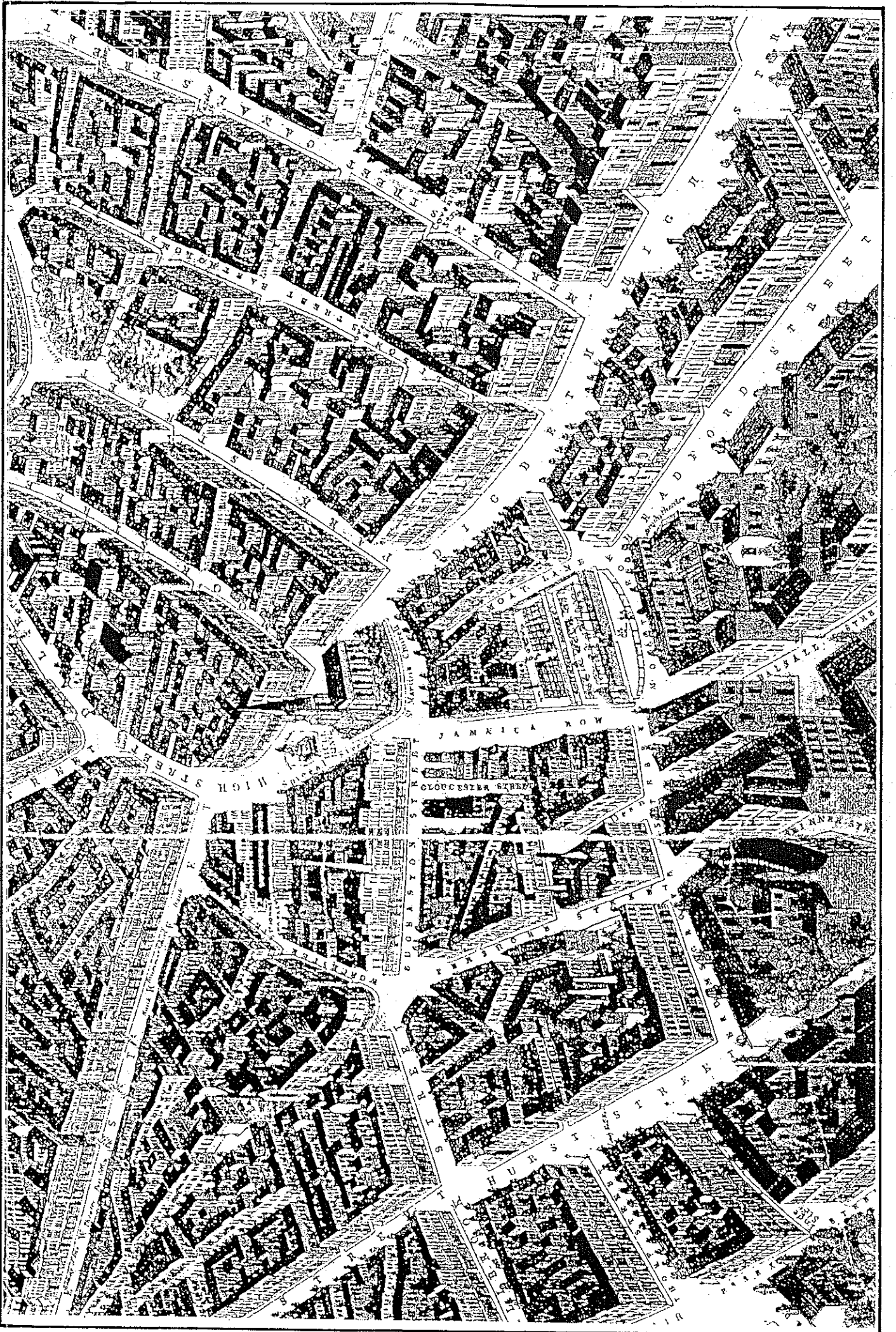
Map 1



Map 2



Map 3



Map 4



Plate 1





Plate 2



Plate 3

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