

# **A Re-assessment of the Use of Building Accounts for the Study of Medieval Urban Houses**

Jayne Rimmer

## **INTRODUCTION**

This paper will evaluate the use of building accounts as a source for medieval construction. It considers how architectural and documentary historians have used these records principally for the study of high-status buildings. In contrast, lower-status urban buildings tend to be studied by archaeologists through excavation. However, the main aim of this paper is to show that building accounts are an equally valuable source for the study of small and lower-status medieval urban buildings. It proposes that the analysis of building accounts can provide further detailed information about the construction of this type of medieval structure, in addition to the excavated and standing evidence.

## **MEDIEVAL BUILDING ACCOUNTS FOR HIGH-STATUS STRUCTURES**

A building account is a record of expenditure kept during a building operation by the institution in charge. Building accounts are a valuable source of information for building costs, hire of labour, quantity of materials and sources of supply. Unlike building contracts, they rarely provide details about dimensions and it has been argued that they are sometimes difficult to interpret unless something is known about the building structure from other sources (Pantin 1958, pp. 161-62). Moreover, the strength of a building account lies in its ability to expose information about original building processes, especially management practices and building sequences. However, although it is possible to analyse all these details, they have not been the main focus of traditional studies of building accounts.

Scholarly interests in medieval buildings have favoured high-status examples because of the availability of information at this level, both in terms of the extant fabric on hand for study, and also the survival of documentary sources relating to construction. Dr Harvey for instance, concentrated on medieval architectural style in cathedrals (1961; 1974; 1978). As an architectural historian, Harvey was interested in the chronological development of architectural style, particularly Gothic designs, and sought to identify the architect or master mason responsible for the workmanship. He used building accounts to confirm construction dates and attribute them to a particular author (Harvey 1961; 1974). The work of the medieval master mason and the mason's craft was a fascination of Harvey's, and building accounts also provided the opportunity for a close study of the practises of medieval craftsman (1971, pp. 39-51; 1974, pp. 51-64; 1975; 1978, pp. 41-55). His

interest in medieval craftsmen had such an impact, that it set a precedent for further research among scholars interested in medieval construction (Andrews 1974; Knoop and Jones 1933; Salzman 1952).

Harvey used building accounts for the identification of names and dates, rather than an analysis of the day-to-day details of the building process. Building accounts proved a very useful source for this type of study as Harvey's biographical work on medieval craftsmen demonstrates (1946, 1984). Nevertheless, the architectural study of medieval high-status buildings was not only confined to cathedrals. Royal buildings such as castles, houses and abbeys also yielded information in the form of extant structures and good documentary sources. Mr Colvin's *History of the King's Works*, combined architectural examinations with an analysis of royal building accounts (1963). Colvin was perhaps less selective than Harvey in his approach to the documentary sources, but one of his chief aims was to identify the clerk of works and other important offices help by craftsmen working on royal buildings (1963).

Not all architectural historians studying high-status medieval structures have approached building accounts with such a specific research agenda. In a history of the university and colleges of Cambridge, Professor Willis's aim, as it had been in previous works, was to:

[...] bring together all the recorded evidence that belongs to the building [...] [in order] to examine the building itself for the purpose of investigating the mode of its construction, and the successive changes and additions that have been made to it; and, lastly, to compare the recorded evidence with the structural evidence as much as possible.

(Willis and Clark 1886, pp. xcii-xciii)

Unlike Harvey, Willis was interested in building accounts because they could provide information about the construction process, as well as names and dates. As an example of this, Willis noted that the building accounts for the colleges of Peterhouse and Eton could yield much information about phases of construction and original room function, features which were no longer identifiable in the building fabric because they had been obscured by later modifications (1886, pp. 10, 26, 380-405).

Alongside architectural historians, documentary historians have also investigated building accounts for high-status medieval structures. A number of expenditure accounts for significant construction projects have been transcribed and published in edited volumes. In 1859 Canon Raine published a transcription of the Fabric Rolls of York Minster, which documented the early accounts of the construction of the Minster. In 1907, Canon Chapman published the Sacrist's Rolls of Ely Cathedral, which recorded, among the commonplace accounts of the sacristy, expenses made in the rebuilding of the central tower. Similar transcriptions of fabric accounts relating to cathedral construction work at Norwich and Exeter were also undertaken (Fearnie and Whittingham 1972; Erskine 1983). Historical interest in building accounts for high-status buildings was again

influenced by the availability of documents of this nature. However, historians were keen to show that building accounts did not necessarily have to complement surviving structures, but could provide evidence for buildings that had not withstood the test of time. Secular building accounts for modification work at Tattershall Castle were published, along with records relating to royal expenditure on building works at Dover Castle, Winchester Castle, and Westminster Abbey (Douglas Simpson 1960; Colvin 1971). This work was borne out of a desire to make medieval documents widely accessible, but also implicitly recognised that building accounts could provide important information about medieval construction if they were reproduced in their entirety.

A comprehensive documentary analysis of medieval construction using building accounts as the main reference was undertaken by Dr Salzman (1952). Salzman was particularly interested in investigating specific aspects of the building process, which could not be analysed from the standing evidence alone. For example, he undertook a close analysis of the economics of the building process, concentrating on the cost of materials and where they had been bought. He employed a thematic approach to the evidence, comparing for example, references made to doors and windows in documents from across the country. Although Salzman was aware of sources for lower status buildings in the form of building contracts (transcriptions of which he included in an appendix), his analysis of the construction process focused on the widely accessible building accounts for royal and ecclesiastical structures.

Thus, although architectural and historical studies have focused on high-status examples of medieval structures because they leave good standing and documentary evidence, approaches to the use of building accounts for evidence of medieval construction have varied between the two disciplines. More recently, architectural historians have developed an interest in lower status domestic houses and historians have also investigated the role of the lower classes in rural as well as urban environments (Quiney 2003; Dyer 1998 etc). However, the detailed investigation of commonplace domestic houses has been undertaken outside of these disciplines, by archaeologists. Indeed, it was an archaeological investigation that pioneered the close analysis of documentary sources alongside excavated evidence for the study of medieval peasant houses (Field 1965). Perhaps a similar approach could be emulated for urban buildings.

## **THE STUDY OF URBAN MEDIEVAL HOUSES**

Evidence for smaller domestic structures of the medieval period has been more commonly found through excavation rather than documentary analysis. Urban archaeology in itself is a fairly recent phenomenon, which gained impetus after the Second World War, when bomb-damaged areas allowed an unprecedented opportunity to study urban archaeological remains (Schofield and Vince 1994, pp. 1-2). Future redevelopment in towns called for archaeological examinations in the form of rescue archaeology and many archaeological units across the country began to investigate below ground evidence for a town's history. In Winchester, investigations uncovered information about

domestic dwellings across the social scale, which had not survived the test of time. Dr Biddle excavated a number of sites, which contained evidence for small rows of cottages (1967, pp. 264-66; 1968, pp. 259-63, 265-66). Excavations in York also uncovered evidence for smaller medieval houses (Hall, MacGregor and Stockwell 1988). York is perhaps an exceptional city as it contains a number of surviving examples of small rows of houses (Short 1979). Indeed, the below ground evidence showed that this type of housing was more common in the medieval period than the standing evidence suggests. Archaeological excavation and recording work has therefore generated evidence for a different type of medieval building than those traditionally studied by architectural historians.

Post war urban archaeological investigations perhaps prompted further topographical investigations of urban towns using documentary sources. Keene was able to reconstruct tenement histories for the domestic properties found in Winchester using evidence from title deeds (1985, pp. 3-41). Further historical studies in London, Norwich and York have shown that documentary sources relating to medieval property transactions and institutional management can disclose information for medieval houses across the social scale (Harding and Wright 1995; Rutledge 1995; Rees Jones 1987). Craft and guild records have also yielded interesting and unexpected information about urban medieval houses (Keene and Harding 1985; Rimmer 2003 etc). However, excavation evidence and documentary sources for property management provide limited information about the original form and fabric of medieval buildings. Perhaps the only documentary records that can provide detailed information about the construction of smaller medieval houses are building accounts. However the study of smaller medieval houses thus far, has tended not to utilise this source.

## **BUILDING ACCOUNTS FOR SMALLER MEDIEVAL HOUSES**

The rest of this paper will concentrate on a close reading of a building account, which records the construction of two rows of small houses in York between 1360 and 1364. It will argue that this source can provide valuable information for lower-status houses of the later medieval period. The building account is part of the archive of the vicars' choral of York Minster (YMA VC6/9/1). In the light of previous studies of building accounts for high status structures, it is important to identify new research questions that will complement the urban domestic context of these houses. As it has already been noted, the research agendas of Harvey and Salzman, for example, were based on the investigation of architectural features and specific aspects of the construction process, which demanded a highly selective examination of building accounts (1961, 1974; 1952). In this present study, an approach that looks at the account in its entirety (similar to that advocated by Willis and Clark (1886, pp. xcii-xciii)), hopes to ensure that important evidence about the construction of smaller houses is not overlooked. What is striking about the vicars' choral building account, is that it can be read as a narrative of the construction operation across the four-year project. A close reading of the account therefore anticipates the exposure of important information that will help further our knowledge of this particular type of housing. The analysis will focus on aspects of the

building process that cannot easily be interpreted from the standing or excavated evidence alone. Moreover, it will also utilise some of the research questions that have commonly been asked by archaeologists, considering whether documentary sources can help identify, in a practical sense, how these small rows of houses were erected on the ground.

### **Institutional Management**

The origins and developments of the College of vicars' choral at York Minster has been the subject of a number of previous studies (Harrison 1952; Tringham 1993a, pp. xvii-xx; Rees Jones 2001, pp. 380-96 etc). The College of vicars' choral at York held property in common from the thirteenth century onwards and a detailed investigation of its role as a medieval property holder and estate manager, was undertaken by Dr Rees Jones (1987, 2005). For the purpose of this present investigation, it is important to highlight that the College invested in a number of rows of smaller houses, or cottages, from the fourteenth century onwards (Rees Jones 1987, pp. 207-08). The houses were similar in design to a famous extant example in Goodramgate York, known as "Lady Row" (Short 1979, pp. 86-96; RCHME 1981, pp. 143-44). The vicars' choral built houses of this nature in the city centre, some situated behind the College precinct, known as the Bedern, along Aldwark and St Andrewgate (Rees Jones 1988, pp. 51-62; Tringham 1993a, pp. 11-12, 254-55). Further rows of small houses were constructed in Goodramgate and Stonegate, and also outside the city centre, in Layerthorpe (Tringham 1993a, pp. 117-18; Rees Jones 1987, p. 209). These investments provided a good income for the College and mark a different kind of building project from ecclesiastical institutions building high-status structures. The 1360-1364 building account records the development of two further areas of the city with rows of small houses. This was confirmed in a post-construction rent account for 1364, when new "rents", a term used by the vicars' choral to identify the smaller houses on its estate, were recorded (YMA VC4/1/12).

The building account documents construction work across two city centre sites, referred to as Cambhall and Benetplace. These sites were named after buildings that had occupied the areas prior to the new developments. Cambhall was the name given to an old stone building, which was pulled down before the new building works began in 1360, and corresponds to a plot on the corner of modern Goodramgate and College Street (Tringham 1993a, pp. 99-101, 150-51; RCHME 1981, pp. 143). Benetplace was named after the redundant church of St. Benet's, which was dissolved at the turn of the fourteenth century, and occupied a plot on the corner of modern Swinegate and Back Swinegate. (Tringham 1993a, 211-13, 380; 1993b, pp. 173-74). The houses erected at Benetplace have not survived the test of time, although the rows at Cambhall still stand, albeit in a much altered form (RCHME 1981, pp. 143-45). The following analysis will concentrate moreover, on the documentary evidence for the construction of smaller houses on these sites presented in the building account.

The building account is over six feet in length, drawn up on a parchment roll consisting of several membranes sewn together (YMA VC6/9/1). The accounts were written in Latin for the most part,

except where the scribe was unable to identify Latin terms for certain building vocabulary. Building work started at the feast of St John the Baptist (24<sup>th</sup> June) in 1360. Accounts relating to construction from 1360 to 1362 were recorded on one side of the manuscript and from 1362 to 1364 on the other (although the manuscript has been rolled in a way that years 1362-1364 are presented on the face and 1360-1362 on the dorso). The building account was administered on a weekly basis by the vicars' choral chamberlain. It was probably drawn up from separate receipts, possibly at the end of every week, following a similar procedure identified in royal and ecclesiastical accounts by Colvin and Harvey (1971, pp. 3-4; 1984, p. xlv).

Three main phases of construction work can be identified in the accounts, exposing when building work was operational. The first period of 25 weeks began at the feast of St. John the Baptist in 1360, followed by a further phase of 18 weeks, starting towards the end of June 1361. A third and final building phase commenced from the feast of St. John the Baptist in 1362 and consisted of 55 weeks. The weeks were numbered, rather than assigned calendar dates and so the interpretation of the time frame of operations is not that clear. Construction work at the Cambhall site was recorded across the four-year period however, work at Benetplace does not appear to have started until c. 1362. An analysis of this information provides an insight into the management of building activity. The first two phases undertaken between 1360 and 1362, both starting in June and ending five to six months later, indicated that building construction work ceased during the winter months. Salzman argued that it was common for building work to cease from November to February due to shorter daylight hours (1952, pp. 56-60). However, if the 55 week phase from 1362-1364 related to consecutive weeks, then perhaps building work continued through the winter months in the final years of this operation.

### **Building Materials**

Within these building phases, the most common entries relate to the purchase of building supplies. These records expose evidence about the original fabric of the buildings. The following analysis will consider the main categories of timber, brick and lime and plaster. Previous scholars have examined the vocabulary of medieval building accounts and glossary compilations can help with the identification of obscure terms (Gee 1984; Salzman 1952). Latin and online Middle English dictionaries are also useful for translations of building materials (Latham 1980; Electronic Middle English Dictionary).

A close analysis of the terms used in the account to record timber purchases shows that it was bought in a variety of forms. The word "timber" (*meremium*) has been identified as the term used to describe wood, usually oak, that was prepared for constructional use by a conversion process called box hearting (Grenville 1997, pp. 27-28; Harris 1999, pp. 17-20; Salzman 1952, pp. 237-52). This was differentiated from wood that was purchased in its raw state, referred to simply as "a tree", (*arbor*). The majority of the timbers purchased by the vicars' choral had undergone the conversion process. Only on a few occasions were oaks purchased in their raw state, in c. 1360, "seven trees" (*vii arboribus*) were bought from Acaster Wood (YMA VC6/9/1(d)). Timbers bought in this state

were more expensive in terms of the hire of sawyers to convert it and transport it back to the city of York.

The vicars' choral also bought timbers from the port of Hull, in the form of "Riga-Boards", timbers from the Baltic region (YMA VC6/9/1(r)). (For a further discussion of timber imports from Hull, see Childs 1990, pp. 18, 20, 36). Timber was more commonly bought as "beams", or "posts" (*lignum*) from the outskirts of York in Bootham, Grimston and Clifton but also within the city itself (YMA VC6/9/1). Given that these timbers were purchased for a specific purpose, they could refer to parts salvaged from other buildings. Recycled timbers were recorded in other instances in the account; the vicars' choral dismantled a house in Huntingdon, just outside York, and brought the timbers into the city for use in the Cambhall houses (YMA VC6/9/1(d)). An analysis of such terms offers an insight into the choices made by the developer regarding material supplies. Budget restraints may have resulted in cheaper options. The vicars' choral also exploited its links with craftsmen in order to source building materials. Carpenters working on the Cambhall and Benetplace sites acted as timber suppliers; a carpenter named John Colwyk, sold a large number of beams to the vicars' choral throughout the operations (YMA VC6/9/1). The building accounts therefore disclose important information about the way that materials were sourced for the construction of these small houses and also show how networks of building craftsmen could influence building operations.

Further records of material purchases help to identify the original appearance of the houses under construction. "Wall-tiles" (*walltigill*) or bricks, in the modern sense, were purchased in large quantities throughout the building account. This term was presumably used in order to distinguish tiles used in the wall from tiles for the roof, which were recorded as "covering-tiles" or "thak-tiles" (Salzman 1952, pp. 140-45, 229-32). Bricks were used in a variety of ways in the construction of a house. They were sometimes used to build dwarf-walls, on which the timber-frame could sit above ground level (Salzman 1952, pp. 201-02). However, more than 82 000 bricks were purchased by the vicars' choral across the four-year period, which shows that they were widely used in the construction process. The use of brick as infill material within the timber-frame has traditionally been associated with the later fifteenth century and Tudor period rather than the fourteenth century (Wight 1972, p. 32). However, Brunskill has also argued that framing panels filled with brick, more commonly known as "brick-nogging", may have been an earlier practice (1978, p. 70). The RCHME investigators found that timber-framed buildings from medieval York were frequently consolidated with thin bricks set on edge (1981, pp. lxii-xiii). It is a common assumption that bricks were expensive and therefore less likely to be used in the construction of smaller houses. However, the vicars' choral building account identifies the extensive use of brick in the construction process, which allows a more specific interpretation of the original building fabric that challenges previous assumptions about small houses.

Laths and plaster purchases were also recorded in the account, which shows that some walls were filled with alternative materials to brick. Perhaps brick was used in external walls to give durability,

while lath and plaster was used for internal partitions. The lack of precise information for the use of these materials makes a clear interpretation difficult. However, it raises some questions about the external appearance of these houses. Lime was also bought in very large quantities over the course of the building work (YMA VC6/9/1). Plasterers were also employed to make kilns of lime plaster on site (YMA VC6/9/1). The application of a coat of lime was a frequent finish to a timber framed building and may have been applied throughout (Salzman 1952, p. 157). It is difficult to assess whether the whole of the external frame, including the timbers, were coated with plaster or lime. It has been assumed that timbers were left on display in all medieval buildings. This was certainly the case in high status buildings and has been identified at the Merchant Adventurers Hall in York (Giles 2000, pp. 29-31). However, it is questionable whether this practise was also common among lower-status buildings. Methods used in the construction of higher-status buildings may not necessarily have been emulated in smaller, less conspicuous buildings.

### **Domestic Features**

The account allows an insight into further features of small houses, which not only affect their appearance, but also discloses information about the internal comfort of the occupier. These small cottages contained one room to the ground floor and one room to the first floor, which was open to the roof. References to the purchase and construction of louvres, suggests that a basic provision for heating was made by the vicars' choral for the tenants of its property (YMA VC6/9/1(d)). The louvres seem to have been made out of moveable slatted boards, which were operated by ropes to let smoke from the fire out of the building. The account does not give any further information about hearths, indicating that the method of containing the fire may have been left up to the occupant. The accounts record the construction of a chimney in one house, possibly in Benetplace, although this was probably a timber and plaster hearth hood rather than a chimney stack (YMA VC6/9/1(r)). It is difficult to conclude whether chimneys and louvres were inserted into all the houses; the unsystematic recording of these items suggests that there were differences either across the two sites, or between houses. Other features, such as doors and windows, appear to have been built to specification on site. A large amount of ironwork for doors and perhaps shutters for windows were purchased, for example, riders, hooks and staples (*dourbandes, crokes, stapils*) (YMA VC6/9/1). Security was also a concern and locks (*hinglokes*) were frequently purchased throughout the account. The absence of glass indicates that windows were made of timber only. Glass was an expensive item in the Middle Ages, used predominantly in grander buildings, and was not included in these smaller houses (Salzman 1952, pp. 173-86).

The jetty was a predominant feature of many urban timber-framed houses of the later medieval period (Harris 1990, pp. 33-6; 1999, 55-6). Extant examples of smaller rows of medieval houses in York show that houses at the lower end of the social scale also incorporate jetties at first floor level (Short 1979; RCHME 1981, pp. 143-45). However, the account does not record specific timber purchases that relate to this element of the frame (possible vocabulary includes *jetty, gettye, jactura*; see Gee 1984, p. 47). A small part of a jetty can be seen on the surviving structure facing College



Street, which shows that the houses on this site did have this feature (RCHME 1981, p. 143). This is an example of how building accounts sometimes provide a limited amount of information about certain features. General timber items recorded in the account, such as beams or posts, were undoubtedly used in the construction of the jetties.

### **Craftsmen**

The vicars' choral employed several carpenters to work across the Cambhall and Benetplace sites. Two carpenters in particular, can be linked to other building operations in York around the same time. From 1360 to 1362, a John Colwyk was paid to work at Cambhall on a weekly basis (YMA VC6/9/1(d)). The same carpenter was employed to work again from 1362 to 1364, although he was paid a lump-sum in advance, rather than a weekly wage (YMA VC6/9/1(r)). The records of the fraternity of Our Lord Jesus Christ and the Blessed Virgin Mary, show that it also employed a John Colwyk to work on its new hall in Fossgate, York (now the Merchant Adventurers' Hall) in 1357 (Sellers 1918, p. 5-16; Harvey 1984, p. 68). John Colwyk was distinguished as the master carpenter in the vicars' choral account because he was paid a set wage at 2 s. 9 d. per week, which was greater than other more itinerant carpenters who worked on the site, who received a more varied wage, between 2 s. and 2 s. 3 d. per week (VC6/9/1(d)). A second carpenter, John de Cranby, was employed in 1362, for a period of 18 weeks for a lump-sum payment of 46 s. 8d (YMA VC6/9/1(d)). Harvey has linked a John de Craneby of York to the construction of houses in Pavement, York for the Guild of the Assumption in 1366-68 (1984, p. 75). The vicars' choral could have actively sought a reputable carpenter to oversee its building operations throughout the 1360s. A number of additional nameless carpenters were employed during the operations, in some weeks as many as seven extra (YMA VC6/9/1(d)). Presumably the nature of the work at hand determined the number of carpenters needed and the number of days they were employed. The majority of carpenters in fourteenth-century York were employed as journeymen on a daily basis rather than for extended periods of time (Swanson 1983, p. 12). Further work into documentary sources for lower status houses could help to build up a picture of craftsman's work in an urban environment. These networks are just as important as establishing links between architects of higher-status buildings.

### **Methods of Construction**

Building accounts also disclose important information about the construction process for urban buildings. Previous investigators of high-status building accounts have noted that the process of framing-up timber buildings was undertaken away from the construction site itself, either in close proximity to it, or further a field. A famous example is Westminster Hall roof, which was constructed in Farnham in Surrey and transported to Westminster by boat (Salzman 1952, p. 200). However much of the construction work recorded in the vicars' choral building accounts seems to have been undertaken on site. If timbers were framed up away from the building site then the process may have shown up on the account in a record of transportation costs, but there is no evidence for this. It is possible that the Benetplace site was utilised either for storage or building work, as records of transportation costs were linked with this site prior to construction work in 1362

(VC6/9/1(d)). The only other area mentioned in the accounts was the Bedern, the College precinct, where perhaps stores of building materials were also kept. Craftsmen employed to work on the building operations were usually identified either with the Cambhall or Benetplace sites rather than any other location, indicating that work was undertaken primarily in these two areas. Perhaps building practices differed between the construction of high-status buildings and smaller operations.

The account also provides some evidence to illuminate how the rows of houses were erected on the ground. Foundation opening and timber-erections were documented at intervals throughout the building operations. In the intervening periods, purchases of materials and hire of labour regarding the fabric of buildings were recorded, including the tiling of roofs. Thus it seems unlikely that the rows of houses were constructed as one complete unit. The rent accounts for Pentecost (Whit-Sunday) 1364, record twelve rents collected at Benetplace and six rents at Cambhall (YMA VC4/1/12). Perhaps it was impractical to construct rows of this length as one operation. Professor Keene has argued that small cottages in Winchester were usually built as units of four or less, although more houses were often added to form longer rows over time (Keene 1985, p. 164). It is important not to lose sight of the context of the York building operations; perhaps the construction of houses across the four-year period was deliberately undertaken in small blocks so that the vicars' chorals could rent some of the houses before the rest were completed.

## **CONCLUSION**

The study of building accounts as a source for medieval housing need not be confined to high status examples only. Indeed, building accounts provide important information about the form and fabric of houses at the lower end of the social scale, many of which have not survived the test of time. Moreover, if the research approach looks at the record in its entirety, taking a complex rather than selective approach, then new information about methods of construction in the urban environment can be exposed. This methodology could be usefully applied in future studies of the source and perhaps provoke a reassessment of other known building accounts for further information about construction methods.

## **REFERENCES**

### **York Minster Archives (YMA)**

VC4/1/12

VC6/9/1

Andrews, F.B, 1974. *The Mediaeval Builder and His Methods*, Wakefield: EP Publishing Limited.

Biddle, M, 1967. "Excavations at Winchester 1966: Fifth Interim Report", *The Antiquaries Journal*, 47/2, pp. 251-79.

Biddle, M, 1968. "Excavations at Winchester 1967: Sixth Interim Report", *The Antiquaries Journal*, 48/2, pp. 250-84.

Brunskill, R.W, 1978. *Illustrated Handbook of Vernacular Architecture*, London: Faber and Faber.

Chapman, F.R, (ed.), 1907. *Sacrist Rolls of Ely*, 2 vols., Cambridge: Cambridge University Press.

Childs, W.R, (ed.), 1990. "The Trade and Shipping of Hull", *East Yorkshire Local History Series*, 43, Leeds: East Yorkshire Record Series.

Colvin, H.M, 1963. *The History of the King's Works*, 6 vols., London: HMSO.

Colvin, H.M, (ed.), 1971. *Building Accounts of King Henry III*, Oxford: Oxford University Press.

Douglas Simpson, W, (ed.), 1960. "The Building Accounts of Tattershall Castle 1434-1472", *The Lincoln Record Society*, 55, Lincoln: The Lincoln Record Society.

Dyer, C, 1998. *Standards of Living in the Later Middle Ages Social Change in England c. 1200-1520*, Cambridge: Cambridge University Press.

Erskine, A.M, (ed.), 1981-83. "The Accounts of the Fabric of Exeter Cathedral, 1279-1353", 2 vols., *Devon and Cornwall Record Society* 24-26, Exeter: Devon and Cornwall Record Society.

Ferne, E.C, and Whittingham, A.B, (eds.), 1972. "The Early Communar and Pitancer Rolls of Norwich Cathedral Priory with an Account of the Building of the Cloister", *Norfolk Record Society*, 41, Norwich: Norfolk Record Society.

Field, R.K, 1965. "Worcestershire Peasant Buildings, Household Goods and Farming Equipment in the Later Middle Ages", *Medieval Archaeology*, 9, pp. 137-45.

Gee, E, 1984. *A Glossary of Building Terms used in England from the Conquest to c. 1550*, Frome: Frome Historical Research Group.

Giles, K, "An Archaeology of Social Identity Guildhalls on York c.1350-1630", *British Archaeological Report British Series*, 315, Oxford: John and Erica Hedges Ltd.

Grenville, J, 1997. *Medieval Housing*, London: Leicester University Press.

- Hall, R.A, MacGregor, H, and Stockwell, M, 1988. *Medieval Tenements in Aldwark, and Other Sites*, London: Council for British Archaeology.
- Harding, V, and Wright, L, (eds.), 1995. "London Bridge: Selected Accounts and Rentals, 1381-1538", *London Record Society*, 31, London: London Record Society.
- Harris, R, 1999. *Discovering Timber Framed Buildings*, Princes Risborough: Shire.
- Harris, R, 1990. "Jetties", *Vernacular Architecture*, 21, pp. 33-36.
- Harrison, F, 1952. *Life in a Medieval College*, London: John Murray.
- Harvey, J, 1946. *Henry Yevele c. 1320 to 1400 The Life of an English Architect*. London: B.T. Batsford Ltd.
- Harvey, J, 1961. *English Cathedrals*, London; B.T. Batsford Ltd.
- Harvey, J, 1971. *The Master Builders, Architecture in the Middle Ages*, London: Thames and Hudson.
- Harvey, J, 1974. *Cathedrals of England and Wales*, London: B.T. Batsford Ltd.
- Harvey, J, 1975. *Mediaeval Craftsmen*, London: B.T. Batsford Ltd.
- Harvey, J, 1978. *The Perpendicular Style 1330-1485*, London: B.T. Batsford Ltd.
- Harvey, J, 1984. *English Mediaeval Architects*, Gloucester: Alan Sutton Publishing.
- Keene, D, 1985. *Survey of Medieval Winchester*, vol. 1, Oxford: Clarendon Press.
- Keene, D, and Harding, V, (eds.), 1985. "A Survey of Documentary Sources for Property Holding in London Before the Great Fire", *London Record Society*, 22, London: London Record Society.
- Knoop, D, and Jones, G.P, 1933. *The Medieval Mason*, Manchester: Manchester University Press.
- Latham, R.E, 1980. *Revised Medieval Latin Word-List From British and Irish Sources*, Oxford: Oxford University Press.
- Pantin, W.A, 1958. "Monuments or Muniments? The Interrelation of Material Remains and Documentary Sources", *Medieval Archaeology*, 2, pp. 158-68.

Quiney, A, 2003. *Town Houses of Medieval Britain*, New Haven and London: Yale University Press.

Raine, J, (ed.), 1859. "The Fabric Rolls of York Minster", *Surtees Society*, 35, Durham: Andrews and Company.

RCHME, 1981. *An Inventory of the Historical Monuments in the City of York Volume 5 The Central Area*, London: HMSO.

Rees Jones, S, 1987. "Property, Tenure and Rents: Some Aspects of the Topography and Economy of Medieval York" Unpublished D.Phil Thesis, The University of York.

Rees Jones, S, 1988. "Historic Background of the Aldwark/ Bedern Area" in Hall, R, A. et al., 1988.

Rees Jones, S, 2001. "A Short History of the College of the Vicars Choral" in Richards, J, *The Vicars Choral of York Minster: The College at Bedern*, York: Council for British Archaeology.

Rees Jones, S, 2005. "God and Mammon: The Role of the City Estate of the Vicars Choral in the Religious Life of York Minster" in Hall, R, and Stocker, D, *Vicars Choral at English Cathedrals Cantate Domino*, Oxford: Oxbow Books.

Rimmer, J, 2003. "Court Minutes of the Armourers' Company of London (1536-38): A Select Edition and Commentary" Unpublished M.A. Thesis, The University of York.

Rutledge, E, 1995. "Landlords and Tenants: housing and the rented property market in early fourteenth-century Norwich", *Urban History*, 22/1, pp. 7-24.

Salzman, L.F, 1952. *Building in England Down to 1540: A Documentary History*, Oxford: Oxford University Press.

Schofield, J, and Vince, A, 1994. *Medieval Towns*, London: Leicester University Press.

Sellers, M, (ed.), 1918. "The York Mercers and Merchant Adventurers 1356-1917", *Surtees Society*, 129, Durham: Andrews and Company.

Short, P, 1979. "The Fourteenth-Century Rows of York", *Archaeological Journal*, 137, pp. 86-137.

Swanson, H, 1983. "Building Craftsmen in Late Medieval York", *Borthwick Papers*, 63, Leeds: East Yorkshire Local History Society.

Tringham, N.J, (ed.), 1993a. "Charters of the Vicars Choral of York Minster: City of York And Its Suburbs To 1546", *Yorkshire Archaeological Society Record Series*, 148, Leeds: The University of Leeds.

Tringham, N.J, 1993b. "A Redundant Church in Medieval York: A Note on St. Benet's", *Yorkshire Archaeological Journal*, 65, pp. 173-74.

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

Willis, R, and Clark, J.W, 1886. *The Architectural History of the University of Cambridge and the Colleges of Cambridge and Eton*, vol. 1, Cambridge: Cambridge University Press.

Electronic Middle English Dictionary: <http://ets.umdl.umich.edu/m/med/>

The study of urban history Leicester University Press, Leicester. Crummy, P. (1979) 'The system of measurement used in town planning from the ninth to the thirteenth centuries', in Hawkes, S.C., Brown, D. and Campbell, J. (eds) Anglo-Saxon studies in archaeology and history BAR no. 72, British Archaeological Reports, Oxford. Note that there is a significant literature on urban form and GIS as applied to studies of land use and urban real estate, led by Grant Ian Thrall A Re-Assessment of the Behavioural Foundations of Urban Models of Housing, Labor and Transportation Markets, 1st Edition. By Paul A. Waddell. Routledge. Routledge Revivals spans the whole of the Humanities and Social Sciences, and includes works by some of the world's greatest thinkers including Emile Durkheim, Max Weber, Simone Weil, Martin Buber, Karl Jaspers and Max Beloff. If you are interested in Revivals in the Behavioral Sciences, please visit <https://www.routledge.com/series/PSYREVIVALS>. Variety of house building technologies, involving the use of masonry materials, precast reinforced-concrete structures, formwork systems and modern construction equipment, contributed to the need to perform expert evaluation of their applicability in various construction conditions. Expert evaluation of house building technologies is based on a set of weighty criteria considering not only costs of resources but consumer appeal of apartment buildings as well. The expert evaluation method represents a tool for comparison of technologies by means of the system of incomparable criteria such as arc