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THORNTON ABBEY, NORTH LINCOLNSHIRE

HISTORICAL, ARCHAEOLOGICAL AND ARCHITECTURAL INVESTIGATIONS

Al Oswald, John Goodall, Andrew Payne and Tara-Jane Sutcliffe

ARCHAEOLOGICAL SURVEY AND INVESTIGATION

ENGLISH HERITAGE

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SUMMARY

Between 2007 and 2009, English Heritage carried out historical, archaeological and architectural research at Thornton Abbey, a major Augustinian house in Lincolnshire. The findings of geophysical surveys undertaken by English Heritage in 1995 were also taken into account. New documentary research highlighted information previously overlooked in Thornton's 16th-century *Chronicle* and produced a more thorough account of the site's later use. The effects of post-medieval activity were clarified by detailed survey of the complex earthworks lying between the claustral buildings and the surviving gatehouse. These include garden landscaping – apparently unfinished – associated with a short-lived stately home, built about 1607 for Sir Vincent Skinner, and various scars left by 19th- and 20th-century archaeological excavations. Evidence for the medieval constructional sequence was also identified. The 1995 geophysical surveys complemented the earthwork survey and detected a number of monastic buildings and boundaries not recognisable in the surface remains, including some apparently erased by Skinner's garden works. Architectural analysis of the gatehouse, alongside a suite of post-medieval depictions of the building, shed light on its development and purpose. Aerial photographic transcription of the North Bail, probably the site of the home grange, revealed a range of medieval features and led to the re-interpretation of features identified previously.

CONTRIBUTORS

The 2007 investigations were initiated by Kevin Booth, English Heritage's Senior Curator with responsibility for English Heritage's North Territory. Documentary research was carried out by Dr John Goodall of English Heritage's Properties Presentation team and Al Oswald of the Archaeological Survey and Investigation team. John Goodall, together with Dr Adam Menuge of the Architectural Investigation team carried out analysis of the gatehouse and other standing remains. The earthwork survey, together with supporting documentary research and aerial photographic analysis, was carried out by Al Oswald, Abby Hunt, Marcus Jecock and Sarah Newsome of the Archaeological Survey and Investigation team. Catherine Grindey and Jon Millward participated as part of the IFA-sponsored EPPIC (English Heritage Professional Placements in Conservation) training scheme. In 2009, aerial photographic transcription of the destroyed earthworks in North Bail was carried out by Tara-Jane Sutcliffe under the auspices of the same scheme, while in 2010 Anthony Gale helped with the completion of the survey, again as a trainee. The 1995 geophysical surveys were undertaken by Mark Cole and Andrew Payne of the Archaeological Science team, and initially processed and analysed by Mark Cole. Supporting photography was carried out by Bob Skingle and Steve Cole. The reconstruction drawings commissioned by English Heritage were produced by Gill Atherton. The report was written by Al Oswald, John Goodall, Andrew Payne and Tara-Jane Sutcliffe, and brought to publication by Al Oswald. Keith Miller, the current Inspector of Ancient Monuments with responsibility for the site, contributed a section on the use of brick at the abbey and commented extensively on the rest of the text. Editing was carried out by Dave Went and Tim Gates.

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Thanks are due to:
John Farrow, owner of the land on which most of the monastic remains survive and occupant of Abbot's Lodge Farm, both for allowing access to various historic maps and other documents in his possession and, equally valuably, for his hospitality and enthusiasm for the research.
Mr G W Brocklesby of Brigg, who made available the results of his historical research into the Skinner family.
Bill and Cilla Spink of Thornton Hall, for giving permission to consult and use a number of images in their possession.
Caroline Atkins, for sharing early drafts of her report on the new excavations and investigations within the gatehouse, as well as her recollections of the 1985 earthwork survey.
Madi Grout, Collections Assistant at North Lincolshire Museum Service, for her help in examining the Fowler archive at Normanby Hall.
Alison Williams, of North Lincolnshire Historic Environment Record, for providing information about the abbey and its environs.
Paul Everson, expert on monastic landscapes and post-medieval garden archaeology, who commented on the text.
Dr Glyn Coppack, former Inspector of Ancient Monuments with responsibility for the area and director of previous investigations at the Abbey, who offered comments at various stages.

ARCHIVE LOCATION

The archive is held in English Heritage's public archive, the National Monuments Record Centre, Kemble Drive, Swindon SN2 2GZ.

DATES OF SURVEYS

Earthwork and architectural surveys January - April 2007, July 2010
Aerial survey September - December 2009
Geophysical surveys July 1995

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LIST OF ILLUSTRATIONS

1. INTRODUCTION

Between 2007 and 2010, English Heritage carried out a programme of historical, archaeological and architectural research at Thornton Abbey, a major Augustinian foundation near the village of Thornton Curtis in North Lincolnshire (Figure 1). The house, dedicated to St Mary, was founded as a priory in 1139 by William Le Gros and

Figure 1. Location map, highlighting the numerous foundations and major endowments of William Le Gros, Earl of Aumale and Lord of Holderness, in the mid-12th century.
(Based on the OS map with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office. ©Crown Copyright 2010. All rights reserved. Ordnance Survey Licence 100019088)

elevated to the status of an abbey within a decade. In 1313, its annual income, built upon wool production and easy access to the ports of the Humber estuary, totalled £1,543, an astonishing sum, comparable to the income of a major nobleman. The late-14th century gatehouse, whose gradual descent into ruin was reversed in the mid-19th century through the reinstatement of its roof and floors, is the largest and most magnificent structure of its kind to be found anywhere in England. The chapter house, whose ruins were stabilised at a similar date, was begun in 1282 and completed in 1308. The earliest visible building remains, revealed by a succession of excavations from the early 19th century onwards, include the foundations of the church and cloister, begun in 1261. Thornton was among a select few of England's greatest abbeys to outlive Henry VIII's suppression through conversion to a secular college for priests; it survived as such until 1547 when it was finally dissolved under Edward VI. Post-medieval activity on the site, which culminated in about 1607 with the construction for Sir Vincent Skinner of a large, fashionable and architecturally ambitious house with formal gardens, has generally seen less research; the extent of this activity and its impact on the monastic remains have therefore been underestimated.

The abbey's entire precinct, together with College Bridge, a medieval stone bridge which lies just outside the precinct to the north, and an elaborate complex of medieval fishponds located immediately to the south, are designated a scheduled ancient monument (RSM number 13377), while the gatehouse and the and the ruins (and excavated foundations) of the claustral buildings have been in state guardianship since 1938. The core of the site remains under pasture, allowing extensive and complex earthworks to survive here, particularly between the gatehouse and the remains of the claustral buildings (Figure 2).

The 2007 investigation underpinned English Heritage's project to restore, re-present and re-open the gatehouse and principal ruins as a visitor attraction in July 2007, a project partly funded by Yorkshire Forward, the Regional Development Agency, in support of the South Humber Bank Heritage Tourism initiative, a consortium in which North Lincolnshire Council is a key partner. The investigation comprised fresh research into the primary documentary sources (as well as a review of secondary sources), rapid re-examination of the surviving building remains and detailed earthwork survey covering approximately 6.8 hectares (at 1:1,000 scale and Level 3, as defined in English Heritage 2007). Small-scale excavations and building recording necessitated by alterations to the gatehouse to improve visitor access and create facilities near the custodian's cottage were also undertaken on English Heritage's behalf, and their findings are taken into account in this report (Atkins 2010). The opportunity was also taken to incorporate the findings of geophysical surveys undertaken in 1995 by the former Ancient Monuments Laboratory of English Heritage, now part of its Archaeological Science team. This investigation, which examined parts of the area subjected to detailed earthwork survey in 2007, had been instigated under similar circumstances by English Heritage's then Inspector of Ancient Monuments for the area, when a new Countryside Stewardship scheme came into force in 1994. Then too, the anticipated pressure of increased public access over the fields around the claustral range necessitated improved understanding to inform the management and presentation of the site. The northern half of the precinct, almost certainly the land parcel referred to in the abbey's late medieval *Chronicle* as North Bail,

has been in arable cultivation since the mid-1950s. The prolonged ploughing has left only vague undulations on the ground surface, together with basic depictions on earlier Ordnance Survey maps, to represent the largest of the earthworks that once existed here. However, the earthworks are visible in a more intelligible condition on aerial photographs taken in 1951 and earlier; these were plotted by English Heritage's Aerial Survey team in 2009.

All three episodes of research reported here took as their starting point an earthwork survey undertaken in 1985 by Caroline Atkins, Denny Coppack and Janet Tully (*see* Figure 16). Based on this and supporting documentary research, Dr Glyn Coppack proposed a fairly detailed interpretation of the layout of the monastic complex (Coppack 1991; *see* also Figure 17). He commented astutely that 'the earthworks represent developments which are not necessarily contemporary, or indeed monastic' and, in line with this observation, recorded the sites of Sir Vincent Skinner's 17th-century house and associated outbuildings, incorporating earlier documentary research by architectural historian David Roberts (1984). The primary objective of the 2007 investigation was to develop Coppack's observations by clarifying the nature and extent of any post-medieval modifications of the monastic remains.

Figure 2. Oblique aerial photograph of the core of the monastic complex taken 19 July 1999, looking north, showing Abbot's Lodge Farm towards the bottom right corner and the late 14th-century gatehouse towards the left-hand side. The earthworks in the pasture between the gatehouse and the ruins of the claustral buildings, including most of those surveyed in 2007, are obscured by cut hay. The land parcel called North Bail in the Thornton Chronicle *corresponds to the field containing a ripe cereal crop, at the top of the frame. English Heritage NMR index number TA1118/38, accession number 17295-09.*

2. TOPOGRAPHY AND GEOLOGY OF THE SITE

The abbey church and claustral buildings occupy a site with an average height of 5m above sea level, on the western edge of the broad, shallow valley of the Skitter Beck. Part of this watercourse is now known as the East Halton Drain, having been canalised around 1800 and probably also in the medieval period (*see* Section 3.2). The stream, which is tidal up to the abbey and for some distance upstream, discharges into the Humber estuary, 4.6km (almost 3 miles) to the north-east. Hereabouts, perhaps represented by a scatter of medieval pottery on the foreshore, lay the port of Skottermouth or Skitter Haven, whose potential relevance to the abbey is discussed in Section 7. On its course to the sea, the stream broadened out to form at least two natural meres - Langmere and Sandmere - the former perhaps representing the stream's outflow into the Humber in the Middle Ages, and therefore conceivably the real site of the medieval haven (Russell and Russell 1982, 80; Cox *et al.* 2007). The wetlands on the margins of the meandering stream would undoubtedly have provided a wide range of natural resources in the medieval period and earlier (English 1979, 203). A silver coin, an *antoninianus* of Philip I (ruled AD 244-9), discovered somewhere within the abbey precinct by a local schoolboy in 1987 (according to an exchange of letters in the site file AA30979/2) might testify to a the existence of a small Roman settlement in what would be a very typical marsh-edge location. Historic Ordnance Survey maps and other sources show that in the post-medieval period the shallow valleys draining to the Humber were exploited for osier beds and water meadows. The form of the topography, though slight, also heavily influenced medieval (and present) routes, which tend to run parallel to the valley of the Skitter Beck and cross it at its narrowest points.

The Skitter Beck is known to have been navigable by small barges or boats in the monastic period, which must have been an important factor in the choice of site (*see* Sections 3.1 and 7). To judge from its relationship to the foundations of College Bridge, recutting since the medieval period has deepened the channel by around 1m, in the process making its sides steeper and the actual watercourse narrower. Despite such improvements, the valley of the Skitter Beck was severely flooded in June 2007 echoing documentary references to floods which, according to the Thornton *Chronicle*, reduced the abbey's revenue in 1332 and again in 1534 (*see* Section 3.1 and Figure 19).

The abbey lies within the area surveyed at <2m resolution by the Environment Agency using Lidar (Light Detection And Ranging). The resulting imagery (Figure 3) demonstrates clearly that the abbey occupies a low spur bracketed by the shallow valleys of two minor tributaries of the Skitter Beck, which flow from west to east. The more northerly of these has apparently been piped underground outside the abbey precinct, but still sometimes feeds a small pond immediately to the west of the gatehouse (now often dry, particularly in summer); it re-emerged strongly on the surface during the June 2007 floods. Within the area of the precinct, the Lidar data suggests that the stream would have wandered across the low-lying northern half of the field between the gatehouse and the claustral buildings, probably eventually becoming the precursor of a deep channel that has long been assumed to be of artificial origin. This lost watercourse is potentially of some importance in understanding the water supply to the abbey's moated perimeter and perhaps its water-powered cornmill (*see* Sections 5.2 and 5.11)

The local geology consists of till and fluvio-glacial sand and gravel deposited over Cretaceous Burnham Chalk (Geological Survey of Great Britain 1983). In the 19th century, a series of bore-holes were sunk to the level of the chalk at irregular intervals along the middle of the valley of the Skitter Beck, causing relatively warm springs to rise to the surface. The water was channelled back to the beck under normal circumstances, but could be used when needed to irrigate the surrounding land (information from John Farrow). These bore-holes, which were reportedly filled in during the 1950s, are depicted on all prior Ordnance Survey maps, but not on the 1867 plan, which seems to be thorough in its depiction of the water features in this area (Ordnance Survey 1887; 1908; 1932; *see* Figure 13), indicating that they were dug at some point between 1867 and 1886. The bore-holes seem to have been imitations of the natural artesian springs known as 'blow wells', which occur widely around the Lincolnshire coastal fringe. The pond to the west of the gatehouse, now often dry, may well be such a blow well, though

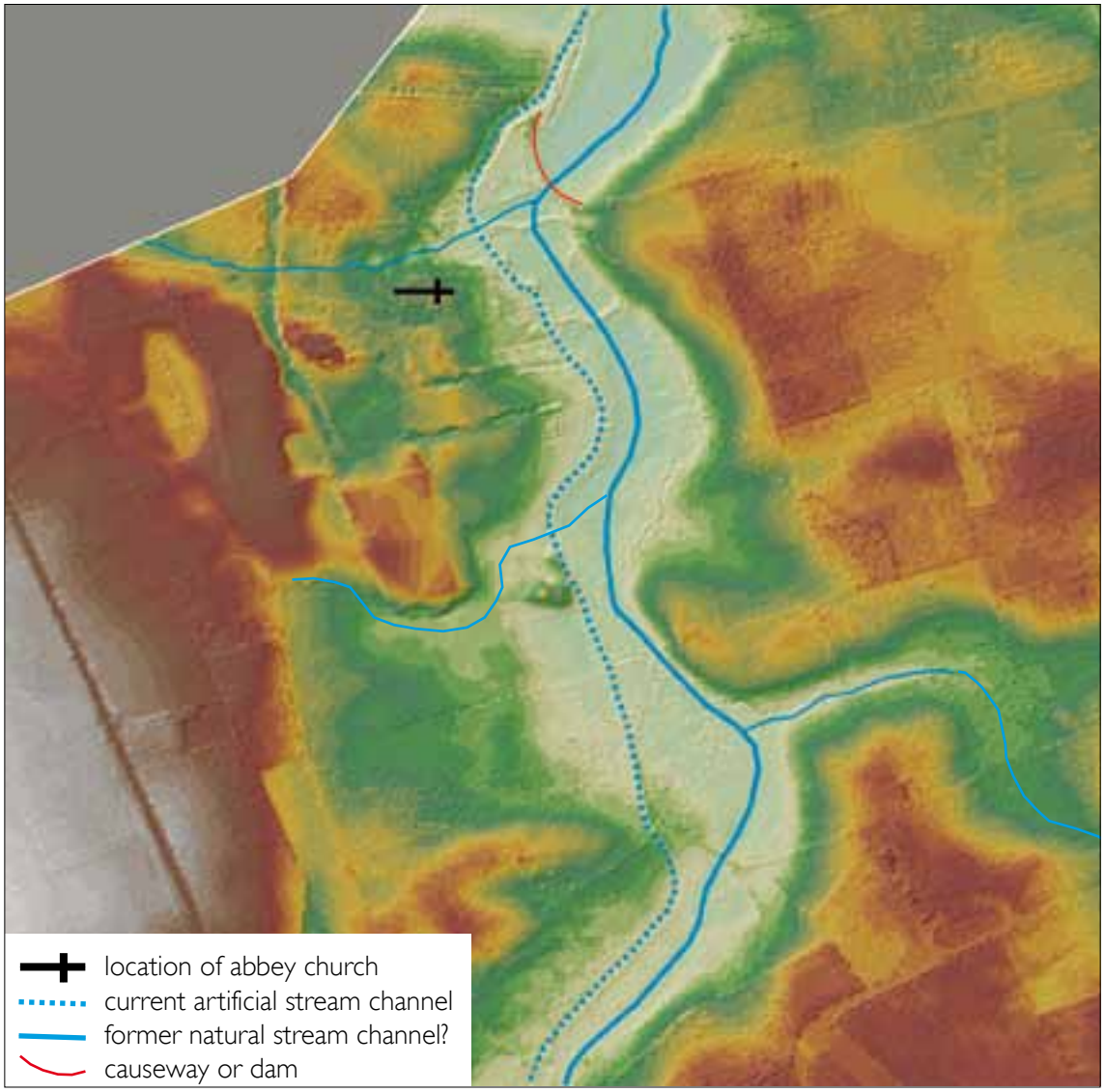


Figure 3. Lidar image of topography in the environs of the abbey, highlighting natural and artificial watercourses and a causeway or dam across the valley. (Height data licensed to English Heritage for the Pan-Government Agreement, through Next Perspectives™.)

probably artificially modified on more than one occasion (certainly in the late 20th century, when it was turned into the focus of a small picnic area). Alternatively, it may have been dug deliberately, like the 19th-century bore-holes described above but at a considerably earlier date, for example if the adjacent stream disppeared gradually due to de-watering, which must have been exaccerbated by the monastic drainage works. Indeed, a bore-hole here may have been intended to retrieve or replicate the natural water source originally harnessed to supply the monastic water features, although it is arguable that the digging of the moats would have achieved this more efficiently.

The sand and gravel deposits include drifts of pure sand, a material which must have been required in large quantities for the construction of the abbey. A pit outside the precinct, 300m south of the gatehouse, is named 'The Canch' on the 1-inch to the mile scale map (Ordnance Survey 1824; *see* Figure 10). The name, usually meaning a worked bed of stone, or, locally, any sloping trench (Cameron 1991, 281) is documented first in 1578 and later occasionally as the 'the water called the Canch', suggesting that the quarry soon filled with water. It appears to have remained in intermittent use throughout the late 19th and earlier 20th centuries, but by this time, if not before, access to it was gained from the south, in other words away from the abbey gates (Ordnance Survey 1887; 1908; 1932). However, other diggings in the locality which encountered sand deposits may have served the abbey; for example, variation in the width of the broad ditch depression to contain the moat to the south of the gatehouse suggests that sand may have been extracted from here prior to the digging of the actual moat. Clay deposits are also common in the wider environs of the abbey, especially along the edges of the Humber Estuary, where dozens of brick and tile works thrived well into the 20th century. One of these, possibly with much earlier origins, lay just west of the mouth of the Skitter Beck, while others existed on the Humber marshes at Barrow, where the Counts of Aumale held land in the medieval period. A valuation of 1823 mentions the existence of disused brick pits, conceivably of medieval date, on monastic land at Nun Cotham, another house endowed by Le Gros, which lies 8.8km (5½ miles) south of the abbey near the source of the Skitter Beck (*see* Figure 1). On the north bank of the Humber, medieval brick pits are well documented. Some or all of this may be significant in view of the use of the lower reaches of the Skitter Beck as a route for transporting building materials to the abbey, explicitly documented in 1341 (Thornton *Chronicle*, 59) and the relatively early use of brick, first documented in 1348 (Thornton *Chronicle*, 63-4) and evident in the surviving remains of the late 14th-century gatehouse. Clay could also have been used as a form of marl for improving the quality of sandy soils for agriculture; a marl-pit is documented in 1395, although its location is not specified (Thornton *Chronicle*, 60).

The drift deposits are overlain by deep, fine loamy soils and deep, well drained, coarse loamy and sandy soils of the Bishampton 1 and Wick 1 associations (Soil Survey of England and Wales 1983). These soils are well suited to arable cultivation and aerial photographs indicate that much of the slightly higher and better drained ground, including most of the land on the eastern bank of the Skitter Beck in the parish of East Halton, was under broad ridge and furrow in the medieval period (Russell and Russell 1982, 80; *see* also Figure 33).

3. THE DOCUMENTED HISTORY OF THE SITE

by Dr John Goodall and Al Oswald

3.1 The monastic period

Though next to nothing is known of the history of the site prior to 1140, its monastic history is fairly well understood, and has been so since the mid-19th century, through the survival of an extensive chronicle now held in the Bodleian Library, Oxford. Although various translations and interpretations based thereon have been published (Parker 1846; Clapham 1946; Major 1946), the original document was re-examined for the purposes of English Heritage's recent research. The author was an unknown canon who had probably joined the community in about 1501, since he begins to list the reception of canons into the order from that year. His knowledge of technical terms was limited and he therefore sometimes substituted English words where he was uncertain of the Latin (for example, 'tresuls'), meaning that his version of architectural works may contain errors (Alexander 1993, 120). It is clear from the varying quantity of information recorded that the documents within the lost archive on which the history is based largely dated from the 13th century onwards. The Thornton *Chronicle* (hereafter TC) comprises three sections.

It begins with a list of abbots and their dates of election and death. In some cases, amongst the later abbots there are also short notes of their achievements. This whole section is roughly drafted. There are also occasional omissions, as for example in the note of election of *Iordanus de Vill*, the year of which is written incompletely as *mcc* (TC, 1).

A short preface to the second section describes the foundation of the monastery in 1139 and 1140. There follows a history of the abbey written out as a chronological table of dates and divided up into the rules of abbots. In some places the author omitted to write out runs of years and had to squeeze them in as double columns. The lists of achievements credited to abbots in this section correspond to information in the opening part of the chronicle. The two sections do, however, incorporate different information.

The final section lists the names of all the principal officers of the abbey: the cellarer, responsible for the estates (for the years 1239 to 1436); subcellarer (1315-1533); *camerarius* (chamberlain) (1273-1443); *elemosinarius* (almoner) (1274-1452); master of the fabric, responsible for buildings (1260-1390s); sacrist, responsible for the church and liturgical arrangements (1260-1530); *refectorius*, responsible for procuring and dispensing the community's food (1282-1531); infirmarian (1270-1531); the officer called 'Northbayll' (1303-1524); *hostelarius* (1438-1531); officer of *caseis* (in charge of producing cheeses. probably primarily from sheep's milk, cheese being the only form in which dairy products could be stored) (1267-1342); *instaurius* of Lindsay (in charge of livestock) (1259-1364). At the end of each list, the author has transcribed a complete account submitted by that officer: the cellarer for 1313-14; subcellarer for 1314; *camerarius* for 1313; *elemosinarius* for 1313; master of the fabric for 1313; sacrist for 1314; *refectorius* for 1314; infirmarian for 1313; the officer called Northbayll for 1313; *hostilarius* for 1438; officer of *caseis* for 1314; *instaurius* of Lindsey for 1313. The sections relating to the sacristan and master of the fabric additionally incorporate many interesting entries lifted from other accounts. In

some respects this is a working list with details inserted at later dates. There is no exact parallel for this remarkable document, which shows a sophisticated awareness of how documents originally created for different functions could be used for historical purpose.

There is good evidence for dating the compilation of the manuscript in the treatment of the various chronological tables. The abbot's list concludes in 1532; that of the subcellarer in 1533; that of the *Instaurius* in 1530; that of the *refectorius* in 1531; that of the Infirmarian in 1531; that of the officer called Northbayll in 1524; that of the hostler in 1531. The *Chronicle* therefore seems to have been completed in 1533.

The *Chronicle* records that William Le Gros, Count of Aumale in Normandy, Lord of Holderness and for a time Earl of York, pledged to found a priory at Thornton on the feast day of St Hilary (13 January) 1139, on the counsel of his kinsman Waldef, Prior of Kirkham, his brother Simon Earl of Northampton and Henry Earl of Huntingdon and heir of the king of Scotland. Le Gros was at that time effectively ruler of a huge swathe of northern England, including most of Yorkshire and parts of Lincolnshire (see Figure 1). His pledge was made approximately four months after he led the English forces which gained victory over the Scots, led by King David I, at the Battle of the Standard, fought near Northallerton on 22 August 1138, having been entrusted with the defence of York by King Stephen (English 1979; Dalton 2004). The community at Thornton was established by the customary number of twelve canons, led by Waldef from Kirkham Priory; their arrival was symbolically timed to fall exactly a year after Le Gros had first determined to make the endowment. The priory was well endowed by its founder and other benefactors with churches and land in the locality (Figure 4), an area which was already growing prosperous on wool production. The foundation coincided approximately with the start of a comparitively mild, dry century, when relative sea levels were falling, making the reclamation and use of marginal wetlands more viable (Neave and Miller 2000, 100). The original gift made by Le Gros comprised, in Lincolnshire, the vills of Thornton, Grasby, Audleby (*see* Owen 1958), Frodingham, Burnham and Helewell (Holywell near Castle Bytham in south-west Lincolnshire), with the churches of Auldleby, Ulceby, Barrow-on-Humber, Randa (probably Rand) and 'Heccam', whose location is uncertain.

Other benefactors added the vill of Humbleton and half that of Warham (perhaps Wharram, in North Yorkshire), with various other parcels of land, and the churches of Thornton itself, 'Ulstikeby' (probably Ulceby or Ulceby Skitter) and half that of Wyner (probably in Lincolnshire). along with Humbleton, Garton and Welton in Yorkshire. Thornton was elevated to the status of an abbey in 1148 and Richard, who had been made prior in 1140, became the first abbot. Thornton was the first of five religious houses in the region, including the major Cistercian abbey of Meaux, to be founded by Le Gros. It may be this fact, as well as the evident success of Thornton, that persuaded Le Gros to have himself buried beneath the high altar on his death in 1179 (English 1979, 24). At the time of the Dissolution, his burial monument still survived, surrounded by a 'cradle' of wrought iron.

In 1163, the canons were temporarily grazing their sheep over the abandoned fields of Ulceby 'until the village shall be resettled and restored'; both the cause of its depopulation and its eventual restoration, which had come about by the early 14th

century, are unknown (Bond 2004, 256). Between 1176 and 1184, successive abbots petitioned the Pope concerning the church at Barrow. By 1190, the abbey had acquired land in Withenwick and by 1220 property in the borough/port founded by Le Gros at Hedon in Holderness (English 1979, 148; 217). In 1221, the abbot secured the advowson of Welton-in-the-Marsh through an agreement with Walter de Hamby, a descendant of Le Gros, having acquired the churches of Humbleton, Garton and Frodingham in the previous year. By 1284, the Aumale estates had passed to the crown, but the king, in consideration of a fine of £10, promised not to grant the advowson of the abbey out of his own hands and those of his successors. Thornton therefore remained under royal patronage until the Dissolution.

Little is known of the early physical development of the complex. Work on the first of the buildings whose excavated foundations are now visible was probably initiated in 1261 by William of Lincoln, abbot from 1257-73, as part of what seems to have been a

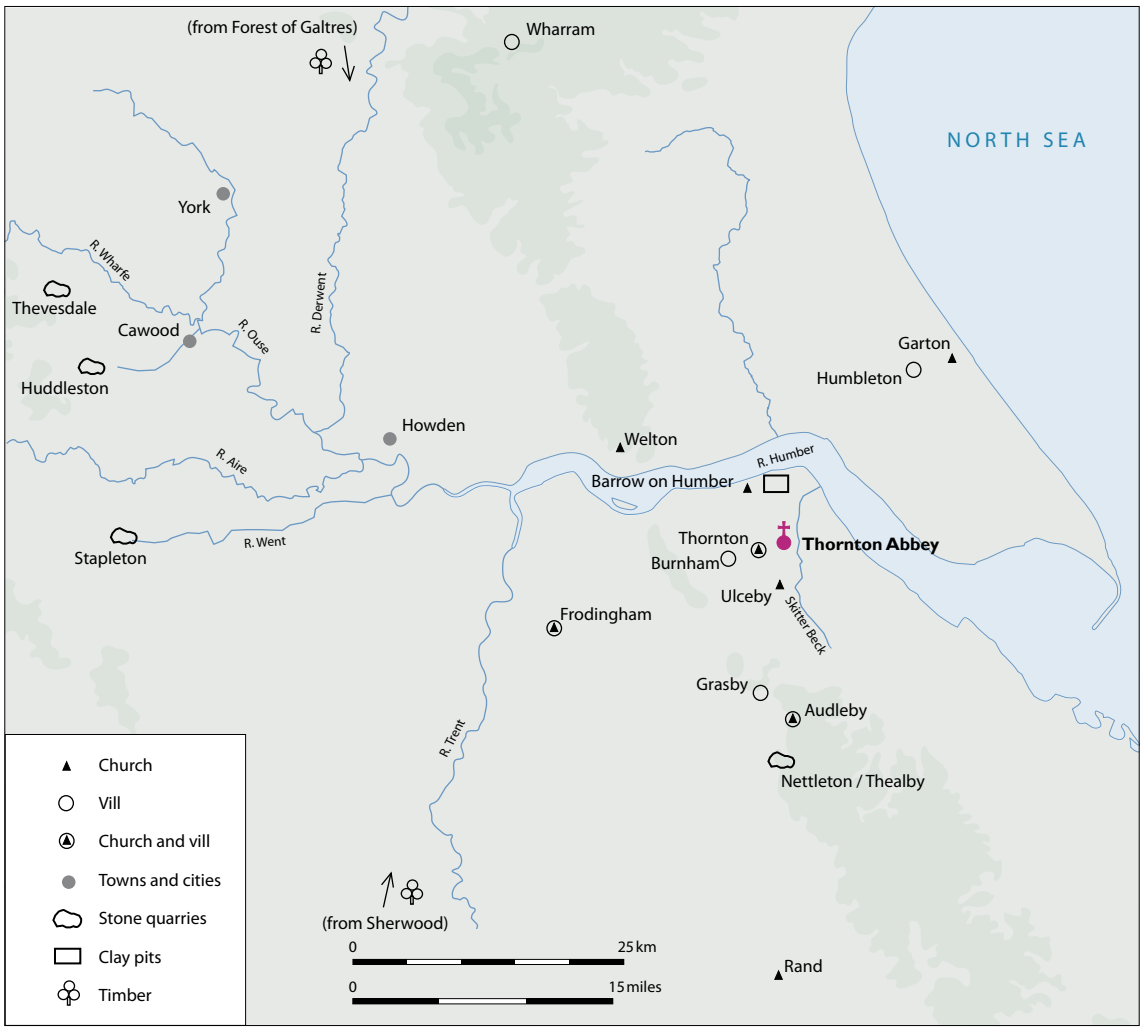


Figure 4. Location map, showing Thornton Abbey, its endowments gained between 1139 and about 1221, and the sources of some of the materials used in its construction between about 1261 and 1341. Note the implied importance of river transport.

(Based on the OS map with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office. ©Crown Copyright 2010. All rights reserved. Ordnance Survey Licence 100019088)

general rebuilding (Clapham 1951, 6). Interestingly, the rebuilding took place soon after the start of a relatively rapid increase in precipitation and storminess, rising seal levels and consequent flooding, including the great flood of 1253, a climatic deterioration which lasted for some 200 years and had serious implications for the viability of low-lying sites in the region (Neave and Miller 2000, 100-1). The start of work is commemorated in the *Chronicle* by payments for a large stone for a new high altar and for 44 masons to quarry 1,500 stones (TC, 58). William of Lincoln may well have been inspired by knowledge of changes to the cathedral church of his home town: the design of the Angel Choir at Lincoln, begun in 1256, certainly influenced the huge east window of the church at Thornton (Pevsner, Harris and Antram 1995, 51). Also in 1261 minor repairs were made to the dormitory roof, changes perhaps made necessary by the demolition of the old church. However, work began in earnest in 1264, when the *Chronicle* records that 12 workmen and 52 masons were at work and:

> *There have been great expenses about this time around the foundations of the church; the chapter house; the refectory; cloister; kitchen; dormitory.* (TC, 18)

In 1272, the king gave twelve oaks from Sherwood towards the work on the church, probably marking the start of work on its roof (*Calendar of Close Rolls* 1938, 485). In 1274, payment was made for a clock (TC, 63). Construction of the chapter house was anticipated in the works of the 1260s (Alexander 1993), but began in earnest under Walter Hotoft, the 10th abbot in 1282 (a few years later than work on that of York Minster). Stone for this phase of works, if not for the earlier phase as well, seems to have been obtained from quarries at Thevesdale near Tadcaster (*see* Figure 4), for a grant of stone made to Sawley Abbey, Lancashire, in 1292 mentions that the allotted area adjoined a quarry held by Thornton Abbey (Oswald 1959, 63). Work on the chapter house roof probably began in 1305, and must have been driven forwards with urgency, since the Abbey was subsequently granted a pardon for taking eight more oaks than the twenty-two specified by the original grant, of which twelve were to come from Sherwood and ten from the Forest of Galtres (*Calendar of Close Rolls* 1908, 232; *Calendar of Patent Rolls* 1898, 376). The building was completed by the 11th abbot, Thomas of Glamford Brigg (or Thomas Brigge), in 1308 (TC, 20; 58). In 1295, the treasury was constructed (TC, 21; 58). A 'new hall in the court' mentioned in 1313 (TC, 42) is thought by Coppack (1991, 4) to be the standing building now known as Abbot's Lodge. In the same year, payments were made for cutting stone and transporting it via Cawood in North Yorkshire. A payment was later made for 'liberating' from the king one of the boats used to carry the stone (TC, 61-2). This stone presumably came from the magnesian limestone quarries at Huddlestone near Sherburn-in-Elmet, which were used for some of the great buildings of the medieval era, and probably transported by boat via the Archbishop of York's wharf at Cawood, which stands on the River Ouse, a tributary of the Humber (*see* Figure 4). The construction of stalls and the laying of tiles in 1313 probably mark the completion of the structural works to the east end of the church begun in 1261. The last stage of the work involved decorating the newly-created interior: in 1313 a statue of the Virgin Mary was purchased, painted, ornamented and fixed to a column in the church (TC, 61-2) and in 1315 the Master of the Fabric purchased 800 leaves of gold and 600 of silver to adorn the choir as well as 12 pounds of red lead and 10 pounds of white lead as pigments for painting the vault of the choir (TC, 22; 58).

At this time, Thornton Abbey was evidently enjoying extraordinary prosperity, largely through its production of wool. Between 1269 and 1292, the abbey had invested considerable sums in the purchase of various manors and advowsons, while in 1275 the abbot had been accused of appropriating 16 acres on the moor of Caistor (Lincolnshire) for his sheepfolds. The *Instaurius*' (stock-keeper's) account for 1313 shows that two of the abbey's twenty-five demesne farms had flocks of nearly 400 sheep each, while the total number stood at 7,934, producing more than 86 sacks of wool (Owen 1958, 114). In 1291, the abbey's annual income was £235, but by 1313 this figure had risen dramatically to £1543 - a figure comparable to the income of a powerful nobleman – of which £700, or nearly half, came from the export of wool. The number of sheep owned by the abbey in 1313 was almost equal to the top two houses in Wales (Margam and Tintern abbeys) combined, at about the same date, yet still significantly less than Meaux, Fountains and Rievaulx, each of which had more than 14,000 beasts (Bond 2004, 59). With increasing wealth came greater responsibility. In 1304, according to the *Calendar of Patent Rolls 1301-7*, Edward I stayed at Thornton on his way south from Durham to spend Christmas at Lincoln. In 1312, the abbot was summoned for the first time to Parliament. He and his successors made great efforts to escape this duty and in 1341 an exemption was formally granted, but in 1348 it was revoked and attendance was required thereafter. There is no precise record of the number of canons in the abbey's most prosperous days, but from the order of Bishop Alnwick in 1414 that one canon out of every twenty should be maintained at university, it would seem that there were more in his time than at the Dissolution, when there were just twenty-three.

The crisis of royal government in northern England that followed the catastrophic defeat of the English army by the Scots at Bannockburn in 1314 evidently did not much affect the abbey. According to the *Chronicle* the community had to contribute provisions for the Scottish war at considerable expense, and were also disseised of some property by Hugh le Despenser, whose lack of reverence for church property is attested elsewhere. Thornton became a refuge for other Augustinians caught up in the fighting: the abbot of Jedburgh died here and two canons from Newburgh Priory in North Yorkshire were taken in here in 1322, after their house was destroyed by the Scots.

It is a remarkable indication of Thornton's confidence and wealth at this time that the community embarked on a new round of building which lasted well into the 1320s. In 1318, the Master of the Fabric paid for building 'at the North Mill wall', a description from which the existence of a second, more southerly, mill may be inferred (TC, 58). This was incidental to the main building works, which aimed to draw together the completed elements of the 1260s plan into a new and more splendid composition, crucial to which was the decision to enlarge the nave with a second aisle. This change of plan was accommodated by reducing the size of the north range of the cloister, reflected in the *Chronicle* first by a record of a payment in 1322 to masons working 'around the foundations of the new cloister' and of payments in 1325 and 1326 for the lead covering of its roof (TC, 21; 23; 58). A new kitchen and offices were also begun in 1322, and repairs to a chapel of St James 'in the hospital without the walls of Thornton Abbey' are also mentioned in that year (Page 1906, 235). The modification of the cloister was followed in 1327-8 by construction of a new refectory (TC, 23; 58). In 1328 the painter John Arkll was employed in the choir and work began to the 'columns of the church',

almost certainly parts of the new nave. By 1331 the windows of the cloister and refectory were being glazed, the latter by a certain Master Robert (TC, 24), and a statue of the Virgin was purchased for the high altar for the considerable sum of 73 shillings 4d (TC, 63). In addition to all this, in 1325 and 1328, Thomas Brigge, the 11th abbot (1300-33) had respectively acquired the advowson of Whitton for £60 (TC, 23) and the manor of Barrow (both in Lincolnshire) for £200 (TC, 42).

These operations appear briefly to have been suspended in January 1332, when the community complained of financial difficulties caused by the 'sumptuous rebuilding of the church and cloister' in a period of plague, flooding and cattle blight (Lincoln *Episcopal Registerno*, folios r-v). However, under William Grasby, a former cellarer who became the 12th abbot (1333-47), recovery seems to have been swift. In 1334, trestle tables were made for the refectory by John the Staller (TC, 24) and in the same year a glazier from Lincoln fitted glass in the cloister (TC, 59). The next year, work began to beautify the tabernacle of the high altar, which was repainted in 1336 and furnished with a new altarpiece by John Barnaby, a master painter also documented in the employ of Edward III, for the price of 100 shillings (TC, 63). Also in that year, a costly altarpiece of St Augustine was bought and a copy of his rule made for the monastery (TC, 24). Although such expenditure has been seen by modern historians as profligate, Pope Benedict's appointment of Abbot Grasby and the Prior of Kirkham to convoke a general chapter of the Augustinians in 1340 seems to imply that he had a good reputation within the order.

In 1341, the 'Skyter' Beck is mentioned by name in the context of transporting stone (which must be magnesian limestone) from Stapleton in North Yorkshire (TC, 59). This may have come from from the known quarry at SE 514 184, between the Rivers Aire and Went, both tributaries of the Humber (*see* Figure 4), or from the quarry at SE 504 174, now just outside the parish of Stapleton, which directly overlooks the River Went (Lott and Cooper 2008). Both these quarries are depicted on early Ordnance Survey mapping and were inspected in the field after the completion of the main fieldwork at Thornton Abbey. The River Went, although only slightly bigger than the Skitter Beck and now choked with vegetation, could have served to carry the stone downstream. An incident in 1348 casts further light on the nature of the abbey's use of water transport. In that year, a canon named Peter Franke was involved in a quarrel between the servants of the monastery and those of a knight of the neighbourhood. The knight's servants had seized a boatload of victuals on its way to the abbey, and Peter, being the knight's kinsman, thought he could induce them by fair words to give up the booty; but though he urged the ringleader 'in the sweetest possible way' to restore the boat, he was answered so rudely that he lost his temper, snatched up the nearest weapon, and wounded the man mortally. The Earl of Lancaster interceded for the canon, who would naturally for this act have been disabled from exercising any ecclesiastical function; and the pope allowed him to retain the exercise of minor orders, and to hold a benefice.

Robert of Darlington, the 13th abbot (1348-64), built a large granary and carried out much work on the cloister and dormitory. The earliest recorded use of brick by the abbey was in 1348, when a certain William Tylere was employed to build a wall using 24,000 tiles described as *spisse* (meaning 'thick/dense') near a 'river aqueduct' (TC, 63-4). The word *spisse* is not recorded elsewhere in Wight's glossary of medieval terms (Wight

1972, 263-8), and the acqueduct was presumably a simple channel rather than any raised structure and probably not the perimeter moat, given the reference to the river. Meanwhile, the completion of the nave was overseen by Stephen 'who was mason for a long time' (TC, 59-60). The leading of the roof and glazing of windows in the church in 1364 (TC, 26) suggests that the whole structure was roofed by this date.

Eventually, in 1391 a carpenter, William of 'Riping' (probably Ripon), vaulted the nave in timber (TC, 60). Two years later this vault was painted with pictures while the floor beneath it was covered with tiles. A final extension of the church was begun in 1395 under William Multon, the 15th abbot (1393-1418), when a new Lady Chapel was begun to the east of the choir (TC, 60). More than a 150 years after it was first begun, the cruciform church, visible today as exposed foundations, was completed.

The late 14th-century works on the abbey are relatively poorly documented because one relevant section of the *Chronicle*, describing the rule of Thomas Gresham, the 14th abbot (1364-93), was deliberately destroyed. This section, according to an anonymous marginal note in a hand which may be 17th-century (once believed to belong to Tanner, who donated the manuscript to the Bodleian Library in the 18th century), was:

> *…torne out by a frend of mine that had this booke, to prevent, as he sayd, the scandal of the church. The truth is the account given on him* [Gresham] *was that he was a wicked man, a Sodomite and wot not.* (TC, 60)

This loss is the more unfortunate because it was under Gresham's rule that the abbey gatehouse, the largest and most magnificent building of its kind to survive in Britain, was built. Completion of the main gatehouse can be dated by a royal license issued on 6 August 1382 that permitted the abbot and convent of Thornton to crenellate (*kernellandia*) 'a new building [*domus*] over and beside the gate' (*Calendar of Patent Rolls Richard II* 1897, 166). Work had probably begun in 1377, when a new master mason was appointed by the abbey, although a considerable quantity of stone had been brought from the quarries (whose location is not specified) as early as 1373 (TC, 60). The flanking walls were probably complete by 1389, when money was paid out for building 'the walls and ditch [*fossato*] to the south of the gates', presumably referring to the moat and the surviving brick retaining wall along its inner edge (TC, 60).

In the 15th century, the abbey witnessed considerable further development and it is clear that its prosperity was not much diminished since the late 14th century. Most of the changes to the church involved the creation of new furnishings and decoration. At some point between 1418 and 1422, for example, a peal of bells was installed in the central tower (TC, 3; 29), while between 1422 and 1439 a tabernacle was built for use in the great ceremonies of Easter (TC, 30). Depositions made during Bishop Alnwick's visitation of 1440 seem to indicate that the new abbot, Walter Moulton, was responsible for a brief period of moral and infrastructural decline (Lincolnshire Record Society *Visitations of Religious Houses* III, 370). The canons complained that he was thoroughly incompetent; that manors, granges, and so on were let without consent of chapter; that obedientiaries did not render their accounts; that the sick were not provided for; that there were only two boys in the almonry and no scholar at the university; that the brethren did not eat regularly in the refectory; and that the sacrist had lent the sacred vestments to seculars

for games and spectacles. The Bishop's injunctions ordered reform on all these issues and, after personal examination of the abbot, he appointed a co-worker elected by the convent. After this, the house seems to have recovered higher standards.

William Medlay, the 19th abbot (1443-73) rebuilt the Presbytery and a 'great barn [*horreum*] in North Bail Yard' (TC, 34). John Beverley, the 20th abbot (1473-92) built a large chest for storing three huge and valuable liturgical cloaks (copes), while his successor, Abbot John Lowthe (1492-1517) added a stone vault to the tower (presumably to its top) and in the final year of his rule was able to secure from Pope Leo X a bull granting him the privilege of celebrating mass in a mitre with gold plates and full pontificals (TC, 35-6). The abbey was described in 1521 as 'one of the goodliest houses' of the order in England. In 1505, the *pistrium* (bakehouse) was burnt down (TC, 5) while a cellarer's account dating, according to a 17th-century annotation, to 1525, seems to refer to a windmill ('wind mylln') somewhere within the precinct (Lincolnshire Archives, Box 92/6/1/a). Slight losses were suffered through flooding in 1534, but the income for the same year was £591, still a very considerable sum.

The Dissolution of the abbey and the foundation of Thornton College

Thornton Abbey was suppressed on 12 December 1539, at which time there were twenty-three canons; Abbot William Hobson surrendered the abbey to the king, receiving a pension of £40, while the canons received annuities of £5 to £7 each (Minns 1898, 492-3). On the following day a detailed inventory was made of all objects of value within the precinct, from the lead on the roofs to the hangings around the choir decorated with thorn bushes and barrels (or tuns), a punning reference to the name Thorn-ton (Minns 1898). At that moment, the fate of the buildings hung in the balance. Henry VIII and Catherine Howard stayed at Thornton for three days in early October 1541, from which it may be inferred that none of the buildings had been despoiled immediately (Coppack 1991, 37). On 27 December he determined to re-found Thornton (in the same manner as some of the greatest monasteries, including Westminster Abbey) as a secular college for priests. According to royal direction, a new dean was to head the college, supported by four prebendaries, six minor canons, a schoolmaster, and a choirmaster. The college was also to appoint a gospeller, an epistoler, four singing men and five choir boys to celebrate church services. Salaries were also to be provided for a porter, a sub-sacrist, a butler, and a cook as well as four almsmen or women (Page 1906, 237). However, after only six years, the college was in turn suppressed under Edward VI in 1547. The first dean, Roger Dalyson, became Precentor of Lincoln in 1555. The crude copper seal of the college was rediscovered in 1929 in a workshop in Hull, reportedly discarded amongst some lumber having been reused as the handle of a carpenter's brace, and was eventually purchased by English Heritage in 1995 (Gibbons 1931).

3.2 The post-monastic period

In September 1547, the abbey was granted to Henry Rands (also known as Holbeach), Bishop of Lincoln. The grant specified:

> *…the capital mansion and outer gate of the college of Thornton … and the towers, chambers and buildings thereon, the house commonly called 'le Froyter' and all messuages, etc, within the limits which Henry VIII divided off by walls and ditches and reserved in his own hands at the foundation of the said college, and the park of 80 acres enclosed with pales or a wall in Thornton… and the laundry and conduit within the site of the college of Thornton…* (*Calendar of Patent Rolls Edward VI* 1924, 153).

Little is known of Rands' immediate treatment of the college and this represents an important gap in the documentary record. However, in July 1549, a further grant was made by the Crown to Robert Wood, comprising

> *…the site of the late college of Thornton, Lincs, the burial ground of the same, a garden [*gardenum*] called Le Farmerye Yarde (2½ acres) lately in tenure of the dean and chapter of that college, a cottage and garden there in tenure of Richard Parker, a cottage called Le Launderhouse and all the river banks there near adjacent in tenure of Ralph Knyght and Joan his wife, also the water mill in tenure of Richard Perkinson, there and the messuage called 'a Cowhouse' and a great garden, a barn, a 'le garner' in the eastern end of that barn, a dovehouse, a 'kylnehouse', the ground and precinct called le Uttercourt and Cowhouse Garthe…*
> (*Calendar of Patent Rolls Edward VI* 1925, 97)

A rental states that 'the lord's wind-mill' and 'the waterrmill below the site of the monastery' were both initially held by Richard Parkinson (137-8). In 1575, Rands' son sold the remaining land, which had not been granted to Wood, to Sir Robert Tyrwhitt of Kettleby, whose grandson, also named Robert, acquired it in 1588 and did not inherit the seat at Kettleby until four years later; he sold it to Sir Vincent Skinner in 1602. In both 1575 and 1602, a 'great garden' was specified. The park mentioned in 1547 is referred to again in 1558, while a Little Park (perhaps distinct from that of 80 acres) is documented on occasions between 1578 and 1720 (Cameron 1991, 287-90).

Abraham de la Pryme, curate of Broughton, Lincolnshire, and a keen antiquary, was greatly impressed when he visited Thornton on 1 May and again on 24 July 1697 and, in his diary, recorded his observations in some detail (Surtees Society 1870). His description of the gatehouse is quoted in full in Section 5.3 and he also described:

> *…the hugest finest court that ever I saw in my life, with two rows of trees on each side, on both sides of which trees is the ruins of vast buildings to be seen, and the like almost all over. At the north side is the fragments of the chappel* [undoubtedly the Chapter House, notwithstanding the erroneous direction]*, of mighty fine stone, and curious workmanship, which, by the arches that is now stand*[ing]*, appears to be above half buried in the ground in its own ruins. The drainers that drained these levels of Ank,* vulgo Ankham*, fetch'd all the stone from this chappel that*

> *they built Ferry* [Ferriby] *Sluce with, and by a just judgement of God upon* [them], *for applying that to profane uses that* [which] *had been given to God, the drainers were all undon, and the sluce which cost many thousands of pounds building, is now coming down.*

Ferriby Sluice lies at the mouth of the canalised New River Ancholme, 14 kms (9 miles) west of Thornton. De la Pryme goes on to state that:

> *Sir* [Vincent] *Skinner, that pull'd the college down, built a most staitly hall out of the same on the west side of the abby plot within the moat, which hall, when it was finished, fell quite down to the bare ground, without any visible cause and broke in pieces all the rich furniture that was therein. Then Sir Edm*[und] *Win, seeing no building would thrive there, he caused all the stone to [be] fetched away, and built a most delicate hall at Thornton town, but that prospered not neither, so that there is now onely a few of the lower walls to be seen thereon. After that… Skinner built another hall out of part of the stones that the other was built of, which hall now stands on the east side of the court of the abby, and is all built on arches of some of the old building.*

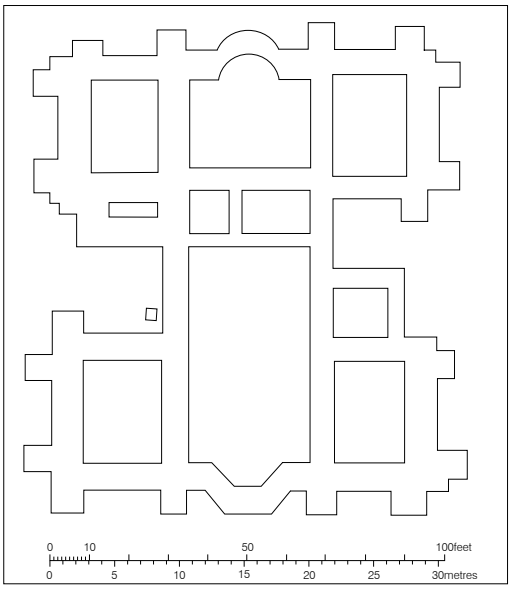


Figure 5. Fair copy of a plan of Sir Vincent Skinner's house built around 1607, apparently based on the findings of the first Earl Yarborough's excavations in the 1830s and now held in .the Muniments Room at Brocklesby Park.

The last building mentioned by de la Pryme is described earlier in his account as a 'large but somewhat low hall' located near the Chapter House and 'built out of part of the old buildings'; here, he records that it belonged to 'Lady Skinner, who lives in London.' This can be equated with Abbot's Lodge, a Grade I Listed Building which was last examined in detail 1967, but was not investigated in any detail as part of the recent research (Figure 6; labelled **d** on Figures 17 and 39). As the List description states, the farmhouse incorporates the ground floor of a monastic range of late 13th-century or early 14th-century date, comprising a vaulted undercroft of three by two bays, built of limestone rubble and squared blocks with limestone ashlar patching and dressings. The first floor, which was entirely rebuilt in the 17th century, employs ashlar with brick gables, stacks and upper sections to the west extensions. The building has long been known as Abbot's Lodge and this interpretation has been accepted uncritically by some later scholars (see, for example, Pevsner, Harris and Antram 1995, 760). However, this name may reflect a

Figure 6. Pencil sketch dated 1787, showing 'Abbot's Lodge' (probably the 'New Hall' built in 1313). The building was remodelled in the 17th century, probably to house Lady Anne Skinner (died 1707). Reproduced by kind permission of Lincolnshire Archives (YARB/11/2/4).

romanticised Victorian notion; Coppack (1991, 40) has argued that the building may have been the 'New Hall', whose construction is documented by the *Chronicle* in 1313, and that the actual abbot's lodging must have occupied the west claustral range.

It is unlikely that earlier owners of the site in would have done absolutely nothing during the 65 years before 1605 to modify the buildings they acquired. However, archaeology has provided some support for de la Pryme's suggestion that Skinner was responsible for the first major dismantling of the monastic buildings, presumably to obtain building stone for his new house. Clapham's excavation in April 1952 (see Section 4.1) uncovered a hoard of 23 silver coins and two thimbles, mostly assembled soon after 1578 but with a few later additions until about 1590 when the hoard was concealed, beneath a tile in the south cloister range (manuscript report held in site file AA30979/2a; Rigold 1967). This seems to imply that the building was more or less intact immediately prior to Skinner's acquisition of the site, raising questions as to how it had been used by preceding owners.

Vincent Skinner's grand house was undoubtedly short-lived and, based entirely on De la Pryme's moralising comments quoted above, the view that it was a showy but shoddily built 'gimcrack' has persisted unchallenged (*see*, for example, Pevsner, Harris and Antram 1995, 75). However, De la Pryme's version of events needs to understood in the context of his religious and antiquarian sympathies and consequent antipathy to Skinner. Skinner's biography has been researched in detail (Brocklesby 2008 unpublished; *see* also Jackson *c*1870); his life is worth examining, for it offers a context for the most dramatic physical changes experienced by the abbey site and an alternative perspective on de la Pryme's sanctimonious delight about the fall from grace of a 'new man'. Vincent was born about 1540 at Thorpe St Peter in southern Lincolnshire. His father, who had received Duchy of Lancaster lands at the Reformation, was a merchant and must have been fairly wealthy, since in 1557 Vincent was sent to Trinity College, Cambridge, obtaining his first degree in 1560, a fellowship in 1561 and a Master of Arts in 1564. In 1565 he went to Lincoln's Inn to study law. At Trinity, his colleagues were Thomas Cartwright, the greatest of Elizabethan puritans, along with Michael Hickes and John Stubbe, both also notable puritans. All four of them were at Lincoln's Inn and while there they published religious pamphlets together.

In the 1570s, Skinner came under the influence of Robert Cecil, later Lord Burghley, who was a Lincolnshire man, a former Cambridge student and a lawyer. Burghley, as Secretary of State, was a councillor to Queen Elizabeth along with Leicester and Walsingham. In 1583, Skinner was made Constable of Bolingbroke Castle and then of Lincoln. He was also a Member of Parliament and sat for Boston, where he was Recorder, in 1584, 1586 and 1589, and Boroughbridge in 1593, in every case with Burghley's support. He then left the employment of Burghley and until 1609 held the post of Auditor of the Receipt, the principal office in the Exchequer and a powerful position through which many of Skinner's predecessors had successfully lined their pockets. He was among the first knights dubbed by King James on 7 May 1603 (six weeks before the actual coronation), a rank which could have cost him as much as £8,000. According to the text that accompanied a later map of the site (Wallis 1870), Skinner bought the Thornton estate in 1602 for £3,000. It would appear that Sir Vincent acquired the property, at least in part, to reflect his newly-acquired status. The Soane Museum holds three drawings by the architect John Thorpe, which closely match the earthwork remains now visible on the ground to the north-west of the gatehouse (Roberts 1984; see also Section 6.1), as well as the plan of the foundations apparently recorded by the first Earl Yarborough in the 1830s (see Figure 5). Thorpe had also made extensive and detailed surveys for Lord Burghley and after working for Skinner went on to design such grand residences as Summerhill in Kent (about 1611) and the outer court of Audley End in Essex (about 1615) (Summerson 1966).

On 25 February 1611, Skinner had written that he hoped to pass his house on to his son, implying that the building was still standing at that point (Summerson 1966, 65). However, he may already have begun to experience financial difficulties by midsummer 1606, for a letter from a widow, Elizabeth Huggins, shows that he was in debt to her and others by that date (YARB/11/2/4). Returning to Brocklesby's research, in 1609 Skinner had raised a loan, using the house as security, from Margaret Winn, wife of the Edward who, according to de la Pryme, later took the building material for his house in nearby Thornton Curtis. By July 1610, Skinner had begun to shower his friend Sir Michael Hickes and even Burghley's son William (now Earl of Salisbury) with letters pleading for financial assistance. Since Hickes frequently levied interest of more than 15% on his loans (Smith 1977, 154-9), a measure of desperation must be inferred. Skinner's begging intensified until October 1611 but Salisbury distanced himself. It would seem likely that it was about this time that the house was lost, taking Skinner's hopes of avoiding financial ruin with it. In 1612, he was granted immunity from arrest for one year, but evidently this was not enough. On 28 February 1616, at the age of 76, Sir Vincent Skinner died, intestate, disgraced and owing about £10,000. He was buried the following day at St. Andrew's Holborn, 'out of Isaac Bringhurst's house in High Holborn', a debtors' prison. An interesting point emerges here: in view of the fact that Skinner was apparently already falling into serious financial problems before the loss of his house, we may conclude either that the timing of its disastrous collapse was a very unfortunate coincidence indeed, or perhaps that de la Pryme's version of events was erroneous. It seems plausible that Edward Winn may have dismantled the building, both to acquire materials for his own new home in Thornton Curtis and to offset as far as possible the bad debt left by Skinner mortgaging the property to his wife Margaret. On the other hand, it might be argued that the fact that Winn went to the expense of building himself a new house, rather than

taking up residence in Skinner's, would suggest that the building was uninhabitable when he took possession of it. The extant Thornton Hall, 2.4kms (1½ miles) south-west of the abbey, was begun some time after 1695 for Sir Rowland Winn and was described as newly completed in 1722 (Pevsner, Harris and Antram 1995, 761; Worsley 1986, 19). This building, drawn by Claude Nattes in 1797, presumably replaced the 'most delicate hall' built by his grandfather Edward more than a century earlier, which de la Pryme states had been reduced to foundations by 1697.

Skinner's wife and son declined administration of the estate, and in 1622 this authority was granted to Robert Marston, a Thornton lawyer. Vincent Skinner's only son, Sir William, had married Bridgett, the wealthy second daughter of Sir Edward Coke. On William's death at the age of thirty-three on 7 August 1626 (according to his memorial in Thornton Curtis church), his eldest son Edward inherited. Vincent Skinner's wife outlived both her husband and her son; she was buried at Thornton in 1633. Bridgett drowned while being ferried across the Humber in 1648. The 'Lady Skinner' referred to by de la Pryme, who was reportedly living in London in 1697, was undoubtedly Edward's wife Anne (*née* Wentworth), who died in 1707, having outlived her husband by fifty years; both are buried at Goxhill, near Thornton.

In 1720, Sir Robert Sutton, of Kelham in Nottinghamshire, purchased the estate from the Skinner family. A 1724 engraving by Stukeley (Figure 7) is the earliest of a wealth of depictions of the abbey compiled by successive Lords Yarborough in a scrap-book between the 1850s and early 1900s (Lincolnshire Archives YARB/11/2/4). It shows the rear of the abbey gatehouse, approached by three broad, straight, parallel paths that can all be identified on the ground as earthworks. A mound in the foreground, to

Figure 7. William Stukeley's 1724 engraving of the rear of the gatehouse, showing the remains of an avenue of trees. Note the gateway partly hidden by the intact tree; this is also visible, from the opposite side, on later depictions (see Figures 11-12) (reproduced from a print owned by Mr J Farrow; see also Lincolnshire Archives YARB/11/2/4).

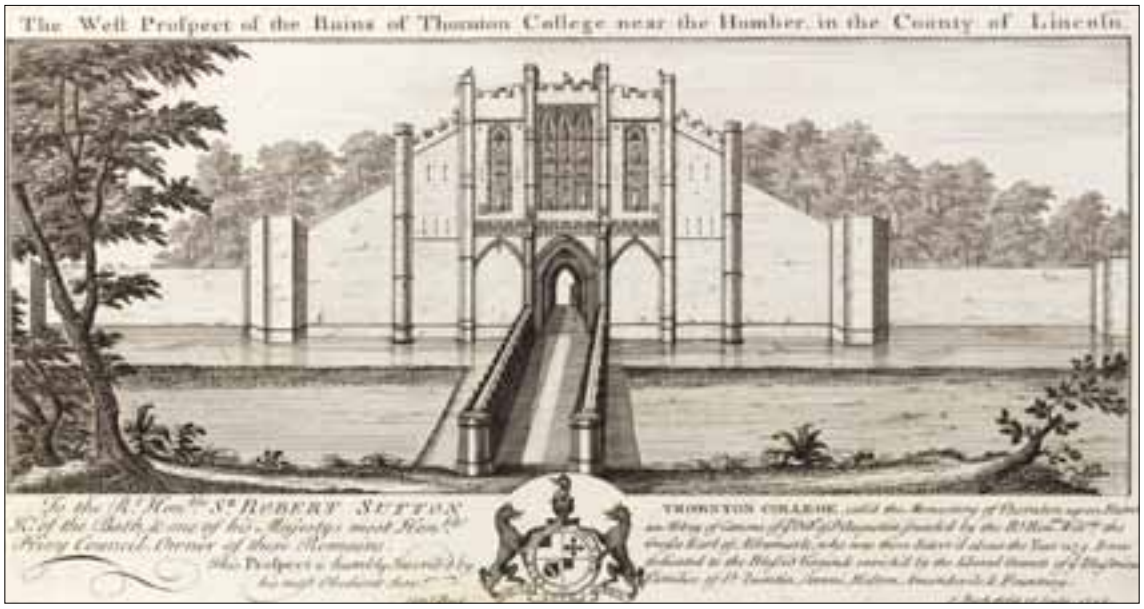


Figure 8. Samuel Buck's 1726 engraving of the front of the gatehouse. Note the deliberate distortion of the alignment of the barbican, which in reality is not perpendicular. (reproduced from a print owned by Mr J Farrow; see also Lincolnshire Archives YARB/11/2/4).

which two of the paths lead, may also represent a real earthwork, although it seems primarily intended for artistic effect (it is shown with a horse grazing on the summit). The southern path, which seems to correspond to the broad level path that runs between the gatehouse and the west end of the church, is flanked by an avenue of trees. All except one of these appear to have been crudely cut down, but this must be an artistic device, intended to frame and reveal the architecture. The height and girth of the 'surviving' tree would suggest that it had grown to maturity but was not particularly ancient, so it seems likely that these are the 'two rows of trees' mentioned by de la Pryme twenty-seven years earlier. In 1726 Robert Sutton commissioned an engraving from Samuel Buck, which shows the frontage of the gatehouse clear of overgrowth and retaining numerous sculptures, some of which appear to tally with those recorded by de la Pryme (Figure 8; see also Section 5.3). The engraving shows water standing in the moat on both sides of the barbican and the portcullis intact, but all this may be artistic licence, given that Buck chose to portray the barbican as being slightly angled to the north, when in reality it is angled to the south. In an engraving of 1727 by Millicent, contained in the Yarborough scrap-book, the avenue is visible through the gateway, while an anonymous newpaper cutting of about 1878 in the same collection states that the trees were later removed by one of the Suttons (Lincolnshire Archives YARB/11/2/4). The engraving shows only one of the three human figures shown on the battlements by Buck. Sir Richard Sutton, son of Robert, commissioned more engravings of the front of the gatehouse (Gale 1783), showing that the condition of the building remained virtually unchanged over the intervening period.

In 1792, George Uppleby of Barrow Hall bought the property. In 1797, John Claude Nattes painted three watercolours of the gatehouse and one of the chapter house as part of a series on the buildings of Lincolnshire commissioned by Sir Joseph Banks (*see* Figures 11, 21 and 24). The paintings give a good impression of the decay of the buildings; the gatehouse evidently lacked both its roof and its second (timber) floor at that date

Figure 9. William Fowler's March 1818 hand-tinted engraving of the front of the gatehouse, based on an earlier painting by his son Joseph. Comparison with the same view today shows that little has been altered since the first Lord Yarborough acquired the site in 1816. Fowler collection, volumes 3 and 4, Lincolnshire Museum Service archive at Normanby Hall. Reproduced by permission of North Lincolnshire Museums Service

(see Figure 21). In July 1798, B Howlett produced two engravings showing the east and west sides of the gatehouse; the text accompanying the latter seems to be the first to contain the suggestion, which was taken up by several later commentators, that a drawbridge lay between the two outer towers of the barbican (Howlett 1798).

Thornton Abbey under the ownership of the Lords Yarborough, 1816 - 1938

On Uppleby's death in 1816, the site was sold by his eldest son to the first Lord Yarborough, who acquired it with the express intention of protecting the remains from the damage being done by quarrying for road-stone (Boyle 1897, i). Baron Yarborough and subsequently his son, the first Earl, carried out a number of measures to conserve and display the monastic remains (see Section 4.2). The detailed elevation of the gatehouse painted by Joseph Fowler in 1818 and engraved by his father William in March of that year (Figure 9), along with the accurate floor plans made by William in May 1821 may have been instigated for the same reasons (Fowler collection, volumes 3 and 4, Lincolnshire Museum Service archive at Normanby Hall).

In passing, it is worth noting that a valuation of Yarborough's estates, which describes the state of the land around Thornton Abbey in 1823, mentions a 'Bellpit Plantation', whose location is uncertain (Lincolnshire Archives YARB 5/1/52).

Production of the Ordnance Survey's 1-inch to the mile scale map, surveyed shortly prior to 1824, was closely followed by C and J Greenwood's hand-tinted map at the same scale, surveyed in 1827-8 (Figure 10; Ordnance Survey 1824; Greenwood and Greenwood 1830). Both maps show that access to Abbot's Lodge Farm was at that time gained via a track leading through the gatehouse and curving gently south-eastwards to enter the farmyard on the north, suggesting that the 1st Earl of Yarborough must have

Figure 10. Extracts from (left) the Ordnance Survey 1-inch scale map, sheet 86, surveyed prior to 1824 and originally published in that year and (right) C and J Greenwood's map of the county, surveyed at the same scale in 1827-8 and published in 1831. Reproduced at scale, respectively from the 1824 Ordnance Survey map and by kind permission of the Trustees of Cambridge University Library.

Figure 11. Watercolour of 1797 by John Claude Nattes of the rear of the gatehouse, showing, in the foreground, a pedestrian gateway whose position corresponds, more or less, to the front door of the custodian's cottage built in 1900.

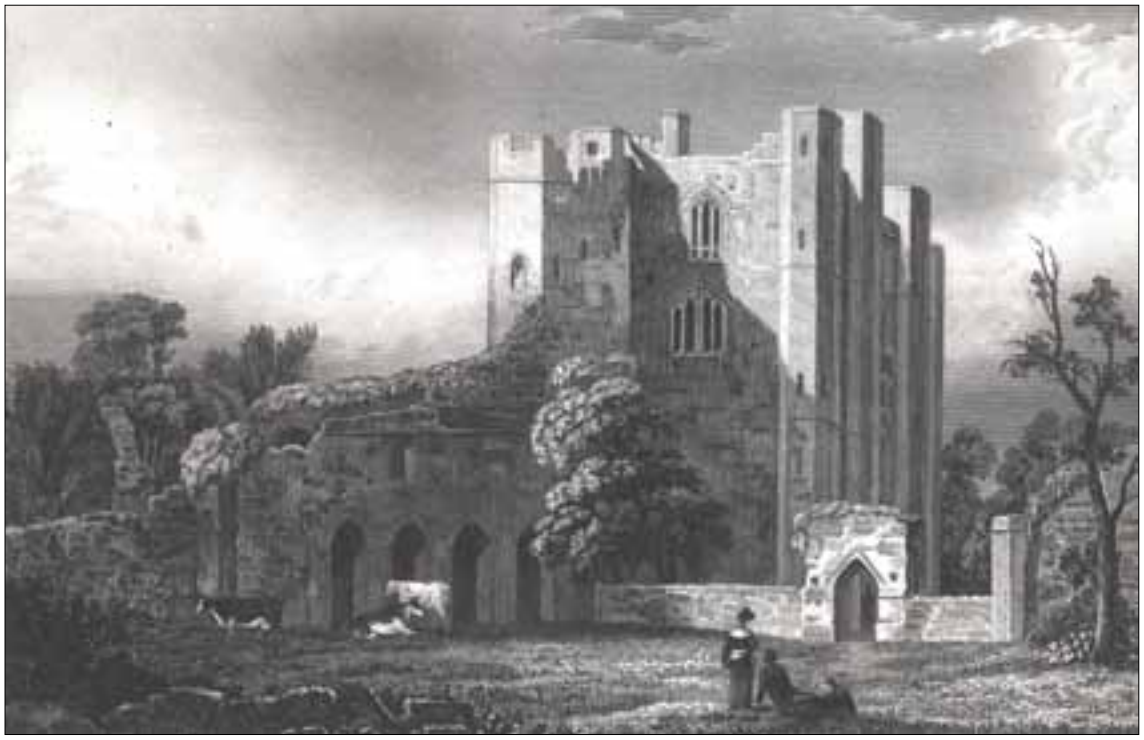


Figure 12. Rhodes and Watkins' 1832 engraving, showing the rear of the gatehouse from a persepctive similar to that of Nattes' 1797 watercolour.

constructed the present driveway before he began to expose the church in the early 1830s. The earlier route has been identified as an earthwork in the course of the 2007 survey. Both maps also show South Cloister Covert as managed woodland, indicating that the absence of trees on the 1887 Ordnance Survey map must represent an episode of clear-felling. The Greenwood map shows three routes converging on the gatehouse: one from from Barrow, one from Goxhill and one from Thornton Curtis (that on which the barbican is aligned), although the earlier map omits the first of these, which appears to have developed as a short-cut. The later map also employs a green tint for the whole area of the precinct within the moats, used elsewhere on the map to signify a private park or garden, which offers an interesting insight into how the 1st Earl of Yarborough may initially have conceived his future use of the site and perhaps the motivations underlying the excavations and conservation work begun in the 1830s.

An 1832 engraving shows details of the rear of the gatehouse and adjoining boundary wall, including a pedestrian gateway through the stretch of wall later destroyed by the insertion of the custodian's cottage in 1900 (Rhodes and Watkins 1832; Figure 12). This view had been painted from roughly the same standpoint by Nattes in 1797, but showing the boundary wall and gateway partly covered in ivy, suggesting that the first Lord Yarborough's conservation work in the early 1830s was extended to all the monastic ruins. A carriage gate a few metres to the east of the pedestrian gate, which appears on Stukeley's 1724 depiction, is shown blocked on the 1832 engraving and probably on the 1797 painting, though it is barely discernible on the painting. Coppack (1991, 40) describes the masonry as representing 'a ruinous structure', but while Nattes' watercolour hints tantalisingly at details not shown on the later engraving, the depictions give no clear indication that the stonework was part of an actual building.

One of the least known episodes in the abbey's post-Dissolution history, yet in terms of numbers of people and intensity of activity, one of the most significant, was its use for Temperance Society rallies in the mid-19th century. The Temperance Movement in Lincolnshire grew rapidly in support and influence during the first half of the 19th century. Essentially a radical movement, challenging many of society's accepted customs and standards, it drew mainly on the working class for its membership, but also on the middle and upper classes for support. Under its slogan of 'Rational Recreation', it provided alternative forms of leisure to the alehouse, including lectures, outings and excursions, and established reading rooms, libraries and local Temperance Halls (Russell 1987; Russell 2002, 49-61). The largest Temperance meetings in Lincolnshire (and probably in northern England) were mass rallies held at Thornton Abbey between 1848 and 1851.

The gatherings were initiated by a group of north Lincolnshire Temperance societies from Grimsby, Louth, Barton and Barrow, and were prompted by the availability of the abbey site as a visitor destination newly accessible by train. The first was held on 14th August 1848, shortly after the opening of Thornton Abbey station on the Manchester, Sheffield and Lincolnshire Railway. Held by permission of the Earl of Yarborough, it was billed as a Grand Temperance Gala. Contemporary newspaper reports estimated that around 4,000 people attended (3,000 by train) and mention games and talks by 29 speakers, one on the history of the abbey (Russell 1987, 49-50).

In July 1849 a similar event was held, this time involving a wider group of societies, with around 10,000 expected for what was seen as 'likely to be one of the largest musters of the temperance societies in England'. In the event, this goal was exceeded, with estimates of attendees ranging from 12,000 to 19,000, coming from throughout Lincolnshire and from Hull (including by special boat to East Halton Skitter). The railway company offered special fares for those 'embracing this Favourable Opportunity of visiting the Noble and Interesting Ruin, and realizing a day of rational Recreation and Cheap Enjoyment'. The campaigners' enthusiasm was not merely based on the convenience of the venue; the ruined abbey had an especially strong resonance for the Temperance cause and for its particular imagery and sentiments. Thus, the songs specially composed for the occasion combined expressions of gratitude to Lord Yarborough with romantic appreciation of the 'fair proportions' and 'antique store' of the abbey ruins, and triumphant exhortations to the 'moral revolutionist army' in their campaign to vanquish Alcohol 'the despotic tyrant king'. Activities were similar to those in 1848, but on a much larger scale: 'There were roundabouts, swing-boats, mechanical figures etc…stalls… Banners floated from the castellated front of the abbey, and from the stand and tents', there were 'bands of music… and ballad singers', and people entertained themselves with 'cricket, dancing and kissing rings, &c.' (Russell 1987, 53-5, 77; Russell 2002, 55-8).

In 1850 and 1851 the attendees of the 'Lincolnshire and Yorkshire Temperance Societies Annual Demonstration Grand Festival' came from even further afield: north Nottinghamshire, West Riding, Hull and East Yorkshire. In 1850 there were two events: the first on 29 July was reduced because of poor weather but went ahead with around 3,000 people, followed by another rally a week later attended by 12,000. In summer 1851, in addition to the abbey rally, there was a gathering at the Earl of Yarborough's park at Brocklesby, where Temperance Society supporters were joined by local gentry and clergy (Barton 1977; Barton 1984, 87). After this the large Thornton Abbey rallies appear to have ceased, with efforts directed instead at events in Grimsby and elsewhere, but there can be no doubt that the mass gatherings here had had a major impact on the confidence and promotion of the Temperance cause (Russell 1987).

The rallies at the abbey would inevitably have had some physical impact on the site, an issue that the organisers were well aware of. The 1851 poster announced that: 'The Earl of Yarborough has been pleased to give his special permission for these large gatherings to be held at this Favourite Resort of the Antiquarian and the Pleasure-seeker, with the conviction that the Principles of the Visitors are a sufficient guarantee for the preservation of order and the prevention of damage.' However, whilst there may have been general awareness of the need to avoid damage to the visible remains of the abbey buildings, it is unlikely that this concern extended to the earthworks. Indeed, judging by the Earl's archaeological excavations of the abbey and the various groundworks undertaken here by the Lincolnshire Volunteers (see below), the Earl took a fairly relaxed view of physical changes to the abbey grounds.

The nature of these impacts can be imagined from the lively and engaging contemporary reports. In addition to the 'omnibuses, postchaises…carts and wagons, gigs, spring carts, etc.' and fairground rides mentioned in the press, there must have been large scale provision of latrines and probably trackways or localised ground works to facilitate

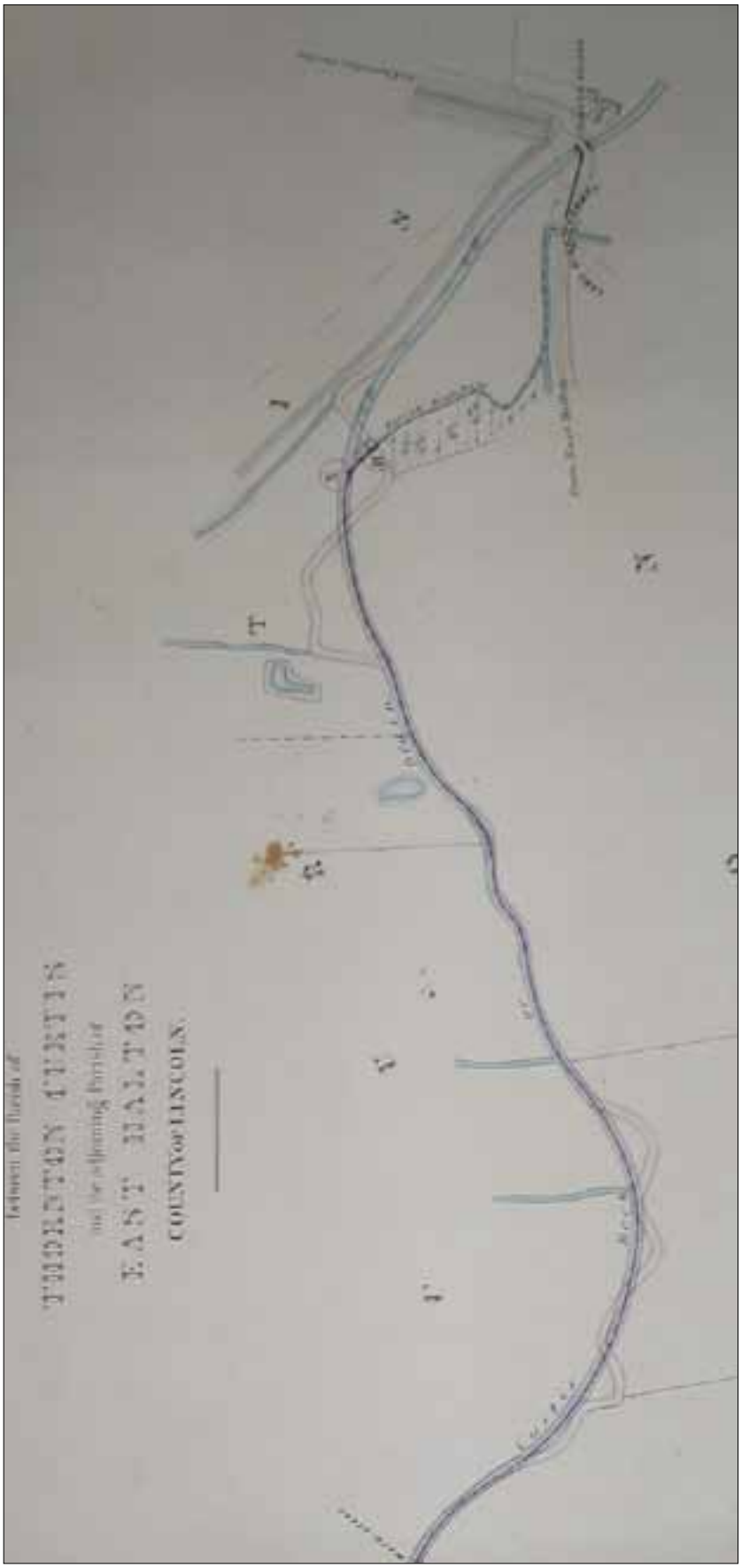


Figure 13. Plan of the course of the Skitter Beck in 1867, produced in order to resolve a parish boundary dispute. Note the two water-filled fishponds, which were both filled in with excavation spoil in the 1950s, and the pre-1867 course of the Skitter Beck, which itself appears to be partly artificial, shown in outline. Reproduced courtesy of Mr John Farrow.

access across the field by wagons carrying food and water supplies for both people and horses, as well as makeshift accommodation for horses. Thousands of visitors in a day, many of them in wagons or on horseback, and most of them in stout shoes, would have resulted in localised wear of the site, especially on occasions like 1850 when ground conditions were wet. The gatehouse too will have borne some impact, and it has been suggested that the wear on the wall-core rubble 'steps' in the wall passage of the southern gatehouse wing-wall (newly re-opened in 2007), and also perhaps some of the gatehouse graffiti, may have come from these mid 19th-century rallies (Atkins 2010). However, identifying specific features in the wider site that might be attributable to the Temperance rallies is not easy, and it may be that some were later re-used or overlain during the later visit of the Lincolnshire Volunteers

Throughout this period, the historic remains appear to have normally been kept open to visitors: in 1851, a guidebook was produced by a member of the Archaeological Institute (Anon 1851) and *White's Directory* for 1856 states that the ruins were 'shewn to the public by the occupant of the adjoining house', that is Abbot's Lodge.

A large-scale plan of a strip of land encompassing the Skitter Beck and some of the monastic reamins was accurately surveyed in 1867, in the wake of a parish boundary dispute; this is now in the possession of John Farrow of Abbot's Lodge (Figure 13). In the process of establishing the course of the boundary, the surveyors recorded both the old course of the beck (described in the accompanying Award as 'having been lately altered') and two ponds, at that time still containing water, that are undoubtedly of medieval origin. The 2007 earthwork survey indicates that one of these ponds was systematically filled in with spoil from the mid 20th-century excavations and the other partially filled (*see* Sections 4.1 and 5.12).

Each summer between 1866 and 1870, the 2nd Earl of Yarborough, as commander of the Lincolnshire Light Horse, hosted a week-long encampment of the Lindsey Battalion of the Lincolnshire Rifle Volunteers and Lincolnshire Light Horse. A detailed plan of the encampment made to commemorate the last of these events (Wallis 1870; Figure 14) shows that 180 bell tents for the men were pitched in the western half of Norcroft Close (this almost certainly corresponds to the parcel known as North Bail in the *Chronicle*), the eastern half serving as a parade ground. The men's mess tent and canteen were erected to the west of the church, perhaps necessitating the deliberate levelling of the surface that the degraded condition of the earthworks in this area strongly suggests to have taken place (*see* Section 4.1). Two small, rectangular, masonry buildings were located immediately north of the abbey church. These, which were apparently built as components of the encampment since they stood next to a cluster of tents of different types and sizes, survived until some point between 1886 and 1906 (Ordnance Survey 1887; 1908). By this date, the stretch of the western moat to the south of the gatehouse no longer contained water (at least in late June when the plan was made) and the watercourse that entered the moat immediately north of the gatehouse flowed northwards to join the Skitter Beck.

Although Wallis' plan of 1870 cannot be relied on entirely for its metrical accuracy, and was of course primarily intended to record the military event rather than the historic

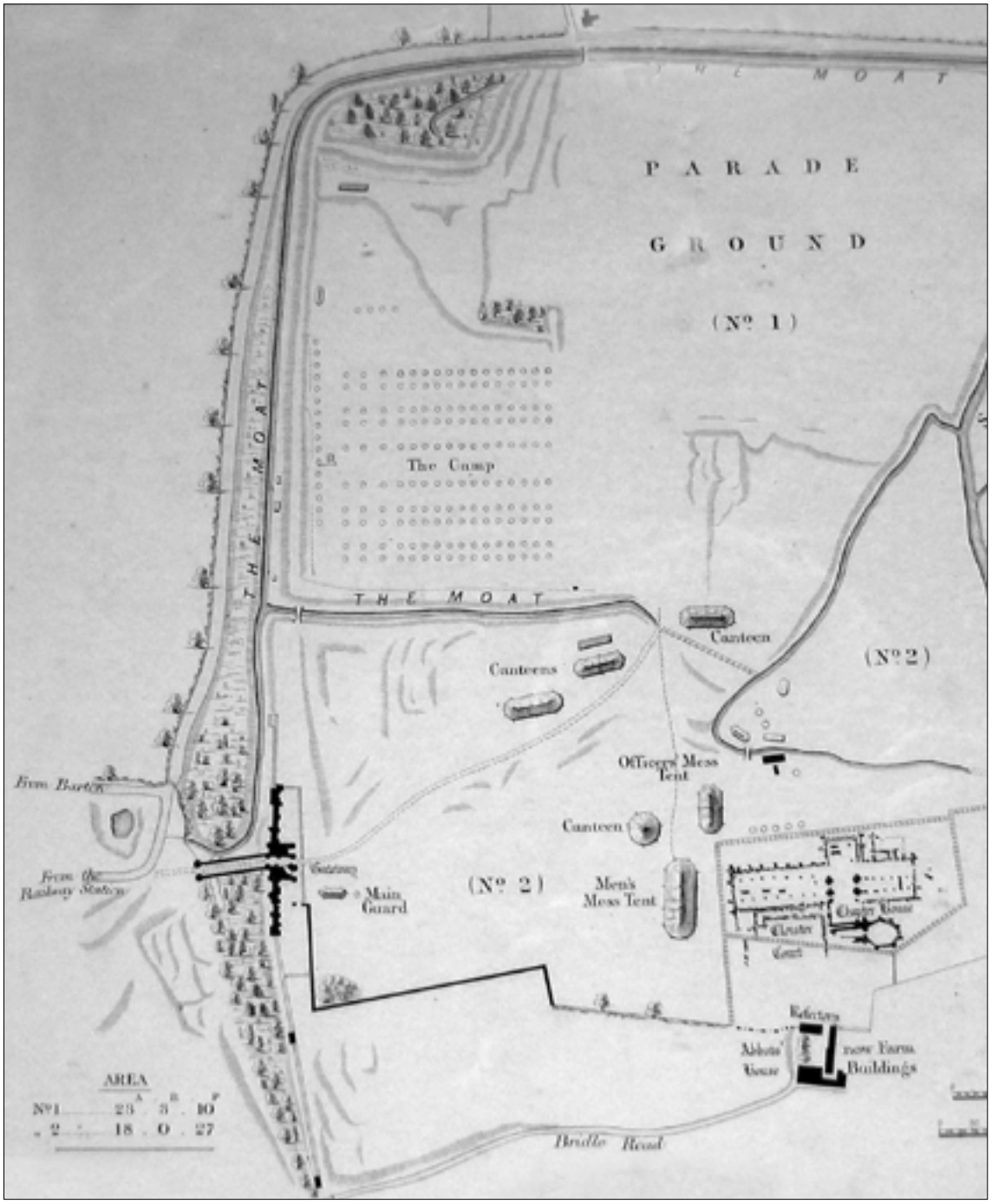


Figure 14. Extract from TW Wallis' poster of 1870, commemorating the summer encampments of the Lindsey Battalion. Reproduced by kind permission of John Farrow.

venue, comparison with the 25-inch to the mile scale mapping surveyed in 1886 (Figures 14 and 15) shows that minor changes occurred in the intervening years, including the planting of a small enclosed orchard, which still exists, against the south face of the surviving stretch of medieval wall, south-east of the gatehouse. Subsequent editions of Ordnance Survey mapping show that, other than the developments described in Section 4, there was little change up until the present day.

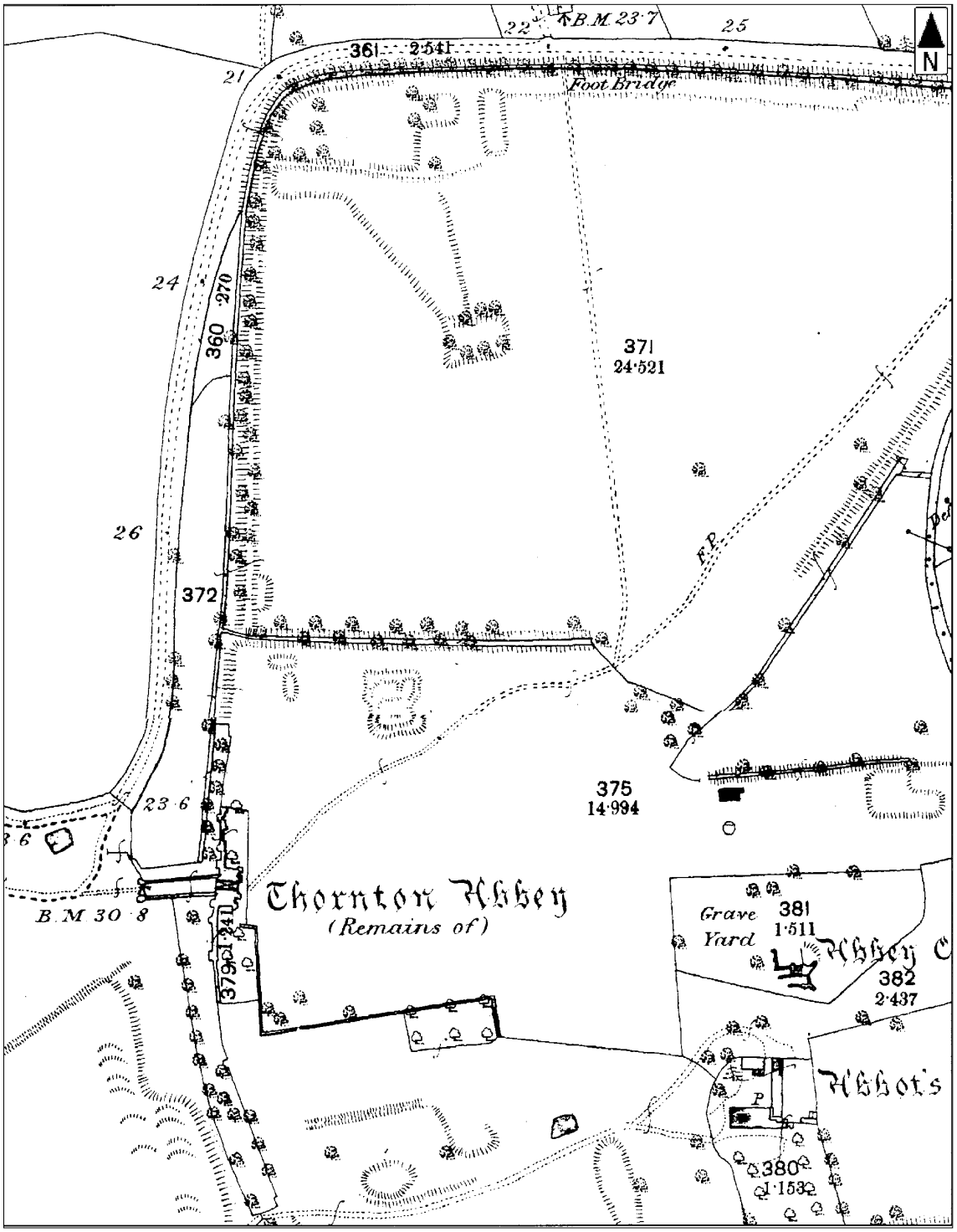


Figure 15. Extract from the Ordnance Survey 25-inch to the mile scale map surveyed in 1886 and published in the following year. Reproduced from the 1887 Ordnance Survey map.

4. EARLIER FIELD RESEARCH AND CONSERVATION WORK

4.1 Archaeological surveys and excavations

Within the first few years of his ownership, the first Lord Yarborough commissioned measured plans and elevations from William Fowler (Fowler 1818; 1821; *see* Figures 9 and 20). His son, the 1st Earl, began, probably after June 1832, to expose the foundations of the church, reportedly leaving the work incomplete in 1835 (according to an anonymously authored manuscript held in site file at English Heritage's archaeological store, Helmsley; Greenwood 1835, 17). The only publications arising from this investigation, indirectly, are depictions of grave covers uncovered in the abbey church and a list of the inscriptions (Greenwood 1836; Maddison 1911). As mentioned in Section 3.2, maps made a few years earlier suggest that the 1st Earl must have been responsible for diverting the track to Abbot's Lodge to its present line from its former course, which had led eastwards from the gatehouse, in anticipation of the excavations (Ordnance Survey 1824; Greenwood and Greenwood 1830). In 1852, the excavation of the church was completed and work on the northern half of the cloister begun by W H St John Hope (Lowe 1852; Alexander 1993, 120; see also 'Author's Foreword' in Binnall 1931). Members of Lincolnshire Architectural Society visited the excavations and were read a long treatise by the Reverend Frederick Pyndar Lowe (1852). In July 1878, the architect B Priestly Shires published a collection of plans, elevations and sections of the gatehouse for which he was subsequently awarded a silver medal in a national competition. (Priestly Shires 1878).

Plans held in the private collection of Lord Yarborough (*see* Figure 5) apparently indicate that at some point the remains of Vincent Skinner's house were also investigated, but these plans were not available for consultation during the period of English Heritage's research. The absence of any large or obvious spoil dumps may indicate that the work here was limited to exposing and cleaning the foundations, which might imply that they had already have been excavated to a considerable depth before this. However, while the foundations of the whole church (except the Lady Chapel) and the northern half of the cloister, exposed by Hope's excavations, were evidently still visible in 1870, those of Skinner's house were apparently not and Wallis' vague depiction of the earthworks here could indicate that the house had not been excavated at all by this date (Wallis 1870 and Figure 14). The First Edition 25-inch scale map surveyed sixteen years later, on the other hand, shows the earthworks representing the house foundations in their present form (Figure 15), which, if the accuracy of Wallis' plan can be relied on, would seem to indicate that the excavation took place within the intervening sixteen year span. Returning to the claustral buildings, the 1887 map depicts only the standing fragments of the Chapter House and does not depict any of the excavated foundations; the same is true of subsequent map editions made prior to the 20th-century excavations (Ordnance Survey 1887; 1908; 1932). However, a plan made in 1896 does show all the excavated foundations except the Lady Chapel and the southern half of the cloister (Hodges 1896). Binnall's description (1932, 47), on the other hand, indicates that the excavated foundations had become overgrown by that date.

An annotated site plan held in English Heritage's archaeological store at Helmsley and

documents held in the site file (AA30979/2 part 1) show that the Ministry of Works had planned the re-exposure and presentation of the church and conventual buildings from March 1936 onwards, in anticipation of the property coming into state guardianship on 17 February 1938. The Ministry evidently began to implement the scheme before the outbreak of the Second World War, but the site was closed to visitors soon after war was declared 'at the request of the military authorities', according to a letter of 17 September 1943 held in the site file. The site of a small shed, almost certainly belonging to this era, is discernible as an earthwork towards the north-east corner of the fenced enclosure around the church. Initial work may have included construction of a tramway for the disposal of rubble, which ran northwards from the chapter house, across the choir of the church, and then curved eastwards. The tramway embankment is visible, apparently in a grassed-over condition, on an aerial photograph of 21 September 1946, but clearly in active use on a photograph of 29 April 1947, implying that it had lain unused for long enough to become overgrown before work resumed (RAF 1946; 1947). The 21 September 1946 photographs further hint that clearance of the chapter house had been started, confirming a passing comment made by Clapham (1946, 174) early in the preceding July. By the end of April 1947, the rest of the chapter house, the north-east corner of the cloister and the whole church – in other words, everything that had been excavated previously by the successive Lord Yarboroughs – had once more been exposed by Clapham. Lists of coins and metal tokens (the only finds recorded) show that the actual excavations of the remaining southern part of the cloister eventually began in September 1950 and continued until September 1953, again under Clapham's direction. In the absence of any documented activity, the suspicion that Sir Vincent Skinner's house itself may again have been explored in the mid-20th century is difficult to substantiate, especially given that both earlier robbing and archaeological excavations are likely to have taken place there. The need for a new site guidebook stimulated a series of publications before the excavations of the early 1950s were completed, but in the fullness of time the archaeological findings were taken into account (Major 1946; Clapham 1946; 1951; Baillie Reynolds 1954; Clapham and Baillie Reynolds 1963; Rigold 1967).

Quite typically for the period, a letter of 12th April 1937 from Lord Yarborough's Estate Manager to the Ministry of Works, held in the site file (AA30979/2 part 1), proposes that if the workmen could '…cart the turf from the grass field, known as Abbey Field… into the corner where the water is now standing, adjoining the farmyard,… and spread it there, it would be better for all parties.' This particular spread of material cannot be pinpointed, but it is possible to identify other specific instances where the disposal of spoil from the 20th-century excavations has masked or distorted the form of medieval earthworks (see Figure 39). For example, an L-shaped pond to the north-east of the church, shown containing water on the 1867 parish boundary plan (see Figure 13) and as a dry depression on all Ordnance Survey mapping prior to the 1950s, is now barely discernible on the surface. The stretch of the tramway embankment mentioned above that lies outside the Guardianship boundary fence (a prominent bank, up to 0.7m high) terminates in a fan of overlapping tips which show that the depression was systematically filled in - a process which was apparently under way by 29 April 1947 (RAF 1947). To the west of Abbot's Lodge, another pond, shown holding water on all Ordnance Survey mapping prior to the 1950s, was similarly filled in. In this case, the tramway is less easy to discern, because for most of its length it followed the course of an embanked track which

had given access to the northern side of the farm buildings prior to the excavation of the southern half of the cloister (Ordnance Survey 1887; 1947). Other mounds in this area, clearly containing rubble and with a relatively fresh appearance, suggest that dumping continued in this area even after the boggy depressions had been filled. Two of the three ponds to the east of the church (Figure 39, **w1** and **w3**) have been partially infilled with spoil and here, too, the earthworks suggest that this may have been achieved by use of two tramways, one originating at the south-east side of the chapter house and another perhaps near the east end of the Lady Chapel. While it is known that the 1st Earl of Yarborough had put great effort into the clearance of the chapter house in the 1830s (*see* below), one of the ponds (**w3**) was depicted on the 1867 parish boundary plan and later Ordnance Survey map editions (*see* Figures 13 and 15; Ordnance Survey 1887; 1908; 1932), indicating that the infilling was associated with the mid-20th century works.

The excavations by the successive Lords Yarborough in the 19th century may have generated even greater quantities of spoil, for while they left the more deeply buried southern half of the cloister untouched at that stage, they did clear the chapter house, De la Pryme's 1697 account records that this building 'appears to be above half buried in its own ruins'; while consideration of Nattes' 1797 watercolour (Figure 24) and other depictions suggest that this is probably an exaggeration, it seems that the debris was at least a metre deep. It seems likely that spoil produced by Yarborough's exposure of the northern half of the cloister may have been dumped immediately to the south, thus burying the southern half more deeply, for the 1950s excavation unearthed a penny dating to 1806 or 1807 1 foot (30 cms) below the surface at the southern end of the west range of the cloister (according to a manuscript held in site file at English Heritage's archaeological store, Helmsley). The fact that considerable quantities of spoil were removed from the church in the 1950s may indicate that Yarborough had defined the plan of the building through a technique typically used at that period and often called 'wall chasing'; that is, digging cuttings not much wider than the width of the wall itself and leaving the intervening floor areas to be cleared in the 1950s. This said, the 1870 plan shows that Yarborough had also successfully located all the pillar bases within the body of the church, possibly initially by probing with a steel rod, and he also uncovered a number of grave slabs (Greenwood 1836; Maddison 1911). Though the spoil removed by Yarborough's excavations is less easy to pin-point than that produced in the 1950s, there are a number of amorphous mounds that may result from his work. The most obvious candidates lie to the north of the west end of the church and alongside the northern transept, where a series of mounds, interpreted by Coppack (1991, 40) as the remains of possible vestries and other buildings (Figure 39, **a** and **s1**), are surmounted by what might be small 'finger-dumps', suggestive of repeated dumping using wheelbarrows. Mound **s1** is topped by a cluster of mature hawthorns, a species which typically colonises disturbed and stony ground. In addition, it is tempting to relate the apparent deliberate grading of a low spread immediately to the west of the church to the placing of several large military tents here, as depicted on the 1870 plan (*see* Figure 14), in which case the spoil must relate to Lord Yarborough's earlier excavations. This spread corresponds quite closely with a patch of generally higher background resistance identifiable in the 1995 earth resistance survey, conceivably denoting a relatively high rubble content. Some excavation spoil may have been dispersed immediately around the outer edge of Skinner's house, as suggested both by ill-defined earthworks and another patch of generally higher

background resistance to the west of the house site, although it could equally result from earlier stone robbing. Clearly, identification of earlier features in all these areas is difficult through earthwork survey alone, but the 1995 geophysical surveys do hint at a number of anomalies which might relate to underlying medieval structures (see Section 5.8).

Field-walking south of the precinct, undertaken by Rex and Eleanor Russell in the summer of 1966, identified medieval brick, tiles, concentrations of cobbles, scatters of pottery spanning the 12th to 16th centuries and a fine, figured belt buckle. Although they were unable to pinpoint any foundations, they inferred that barns or other buildings may have existed thereabouts, a theory approved by medievalist Dr John Hurst (according to letters of 30 August 1966 and 9 August 1967 held in the site file: AA 30979/2) and supported by Keith Miller's observations of rubble spreads and platforms in the 1990s.

Coppack (1991, 42) refers to a trial excavation undertaken in the early 1980s by Gerry Pratt, adjacent to the wing wall north of the gatehouse. Although no other records of this work are known, what may be the site of the trench, together with associated spoil heaps, was identified during English Heritage's 2007 earthwork survey about 50m from the gate passage (Figure 39). Similarly sized and comparably located trenches cut through the terrace immediately north of Sir Vincent Skinner's house and across the same terrace where it runs eastward from the house (**x**), hinting that Pratt's excavations may have been more numerous. Other trenches that may represent undocumented archaeological excavations, including one across the width of the probable building **y4**, are indicated on Figure 39. Whether attributable to Pratt or not, the simple rectangular trenches, neatly dug and carefully laid out perpendicular to earthworks, and fringed by spoil heaps on both sides, are suggestive of 20th-century investigations.

In 1984, Glyn Coppack himself carried out a small-scale area excavation in the garden of the custodian's cottage prior to installation of a new septic tank, recovering quantities of mid-16th century occupation debris from several rubbish pits (Coppack 1991, 40; Atkins 2010, Appendix A). Coppack also instigated the earthwork survey undertaken at 1:1,000 scale in 1985 by Caroline Atkins, Denny Coppack and Janet Tully, reproduced here as Figure 16, which was supplemented in August 1986 by a plan of the barbican, gatehouse and fenced lawn to the east surveyed at 1:100 scale by Plowman, Craven and Associates. At intervals between 1984 and 1988, York University's Photogrammetric Unit took opportunities provided by the erection of scaffolding around the gatehouse (primarily to assess the condition of the stonework) to carry out a photogrammetric survey of the gatehouse. In 1994-5, further photogrammetry was carried out on the chapter house walls and church floor tiles. Detailed drawn records of the south gateway and so-called 'parlour' were also produced (copies of the latter are archived in the site file AA030979/2/pt9). At some unknown date an inventory of the masons' marks on the gatehouse and chapter house was made, reproduced here as Figure 22. Excavations in the locality of the custodian's cottage in 2007, in advance of the various services associated with the latest visitor facilities, exposed the foundations of a wall whose existence was already known from documentary sources (see Section 5.9, wall **f**). Caroline Atkins, who had been involved in the earthwork survey 22 years earlier, carried out these excavations on behalf of English Heritage (Atkins 2010).

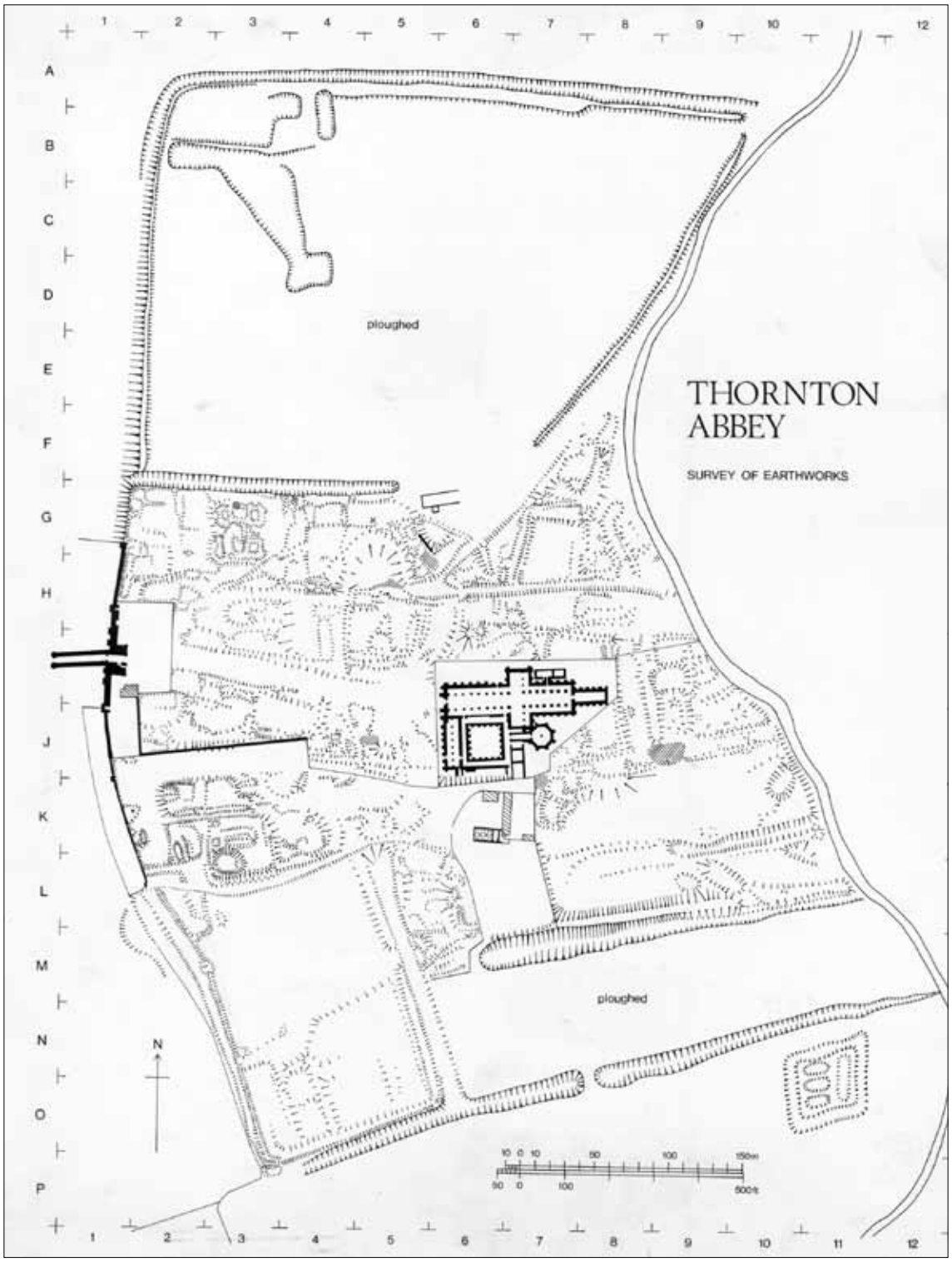
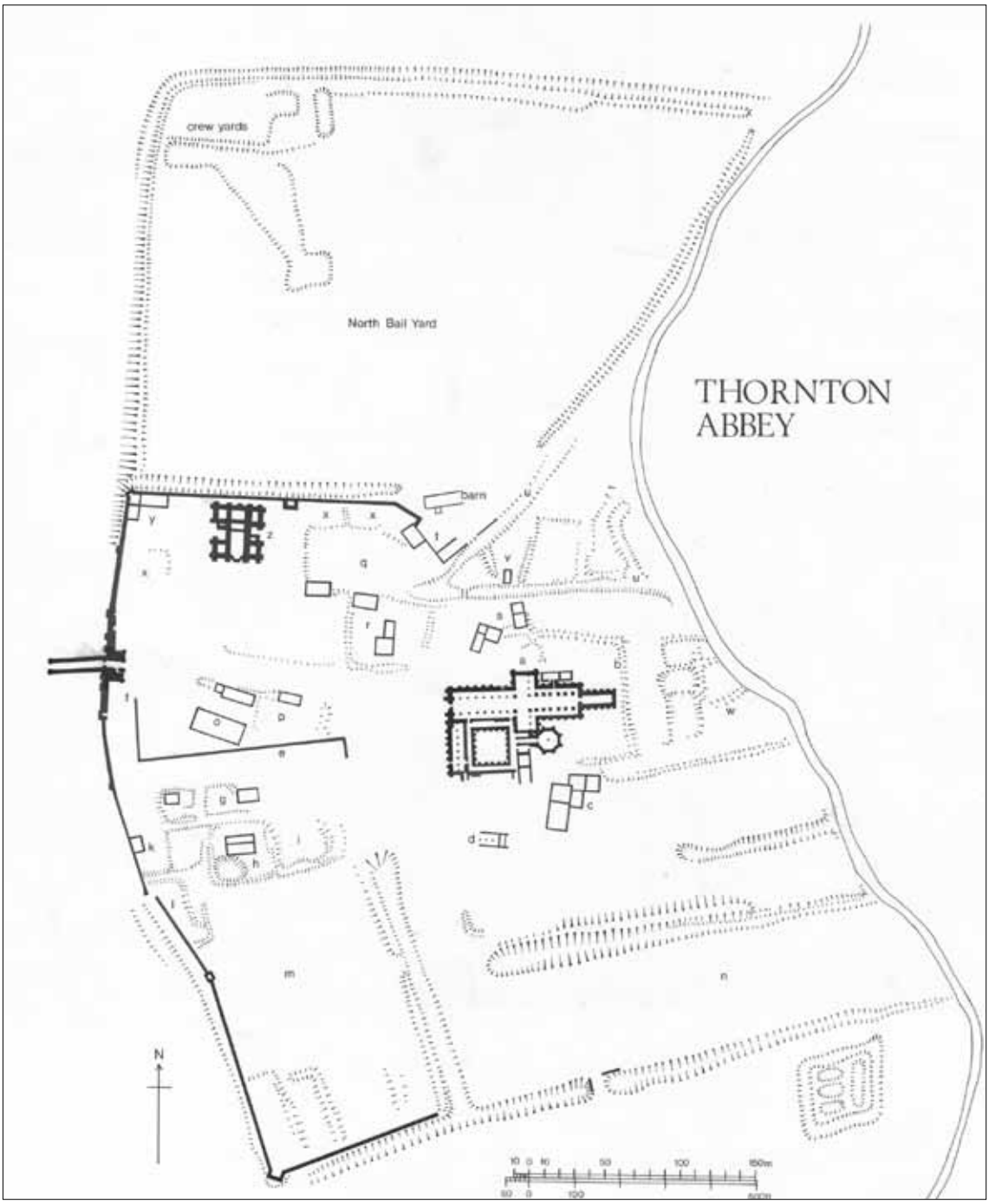


Figure 16. Earthwork plan made in 1985 by Caroline Atkins, Denny Coppack and Janet Tully, reduced from the original survey at 1:1000 scale, held in the English Heritage archives. Scarps topped by solid lines were transcribed from Ordnance Survey maps at 1:2,500 scale.

Figure 17. (opposite page) Simplified interpretative plan produced by Glyn Coppack based on the 1985 survey and further fieldwork in 1989. The letters used to denote individual features on this plan have been retained throughout the current report, with some refinements, to allow comparison of the findings. Reproduced from Coppack 1991, Figure 3.



The earliest oblique aerial photography was captured on 22 July 1948 by Cambridge University Committee for Aerial Photography, with a second sortie on 8 June 1951 (CUCAP 1948; 1951). Both sorties concentrated on the core of the site, so the images are less useful for features in the environs which were subsequently ploughed out (*see* Section 5.13). More oblique photographs, both black/white and colour (NMR 17295/8-10, 17310/24-26, 17319/10-20) were taken on 19 July 1999 (see Figure 2) and on 12 June 2009 (English Heritage Flight N707). The National Mapping Programme has mapped large parts of the county (Bewley (ed) 1998), but the programme has not so far included North Lincolnshire. An aerial survey of North Lincolnshire undertaken by Dilwyn Jones of English Heritage's Aerial Survey team focused on cropmarked archaeological sites, omitting the abbey because of the 1991 field survey.

4.2 Conservation and presentation by the Lords Yarborough, 1816 - 1900

According to contemporaries, the first Lord Yarborough's motivation in purchasing the site in 1816 was to protect it from stone-robbing. An 1835 engraving of the interior of the gatehouse shows that its roof, wooden floor and windows had been reinstated by the 1st Earl in the same campaign of work as the first excavations (Greenwood 1836, Plate 2). Scrub and ivy, which earlier images show covering the building to varying degrees, had evidently been removed in preparation for this. The reinstatement of the floors is reflected in the distribution and density of graffiti in the building's interior.

The single-storey custodian's cottage, constructed by the 4th Earl of Yarborough in 1900 (according to a stone over the door), was fitted into the oblique angle of the medieval boundary wall (**f**), evidently to minimise its visual impact. As a result, the cottage has a rhomboidal plan and its east wall incorporates medieval masonry, though perhaps reset. Its north (front) wall followed the line of the medieval wall (see Figures 11 and 12 and Section 5.10), but was built from scratch, in stone, with octagonal corner buttresses and other detailing in a Tudor Gothic style 'designed to harmonize as far as possible with architecture of the gatehouse' (Watt 1903, 143). The walls less visible to visitors are constructed in hard red brick. The cottage was accompanied by a lawn behind the gatehouse, surrounded by a cast-iron fence (replacing an earlier wooden fence shown on 19th-century depictions), both still in existence today. The lawn was framed by golden and green Irish yews and a species of ornamental red-leafed plum, apparently planted in a repeating sequence, of which only eleven now survive. Most of the slight earthworks within the fenced lawn seem to reflect post-medieval activity, including spoil-dumping, trackways and perhaps the creation of flower beds flanking the footpath to the gate.

Stukeley's 1724 engraving gives the clear impression that there was a path leading from the gatehouse to the church at that date and, prior to its diversion by Lord Yarborough *c.*1832, it appears that the drive to Abbot's Lodge, seen on earlier maps, in part coincided with this (see Figures 7 and 10). Both routes followed a 15m-wide level 'avenue' which is likely to be of medieval origin (see Section 5.4). However, it seems likely that a new footpath (perhaps surfaced with clinker, which was observed in 2010 in disturbed soil immediately outside the fenced lawn) was laid out in about 1900, for the route is first depicted and annotated as a 'footpath' on the Second Edition 25-inch scale map surveyed in 1906 (Ordnance Survey 1908). The mapped footpath is virtually undetectable as an earthwork but gives a strong magnetic response (probably reflecting the use of clinker; see Section 5.8.3). The gate in the cast-iron perimeter fence was set some 9m south of the direct line between the gate passage and the west door of the church, presumably to encourage visitors to pass via the newly built custodian's cottage.

The first or second Lord Yarborough was almost certainly responsible for planting a stand of horse chestnuts around the suggested site of the water mill (Figures 17 and 39, **t**). Tree-rings exposed when one of these trees fell over in 2009 indicate that it was nearly 190 years old at that point, in other words that the trees must have been planted soon after the first Lord Yarborough acquired the land. It is conceivable that the trees may have inspired the name Nutwood Close and Foreyard, which has been applied since at least the mid-20th century to the pasture between the gatehouse and the church. However, nutwoods are generally hazel copses, and the name may have earlier origins.

5. DESCRIPTION AND INTERPRETATION OF THE MONASTIC REMAINS

5.1 Overview (Figure 18)

The roughly rectangular block of land occupied by the abbey precinct and North Bail, covering some 30.2 ha (74.6 acres), was defined on the north, west and south by a series of straight, moat-like ditches, which could be broadly contemporary in origin with each other and with the construction of the gatehouse in the 1380s. This area seems sufficiently close to 'the park of 80 acres enclosed with pales or a wall' mentioned in Edward VI's grant to Bishop Rands of 1547 to suggest that the entire block was treated as a park at that date. On the east, it has generally been assumed that the perimeter was marked by the course of the diminutive Skitter Beck, but the new investigation may point to the former existence of a more impressive expanse of water in the valley bottom. The land within the outer perimeter was sub-divided by further moat-like ditches, which, with one exception, are probably of monastic origin. Both the 1995 geophysical survey and the 2007 earthwork survey focussed on the central part of the enclosed area, an area of pasture covering approximately 11 ha (27 acres), corresponding to parts of the medieval inner and outer courts. This is the core of the abbey complex, containing the gatehouse, an upstanding stretch of 14th-century wall, the ruins of the chapter house, the excavated foundations of the church, cloister and other buildings, and Abbot's Lodge (a 17th-century farmhouse which incorporates medieval vaulting thought to be the undercroft of the 14th-century 'New Hall'). Here too are the most numerous and complex monastic earthworks, representing the remains of further buildings, closes, ponds and so on, as well as the site of Sir Vincent's Skinner's early 17th-century house and gardens. South-east of the gatehouse, a large artificial mound is surmounted by an apparently self-contained compound with the remains of several buildings. To aid comparison with the 1985 earthwork survey (Figures 16 and 17), the same letters (**a**–**z**) have been adopted in this report, as far as possible, to denote specific earthworks, where necessary suffixed by numbers to distinguish between individual features in the same locality (see Figures 23 and 39). Geophysical anomalies are cross-referenced to these wherever possible, but are referred to by separate number sequences: [**M1-12**] for magnetometric anomalies, [**R1-17**] for earth resistance anomalies) because they do not correspond in every case to the earthworks (Figures 26-30).

North of the core of the abbey, an enclosure, probably that called North Bail in the *Chronicle,* has been under continuous arable cultivation since the mid-1950s. It appears, from Second World War aerial photographs, to have once contained broad ridge and furrow and a series of four closes, of which two contained buildings (see Section 5.13). In 2009, these earthworks were plotted from the available aerial photographs, considerably improving on Coppack's depiction, which was derived primarily from the First Edition 25-inch scale map (Ordnance Survey 1887). Although Coppack's interpretation of certain specific features here may need revision, his overall interpretation of the enclosure as the site of the abbey's home grange remains convincing.

Land to the south of the present drive to Abbot's Lodge was not surveyed in detail in 2007, but a rapid examination was made. This unsurveyed area includes Coppack's

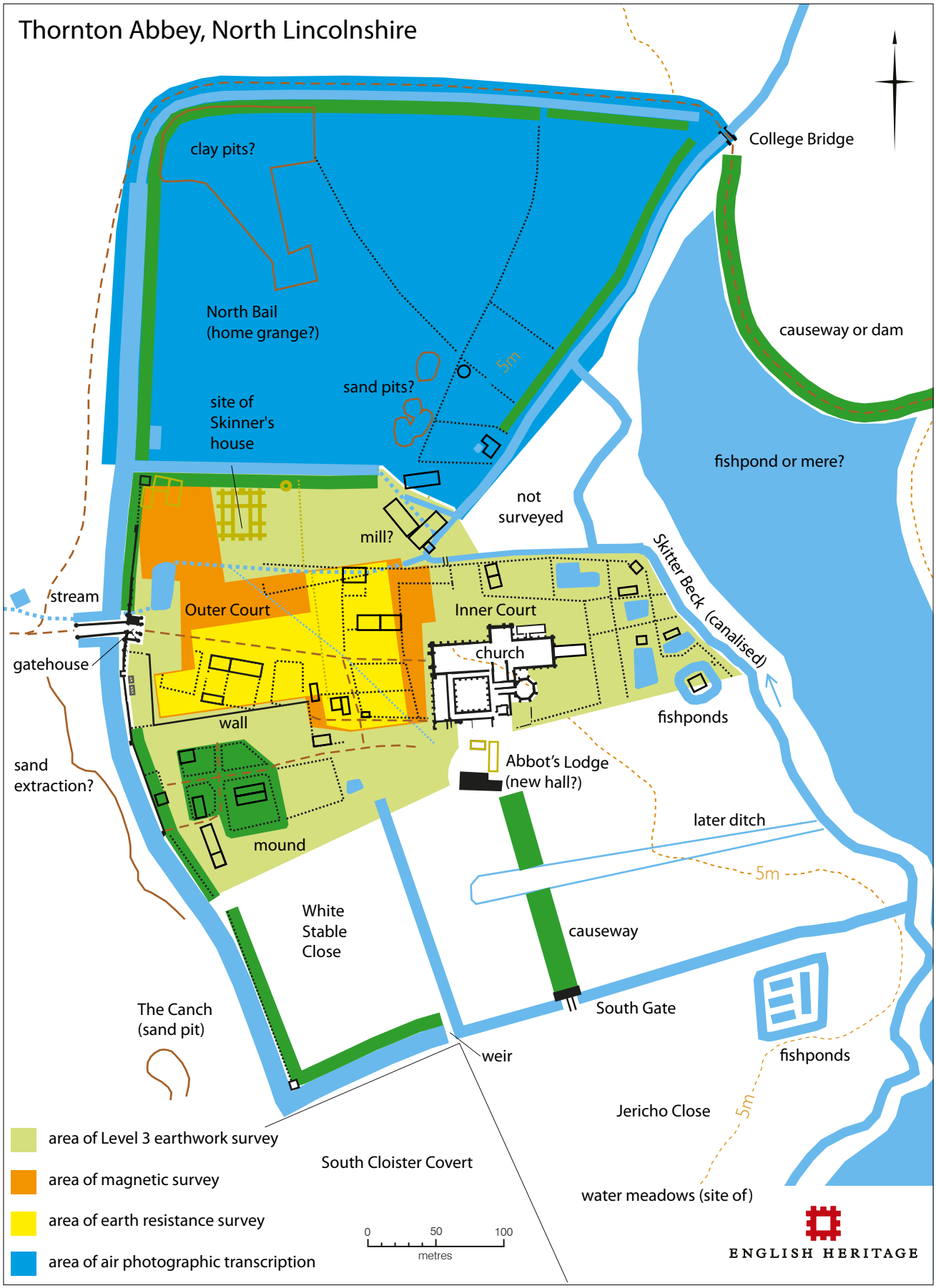


Figure 18. English Heritage schematic plan of the abbey.

enclosure **m**, historically known as White Stable Close (although the antiquity of the name is uncertain). This is currently under pasture, but has evidently been ploughed at some point (possibly in two separate episodes), rendering the surviving earthworks slight and indistinct. South of Abbot's Lodge itself, an unnamed field (**n** on Figure 17) which has been under plough since 1964 still contains degraded traces of what earlier aerial photographs show to have been the most robust earthworks (*see* Figures 33 and 34). These include a raised causeway leading to the abbey's minor southern gate, whose stone and brick piers still stand, though in a ruinous condition. Outside and just south of the moated perimeter, in a field known historically as Jericho Close, the onset of ploughing at the same date and subsequent deep under-drainage (in spite of objections expressed by local archaeologist Rex Russell, according to an exchange of letters held in the site file: AA 30979/2), evidently destroyed a very elaborate and well-preserved expanse of water meadows. The earthworks, which were interpreted by the then Inspector of Ancient Monuments M W Thompson as simple ridge and furrow, are recorded on earlier aerial photographs (*see* Figure 33). Though at face value the water meadows would seem unlikely to have been medieval, there are hints that monastic houses did, on occasion, construct earthworks to irrigate pasture (Bond 2004, 84). With the agreement of the Ministry of Works, the ploughing in this area left a complex arrangement of fishponds, comprising one large and three smaller rectangular ponds within a square moat, isolated within the arable land. Later investigators detected evidence for possible medieval structures in this locale. Further west, in South Cloister Covert, woodland management from at least the early 19th century is also likely to have confused or erased any earthworks that may once have existed there.

5.2 Moated boundaries and the possible mere

Most of the moat-like ditches are now virtually dry, but at a meeting in October 1987, at which a proposal to reflood the moats was under discussion, the landowner Mr John Farrow recalled that in his youth the water levels had usually been much higher, and that it had only rarely been possible to walk along the foot of the retaining wall running south from the gatehouse (minutes dated 29 October 1987 held in site file AA30979/2). A condition report of March 1936 (AA30979/2 part 1), along with all the available historic maps and the growth patterns of the roots of a line of mature beech trees planted along the outer edge of the moat to the south of the drive to Abbot's Lodge, confirm this recollection; the moats were still regularly flooded in winter well into the 1980s (information from Keith Miller). All the moat-like ditches were examined briefly in 2007, but none were surveyed in detail. Some, but not all, of the spoil resulting from their excavation appears to have been thrown inwards to form continuous broad, low internal embankments. The whole of the moat that surrounds the Outer Court and two of the arms crossing its interior might be broadly contemporary in origin with each other, taking into account their interdependence and the regularity of their overall plan. The only medieval documentary reference to moats suggests a link with the construction of the gatehouse in the mid-1380s. In 1389, money was paid out for building 'the walls and ditch [*fossato*] to the south of the gates'. The physical remains offer some circumstantial support for the inference that their construction, at least in the form detectable today, took place after 1322. Wall **e** seems to only slightly predate the spread of soil north of the massive sandy mound surmounted by buildings **g1**, **g2** and **h**, for which the most

obvious source is the adjacent section of the western moat. The spread on the north of the mound overlies **Track 3**, which appears to have become redundant in that year due to the southward expansion of the cloister. Although there is no conclusive evidence to support the theory, the moat that encloses North Bail might be a later addition to that surrounding the Outer Court. However, the North Bail itself was in existence in some form as early as 1303 (when the name of the officer with the same title is first recorded in the *Chronicle*), so if these arms of the moat are of late 14th-century origin, it seems likely that they would have replaced earlier, less imposing ditches (the evidence for the development of the North Bail enclosure is discussed further in Section 5.13).

The construction of the northern moated perimeter, or more probably whatever boundary preceded it, appears to have interrupted the east-west road across the valley, conspicuously forcing its diversion around the North Bail to cross the Skitter Beck at College Bridge (English Heritage 1992). Prior to this, it seems likely that the road would have followed a more direct route, perhaps following the edge of the lost watercourse mentioned in Section 2 that flowed into the Skitter Beck. However, no physical trace of this supposed earlier, more direct route can now be discerned, either because it was seldom used or because any surface traces have been erased by monastic land-use. **Tracks 6** and **7**, which seem to have come into existence late in the post-medieval period, effectively represent the re-assertion of the conjectural earlier route.

The Skitter Beck may have served to fill the eastern stretch of the moat defining the southern perimeter of the Outer Court and the arm of moat running northwards from it, particularly if the water level in the stream was artificially raised, as suggested below. However, a change in the level of the base of the moat, coinciding with an earthen weir (possibly once with a superstructure) at the south-eastern corner of White Stable Close, (enclosure **m**), would have made it impossible for the beck's water to flood the western reaches of the system. The moat-like ditches on the west must have penetrated the water table - especially given that the land was undoubtedly poorly drained by comparison with today - so that they collected ground water. In addition, as described in Section 2, a minor watercourse to the north of the spur on which the abbey was placed may have been directed into the moat at its intersection with the perimeter, which apparently lay immediately to the north of the gatehouse. Though this watercourse seems to have been lost underground, it re-emerged strongly on the surface during the floods of June 2007 and probably still feeds, to some degree, the pond (now often dry) to the north-west of the gatehouse. Lidar data suggests that, prior to its diversion into the moat, the lost stream woud have wandered across the low ground north of **Track 1** to join channel **u2**, which may be a modified remnant of the natural watercourse (Figure 3; *see* also Section 5.11).

Clapham (1951, 10) suggests that there was no culvert to allow water to pass under the barbican, but the 1870 plan of Lord Yarborough's encampment (Figure 14) appears to show just such a passage. It also shows, as does the 1887 Ordnance Survey map, a stream issuing from the nearby pond, entering the moat and then following it northwards, as the earthwork remains that survive today would also suggest. As proposed in Section 2, it is possible that this small, roughly circular pond was originally a 'blow well', either occurring naturally or artificially induced, like those of 19th-century

origin in the bottom of the valley of the Skitter Beck. If so, although the volume of water produced may have been greatly diminished by later land drainage, it could once have played a quite important role in the medieval water supply. The moat north of the barbican, though silted, still contains up to 0.3m of water. To the south of the barbican, the moat is now usually dry, although, as described above, there is ample evidence that it has usually contained water in the recent past. Buck's 1726 engraving shows the moats, rather implausibly, as being full to the brim and consequently fairly broad bodies of water (Figure 8). The surviving earthworks suggest that the water would not have been more than c.0.8m deep. Later drainage channels have been cut along the centres of these sections of the moat, that to the north of the gatehouse depicted on Wallis' 1870 map and subsequent Ordnance Survey mapping (*see* Figures 14 and 15). Buck's engraving also shows narrower arms of moat on either side of the barbican extending at right angles from the main moat; this is consistent with the form of the earthwork remains and with the existence of a garderobe on the outside of the northern tower of the barbican, since this could be expected to have discharged into a drain. Both to north and south of the barbican, levels taken on the base of the relatively narrow channels within the moat that definitely contained water prove that each arm slopes slightly downwards away from the gatehouse, back to confluences with the Skitter Beck. As a result, the relatively minor flow emerging from the lost watercourse could have been straightforwardly channelled in either direction to help manage the water level and quality. With a potential through-flow of fresh water, the moats could have served as large fishponds for a variety of fish species. Although in the popular imagination carp are dominant at monastic sites, they are well-known to prefer almost stagnant water and were probably a relatively late introduction to Britain, being imported from the Orient in the 1460s (Bond 2004, 205).

The North Bail is bounded on the east partly by the canalised course of the Skitter Beck, on the north and west by the moat-like perimeter ditch, and on the south primarily by an arm of moat-like ditch extending eastward from the perimeter (these are all still fairly well preserved and water-filled to some degree). These too were accompanied by broad, low internal embankments which, though still just discernible in places on the ground, have been degraded by ploughing since the mid-1950s. The ditch on the northern side, while broader than an average field boundary ditch, is not as broad or deep as the *bona fide* moats along the precinct's western side. The lesser depth may simply reflect a reaction to the topography, which slopes gradually down towards the Skitter Beck, so that less excavation would have been needed here to maintain a constant depth around the whole perimeter. The narrower width, on the other hand, seems to indicate the lesser symbolic importance of this stretch of the perimeter by comparison with the western frontage. Historic maps, of which the 1867 boundary plan is most detailed and informative (*see* Figure 13), and aerial photography both indicate that the ditch that forms the northern perimeter of the North Bail has not, at any stage in the period covered by these sources, linked above ground with the channel of the Skitter Beck. However, as water continues to flow west to east along this ditch, some form of underground culvert must exist; if coupled with a sluice, this would have allowed the control both of floodwater backing up the Skitter Beck and of the water level in the perimeter moats.

The provision of such imposing boundaries on three sides of the perimeter (although the northern ditch of the North Bail is somewhat smaller) begs the question as to how

the required barrier was formed on the eastern side. The channel of the Skitter Beck is now deep and steep-sided, having clearly been subject to repeated recutting and cleaning, indeed to judge from the relationship of the current channel to the footings of College Bridge, the beck appears to have been deepened by about 1m. Much of its current depth may be the result of the canalisation undertaken shortly before 1867, since a section of the relict course depicted on the 1867 plan can still be identified as a much shallower channel, running northwards from the supposed mill headrace (**u1**). There is some evidence that this pre-canalisation course of the Skitter Beck was itself the product of an earlier diversion. Despite its sinuous course, which is at first sight suggestive of natural meandering, the watercourse hugs the valley edge up to 2m above the valley floor. Along the more predictable line in the centre of the valley, which is evident from the Lidar imagery (Figure 3), a stream flows spontaneously following heavy rain. This diversion to the edge of the valley must have happened during the medieval period, since the modified channel passes under College Bridge, which is a late medieval structure. It has been suggested that it dates to the 14th century (English Heritage 1992), but the basis for such precision seems insecure. However, it is questionable whether this watercourse alone would have provided an adequate perimeter as has previously been assumed (Coppack 1991, 37). South-east of College Bridge, the road passes across an embankment up to 2m high, which acts as a causeway across the lowest ground in the centre of the valley (see Figure 3). There is nothing to prove that this earthwork is not a later addition, but it seems to be designed to partner the bridge, and would therefore appear to be of medieval origin. During the floods in June 2007, it became apparent that this embankment could also have functioned as a dam to retain a broad but fairly

Figure 19. The chapter house, seen from the north-east across the flooded Skitter Beck on 26 June 2007. The floodwaters were held back by the substantial earthen bank south-east of College Bridge, which carries the modern road across the valley and may once have acted as a dam as well as a causeway (see Figure 3). Photograph by Keith Miller.

shallow sheet of water in the valley bottom extending along the whole eastern perimeter of the abbey (Figure 19). Fishponds of this size, including ponds of natural origin, are not unknown: the Counts of Aumale stocked Skipsea Mere (English 1979, 208). Furthermore, similar artificial features - also called meres - were attributes of major castles between the early 13th and late 14th centuries. If contemporary with the moats, a mere might be in keeping with the date and architectural pretension of the gatehouse. Canalisation would have reduced the already naturally slight fall of the Skitter Beck, which must have entailed the introduction of a sharp fall somewhere downstream, but the full extent of the stream was not investigated. This change would have reduced the tidal influence while increasing the depth to which the adjoining moats could have been flooded. It would also have allowed the watercourse to remain navigable.

Two arms of the moat in the interior of the precinct are likely to be contemporary with the moated perimeter. One arm extends eastwards at right angles from the western perimeter moat, defining the boundary between North Bail and the Outer Court. This arm does not appear at first glance to have connected with the alleged tail race **u2**, but it seems likely that a conduit existed that is no longer straightforwardly recognisable as such on the surface (see Section 5.11). Some support for this theory is given by the anomalous oblique alignment of building **t**, which has been interpreted by Coppack as the abbey's North Mill. Alternatively, there may genuinely have been no connection between the two channels because such a direct link to the Skitter Beck would have made it less straightforward to manage water levels, particularly in the perimeter of the North Bail. The other arm of moat extends northwards at right angles from the southern perimeter. While this evidently served to divide White Stable Close from the land parcel to the east (Coppack's enclosures **m** and **n** respectively), it is unclear whether this was its main purpose. These 'dead end' ditches may have facilitated the catching of fish or water birds (it is worth noting that a 'keeper of ducks and wild fowl' was amongst the staff present in 1540). The ditches also presumably helped to drain the interior of the site.

One length of ditch in the interior, running westwards from the Skitter Beck south of Abbot's Lodge and now blocked at its eastern end, seems unlikely to be of monastic origin, though this has been assumed previously, Coppack (1991, 42) seeing it as the division between enclosure **n** and the field to the north where he concludes that the infirmary and other buildings must have stood. The ditch is anomalous in its form, for the channel has been carefully dug so that its base remains level in spite of the rising ground to the west, suggesting that it was intended to be flooded by the Skitter Beck. Unlike the other moats, spoil has been mounded up along its northern side to form a massive bank that increases gradually in breadth and height towards its western end, reflecting the increasing depth of the adjacent ditch. At its deepest point near its western end, the ditch reaches a maximum depth of around 5m, with the bank reaching a corresponding height. While the earthwork shares the alignment of the moated boundaries, it seems unlikely to be contemporary, for it interrupts the line of a broad causeway, degraded by continuing ploughing, leading northwards from the abbey's south gateway. This causeway, overlooked by the 1984 survey, is visible on early aerial photographs (see Figures 33 and 34), The prolonged survival of both the gateway (now ruinous) and the causeway, together with the 16th-century pottery found outside the gateway (see Section 4.1), suggest that this remained an access route until late in the life of the abbey, if not beyond,

from which it follows that the ditch may be of post-medieval origin. It is tempting to recall the 1547 grant's reference to 'the limits which Henry VIII divided off by walls and ditches' (*Calendar of Patent Rolls Edward VI* 1924, 153), but the ditch in question is clearly more than a simple boundary. In short, the purpose of this earthwork, which represents a very considerable investment of labour, is not at all clear.

5.3 The gatehouse and barbican (Figures 20 - 21)

The late-14th century gatehouse, designed with turrets and battlements in evocation of castle architecture and with a wealth of surviving sculptural detail, is the largest and most magnificent structure of its kind in England. In plan, it comprises a tall central block with narrow wings extending to either side. Shown unroofed, overgrown and partially ruinous by Nattes in 1797 (Figure 21), the decline of the building was reversed shortly before 1835 by the 1st Earl of Yarborough through reinstatement of the roof and wooden floors and removal of encroaching scrub and ivy (*see* Section 4.2). As described in Section 3.1, documentary evidence suggests that the construction of the gatehouse began in 1377 and was essentially complete by 1382, with the wing walls added by 1389. The *Calendar of Patent Rolls* 1897*, 166 (1381-5)* refers to 'a new building [*domus*] over and beside the gate', a form of words which may imply the enlargement of a pre-existing building. Recent observations of the structure could support the theory that there was originally a smaller two-storey building on the site, of which the extant porter's lodge set to the south of the gate passage (labelled 'G' on Figure 20) was part (Atkins 2010, 27-8). This may be significant, given that the centre line of what seems to have been the broad medieval way between the gate and the west front of the church, defined by the linear earthworks on either side of **Track 1**, is not aligned on the present gate passage, but fractionally to its south, in other words on what may be the site of the putative earlier building.

Throughout the building, magnesian limestone, and a smaller proportion of ironstone from the Lincolnshire Wolds, probably from the Nettleton/Thealby area (*see* Figure 4), was used for the quoins and detailing. The stones display a fine collection of masons' marks, which were systematically recorded at some point probably in the early 1960s (drawing held in English Heritage site file AA 30979/2, part 3 *see* Figure 22), Brickwork was used to form the walls and panels between, with limited use of chalk blocks (available locally at Barton-on-Humber and from the Lincolnshire Wolds). The fact that this was evidently rendered over originally, with some traces of plaster surviving, notably within the gate passage, indicates that the brick was not being used for decorative effect (*contra* Bond 2004, 335). Although the selective use of brick for quoins, dressings and vaults is known to have begun in the later 12th century, particularly in the Cistercian houses of eastern England (Bond 2004, 335), its use in the 1380s for the construction of almost an entire building would, until recently, have been thought to be remarkable and fairly early. However, reconsideration of the evidence from the region as a whole shows that some aspects of the gatehouse and its construction can be seen as entirely in keeping with contemporary trends (*see* Section 7).

Analysis of the surviving fragments of the gates by English Heritage has indicated that without totally dismantling what survives the timbers would not be susceptible to dendrochronology. A felling date for the timber and thus a precise date for the

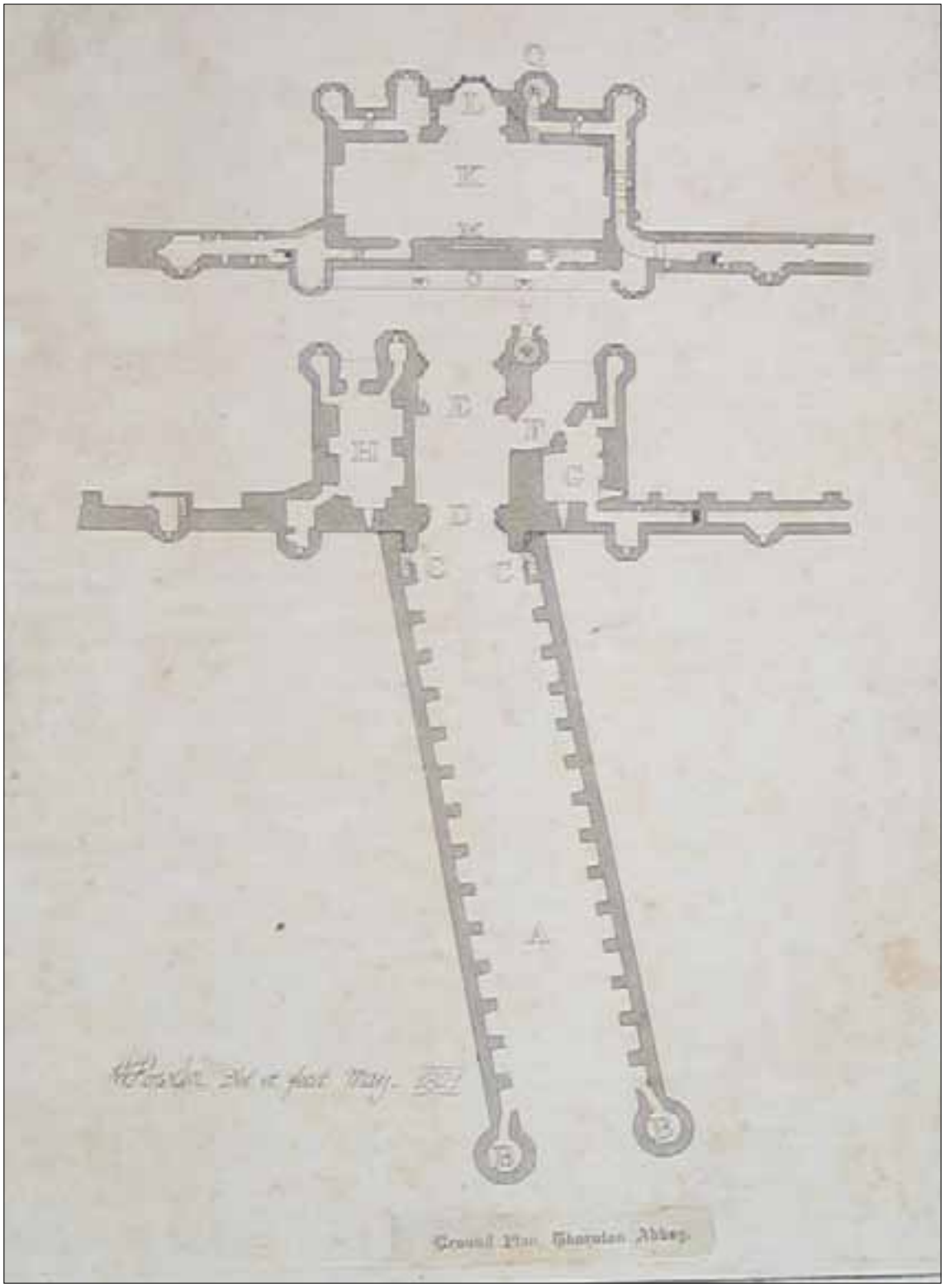


Figure 20. Plan of the gatehouse by William Fowler, surveyed in May 1821. The key to which the letters on the plan referred is now lost.
Reproduced by permission of North Lincolnshire Museums Service.

completion of the building cannot therefore be obtained. The examination did reveal, however, that the frame is constructed of imported Baltic oak, while the panels are of English oak.

In front of the gatehouse, a 36m-long barbican, built almost entirely in brick, spans the western perimeter moat; it was flanked by two narrower arms of moat, as shown, almost certainly in an idealised form, on Buck's 1726 depiction (*see* Figure 8); all these channels are now virtually dry, as described in Section 5.2. The structure abuts, and therefore clearly post-dates, the main building, but by how long remains a matter of debate, as discussed further below. As noted by previous investigators including Clapham (1951), the alignment of the barbican, which is not perpendicular to the gatehouse, follows that of the former road from Thornton Curtis. The stretch of this route east of Thornton Abbey Station has served only as a track since the imposition of the railway. The historian C C Hodges interpreted the skewed angle of the barbican as a defensive device, intended to prevent a direct line of fire through the gate (Hodges 1896, 7), an explanation which seems inadequate in the light of other observations about the building. Both of the barbican walls incorporate internal arcading comprising thirteen covered recesses, each with a central cruciform arrow loop. The arrow loops in the southern wall are generally much better preserved (conceivably reflecting Lord Yarborough's sensitive conservation work). Each wall was surmounted by a crenellated wall-walk, reached via stone stairs at

Figure 21. Watercolour of 1797 by John Claude Nattes, showing the first and second floors of the interior of the gatehouse, seen from the north-west.

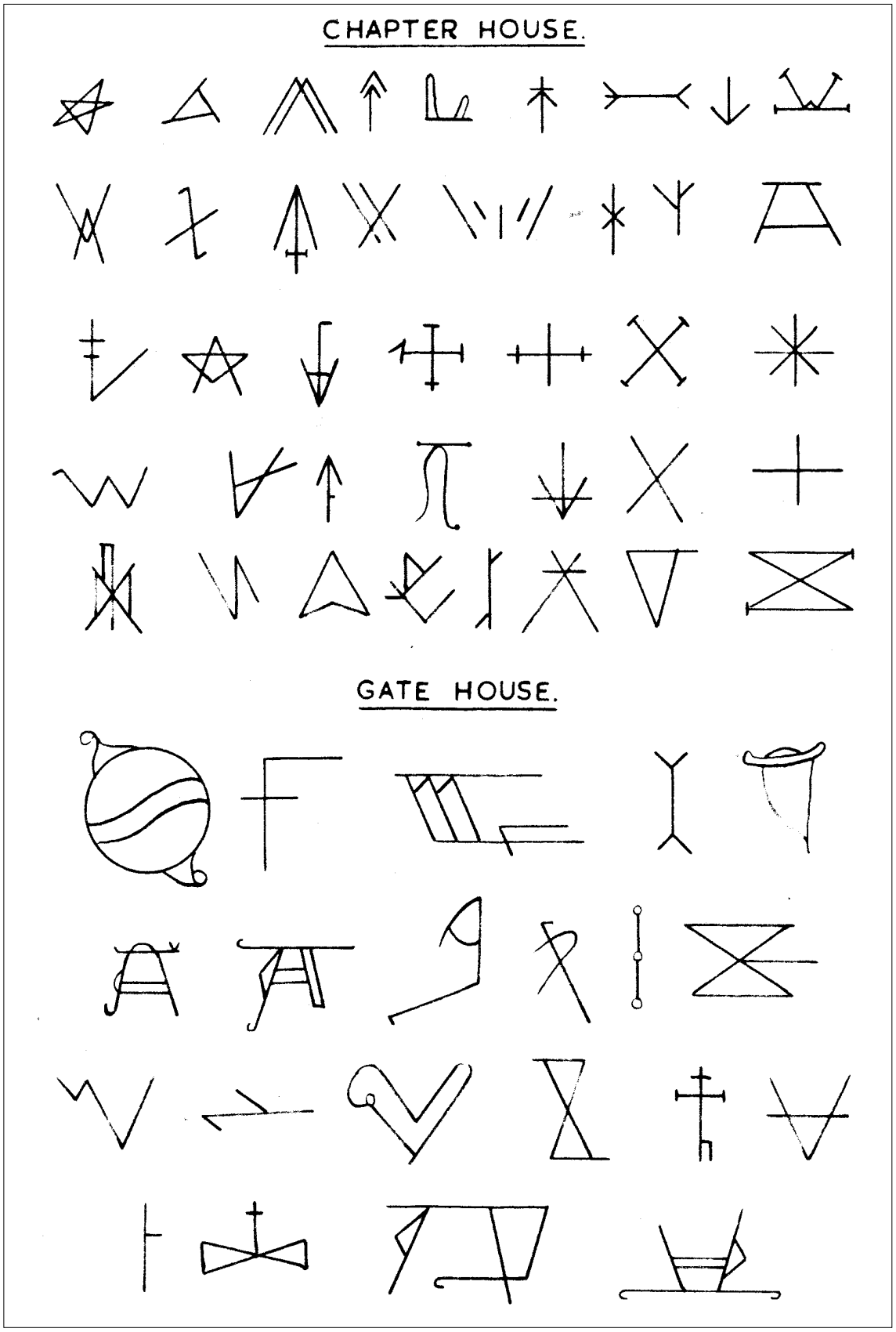


Figure 22. Record of the abbey's masons' marks, made by an unknown researcher at some point in the early 1960s, held in English Heritage site file AA 30979/2, part 3.

the eastern ends, and each terminates to the west in a low round tower. The floor level in the southern tower is below ground level, while that in the northern is 0.9m above, and the stone heads of their doorways differ in style from each other. The northern tower has a single circular tube some 8cms in diameter and 40cms long, fashioned out of two abutting stone blocks, pointing directly across the gate passage. An undated 19th-century etching shows the mirror image of this feature in the opposite tower, but this appears to be artistic licence, for there is no evidence that such a feature ever existed here (etching held by North Lincolnshire Museums Service, Normanby Hall, Fowler Collection). The genuine aperture, which was interpreted by Clapham as a gun-loop, is about 1.6m above the roadway, but only 0.7m above the higher internal floor; this, together with its considerable length and small diameter, makes it entirely impractical as a gun-loop. It may simply have served as a spy-hole or speaking-tube to allow a porter to communicate cautiously with visitors. Although 18th- and 19th-century depictions show that wicket gates were eventually hung from the towers, there is no convincing evidence that gates formed part of the original design. This led Clapham (1951, 10) to infer that there may have been a drawbridge here, a proposal which has been taken up by later authors (English Heritage 1992), although there is almost equally little supporting physical evidence. A more convincing option for a barrier here is suggested by the greater wear along the lower edge of the circular hole, perhaps indicating that a rope or chain was stretched between the towers, operable by someone concealed and protected within the northern tower.

Clapham (1946, 174) initially suggested the barbican to be a 15th-century addition, pointing to the existence of the supposed gun-loop, a theory which was followed by later scholars (for example, Pevsner, Harris and Antram 1995, 757). However, even if this interpretation of the tube were correct, more recent research has shown that the earliest gun-loops were created in the 1360s. Clapham later revised his proposal, apparently based in part on the conclusions of earlier scholars, and suggested that it was added by one of the Tyrwhitt family in the 16th century, perhaps by Sir Robert in the years between 1588 and 1592 (Parker 1846, 360; Watt 1903, 144; Binnall 1932, 46; Clapham 1951, 10-11), and this opinion has also convinced some later scholars (including Rigold 1975, 376). The lack of any provision for the addition of the barbican in the original construction of the stone plinth of the main gatehouse certainly indicates that its construction was not anticipated at the outset. However, the brick and stone of which it is constructed is indistinguishable from that used in the main gatehouse and shows none of the usual symptoms of re-use. The only suggestion that that the brickwork might be later comes from the 'cogged' course above the internal arcades, a decorative deployment that contrasts with the plain, utilitarian use of the material in the main building. Fundamentally, however, the ornamental style of the architecture is not really distinct from that of the main gatehouse, with its military trappings. In conclusion, Thornton's barbican may, like the gatehouse itself, be of late 14th-century origin.

The gatehouse has been called a *folie de grandeur* (Clapham 1951, 4) and a 'peculiar combination of the domestic and the potentially military' (Pevsner and Harris 1989, 73) but such expressions arguably miss the mark in their stress on the outlandishness of the architecture. Rather, the appropriation of military design, yet in a style that could not be confused with castle architecture, was essentially the idiom of monastic gatehouse

design. Many major English monasteries built great gatehouses and walls in the 14th century, and between the late 13th and early 15th centuries, more than thirty acquired licences to crenellate (Bond 2004, 122). At the Benedictine Abbey of St Benet's in Norfolk, for example, the precinct wall built in the 1320s overlooked a perimeter moat, and this wall too was embattled and pierced by arrow slits, at least where it flanked the gatehouse (RCHME 1994). Here too, the wall made use of brick around the apertures (the majority of the wall being built in locally available flint). Opinion is divided, however, as to how important these features were in defensive terms. Eruptions of violence, such as the Peasants Revolt of 1381, must have encouraged landholding institutions to protect themselves. At the same time, these buildings celebrated in architecture the wealth and feudal authority such institutions enjoyed. The gatehouse at Thornton is almost unique among surviving abbey gatehouses in having had a portcullis. At Battle Abbey, East Sussex, a smaller portcullis, which (along with a *meutrière* or 'murder hole'), protects the passage that gives access to the major first- and second-floor rooms in the gatehouse, shows some signs of use. At Thornton, however, the soft stone shows no obvious signs of wear, suggesting that the portcullis was seldom, if ever, used. The main timber gates were hung at the inner end of the gate passage and the presence of stone benches alongside the passage indicates that this roofed space, sheltered from the wind, would almost certainly have been used for the distribution of food to the poor. With the main gates recessed, the provision of a barrier at the outer end of the gate passage must have been considered only prudent to protect the main gates from otherwise virtually indefensible close-range attack and to prevent undesirables, whether overtly hostile or otherwise, from gaining unrestricted access to the underbelly of the gatehouse. The portcullis could be raised and lowered from the first floor of the gatehouse without the need for a porter to go outside the main gates. On the other hand, to consider the defensive potential of the gatehouse in isolation risks overlooking the fact that some of the rest of the abbey's perimeter was weakly defended by comparison.

Whatever its strength as a fortification, the gatehouse at Thornton was also a piece of architectural theatre, arguably the most conspicuously contrived component of a wider 'designed landscape', as discussed in Section 7. Although De la Pryme's 1697 description of the barbican is uninformative, his account of the gatehouse is worth quoting in full:

> *There is all the gaithouse yet standing, of a vast and incredible bigness, and of the greatest art, ingenuity, and workmanship that I ever saw in my life. There is four or five images [that is, statues], standing in front thereof, of excellent simitry and workmanship, and upon every exalted or turreted stone in the battlements of the gatehouse, and on the top of the turrets, stands images, from the middle, of men holding swords, shields, poleaxes, etc., in their hands looking downwards; and I was told that upon the battlements of the whole college, when it was standing, was innumerable statues of the greatest ingenuity and workmanship imaginable, some in shape of soldiers, others of astronomers, others of carpenters, others of all trades and sciences, so that, looking up, the battlements of all the whole building seemed to be covered with armed men. There are abundance of images yet, in various places of the gaithouse, of dogs, bulls, bears, foxes, lions etc.*

Images of the patrons of the abbey – including those of the Virgin and St Augustine – still occupy the façade, although these have been cut down to fit the niches in which they stand and are therefore likely to have been brought from the church, presumably at some point after the Dissolution. Indeed, the apparent dominance of secular imagery recorded by De la Pryme may give rise to a suspicion that many of the figures he mentions may also have been substitutes introduced at some point after the iconoclasm that followed the Dissolution. Some of the allegorical representations would be very much at home in a Elizabethan or Jacobean secular context.

Neither the physical remains of the gatehouse nor documentary evidence associated with it reveal what the interior was used for. Clapham followed Boyle in suggesting that the building had served, at least by the 16th century, as the Abbot's lodging (Boyle 1897, 32; Clapham 1951, 8). Writing after Clapham's death, Baillie Reynolds (Clapham and Baillie Reynolds 1956) later cast doubt on this, agreeing instead with the author of an earlier guidebook who interpreted the building as a guesthouse (Section 3 in Binnall 1931). This was based on the fact that in 1284, and again in 1322, the king reserved the right to appoint 'one servant to keep the gate and another to keep the guest house', hinting that guest accommodation may have been contained within the same building (*Calendar of Patent Rolls* 1893, 122; *Calendar of Close Rolls* 1895, 619). In this context, it may be significant that recent examination of the porter's lodge identified modifications perhaps intended to cater for a more self-sufficient full-time porter, including a recess capable of containing a bed, the installation of an oven and new or improved access to a garderobe (Atkins 2010, 27-8). However, there are no kitchens or service chambers to suggest that the gatehouse contained a grand domestic space of any sort. A more likely alternative was that it served an administrative purpose as the seat of the abbey courts or exchequer, the former function reflecting the gatehouse's significance as a building on the threshold between the secular and religious worlds, for which there are numerous parallels elsewhere, often resulting in the survival of the gatehouse well beyond the Dissolution.

5.4 Routes eastward from the gatehouse (Figures 23 and 39)

As mentioned in Section 4.2, the direct path currently followed by visitors between the gate in the fenced garden at the rear of the gatehouse and the site of the west door of the church was probably resurfaced with clinker in about 1900 when the custodian's cottage was built and the adjoining fenced garden laid out. A strong magnetic response (*see* Section 5.8.3, anomaly [**M7**]) corresponds to the line of the footpath, which was first depicted on the Second Edition 25-inch scale map surveyed in 1906 (Ordnance Survey 1908). Maps surveyed at smaller scales in the 1820s show that prior to Lord Yarborough's excavations in the early 1830s, access to Abbot's Lodge was gained via a track leading through the gatehouse passage and then curving gently across the south-west corner of the (then buried) cloister to enter the farmyard at its north-eastern corner (Ordnance Survey 1824; Greenwood and Greenwood 1830; *see* Figure 10). A low, spread bank, which overlies earthworks that are almost certainly medieval and gives a strong magnetic and resistance response, probably represents the line of the central part of this route (**Track 8**). At the western end of the bank, where there would presumably have been some form of graded ramp to allow the track to cross the

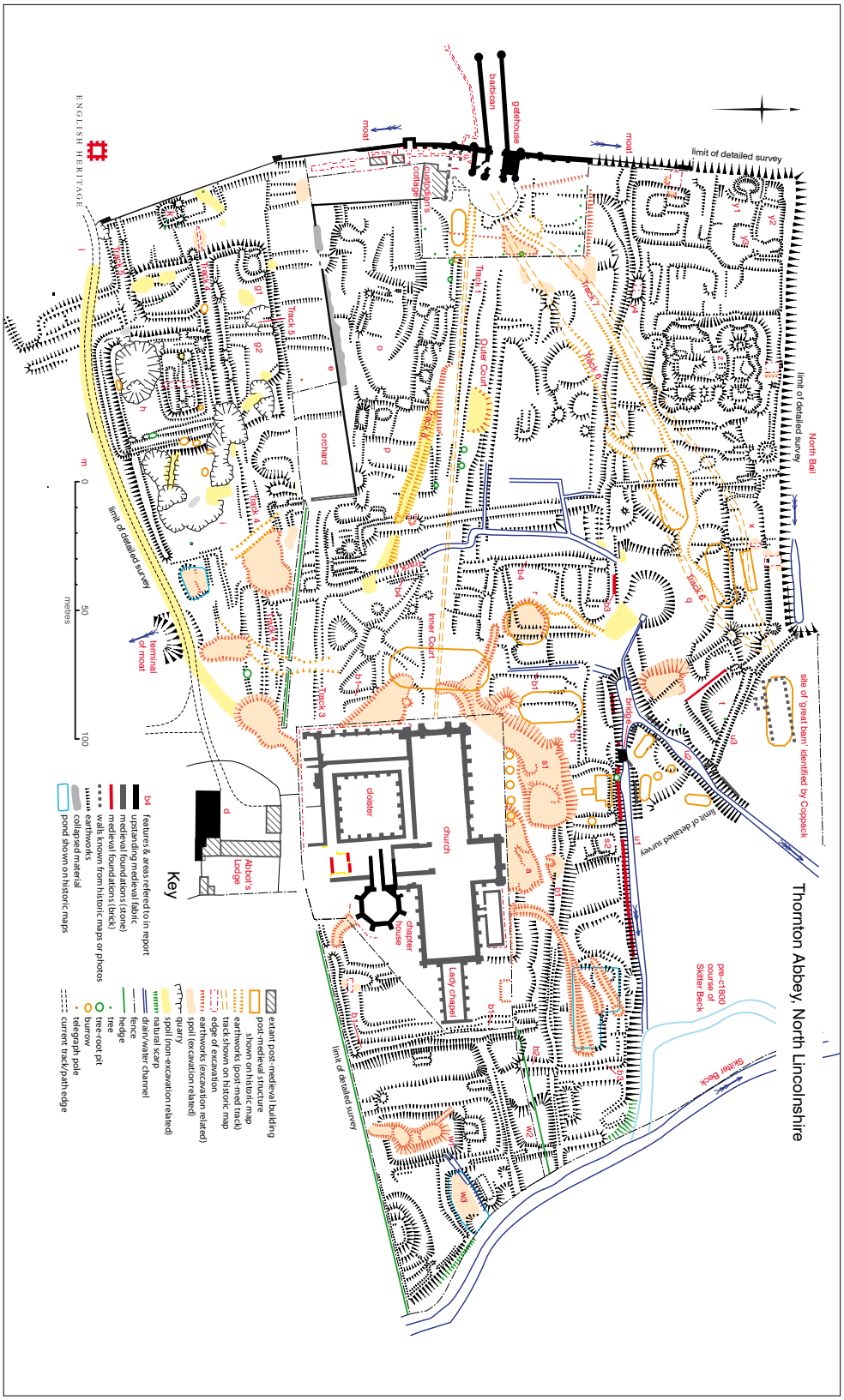


Figure 23. English Heritage earthwork survey of the core of the site, reduced to 1:2,500 scale from original at 1:1,000 (see also Figure 39).

prominent bank defining the northern side of close **o**, both earthworks have been cut back, leaving a steep, crisp scarp. The resulting spoil appears to have been spread in a low mound on the opposite side of the terrace created to carry **Track 1**. This modification may also be attributable to the 4th Earl of Yarborough's re-presentation of the site in about 1900.

Neither of these relatively recent routes exactly matched the line of what seems to have been the medieval route between the gatehouse and the church. This is marked by a vestigial bank or carriageway some 5m wide (**Track 1**), which runs along the centre of a carefully levelled and perfectly straight 15m-wide terraced way. A broad, regular ditch on the northern side of the terrace may well have provided material for its construction, as well as helping to keep the route well-drained. This may have been important, if, as proposed in Section 2, the channel of the lost natural watercourse ran somewhere just to the north of **Track 1**. The route intersected with bank **b4**, the putative boundary of the inner court, at the point where this boundary changes angle slightly and appears from the geophysical survey responses to be interrupted by an inner gateway (*see* Section 5.8, anomalies [**R10**] and [**M5**]). There is also a suggestion, if the line of the central carriageway is projected eastward, that the carriageway itself must have changed alignment slightly at this point, so that the final stretch approached the west door of the church almost straight on. However, though similar in breadth to the main block of the gatehouse, the terrace does not seem to be aligned on the centre of the gate passage, but slightly to its south. The same is not true of the central carriageway, which is precisely aligned on the gate passage. This may indicate that the route, and by extension closes **o** and **p**, which fronted onto the southern side of the terrace of **Track 1**, were in existence in virtually the same form before the construction of the gatehouse in the 1370s and related to an earlier gatehouse in a slightly different position.

The route by which Sir Vincent Skinner's early 17th-century house would have been approached – given that a house of this pretension must have been equipped with a driveway suitable for carriages – remains uncertain, but it must have passed through the medieval gatehouse and it therefore seems likely that it would have followed **Track 1** for some of its length (*see* Section 6.1). Indeed, were it not for the carriageway's inferred change of angle at the point where it intersected with boundary **b4**, it would be tempting to suggest that the carriageway (though not the terrace that it follows) might have been constructed by Skinner. Stukeley's 1724 engraving (*see* Figure 7) shows a path or track apparently at least 2m wide, flanked by single lines of mature but slim trees, leading eastward straight from the gate passage. Perhaps the most plausible context for the creation of the avenue of trees is Skinner's brief tenure in the early 1600s. Binnall (1932, 46) states that the trees were elms and that they were cut down under the ownership of the Sutton family at some point before 1792; on what evidence this is based is unclear. The identification in 2007 of several possible tree-root pits along the line of the terrace seems to confirm that that it was indeed the route depicted by Stukeley. It may be significant that most of the root-pits lie east of the point at which **Track 8** diverges from the line of the avenue and that the central carriageway is slightly wider to the west of this point; this could suggest that **Track 8** followed the earlier straight route for a convenient distance, erasing slight earthworks such as the tree-root holes, before itself being partially overlain in about 1900 by the clinker footpath.

5.5 The church and claustral buildings (Figure 25)

Although no detailed examination of the remains of the church and claustral buildings was carried out, the new survey adds something to the appreciation of their location. Surprisingly, perhaps, the church does not occupy the highest ground within the eventual extent of the precinct; Lidar imagery makes it clear that the building stood somewhat lower than the crown of the low spur between two minor tributaries of the Skitter Beck (Figure 3). However, during the severe flooding of June 2007, the church remained untouched by the floodwaters. Its apparent invulnerability may be, in part, because the ground on which it stands has been artificially raised, probably using dumps of clay obtained locally, as occurred on other low-lying sites in the region (Evans 2000, 212). The ground surface to the north of the church is around 1.2m higher than that on the north side of channel **u1**, where the ground is clearly drained marshland which has been subject to little alteration. It also drops away abruptly to the east next to the current channel of the Skitter Beck, although in places the underlying natural scarp, gentler and lower, remains visible. Surmounting this broad area of raised ground, a smaller platform, up to 0.3m high, whose north-east corner alone is identifiable, seems to have been built specifically to support the main body of the church, prior to the addition of the Lady Chapel in 1393-1418. Alternatively, it could be a more localised addition intended to carry the free-standing early 14th-century building interpreted as the Chapel of St Thomas (Clapham 1951, 12). In either scenario, the more widespread build-up of the whole tip of the spur may have been carried out in anticipation of the rebuilding initiated in 1261.

Figure 24. Watercolour of 1797 by John Claude Nattes, showing the ruins of the chapter house from the west. Note the depth of collapsed material.

The source of the material required to achieve this is uncertain, but it is worth noting that several large fishponds existed in the vicinity (including three (**w1-3**) identified by Coppack), which might have served in the first instance as quarries. Alternatively (or in addition), while the perimeter moats as they appear today are not thought to have been created until the 1380s, it is quite likely that they replaced earlier boundary ditches, which could have provided a considerable volume of material . Assuming that the 13th-century church occupied approximately the same site as the first building constructed in the 1140s, it may be possible to infer that the dry ground was originally more restricted in extent, giving the first monastic buildings a stronger impression of isolation against the backdrop of the marshland in the valley of the Skitter Beck.

The first stage of the rebuilding of the church in the 1260s evidently involved laying down the foundations of a new, aisled choir seven bays long. This had a flat east end which permitted the creation of a huge east window, a form spectacularly pioneered in the Angel Choir at Lincoln, begun in 1256 (Alexander 1993, 115). As the space where the community performed its daily devotions, the choir was the most important part of the new church to finish. In order to support its rising structure, however, work also began to the other three arms of the cross-shaped church: the transepts and two bays of the nave as well as the four great piers of the tower that was to rise above the crossing. Importantly, the surviving foundations show that the nave was originally planned with only one aisle to the north, possibly an inheritance from the earlier church on the site.

Beside the church, two walks of a grand new cloister and their adjacent ranges were begun. As with parts of the chapter house - and indeed as is commonly the case - it is the fact that the more elaborately carved pieces of stone that made up the window tracery in the cloister were rejected by later stone robbers that has left us with the evidence on which to base some of the finer details of reconstructions. The most important new building in this area was the chapter house (Figure 24), where the canons formally met together in community every day. This was designed on an octagonal plan, a form unique to chapterhouses in Britain, and its tracery again recalls Lincoln's Angel Choir (*ibid*, 115). Clapham (1946) believed that the building at Thornton was intended to have a high stone vault supported on a single, central column, but excavation found no trace of such a feature. It seems more likely, as Coldstream (1972) has suggested, that the large quantity of oak obtained from Sherwood and the Forest of Galtres in 1305 indicates that the building was designed with a timber vault, without a supporting column. If so, this must have been in imitation of the daringly-conceived vault of the chapter house of York Minster, completed in around 1295, one of only two other chapter houses in the country (the other belonging to Southwell Minster in Nottinghamshire) without central columns. Such were the priorities of the community, however, that only two of its walls (coincidentally, the two that survive) were actually raised to any height at first (Alexander 1993, 116-7), because these were integral to the church transept and the new east cloister range. For the remainder of the century, the community pursued the first stage of the rebuilding programme but nothing was brought straightforwardly to completion. Architectural competition between religious foundations demanded that the designs be adapted to reflect new fashions. When the chapter house was finally completed in 1308, for example, the original form and detailing of the 1260s windows visible in the surviving walls was abandoned in favour of more up-to-date designs.

5.6 The Inner Court (Figure 25)

On every side of the church, more than one bank can be identified which might represent the line of a wall enclosing a rectangular inner court or precinct; it seems quite likely that all these wall-lines might represent incarnations of an inner court boundary at different phases in the abbey's development. The fundamental question of whether inner courts, whose significance was primarily liturgical, were usually physically demarcated with walls, or were concentrically organised, will be addressed further in Section 7.

A bank up to 0.5m high (**b1**), surmounted by a narrower bank apparently marking the footings of a wall, has been identified as the probable boundary of the canons' cemetery, the eastern end of the church being the conventional location for this (Coppack 1991, 40). To the east of the church, the bank runs within 4m of the end of the Lady Chapel built under Abbot William Multon (1393 -1418), but around 24m from the main body of the church, a similar interval to the distance between the westward return of the bank and the northern side of the church, suggesting that the Lady Chapel may have been designed to fill the space available within the boundary. To the north of the church, the bank seems to over-ride several close boundaries aligned perpendicular to it, but this apparent relationship could be deceptive, perhaps reflecting the collapse of the wall

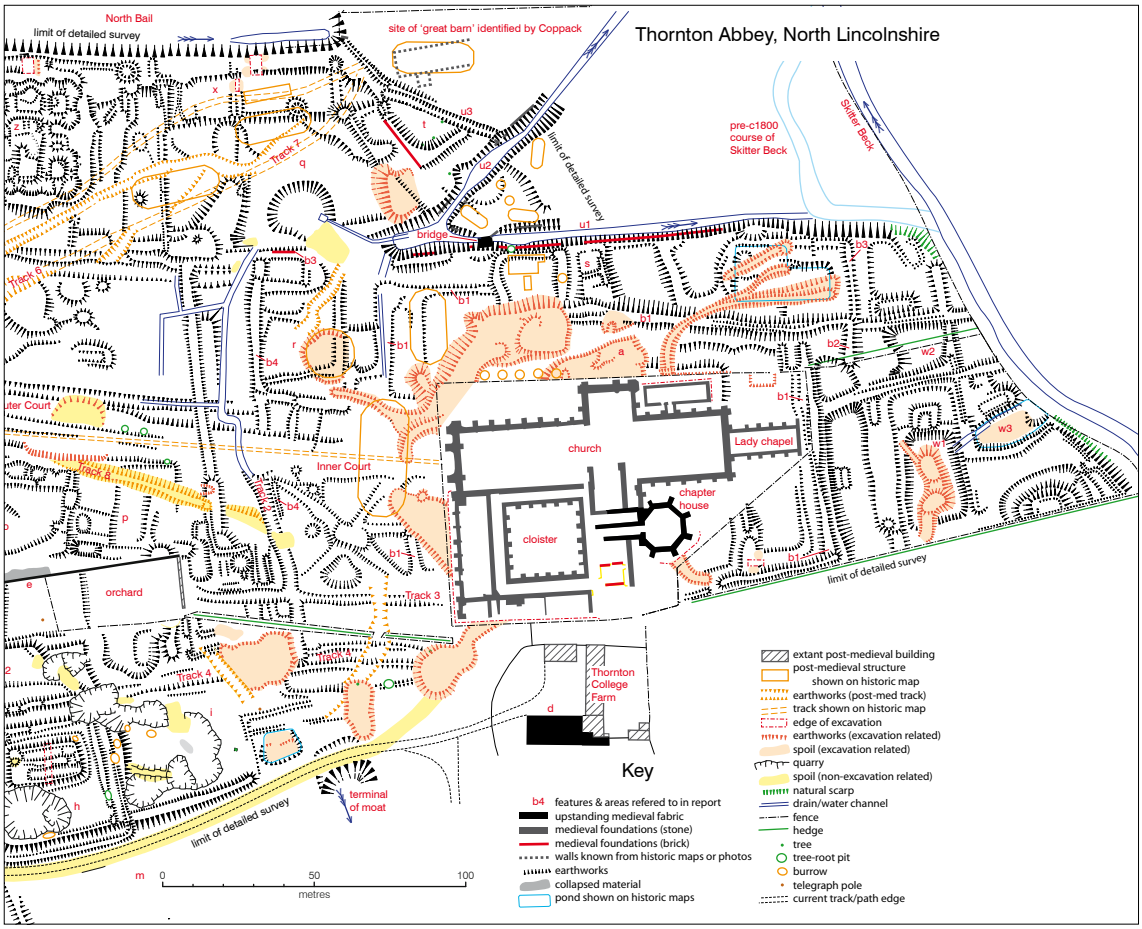


Figure 25. Extract from English Heritage earthwork survey, reduced to 1:2,500 from original at 1:1,000, showing boundaries around the church which may have defined an inner court.

rather than its original form. To the south of the church, the boundary returns westwards and could conceivably be aligned on the south-east corner of the cloister in its un-extended (that is pre-1326) form. One hypothesis, then, could be that bank **b1** marks the boundary of the burial ground and inner court prior to 1326, perhaps itself a modification of an earlier boundary, and that the addition of the Lady Chapel between 1393 and 1418 led to the construction of a new boundary, **b2**, a comparable distance further east. Bank **b2** appears to overlie bank **b3**, suggesting that **b3** was already in existence and simply more emphatically defined. This sequence is supported by the slight angle change at the junction of banks **b1** and **b2**, which seems to result from an adaptation to the slightly different alignment of bank **b3**. Though bank **b2** was recorded in part by the 1985 survey, it was not interpreted by Coppack as a boundary. On the north side of the church, bank **b1** can be traced for 95m, but its western end appears to be overlain by a dump of spoil (**s1**) from the 19th-century excavations (this corresponding to an L-shaped building identified by Coppack). To the west of the spoil heap, vestigial traces of a bank which may represent a continuation of bank **b1** are on a slightly different alignment and slightly further from the church. This earthwork, however, returns to the south as a slight but more obvious bank (also partly recorded as an earthwork in 1985, but not interpreted by Coppack as a boundary), which again runs some 20m from the west front of the church. This is detectable as a moderate earth resistance anomaly (see Figure 28), but lies beyond the area investigated with magnetometry. Vague traces of what may be the continuation of boundary **b1** are also identifiable to the west of the cloister, both as an earthwork and as a resistance anomaly. Thus, as a whole, the boundary seems to have defined a rectangular inner enclosure encompassing the church and claustral nucleus, initially measuring 130m long by around 75m wide and eventually extended by an extra 20m to the east.

Running from beneath the north-east corner of bank **b2**, another bank, **b3**, continues northwards to the edge of the pre-1860s course of the Skitter Beck. This seems to have formed one side of an almost square close to the east, containing at least one rectangular building, but the boundary more clearly turns to the west along the south side of the artificial watercourse **u1**. Set within this corner, possibly within its own walled close, was an L-shaped pond, now infilled, as described in Sections 4.1 and 5.12. It is open to question whether a fishpond - even of ornamental appearance - would have been included within the same enclosure as the church itself from the outset. This may support the argument that **b3** represents an enlargement of the original inner court intended to embrace a number of formerly separate closes, with **b1** representing an earlier incarnation. Along much of the steep southern side of the watercourse **u1**, the footings of a brick revetment wall, discussed further in Section 5.11, are partially exposed, but this appears to be separate from a low bank which runs intermittently along the top of the scarp, perhaps representing the line of a wall continuing boundary **b3**, adjoining the northern wall of a building (**s2**) and then extending all the way to the north-west corner of an enclosure (**r**). This stretch corresponds to anomalies in the geophysical surveys [**R12** and **M6**]. In the north-western corner of the enclosure, apparently within its own close (**r**), Coppack (1991, 42) observed, during digging of a land drain in 1984, a brick building with fine late 14th-century masonry dressings set into the angle of the wall, whose outline is clearly evident in the earthwork traces. From this point, a bank **b4** runs southwards for at least 100m, the earthwork in places clearly representing a buried

wall-line, complemented for much of its length by strong earth resistance and magnetic responses [**R10** and **M5**]. South of **Track 1** (the route from the gatehouse to the church) another track (**Track 2**) turns off and runs southwards alongside the outer face of the wall to a crossroads with **Track 3**. **Track 3** would seem to represent the original line of the return of boundary **b4** and indeed **b1**. Significantly, the only break apparent in boundary **b4**, in both the earthwork and the geophysical surveys [**R10**/**M5**], coincides with a slight but distinct change of angle in the boundary, and lies at the point where the major route leading from the gatehouse to the church (**Track 1**) intersects with it. This is the strongest candidate for a western boundary between the Inner and Outer Courts, but it may be more obvious in part because it is of relatively late origin, possibly contemporary with the reconstruction of the great gatehouse in the 1380s. A large rectangular building on the southern side of close **r**, set back from the northern side of **Track 1** but on the same alignment, is more clearly revealed by the geophysical surveys (anomalies [**R1**] and [**M1**]) than by the earthworks; it is described in Section 5.8.

West of the cloister, set within the corner defined by **Tracks 2** and **3**, is a remarkable pattern of very slight earthworks, largely replicated by the geophysical results (particularly anomalies [**R8** - **9**]), whose clearest element is a saltire cross formed by broad, low banks running obliquely to the monastic earthworks. This pattern may be the product of superimposed features of different dates: interpretation is complicated by the existence of a buried drain, or culvert, revealed by the earth resistance survey [**R8**], which follows almost the same alignment as the south-east to north-west bank. If it was located further west, the pattern might be interpreted as a geometric garden compartment relating to Skinner's house of about 1607. In this position, it is tempting to propose that it could represent traces of a late medieval garden compartment of similar design overlooked by the abbot's lodging, which is thought to have occupied the west claustral range by 1539 (Coppack 1991, 19). If it was originally a garden intended for the Abbot's private use, it and the lodging itself may still have been incorporated into one or more post-Dissolution remodellings of the monastic inheritance in the 60 or so years before Skinner acquired the land. There are problems with both interpretations, as discussed further in Section 7.

5.7 Earthwork remains in the Outer Court (Figure 39)

Coppack's suggestion that the area north of boundary wall **e** equates in essence to the Outer Court referred to in the *Chronicle* seems entirely credible, although the degree to which such courts were physically bounded remains an open question at most monastic sites. Most of the earthworks lying in the strip of ground between wall **e** and the ditch defining the north side of the route from the gatehouse to the church (**Track 1**) almost certainly represent features of monastic origin. They appear as a group to pre-date wall **e**, which is suggested in Section 5.9 to have originated between 1326 and the 1380s. Some of the more obvious remains north of the way from the gatehouse to the church (**Track 1**) may well relate to the house and gardens built by Sir Vincent Skinner in about 1607, any that are of monastic origin probably having been modified to some degree, and these are therefore discussed in more detail in Section 6.1. The broad linear depression and associated earthworks extending west from channel **u1** are almost certainly of monastic origin, but are discussed in Section 5.11 in the context of the water supply to the supposed cornmill (**t**).

South of **Track 1**, two enclosures **o** and **p**, whose southern sides are overlain by boundary wall **e**, were thought by Coppack (1991, 42) to have included a stable block. The 2007 earthwork survey clarifies the form of the earthworks, which can now be seen to be two adjoining rectangular enclosures, **o** measuring 40m east – west by 35m and **p** some 30m square. Close **o** is overlooked by a range of buildings on its northern side, while the central third of close **p** appears to have been slightly sunken, perhaps indicating that it was overlooked by timber buildings which are not easily detectable through survey techniques. The eastern boundary of close **p** (whose northern end is clear as an earthwork while its southern part is clear as an anomaly in the earth resistance survey), is on almost the same line as the southward return at the eastern end of wall **e**. On the southern side of close **p**, a rectangular depression directly overlain by boundary wall **e** may represent a pond, or perhaps the undercroft of a building. Apparently connected via a gateway in the west wall of close **o**, earth resistance survey reveals the existence of another rectangular close, of similar proportions, whose south-eastern corner alone is identifiable as an earthwork. To the south of this westernmost enclosure, magnetometry confirms that a circular depression, cut into the rising ground, is the site of an oven or kiln (see Section 5.8.3 [**M11**]), which, to judge from its condition may be of post-medieval origin, for example a lime-burning kiln contemporary with the destruction of the monastic buildings. This too appears to lie within a walled enclosure, whose alignment appears to have been superseded by the wall running between wall **e** and gateway **f**, which itself appears to post-date wall **e**.

Together, the three closes seem to have formed a long range across the southern side of the Outer Court, extending close to boundary **b4**. On the opposite side of **Track 1,** earth resistance survey has revealed a wall-line (see Section 5.8.2, anomaly [**R12**]), of which only discontinuous traces can be identified as an earthwork, apparently due to landscaping associated with Sir Vincent Skinner's gardens (see Section 6.1). In its alignment and extent, this appears to have mirrored the wall that formed the northern side of the three conjoining closes south of **Track 1**.

5.8 Geophysical surveys of parts of the Inner and Outer Courts

by Andy Payne

5.8.1 Overview (Figure 26)

A brief overview of the general character of the geophysical response from the area investigated will first be provided, followed by more detailed discussion of specific anomalies and their interpretation. The local geology (see Section 2) is generally well-suited to the application of geophysical techniques. Since the area investigated lies mainly to the south of the site of Sir Vincent Skinner's house and gardens, many of the remains recorded are probably of medieval date, apart from a few drainage features and other disturbances of relatively recent origin. The earth resistance survey covered a wider area extending further to the north in the expectation that this method would be the most appropriate for further investigating the nature of the earthwork remains in the precinct (especially those believed to largely represent the remains of buried brick and masonry built structures). The geophysical surveys complement the analytical earthwork survey,

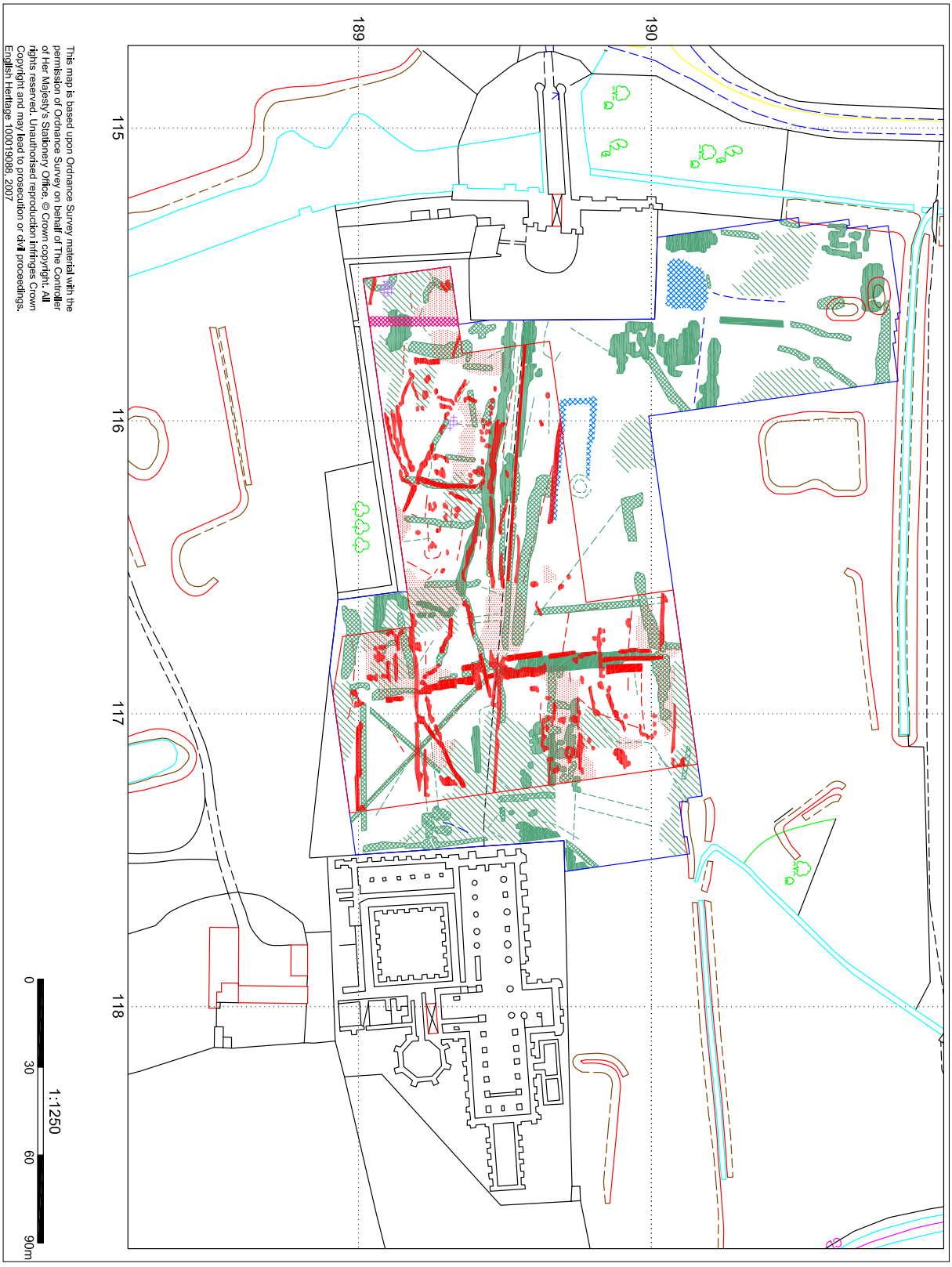


Figure 26. Interpretation of earth resistance and magnetic survey data combined, showing significant anomalies.

each technique either reinforcing the findings of the others or allowing the resulting interpretations to be refined.

A clear response to suspected archaeological features was recorded over the site by both the resistance and magnetometer surveys. Numerous alignments of high resistance (lighter tones in the greyscale plots) as well as widespread broader, more amorphous, areas of disturbance indicate buried stonework. Some of the most extensive patches of generally higher background resistance, for example the large spreads west of the church and perhaps that immediately west of the site of Skinner's house, correspond to earthworks interpreted as spoil probably produced by excavations carried out by successive Lords Yarborough in the 19th century. A smaller number of linear low resistance anomalies have also been detected which may indicate ditches, drainage features or robber trenches. Significantly reduced background resistance in the central and south-east areas of the survey has depressed the contrast of both high and low resistance responses to buried archaeological structures, requiring high pass filtering and contrast enhancement of the data to reveal additional detail in these areas. Mixed positive and negative magnetic signals reveal the presence of buried walls and buildings containing brick and fired or burnt material and more uniformly positive magnetic linear responses are indicative of ditches defining enclosures.

5.8.2 Earth resistance survey (Figures 27 - 28 and 40)

There are several possible indications of buildings in the resistance data in the form of rectilinear patterns of high resistance [**R1-7**], some more clearly defined than others. The clearest of these is the ground plan of a rectangular building some 30m by 10m in dimensions [**R1**], located within Coppack's close **r**, 30m to the west of, and approximately on the same axis as, the church. Together, the earth resistance survey and the corresponding magnetic response [**M1**] add considerable clarity to the vague impression of this large building that can be inferred from its earthwork remains. Gardens or open spaces may have existed around this building and to the west of the cloister, as suggested by an area that appears relatively empty of magnetic disturbance and high resistance rubble deposits. Possible buried drains or culverts or former paths, visible as slight earthworks and as weakly defined high resistance linear anomalies [**R8-9**], cut across this more empty area, apparently describing a saltire cross or perhaps a Union Flag pattern. This might conceivably represent the superimposition of several different features of different dates. Although they lie on completely different alignments from the monastic layout, the possible conduit [**R8**], which extends south-east to north-west and can perhaps be traced for a considerable distance into the Outer Court, makes a slight angle change at the inferred location of the gateway between the Inner and Outer Courts, suggesting it to be of contemporary or somewhat later origin. The probable boundary (**b4**) between the Inner and Outer Courts as identified on the evidence of the earthwork survey is represented by alignments of high resistance [**R10**] and corresponding lines of magnetic disturbance [**M5**]. West of this are a series of major linear features, again defined by high resistance alignments [**R11**] and also as lines of magnetic disturbance [**M7**], running eastward from the gatehouse. These anomalies correspond in part to the earthworks flanking **Track 1**, the most southerly alignment apparently representing the walled boundary of Coppack's closes **o** and **p**; other linear

anomalies [**R3**] relate to the boundaries of these enclosures. At the southern end of [**R10**]/[**M5**] are a series of earthwork enclosures and several possible buildings [**R2**]; these are defined by moderately high resistance. At its northern end, the boundary between the Inner and Outer Courts [**R10**/**M5**] meets an east-west wall alignment [**R12**]. The stretch of this leading eastward corresponds to the earthwork boundary **b3**, and defines the northern side of Coppack's close **r** and the rectangular building set into its north-west corner inspected during a watching brief by Coppack (1991, 42) The stretch of [**R12**] leading west, however, is not recognisable at all as an earthwork, except in that its alignment is reflected in the anomalous oblique angle of an adjacent drainage channel. This seems to highlight some kind of differential later treatment of the monastic remains on either side of the boundary dividing the Inner and Outer precincts, which may relate to works carried out by Sir Vincent Skinner. Similarly, at the southern end of [**R10**/**M5**], a probable wall-line is evident in both the resistance and magnetic responses returning eastwards alongside **Track 3**; the resistance data hint at the existence of a square corner tower at the intersection. Another potential monastic building, not clearly apparent from the earthwork traces, is indicated by high resistance [**R4**] towards the western side of the Outer Court. In the north-west corner of the Outer Court, two or three more buildings evident in the resistance data [**R5-6**], corresponding to earthworks (**y1** and **y2**) may be outbuildings relating to Skinner's house, as suggested by Coppack.

Two linked parallel linear anomalies of low resistance [**R13**] correspond to drainage channels clearly evident as earthworks. The resistance responses fade to the east as they reach part of the site that is naturally prone to waterlogging, where the background resistance is consequently very depressed. However, contrast enhancement of the data successfully shows that **R13** feeds into a more extensive network of linear low resistance anomalies [**R14**, **R15** and **R17**] not initially invisible in the raw data (or in every case clear as earthworks). The earthwork stratigraphy suggests that all these channels probably reflect post-medieval attempts to drain the area, but since the drains in some cases re-use earlier earthworks, including the ditch flanking the northern side of **Track 1**, their alignments match those of the monastic features, potentially confusingly. The resistance responses do, however, appear to cut through wider patterns of high resistance.

Another linear anomaly in the earth resistance data [**R16**] corresponds to a low bank, which the new earthwork survey shows is stratigraphically late, and which has been interpreted as the intended eastern boundary of Vincent Skinner's formal garden compartment (see Section 6.1). The earth resistance response seems to suggest that the bank may conceal wall foundations, although these are not necessarily indicated by the form of the earthwork, which is slight and not especially crisp, although very straight.

A rectangular patch of low resistance [**R18**] interpreted as the site of a pond, bracketed on the east and west by high resistance responses, and with a linear anomaly leading eastward from it, may represent elements of the system of monastic water management, as described further in Section 5.11. A second linear anomaly leading northwards from the supposed pond may be contemporary, but its purpose is open to question.

Figure 27. Earth resistance survey data, reduced from original plot at 1:1,250 scale.

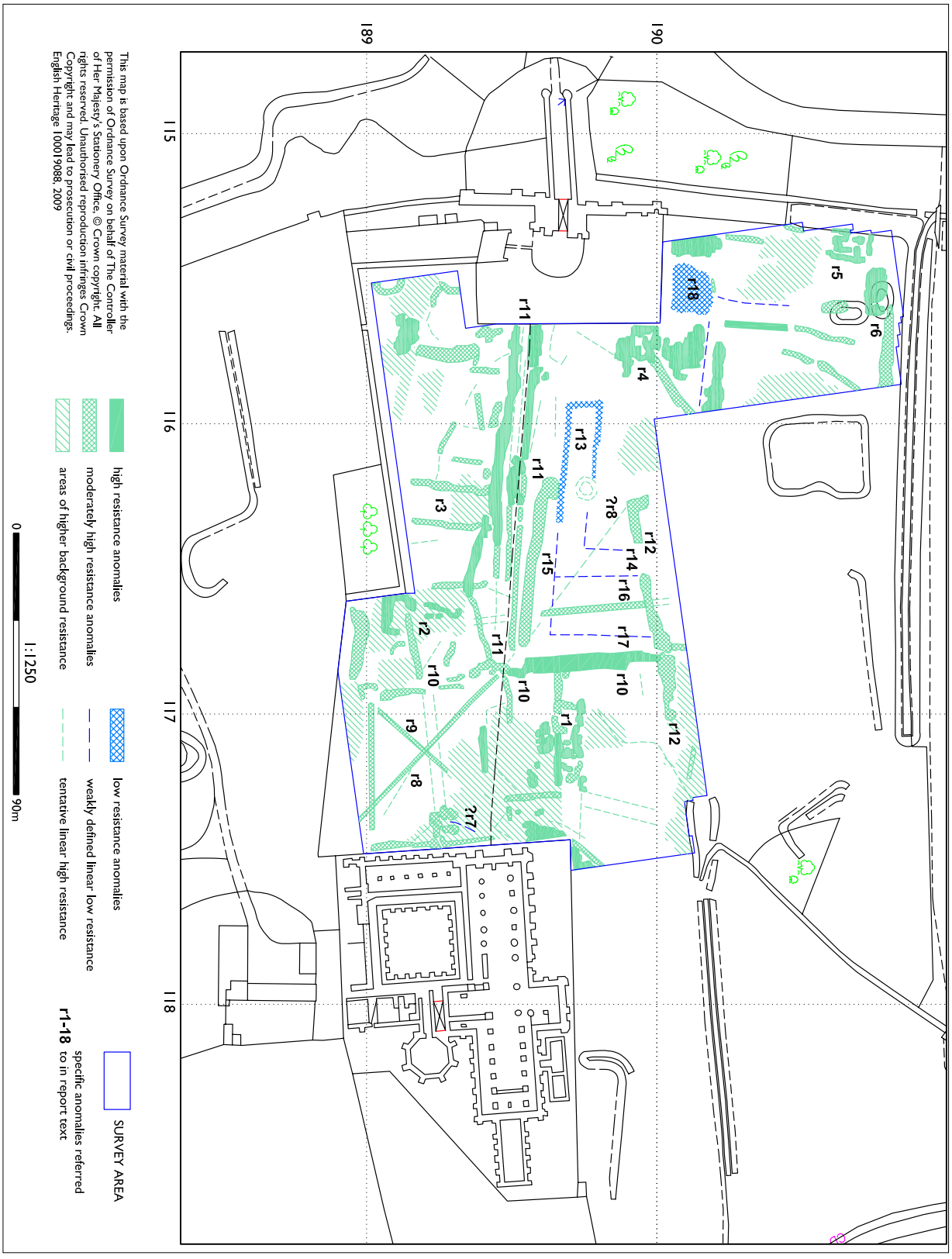


Figure 28. Interpretation of earth resistance survey data, showing significant anomalies.

Figure 29. Magnetic survey data, reduced from original plot at 1:1,250 scale.

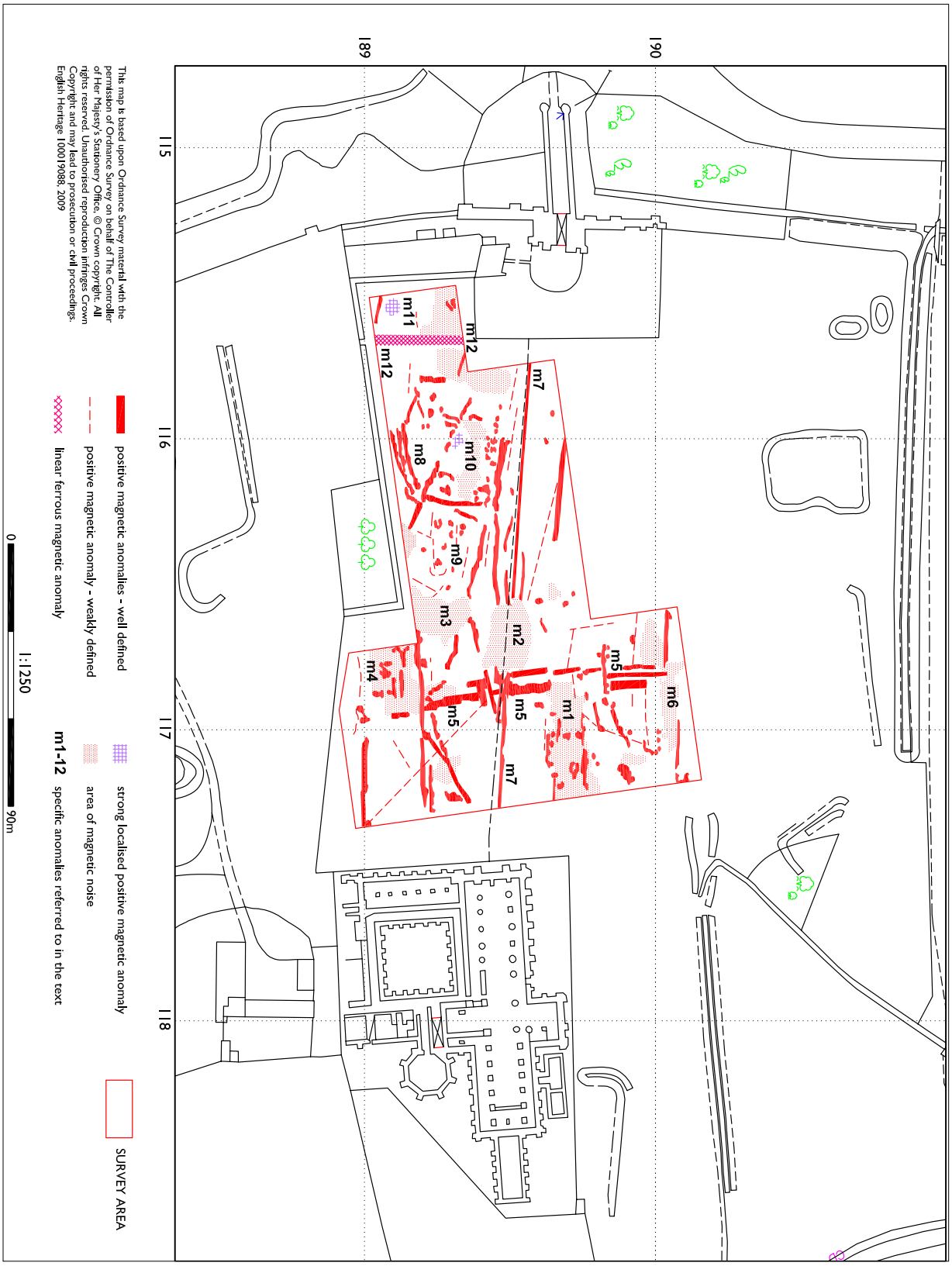


Figure 30. Interpretation of magnetic survey data, showing significant anomalies.

5.8.3 Fluxgate magnetometer survey (Figures 29 - 30 and 41)

In the magnetic data, the likely locations of buildings are evident as more or less discrete areas of magnetic 'noise' [**M1-4**], probably indicative of brick and tile built structures and other mixed demolition deposits. Wall alignments composed of brick material are also evident as non-uniformly magnetic linear responses [**M5-6**]. The linear anomaly at **M5** coincides with a major high resistance alignment [**R10**] and with a linear earthwork (**b4**), possibly representing a walled boundary dividing the Inner and Outer Courts. The possible use of brick in the construction of this wall is noteworthy in the context of the theory proposed in Section 5.6 that this boundary represents an expansion of the Inner Court contemporary with the construction of the great outer gatehouse, which also makes extensive use of brick. Directly west of this boundary and aligned on the approach from the gatehouse (**Track 1**) is a rectangular area of magnetic noise [**M2**] that may represent collapsed building material, or perhaps some form of paved surface in front of an inner gatehouse. The footpath connecting the gatehouse to the church is apparent as a single well-defined linear positive magnetic anomaly [**M7**] that may relate to the inferred re-surfacing of **Track 1** in about 1900 with clinker, a highly magnetically responsive material. South of **Track 1**, and complementing the resistance data [**R3**], the boundaries of enclosures **o** and **p** are represented by positive magnetic anomalies [**M8-9**], with indications of internal features in the form of localised positive magnetic responses. Two intense magnetic responses [**M10-11**] are suggestive of the presence here of heavily burnt or fired features such as ovens, hearths or furnaces, possibly showing that the enclosures in this area of the precinct performed service functions such as baking or smithing. The earthwork traces corresponding to the larger of the two [**M11**], however, hint that it may be relatively late, such as a lime-burning kiln associated with the dismantling of the monastic structures. The course of a ferrous pipe still serving a water trough set against the southern side of the extant medieval boundary wall (**e**) has been detected running north-south near the western limit of the survey at [**M12**].

5.9 Boundary wall (e) and its implications for phasing (Figure 39)

A wall originally constructed of large, dressed blocks of chalk, but over the years repaired in places with various other materials, including moulded stones apparently from the church, survives to a maximum height of 2.8m and extends for 115m perpendicular to the southern wing-wall of the gatehouse. On its north side, a plinth made mainly of magnesian limestone, with some ironstone, is visible up to 0.9m above ground level, but on the south, a long stretch of this has been concealed by an extensive dump of spoil surmounted by a quadrangular mound, surmounted by at least two enclosures containing buildings (**g** and **h**). The survival of the wall in a relatively complete form, against the background of Sir Vincent Skinner's fairly comprehensive dismantling of the rest of the standing buildings in the early 17th-century, may be due simply to the abundance on the site of more valuable blocks of limestone. However, as discussed in Section 6.1, another possible reason may be its deliberate retention by Skinner as an intended southern boundary of a formal garden compartment in front of his new house. Coppack (1991, 40) interprets the wall's original function as being a boundary between the Outer Court on its north and the Inner Court on its south. If so, it may – in the light of the discussion in Section 5.6 - represent a late extension of the Inner Court. The wall has been truncated at both ends; to the east, the footings are intermittently traceable for a short

way as a low bank, while the earth resistance survey suggests that it continued [**R2**], not unpredictably, all the way to the to the boundary (**b4/R10/M5**) between the supposed Inner and Outer Courts, taking its alignment from an angle perpendicular to this wall (Figure 28). At its west end, it may not have continued all the way to the wing wall of the gatehouse, since no earthwork traces survive here and recent observation of a shallow service trench did not encounter its buried remains (Atkins 2010, 29-30).

At the current eastern end of wall **e**, a short stretch of wall, roughly built and containing a number of medieval architectural fragments, turns to the south. This section was mapped in 1870 and an orchard had been planted in the corner formed by its junction with wall **e** by 1886 (Wallis 1870; Ordnance Survey 1887). Most of what is visible above ground may be a relatively modern concoction, but a few exposed facing stones, visible embedded in the ground immediately south of the southern end of this rough extension and apparently *in situ*, hint that the extant wall may be built on approximately the same line as a medieval precursor.

From the current, truncated western end of wall **e**, another stretch of wall, also a later addition, runs northwards parallel to the flanking wing of the gatehouse and then, formerly, turned an obtuse angle to meet the flanking wing, as shown on Stukeley's etching of 1724, Nattes' painting of 1797, Rhodes and Watkins' etching of 1832 and Wallis' plan of 1870 (*see* Figures 7, 11, 12 and 14). It survives to a maximum height of 2.7m and is made of materials similar to - and possibly reused from - the earlier wall, but lacks a plinth. As mentioned in Section 4.2, the obtuse angle was later deliberately replicated in the design of the 1900 custodian's cottage, giving the cottage its rhomboid plan. The eastern wall of the cottage, though doubtless refurbished, retains the same superficial appearance as the rest of the earlier wall. The foundations of the stretch running to the flanking wing were exposed during excavations in advance of the laying of services to a new visitor facility in 2007 (Atkins 2010, 27-30). Mid-way along this stretch, a broad gateway (which seems to have been blocked by 1797) with a more ornate pedestrian gate (**f**) a few metres to its west, is shown from the north on Stukeley's depiction and from the south on the others; only the narrow pedestrian gate is shown on Wallis' 1870 plan. As described in Section 4.2, the gateway and adjoining stretch of wall were demolished in 1900 to make way for the custodian's cottage, with the position of the gateway, and to some extent its style, carefully reflected in the design of the cottage's front door. The style of the earlier doorway, which is depicted in some detail on the 1832 etching, with hints of other features visibile on Nattes' 1797 watercolour, suggests a late medieval origin: it has a pointed arch and at least two levels of plinth on the flanking buttresses. Coppack (1991, 40) interprets this as part of a ruined structure, but even the closest examination of the post-medieval depictions leaves some uncertainty as to whether there was anything more here more than a gateway, albeit one that has undergone modifications.

As noted by Coppack (1991, 42), boundary wall **e** also physically overlies a series of earthworks to its north, while its alignment, which is at odds with the wall-lines to the north, is followed closely by wall-lines and other earthworks to its south. Thus, the wall seems to mark the boundary between two major phases of construction visible in the earthwork remains: an earlier phase to the north, and a later one to the south. This

basic phasing is used to structure the description and interpretation below, admitting the strong likelihood of continuous modifications to both episodes after their initial construction.

The date of the wall, which would offer a benchmark for dating the two major phases of constructional activity, is uncertain. However, a number of strands of evidence point to an origin in the mid- or late-14th century, as suggested by Coppack (1991, 40). Coppack does not make explicit that the ground to the south appears to have been built up by about a metre, so that the mid-height plinth along much of the wall's southern side is only just above ground level and in places entirely concealed. This build-up is part of, or perhaps predates, the construction of the quadrangular artificial mound (interpreted by Coppack (1991, 40) as a natural hillock) on which sat two enclosures containing various buildings (**g1**, **g2** and **h**). The most plausible source for this large volume of material, especially given that the immediately adjacent stretch of the western perimeter moat cuts through a naturally slightly higher piece of ground, is the excavation of the moat, which may have taken place in the 1380s, as described in Section 5.2. In plan, the wall is also almost precisely perpendicular to the flanking wall along the adjacent arm of the western perimeter moat.

The imposition of the wall also appears to have superceded **Track 3**, the alignment of which is close to that of the buildings to the north of the boundary wall. The alignment also indicates that **Track 3** would have originally have passed alongside the southern wall of the earlier cloister (which corresponded to the northern wall of the later southern range), but was obstructed when this was rebuilt and extended southwards in 1326-28 (Baillie Reynolds 1954, 7). Baillie Reynolds (*ibid*, 8) suggests that the normal entry into the claustral range may have lain in the vicinity. While there is no proof that **Track 3** was in use right up until 1326, at face value it seems reasonable to suggest that the wall is more likely to have been built after that date.

5.10 Remains south of boundary wall (e) (Figure 39)

Coppack's interpretation of the area to the south of boundary wall **e** as lying within the Inner Court requires closer scrutiny in view of the identification of boundary banks which appear to enclose the church and claustral range more tightly. South of wall **e**, there seems to have been much less disturbance relating to the house and gardens built by Sir Vincent Skinner *c.*1607 (*see* Section 6.1) and a number of features almost certainly of monastic origin are well preserved as earthworks. Here, a quadrangular mound some 66m square and 1.2m high, was interpreted by Coppack (1991, 40) as a natural hillock. This surmounts a more extensive but less well defined spread of material that may be up to 1m deep, given that it conceals part of the mid-height plinth of boundary wall **e**. Much of, if not all, this material seems likely to represent a dump of spoil resulting from the excavation of the adjacent moat defining the western perimeter, which is at its deepest at this point because it passes through a spur of slightly higher ground. It follows that the building remains on top of the mound, probably along with other structures in the environs, post-date the construction of the moats as they appear today; in other words, they were probably built after the 1380s. Enclosures **g** and **h**, each containing traces of buildings, were interpreted by Coppack (1991, 40) as the bakery and brewhouse closes

respectively. As he notes, the two enclosures are separated by a hollow way (**Track 4**) which bisects the quadrangular mound and can be traced for a considerable distance to the east. This route, which passes to the south of the cloister in its extended form, seems likely to have replaced **Track 3** when the cloister was redesigned in about 1326. From the hollow way's relationship to the quadrangular mound, it might be inferred that the mound physically buried the original surface of the track, but that its line was preserved and the route reinstated. To the west, the start of **Track 5** may have been a minor gateway at or near the point where the present drive to Abbot's Lodge crosses the moat. Coppack (1991, 42) notes that a disjunction in the alignments of the surviving sections of the outer precinct wall at this point (the southern stretch not recorded by the more recent survey) may imply the existence of such a gateway.

The forms of the building foundations surviving as earthworks in enclosures **g** and **h** are much as Coppack describes them, the sites of the two northern buildings here distinguished as **g1** and **g2** can be identified within enclosure **g**, occupying the north-western corner of the quadrangular mound. The remains of the major building in enclosure **h** are well preserved, apparently comprising two adjoining aisles 22m long by 11m wide in total. In support of his interpretation of the function of enclosure **h** as a brewery, Coppack (1991, 40) points to a large hollow cut into the south-western corner of the quadrangular mound, which he suggests might be the site of a large cistern. However, the irregular form of this hollow, and several similar pits cut into the eastern

Figure 31. View of part of wall (**e**) and the earthworks beyond it (to its south), seen from the roof of the gatehouse.

side of the mound and within enclosure (**i**), suggest extraction rather than construction. The landowner recalls that an extensive badger sett on the eastern side of the mound, now defunct, revealed the mound to be very sandy (information from John Farrow). There are also ample surface indications that the nearby section of the moat was cut through a natural deposit of almost pure sand. It therefore seems likely that the supposed cistern and other hollows cut into the mound are sand extraction pits which post-date the demise of the abbey. Though the conspicuous siting of the building on top of the site's most prominent high ground is remarkable, its plan form is not especially diagnostic, so the function of enclosure **h** must remain open to question. An industrial purpose seems rather unlikely given the visual dominance that the buildings would have been afforded by their elevated location. An abbot's lodging, with its appurtenances, would be an attractive possibility, were it not for the documentary evidence suggesting that this occupied the western claustral range (Coppack 1991, 40).

In the corner formed by the junction of wall **e** and the boundary (**b4**) separating the Inner and Outer Courts, a cluster of earthworks, with corresponding geophysical responses [**R2** and **M4**], seem to represent a cluster of buildings. It remains open to question whether these are of monastic origin, or whether they were inserted into a space made available by the demolition of the eastern end of wall **e.**

As Coppack (1991, 42) notes, building **k** and its associated enclosure overlie the broad, low bank of spoil cast up from the moat and therefore probably date to after the 1380s. Though the function of the building and its enclosure remains uncertain, its small size, utilitarian form and relative isolation from the other monastic buildings hint that it may have related to horticulture, or the keeping of smaller livestock. What is interpreted by Coppack as an irregular enclosure (**l**) could conceivably represent a walled trackway (**Track 5**), since it appears to link up with **Track 4**.

5.11 The supposed monastic watermill and millrace (Figure 39)

Adjacent to the supposed mid 15th-century 'great barn' described in Section 5.13.3, Coppack (1991, 42) identified the remains of a building (**t**) which he interpreted as a water-powered cornmill, equating this with the 'North Mill' whose existence in 1318 is recorded in the *Chronicle* (TC, 58). Coppack notes that this reference seems to imply the existence of a second, more southerly mill, which has been very tentatively identified in the course of the new survey, as described in Section 5.12, as a small building lying to the east of a large fishpond (**w1**). *Monasticon Anglicanum* also records the existence in 1190 of 'two mills next to the abbey' (Dugdale 1693, 327). Presumably, mill **t**, located between North Bail and the Outer Court, would have been well sited to serve the needs of the monastic community itself. It is worth observing that one or other watermill may have outlived the dissolution of both the abbey and the college: a grant of July 1549 mentions a water mill, then in the tenure of Richard Perkinson (see Section 3.2).

Exposed structural elements of this building, or buildings, comprise a stretch of wall foundation aligned north-west to south-east, made up of brick, flint nodules and reused dressed and moulded stones, a mode of construction characteristic of later developments at the site. In addition, on an alignment which is not perfectly

perpendicular to the first wall, a course of dressed facing stones is set into the north side of the supposed mill race (**u2**). It might be inferred from this evidence that an earlier stone building adjacent to the channel was ultimately extended north-westwards. The alignment of the building as a whole is at odds with the generally north to south or east to west pattern of nearby buildings and boundaries. If the hypothesis is correct that the building was extended north-westwards and the mill relocated, it would seem that the earlier part of the building was deliberately set out at right angles to the supposed mill race (**u2**), broadly supporting its interpretation as a mill (although other buildings adjacent to the channel, beyond the area surveyed in 2007, were evidently similarly oriented). Channel **u2** is also relatively narrow where it passes the remains of the stone wall and, almost opposite, stubs of stone-built abutments project into the channel from the southern side of channel **u2**. These are set closer together than the sides of the **bridge** which spans channel **u1** just to the south, suggesting that this structure was not another bridge but perhaps the southern side of the waterwheel's mounting. Given the gentle natural topography, a wheel located here must have been undershot, and therefore would not have required an actual pit. Beyond this point, the supposed tailrace (**u2**) immediately flares out. The Lidar data offers some support for the theory that this watercourse (**u2**) may have started its existence as a natural channel carrying the minor stream, now lost, that once intersected with the perimeter moat near the gatehouse. If

*Figure 32. Watercolour view of the west side of the fine, two-span, 14th-century bridge across water channel (**u1**), painted in July 1883 and pasted into the Yarborough scrap-book (Lincolnshire Archives YARB/11/2/4). Note that the standing water is today retained by material blocking the channel to the east, concealing two more courses of stonework and giving the bridge a rather squatter appearance than the painting shows that it once had. Reproduced by kind permission of Lincolnshire Archives.*

the channel is the earliest feature, this would help to explain why its alignment appears to have influenced the alignment of the buildings along its course.

The southern side of channel **u1** was reveted by a brick wall, whose lower courses are partially exposed in the side of the channel, notably immediately east of the **bridge**, where a mature tree was blown over in 2005 (some stonework was also revealed at this point). This appears to have been separate from a bank surmounting the edge of the cutting (**b3**), which may represent a boundary wall dividing the Inner Court from the North Bail and the triangle of land between the arms of the channel (**u1/u2**). The revetment may equate to building works 'at the North Mill wall' mentioned in the *Chronicle i*n 1318 (TC, 58), or to the wall near a 'river aqueduct' mentioned in 1348 (TC, 63-4); indeed, these may be one and the same. Walling, possibly brick faced, is also visible intermittently on the inside of the acute angle, extending between the **bridge** and the stone abutment opposite building **t**, interpreted above as a waterwheel mounting . However, there is no compelling evidence that the channel was reveted on both sides or along its whole length, so the brick revetment on the southern side of channel **u1** was presumably intended to prevent the boundary wall above (**b3**) being undermined by erosion.

Coppack acknowledges that the artificial channel (**u1**/**u2**) which he interprets as the headrace and tailrace respectively for the supposed mill seems awkwardly designed, in that it diverged sharply from the Skitter Beck and, immediately before the mill, turned an acute angle to return to the stream. In part, this awkwardness could be due to the incorporation of a pre-existing natural channel, as proposed above. To function effectively, undershot waterwheels require the flow from the head race to be constant and settled; it is questionable whether such a sharp change of angle just before the mill could have allowed this. Both channels still hold some water; the original water level in channel (**u1**) is indicated by the height of the small stone **bridge** whose masonry Coppack dates to the 14th century (*see* Figure 32). A short stretch of the pre-canalisation channel of the Skitter Beck, as depicted on the 1867 plan (*see* Figure 13), survives between the eastern ends of channels **u1** and **u2**. Levels taken in 2007 along the base of channels **u1** and **u2** confirm that both arms slope gently downwards towards the Skitter Beck from the acute angle, and that the base of the old stream is on average 0.45m lower than the base of the channel at the supposed site of the mill. In order to function as Coppack suggests, the water level in the beck would have to have been raised quite significantly, presumably by a dam or weir spanning the main channel of the Skitter Beck, for which no evidence is detectable. The effect of such a dam, given the slight gradient of the Skitter Beck, would also have been to cause water to back up in the beck for a considerable distance. Given that the locations of watermills were commonly dictated by pragmatism, such awkwardness begs an explanation.

One possibility, which may perhaps be regarded as special pleading in support of Coppack's interpretation, is that the location of the mill and the design of its water supply were intended to counteract the effects of tidal variation in the Skitter Beck, or harness them to power a tide mill. The 'mill on the Skitter' first documented in about 1155 was probably a tidal mill at the mouth of the stream and the hamlet of Skittermilne was still recorded in the 16th century (Cameron 1991, 150). At the abbey itself, the stream may

have been dammed at its intersection with channel **u1** in order to force water up the channel to a watershed at the acute angle (some 0.5m higher than the usual height of the beck at high tide), so that water then descended more steeply along channel **u2**, preventing the flow from backing up into the waterwheel at high tide. If a sluice rather than an immovable dam was used to block the beck, then this could have been used to capture water at high tide. Another possibility that needs to be considered is that the site of the watermill has been wrongly identified and was one of the ploughed-out buildings identified by aerial survey in the North Bail (see Section 5.13.4), or was in fact located more typically adjacent to the Skitter Beck, which is the obvious source of water power on the site.

Another possibility – although one based on circumstantial evidence and conjecture - is that the watermill was not only powered, or not powered at all, by the tidal Skitter Beck, but rather by the minor tributary stream which once entered the perimeter moat near the gatehouse and flowed eastwards following the natural lie of the ground (see Section 5.2). It has already been suggested, above, that channel **u2** may have originated as the lower stretch of the natural channel of this lost watercourse. Although the apex of the junction of the two channels **u1** and **u2** appears to have been deliberately filled in, the line of channel **u1** is continued westward, most clearly west of close **r**, by a broad channel up to 1m deep. This runs virtually parallel to **Track 1** and effectively demarcates the northern strip of the Outer Court eventually occupied by Vincent Skinner's house and gardens. It appears to be overlain by the brick building in the north-western corner of close **r**, where Coppack (1991, 42) observed, during digging of a land drain in 1984, fine, late 14th-century masonry dressings. At its western end, the channel emanates from a large rectangular depression, some 32m long by 15m wide, which seems to have been levelled up at its southern end, in part by the creation of the lawn laid out in about 1900. The southern end of this infilled depression is reflected in a pronounced deviation in the course of **Track 7** (see Section 6.3). While the upper portions of the sides of the broad channel are sharp and straight, the lower portions are markedly more sinuous, in places apparently distorting the more regular upper portions. This is strongly reminiscent of the effects of erosion by flowing water, while the large rectangular depression at its western end could be a pond. As well as the lost watercourse, a pond here may fed by the possible 'blow well' located on the opposite side of the western moat (see Section 2). The northern end of the possible pond and the western end of the channel leading from it lie within the area covered by the earth resistance survey, the former showing as a large patch of low resistance [**R18**] consistent with a pond and the channel as a weakly defined line of low resistance. In other words, it seems plausible that at some stage prior to the construction of the moat and the brick building in close **r**, both of which may have taken place in the late 14th century, a water channel connected a pond, fed by either a minor stream or by an artificial blow well (or both), with the angle change at the junction of channels **u1** and **u2**. This seems more straightforwardly consistent with the fact that the supposed head-race **u1** actually slopes downwards towards its junction with the Skitter Beck. The proposed arrangement would also make for a relatively gentle change of angle at the junction of the channels, water either by-passing the mill (**t**) by continuing straight along channel **u1**, or being diverted by some form of sluice to pass down channel **u2** to power the waterwheel. This arrangement would presumably have been made redundant by the construction of the moat marking the boundary between

the Outer Court and the North Bail, and this is consistent with the construction of the late 14th-century building in close **r** on top of the inferred head-race. It is possible that the strip of land between this channel and the moat was initially part of the Outer Court, and that it represents an expansion in the late 14th-century into what had hitherto been part of the North Bail. Given that the **bridge** across channel (**u1**) also dates to the 14th century, it could be inferred that the use of the triangle of land between the two arms of the channel **u1/u2** may have been a contemporary expansion.

With the construction of the large perimeter moats, probably in the 1380s, this arrangement would no longer have worked, and this may provide a context for the inferred extension of building **t** north-westwards and repositioning of the waterwheel. The north-western end of the later building coincides with what may be the exit of a conduit running between the eastern end of the moat that divides the Outer Court from North Bail and channel **u2**. The existence of the conduit is suggested by a short stretch of exposed stonework at the eastern end of the moat, perhaps representing the entrance of the conduit, and by a low bank running from this point towards channel **u2** on the same alignment as the putative mill (**t**). Wallis' plan of 1870 (Figure 14) shows that the bank carried a fence line in the 19th century and this field boundary marked the limit of the ploughing carried out in the mid-20th century, but its alignment is at odds with other field boundaries and it could well be of monastic origin. In this scenario, the stretch of moat dividing the northern side of the Outer Court from the North Bail could have effectively functioned as a linear reservoir, possibly supplemented by the water held in the moats defining the entire western perimeter. Another channel (**u3**), which also ultimately functioned as a field boundary, may have served as a by-pass channel avoiding the mill and returning the water to channel **u2**. This channel was reveted with stone walls at the point where it discharged into channel **u2**, suggesting that erosion may have been a problem, and therefore that it must have been in regular use. Thus, the general site of the mill may have been retained, but the building modified and enlarged, with the axle of the waterwheel turned through 90 degrees, the capacity of the 'millpond' greatly increased and the head-race shortened.

5.12 Fishponds (Figure 39)

Monastic communities depended heavily on fish, particularly sea fish, as a form of food that complied with the religious restrictions on their diet. Coppack (1991, 42) interpreted a number of large, shallow, rectangular depressions east of the church as fishponds. These may have been fed, somehow, directly by the Skitter Beck, but their low-lying location would have allowed them to capture a fair volume of ground water. Three of these (**w1-3**) were confirmed by the more recent survey; all are potentially *vivaria*, that is, larger ponds where fish were allowed to breed and grow (Dyer 1988). As described in Section 4.1, pond **w1** (and perhaps pond **w3**) was evidently partially filled in during the 1940s or '50s with spoil from the clearance and excavations. Rather disappointingly, this means that a scatter of oyster shells noted on the surface within pond **w1** is unlikely to relate to any original use of the pond as a saltwater *vivarium* for shellfish.

At some stage prior to the infilling, a channel was cut obliquely back to the stream, linking ponds **w1** and **w3**, at face value simply in an attempt to drain them. The channel runs

alongside the site of what may be a rectangular building some 9m long by 4m wide, on its own platform. This arrangement is reminiscent of a mill (bearing in mind the implied existence of a southern watermill noted in Section 5.11), but the means by which pond **w1** could have been supplied with water in order to have served as a millpond is unclear.

Ponds **w1** and **w2** seem to have lain within their own walled closes, the wall on their eastern sides surmounting broad low banks, which may have served to prevent flooding from the Skitter Beck. Tellingly, the severe floods in June 2007 did not reach pond **w1** (information from John Farrow, landowner). The head of pond **w1** appears to have been overlooked by a small square building occupying the remaining space within the walled close; this must have related to the management of the ponds, for example a 'fish house', where nets and other equipment may have been stored or processing carried out. Ponds **w2** and **w3** appear to have originated as broad cuts projecting at right angles from the Skitter Beck; the opening of **w2** into the stream was eventually blocked by an earthen bank to create a roughly square pond, but if there was a similar arrangement for **w3**, it has been destroyed by subsequent recutting of the stream channel. It is tempting to speculate that the original cuttings (particularly that of **w3**, which is less regular and could have opened directly into the beck), may have been created as wharves to allow building materials transported up the Skitter Beck to be unloaded close to the site of the church.

The 2007 survey identified the sites of two more ponds that were filled in with excavation spoil. The outline of an L-shaped pond to the north of the church, in the north-east corner of the enclosure defined by bank **b3**, shown containing water on the 1867 plan and as a dry pit on all Ordnance Survey mapping prior to the 1950s (*see* Figures 13 and 15), can just be distinguished from the overlying tips. Between Abbot's Lodge and enclosure **i**, the outline of another pond, shown holding water on all Ordnance Survey mapping prior to the 1950s, can also be discerned. This much smaller pond, placed closer to what might have been the abbey's domestic ranges, is a reasonable candidate for a *servatorium*, that is a pond used for storing live fish just prior to their consumption.

5.13 Destroyed earthworks in the North Bail (Figures 33, 34 and 35)

by Tara-Jane Sutcliffe and Al Oswald

5.13.1 The North Bail (Figures 33 - 35 and 42)

A moated or ditched quadrangular parcel of land covering *c* 9 ha (*c* 22 acres), adjoining the northern side of the Outer Court, has been known since at least the later 19th century as Norcroft Close and can probably be equated with the 'North Bail' referred to in the Thornton *Chronicle*. This enclosure, which was overseen by an officer of the same title whose name is recorded in the *Chronicle* from 1303 onwards, appears to have served a range of agricultural and rural industrial needs, generally supporting Coppack's (1991, 39) theory that it was the site of the home grange. By way of comparison, its area matches fairly closely the 18 acres occupied by the excavated home grange of Waltham Abbey, Essex, again located immediately to the north of the Inner Court and containing a suite of agricultural and industrial buildings (Huggins 1972).

Figure 33. Extract from RAF vertical aerial photograph taken 21 September 1946 (RAF/CPE/UK/1748, frame 4047). Note the widespread ridge and furrow and the well-preserved water meadows north-west of the abbey, subsequently ploughed out.

Figure 34. Extract from CUCAP oblique aerial photograph taken 8 June 1951 (CAP8022/73) showing extant earthworks in North Bail which were subsequently ploughed out.

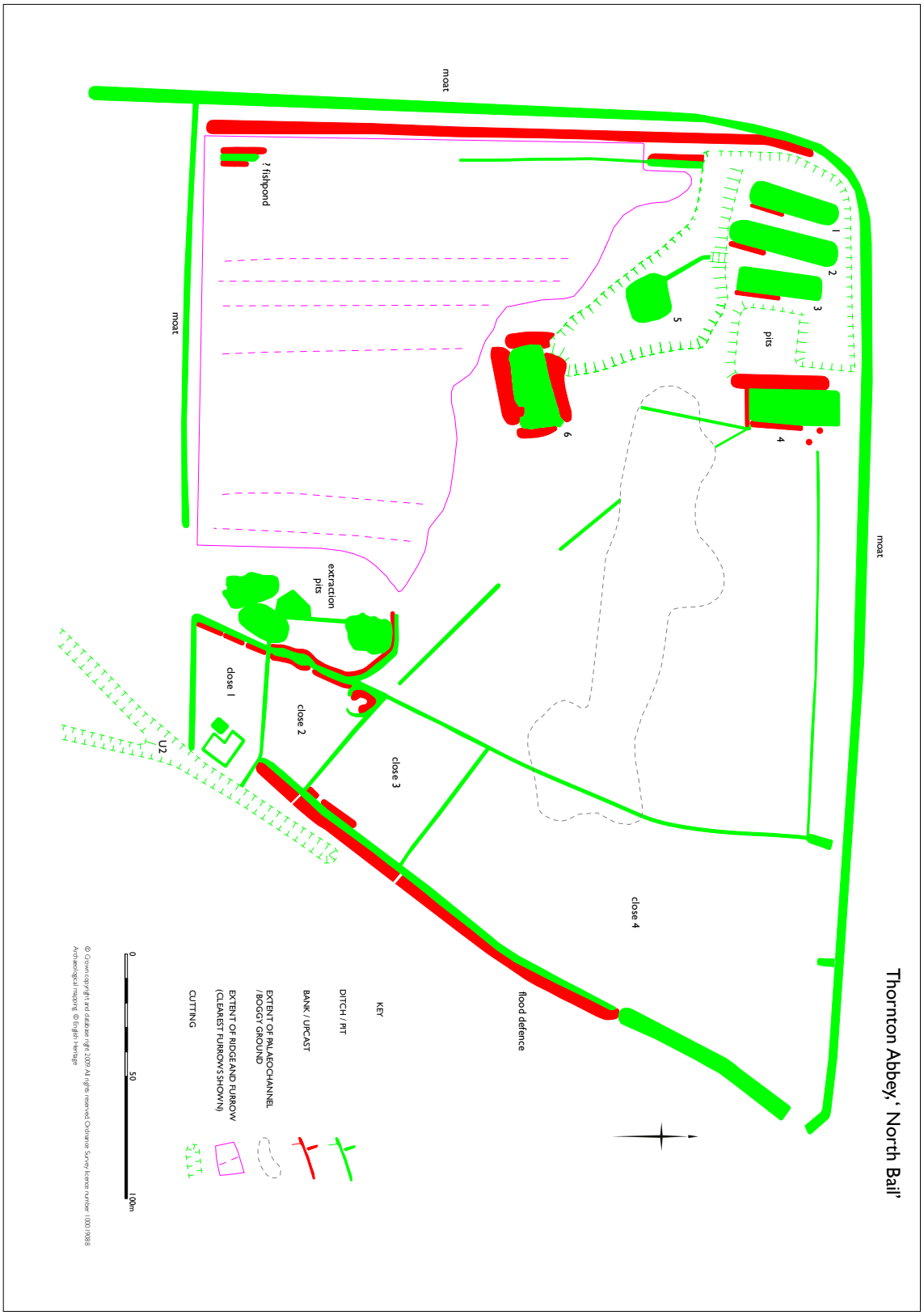


Figure 35. New air photographic trancription, reproduced at scale from the original plot at 1:2,500 (see also Figure 42).

The new aerial survey (Figure 35) was prompted by the recognition on historic aerial photography of relevant features omitted from Coppack's plan and by doubts about his re-interpretation of a complex of earthworks (**pits 1 - 6**), previously interpreted as fishponds or crew-yards (overwintering enclosures) for draft animals. These and other earthworks had been destroyed or drastically modified some decades before Coppack's investigations, so the objective of the new research was to carry out a more thorough and metrically accurate survey, but one based primarily on the same historic aerial photographs and maps available to Coppack previously. Some of the features recorded for the first time by the new aerial survey are certainly medieval, others probably so and others probably post-medieval. However, relatively few clear-cut stratigraphic relationships between features were observed and these generally do not allow great precision in terms of dating. The features identified, described further below, include a probable dovecote and a possible mill, laundry or tannery (at least, a relatively large building whose function apparently related to water) each building standing within its own enclosure (**closes 1-2**). Two more closes, without recognisable building remains, may suggest paddocks for livestock, or perhaps orchards (**closes 3-4**). A cluster of large, shallow hollows that may represent gravel or sand **extraction pits** are also potentially of medieval date, but may be later. In the western portion, traces of broad ridge and furrow are certainly indicative of medieval arable cultivation, though not necessarily contemporary with the operation of the home grange. The new aerial survey, in the light of observations on the ground, also suggests that the complex of earthworks previously interpreted as fishponds or crew-yards may actually be post-medieval brick pits.

The archaeological features mentioned above are visible as earthworks on the earliest available aerial photographs, which predate the onset of modern ploughing in the North Bail; some features are clearer subsequently as cropmarks. The earliest are RAF vertical photographs taken on 21 September 1946 (RAF 1946; Figure 33). Taken in the autumn, the picture quality is sharp (although marred by a number of horizontal scratches and minor print blemishes), with good contrast, aiding the identification of cropmarks and earthworks. The majority of features were mapped from a stereo pair of these photographs. At this date, the whole abbey precinct appears to have been under pasture, with the earthwork remains in the North Bail consequently well preserved. Additional detail of earthwork features in the south-east corner of the field is discernible on specialist oblique photographs taken by Cambridge University Committee for Aerial Photography in 1948 and 1951 (CUCAP 1948; 1951; Figure 34).

Ploughing began in the mid-1950s and has continued to the present, rendering earthwork survey here ineffective. Although a few of the earthworks, those which were formerly most prominent, are still just discernible on the ground, some ploughed out earthworks are no longer detectable even as cropmarks. An extensive network of drainage ditches, likely to be of post-medieval date, observed in part as earthworks on the 1946 and 1947 photography and as more extensive cropmarks on later photography, suggests that the medieval features had already been subject to a degree of damage. Documented military activity in this field in 1866-70 (*see* Sections 3.2 and 6.2), though short-lived and mostly unintensive in nature, may also have affected the condition of the earthworks, although no positive evidence for this was discernible from the aerial photography.

5.13.2 Medieval ridge and furrow

The land beyond the monastic precinct contains traces of both broad and narrow ridge and furrow, indicative of medieval and post-medieval ploughing (see Figure 33). Field-walking by Coppack (1991, 37) recorded spreads of medieval pottery in a field to the west of the abbey, almost certainly reflecting the medieval practice of spreading domestic midden material on arable land, given that ridge and furrow is visible in many fields west of the abbey. In the south-western quadrant of the North Bail, a block of ridge and furrow, comprising perhaps a dozen ridges aligned north to south and covering at least 2.5 ha, is visible as fairly well-developed earthworks on the aerial photographs of 1946 and 1947. In the north-eastern part of the field, dark patches are suggestive of depressed and boggy ground, probably related to a palaeochannel of the former tributary of the Skitter Beck described in Section 2 and visible on Figure 3, which may have deterred arable cultivation here. The individual ridges are broad, approximately 10m wide, strongly suggesting a medieval origin, but the characteristic 'reverse-S' pattern associated with ox ploughing is barely evident, except perhaps in the beginnings of a slight curvature in the southern ends of a few of the ridges. Their alignment seems to correspond to that of the western moated boundary, and the minimal curvature at the southern ends of some of the ridges suggests that they may once have continued somewhat further to the south, beyond the moat which divides North Bail from the Outer Court, perhaps as far as the supposed watercourse that continues the line of channel **u1** westward, which may have originated as a natural stream (*see* Sections 2 and 5.11). In this scenario, the ridge and furrow may have gone out of use in the late 14th century.

An alternative, and on balance quite attractive, possibility is that the moated perimeters of the North Bail themselves followed pre-existing furlong boundaries, perhaps defined by ditches, which must eventually have been massively recut to form the moat-like ditches. Although it seems fairly unlikely that such well-developed ridges could entirely predate the foundation of the abbey in 1140, the ploughing could well pre-date the creation of the North Bail, which may have taken place around 1303 (the year in which the officer of the same title is first recorded in the *Chronicle*). Construction of the actual moats has tacitly been accepted as having taken place in a single episode contemporary with the construction of the great gatehouse in the 1380s (see Section 5.3). Another plausible scenario is that the enclosure of the North Bail, though achieved through the construction of a superficially similar moat-like ditch, actually took place considerably later than the enclosure of the Outer Court in the 1380s. If the northern ends of the ridges coincided with the southern side of the strip of boggy ground, as seems likely, their length would have been fairly close to that of a conventional furlong (220 yards or 200m), offering circumstantial support for the theory that the North Bail could have taken over a full block of what had hitherto been arable land. Although no conclusive stratigraphic relationship was observed, it seems likely that the irregular northern extent of the block is due to the furlong having been truncated by the supposed crew-yard, whose date and function are discussed further in Section 5.13.5. If the crew-yard interpretation – which is disputed below – were to prove correct, this would again point to the arable cultivation being earlier than the construction or use of the home grange.

It can also be inferred from the fact that the ridges have evidently never been subdivided into narrow ridges, as clearly happened in some other fields in the environs, that

ploughing here did not continue into the post-medieval period, or resume then (if the abandonment of the broad rigs had already taken place before the Dissolution). This could conceivably be directly linked with the introduction of Sir Vincent Skinner's house and the 'fossilization' of the medieval landscape by a post-medieval designed landscape, for example the Little Park documented occasionally between 1578 and 1720 (Cameron 1991, 287-90). However, to take a wider view, sheep farming remained the mainstay of the region's economy throughout the later medieval period and into the 19th century, with arable agriculture not becoming so prevalent until the modern era, so the survival of a block of medieval ridge and furrow which had possibly not been ploughed for centuries is not necessarily unusual.

5.13.3 The great barn

At the eastern end of the stretch of moat that divides North Bail from the Outer Court, Coppack (1991, 39) identified 'a barn with at least one porch against its south boundary', which he equated with the 'great barn [*horreum*] in North Bail Yard' mentioned in the *Chronicle* (TC, 34), built under William Medlay, the 19th abbot (1443-73). The *Chronicle* may imply a distinction between North Bail and North Bail Yard, the latter perhaps therefore referring specifically to the triangle of land defined on the south by water channels **u2** and **u3**, adjoined by a building (**t**) that Coppack interpreted as the documented 'North Mill' (*see* Section 5.11). The piece of land that is the supposed site of the barn was ploughed for some years after the mid-1950s, but was eventually taken out of cultivation in order to preserve the buried remains and is now under pasture once more. Coppack's identification of the barn was based on a 1975 CUCAP aerial photograph which he refers to as 'BZ741', a photograph which can no longer be found amongst either the NMR collection or that held by the Unit for Landscape Modelling (which was, prior to its closure in 2010, responsible for the CUCAP collection). Indeed, the format of the photographic reference suggest that the '7' was wrongly transcribed: three letters usually indicate the film number and numerals record the individual frame (and it is impossible that 741 frames were taken using a single photographic film). Without access to the 1975 CUCAP photograph or the associated documentation, it is impossible to confirm Coppack's conclusion, although the damaged foundations were reportedly visible intermittently while modern ploughing was taking place (information from Keith Miller). The location of the barn, as identified by Coppack is marked in the earthwork plan (Figure 39). Its position and alignment correlate almost precisely with a 'canteen tent' shown on Wallis' 1870 map of the military encampment (see Figure 14), but this could be because the tent was deliberately placed so as to make use of the platform created by the medieval building's earthwork remains.

5.13.4 Closes and buildings

Along most of the eastern side of the North Bail a substantial bank, with a narrow ditch immediately to its west, runs parallel to the Skitter Beck and the northern part of the supposed outflow from the mill (**u2**). This is best interpreted as a form of flood defence. The bank was depicted on historic Ordnance Survey maps and almost linked at the north-east corner of the North Bail with the embankment on the inside of the northern boundary moat, as depicted on the First Edition 25-inch map (Ordnance Survey 1887;

see Figure 15). The location and significance of the southern terminus of the bank is discussed further below.

A ladder-like arrangement of four conjoined, quadrangular, closes (**closes 1 – 4** on Figure 35) is ranged south-west to north-east along the side of the field, roughly parallel to the Skitter Beck and making use of the supposed flood defence bank as their eastern side. Their other sides are defined by 2m-wide ditches, probably accompanied by banks that cannot be detected on the available aerial photography. Comparison with the First Edition 25-inch scale map (Ordnance Survey 1887) shows that the northern end of the earthwork defining the western sides of the closes coincided with an abrupt change in the size of the upcast bank along the southern side of the moat-like outer perimeter, the bank becoming much smaller to the east of the intersection. This seems to indicate a degree of contemporaneity. At some point, possibly after their disuse, the east-west ditches appear to have been cut through the flood defence bank to their east, presumably to allow water to drain through into the adjacent watercourse.

The southern side of the southernmost close (**close 1**) almost continues the line of the east-west arm of the moat that divides the Outer Court from the North Bail, but is slightly off-set, while its northern side follows the same alignment, making the close trapezoid in plan. Within this, next to the supposed mill tail-race (**u2**), the now destroyed earthwork remains of a large, L-shaped building (just visible on Figure 33) suggest that it had maximum dimensions of 13m by 14m, with no visible internal divisions. Trenches approximately 1m wide suggest that the walls, which had evidently been comprehensively robbed out, were thick and therefore presumably of stone construction. Immediately adjacent to the building is a sub-rectangular cut feature *c* 6m in diameter, whose date and function are uncertain. It may be significant that **close 1** appears to have allowed unrestricted access to the watercourse, with the supposed flood defence bank terminating against its northern boundary. This relationship would seem to confirm that the two features were in contemporary use and probably of monastic origin. It may also be significant the building itself picks up the alignment of the supposed tail-race (**u2**), like the supposed watermill (**t**), bringing it into an awkward relationship with the other boundaries of **close 1**. It is tempting, for example, to associate the building with the 'cottage called Le Launderhouse and all the river banks there near adjacent in tenure of Ralph Knyght and Joan his wife', mentioned in the 1549 grant (*see* Section 3.2), but a laundry might be expected to form part of the main domestic complex, and such a substantial stone building seems unlikely to have been described as a cottage.

A tannery - since one must have existed, even though it is not recorded in the surviving documents - is another plausible candidate, perhaps more consistent with the building's separation from other activities and with the generally utilitarian character of activity in the North Bail. The tanning process would have required water and could potentially have involved the approximately circular cut feature, although definite medieval tannery tanks are generally rectangular and laid out in small groups (for example, the late medieval examples at Rievaulx, North Yorkshire). It may even be that the building represents the North Mill identified by Coppack as lying further to the south (**t**), although its south-eastern side lies a few metres from the watercourse, rather than immediately adjacent as might be expected of a watermill.

The northern side of the next close to the north (**close 2**) was evidently defined by a pre-existing boundary, whose ditch can be traced running diagonally, south-east to north-west, across North Bail for more than 200m. As a result, the close is an irregular quadrilateral in plan, diminishing from 48m wide on its western side to only 21m on the east. Set into its north-western corner was a roughly circular building platform, *c* 10m in diameter, enclosed within a ditch with an opening to the south-east, towards the centre of the close. The earthwork is indicated vaguely on Wallis' 1870 plan (*see* Figure 14), as are the western and northern boundaries of the close. The building may represent a large dovecote; although the inventory of 1539 makes no reference to one (Minns 1898, 484-92), the grant of 1549 to Robert Wood does. Dovecotes, which provided meat and eggs, as well as feathers for stuffing mattresses and manure, are often found as components of monastic complexes (Hansell & Hansell 1988; Bond 2004, 147-52). Although they have a long currency from the 11th through to the 18th centuries, those of post-medieval date in this region are usually rectangular or occasionally octagonal, while those of medieval origin are generally circular. The same 1549 grant also mentions cottages and gardens, possibly of post-monastic origin, to which these closes, and the buildings identified within them, could conceivably relate.

An alternative interpretation for the circular building, which may be supported by its proximity to the 'great barn', is that it was the windmill referred to in a cellarer's account apparently dating to 1525 (Lincolnshire Archives, Box 92/6/1/a). Most medieval windmills were of the post-mill type; while circular, stone-built tower mills had begun to appear by the end of the 13th century, the available documentary evidence suggests that monasteries were slow to embrace their use and none has yet been convincingly identified on a monastic site (Bond 2004, 328). However, the fact that post-mills were usually (particularly in low-lying country) built on a distinctive earthen mound, for which no obvious candidate is identifiable at Thornton, appears to increase the likelihood that the newly recognised circular building could be a tower mill. A potentially comparable co-location is known at Meaux Abbey, William le Gros' great Cistercian foundation in Holderness, where a windmill had been constructed next to the tide mill at the end of Ashdyke by the mid 13th century (English 1979, 207).

The northern side of the third close (**close 3**) in turn picks up the alignment of the pre-existing ditch that forms the northern side of **close 2**, so that this too is trapezoid in plan. The northernmost close (**close 4**) appears to have extended all the way to the northern perimeter of North Bail. Parallels for such 'empty' enclosures are to be found at other monastic sites in Lincolnshire, where it has been suggested that small paddocks may have served stock management purposes (Everson, Taylor & Dunn 1991). Alternatively, orchards must have existed within the monastic complex; these would have required protection from livestock at certain times of year

5.13.5 Crew-yards, fishponds or clay-pits

In the north-west corner of the North Bail enclosure is a complex of six pits, five of which (**pits 1-4** and **6**) were long and rectangular while the other (**5**) was squarish, all set within two adjoining, larger, shallower cuttings of more irregular plan. Aerial photographs show that at some point between 1967 and 1976, the three adjacent pits

(**pits 1-3**) were drastically recut to form the single irregularly-shaped pond that still exists today. As surveyed for the First Edition 25-inch scale map (Ordnance Survey 1887), only the two outlying rectangular pits (**pits 4** and **6**), which were evidently more prominent earthworks, were depicted individually, along with the larger, irregular cuttings within which the other four lay. Successive historic Ordnance Survey mapmakers from 1887 onwards conspicuously avoided labelling these prominent earthworks as fishponds (*contra* Coppack 1991, 39). This interpretation was subsequently reached by Clapham and Baillie Reynolds (1956, 4), who had presumably taken the opportunity to examine the earthworks when they were still intact in the 1950s and thereby observed the internal rectangular depressions previously omitted by the Ordnance Survey, prompting their interpretation. The ponds were subsequently resurveyed by the Ordnance Survey Archaeology Division at 1:2,500 scale and marked as fishponds (Ordnance Survey 1967). Working after the remodelling in the late 1960s or early 1970s, Coppack's (1991, 39) dismissal of the fishponds hypothesis, in favour of crew-yards, fitted well with his interpretation of the North Bail as the home grange, but his conclusion was evidently based entirely on the Ordnance Survey's secondary – and selective – depiction.

Both the larger cuttings appear to have been separated from the western and northern perimeter moat by a narrow bank, but there is a strong suggestion, both in the overall plan and in the narrower width of this bank, that the pre-existing embankment of the moated perimeter, whose breadth elsewhere is clearest from historic Ordnance Survey mapping (see Figure 15) was cut back to produce it; in other words, that the complex of pits post-dates the moated perimeter. This has some bearing on the new interpretation of the complex proposed below.

Wallis' map of 1870 and the Ordnance Survey depiction surveyed in 1886 show elements of the earthworks as being wooded at that period (as most still are today), woodland apparently having developed naturally in many of the wetter parts of the site (see Figures 14 and 15). Wallis' plan shows a rectangular building standing within the western arm of the more southerly cutting, perhaps built in timber since it is depicted differently from both the tents and a building to the south-east of the **bridge** over channel **u1**. This isolated and presumably, given its sunken location, partially hidden building may have been a latrine block for the common soldiery (a similar building was sited near the canteen tents in the Outer Court). The plan also provides more concrete evidence that some of the depressions were boggy, for it shows a water-filled ditch, evidently a later feature, cutting across and through **pit 3**, presumably to act as a drain.

Notwithstanding the incomplete depiction of the form of the earthworks on which Coppack based his interpretation, it has to be questioned, in this low-lying terrain where any depression tends to fill with water, whether the construction of sunken crew-yards would have been practical or sensible. Regular layouts of rectangular fishponds, on the other hand, are a fairly common feature of low-lying monastic sites, for example the well-recorded examples at Kirkstead Abbey near the River Witham in Lincolnshire (RCHME 1995) and St Benet's Abbey next to the River Bure in Norfolk (RCHME 1994; Pestell 2008). At Thornton Abbey itself, too, a slightly less extensive set of rectangular ponds enclosed within a moat lies just outside what appears to be the southern boundary of the precinct (see Figure 18). In all these more conspicuously planned sets of ponds,

however, the sizes and alignments of the individual ponds are markedly more uniform and their overall layout more coherent. In short, neither of the interpretations proposed previously is entirely convincing.

Although the individual pits are rather broad, their overall pattern is reminiscent of the post-medieval 'brick pits' (that is, clay extraction pits) found widely in the region. Along the southern shore of the Humber estuary (see Section 2), for example, many examples still survive as parallel series of trenches, while the outlines of many more are depicted on historic Ordnance Survey maps. The glacial deposits in this area typically comprise a mix of gravels, sands and clays, with some very pure localised patches (Geological Survey of Great Britain 1983; Soil Survey of England and Wales 1983). Exposures of subsoil in the sides of the present pond show it to be pure clay below a depth of *c* 1m. This, together with the fact that the modern pond carved out of the earlier depressions holds water all year round, may indicate that just such a localised deposit of clay exists here. Indeed, the main cluster of pits approximately continues the line of the strip of boggy ground evident on aerial photographs. The interpretation of these earthworks as extractive pits would account fairly well for the irregular form of the larger cuttings, which would be consistent with initial overburden stripping to expose the clay deposits. The location of the southernmost depression (**pit 6**) might be consistent with 'proving' the depth and quality of the deposit prior to more extensive stripping and extraction.

Given the well-attested use of brick in the construction of Thornton Abbey from at least the mid-14th century and the utilitarian nature of activities in the North Bail, it might be tempting to infer that these supposed brick-pits could be of medieval date, as Bond (2004, 336) appears to suggest. However, the apparent stratigraphic relationship of the complex to the internal bank of the moated perimeter tends to suggest that the pits are of relatively late origin. In the light of the discussion above concerning the date of the moated perimeter of North Bail, an origin within the monastic period cannot be ruled out, but a post-medieval date still seems on balance perhaps more likely. Although it must be assumed that stone reclaimed from the abbey was exploited by Sir Vincent Skinner for the construction of his grand house of about 1607 (described in Section 6.1), the extent to which he may also have used brick, whether reclaimed or newly made, is uncertain.

5.13.6 Probable extraction pits

In the south-east quadrant of the field, immediately west of **closes 1** and **2**, was a cluster of irregular, shallow pits, three of which inter-cut one another. On the north and east, the pits were enclosed, or perhaps screened, by a bank and ditch, the eastern ditch apparently representing a later recut of the western boundary of the four putatively monastic enclosures. The pits occupied a low natural rise, which, in this geological context, could represent a localised deposit of glacially deposited sands or gravels. This supports the theory that the shallow pits were extraction pits. Narrow trenches, probably later drainage channels, linked the outlying pit to the main group and these pits directly to the ditch dividing **close 1** from **close 2**. The pits' stratigraphic relationship with the nearby ridge and furrow cultivation is not clear-cut, though they do appear to post-date the enclosures to the east. On the other hand, the fact that the enclosing ditch

(or screening bank?) was built at all may indicate that even if the pits originated after the enclosures, they may have remained in contemporary use; therefore, it is plausible that they are of monastic date.

Alternatively, if the subsoil is clay rather than permeable sand or gravel, the pits may have functioned as 'retting ponds' for processing flax into fibre for the manufacture of linen and rope. Flax was grown widely in medieval and post-medieval Lincolnshire, with demand increasing sharply during the Napoleonic wars, for the manufacture of sail-cloth. Flax certainly thrives on light sandy soil like that found in the vicinity of Thornton Abbey and plenty of examples of retting pits are known in the north-west of Lincolnshire. The retting process - whereby the soft plant material that binds the fibres in the stem decomposes - was usually carried out in ponds filled with stagnant water (Bond and Hunter 1987, 178). Retting-ponds have been shown to be typically located on flat ground close to a river, but utilizing smaller streams which have been channelled to provide a controlled water supply (Higham 1989). In this case, the Skitter Beck could have performed such a function. However, definite examples, which are all of post-medieval date, tend to be smaller, rectangular, and to occur in larger numbers. It remains uncertain whether medieval examples differed in form, or whether they were ever connected with monastic economies. Post-medieval ponds were often specially dug for the purpose, but pits resulting from other extraction appear also to have been re-used (Carter nd); it is conceivable, therefore, that both extraction and subsequent re-use for retting could have occurred here.

5.13.7 Possible pond

In the extreme south-western corner of the North Bail, a small, rectangular depression may have been a small pond. As depicted by the Ordnance Survey (1887; *see* Figure 15), the earthwork lay alongside the perimeter embankment, without impinging on it, conceivably suggesting the two features to have been in contemporary use, if not of contemporary origin. The new aerial survey, on the other hand, suggests a greater separation between the two features, which does not allow for any secure inferences regarding the possible chronology, although the shared alignments might imply that the pond is the later feature. The new survey also indicates that the rectangular depression, some 16m long by 5m wide, was flanked by low banks of upcast; neither this characteristic, nor its regular rectangular plan is suggestive of a pond for watering livestock. Its possible function is discussed further in Section 6.1.

6. POST-MEDIEVAL REMAINS IN THE OUTER COURT

6.1 The early 17th-century house and gardens of Sir Vincent Skinner

As previous commentators from de la Pryme onwards have noted, the house built in about 1607 for Sir Vincent Skinner stood on the northern side of the abbey's Outer Court, approximately mid-way between the gatehouse and the church, facing south. David Roberts (1984) first made the link between three drawings of the house by the London architect John Thorpe, now held in the Soane Museum, and the ground plan of the foundations recorded for Lord Yarborough in the mid 19th century (*see* Figure 5). In essence, the house was inspired by Palladio's Villa Valmarana of *c* 1560. It followed Elizabethan fashion, with a central hall entered on the south through a small porch opposite the dais. Thorpe's original design specified a hall 34 feet (10.36m) wide – a huge span by the standards of the day – but a later drawing revised this to a more manageable 25 feet (7.62m). In line with the hall, behind the dais, was a chapel with two rows of pews. Behind this again was a large parlour with a compass window. On either side of this axis, two 'lodges' (that is, lodgings) flanked the parlour, while the kitchen and pantry flanked the front of the hall, the whole arrangement interrupted in the centre of the house to allow windows to light the dais and the chapel. A 'best stair' occupied a tower on the west, opposite the chapel, while a second stair on the east led off the hall. Roberts (1984, 60) suggests, based on the different foundations recorded by Lord Yarborough, that the former was built in stone, while the latter was wooden. On the first floor, a dramatic long gallery extended the full depth of the house, above the hall, chapel and parlour, flanked by an arrangement of chambers corresponding to those on the ground floor. Substantial external buttresses may have mimicked those of the church, being of similar size and spacing; as Roberts (1984, 57) notes, these are unique amongst Thorpe's designs.

The earthworks (**z** on Figure 39; *see* also cover photograph) take the form of crisply-defined trenches up to 1.2m deep corresponding to the buttresses and wall-lines, with mounds filling the spaces (that is, the rooms) between. As Roberts (1984, 60) observes, the overall plan shows that Thorpe's final drawings were ultimately reinterpreted by Skinner. The parlour was foreshortened but the size of the flanking lodgings maintained, so that the best stair obscured a window that had been intended to light the chapel from the west, while a minor room accessed through the north-eastern lodging was lost to retain the chapel's eastern window. There has been little explicit discussion of how the building, which reportedly collapsed soon after its construction, came to be represented by negative earthworks. Although it is known that Lord Yarborough excavated the remains, it seems improbable that he would have aimed to do more than expose wall-lines already detectable on the surface, as he did with the church and cloister. This leaves the depth of the trenches unexplained: systematic robbing seems the most plausible explanation and it appears that this continued below ground level right down to the very foundations. Such unusual thoroughness lends circumstantial support to de la Pryme's comment that Skinner was responsible for dismantling the abbey buildings, for it is likely that he did this in part to acquire building materials for his new house, thus inadvertently making his new house equally attractive to later stone robbers. As discussed in Section 3, it seems plausible that Edward Winn instigated this robbing, and perhaps

actually dismantled the building, and that the traditional account of its extraordinary and unexplained collapse is misleading. His intention in doing so may have been both to acquire materials for his own new house in Thornton Curtis and to offset as far as possible the bad debt left by Skinner mortgaging the property to his wife Margaret.

In interpreting the earthwork remains of two possible buildings (**y1** and **y2**) in the north-west corner of the Outer Court as possible outbuildings of 17th-century date, Coppack (1991, 44) implicitly recognises that Skinner's house is likely to have been associated with a setting appropriate to its grandeur. However, the presence of any garden remains, of the sort that might also typically be expected to accompany a great house of the era, has not previously been considered explicitly, all the other earthworks being assigned to the monastic phase of the site's use. Reappraisal of the major earthworks recorded by the 1985 survey, as well as identification of vestigial traces overlooked by earlier fieldwork, suggests that formal garden compartments may indeed have lain to the east and west of the house. On their south sides, both these garden compartments, as well as what seems to have been the forecourt of the house, are bounded most conspicuously by the channel that continues the line of channel **u1** westward. An intermittent bank on the north side of this channel was probably surmounted by a wall, since foundations of both stone and brick are exposed in places. The boundary, if not the wall, may well be of monastic origin, if (as suggested in Section 5.11) this channel once carried water to the watermill (**t**). A broad bank running along the northern side of these garden compartments seems to be made of spoil presumably cast up from the adjacent moat, and therefore must also be of medieval origin, though the bank seems ultimately to have served as a terraced walk commanding views over the garden compartments, as well, perhaps, as northwards across what had been North Bail. Within the compartments, other monastic features may well have continued in use, or determined or more indirectly influenced the garden design.

Figure 36. Reconstruction of Sir Vincent Skinner's house of about 1607 (by Gill Atherton).

To the east of the house, the earthworks are more prominent and some can fairly confidently be interpreted as garden features. Details of Thorpe's drawings of the house, although unconfirmed by Lord Yarborough's excavations, suggest that on this side he intended a broad paved terrace to span the space between the north and south wings, with a central flight of steps down into the garden. Strangely, however, what appears to be the garden compartment's central axis does not align on the predicted position of the flight of steps descending from the paved terrace, but lies considerably further to the south; a similar off-set is detectable, though less clear, to the west of the house. It seems quite unlikely that Skinner would have progressed some way with executing the garden design before taking the decision to modify Thorpe's architectural plan by foreshortening the building's north-south extent, as described above. The earthworks suggest that the axial path on the east descended two more broad terraces, the upper of which also gave access to the terrace running alongside the moat on the north. Where these terraces met, a prominent ring-shaped earthwork very could well represent the overgrown remains of a dovecote. Such a structure, within or close to the Outer Court, is mentioned in a grant of 1549, so it is possible that Skinner incorporated a pre-existing feature into his designs. Alternatively, this could represent a more explicitly ornamental building such as a belvedere. In the south-east quadrant of the garden compartment, a large oval depression up to 1.8m deep may have been the site of an ornamental pond. The depression is still prone to flooding, despite relatively recent attempts to drain it, and its creation may have served to make a virtue out of a necessity by draining the boggy ground in its environs. Opposite this, on the edge of the lower terrace running parallel to the moat, a slight ring-shaped earthwork may result from the robbing out of a feature such as a statue or fountain. The supposed garden compartment as a whole seems to have extended at least as far eastwards as the end of the medieval moat and perhaps as far as the western wall of building **t**, which seems unusually well-preserved, and was perhaps incorporated, making the end of the garden compartment far from square.

Thorpe's drawings show a loggia spanning the space between the wings on the west of the house, presumably offering sheltered seating from which to enjoy a vista across the gardens. On this side, too, a central path seems to have extended away from the house, but on this side too apparently aligned considerably further south than the anticipated centre of the loggia, resulting in what appears to have been an awkward dog-leg in its course. Both north and south of this path, smaller rectangular compartments suggest an approximately cruciform pattern overall, typical of the early post-medieval period. The layout of the buildings identified by Coppack in the north-west corner of the compartment (**y1** and **y2**) supports his suggestion that they blocked access to the corner of the medieval moat, where a tower may formerly have existed. Both the earthworks and the earth resistance survey suggest that the corner of the walled platform on which **y1** sat touched the corner of **y2**, possibly even leaving an unoccupied space in the very corner which might have been taken up by such a tower. The rectangular form of building **y1**, which is clearly visible in the earth resistance responses (*see* Section 5.8.2, anomaly [**R5**]), is disguised on the surface by an overlying oval bank of spoil, which may result from robbing or perhaps excavation by Lord Yarborough. Historic Ordnance Survey maps identified the site of another building (**y3**), stretching southward from the eastern end of **y2** and mirroring **y1**, and this depiction has passed into modern mapping (Ordnance Survey 1887; *see* Figure 15). There is some support for this suggestion both

in the earthwork remains and the earth resistance data (anomaly [**R6**]). The function of buildings **y1-3** is open to question, but their detachment from the main house and close association with what appears to be a formal garden compartment of equal breadth immediately to the south is suggestive. The rectangular pond in the North Bail (*see* Section 5.12.6), on the other side of the moat immediately opposite **y2**, might also be relevant in this context. What appears to be another rectangular building (**y4**), which may have been subject to trial excavation in the 20th century, occupies a comparable position overlooking the opposing, south-eastern quadrant of the garden compartment. If the range identified by the Ordnance Survey (**y3**) is genuine, the complex could conceivably represent a previously unsuspected domestic hall range with wings, for example the messuage with gardens granted to Robert Wood in 1549, or a residence associated with Archbishop Rands' 28-year long ownership of the site, or with the equally long tenure of the Tyrwhitt family of Kettleby. Any of these might represent a precedent for a domestic residence in this locale that might help to explain why Skinner sited his house where he did. Indeed, it is even possible that the curious disjunction between Skinner's house and the surrounding garden remains, noted above, was caused by the superimposition of his house onto a pre-existing garden layout belonging to an earlier residence, which was never adjusted. However, it is difficult to imagine why, prior to Skinner's demolition of the abbey's buildings, Wood, Rands or one of the Tyrwhitts would not have made use of a pre-existing building. Alternatively, the stable block at Audley End, Essex, whose construction has recently been shown to be almost exactly contemporary with that of Skinner's house, comprises a long south-facing range with short wings and a central porch, standing in a very similar relationship to the main house as that seen at Thornton Abbey (Smith 2010). At the lower social echelon represented by Skinner, a much more modest stable block might be expected, yet it is very likely from what is known of his character that he would have emulated, as far as his finances allowed, whatever trappings were in vogue amongst nobles like the Earls of Suffolk. However, the difficulty of identifying any means by which carriage access to buildings **y1-3** could have been gained presents a major impediment to its interpretation as a stable block.

It might be inferred that the compass window on the north side of the parlour of Skinner's house was also intended to command views towards a designed landscape that extended beyond the medieval moat into the North Bail enclosure. Indeed, slight earthworks in the interval between the edge of the robber trench and the edge of the moat (where it would also appear that an undocumented excavation has taken place) hint at the former existence of a bridge across the moat directly in front of the compass window. Aerial survey of the North Bail (*see* Section 5.3) betrays no positive evidence that Skinner's tenure made any physical impact on the appearance of this area. The absence of any post-medieval over-ploughing of the broad ridge and furrow, on the other hand, suggests that the North Bail remained under pasture from the abandonment of the medieval cultivation until the 1950s. The enclosure may therefore have been reserved by Skinner as a small deer park or a warren, both obvious components in a designed landscape of a country house of this date. In any case, given the rapid demise of the house and the evidence encountered elsewhere that garden works may have been abandoned (*see* below), it is simple enough to explain away the paucity of evidence for more overt modifications in the North Bail.

Given that the house faced south and must have been approached from the medieval gatehouse to its south-west, an impressive formal garden might be anticipated on this side, but there is scant evidence that this existed. As mentioned in Section 5.9, the survival of the medieval boundary wall **e** in the context of such heavily robbed environs demands some explanation: it is possible that this was retained as the intended southern boundary of the compartment. Just east of the truncated eastern end of the wall, a low, regular bank is traceable running northwards towards, and on the line of, the boundary dividing the enclosure surrounding the house from the supposed eastern garden compartment. This is clearly visible in the earth resistance survey [**R16**], though not in the magnetometric survey. As noted in Section 5.4, the medieval route running directly from the gatehouse to the west end of the church (**Track 1**) may have been re-used as the first part of a carriage drive to the new house, for there is no clear evidence for any more direct approach. As mentioned in Section 3.2, de la Pryme mentions 'two rows of trees on each side' of the court (his subsequent description shows that he means an avenue), which must correspond to the avenue of mature but badly damaged trees flanking **Track 1** depicted on Stukeley's engraving of 1724 (*see* Figure 7). A few corresponding tree holes were identified by the 2007 survey and the most plausible context for such an avenue is Skinner's garden design. Although there is no clear evidence for its course beyond **Track 1**, the route must have turned back on itself before the church and run directly in front of the house to allow guests to disembark.

Apart from these fragments of evidence, almost all the earthworks and geophysical anomalies identifiable between **Track 1** and the site of Skinner's house are amorphous mounds. Two possible explanations for this can be proposed: first, it may be that spoil has been dumped here, perhaps emanating from Lord Yarborough's work on the gatehouse and its environs or Skinner's house itself, in the mid-19th century. However, the ability of the earth resistance survey to identify at least one buried wall-line [**R12**] that appears from its alignment to be of medieval date begs the question as to why 17th-century features are not equally recognisable. The second possibility is that the amorphous earthworks represent gross earth-moving for an intended garden compartment which was left incomplete when Skinner's house was lost (whether by accident or design). Some support for this theory comes from the observation that the earthworks seem to be broadly commensurate in width with the frontage of the lost house. One pragmatic reason for leaving till last the construction of this compartment – though it would arguably have been a very important aspect of the garden's design – might be that Skinner's house was only really accessible from the south; therefore, traffic across this area would have continued throughout the period that the house and the east and west garden compartments were under construction.

6.2 The military encampments of 1866-70

Wallis' plan of 1870 (*see* Figure 14), owned by the current landowner Mr John Farrow, and unknown to researchers until 2007, testifies to an episode in Thornton Abbey's history which could go completely unsuspected on the field evidence alone. The soldiers' tents themselves were generally sited on level ground, leaving no discernible trace, although a roughly circular spread of spoil (whose source is unclear), overlying enclosure **r**, corresponds remarkably closely to one of the large bell-tents depicted on the 1870

plan and may therefore represent an attempt by the soldiers to level up the earthworks here. In addition, as mentioned in Section 4.1, the erection of the men's mess tent and canteen to the west of the church may have necessitated the deliberate levelling of the surface there. The 1870 plan suggests that the tent was erected at some distance from the guardianship area, beyond the limit of the dumped spoil. However, a large steel picket, of the size and type generally used to hold the guy ropes of such tents, remains driven into the ground right next to the pedestrian gate into the guardianship area, indicating that, at least during one of the four summer camps, a tent may well have stood much closer to the fence. The sites of two tents shown to the east of the site of Skinner's house seem implausible if the plan is taken at face value, because they would have stood on very uneven ground where shown, but the map's lack of metrical accuracy can be detected in several other places.

To the south-east of the **bridge** across channel **u1**, two small, rectangular buildings, possibly components of the military encampment, survived until some point between 1886 and 1906 (Ordnance Survey 1887; 1908). Perhaps the most likely context for their loss is the re-presentation of the site instigated by the 4th Earl of Yarborough in 1900. Their foundations cannot now be identified as earthworks, suggesting that they were not substantial structures, but the fact that they were depicted using solid tone, both on Wallis' plan of 1870 and the later Ordnance Survey maps, seems to indicate that they were constructed in brick or stone. Given this inference, together with the relative isolation of the buildings and the provision nearby of what may be a guard tent, the buildings may have been cartridge or powder stores. While it could be argued that a building with such a key function would have been named on Wallis' plan, it must be conceded that no alternative, named or otherwise, can be identified.

The Temperance gathering known to have taken place earlier in the 19th century must have required similar tented accomodation, washing and latrine facilities, and so on, but no trace of the inferred structures, or of contemporary activities, can now be recognised in the earthwork remains.

6.3 Tracks 6 and 7

Two braids of a single route running north-eastwards from the gatehouse to a field gate into the North Bail at the eastern end of the moat that defines the northern boundary of the Outer Court, are intermittently traceable as hollow ways. The more southerly (**Track 6**) was evidently in use in the late 1860s, while the more northerly (**Track 7**, or a variant of it) is shown on the more accurately surveyed First Edition 25-inch scale map (Wallis 1870; Ordnance Survey 1887; 1908). Both trackways cut through all the other earthworks, including those thought to be associated with Sir Vincent Skinner's garden of about 1607, and both were presumably put out of use by the creation of the fenced garden at the rear of the gatehouse in about 1900. The fact that they are both fairly well-defined as earthworks may indicate that they provided not just farm access but also a short-cut from the gatehouse to College Bridge. If so, this re-established, to a degree, the more direct route across the valley argued to have existed prior to the establishment of the abbey precinct.

7. DISCUSSION

Acknowledgement of change through time has been implicit throughout earlier scholars' work on the dating of individual monastic buildings, while Coppack's (1991, 40) recognition of two broad phases apparent in the earthwork remains began to elucidate how the extent, layout and appearance of the monastic complex as a whole could have changed over the four centuries of its existence. At the outset of the recent investigations, there was little confidence that much progress would be made in understanding the developments of the medieval period, but ultimately this presumption has proved unfounded: a clearer picture has emerged of how the basic building blocks of the abbey's layout may have been progressively enlarged over the course of the Middle Ages, each time retaining some elements of what had gone before while abandoning or modifying others. What was clearly evident at the start of the new investigations was that even Coppack's study, the only one to discuss post-Dissolution activity at any length, underplayed the impacts of later developments on the medieval remains, with the obvious exception of their despoliation. Other studies have almost entirely overlooked the positive impacts of post-medieval re-use of the monastic site: Jennifer Alexander (1993, 113), for example, suggests that the gatehouse survived robbing solely because it was constructed primarily in brick - a less valuable building material - rather than because the building was actively incorporated into the schemes of successive post-Dissolution owners, as was clearly the case.

The primary research questions at the outset of the recent investigations therefore revolved around questions of change over time, focussing initially on the degree to which the monastic remains, both the standing buildings and the earthworks, might have been modified in the post-medieval period, most conspicuously under the brief ownership of Sir Vincent Skinner in the early 17th century. In addition, while modern changes such as the ploughing of the North Bail in the mid-1950s have had obvious consequences for the medieval remains, some of the impacts of the endeavours of successive Lords Yarborough and 20th-century archaeologists in excavating and presenting the site are more difficult to detect and have consequently been underestimated or entirely overlooked in recent discussions. In anticipation of the latest re-presentation of the site to visitors, it was hoped that an improved knowledge of post-Dissolution activity might help not only to highlight aspects of the site's more recent history that are of interest and importance in their own right, but also to refine the interpretation of the medieval complex itself, if only in a 'negative' sense by demonstrating that interpretations thought to be well-founded were either disputable or incorrect. In this way, the research could serve more generally to illustrate how monuments and landscapes are dynamically constructed through time.

Summary of key individual findings

The application and complementary interaction of several different research techniques at Thornton Abbey has resulted in a number of revisions and refinements of individual components of Coppack's 1991 benchmark study. It is worth itemising some of the key findings before discussing the evolution of the complex as a whole.

Several possible incarnations of the boundary of the rectangular Inner Court can be identified, of which the earliest may well have been laid out at the same time as the earliest visible foundations of the claustral range, that is, in the 1260s. The eventual western boundary (**b4**/**R10**/**M5**) can now be identified fairly securely, along with the probable site of an inner gatehouse or major gateway giving access from the Outer Court. There are several indications that this incarnation of the boundary may have been laid out in the mid- to late 14th century.

Wall **e** was clearly a major boundary, but it remains open to question whether its purpose was to enclose part of the Inner Court, as Coppack has suggested. If so, as he points out, it was evidently a further expansion of the earlier Inner Court, a development which can now perhaps be dated to the late 14th century, perhaps hard on the heels of the digging of the moats that accompanied the construction of the great outer gatehouse. The utilitarian functions that Coppack attributes to the buildings in enclosures **g** and **h** – bakehouse and brewery – are perhaps not entirely consistent with the visual prominence lent them by their elevated position, and the supposed 'cistern' on which the interpretation of the brewery was partly based is almost certainly a pit produced by later sand quarrying.

A number of individual buildings identified by Coppack have been rejected on the evidence of the new surveys, some probably represent dumps of 19th-century excavation spoil, while the form of others is now more fully understood. Furthermore, several others that have not previously been recognised can now be proposed with varying degrees of confidence, based on either earthwork or geophysical survey, and usually a combination of the two techniques. Arguably amongst the most important is the large, rectangular building [**R1**/**M1**] set towards the southern side of close **r**, just within the inferred site of the gateway between the Inner and Outer Courts. This could be a guesthouse, similarly located to that at Rievaulx Abbey, North Yorkshire (*see* Coppack 1994, fig 8) and elsewhere, or the 'new hall' documented in 1313 (this hall thought by Coppack to equate to what is now Abbot's Lodge), or perhaps a large and imposing almonry. Allowing public access to an almonry in the Inner Court is unusual, but not entirely unknown, and may reflect the greater openness of the Augustinian order.

The broad, carefully levelled way leading directly from the great gatehouse to the church (**Track 1**) seems likely to have had ceremonial significance and must have been a key element in structuring the layout of the Outer Court and visitors' aesthetic encounter with the most sacred and beautiful buildings. It would appear that its route made a slight change of alignment at the inferred site of the inner gate, apparently in order to approach the church's imposing west front almost straight on. There are also hints that the route was originally aligned on a predecessor of the present gatehouse, sited slightly to the south of that built in 1377-82. Several episodes of later re-use and reworking of this route can now be distinguished.

Various fishponds not identified by the previous earthwork survey because of deliberate infilling, have been recognised, while it is clear that most of those identified previously have been partly infilled with excavation spoil.

Immediately west of the cloister, and within the bounds of the supposed Inner Court at its greatest extent, is an extraordinary pattern - either a saltire cross or a Union Flag - of vestigial earthworks complemented by geophysical anomalies, which may tentatively be interpreted as the remains of a late monastic garden. The elaborate geometric pattern of the earthworks is at first glance perhaps reminiscent of garden design of the later 16th and 17th centuries and 'ruin gardens' that have been identified on other newly abandoned monastic sites (for example, at Kirkstead Abbey in Lincolnshire; see Everson and Stocker 2003, fig 4). However, one of the axial divisions seems to coincide with the line of a buried conduit which respects the proposed inner gateway, allowing a date as early as the mid-14th century. Then again, given that the abbey evidently thrived throughout the 15th century and right up until the Dissolution, it would perhaps be more surprising if the community failed to follow garden fashion right to the end.

The site of the abbey's 'north' watermill (**t**) may well have been correctly identified, but the recent investigations suggest that the way it was powered may have been dramatically modified - the arrangements in both phases quite different from that proposed by Coppack. The Skitter Beck may have been the source of power for the 'south' mill, which has now been tentatively identified, but not - perhaps surprisingly - for the north mill. Instead, a minor stream or 'blow well' outside the precinct may initially have fed a pond discharging into a channel which extended eastwards across the precinct to meet the two watercourses identified previously (**u1** and **u2**). Indeed, this channel may, prior to the 1380s, have marked the northern boundary of the Outer Court, the strip of ground north of this representing an encroachment onto what had previously been part of the North Bail. The blow well may eventually have been superseded, again in the late 14th century, by the moats themselves, which must have tapped into the high water table and may thus have acted as a vast linear millpond, the point of release being located conveniently at the eastern terminus of the 'dead-end' arm of moat dividing the Outer Court from the North Bail.

The moats that seem to have been constructed to complement the great gatehouse of 1377-82 constituted the culmination of water management at Thornton Abbey. Simply yet cleverly engineered, it would seem that these bodies of water were supplied by collecting ground water on their higher western side (as well as from the supposed blow well and the lost stream that intersected with the moats near the gatehouse) and controlled by sluices at the point where they discharged into the Skitter Beck. Their construction was perhaps accompanied on the east by the canalisation of the Skitter Beck and the creation of an extensive mere or large fishpond.

Coppack's interpretation of the North Bail, first documented in 1303, as the site of the abbey's home grange remains uncontested, but the parcel was probably not enclosed with large moats until the 1380s at the earliest. Though the new aerial photographic transciption has recorded traces of a number of buildings that are likely to be of monastic date within the enclosure, only the great barn built in 1443-73, first recognised by Coppack, can be confidently identified with a particular structure named in the *Chronicle*. Even the aerial photographic evidence on which this interpretation was based is now difficult to recover. The re-interpretation of a complex of rectangular pits, variously interpreted in the past as fishponds or crew-yards, as post-medieval brick-pits leaves

a large proportion of the enclosure as an open space containing only tracts of ridge and furrow, which may actually predate the act of enclosure with moats and perhaps the establishment of the home grange. The reasons for enclosing arable land with such a monumental boundary are therefore less clear, but if the ridge and furrow actually predates the enclosure, the land may have been used for orchards or some similarly 'exotic' purpose. Given Thornton's extraordinary wealth and status, it is even possible that the abbey may have held its own hunting park, although such an attribute might be expected to have found its way into the documents well before the obscure reference to the much larger 'park of 80 acres' retained in 1547 by Edward VI (Calendar of Patent Roll Edward VI 1924, 153).

The evidence for the active modification of the site in the early 17th century by Sir Vincent Skinner now appears more widespread; there are also tantalising hints that an earlier post-medieval house may have stood nearby, perhaps with gardens that were later appropriated by Skinner. However, unanswered questions remain about the degree to which Skinner's work progressed and the veracity of the traditional account of his house's dramatic 'collapse'.

Lastly, the new research has revealed the quite significant impact of 19th- and 20th-century archaeological excavation and conservation on the appearance of the visible remains. The surface traces of this relatively recent activity, along with stone robbing, sand-quarrying and the erection of military tents and various other lightweight structures, constitute a series of filters through which the image of the medieval abbey must be discerned, in places with great difficulty.

Evidence for design in the evolving layout of the abbey

The series of rectangular enclosures around the church that have been identified by the recent investigations, apparently expanding over time and perhaps representing successive incarnations of the Inner Court, lend a much stronger impression of structured and designed layout to the interpretative plan of this area proposed by Coppack (1991, Fig 3; *see* Figure 17). In the Outer Court, this geometric regularity is repeated, with **Track 1** running ruler-straight between the outer and inner gateways across another rectangular space. **Track 1** was avenue-like even before the addition (or perhaps replacement?) of trees by Sir Vincent Skinner and can only have served as a processional route, a continuation of the linear theatrical set created by the barbican and great outer gatehouse. After the (almost literal) tunnel-vision created by the protracted, high walls of the barbican crowding in, visitors leaving the darkness of the gate passage must have experienced a breath-taking moment of revelation as they entered the bright open space of the Outer Court, suddenly to see before them a panorama of buildings dominated by the splendid frontage of the church. The remarkable non-perpendicular alignment of the barbican in relation to the gatehouse may reflect more than just a convenient adaptation to the line of the existing approach, perhaps an additional deliberate manipulation of the visitor's visual encounter, since Hodges' (1896, 7) military explanation seems deficient in the light of other observations. If, as suggested, a sheet of water filled the valley of the Skitter Beck, this would not have been visible from ground level when approached from the west, not least because of the intervening monastic buildings, but it may have created

an equally dramatic setting if the abbey was approached via College Bridge, or indeed along the Skitter Beck itself (in other words from the coast, in both cases). The supposed mere might also have created a backdrop when seen from the upper storeys of the great gatehouse and other buildings. Although tempting to do so, it is difficult to argue that the oriel window on the first floor of the gatehouse could have been deliberately designed to offer a view-point from which to take in the splendid architectural composition, since it evidently provided backlight to an altar and the space behind this must have been relatively inaccessible (Pevsner, Harris and Antram 1989, 759). The space between the great gatehouse and the claustral range would initially have offered visitors entering the Outer Court through the great gate the necessary distance to gain a proper visual perspective on the abbey's tallest building and then effectively forced them to contemplate its architecture, and the meaning thereof, as they moved gradually closer, perhaps as far as a guest house or almonry set within the inner gateway (if the large, rectangular building [**R1**/**M1**] is correctly interpreted as such). Ramey (2004, 64) notes that it was common for Cistercian gateways positioned at some distance from the claustral range to lie immediately west of the church; at Thornton, **Track 1** exemplifies the same carefully structured aesthetic encounter with the building. It is tempting to interpret this carefully contrived approach as the incarnation of a spiritual journey, as much as a display of wealth and power.

Figure 37. Reconstruction of abbey at the end of the 14th century (by Gill Atherton). Note that the depiction of unrendered brick on the gatehouse is now known to be misleading.

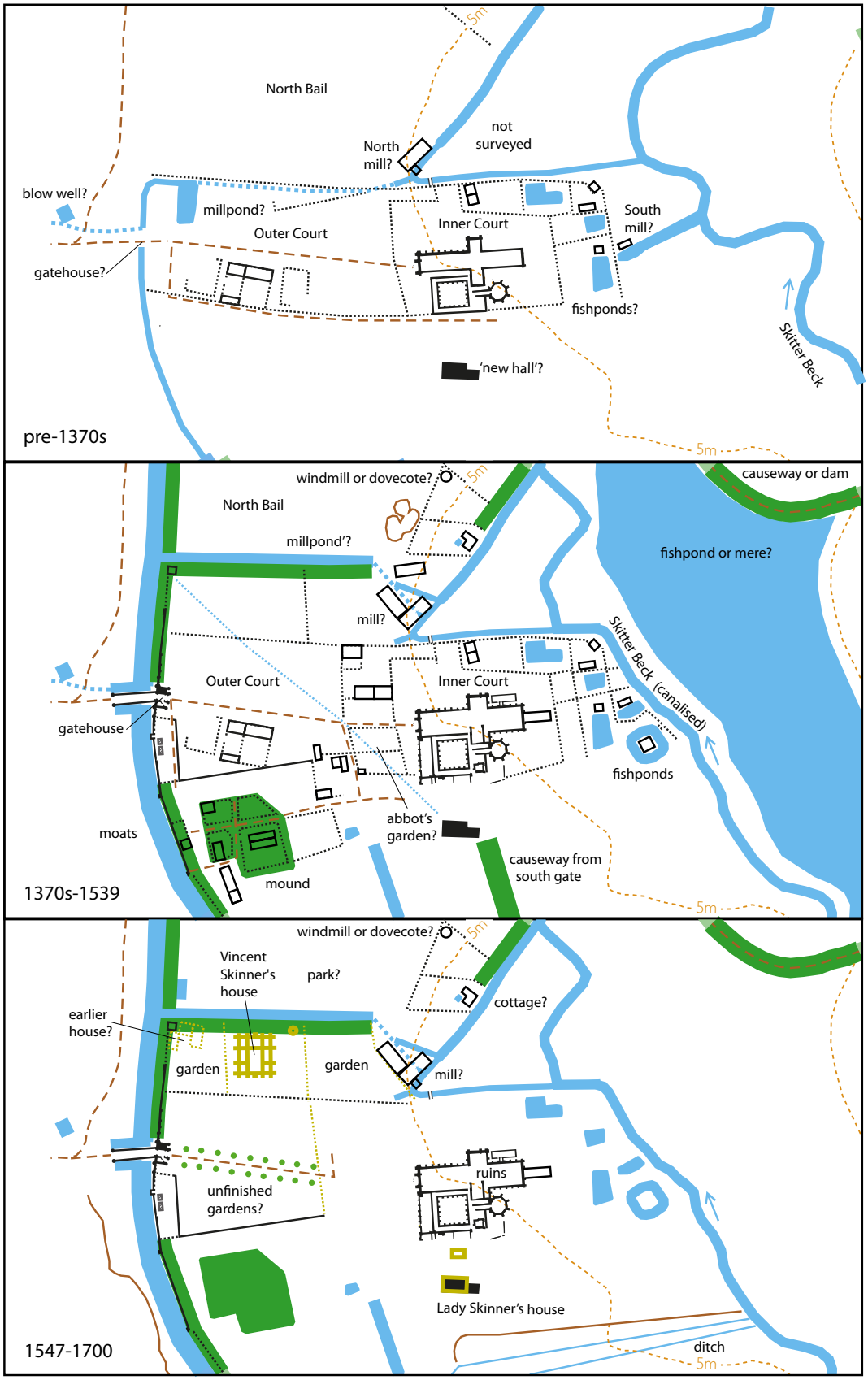


Figure 38. Interpretation of the core of the abbey and later modifications, based on English Heritage's research

Track 1 may have been established as early as the 1260s with this effect in mind, albeit developed to a lesser degree, given the evidence (albeit slight and open to question) that the route predates the great outer gatehouse built in 1377-82. However, earth resistance survey has revealed a boundary [**R12**], whose existence could hardly be detected in the earthworks, on a divergent alignment. There is an important methodological lesson here: while the geophysical surveys are useful in complementing the earthwork evidence, for example by clarifying the forms of buildings that are less clearly detectable as earthworks, they are absolutely invaluable in revealing traces of structures that are not suspected on the evidence of the surface remains (and, of course, *vice versa*). This boundary, angled towards the gatehouse rather than parallel to **Track 1**, may have served to foreshorten the perspective across the Outer Court, making the church seem even more dominant than it was in reality.

Monastic houses with moated perimeters are evidenced elsewhere in Lincolnshire, in other low-lying locations such as Melwood on the Isle of Axholme (founded in the 1390s), Kirkstead, Barlings and Bardney (Bond 1989, 99; Everson, Taylor & Dunn 1991; Stocker and Everson 2002), and at Meaux in Holderness (in this instance thought to have been constructed in 1221-35), as well as similar topographic settings further afield, for example at the Benedictine Abbey of St Benet's on the bank of the River Bure in Norfolk, which may date to the 1320s (RCHME 1994; Pestell 2008, 12-13). Thornton's moated perimeter seems very likely to have developed from an earlier network of smaller boundary/drainage ditches, but its eventual form, apparently dating to the 1380s, seems to represent the culmination of the monastic community's efforts at water management and aggrandisement. The moats could well be contemporary in origin with the newly identified mere or large fishpond, since this would have formed the fourth side of the perimeter. It follows from this that the medieval diversion of the Skitter Beck – which cannot be dated accurately with reference to the architectural style of College Bridge – could also have taken place in the late 14th century. While the moats presumably played a role in draining the core of the site, they were also obviously boundaries that would effectively have deterred all but the most determined potential intruders. They and the supposed mere may also have served as fishponds on a grand scale and as equally utilitarian larders for attracting duck and other wildfowl. The farming of ducks is certainly recorded at Thornton by the mid-16th century and the monks may also, as was often the case, have exercised their right to eat swan. All these water features were at the same time unquestionably attributes associated with secular power and features of aesthetic beauty.

Although Abbot Thomas Gresham (1364-93) has regrettably suffered a *damnatio memoriae,* and this period of Thornton Abbey's development is consequently least well understood from the documentary sources, it may have been under his direction that what was effectively a medieval designed landscape reached its apogee. Archaeology has begun to offer tantalising insights into a glorious period, and perhaps a talented individual designer, which might otherise remain virtually unsuspected from the surviving documentary records.

The use of brick at Thornton Abbey in a regional context

(by Keith Miller)

Although the abbey's great gatehouse impresses us today as a rare and fairly early example of the large-scale use of brick, it is actually the condition of the gatehouse that is truly remarkable, for large brick buildings were not in fact unusual in the medieval Humber region. There is archaeological evidence for brick being used in the region as a building material from the late 13th century onwards, and its manufacture is first documented at Hull from 1303 and at Beverley from 1344 (Miller *et al* 1982, 32; Evans 2001, 56; Evans 2006, 84), while the earliest documented use of the material at Thornton Abbey itself is 1348 (TC 63-4). Looking further afield, a current programme of optically stimulated luminescence (OSL) dating is revealing that examples of the use of brick exist, in areas with a similar lack of good building stone, as early as the 10th century (information from I K Bailliff, Durham University). It has been claimed that Thornton's bricks came from Hull (Platts 1985, 133), but this is very unlikely and if any came from a source on the north bank of the Humber, it is more likely to be Beverley (see below). However, the source of Thornton Abbey's bricks remains uncertain. The main possibilities are the abbey site itself, the locality (especially the nearby Humber marshes), or the known brick and tile-making centres on the north bank of the Humber.

Evidence for medieval manufacture and use of brick and tile in the Humber area, especially at Hull and Beverley, throws useful light on the use of brick at Thornton Abbey and on the question of its origin. Medieval Hull was England's first brick-built town (Wight 1972, 56-60; Neave and Neave 2010, 2-6), and other medieval Humber towns all featured prominent brick buildings. Huge quantities of bricks were produced in the Humber area for building town walls, gates and other civic buildings, and houses, churches and conventual buildings. Leland in 1541 describes Hull's buildings as being 'for the most part' of brick, and singled out for special mention Holy Trinity church, the town walls, the Carthusian monastery and the four mansions of the de la Pole family: each with its own brick tower (Woodward 1985, 66-7). The de la Poles themselves had their own brick yard at Hull from the 14th century (Wight 1972, 58).

The largest of Hull's brick edifices, the town walls and gates, was almost certainly the largest medieval brick structure in England. Between the late 1330s and 1406 the town's earthen rampart and timber palisade defences were replaced entirely in brick, with walls between 4 and 6 metres high, and with four main gates and over 30 interval towers and posterns with square, circular and D-shaped ground plans. The whole is estimated to have taken around 4,700,000 bricks to build – far more than could have been obtained from the town's own yard (Evans 1997, 37-8; Evans 2010). At Holy Trinity church, the major rebuilding of the transepts in 1300-20 (possibly by the royal architect who worked at Westminster Palace) and the new choir in 1340-70, employed brick as a main walling material with dressings and decoration in stone. It is worth restating at this point that at Thornton Abbey too, the evidence shows that the material was not being used decoratively (*contra* Bond 2004, 335). For an example of Hull's domestic brick architecture, excavation of the Ousefleet property on High Street, revealed a large mansion-warehouse with massive stepped wall base and a vaulted undercroft. The building as a whole might have used perhaps 100,000 bricks (Evans 2001, 69).

The construction details here and in the town defences are similar to those found in contemporary Hanseatic towns and in the Low Countries, and also at Thornton Abbey. Indeed, medieval Hull's Holy Trinity church, mansions and town walls provide the closest parallels, both geographically and in actual form and construction, to the gatehouse, walls and towers of Thornton's west entrance front.

Despite the documented presence of brick yards at Hull at the time Thornton Abbey gatehouse was built, it is unlikely that its bricks came from Hull. The Corporation brickyards, in operation between 1303 and 1438, produced between 90,000 and 105,000 bricks yearly most years between the 1390s and 1420s, the period for which the most detailed accounts are available. The bricks were probably all or mostly used for building at Hull itself and, given the limited output from the yard, the town must have drawn heavily on outside suppliers, notably from Beverley. The Hull brickyards went out of business in 1437-8, probably because they were uneconomic compared with other suppliers (Brooks 1939, 163-4).

At Beverley, brick making developed alongside the town's important local tile and pottery industries on the east side of the town, alongside the Beverley Beck. The town's 14th- and 15th-century civic buildings and town gates, and the revetment walls for the town ditch, were of brick (Evans 2006, 84). Building projects could use brick from multiple suppliers: the accounts for the rebuilding of Beverley North Bar in 1409 list 24 tilers or suppliers (Leach 1896). Brick and tile making were combined at the Beverley yards, whereas the Hull Corporation yards appear to have made only bricks, and unlike Hull, where the yards were owned and run by the Corporation, the land for the yards at Beverley was leased by the town to the tilers. Several brick and tile yards and their kilns have been excavated alongside the Beck, the canalised watercourse that linked with the River Hull and the Humber (Atkins *et al* 1987; Tibbles and Evans 1993; Tibbles 1998; 2008). There were quarry pits there too, but reference to Beverley tilers extracting clay from the riverbank at Meaux, 2-3 km away, shows that they were happy to move raw clay some distance to their workshops (Miller *et al* 1982, 32).

The medieval clay pits so far revealed by excavation at Beverley are 3-4m deep, with steep sides, varying in plan from rectangular to circular, or more irregular, with diameters of up to 10m. Similar pits found at Cartergate, Grimsby are believed to have been dug to obtain clay for daub for use in timber-framed buildings (North-East Lincolnshire HER 0381/24/0). Post-medieval pits tend to be more regular, sometimes rectilinear, as at Swinemoor on Beverley (Humberside Sites and Monuments Record 19101). However, such regularity may be due more to site constraints or economics than the date or method of extraction, and morphological differences are an unreliable indicator of date without additional documentary or archaeological evidence. The question of clay extraction at Thornton Abbey is discussed below.

The Beverley yards are likely to have supplied Hull with brick and tile (Evans 2006, 84) and documentary evidence that Beverley brick was obtained in 1391 for Grimsby's town hall (Gillett 1970, 2), together with archaeological evidence for the use of Beverley tiles in the town (Wise 1990, 224) show that Beverley products were being exported down the Humber at around the same time that Thornton gatehouse was being built. In 1460

a brickyard at Broomfleet on the north Humber Bank was shipping its products as far as York (Reader 1972, 21) and, given its rural waterside position, the yard may well have specialised in exports.

On the south bank of the Humber, the earliest use of brick and tile is represented by the mid- to late 14th-century work at Thornton Abbey, followed by late-14th to 15th century work in churches and high status secular buildings at Barton on Humber, Goxhill, and North Killingholme, all close to the Humber and the abbey. 14th-century use of brick is also known further south in Lincolnshire (generally on a small scale, in stone buildings) and more widely in East Anglia, both in religious houses (including Augustinian priory gatehouses at Butley and West Acre) and town walls at Norwich, Kings Lynn and the wool staple port of Great Yarmouth (Wight 1972), where again, some elements are reminiscent of Thornton gatehouse and its flanking walls. In the 15th century brick became more widespread, particularly in south Lincolnshire, where it was sometimes traded significant distances by boat (Wight 1972, 130). Few actual production sites have been located, notably rural tile kilns at Mareham le Fen and Toynton (information from North Lincolnshire HER).

In northern Lincolnshire, there is as yet no unequivocal archaeological evidence of medieval brick or tile making, although there is evidence to suggest that it took place in the Thornton area. In neighbouring Habrough parish, 6km south of Thornton Abbey, the Tigelpittes and Tygelpitgate are recorded in the late 12th and 13th centuries (Cameron 1991, 147). These, from their date, suggest tile making for one or more of the nearby religious houses at Nuncotham, Newsham and Thornton, all founded in the 12th century and all on the Skitter Beck. Thornton Curtis itself is thought to have been the location of a medieval pottery kiln (Hayfield 1985). A Kilnhouse is recorded in the parish from 1549 to 1720, a 'toft called Brickhouse' is recorded in 1589 to1601 and Brick Kiln Plot or Close in the early 19th century (Cameron 1991, 283, 287). There is also archaeological evidence of brick-making near Thornton Hall, although this may be post-medieval, related to the late 17th-century Hall (Loughlin and Miller 1979, 217). Many of the neighbouring parishes also have brick yards or brick kilns recorded in the late 18th and early 19th centuries, most of them located on the Humber bank, where enclosure made former common grazing marshes available for exploitation. Prior to this, bricks were usually made for individual building projects, or for a season's construction, using local clay dug from shallow 'opportunistic' quarries and fired in temporary clamps rather than permanent kilns. The ephemeral nature of these sites means that their locations remain largely unknown; the above-mentioned site near Thornton Hall being a notable exception.

As Thornton Abbey possessed the raw materials, the fuel and the labour force, it is almost certain that it would have produced its own brick and tile. The most likely location would have been at or near the abbey itself, where a number of the various pits, ponds, moats and ditches could have been clay pits for on-site brick and tile production. Clay is available within the precinct (beyond the sandy patch around the gatehouse) and in the surrounding area, including the North Bail and the valley of the Skitter Beck. No medieval clay pits or kilns have been securely identified on the abbey site, but in places where medieval clay pits have been backfilled, or were re-used - either fortuitously or by design - for other purposes such a moat or fishpond, they will be especially hard to

identify. Similarly, clamps for firing bricks leave little surface trace, though they would undoubtedly be susceptible to magnetometer survey. The rectilinear clay pits in the north-east corner of North Bail appear, from their relationship to the upcast bank within the moated perimeter, to be the result of later medieval or post-medieval clay digging (see Section 5.13.5), but this could perhaps be a re-working or expansion of earlier clay pits. This kind of location, distant from the abbey, would also have been suitable for firing, as it would have reduced the likelihood of smoke drifting downwind into the claustral area.

Another possibility for abbey brickyards is on its land at Barrow or East Halton on the Humber coastal marsh (the preferred location for 18th-century and later brick and tile yards) where the sites themselves may have been lost to coastal erosion or later clay quarrying. To manage the process, the abbey could have called on specialists from across the Humber, much as Hull brought in Beverley tilers to help when their yards got into difficulties (Brooks 1939, 162), or Thomas Cromwell brought in the brickmaker Baldwin Dutchman for Tattershall Castle in the mid-15th century (Simpson 1960). As noted above, raw clay and finished products were often carried significant distances, especially where water transport was available, and Beverley, the leading manufacturer in the region, may have been a source of expertise and of finished products for Thornton Abbey. It is clear that Humberside's medieval brick and tile industry was quite capable of providing standardised products that could be easily combined from several sources for major projects and it is possible, perhaps likely, that Thornton Abbey used a combination of local and imported brick and tile to provide the large quantities needed in the rebuilding of the gatehouse complex and other structures, commissioning specialised brick makers and builders to undertake the task.

The setting of the abbey in the landscape

Canon Binnall, a much respected latter-day antiquary writing in this instance for a popular readership, characterised the condition of the site prior to the monastic foundation as 'an isolated Lincolnshire swamp' (Binnall 1932, 43). Very little can be inferred about the use of the land prior to 1140, but improved understanding of the abbey's topographic setting begins to paint a picture of a site which initially comprised a promontory of relatively well-drained land on the edge of unimproved wetland. Although the Augustinians were far from being a closed order, such a secluded location would presumably have been suitable as a spiritual 'home base' from which the canons could reach out into secular communities. Nor would the transformation of a marshland environment have been an unfamiliar challenge to the canons: before 1200, they had instigated the building of Thornton Dam at the mouth of the River Ouse to reclaim land for pasture (Bond 2004, 83). At Thornton Abbey itself, it seems very likely that moats or drainage ditches would have existed long before those documented in the 1380s, as they did by 1235 at Meaux Abbey, William le Gros' great Cistercian foundation in a similarly marshy location in Holderness (*see* Figure 1). Similar works were instigated by monastic houses on the marsh edges in the Witham Valley, Lincolnshire (Stocker and Everson 2002), and further afield. In all these cases, determined water management and drainage turned a problem into an asset.

The probable presence of at least one blow well, represented by the pond just outside the gatehouse, may also have helped to determine the site of the abbey. The pond lies close to, rather than on, the line of the lost watercourse decribed in Section 2, but similar juxtapositions occur naturally elsewhere, for example nearby at Barrow and Barton on Humber. The importance of the supposed blow well may have extended beyond the utilitarian value of a natural supply of fresh water: the relationship between natural blow wells and the medieval churches and associated ritual structures (including a dug well) at Barton on Humber suggests that they played a part in the Christian liturgy and influenced the ecclesiastical layout here. In this context, it is also worth noting that a blow-well pool was incorporated within the precinct of the Augustinian Priory at Haltemprice, near Hull (Miller 2001, 72-3).

The probable role of the Skitter Beck in the economy of the abbey, which must have been a primary consideration at the time of the foundation, is discussed more fully below. The name Skitter, first recorded in 1150-1170 as Scithere and Schitere and fairly frequently documented thereafter, may itself be directly linked to the abbey. Skitter derives from Old English *scitere* or *shiter* - a sewer, or stream used as an open sewer (Ekwall 362-64; Cameron 1991, 150, 292); or from the Old English *scitan* and Middle English *skitter*, or Scandinavian *skita* - 'to void thin excrement' (Fellows Jensen 1978, 185-6). The first appearance of the name in documents two decades after the foundation of Thornton Abbey may simply reflect the advent of legal documentation, but perhaps commemorates the sudden use of the watercourse for disposal of sewage from the abbey latrines, or from those of the 12th-century religious houses of Newsham and Nun Cotham a few kilometres upstream – a development that cannot have failed to make an impression on local people.

The economy of the abbey and the role of the Humber ports

The general economic importance of maritime and riverine transport in the Middle Ages (see Friel 1995) is exemplified by the distribution of William le Gros' centres of power, especially the initially successful borough and port he founded at Hedon, where Thornton Abbey had acquired property before 1220 (Figure 1; English 1979, 213-22). It is clear that the choice of the abbey's site must likewise have been heavily influenced by the economic opportunities presented by its location on the Skitter Beck, a navigable stream within easy reach of the Humber estuary and the wool staple ports of Boston and Kingston upon Hull, which eventually overtook Hedon in importance. By way of comparison, it is worth noting that between 1160 and 1182, the Cistercian monks at Meaux Abbey in Holderness constructed the Ashdyke in order to link their chosen site to the River Hull; there, 'small boats without prows' are often referred to and towpaths are mentioned in accounts from 1197 onwards (English 1979, 204-5). Long-distance inland water transport is known to have been important to several other monastic houses, including Tupholme Abbey in Lincolnshire and Sawtry Abbey in Cambridgeshire. If College Bridge is a measure of the kind of contribution that Thornton Abbey made to the local transport infrastructure, then the community's impact on the Skitter and other watercourses may have been considerable.

East Halton Skitter, usually called Scottermuth in medieval documents, was one of a series of small but active tidal havens on the Humber and Lincolnshire coast; it was large enough to take a boat of 40 tons and was listed in the 14th century among those capable of supplying vessels for the impressed fleet (Pawley 1993a). Many havens benefited from their links with religious houses, which not only brought trade but also ensured some degree of physical maintenance. In addition to the anecdotal documentary references to the use of boats to transport materials up the Skitter Beck to Thornton Abbey, detailed in Section 3.1 (*see* Figure 4), there is a wealth of other circumstantial evidence to suggest that Scottermuth maintained strong links with Thornton Abbey: 'bailiffs of Skyter' are recorded in 1342 (Cameron 1991, 292). In one instance, the haven is identified as Skitter Milne, a mill first documented *c* 1155 which may have survived well into the post-medieval period, and was almost certainly, if located at the mouth of the stream, a tidal mill. A Humber crossing between Holderness (probably initially Paull, on the Humber estuary 2.4km south-west of Hedon, and later Hedon itself) and Scottermuth, in this context called Skitter Ferry, is also referred to in the later medieval period (Poulson 1840, 481-2; Cameron 1991, 149-50). Most ports along the Humber Estuary maintained strong trade links with the east coast and continental Europe throughout the Middle Ages, not least because wool commanded far higher prices when exported. For this reason, Meaux owned its own sea-going ship, the 'Benedict' (English 1979, 207). Other exports from these havens usually included grain, cloth and salt, whilst imports focused on peat turves from the Humberhead turbaries, timber, cloth, stockfish and wine (Pawley 1993a; Bennett and Bennett (eds) 2001, 56-7; Miller 2001, 67). Significant trade centred on and passing through Scottermuth is evidenced by copious amounts of pottery, with dates spanning the whole medieval period, retrieved from the foreshore at the mouth of the haven (Loughlin and Miller 1979, 196). In common with other Humber and Lincolnshire havens, the port also served as a base for herring fishing; a 'curer of herrings' was amongst the staff present at Thornton in 1540. In 1565 'crayers and keels' from Scottermuth were still 'occupied in carrying turfe from the weste countre', as well as corn and wood to Hull and York (Sturman 1984, 54). By the 17th century, however, the decline in the wool and salt trades and the loss of the religious houses, combined with the perennial problem of silting, led to a significant decline in activity at the Lincolnshire and Humber havens. By 1628 Scottermuth, like most of its fellow ports, appears to have become a small-scale fishing haven (Pawley 1993b). Even as late as 1643, though the port was omitted, Wenceslas Hollar's map of Hull showed the Skitter very prominently, suggesting that it may have remained in use for water transport.

Thornton Abbey also used Barrow Haven, 10km upstream from Scottermuth (*see* Figure 1); the port (*portum*) appears in a confirmation of a grant to Thornton Abbey of 1190 (*Monasticon Anglicanum* VI i, 326). The Humber ferry from Barrow, owned by the Counts of Aumale, and linking with Paull and Hedon, was probably older and, initially at least, more important than the crossing from Scottermuth (English 1979, 214). The ferry was toll-free for Barrow tenants and gave 'passage over the Humber for the monks and all serving them and their requirements' according to documents of 1287 and 1371 (when it is specified as on abbey land) and later (Beverley Record Office DDCC111. no.3; *Calendar of Close Rolls Edward III* 1911, 241; Foreman 1996, 6,7). The Humber crossing here remained sufficiently important to be used by Henry VIII *en route* to Thornton Abbey in 1541 (Miller 2001, 70). The stream at whose mouth the haven lay was formerly navigable

as far as the north side of the village of Barrow, only 5km from Thornton Abbey, from where a road known as Abbey Gate and later College Road ran directly to the abbey. Thornton Abbey holdings at Barrow also included a mill on the north side of the village at Down Hall on the haven or the beck that fed into it, which is recorded in the 16th century as a fulling mill, for fulling woollen cloth (Foreman 1996, 6).

Barrow appears to have been the most important Aumale holding on the south Humber bank, judging from the manor courts and documents signed there, including one by Count William le Gros between 1150-70 (English 1979, 84; East Yorkshire Charters III, 106). The Aumale possessions at Barrow granted to Thornton Abbey included the church, manors and two mills, one referred to as being next to the castle at Barrow. The castle, sited alongside Barrow Haven, would have controlled the port and commanded a large swathe of the adjacent Humber shore and marshes. The site, known as 'The Castles', and now represented by a complex of earthworks, appears from archaeological finds to have been occupied throughout the medieval period. Its earthworks suggest several phases of construction, starting perhaps with a late Saxon or early post-conquest Norman ring work, later enlarged in the 11th and 12th centuries to a motte and bailey with defensive ditches carrying water from the haven. The site was enlarged again in the later medieval period with large ditched enclosures possibly associated with stock-keeping (Atkins 1983; Miller 2001, 69-71). The adjoining marshland pastures were held by the abbey, and perhaps we are seeing here the physical evidence of late medieval cattle farming that is also reflected in the abbey's home farm in North Bail.

Another port used by Thornton Abbey was Barton on Humber, an old established haven port that thrived in the Middle Ages but was eventually eclipsed by Hull. The abbey was granted property in the town and the right to free passage by Gilbert de Gant (*Monasticon Anglicanum* VI i, 326).

Thornton Abbey's interests in peat extraction throw useful light on both its business interests and on domestic and industrial activities at the abbey itself and further afield. By 1190, Thornton, along with many other of the region's religious houses, held substantial turbary holdings on the great peat moor on the Yorkshire Marshland south of the River Ouse known in the Middle Ages as Inclesmore (*Monasticon Anglicanum* VI i, 327), now represented by Thorne, Goole and Crowle Moors, a distance of some 50km (by boat) to the west of the abbey. Peat turves were extracted and shipped along the Ouse and Humber for use as a domestic fuel, especially in those towns and communities (including monasteries) with limited supplies of wood, and as an industrial fuel, for baking, brewing, dyeing, and pottery, brick and tile manufacturing and salt production (Beresford 1986; Dinnin 1997, 21-2). Thornton's Inclesmore turbaries were large compared with neighbouring holdings and extraction was on a huge scale, with annual turbary output numbered in the tens and hundreds of thousands of turves. An indication of the volume and value of the trade is given by an annual turbary rent paid by Thornton Abbey, of 16,000 turves, together with a cash rent and obligations to maintain river and dike banks, and alms to the poor at the abbey gate (Beresford 1986, 153-5). A number of 13th- and 14th-century grants give further indications of the capital works involved, such as construction of 'the Kay' (probably a navigable drain), mentioned in an agreement made at Thornton in 1306 between the abbots of Selby and Thornton (National Archives

DL42/12, f32v); and a great road 40 feet (12.2m) wide between Swinefleet and Reedness (*ibid*, f33v).

In the 13th and 14th centuries Thornton was collecting a tithe of salt from a saltern at East Halton, which would presumably have lain on the Humber marsh near Scottermuth (Rudkin and Owen 1960, 77; Healey 1993, 29 Pawley 1993a; Loughlin and Miller 1979, 196). Salt was a valuable commodity in its own right, and was also central to the process of curing herrings, in which the abbey is known to have been involved, as mentioned above. Like other Lincolnshire salterns, the manufacturing process would have used peat turves as fuel for boiling the brine. There is place-name evidence for medieval turf cutting in East Halton, Goxhill and Killingholme parishes (Cameron 1991, 134, 155, 203) but, as in the coastal parishes further south, the limited local supplies would almost certainly have had to be supplemented with turves from Inclesmore. For this reason, in part, Thornton and its neighbouring religious houses at Newhouse (or Newsham) and Nuncotham, and other east Lincolnshire monasteries at Louth Park, Alvingham, Ormsby, all with salt-making interests in the coastal marsh, each also had turbaries at Inclesmore (Loughlin and Miller 1979, 168; Sturman 1984, 53-4, Cameron 1991, 147).

The use of Inclesmore peat for brick making is recorded in the accounts of the Hull Corporation brickyard. In 1432-3, for example, three boatloads of peat were brought from Ousefleet for firing. The Hull kilns used peat exclusively, and 84,000 turves were required for firing a kiln that contained around 35,000-45,000 bricks (Brooks 1939, 159, 163). The annual output of the Hull yards ranged for the most part between 80,000 and 105,000 bricks, which would have required up to a quarter of a million turves a year for these brickyards alone.

In conclusion, it is clear that the abbey's location offered particularly good opportunities for effective use of water transport, with one watercourse linking directly to the abbey itself and others to within a few kilometres. The ease with which the abbey could trade with the major wool ports must have been especially important and, together with its extensive holdings of both wold and marshland pasture, gave it a strong position among the region's wool-producers. However, it is also clear that wool production was just one strand, although perhaps the most important strand, of an economic web of interwoven industrial activities.

8. METHODOLOGIES

Earthwork survey

Hard detail, control points and some of the more obvious earthworks were surveyed using Trimble R8 survey grade GNSS receivers working in Real Time Kinematic mode (RTK) related to an R8 receiver configured as an on-site base station. The data was transformed to OSTN02 to a stated accuracy of 0.01m per point by post-processing using Trimble Geomatics Office software. The transformation used data downloaded in Rinex format from OS Active base stations. After transformation, the survey was downloaded into Korec's Geosite software to process the field codes and the data transferred to AutoCAD software for plotting out for graphical completion in the field.

Additional detail, including spot-heights to give levels along the base of selected water features, was surveyed using a Trimble 5600 Total Station theodolite by taking radiating readings from each station on a baseline of two stations. The traverse was adjusted for errors using Korec's Geosite software. After adjustment, the data was transformed to OS National Grid by adjusting the positions of the stations to the National Grid Transformation OSTN02 by use of a Trimble R8 survey grade GNSS receiver.

Across the majority of the survey area, where earthworks are complex and subtle, detail was supplied using standard taped survey techniques of baseline-and-offset from a temporary network of pegs previously located with GNSS or Total Station theodolite and plotted on to polyester drawing film at a scale of 1:1,000 for use in the field. The principal reason for the use of this technique was to facilitate training in basic field skills of observation and analysis, training being an important driver for the field survey.

Aerial survey

Aerial photographs held by the National Monuments Record comprise 43 vertical and 41 specialist oblique prints; of these, four stereo pairs and an oblique print were suitable for mapping purposes. The photographs cover the period 1946-1999 with prints from the RAF, Meridian Airmaps Ltd, Ordnance Survey, CUCAP and English Heritage; with the exception of the CUCAP and English Heritage images, these were taken for a range of non-archaeological purposes. An additional cover-search was undertaken for photographs held by the Cambridge University Unit for Landscape Modelling (ULM, formerly CUCAP), which yielded no further evidence for the study area. Additional photographs may be available to future research which were not consulted for the current project, potentially held by local repositories such as the North Lincolnshire Historic Environment Record or the County Record Office.

The aerial survey involved digital transcription, interpretation and recording of all archaeological features visible within the North Bail on the available aerial photographs to the standard developed for the National Mapping Programme (Kershaw 1998). This involved systematic examination of all relevant oblique and vertical photographs using stereoscopes with a power of magnification 2x and 4x; of these, four vertical stereo pairs and one oblique print were rectified to map from. These photographs were scanned at

a resolution of 400 dpi and rectified using AERIAL 5.29, specialist software developed by J G B Haigh of the University of Bradford. Control was derived from OS MasterMap® tile at a scale of 1:2,500, which has a nominal positional accuracy of ±2.5m based on 95% confidence levels. Inputting topographic data in the form of a digital terrain model (DTM) potentially improves the accuracy of rectification, but this was judged unnecessary in the relatively flat terrain of the study area. Photograph rectification normally lies within ±2m of the base map, giving a compounded potential error of ± 4.5 m.

The rectified images were imported into AutoCAD Map 3D 2008; in this digital environment all features considered of archaeological significance were mapped using National Mapping Programme conventions, at a nominal scale of 1:2500. At this scale, subtle details of phasing and possible re-cutting of earthwork features proved difficult to depict. The digital map was accompanied by attached object data comprising period, monument type, evidence and photo reference.

Geophysical surveys

The survey area was divided into a series of 30m grid squares set out and measured in to adjacent boundaries and standing buildings using a total station theodolite.

i) Earth resistance survey

Earth resistance was measured using a Geoscan RM15 meter and Twin Electrode configuration with a 0.5m mobile probe separation. Readings were recorded at a 1.0m sample interval. The resulting raw data is presented on Figures 2 and 3 in the form of trace and greyscale plots. Figure 27 presents the data after enhancement using a 5m radius Gaussian high pass filter and Wallis statistical differencing algorithm to improve the clarity of archaeological anomalies obscured by strong differences in the background resistance between various parts of the site (Scollar *et al.* 1990, 174-6)

ii) Magnetometer survey

Each 30m grid square was surveyed with a Geoscan FM36 fluxgate gradiometer. Measurements were recorded on the 0.1 nanotesla (nT) instrument range at 0.25m intervals along successive 30m traverses spaced 1.0m apart. The resulting data are presented on Figure 29 in the form of trace and greyscale plots after the removal of instrument drift and directional sensitivity by reducing each data traverse to a zero mean, followed by the truncation of extreme values in the data caused by iron objects (excluding values outside the range -25 to +40 nT).

Graphical summaries of significant geophysical anomalies described in the text are identified by the prefixes [**R**] on Figure 28 and [**M**] on Figure 30, for the earth resistance and magnetometer surveys respectively.

9. REFERENCES

Alexander, J S 1993 'The building of Thornton Abbey chapter house'. *Journal of the British Archaeological Association* **146**, 113–120

Allison, K J (ed) 1969 *Victoria history of the County of York: East Riding I. The city of Kingston upon Hull*. London: Oxford University Press.

Allison, K J (ed) 1974 *The Victoria County History of Yorkshire: East Riding 2*. London: Oxford University Press.

Allison, K J (ed) 1989 *Victoria history of the County of York: East Riding VI. The Borough and Liberties of Beverley*. London: Oxford University Press.

Anon 1851 *Handbook for visitors to Thornton Abbey*. London: Whittaker and Co

Anon 1867 Unpublished plan 'Boundary Award between the Parish of Thornton Curtis and the adjoining Parish of East Halton, County of Lincoln', in the private collection of Mr John Farrow

Atkins, C 2010 'A programme of archaeological work associated with the repair and development of Thornton Abbey gatehouse, North Lincolnshire'. Unpublished archive report

Atkins, C, Tibbles, J and Asquith, D1987 *The Archaeology of a Medieval Roof Tile Factory Site in Grovehill, Beverley.* Beverley: Humberside County Council Archaeology Unit.

Baillie Reynolds, P K 1954 *Supplement to the official guide to Thornton Abbey, Lincolnshire: the monastic buildings*. London: HMSO

Barton 1977 *Barton in the 1850s, Part 1: Leisure and Pleasure*. Barton on Humber: WEA Branch

Barton 1984 *Barton in the 1850s, Part 4: Cradle to the Grave*. Barton on Humber: WEA Branch

Bennett, S and Bennett, N H (eds) 2001 *An Historical Atlas of Lincolnshire*. London: Phillimore

Beresford, M W 1986 'Inclesmoor, West Riding of Yorkshire', in Skelton, R A and Harvey, P D A (eds) *Local Maps and Plans from medieval England*, 147-61. Oxford: Clarendon Press

Bewley, R H (ed) 1998 *Lincolnshire's Archaeology from the Air*. Occasional Papers in Lincolnshire History & Archaeology. Gainsborough: The Society for Lincolnshire History & Archaeology

Binnall, P B G 1931 *Thornton Abbey, Lincolnshire. An Historical Guide*. London: Society for the Promotion of Christian Knowledge

Binnall, P B G 1932 ' Thornton Abbey'. *The Lincolnshire Magazine* **1**, 41-47

Bond, C J 1989 'Water management in the rural monastery' *in* Gilchrist, R and Mytum, H (eds) *The Archaeology of Rural Monasteries*. Oxford: BAR, 83-111

Bond, C J 2004 *Monastic landscapes*. Stroud: Tempus

Bond, J M and Hunter, J R 1987 'Flax-growing in Orkney from the Norse period to the 18th century'. *Proceedings of the Society of Antiquaries of Scotland* **117**, 175-181. http://ads.ahds.ac.uk/catalogue/adsdata/PSAS_2002/pdf/vol_117/117_175_181.pdf

Boyle, J R 1897 *A Handbook to Thornton Abbey in the County of Lincoln, with brief notices of adjacent places of interest*. London: William Andrews

Brocklesby, G W 2008 'The Skinner family of Thornton College'. Unpublished typescript

Brooks, F W 1939 'A Medieval Brickyard at Hull' *Journal of the British Archaeological Association* (3rd Series) **4**, 151-74

Buck, S 1726 'The West Prospect of the Ruins of Thornton College near the Humber in the County of Lincoln.' Published by subscription (copy held in Lincolnshire Archives YARB/11/2/4)

Calendar of Close Rolls, Henry III, 1268-72, 1938. London: HMSO

Calendar of Patent Rolls, Edward I 1281-92, 1893. London: HMSO

Calendar of Patent Rolls, Edward I 1301-07, 1898. London: HMSO

Calendar of Close Rolls, Edward I 1302-07, 1908. London: HMSO

Calendar of Close Rolls, Edward II, 1318-23, 1895. London: HMSO

Calendar of Close Rolls Edward III, 1369-74, 1911. London: HMSO

Calendar of Patent Rolls, Richard II 1381-85, 1897. London: HMSO

Calendar of Patent Rolls, Edward VI 1547-48, 1924. London: HMSO

Calendar of Patent Rolls, Edward VI 1549-51, 1925. London: HMSO

Cameron, K. 1991 *The Place-Names of Lincolnshire: Part 2: Lincolnshire, Lindsey North Riding: the Wapentake of Yarborough*. English Place-Name Society **64/65** for 1986-7 and 1987-8. Nottingham: Nottingham University

Carter, A nd 'Evidence for hemp and flax industries in the Vale of York', unpublished English Heritage Vale of York National Mapping Programme report

Clapham, A 1946 'Thornton Priory, Lincolnshire'. *Archaeological Journal* **103**, 172-4

Clapham, A 1951 *Thornton Abbey, Lincolnshire*. London: HMSO

Clapham, A and Baillie Reynolds, P K 1956 *Thornton Abbey, Lincolnshire*. London: HMSO (reprinted 1963)

Coldstream, N 1972 'York Chapter House'. *Journal of the British Archaeological Association* (3rd series) **35**, 15-23

Coppack, G 1991 'The Precinct of Thornton Abbey, South Humberside: the planning of a major Augustinian house' *in* Tyszka, D, Miller, K and Bryant, G (eds) *Land, People and Landscapes: Essays on the history of the Lincolnshire Region*. Lincoln: Lincolnshire Books , 37-44

Coppack, G 1994 'The Outer Courts of Fountains and Rievaulx Abbeys. The Interface between Estate and Monastery' *in* Pressouyre, L (ed) *L'espace cistercien*. Paris: Comité des travaux historiques et scientifiques, 415-31

Coppack, G 1998 *Excavations at Thornholme Priory, Lincolnshire*. Nottingham: Nottingham University Monograph.

Cox, P, James, T, Corney, M, Cottam, S and Chandler, J 2007 'Able Humber Ports Facility, East Halton, North Lincolnshire, Archaeology and Cultural Heritage Desk-Based Assessment'. Unpublished report held in North Lincolnshire Sites and Monuments Record

CUCAP 1948 Aerial photographs film/frames BS16-23, photographed 22-JUL-1948 (copies held in North Lincolnshire Historic Environment Record)

CUCAP 1951 Aerial photographs film/frames FO73-860 , photographed 08-JUN-1951 (copies held in NM,R index TA 1118/1-14, accession number 8022)

Dalton, P 2004 'William le Gros, Count of Aumale and Earl of York (*c* 1110-1179)' *Oxford Dictionary of National Biography*. Oxford: Oxford University Press

Dinnin, M H 1997. 'The drainage history of the Humberhead Levels', *in* Van de Noort, R and Ellis, S (eds) *Wetland heritage of the Humberhead Levels: an archaeological survey*. Hull: Humber Wetlands Project, University of Hull, 19-30

Dyer, C C 1988 'The consumption of fresh-water fish in Medieval England', in Aston, M (ed) *Medieval fish, fisheries and fishponds in England*. 2 vols. BAR British Series **182**. Oxford: BAR, 27-38

English, B 1979 *The Lords of Holderness, 1086-1260: A Study in Feudal Society*. Oxford: University of Hull/Oxford University Press

English, B and Miller, K 1991 'The deserted village of Eske, East Yorkshire'. *Landscape History* **13**, 5-32

English Heritage 1992 Revision of Schedule description 13377

English Heritage 2007 *Understanding landscapes: a guide to good recording practice*. Swindon: English Heritage

Evans, D H 1997 'Archaeological work in the Medieval port of Kingston-upon-Hull' *in* Gläser, M (ed) *Lübecker Kolloquium zur Stadtarchäologie im Hanseraum, I: Stand, Aufgaben und Perspektiven*. Lübeck, 35-49

Evans, D H 2000 'Archaeology in the modern city of Kingston upon Hull, and recent research at Kingswood' *in* Van der Noort, R and Ellis, S (eds) *Wetland Heritage of the Hull Valley*. Exeter: Humber Wetlands Project/Short Run Press, 193-216

Evans, D H 2001 'Hull: urban domestic architecture in the Lower Hull Valley in the medieval and post-medieval periods' *in* Gläser, M (ed) *Lübecker Kolloquium zur Stadtarchäologie im Hanseraum, III: Der Hausbau*. Lübeck, 49-76

Evans, D H 2006 'Crafts and industries in Beverley and Hull from 1200-1700' *in* Gläser, M (ed) *Lübecker Kolloquium zur Stadtarchäologie im Hanseraum, V: Das Handwerk*. Lübeck, 71-91

Evans, D H 2010 'The fortifications of Hull between 1300 and 1700' *in* Gläser, M (ed) *Lübecker Kolloquium zur Stadtarchäologie im Hanseraum, VI: Die Befestigungen*, 47-70. Lübeck

Everson, P L and Stocker, D 2003 'The archaeology of vice-regality: Charles Brandon's brief rule in Lincolnshire' *in* Gainster, D and Gilchrist, R (eds) *The Archaeology of Reformation 1480 - 1580*. Leeds: Maney

Everson, P L, Taylor, C C and Dunn, C J 1991 *Change and Continuity. Rural Settlement in North-West Lincolnshire*. London: HMSO

Fellows Jensen, G 1978 *Scandinavian Settlement Names in the East Midlands*. Copenhagen: I kommission hos Akademisk forlag

Fenwick, H, Chapman, H, Head, R and Lillie, M 1998 'The archaeology of the lower Trent valley and Winterton Beck' *in* Van de Noort, R and Ellis, S (eds) *Wetland heritage of the Ancholme and lower Trent valleys: an archaeological survey*. Hull: Humber Wetlands Project, University of Hull, 143-98

Foreman, M 1996 'Excavations at St Chads, Barrow on Humber 1977-78'. Typescript

Friel, I 1995 *The Good Ship: ships, shipbuilding and technology in England 1200-1520*. London: British Museum

Fowler 1818 Engraving of Thornton Abbey gatehouse held in the Fowler collection, volumes 3 and 4, Lincolnshire Museum Service archive at Normanby Hall

Gale, B 1783 The West View of Thornton upon Humber in Lincolnshire'. Engraving pasted into the Yarborough scrap-book (Lincolnshire Archives YARB/11/2/4)

Geological Survey of Great Britain 1983 *Kingston Upon Hull. England and Wales Sheet 80. Solid and Drift Geology.* 1:50,000 (one inch) geology map series.

Gibbons, G S 1931 'Seal of Thornton College'. *Lincolnshire Notes and Queries* **21** (no. 6), 81-2

Gillett, E 1970. *A History of Grimsby*. Oxford: OUP for University of Hull

Giffard, J 1818 *Some account of Thornton Abbey, Lincolnshire*. Barton: pivately printed

Greenwood, J 1835 *A Picturesque Tour to Thornton Monastery*. Privately published

Greenwood, J 1836 'A Picturesque Tour to Thornton Monastery' edited and abridged version for *Gentlemen's Magazine* **5**, 282-6

Greenwood, C and Greenwood, J 1830 'Map of the County of Lincoln, from an actual Survey Made in the Years 1827 & 1828' (British Library reference: Maps C.23.c.13)

Hansell, P and Hansell, J 1988 *Doves and Dovecotes*. Bath: Millstream Books

Hayfield, C 1985 *Humberside Medieval Pottery: an illustrated catalogue*. British Archaeological Reports (British Series) **140**. Oxford: British Archaeological Reports

Healey, H 1993. 'Salt Making II: Saxon and Medieval' in Bennett, S and Bennett, N (eds) *An Historical Atlas of Lincolnshire*, 28-9. Hull: Hull University Press

Higham, N C 1989 'Some Evidence for 12th- and 13th-Century Linen and Woollen Textile Processing'. *Medieval Archaeology* **33**, 38-52

Hodges, C C 1896 'Thornton Abbey, Lincolnshire'. *The Reliquary and Illustrated Archaeologist* (for 1896), 1-13

Howlett, B 1798 'East View of Thornton Abbey' and 'West View of Thornton Abbey'. Engravings pasted into the Yarborough scrap-book (Lincolnshire Archives YARB/11/2/4)

Huggins, P J 1972 'Monastic grange and outer close excavation, Waltham Abbey, Essex' *Transactions of the Essex Archaeological Society* **4**, 30-127

Jackson, C *c*1870 'Family of Synner, or Skinner, of Thornton College etc, Lincolnshire' article in *Hull Mercury*, pasted into the Yarborough scrapbook held in Lincolnshire Archives YARB/11/2/4

Kershaw, A 1998 'The Lincolnshire National Mapping Programme Project' *in* Bewley, R H (ed) *Lincolnshire's Archaeology from the Air.* Gainsborough: The Society for Lincolnshire History & Archaeology

Leach, A F 1896 'The Building of Beverley Bar'. *East Riding Antiquarian Society Transactions* **4**, 26-37

Lott, G K and Cooper, A H 2008 'Field Guide to the Upper Permian Cadeby Formation (Magnesian limestone) of Yorkshire' *in* Doyle, P, Hughes, T G and Thomas, I (eds) *England's Heritage in Stone.* English Stone Forum

Loughlin, N and Miller, K 1979 *A survey of Archaeological sites in Humberside carried out for the Humberside Joint Archaeological Committee*. Hull: Humberside Libraries and Amenities

Lowe, F Pyndar 1852 'On the abbey of S. Marie, at Thornton on the Humber'. *Associated Architectural Society Reports and Papers* **2**, 149-63

Maddison, A R 1911 'Notes taken of the excavated floor at Thornton Abbey, 31st August 1835' Lincolnshire Notes and Queries **11**, 16-17

Major, A 1946 'The Thornton Abbey Chronicle (Bodleian Library, Tanner MS 166) with extracts relating to the fabric of the Abbey'. *Archaeological Journal* **103**, 174-8

Miller, K 1998a 'Introduction to the archaeological survey: The Middle Ages' *in* Van der Noort, R and Ellis, S (eds) W*etland heritage of the Ancholme and lower Trent valleys: an archaeological survey*. Hull: Humber Wetlands Project, University of Hull, 129-40

Miller, K 1998b 'Sites and finds from the Isle of Axholme: the Middle Ages' *in* Van der Noort, R and Ellis, S (eds) *Wetland heritage of the Ancholme and lower Trent valleys: an archaeological survey*. Hull: Humber Wetlands Project, University of Hull, 284-7

Miller, K 2001 'Introduction to the archaeological survey: The Middle Ages' *in* Ellis, S, Fenwick, H, Lillie, M, and Van de Noort, R (eds) *Wetland heritage of the Lincolnshire Marsh, an archaeological survey*. Hull: Humber Wetlands Project, University of Hull, 66-73

Miller, K, Robinson, J, English, B and Hall, I 1982. *Beverley: an archaeological and architectural study*. Royal Commission on Historical Monuments Supplementary Series 4. London: HMSO

Minns, E H 1898 'Documents relating to the Dissolution of the monastery of Thornton Curtis in the County of Lincoln left by the Rev. Charles Parkyn to Pembroke College, Cambridge'. *Proceedings of the Cambridge Antiquarian Society* **10** (for 1898-1903), 482-95

Neave, D, and Neave, S 2010 *Hull. Pevsner Architectural Guides*. London: Yale University Press

Neave, S and Miller, K 2000 'Medieval and Post-Medieval settlement and land-use in the Hull valley' *in* Van der Noort, R and Ellis, S (eds) *Wetland Heritage of the Hull Valley*. Exeter: Humber Wetlands Project/Short Run Press, 90-103

Ordnance Survey 1824 1-inch scale map sheet 86, surveyed prior to 1824 (held in the British Library Map Room)

Ordnance Survey 1887 First Edition 25-inch scale map sheets VIII.13 and XIII.1, surveyed 1886

Ordnance Survey 1908 Second Edition 25-inch scale map sheets VIII.13 and XIII.1, surveyed 1906

Ordnance Survey 1932 Third Edition 25-inch scale map sheets VIII.13 and XIII.1, surveyed 1930 and 1929 respectively

Ordnance Survey 1947 Third Edition 6-inch scale map sheet VIII, revised 1947

Ordnance Survey 1967 '495 card' showing antiquity model surveyed 01-Feb-1967, held in National Monuments Record

Oswald, A 1959 'The white stone of Yorkshire'. *Country Life Annual*, 61-4

Owen, D M 1958 'Thornton Abbey and the Lost Vill of Auldleby'. *Lincolnshire Archaeological and Architectural Society* **7 (2)**, 112-6

Owen, A E B 1984 'Salt, Sea Banks and Medieval Settlement on the Lindsey Coast' *in* Field, N and White, A (eds) *A Prospect of Lincolnshire*. Lincoln: published by the editors, 46-9

Parker, I H 1846 'Thornton Abbey, Lincolnshire'. *Archaeological Journal* **2**, 357-64

Page, W 1906 'Houses of Austin canons: the abbey of Thornton' *in* Page, W (ed) *The Victoria History of the County of Lincoln*, volume 2, 163-66

Pawley, S 1993a 'Maritime Trade and Fishing in the Middle Ages' in Bennett, S and Bennett, N (eds) *An Historical Atlas of Lincolnshire*, 56-7. Hull: Hull University Press, 56-7

Pawley, S 1993b 'Maritime Trade and Fishing, 1500-1700' in Bennett, S and Bennett, N (eds) *An Historical Atlas of Lincolnshire*. Hull: Hull University Press, 58-9

Pestell, T J 2008 *St Benet's Abbey: a guide and history*. Norwich: Norfolk Archaeological Trust

Pevsner, N, Harris, J and Antram 1995 *The Buildings of England: Lincolnshire* (second edition, with corrections). Frome and London: Penguin

Pevsner, N and Neave, D 1995 *The Buildings of England. Yorkshire: York and the East Riding* (second edition). Hardmonsworth: Penguin

Platts, G 1985 *Land and people in medieval Lincolnshire. History of Lincolnshire.* Volume 4. Lincoln: Society for Lincolnshire History and Archaeology

Poulson, G 1840 *The history and antiquities of the seigniory of Holderness,* Volume 2. Hull: Brown and Topping

Priestly Shires, B 1878 'Entrance gateway to St Mary's Abbey, Thornton, North Lincolnshire' *The Building News* (July 19)

RAF 1946 vertical aerial photograph CPE/UK/1748, frame 4047 21-SEP-1946

Ramey, R L 2004 'An archaeology of hospitality: the Stoneleigh Abbey gatehouse' *in* Bearman, R (ed) *Stoneleigh Abbey: the house, its owners, its lands*. Stoneleigh: Stoneleigh Abbey Limited

RCHME 1994 'The Abbey of St Benet at Holm, Horning, Norfolk'. Unpublished survey report held in the National Monuments Record

RCHME 1995 'Kirkstead Abbey, Lincolnshire'. Unpublished survey report held in the National Monuments Record

Reader E, 1972 *Broomfleet and Flaxfleet*. York: York Publishing.

Rhodes, J N and Watkins, A 1832 'Thornton Priory' engraving held in the English Heritage site archive

Richardson, W 1981 *Some useful Consumers of Waste: History in two Marshland parishes, Adlingfleet and Whitgift*. York: Sessions, privately published typescript

Rigold, S E 1967 'An Elizabethan hoard from Thornton Abbey, Lincs'. *British Numismatic Journal* **35**, 200-1

Rigold, S E 1975 'Thornton Abbey'. *Archaeological Journal* **131**, 373-7

Roberts, D L 1984 'John Thorpe's Drawings for Thornton College, the House of Sir Vincent Skinner'. *Lincolnshire History and Archaeology* **19**, 57-64

Rudkin, E H and Owen, D M 1960 'The Medieval Salt Industry of the Lindsey Marshland'. *Lincolnshire Architectural and Archaeological Societies Reports and Papers* (new series) **8**, 76-84

Russell, R C 1987 *The Water Drinkers in Lindsey: the earlier Temperance Movement, 1837-1860*. Barton on Humber: WEA Branch

Russell, R C 2002 'From Cock-fighting to Chapel-building: Changes in Popular Culture in Eighteenth and Nineteenth Century Lincolnshire'. *Lincolnshire Archaeology and Heritage Reports Series* **6**

Russell, E and Russell R C 1982 *Landscape Changes in South Humberside: The Enclosures of Thirty-seven Parishes*. Hull: Humberside Leisure Services

Scollar, I, Tabbagh, A, Hesse, A and Herzog, I (eds) 1990 *Archaeological Prospecting and Remote Sensing*. Cambridge: Cambridge University Press

Simpson, W D 1960 *The Building Accounts of Tattershall Castle, 1434-1472*. Lincoln Record Society **55**

Smith, A G R 1977 *Servant of the Cecils: the life of Sir Michael Hickes, 1543-1612*. London: J Cape

Smith, P 2010 'Audley End Stables' in *Research News* **14**. English Heritage, 6-9

Soil Survey of England and Wales 1983 *Soils of England and Wales: Sheet 1 - Northern England*. 1:250,000 soil map. Harpenden: Lawes Agricultural Trust

Stocker, D 1993 'The Early Church in Lindsey: a study of the sites and their significance' *in* Vince, A (ed) *Pre-Viking Lindsey*. Lincoln: City of Lincoln Archaeological Unit, 101-22.

Stocker, D and Everson, P 2002 'The Straight and Narrow Way. Fenland Causeways and the Conversion of the Landscape in the Witham Valley, Lincolnshire' *in* Carver, M (ed) *The Cross goes North. Processes of Conversion in Northern Europe, AD 300-1300*. Woodbridge: York Medieval Press, 271-88

Stukeley 1724 'Inside view of Thornton College gate house' held in Lincolnshire Archives YARB/11/2/4; originally published in *Itinerarium Curiosum* [2nd edition], 18

Sturman, C J 1984 'Salt Making in the Lindsey Marshland in the 16th and Early 17th Centuries' in Field, N and White, A (eds) *A Prospect of Lincolnshire*, 50-6. Lincoln: published by the editors

Summerson, J 1966 (ed) *The book of architecture of John Thorpe in Sir John Soane's Museum*. Glasgow: Glasgow University Press

Surtees Society 1870 *The Diary of Abraham de la Pryme, the Yorkshire Antiquary* **54**. Durham, London and Edinburgh: Surtees Society

Tibbles, J 1998 *Trial Excavations in Beckside North*. Beverley: Humberside Archaeology Reports

Tibbles, J 2008 *Archaeological Evaluation on Land South of Annie Reed Road Road*. Beverley. Humberside Archaeology Reports no. 269

Tibbles, J and Evans, D H 1993 *Excavations at North Beckside*. Beverley: Humberside Archaeology Reports

Wallis, T W 1870 Unpublished (privately printed) plan 'Thornton Abbey. Plan of the Grounds, History of the Abbey and sketches taken during the encampment of the 1st Administrative Battalion of the Lincolnshire Rifle Volunteers 27th June 2nd July 1870' in the private collection of Mr John Farrow. A copy also pasted into the Yarborough scrapbook held in Lincolnshire Archives YARB/11/2/4

Watt, S M 1903 'An Old English Gate-House'. *The English Illustrated Magazine* (for 1903), 140-4

Wight, J A 1972 *Brick Building in England from the Middle Ages to 1550*. London: John Baker

Wise, P J 1990 'The archaeology of the Grimsby-Cleethorpes area' *in* Ellis, S and Crowther, D (eds) *Humber perspectives: a region through the ages*. Hull: Hull University Press, 213-26

Woodward, D 1985 *Descriptions of East Yorkshire: Leland to Defoe*. Beverley: East Yorkshire Local History Series **39**

Worsley, G 1986 'Thornton Hall, Lincolnshire'. *Country Life* **174**, 18-21

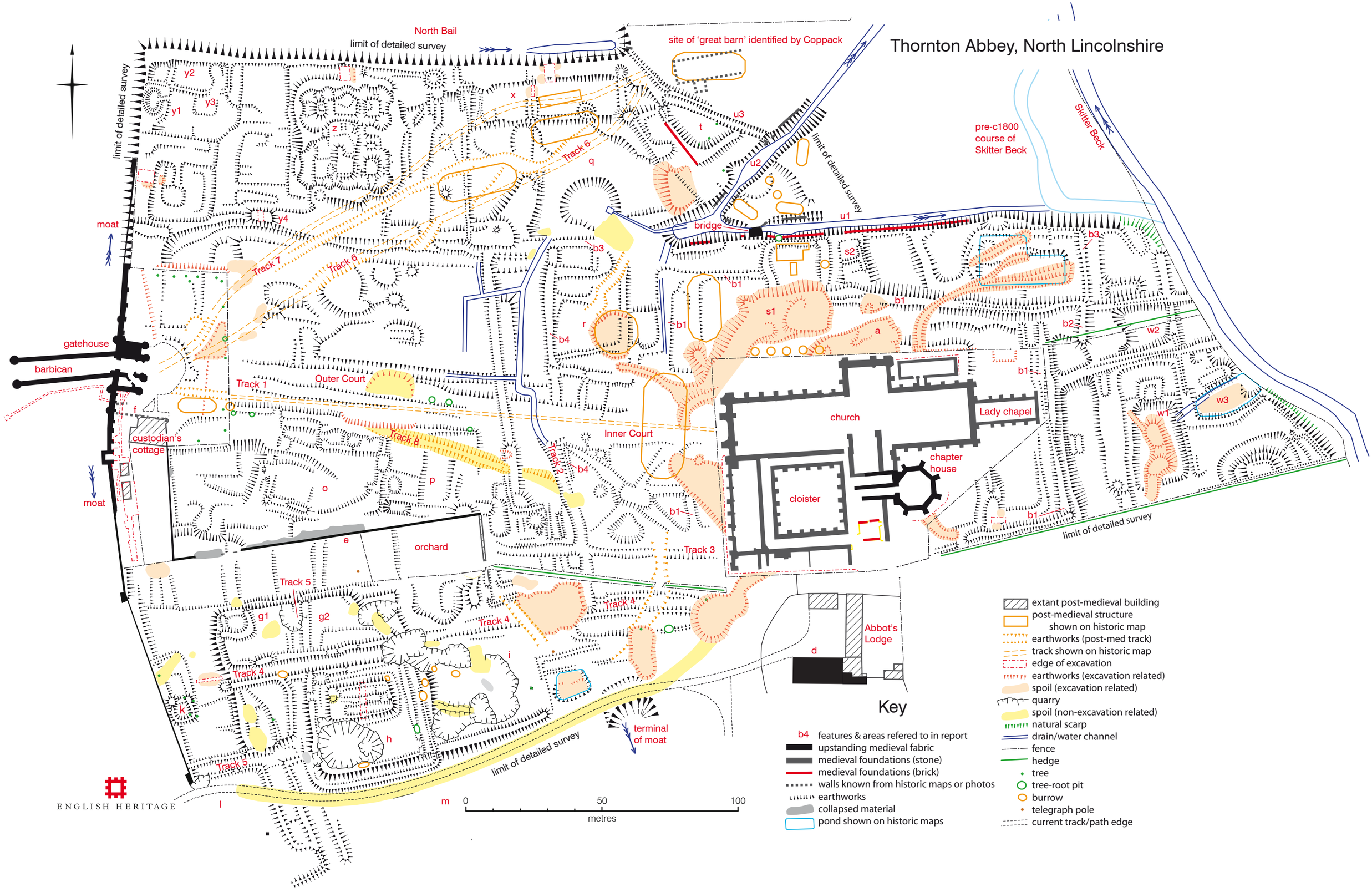


Figure 39 English Heritage earthwork survey of the core of the site, reduced to 1:1,250 scale from original at 1:1,000

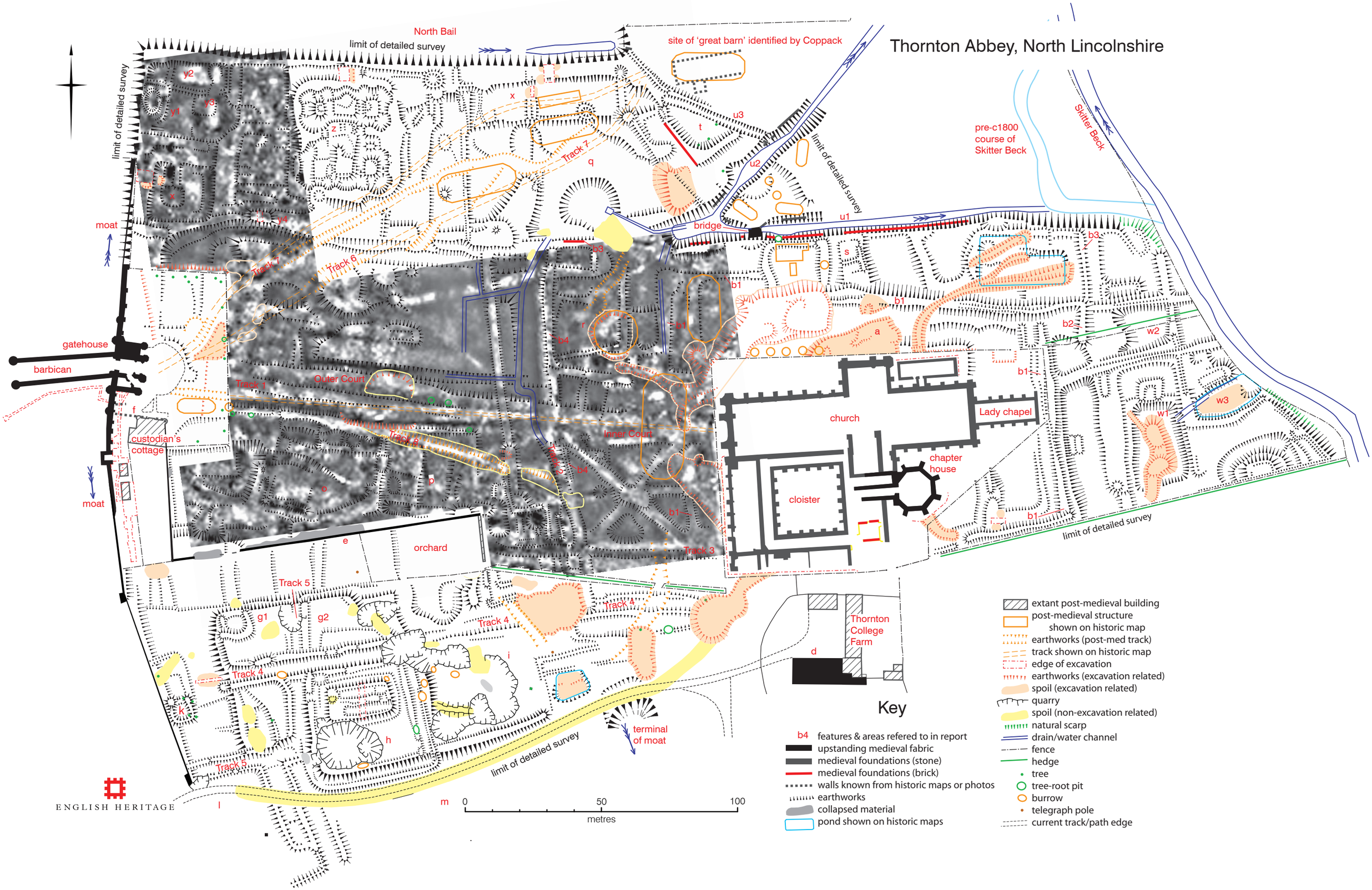


Figure 40 English Heritage earth resistance survey of part of the core of the site, plotted at 1:1,250 scale and overlaid on the earthwork survey

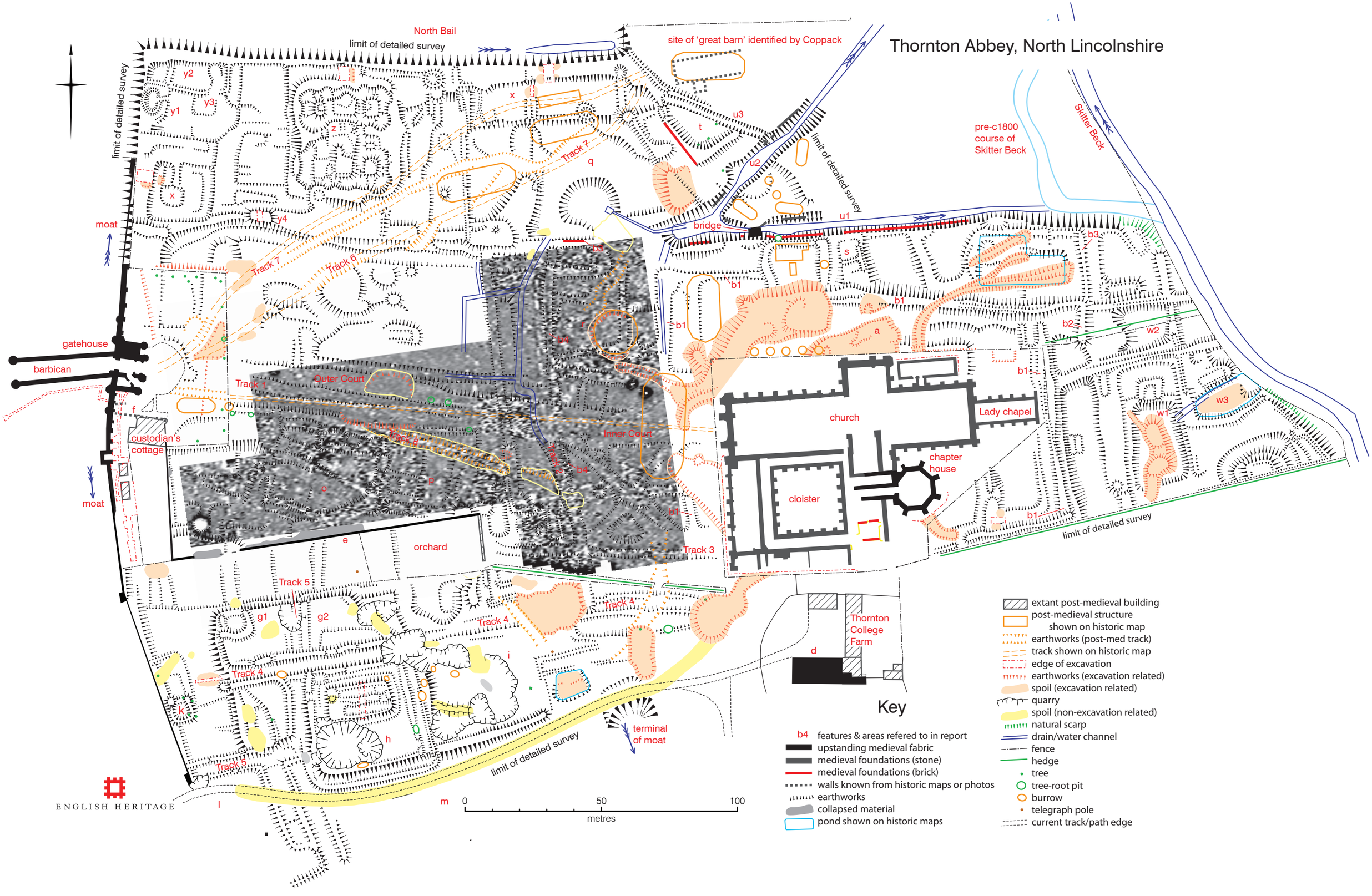


Figure 41 English Heritage magnetic survey of part of the core of the site, plotted at 1:1,250 scale and overlaid on the earthwork survey

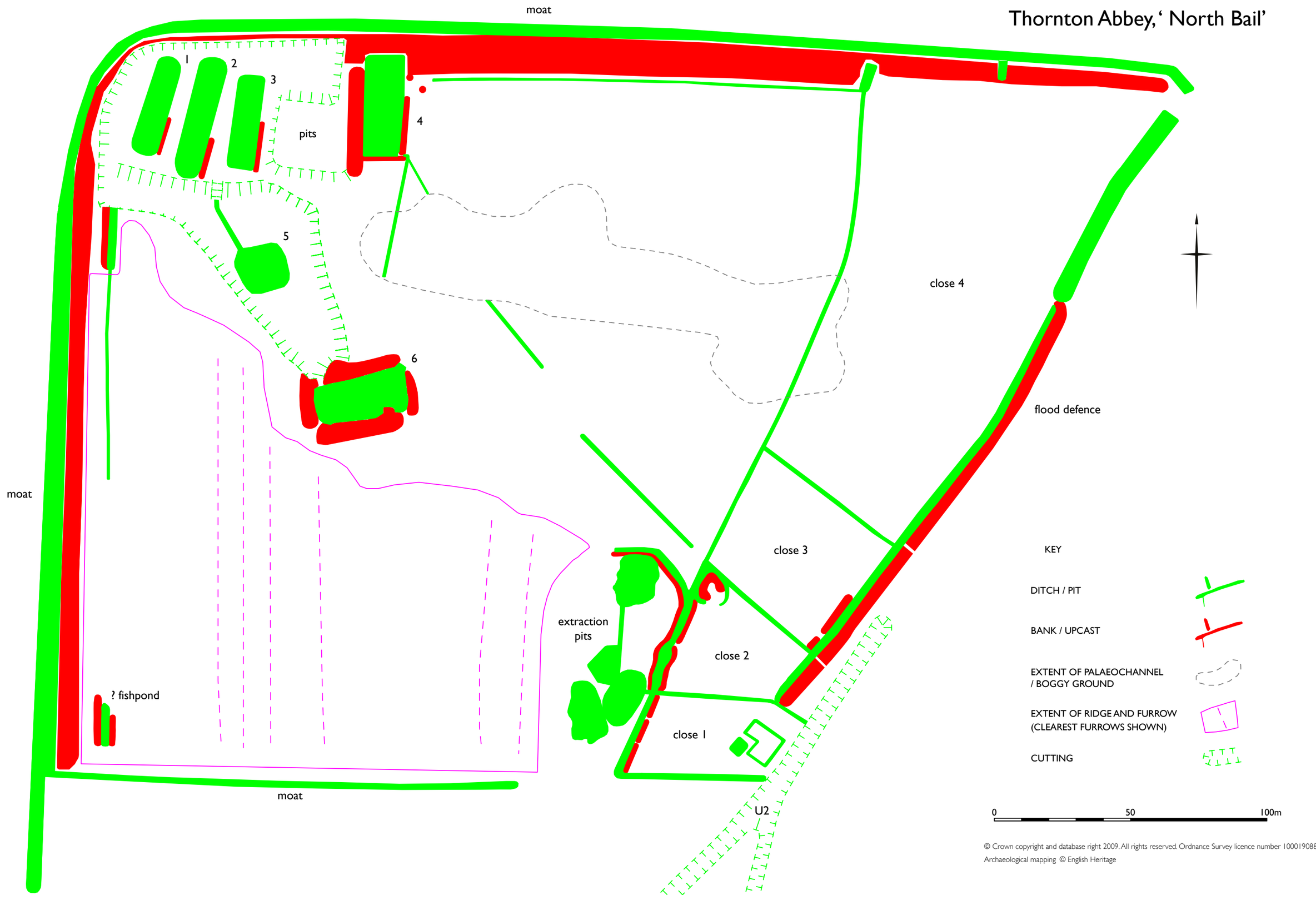


Figure 42. English Heritage air photographic transcription of destroyed earthworks and soilmarks in the North Bail, enlarged to 1:1,250 scale from original survey at 1:2,500 (therefore not to be used for accurate scaled measurement)



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