Control, co-operation and conflict: an interdisciplinary study of later medieval urban water management in Britain AD 1066-1540.

One volume.

Submitted by Margaret Jean Wilby to the University of Exeter as a dissertation for the degree of Master of Philosophy in Archaeology, March 2012.

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Abstract

The inter-relationship between the development of complex societies, their beliefs and the degree of sophistication of their urban water management systems is not a subject which has attracted a great deal of academic consideration. This study has therefore adopted an interdisciplinary approach in order to evaluate the extent to which the types of urban water management schemes in England, Wales, Scotland and Ireland between 1066 and 1540 can be better understood by placing them within their wider historical and conceptual contexts. This was a period which witnessed a rapid expansion in urban settlements and when great political and social conflicts arose as the rigidly hierarchical social order began to change, the power of the church was challenged and towns moved towards independent local government. This study considers the impact of these events on the development of urban water management and the extent to which different groups of city dwellers were able to negotiate arrangements to provide and share the water supply. It also examines whether the ideas and beliefs of the period about the symbolic significance of water and the causes of disease affected the ways in which water was supplied and used.

Two case studies supplement the literature and conceptual surveys to provide a wide overview of urban water management systems during the study period and to test the proposition that these systems are not only indicators of a society’s technical expertise but also reveal aspects of the nature, development and complexity of its social and political structures.
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Introduction

Giraldus Cambrensis, writing about his visit to Ireland in the early 12th century, declared that the development of towns was a sign of “mankind’s progress from forest to field and field to town” (transcribed and translated by Forester 2000, 70). Accordingly the Irish, being “averse to civic institutions” and having other barbarous habits, were “secluded from civilised nations” (ibid.). Thus towns, as beacons of a civilised society, carried a symbolic significance and weight beyond their purely utilitarian purposes and population size. This concept is one which lies at the heart of later medieval cities and may partially account for their rapid development in much of Western Europe during the study period. Fundamental to the success of that endeavour was the effective management of water and yet this subject is rarely given its due importance. This is an omission which this study seeks to correct by researching evidence from a wide selection of multi-disciplinary sources in order to provide a more complete picture of urban water management in England, Scotland, Wales and Ireland from the Norman Conquest to the Reformation (1540). These are the countries which today, together with other adjacent islands not included in the study, form the geographical area known as the British Isles (Webster 1972, 178) and for the purposes of this study the word Britain has been adopted to encompass these four areas. During the study period all four countries experienced invasions by either the Normans or their Anglo-Norman successors with, thereafter, fluctuating degrees of continued direct and indirect political control; the impact of which on the development of towns is investigated and discussed.

The definition of a town which has been adopted is that of Holt and Rosser, namely that it is “a relatively dense and permanent concentration of residents engaged in a multiplicity of activities, a substantial proportion of which are not agrarian (1990, 4). Furthermore, as “there is no formula which defines all the kinds of community to which the [Early English] term burh... was applied” (Martin 1990, 30), the modern derivative term borough is used as an alternative way of referring to a town. The Latin word civitas, which translates as city, was also employed in formal contemporary documents to describe an urban settlement. However, as it was not a different legal entity from a burh or borough, the word is used in this study only to reflect the size and importance of a place.
Evidence has been collated to show that, whilst many of the towns and cities of later medieval Britain are still in existence today, the similarities which they bear mask profound differences between them. These relate, in particular, to their respective administrative, legal and social structures and the concepts upon which these were built. Thus medieval boroughs and their town councils were, with varying degrees of dependency, always under the control of their royal, seigniorial or ecclesiastical overlords (Britnell 1996, 72). Even those which had not been ecclesiastically founded often had, within their boundaries, independent enclaves of cathedral and monastic precincts (Grenville 1997, 164). Furthermore, although town councils gradually acquired more administrative powers, such jurisdiction as they enjoyed rarely extended beyond the town boundary and thus often excluded the vital arterial rivers upon which many towns depended. The resulting fractured physical, jurisdictional and social divisions inevitably led to a lack of any unified administration which could oversee shared water supplies, organise waste disposal and resolve conflicts between users.

The ubiquitous power of the church influenced every aspect of medieval life, including water management, as particularly manifested in the sophisticated technology of large scale rural and urban hydraulic engineering projects (Bond 2001; Magnusson 2001). Possibly of equal importance, however, was the church’s control over conceptual beliefs about the medicinal and symbolic qualities of water and in the part which it played in the causes and cures of disease. In particular, how was clean water defined and recognised, for what purposes was it considered desirable and were any sources identified as having special spiritual significance? This study has attempted to find answers to these questions in order better to understand what the medieval systems of water supply and waste control were aiming to achieve and whether these aims were wholly or partially met. For example, was one of the motivations which lay behind the installation of closed conduits an attempt to provide a “clean” water supply for domestic use?

The complex interactions between the technologies, administration and underlying concepts which created the shape of later medieval urban water management systems have been brought together in the literature and conceptual surveys. In order to provide a wide range of evidence, examples have been selected from towns across the
entirety of the British Isles. This has also enabled a comparison to be made of the similarities and differences between water systems in different regions and how these might be explained by the effects of environmental, geographical, cultural, religious, historical and political factors.

The information contained in the literature and conceptual surveys has supplied a framework for the two detailed case studies centred, respectively, on two cities with a number of interesting differences, namely Exeter and Salisbury. Exeter was selected because of the author’s desire to learn more about its later medieval underground passages which had been built to assist with the carriage of a piped water supply into the heart of the city (Allen 2004). By way of contrast Salisbury’s water supply system was different from that of the ancient royal borough of Exeter in one major respect. Founded and built as an ecclesiastical new city in the 13th century, Salisbury seems never to have had any public (and possibly no private) piped water supplies but instead had numerous open water channels which had probably been incorporated into the original plan (Slater 2000, 600). The case studies have therefore been used to investigate, compare and try to explain the similarities and differences between the water management systems of the two cities and assess how this material has contributed to the objectives of the research.

The contextual overview and case studies have identified and researched three main sources of urban water which required management, namely wells, man-made open/closed conduits and natural watercourses. Wells were an important feature of urban life but the surviving examples are probably a tiny fraction of the total number which once existed. However, by using multi-disciplinary sources, it has proved possible to uncover evidence about the different types of wells; their technologies; locations and their place in the social ordering of society. A similar approach has been used to collate information about the different types, designs, functions and management of both man-made conduits and natural water courses. The rivers, near which many towns had been built because of the benefits such proximity brought, presented particular challenges to medieval communities. Large scale and expensive civil engineering projects were sometimes required to control flooding and maximise industrial and trade usage. At the same time the needs of other multiple users of the river had to be regulated in order to prevent conflicts of interest escalating into serious
disputes. The study examines the extent to which a lack of a unified administration, an under-developed legal system and the political weakness of secular local government contributed to problems of effective river management. Although each of these three sources of urban water supply has been considered separately, they were physically inter-related parts of the total system of urban water management. Open water courses and rivers, for example, supplied water for industrial and domestic use and yet these were, at the same time, being used as depositories for sewage and other unsavoury waste (Coulton 1908, 16; Sabine 1934; Carr 2001, 164 et al).

In summary the main objectives of this study are first to use a multi-disciplinary framework to provide an overview of British urban water management during the study period. Secondly to evaluate the contribution this research method has made towards a better understanding of the complexities of medieval urban life and to the topography of our present cities. Thirdly to investigate and consider whether this approach could be employed as an additional aid to the interpretation of archaeological evidence from other periods and places. In furtherance of these objectives a number of issues will be investigated and these include:

1. What were the main sources of water supply; were there any important regional variations and, if so, how can these be explained?

2. What was the relationship between the development of urban administration and the ways in which water management evolved? How were the problems which arose from the sharing of facilities by different users resolved?

3. What concepts and beliefs underlaid the ways in water was regarded and used and how relevant are these to an understanding of its management in later medieval cities?

4. How, if at all, did the types and methods of water management change and develop over time?

5. What new insights have been gained into the urban life for citizens of all social classes?

6. What traces still remain of the old water systems?
**Chronological Table A.D. 1066-1540 for Britain, Exeter and Salisbury**

This is based on the chronological table in *Excavations in Medieval Southampton 1953-1969, vol.1* (Platt and Coleman-Smith 1975, 39-49) and with addition information taken from the dissertation and from *The Kings and Queens of England* (Ormond 2001).

The purposes of the table are first to provide a chronological historical context within which the Exeter and Salisbury developed their civic administrations and water management solutions; secondly to demonstrate the extent to which these changed over time and thirdly to enable comparisons between the two cities (which are discussed in the course of the study) to be made clearer. The wider historical material comprises important political events, major natural disasters and a representative selection of significant hydraulic undertakings which occurred in the study area. Within this framework critical dates have been taken from the case studies to highlight occasions when the two cities were significantly affected by either national or local events and also when there were important milestones in the evolution of their respective local government and water management systems.
<table>
<thead>
<tr>
<th><strong>Britain.</strong></th>
<th><strong>Exeter</strong></th>
<th><strong>Old Sarum/Salisbury</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1086: Domesday survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1087: Accession of William II</td>
<td>1114: Re-building of cathedral commences</td>
<td>Early 12th century: Cathedral re-built in Old Sarum</td>
</tr>
<tr>
<td>1095: The first Crusade begins</td>
<td>1136: Siege of Exeter castle</td>
<td></td>
</tr>
<tr>
<td>1100: Accession of Henry I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circa 1100: First borough charters granted in England</td>
<td>1153: Plan drawn of the Canterbury water management system</td>
<td></td>
</tr>
<tr>
<td>1135: Accession of Stephen</td>
<td>1154: Accession of Henry II</td>
<td></td>
</tr>
<tr>
<td>1139: Mathilda lands in England</td>
<td>Mid-12th century: First borough charters granted in Wales</td>
<td></td>
</tr>
<tr>
<td>1141: Mathilda crowned queen of England. Anarchy period</td>
<td>1170: Murder of Thomas Becket</td>
<td>Circa 1170-80: St Sidwell’s Conduit built for the cathedral</td>
</tr>
<tr>
<td>1153: Plan drawn of the Canterbury water management system</td>
<td>1171-2: Henry II holds court in Dublin</td>
<td>Late 12th century: Decision made to re-locate cathedral to a new site. Permission granted by pope and king</td>
</tr>
<tr>
<td>1162: Two city charters granted. Civic seal is created</td>
<td>1199: Accession of John</td>
<td></td>
</tr>
</tbody>
</table>

17
1215: Magna Carta. Civil war in England

1216: Accession of Henry III

1219: The new town granted a market charter

1220: Great Conduit built in London for the citizens

1225: Cathedral foundation stone laid. Construction of cathedral and town begins

1226: St Sidwell’s Conduit extended to Townwell via St Nicholas’ Priory

1227: Boundary ditches constructed. Start of construction of new bridge over the Avon

1228: New Exe bridge built by the city council

1229: Office of Mayor instituted

1231: Custodianship of castle taken from earl of Devon and given to Duke of Cornwall

1232: Blackfriars’ Conduit built

1237: Great Conduit built in London for the citizens

1239: Earl of Devon constructs weir across Exe

1240: Bristol port reconstruction begins

1244: Bridge over the Avon completed

1244: Cathedral completed

1249: Office of mayor first recorded

1259: City granted right to hold its fee farm forever

1260-70: St Sidwell’s Conduit extended to new source of water at Headwell

1261: City council in existence

1262: Weir on Exe re-built in stone with 30’ lock for shipping

1272: Accession of Edward I
1276-95: Conquest and subjugation of Wales
1279: Statute of Mortmain restricts right to gift land
1283: Murder of the precentor – mayor implicated
1285: Visit of Edward I who tries the mayor and orders his execution. Relocation of Greyfriars’ monastery
1286: English army sacks Berwick-on-Tweed. Town re-built by the English
1286: Cathedral enclosure built
1292: John Balliol swears oath of loyalty to Edward I and is crowned king of Scotland
1304: Further charters granted to the city
1305: Rebellion by William Wallace crushed at Battle of Falkirk
1307: Accession of Edward II. Beginning of cities being granted incorporation
1306: Unsuccessful challenge to bishop’s right to tallages and confirmation of bishop’s overlordship
1311: North of England ravaged by Scots
1311-2: Earl of Devon re-builds weir which blocks all shipping access to Exeter’s port
1314: Scottish victory at Bannockburn
1315-18: Famine in Northern Europe leads to widespread death
1316: Greyfriars’ Conduit built
1319: Severe flooding in city - cathedral flooded to height of high altar
1324: Accession of David I in Scotland. First borough charters granted in Scotland
1326: Roger Mortimer’s rebellion and Edward II abdicates

1327: Edward II is killed. Accession of Edward III

1330: Execution of Mortimer

1335: English troops invade Scotland

1337: Edward III claims French throne – start of the Hundred Years’ War

Mid-14th century: Start of influence of Wyclif and the Lollards

1348: Black Death reaches England

1373: Bristol becomes a county borough – other cities follow

1377: Accession of Richard II. First poll tax imposed

1381: Peasants’ Revolt

1387: Chaucer writes *The Canterbury Tales*

1392: Further Statute of Mortmain

1399: Accession of Henry IV

1327: Cathedral rebuilding commences

1332: City granted freedom from fee farm burdens in return for fee of £20 pa

1345: Permanent city council created

1346: New cathedral conduit begun. City council included in tripartite agreement

1347: Greyfriars’ Conduit up-grade possibly begun

1349: Building work on the cathedral halted but Cathedral Conduit finished

Later 14th century: New conduit built for St Nicholas’ Priory

1378: City boundary earthworks improved with financial assistance from the king
1400: Henry IV invades Scotland
1403-1408: Percy rebellion. Victory of Henry IV
1413: Accession of Henry V
1414: Defeat of Lollard uprising
1415: Henry V invades France. Battle of Agincourt
1422: Accession of Henry VI
1431: Death of Joan of Arc
1450: Jack Cade’s rebellion begins and is crushed
1461: Henry VI deposed. Accession of Edward I

Early 15th century:
Construction of Lower near Exe Island. Land reclaimed and new mills built by the earl

1420-39: First civic conduit built
1430-50: Improvements made to the civic conduit in co-operation with Blackfriars. Great (Carfax) Conduit house built
1432-3: Mayor and council sued successfully by the bishop
1442: Unsuccessful petition to king to have navigation rights on the Exe restored
1444: Further lawsuit by the bishop. Agreement reached in favour of the bishop

Circa 1450-90: Further improvements to civic conduit undertaken
1451: Henry VI visits the city

1450: Uprising in support of Cade. Bishop Ainscough murdered. Rebellion defeated
1452: Petition for incorporation rejected
1470: Defeat of Edward IV. Restoration of Henry VI
1471: Restoration of Edward IV
1483: Accession of Edward V. Throne seized by Richard III
1485: Richard III killed. Accession of Henry VII
1497: Perkin Warbeck’s rebellion – crushed by Henry VII
1497: Exeter invaded by rebels but stands against them. Visit of Henry VII and creation of a permanent city council of 24 members
1509: Accession of Henry VIII
1533: Henry VIII divorced and marries Anne Boleyn
1534: Act of Supremacy
1536: Dissolution of the monasteries ordered
1465-74: Challenges made by council to the powers of bishop and attempt to buy fee farm all fail.
1473: Edward IV permits the city to hold property contrary to Statutes of Mortmain
1480-90: Civic Conduit improved
1497: Exeter invaded by rebels but stands against them. Visit of Henry VII and creation of a permanent city council of 24 members
1509: Accession of Henry VIII
1533: Henry VIII divorced and marries Anne Boleyn
1534: Act of Supremacy
1536-9: Monasteries in Exeter dissolved
1537: City granted county borough status
1539: Earl of Devon executed. Act of Parliament passed permitting the city to re-open the Exe to shipping
1536-9: Monasteries in Salisbury dissolved but control of the city remains with the bishop
Chapter 1: Literature survey

1.1. Definitions, methodology and sources

The purpose of this literature survey is to review a representative selection of published material which relates to the different ways in which, during the study period, water was supplied, its main uses and the problems which were caused by technical and administrative limitations.

The sources used covered a wide spectrum of published archaeological, historical and literary works which can be grouped in four broad categories. First there are a limited number of books and articles written as works of synthesis on a specific aspect of later British medieval water management such as monastic systems (Bond 2001; Kinder 2002), waterways (Blair 2007), land drainage and reclamation (Rippon 2000), gravity fed conduits (Magnusson 2001) and the water supply in medieval castles (Ruckley 1990). Secondly there are other works of synthesis which include detailed information about a particular aspect of water management as part of a wider study of urban history. For example, the texts which accompany the re-constructed later medieval maps of Salisbury, Bristol, Coventry, Cambridge, Norwich and London in the Atlas of Historic Towns (Lobel and Johns 1969; 1975; 1991) contain some carefully referenced evidence about the history of the water supply and issues of public health of each of these cities. Thirdly there are published site reports, journal articles and booklets devoted to describing the archaeological and historical background of specific water management features and their technology which have emerged from excavations in particular places. Examples include detailed surveys of closed conduits in Bristol (Lea-Jones 1984), Exeter (Fox 1951; Allen 2004) and London (Norman 1916); the open conduit at Tiverton (Sampson 2004) and numerous examples of wells, cisterns, water pipes, drains and cess pits. Fourthly more general historical and archaeological works of synthesis, together with maps and plans (dating from the 12th century to the present day) and historical record data bases have supplied background reading. They have also provided less detailed information about water supply and waste disposal in named towns, often within the context of everyday medieval life. Fifthly contemporary literature and books on medieval art have supplied illustrations to illuminate some of the factual material obtained from other sources.
The literature survey comprises four parts. Sections one and two summarise the evidence concerning monasteries and castles. Although information about the main types of water management systems for them is fragmented and incomplete they provide a useful starting point for the study of urban water management schemes. Both are frequently found within, or on the periphery, of towns and the ways they extracted water, removed waste and diverted rivers inevitably impacted on their neighbours. Monastic establishments in particular were sometimes prepared to share their expertise and facilities with the citizens and examples of the benefits derived from this co-operation will be provided during the course of this study. Furthermore, evidence of different types of schemes which has emerged from investigations of both urban and rural sites has been used to give a fuller picture of the range of medieval hydrology. Thus monastic sources have provided detailed knowledge about the working of water conduits, sewage disposal and larger hydraulic projects and castle studies have furnished evidence of piped water systems, well technology and rain water harvesting. Both these sources can therefore be an interpretive aid to archaeological evidence obtained from urban civilian sites. They also demonstrate the importance of using an interdisciplinary approach in which archaeological site reports and historical sources are supplemented by the close observation and recording of existing structures. The third section considers the extent to which towns across Britain adopted the hydraulic technology and engineering expertise described in the two preceding sections and examples have been selected to demonstrate the widespread use of similar systems across Britain. However closed conduits were only installed in a limited number of towns and the literature sources reviewed in this section focus almost exclusively on English examples. To assist with further exploration of this apparent anomaly the four countries of the British Isles have been considered separately within the sub-section on conduits. A concluding fourth section draws the information together and poses various questions which will be addressed in the study.
1.2. Monastic houses and cathedrals

According to chapter 16 of the Rule of St Benedict (AD 530-40) “water was identified as the first of the necessary things” (Bond 2001, 88) which a monastery needed for both practical and ritual uses. In order to fulfil this requirement the monastic builders mined their inheritance of Roman hydrology to create water management systems using “nearly identical” methods and components to those of the earlier era (Magnusson 2001, ix). To what extent the various monastic orders which spread into Britain during the later Middle Ages were directly responsible for the re-introduction of more sophisticated hydrology and sewage disposal is debatable, as it was only in the field of water-flushed drains that they demonstrated “a clear lead” over secular sites (Bond 2001, 115). In any event, as both lay and religious communities were using similar technology, the evidence from monastic sources is a useful introduction to a study of later medieval water management. This section therefore examines three inter-related aspects of the subject namely the methods by which water was supplied for use within the community; the removal of waste water and sewage through drains and latrines and the hydraulic engineering projects employed to create larger scale water management schemes.

The water supply provided by conduits, cisterns, fountains and wells

There are two works of synthesis which have made a particular contribution to the understanding of the technology of piped water supplies. As part of his review of monastic water management in Great Britain, Bond (2001, 89-99) used material obtained from historical and archaeological sources to demonstrate how about 120 English monasteries and cathedrals created a system of settling tanks, filters, reservoirs and cisterns to provide a conduited water supply. Additional information about the methods adopted by the monastic engineers to avoid (with varying degrees of success) problems such as leaking pipe joins, frost and vibration cracks, sediment accumulation, flooding and so forth are included throughout Magnusson’s book Water Technology in the Middle Ages (2001). Although most of the British examples used by both authors have come from English monasteries, Bond referred briefly to one Scottish example of ceramic water pipes having been discovered at Glenluce Abbey in Wigtownshire (2001, 97). Further evidence that this technology reached Scotland was
confirmed during excavations at later medieval Carmelite monasteries at Aberdeen (Stones 1989, 70) and Linlithgow (Lindsay 1989, 70) where features were uncovered which might have been, respectively, a channel for a lead pipe bringing water from a well-head into the building and either a pipe from a well head or part of a drainage system. Furthermore the extant remains of a rectangular laver built into the wall of Buildwas Abbey in the Welsh Marches (Kinder 2002, 6) is evidence of that a water conduit had once been installed there.

However the most detailed surveys of the complex technology and routes of specific urban ecclesiastical conduits have all come from England. One of the most carefully researched is that which was undertaken between 1899 and 1916 (Norman 1916) to rediscover and record the White Conduit of Grey Friars’ monastery in London. The route of the system, first installed circa 1255-8, was mapped and the construction of the conduit head in Queen’s Square, Bloomsbury was recorded in scale diagrams and explanatory text (figs 1.1; 1.2).

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![Plan of the conduit head of the water system, built circa 1255-8 by the Franciscan Order of Grey Friars in London (Norman 1916, Plate VI).](image_url)

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Fig. 1.2. Plan of the conduit head of the water system, built circa 1255-8, by the Franciscan Order of Grey Friars in London (Norman 1916, Plate VI).
A similar type of investigation was undertaken in 1982-4 to map the route and examine the engineering technology of the complex monastic conduit installed in Bristol by the Carmelite friars in 1267 (Lea-Jones 1984). The water, it was discovered, came from a spring-fed well and was piped, using gravity control, over a distance of about 858m, through a system of underground passages, junctions and inspection chambers and was accessed at various points along its route (fig. 1.3). At full flow the system was assessed to have been capable of delivering 4 gallons (16 litres) of water per minute (ibid. 35).

![Fig.1.3. Scale plan of the vertical elevation of St John’s conduit, Bristol (Julian Lea-Jones 1984, fig. 25, 34).](image)

Both these surveys focussed in great detail on two specific monastic urban monastic conduits in which cisterns formed part of the system (Bond 2001, 96-7). However there is little evidence (perhaps due to the vagaries of preservation) that free standing cisterns were used to harvest rain water, although it has been suggested that roof tanks may have existed at Hailes Abbey in Gloucestershire (Kinder 2002, 138).

Few medieval monastic fountains have survived in Britain, although there is documentary evidence which confirms that, despite the lack of piston technology, they existed in some monasteries where they appeared as part of a system of conduited
water (ibid. 137-8). Magnusson (2001, 104-9) divides these fountains into two types, the spill fountain which exited through a niche in the wall into a trough and the free-standing splash fountain; these are also known as trough and centralised fountains (Kinder 2002, 137). Water for the former came from overhead cisterns which were fed from pipes supplied from nearby springs. The latter were more complex and required an inverted siphon to force water upwards and through a vertical feed pipe in the central column of the base (fig.1.4). The spill fountain is believed to have been most commonly found in England with examples still being extant at Rievaulx and Builth Wells (Kinder 2002, 138 & 6). Broken stone fragments are all that now remain of what may have been a free standing splash fountain at St Nicholas’ Priory in Exeter (Allen 2009, 21).

Fig.1.4. A schematic cross-section of a fountain house showing the arrangement of intake pipe, branch pipes and overflow, based on that at Maubuisson, France (Magnusson 2001, fig. 3.16, 105).

Whilst possibly only 13% of English monasteries and cathedrals had conduited water (Magnusson 2001, 13) the rest necessarily had to rely mainly on wells and natural watercourses. Unfortunately information about monastic wells tends to be sketchy and they are usually referred to in very general terms (Bond 2001, 89-90). Little assistance is given in archaeological site reports, which either make no reference to them or simply record that, for example, “the site of a well” was discovered at the Carmelite friary in Linlithgow (Lindsay, 1980-86); the kitchen at Chepstow Priory “had its own well” (Turner and Johnson 2006, 202) and the prior’s garden at St. Mary Spittle “had its own wells” (Thomas 2000, 25).
Drains and latrines

Although evidence of monastic and ecclesiastical drainage systems is often inaccessible or has been destroyed, archaeologists have periodically discovered their remains either when excavating ruined rural monasteries or during the re-development of urban sites. Bond (2001, 103-5) helpfully summarised the evidence and explained how excess surface water was normally channelled into open drains, although two 15th-century closed ceramic drainage pipes were uncovered in 1973-5 during excavations at Thetford Priory (ibid. 104). Waste water from the kitchen, lavatorium and latrines was carried in closed drains into a main sewer which was positioned at a gradient which allowed stream and rain water to flush it through to the nearest river (ibid.).

An interesting example of medieval ingenuity came to light during excavations beneath a part of York Minster (Phillips 1985, 57-9) when archaeologists discovered how a substantial 11th-century drainage culvert, built to remove excess water from below the foundations, had re-used part of a Roman culvert. However, in order to lessen the possibility of collapse or reversal of flow, the Roman technology had been adapted by enlarging the foundation around the medieval culvert to give a greater weight bearing area (ibid.). Medieval building skills and knowledge were further revealed during excavations at St Augustine’s Abbey, Bristol (Bloore 1989, 217-221) where a substantial stone-built culvert, of possibly 12th-century date, was interpreted as having been the main drain servicing the reredorter, the kitchen, the frater and the lavatorium and which was possibly flushed through with water obtained from a nearby conduit. A manhole gave access to the drain which was housed in a vaulted tunnel of varying height, but rising to 1.1m at one point. The final destination of the drain may have been the river Avon and discharging sewage and other waste into water courses seems to have been one the less desirable consequences of monastic plumbing for those living lower down the river valley. Similarly at both Wolvesey Palace (Keevill 2000, 153) and the Dominican priory in Beverley (Foreman 1996, 246) the latrines were positioned so that they could be flushed by a stream using a system of chutes and culverts.
Detailed knowledge of the technology of medieval water conduits has enabled historians to suggest how the original plan of the system, installed at Canterbury between circa 1153-61, might be interpreted to give an overview of an integrated system (fig. 1.5). The water is believed to have been sourced from five springs and brought through the city wall to the cathedral cloister by pipes feeding into five settling tanks with (possibly) purge pipes placed at intervals along the pipeline (Magnusson 2001, 89). The water tower housed an intake pipe which serviced the lavatorium fountain and then, using an outlet pipe and inverted siphon, a further fountain (ibid. 102). The small circles with a pin running through them may be taps or stopcocks similar to those which have been found at Fountains Abbey (ibid. 111-112). The well, possibly within a well house, is visible towards the top of the plan, and was probably a back-up or additional source of supply (ibid. 107). The great drain below the latrine block and a water drainage channel around the cloister have also been identified (Bond 2001, 103).

Fig. 1.5. Canterbury plan of the cathedral and precincts circa 1153-61. The drains and pipes are marked in red (Delano-Smith and Kain 1999, plate 2).
Water-related civil engineering projects

Medieval water management was not only concerned with the provision of a supply of domestic water for use within a clearly defined unit of habitation but also embraced complex civil engineering projects both in the countryside and within (or very close to) towns and cities. These were intended to exploit and/or control water in order to provide increased economic opportunities and sometimes also to reduce the risk of flooding. Large rural abbeys played an important role in the development of wetland reclamation for agriculture and the exploitation of water for industry. Thus, for example, substantial areas of the estates of Glastonbury Abbey in the Somerset Levels (Rippon 2000, 145-162), Ramsey Abbey in the Fenlands (Spoerry 2005, 85-111) and Bordesley Abbey, Worcestershire (Astill 1993) were transformed by the building of impressive systems of dams, sluice-gates, weirs, canals, quays and water-powered mills. Similar hydraulic expertise was employed on a smaller scale in an urban environment by the monastic builders at Dunfermline in Fife, Scotland. Here “an efficient water system [was created] by combining a stream and a number of built channels which supplied mills, monastery buildings and fishponds” (Schofield and Stell 2000, 377); although possibly not drinking water (Perry 1999, 800-801). The case study of Salisbury, later in this dissertation, will examine in depth the ways in which the bishops caused to be undertaken large scale hydraulic engineering projects so that a new city could be built on a low lying flood plain.

1.3. Castles and palaces

The ruined state of many castles and post-medieval adaptations undertaken in those which have continued to be occupied, have either destroyed or hidden much of the physical evidence of early methods of water supply and waste disposal. However contemporary documents can sometimes provide insights to supplement the often fragmentary surviving evidence. Using evidence from both these sources the account which follows outlines the main water management systems which were used in some castles, with examples being given from both rural and urban locations. The collection of water directly from springs and ponds within the castle boundary and from water courses beyond it have been excluded from the summary as they required little technical expertise.
Conduits, pipes, cisterns and fountains

The elevated position of many castles may be one of the reasons why gravity-fed conduits bringing water into castles seem to have been a rarity, although bringing piped water into a limited part of the building is referred to in contemporary documents and may have been more widespread than the archaeological record reveals. Unfortunately the archaeological evidence is poorly preserved and identifying and dating it can be problematic. Thus a piece of lead piping and trenches at Pontefract Castle may be from a 15th-century conduit (Roberts 2002, 52; 123); what may have been the start of three (undated) conduits was found near the well house at Warkworth Castle (Summerson 1995, 21) and both Caernarfon Castle and Ayton Castle still have the vestigial remains of (undated) piping running into their kitchen sinks (Taylor 1993, 33; Dixon 1988, 23). Contemporary records indicate that a piped water system was installed, around 1169, for the royal bathroom in the low-lying Palace of Westminster (Brown 1963, 549-550). Windsor Castle archives refer to water being fed into the kitchen from a cistern in the Upper Bailey and to King’s Hall from a spring (Renn 1973, 191-2). There is also documentary evidence to support the existence of similar arrangements at Leeds, Restormel (circa 1337) and Old Wardour Castles (Brown 1963, vol.2, 698; 805; Pugh and Saunders 1988, 7). At Orford Castle (built in the mid-12th century) there still exists an alcove in the wall near the garderobe with a stone hand-wash basin which had once received water from a pipe which was probably fed from an overhead cistern (Bormann 2008, 29).

Another aspect of castle water management which has also largely vanished from the archaeological record is rain water collection. One of the few examples came to light through meticulous excavation at Hen Domen Castle, Montgomery, where archaeologists uncovered a 12th-century cistern which received rain water from roof gullies (Higham and Barker 2000, 41). Further rare survivals are the hexagonal 13th-century water tank which is still situated in the roof vault of the Cistern Tower at Caernarfon Castle (Taylor 1993, 37) and a similar 14th century cistern existed at Warkworth Castle (Summerson 1995, 26). In The Kings’ Works reference is made to a rain water collection cistern having been placed in 1242-3 at the foot of the mound at Windsor Castle in order “to receive all rain falling on the ... mound” (cited in St. John Hope 1913, 89).
Fountains which required pipes and gravity are again not well represented in either the archaeological or historical records and those which are known to have existed seem to have been ornamental rather than a source of domestic supply. Thus there is documentary evidence that in the 12th century Henry II’s mistress, Rosemont Clifford and Queen Eleanor both had fountains built, respectively, at what is now Blenheim Palace and at Winchester (Hopwood 2004, 6; 8). Archaeologists excavating at Castle Bolton gardens uncovered later medieval remains of a (possible) fountain base which may have formed part of a series of water features fed from a header tank serviced from canalised watercourses (Creighton 2009, 82). A rare surviving private fountain in Britain is at Linlithgow Palace in Scotland and it was probably constructed about 1538 when renaissance ideas and styles were becoming fashionable.

Wells

Many of the preserved castle ruins still have at least one well and therefore archaeological site reports can sometimes provide information about medieval well construction which is largely absent from monastic literature. Ruckley (1990, 19) has provided a succinct account, using evidence obtained from Aldington, Colchester and Queenborough Castles, to describe how a shallow well shaft was gradually extended downwards using wooden props resting on a steining (a hollow stone or brick cylinder) and then lined with brick, stone or wood. The methods used to raise the water depended, at least in part, on the depth of the well with shallow wells often needing no more than a bucket, a rope and a simple winding mechanism. Deeper wells required more complex mechanisms and careful examination of extant remains can sometimes be interpreted to give insights into winding mechanisms. For example the 49m deep well (circa 1291) at Carisbrooke Castle still has impressions in the stonework which were possibly made by a windlass (Chamberlin 1985, 23); sockets above the well shaft at Caernarfon Castle may have been for three cross beams to support the pulley (Brears 2008, 72) and three arched recesses at Alnwick Castle may have housed a windlass (ibid.75). A rare example of a contemporary picture showing the use of a counterweight to reduce the weight of the bucket and chain is that in the 12th century-Winchester Psalter (fig.1.8).
Drains and latrines

Whereas the provision of water for castles could, therefore, sometimes test the resourcefulness and knowledge of the medieval engineers to the full, the same cannot generally be said for the arrangements for waste disposal and general drainage, which were rarely technologically sophisticated. Many castles had garderobes designed so the sewage simply ran down the castle walls (Johnson, 2002, 20) or, alternatively, exited by a drain into the moat or the nearest river or stream (Keevill 2000, 153-155). However the ability to devise a more complex waste disposal system is illustrated in two examples. The great culverted drain at the Tower of London was first constructed in the reign of Henry III and was later extended by Edward I. It ran beneath the castle, collecting waste from various sources, including the royal garderobes. It was then taken beneath the curtain wall so that its malodorous contents could be deposited in the Thames (ibid. 21). The second example comes from Warkworth Castle which had installed, in the late 14th century, a rain water collection system which enabled water either to be stored in a cistern or diverted “to flush out the discharge shafts from the latrines on the floors above” (Summerson 1995, 26).

Water-related civil engineering projects

Castle builders were enthusiastic diverters of rivers and streams for both practical and aesthetic purposes. The construction of defensive moats, fish ponds and mill leats are well known and are too numerous to particularise. However some of the evidence has recently been re-interpreted to demonstrate how the landscape and its natural watercourses were sometimes manipulated to create an aesthetic landscape. The
approach to Bodiam Castle, for example, appears to have been deliberately constructed to snake through a complex series of water features (Creighton 2002, 77) and its moat was probably intended to set off the castle rather than provide an effective defence (Liddiard 2005, 8). The ornamental landscaped at Kenilworth Castle similarly had planned water features which included a large artificial lake and a series of fish ponds (Creighton 2002, 128).

1.4. Towns and cities

The material provided by the monastic and castle literature has provided a framework for a review of the many literary sources relating to the complex and sometimes confusing picture of urban water management. In the absence of any central planning each urban community adopted different schemes selected from a range of alternatives which are described in this section.

Conduits

There are four types of urban water conduit namely those which were for the exclusive use of a group of people within a specific complex; those which were primarily for the benefit of such an establishment but to which the public was granted some shared access; those which were installed by the civic authorities for the use of the towns’ inhabitants and those which were provided by benefactors for the citizens’ use.

London furnished the greatest number and variety of private ecclesiastical and secular conduits. These were installed at Westminster Abbey, Charterhouse and Grey Friars’ monasteries (Barron 1991, 45) and at several hospitals including St Mary’s, Bishopsgate (1277) (Rawcliffe 1984, 10). Additionally groups of citizens funded, for their own use, conduits at Fleet Street (1388), Faringdon-Within (1398) and Gracechurch Street (1490). As the result of a bequest from a prosperous local grocer in 1436-42, even Newgate and Ludgate gaols had their own piped water systems (Barron 1991, 45).

Conduits installed by the church and shared with the citizens could be found at Wells, where water from springs in the abbey garden was gathered and taken in lead pipes to a public conduit house in the market place (Norman 1899, 252). At Lichfield the friars’ conduit also provided water to the town through a centrally placed well or pump
(Carver 1987, 63-65 and Palliser 2000, vol.1, 160). Until the city built its own conduit the citizens of Exeter were permitted, in 1346, to take up to one third of the water from the cathedral conduit (Allen 2004, 9). In Southampton, from about 1310, the Franciscan friary shared its piped water with the town. However when its maintenance proved too expensive for the monks, its ownership was conveyed (1420) to the mayor and the community of the town who paid for it from a bequest from a private citizen (Historical Environment Record of Scheduled Monuments in Southampton 2009, 2-3). Bristol was another city where monastic conduits were shared between the friars, the hospitals and the citizens, although the city authorities provided a new conduit house in the 15th century (Lobel 1975, 9).

London had a number of civically constructed conduits with the first having been provided as early as 1237, when Gilbert de Sandford allowed the drawing of water from his springs at Tyburn to service a conduit which terminated at the Great Conduit in West Cheapside (Schofield and Vince 2003, 92). The care of the conduit was delegated to a warden and was funded from specifically allotted civic revenues (ibid.). By the mid-13th century wealthy citizens were allowed to pay for a private supply to be delivered from a spur coming off the main conduit (Magnusson 2001, 92). In the following centuries ecclesiastical, private and civic conduits formed a complex web of interlinking conduits running beneath the city streets. Thus in the 15th century a new conduit, which led from wells in Paddington, was joined into the earlier conduits at Stratford Place and Charing Cross (Barron 1991, 45). When the Great Conduit was rebuilt later in the same century it included a link into the privately owned Gracechurch Conduit (ibid.).

The few towns which are known to have had conduits supplied for the use of their citizens by a benefactor seem to have been given ones which were open and above ground, perhaps because they were cheaper to install and maintain. Salisbury (an ecclesiastical borough) is the only known example of a planned later medieval English city which had such a system installed when it was founded in about 1220. Water drawn from the river Avon was diverted through the town’s streets along an open watercourse for the use of the inhabitants and then returned back to the river (Schofield and Vince 2003, 62). However Winchester had had a similar scheme since (probably) the later 9th century when open watercourses were laid down (or earlier
ones substantially modified) as part of King Alfred’s burghal development (Keene 1985, 56). These continued largely unaltered throughout and beyond the later medieval period (ibid.).

Alice de Ros of Chettiscombe in Devon was a seigniorial donor who, in about 1240, provided an above-ground drinking water conduit which was shared jointly between her tenants and the townspeople of Tiverton (Sampson 2004, 25). A leat was constructed which ran from a spring on Norwood Common to the north of the parish and, after running as an open channel through the town, it emptied into the river Lowman (ibid. 27).

Surprisingly some important cities such as York (Schofield and Vince 2003, 62) Cambridge and Chester seem not to have had man-made water conduits to which the citizens had access. In respect of Chester there is an unreferenced statement by Matthews (1999, 13) that piped water was available (dates not given) to “some high status users”, but otherwise the only evidence of a conduit is that recorded in a calendar of patent roll, 1271-82 as supplying St. Werbergh’s Abbey (cited in Hewitt 1929, 126). Cambridge, likewise, had an ecclesiastical conduit installed for the Franciscan friary in 1327 which, from 1344, was shared with Trinity College (Anon. 1959, 232-3). Although there were therefore no practical reasons of geology or topography which prevented a town supply being built in Cambridge, one possible explanation is that, in 1381, the long standing grudges between the civic authority and the ecclesiastically owned colleges finally boiled over into a riot. This resulted in the town’s governing body losing much of its economic control and income to the university until the 19th century (Lobel 1975, 13).

No literary source lists all the known English towns and cities where water conduits (open or closed) were installed and evidence about other towns, additional to those already referred to, has therefore to be gathered from a variety of sources, many of which give the briefest of information. The towns include Waltham, Scarborough, Boston, Daventry, Newport (Shropshire), Gloucester, Hull and Sandwich (Bond 2001, 99; Magnusson 2001, 19; Dyer 2000, vol.1. 532; Platt 1976, 69-70; Schofield and Vince 2003, 62 and Catling 2010, 28). This list is doubtless incomplete and gives little indication of the scale or design of the systems or when, by whom and for whose use
they were installed. Nevertheless it indicates that a limited supply of running water for domestic use in towns and cities in England was not as uncommon as may be the general perception. It also prompts the interesting but unanswered question of why only some places had this facility and this issue will be further addressed later.

Information about the means of access to closed and, particularly underground, conduits is rarely referred in literary sources. Magnusson (2001, 134; 138) is of the opinion that most British conduits were accessed from closed cisterns fitted with taps from which the user filled a large pitcher by placing it on a stone block under the spout. One cistern may have had several outlet taps and each conduit had several conduit houses along its length, two of which still survive in Southampton (Historical Environment Record of Scheduled Monuments in Southampton 2009, 2-3). Entrance to the conduit house was through a door which was probably locked at night (Schofield and Vince 2003, 62) and the remains of stone pads, iron hinge pins and striker plate were found at the Park Street entrance shaft of St. John’s conduit, Bristol (Lea-Jones 1984, 10). Some conduits may, as is discussed later, have provided water through street level fountains.

In contrast to England there is no evidence of any Scottish town having water conduits installed for secular domestic use, although some monasteries may have had this facility. Even if the remains of monastic conduits have been correctly identified, there is no suggestion that they were part of a more extensive or complex system or that they were ever shared with the townspeople. Although small towns such as Dunfermline, whose total population may not ever have exceeded 1,300 (Ewan 1988, 246), might have little need for water conduits this cannot be said of Edinburgh, which had an estimated population of around 12,500 by the close of the study period (Lynch 1988, 4). Yet neither this city, nor ecclesiastically founded Glasgow, had any public piped water supplies until the latter part of the 17th century (MacKenzie 1947, 192 and 287). Perth was also an important burgh with regular access to European culture through trade and pilgrimages (Hall 2005, 19) and it had been laid out “with exceptional formality” (McWilliam 1975, 35). The city is fortunate in the number of published site reports which detail the findings of several “rescue” excavations undertaken between the mid-1970s and mid-1990s on buildings and streets beneath parts of its later medieval centre (Coleman 1996; Moloney and Coleman 1997). None,
however, refers to any findings which could be interpreted as a domestic piped water supply. Mill leats were, however, constructed there from about the late 12th century (Coleman 1996, 692) and, although not intended to supply domestic water, local householders may have taken the opportunity to use them for this purpose or as waste depositories.

Another town where a conduited water supply might have been provided is Berwick-on-Tweed because of its close ties to England both geographically and politically. Furthermore, having razed the town in 1296, Edward I convened a committee of eighteen of the “wisest and ablest” men to create and supervise a new (English) town on the footprint of the old (Lilley 2005, 116). However no literary sources suggest that the opportunity this afforded to install a civic water conduit was taken or that any of the 15 religious houses which had a presence in the borough had such a facility (Stevenson 1988, 100-118).

There is therefore no evidence that any of the councils in Scottish towns or cities had water conduits installed for public domestic use or that, even if some monasteries had such a facility, the townspeople were granted access to them. Yet the basic administrative structures and purposes of Scottish burghs were similar to those in England because King David I (1324-1371) had granted charters to encourage Scotland to emulate the economic prosperity which urban development had brought to England (Lynch 1988, 10-11). Despite periodic incursions into Scotland by Anglo-Norman invaders these towns largely remained largely free from Norman domination (ibid.).

Reviewing the evidence from his study of later medieval Scottish urban administration Lynch concluded that Scottish burghs were “more uniform in burgh law and custom, [were] far lighter taxed, and [had] a more unified voice in national politics” than their English counterparts (ibid.). Furthermore they had also “escaped the jumble of overlords and jurisdictions which so characterised and blighted relations between English towns and magnates” (ibid.12). By the late Middle Ages many burghs were rich enough to pay a lump sum to the Crown for the grant of feu ferm which enabled them to control their own finances (Barrell 2000, 2). Like many of those in England these councils became increasingly oligarchic so that, in 1469, each was given the power to nominate its successors instead of holding burgess elections (McWilliam 1975, 31). These prosperous and confident town burgesses recorded in their council minutes
their investments in substantial public works such as town walls, bridges, tollbooths and mills (Flett and Cripps 1988, 28); but of water conduits the record is silent.

Whereas many of the Scottish burghs were developed on existing urban sites which already possessed “systems capable of organising and sustaining substantial centres of population” (Lynch 1988, 3), the situation was very different in Wales. Research into the nature of early medieval Welsh settlements indicates that these were never larger or more complex than villages, with the houses ringed around a central common field and surrounded by woodland and waste (Butler 1987, 47-8). The earliest towns were those in the Marches which were founded by the Norman barons as adjuncts to their castles (Courtney 2005, 66-79). The remainder of Wales remained largely outside Anglo-Norman control until Edward I conquered the principality in the late 13th century and cemented his domination by building castles with planned towns attached (Lilley 2005). These fortified towns, surrounded by hostile territory, were peopled by incomers loyal to the English crown and were primarily intended to provide support, services and income for the King. The physical form of nine of these towns has been recreated in a digital atlas, with plans and accompanying text, derived from documentary and site survey evidence (ibid.). The resulting maps show that all remained quite small, were overshadowed by a castle but had no significant monastic presence. There was therefore no opportunity to share any monastic water supply or have one provided by a developed civic authority. None of these maps, or any other relevant literary sources, suggest than any of the eighteen Welsh royal or seigniorial towns (as opposed to their castles) had access to conduited water.

In the light of what appears to have been the case in Scotland and Wales it is perhaps initially surprising to find that in Dublin an early and complex system of water conduits was installed. The existing early medieval Hiberno-Norse settlement had been transformed into an English style borough by the Norman invaders (Lydon 2001, 121) and in 1171-2 King Henry II had held his court there. It was during this visit that he put his seal to a charter which purported to give “his” city of Dublin to the merchants of Bristol whilst, at the same time, retaining it for himself as a new royal demesne (ibid.128-9). By the 13th century Dublin had in place “all the political, administrative and legal apparatus necessary for self-government under the authority of the crown” and its prosperity attracted guild members from many parts of Western Europe (ibid.)
Dublin also had a particularly strong ecclesiastical presence with the powerful and wealthy archbishop acting, in addition to his spiritual duties, as a “secular official ... royal judge and diplomat” (ibid. 209). It is against this background that the piped water system was installed, possibly encouraged by the Bristol merchants and other incomers who had experienced similar arrangements in their home towns. Although several texts briefly refer to the existence of the Dublin conduit it is difficult to find any details about its route or construction. In none of the seven volumes of books which cover numerous aspects of medieval Dublin (Duffy 2000-2006) is there any reference to this water supply. According to Magnusson (2001, 8; 33) permission was granted for its construction in 1244 as, possibly, a joint venture between the abbey of St Thomas the Martyr and the city authorities. Branch pipes were constructed in the late 13th century to enable the system to be shared with several monastic houses and some of the wealthier burgesses (ibid. 31-2). However she gives no references to support her statements.

Although several Irish boroughs were also Anglo-Norman colonies (O’Keefe 2000, 90 and 93) there are no accessible literary sources which suggest that they, or any other Irish borough, had a conduited water system; possibly because they were relatively small and unsophisticated (ibid. 93).

**Cisterns**

Another integral part of the supply of water was the cistern. Within the urban setting most of the surviving evidence points to their use as part of the system of for accessing water from wells and conduits or storing it within the kitchens of larger buildings (Schofield and Vince 1994, 118). As downpipes were not used until Tudor times (ibid.) harvesting rainwater from the roof would have been difficult but, despite the lack of evidence from literature sources, it seems likely those whose houses had some outdoor space would have collected rain in cisterns or barrels. Public spaces may also have had troughs for watering cattle and horses.

**Fountains**

There is some evidence, albeit sparse, that domestic water was provided by public fountains in some British towns which had piped water systems, although no
structures have survived (Magnusson 2001, 106). Mention is made, in various sources, of ones in Exeter (Allen 2004, 16), Charing Cross Mews, London (Hopwood, 2004, 8) and Lincoln (Norman 1899, 253). What type or design these were or of what date is not stated, although the fountain in Fore Street, Exeter may have been a free standing splash fountain like its replacement, which was installed in 1534-5 (Allen 2004,16). There is no suggestion that purely ornamental water features were built in any cities for civic use, although they may have been installed in some ecclesiastical or private civilian gardens.

**Wells**

Although wells were to be found throughout the British Isles there is a paucity of detailed information in historical works of synthesis about urban wells. Grenville (1997) is totally silent about water supply to the many medieval urban houses which she describes in detail. Schofield (1994, 117) merely observes that in a London “a well could be located in the middle of a yard, in an alley or in the corner of a yard or court” and that the Merchant Taylors hall “had a well within the great kitchen which was turned into a pump in 1577”. However archaeological reports are a useful source of more detailed information about urban wells which have been uncovered during the course of excavations. This fall into three main categories, namely those situated in the cellars or open areas of properties owned by people in the upper echelons of society; those found in or near humbler artisans’ dwellings and those designated as public wells. A good example of the first type came from an excavation of a substantial 15th-century stone built house in Bristol which occupied two tenement widths (about 10m) and consisted of 13 rooms (Williams 1988, 118-120; fig.1.9). There were two wells and the one in room 13 was described (*ibid.* 120) as being against the rear wall, sunk into alluvial clay and constructed from sandstone, some slate and mortar. The well shaft had a diameter of 0.8m and a depth of 3m. Of particular interest is the finding of a small circular posthole where a timber upright may have supported a winch.
Excavations undertaken in advance of re-development in several British cities have given a useful insight into the construction and form of small domestic wells used by artisans. One such investigation in 1980 of four burgage plots in Canal Street, Perth uncovered a wattle lined well located in the north-west of one of the properties (plot A) which was 3.2m wide by at least 2.5m deep (Coleman 1996, 693). Artefact evidence, together with entries in rental books of the period, indicate that the site was occupied from the 13th century by artisans who worked in a variety of trades including malting, metal working and cat skinning (ibid. 692; 706). Similarly humble 13th- and 14th-century dwellings in Southwark, London were excavated in the 1970s alongside a 70m stretch of road which is now 199, Borough High Street (Anon. 1988, 119). Of the nineteen pits which were uncovered, two were identified as possible wells, one of which was estimated to have been 1.65m deep and between 1.75m and 1.95m in diameter. The lining consisted of a timber barrel (presumably re-used) from which the ends had been removed (ibid. 122). Such wells as these may have been shared between neighbours (Schofield, 1994, 118).
The most detailed evidence about the construction of urban wells came from a “rescue” project in the Grand Arcade area of central Cambridge in 2005-6 (Cessford, 2007, 28-29; fig.1.10). The site is believed to have developed as planned plots in the 11th century and the archaeologists uncovered a series of wells dating from then until the 19th century.

Each plot was generously sized and had its own well, the site of which moved around the plot over time. Of particular interest was the sequence of design, with the earliest wells being shallow and wattle lined, with an average depth of 0.2m to 0.5m and diameter of 0.8m and sunk into the impermeable natural clay which readily filled with water. They were usually dug at the back of the plot where the presence of broken jars at the bottom of one well indicated that water was lifted in a bucket to the surface and transferred to a carrying vessel. Twenty-one such wells were positively identified, with fourteen other pits being possible well sites. The next type of well developed in the 14th and 15th centuries when the wattle lining was replaced by wooden staves (barrel-lined) and five of these were identified. Stone linings were adopted in the 16th century and replaced by brick from the 17th century onwards.

Fig.1.10. Cambridge wells showing, from the top, a wattle-lined well, pots in the bottom of that well and a barrel-lined well (Current Archaeology 208, 2007, 28).
Public wells were probably the main source of drinking water for those with no access to private wells and references to their existence are scattered throughout works of synthesis about medieval social history and are too numerous to list. However, the distribution, construction and depth of these wells are rarely mentioned, perhaps because so much of the evidence has been lost. There is, however, an archaeological site report (Pritchard 1926) which contains detailed information about a draw-well in the Pithay district of Bristol which came to light in 1900, when workmen accidently uncovered its remains. The well was described (ibid. 251-273) as having been “fully 50 feet (15m) deep” and built of dry stone walling. Six 14th-century water pitchers were recovered from the mud accumulated in the base, together with a wooden bucket and assorted wooden pipes. The report recorded that other building work in the area in 1821 had revealed two more deep wells outside the city walls, one measuring approximately 1.05m in diameter and 19.5m deep and the other 4.5m across and 36m deep (ibid. 256).

Where towns had one or more closed water conduits their wells were not just a supplementary source of supply but could be an integral part of the system. Thus, in London, the up-grading of the piped water supply in the 15th century led to the building of several new well heads to provide access to the supply (Barron 1991, 45). In Exeter water for the piped systems was sourced by the cathedral and the city from a number of springs whose water was collected in wells, set within conduit houses (Allen 2004, 5).

DRAINS, LATRINES AND POLLUTION

Pollution of the water supply from human and animal effluence and from industrial and other waste was a hazard for both town dwellers and those living down river. Although some individual establishments installed culverts to remove effluence and kitchen waste the untreated material had to go somewhere and within a town this usually meant that it re-entered the water system at some point. In the early 14th century the abbot of St Werburgh’s Abbey, Chester was reported to the civic authority because he had allowed the abbey latrine drain to block the watercourse in the town ditch into which it discharged its effluence (Laughton 2008, 69).
Grander buildings had garderobes which sometimes overhung a street or watercourse. Carver (1987, 68) has found examples of these from houses in Oxford (1321), Shrewsbury (14th century) and Greenwich (15th century) which all discharged their effluence straight into the river below. The houses of aspiring artisans sometimes had indoor privies which emptied through a pipe into a pit (Schofield 1994, 86). Further down the social ladder those with access to burgage plots dug cess pits, the leakage from which was a recurrent complaint at the City of London Assizes of Nuisance (Platt 1976, 72; Schofield and Vince 2003, 82; Quinney 2003, 90).

Lady Row in York (licensed in 1316) is one of the few surviving rows of houses of the poor and each property consisted of one room only which measured about 3m x 4.5m (Black, 1981, 11). The inhabitants of such dwellings probably had no, or very limited, access to a private privy and they would therefore have had to dispose of their waste as best they could, which often meant tipping it in the nearest convenient place. Ward notes of an inquest held in 1421 for the Basinghall Ward in London noted that the tenants of the Swan had no private latrine and consequently “threw their ordure and other horrid liquids before their doors to the nuisance of ... passers-by” (cited in Sabine 1934, 307). Alternatively public cess pits were sometimes available (Schofield and Vince 2003, 95) and from about the beginning of the 14th century public latrines began to appear in the larger cities. There is documentary evidence of at least 13 blocks of latrines in London during the later medieval period; although not all existed at the same time (Sabine 1934, 309). These either emptied directly into the Thames or into one of its many tributaries (ibid. 308). When one adds to the raw human sewage the excreta which came from the numerous animals which either lived in, or were temporarily brought into, the town (Platt 1976. 49) there is no doubt that urban streets and water courses presented a serious health hazard. The Walbrook river in London was, for example, said to been so “stopped up by divers filth and dung” (cited in Coulton 1908, 16) that in 1462-3 it was vaulted over to prevent its further use as a depository for the contents of privies and other waste (Sabine 1934, 310).

Regulations were periodically passed, but largely ignored, to exhort the populace to better practices (Roberts 2003, 256). Some city authorities, however, attempted to address the problems of waste disposal in a more purposeful way than by regulations. From the mid-14th century some wards in London employed scavengers to take waste
away in dung carts to the river where it was transferred onto dung boats and dumped in the Thames (Ackroyd 2000, 60). A similar arrangement appertained in Hull in the 15th century, where a thrice weekly collection of waste was taken away by carts and left by the side of the Humber for the in-coming tide to remove (Sheeran 1998, 161).

The only evidence of a civic authority building an underground drain has come from Dublin where archaeologists have uncovered part of what may be the drain referred to in documentary sources as having been constructed in 1350 (Simpson, 2000, 55). Its exact route is uncertain but it possibly extended through the city and discharged into a “stone chamber which abutted the quay wall” and from thence into the river Liffey. However it may have serviced only a limited industrial area in the southern part of the city (ibid.).

Industrial waste from the numerous urban trades, such as butchery, tanning and metal working added to the pollution of water supplies. Geochemical analysis of alluvial deposits in the Ouse at York showed that the river was heavily polluted, as early as the 13th century, by lead from mining in the Dales (Roberts and Cox 2003, 255). Even laun-dering added to river pollution and the spread of water borne diseases. St Leonard’s Hospital in York alone employed two full-time laundresses who used a wash-house on the banks of the Ouse to cater for the needs of some 229 patients (Rawcliffe 2009, 2).

It is therefore highly probable that the streams, rivers, shallow wells and open conduits, which provided most of the urban water supplies, were all heavily polluted with hazardous substances. Thus piped spring water, even if not pure by today’s standards, would have provided the safest source of drinking water.

**Water-related civil engineering projects**

Many towns were deliberately sited to make full use of inland waterways and the sea coast for transporting a full range of agricultural and industrial commodities (Blair 2007, Part II). The importance of sea-borne trade can be glimpsed from the report of a boat which sank on its way upstream from Norwich in 1343 and which had been carrying forty passengers; three barrels of iron; sea coal; timber; herrings; salt and onions (Campbell 1975, 14). Furthermore, by the first half of the 14th century,
contemporary documents show that all the major river systems in England carried a large volume of water-borne trade (Langdon 2007, 118 & 114). Ports and landing stages were therefore a vital part of the economic life of many towns and cities and there are numerous examples of natural harbours being improved; quays and docks built and rivers canalised. One major development was undertaken in Bristol when, in 1240, the civil authority obtained a royal writ which permitted it to divert the river Frome through a newly cut and deeper channel. At its northern end a new stone clad quay was constructed to accommodate the rapidly increasing number of ships importing wine. To complete the reconstruction work the Avon was damned, diverted and spanned by a new stone bridge (Lobel 1975, 7).

An interesting example of a different, but equally impressive, scheme was at Romney, Kent, where the harbour had began to silt up rapidly in the later 12th century (Rippon 2000, 197-8). So vital was this port that the King himself became personally involved and, in response to the royal command, earthen banks (the Rhee Wall) were created. Built in the late 12th and early 13th centuries these lay about 50m apart and contained a six mile watercourse which carried fresh water across Walland March to Romney where, it was hoped, it would flush out the silt. Unfortunately this massive engineering project failed to achieve its aim and the port subsequently became virtually unusable and was abandoned in the 14th century (ibid.).

Another important reason for manipulating the flow of rivers was to provide water which had sufficient force to power mills; the economic importance of which can be gauged from their proliferation and wide distribution throughout England and Wales (Holt 1988; Watts 2005; Langdon 2007), Scotland (Russell-White 1995, 1018) and Ireland (Cryrhall, 2006, 35; Simpson, 2000, 62). Although their numbers declined from the 14th century, when windmills grew in popularity (Holt 1988, 119), they continued to be a significant feature of the urban as well as the rural landscape throughout and beyond the study period. Today, in many of our towns and cities with later medieval occupation, it is possible to find traces of these artificially constructed water channels and weirs, as will be illustrated in the case studies.

Economically advantageous as it was for towns to be close to a navigable river or the sea it also meant that floods were an ever present threat. Medieval engineers were
therefore energetic creators of flood defences, which usually took the form of high embankments and ditches. Reviewing the evidence of such schemes in Yorkshire Sheeran (1998) cited a dyke at Beverley ( cerca 1284), a flood bank at Swine Moor (1433) and ditches and embankments at Howden ( ibid. 165). Rippon similarly referred to the repair and construction of embankments and drainage ditches at Canterbury (late 13 th to early 14 th century) and to flood defences having being built in the Humber estuary in the 12 th and 13 th centuries (2000, 199; 212-3). However excessive inundations were, as they still remain today, beyond human control and there are many references in medieval literature to the catastrophic effects of severe floods. Thomas Walsingham, in The Chronica Maiora, recorded great floods in Northumberland around Christmas time 1372 and in Canterbury in 1404 when the dykes burst (cited in Preest 2005, 29 & 335). The artificial narrowing of the Ouse at York to enable the quays to be extended may have had the unintended consequence of increasing the likelihood of flooding (Sheeran 1998, 165). It is therefore not surprising to find that the story of Noah’s flood was regularly re-enacted in Guild miracle plays, with the “Good Gossippes” of the Chester cycle declaring that “The flude comes flittinge in full faste. On every side that spreades full farre: For fear of drowinge I am agaste” (Wright ed. 1843, vol.1. 53).

1.5. Summary and discussion

The literature survey has demonstrated both the ingenuity and quality of the hydraulic and engineering skills and the problems caused by the complex and piecemeal way in which water was exploited for industrial, commercial and domestic purposes. In order to understand better why it proved so difficult to provide a coherent, effective and conflict-free system of water management, the next part of the study examines aspects of the conceptual framework within which medieval towns and cities developed.
Chapter 2: Conceptual framework and its impact on water management

2.1. Introduction, methodology and sources

The purpose of this section is to provide a conceptual context for the case studies which will investigate not only what water-related management features can be identified in medieval towns but also what reasons may have underlain the form which they took. It examines a number of different, but inter-related, later medieval theories and beliefs which all potentially affected the way water was supplied and managed. Firstly, there is an outline of the main practical and theoretical developments which enabled some town councils to emerge as a body, able to create an urban administration which could begin to address the problems of water and waste management. The second part considers certain legal concepts of land and water rights which affected urban water management. This is followed by a summary of some of the ideas pertaining to the symbolic significance of towns and their water features. The section concludes with a brief discussion of the medieval understanding of the causes of illnesses, whether contaminated water was perceived to be a threat to health and, if so, what was believed to be the link.

The information has been obtained from historical and archaeological works of synthesis, from books and articles written about a specific topic and from contemporary literature.

2.2. The evolution of the town/city council

A detailed and critical analysis of the number, ranking and population sizes of British later medieval towns and cities is not required for this study. However, in order to give a context for this section, and with the caveat that these are only a guide, some statistics and distribution maps have been included (figs.2.1-2.4). Population size at any given date within the period is impossible to calculate accurately. The total (as opposed to the tax-paying) population of London has been estimated at around 50,000 in 1300 (Platt 1976, 15; Barron 1991, 55) and, at a similar date, Bristol might have reached a maximum of 30,000 and Norwich 20,000 with the remaining larger towns in England possibly having populations of between 2000 and 5000 (Holt 2000, 102). Smaller towns, which probably accounted for about half of the urban settlements in England, all the Scottish burghs except Edinburgh (which might have reached 12,500
by the end of the period), probably all the Irish towns except Dublin and all the towns in Wales are believed to have had populations of under 2000 (Keene 2000, 194, Holt 2000, 102, Lynch 1988, 4, O’Keefe 2000, 90-4, and Griffiths 2000, 681). There were possibly about 800 medium and small towns throughout England, with the densest concentration in the south west and south east (Dyer 2000, 508-9). By the 15th century the number of Scottish burghs was around 210 and there were about 100 Welsh towns (Dennison and Simpson 2000, 727-8 and Griffiths 2000, 684).

Fig. 2.1. Distribution map of the principal English towns and a ranking of the largest 35 by tax-paying population, both taken from the 1377 poll tax returns (Keene 2000, Map 22.5, 571 and Dyer 2000, list 5, 758).
Figs. 2.2; 2.3; 2.4. Distribution maps of the towns of Ireland, Wales and Scotland at the close of the study period (O’Keefe 2000, fig.35, 89; Griffiths 2000, map 22.12, 628; Dennison and Simpson 2000, map 23.2, 717).
The larger the area of a town and the denser the population the greater became the need for regulation and control, which in turn led to a burgeoning and increasingly expensive bureaucracy (Kermode 2000, 454-5). One of the recurring problems which councils in the greater towns had to address was that of water supply and waste disposal, which both required an effective and properly funded administration. However one of the major difficulties in providing this in the later medieval period was the “administrative incoherence” (Dobson 2000, 287) arising from fragmented political control, conflicts between competing interest groups and the lack of a theoretical framework (Holt and Rosser 1990, 4).

All later medieval British towns, whether developed from existing ones or planted from the 12th century onwards, were under the ultimate control of the king; although the immediate overlord could be royal, seigniorial or ecclesiastical (Britnell 1996, 72). At the start of the study period the burgesses had very restricted rights, but these included the valuable freedoms to transfer the tenancy, in life and on death, of their plots and to manage the day to day ordering of those parts of the town in which they lived (ibid. 73; Campbell 2000, 62). When borough charters started to be granted in England from around 1100, in Wales from the mid-12th century and in Scotland from about 1324 (Campbell 2000, 60; Griffiths 2000, 696; Lynch 1988, 3), they were mainly confined to conferring upon the burgesses, as a group of individuals, certain limited privileges such as freedom from paying tolls and the rights to hold and control markets and to run their own court (Platt 1976, 136). Although there were small urban settlements which prospered without becoming boroughs and some boroughs which failed to develop, for many the acquisition of a borough charter was a practically and symbolically important advancement (Weinbaum 1943, xvii-xxii). First it increased the opportunities for the burgesses to create income both for themselves and for urban improvements. Secondly it was an impetus for the development of a decision making committee from which a more structured and effective town council could evolve. Thirdly the care with which many of the charters were preserved indicates that they were regarded as legally and symbolically significant documents. Perhaps this was not only because of the terms which they contained but also because the giving of rights to the “citizens” of a town was a recognition of group identity and status; even though there was as yet no formally constituted town council or any concept of incorporation.
(Ballard 1913, xiv). This awareness of the town or city as an abstract concept is also reflected in the creation of regalia of office and of the document seals which were both visible and portable signs of the town’s identity and status, in a similar way to those of the monarchy (Steane 1993, 23).

It is from this time that there also emerged, in some towns, the office of mayor with a varying number of councillors and office holders to assist and advise him (Campbell, 2000, 70). However the mayor was still required to swear an oath of fealty to his overlord who could, if he saw fit, revoke any of the privileges he or his predecessors had granted. A famous example of the fickle nature of royal promises occurred in 1392 when Richard II, angered by the City of London’s lack of support for his cause, imprisoned the mayor and removed all the liberties of the city granted by King John. These rights were only restored when the city paid the enormous sum of £30,000 (Barron 1991, 43).

The increased economic opportunities which borough status created enabled some burgesses in both England and Scotland to become sufficiently prosperous to purchase the right to “farm” their own towns so that henceforth they controlled the collection of the overlord’s dues (Campbell 2000, 69; Dickinson 1961, 117). Although this move gave the burgesses greater autonomy over the payment of dues and increased their own status, apart from those in the great mercantile centres like London or Bristol, most continued to possess very circumscribed powers to raise money or make decisions of any consequence. Even modest opportunities to increase income by letting vacant spaces in the town required seigniorial permission (Britnell 1989, 118). Expenditure on civic projects seems to have been mainly directed towards ventures which would be income producing, such as market and harbour improvements or the construction of mills (ibid. 118). Such matters as “the maintenance of bridges, watering places, grates and watercourses were usually the responsibility of the owners of adjacent properties” (Schofield and Stell 2000, 378). Additional income could come from benefactions, so that Aberdeen was granted by Robert I (1314) a part of a royal forest which provided a substantial source of revenue to spend on “significant investments and improvements” (Mitchell 2005, 2). Prominent local citizens also made bequests and donations to the council towards the funding of all manner of civic improvements, including the building of bridges (Hatcher 1834, 95; Lepine and Orme
2003, 129), defensive earthworks (Cave-Penney 2004, 35) and public latrines (Sabine 1934, 309). A bequest by a wealthy citizen to the city of Southampton in 1420 enabled the city council to purchase a conduit from the friars when they could no longer afford its maintenance (Platt and Coleman-Smith 1975, 48). Local taxes could occasionally be raised for a particular project, as happened for the upgrading of London’s public water supply in the 15th century (Barron 1991, 45). However no council could rely on a steady income stream to finance and maintain large civic projects.

The development of the jurisprudentially sophisticated legal fiction of corporate personality in the early 14th century was a significant milestone in the evolution of the concept and development of local government. From about 1307 onwards towns and cities in England could seek a grant of incorporation from their overlord. Interestingly all, save possibly four or five grants, were royal and none was ecclesiastical (Ballard 1913, xcix). Indeed “the presence of a large ecclesiastical landlord near an urban community could often delay and even abort the latter’s constitutional development until and sometimes beyond the Reformation” (Dobson 2000, 286). An incorporated council had a legal personality, separate from the sum total of its members, which enabled it to buy property and hold land (subject to the restrictions of the Statutes of Mortmain 1279 and 1391) in perpetuity. It could also pass and enforce bye-laws, enter into contracts and, importantly, could sue and be sued; thereby freeing individual burgesses from responsibility for council debts (Weinbaum 1943, xxiii-xxiv). Interestingly in Scotland, although craft and merchant guilds (which often worked in close association with the councils) did become incorporated (Dickinson 1961, 233), no towns obtained this status (Rigby and Ewan 2000, 299).

Whether or not incorporated, no council until after the Reformation ever gained control over urban areas owned by the church and there are numerous examples of the conflicts which this caused, especially over perceived interference with rights of exclusive jurisdiction. Sometimes the disputes erupted into serious violence, like that which occurred in 1272 when the citizens of Norwich attacked and destroyed much of the cathedral close in an attempt to “gain control over all intramural areas” (Alsford 1999, 1). As late as 1510 the citizens of the ecclesiastical borough of Glasgow were excommunicated “for dealing in the borough court with a matter which properly pertained to an ecclesiastical court” (Lynch 1988, 127). Coventry and Aberdeen are
perhaps two of the most extreme examples of where conflicting jurisdictions were reflected in their topographies. In Coventry the city was physically and administratively divided into the prior’s half (which had been seized by the bishop of Chester in 1095) and the earl’s half; with the latter finally gaining the ascendancy in the mid-14th century (Lancaster 1975, 3). Aberdeen, on the other hand, remained a physically and jurisdictionally divided city until 1891 when the episcopal burgh (created around 1498 close to the cathedral) and the 12th-century royal burgh were merged (Mitchell 2005, 1). Even the City of London had, by as late as 1550, only gained authority over one of the five independent manors of Southwark (Barron 2000, 398) and the vill of Westminster remained another self administered unit (Rosser 1990, 216). Moreover within the City of London the administration was fragmented into separate wards, each run by its own leading citizens and with some having sufficient independence and money to install a water conduit (Barron, 1991, 44-5).

The final major landmark in the evolution of later medieval local government was the granting of county borough status to a few of the largest and most prosperous cities in England, including Bristol 1373, York 1396, Newcastle-Upon-Tyne 1400, Norwich 1404, Lincoln 1409, Hull 1440 (Platt 1997, 136) and Coventry (Lancaster 1975, 7). However, at the other end of the spectrum, many small towns remained constitutionally and economically underdeveloped (Hilton 1990, 71-96). Only a few medieval town council account rolls have survived for small towns (ibid. 71), including one for the borough of Ipswich, 1446-7, which usefully demonstrates how the town struggled to meet its modest expenses (transcribed and translated by Alsford 2006, 1-5). From a total income of £88.6.3d, £74.15.0d was allotted to the fee farm owed to the bailiffs of the priory. The remainder paid the salaries, expenses and liveries of officials and repairs to properties. Unfortunately, the expenditure for the year exceeded income by £20.13.6d, a sum which presumably (although this is not stated) had to be made up by donations from the burgesses who were personally liable for council debts. To put these figures in context the average wage of a skilled artisan at that time was between £3 and £4 per year (Dyer 1989, 196). Towns in Wales and the Marches never developed independence from lordship (Courtney 2005, 69) and a study of Chepstow indicates the economic problems encountered by one such town. At the close of the 13th century there were 308 burgess plots and the town had to pay annually to Roger
Bigod, the overlord, £61.12d a year, in cash or kind derived from rents, market tolls, ale and fish. In 1311 the councillors claimed, perhaps with a degree of exaggeration, that the town was so impoverished that the inhabitants had “nothing but the roofs over their heads” and were therefore incapable of providing a ship for the King (Turner and Johnson 2006, 201).

The extent to which the natural disasters, outbreaks of plague and civil wars of the 14th and 15th centuries curtailed the development of these smaller towns, or impeded the advancement of the larger ones, has been the subject of much academic debate. Studies of individual towns have produced a complex picture where some suffered serious decline and others continued to move forward; but these changes may be “part of a much wider phenomenon of change” rather than a direct result of the Black Death (Holt 1990, 159).

2.3. Rights over land and water

Those councils which sought to build and maintain conduits or manage rivers not only had to contend with the practical problems arising from fragmented administration, limited jurisdiction and lack of money, but had also had to secure water and land rights. This, however, was no easy matter as throughout the Middle Ages there “was much legal conflict ... over water rights and access to water for various users”, the resolution of which was hindered by a lack a legal doctrines “to describe and balance the interests of multiple yet rival users” (Getzier 2004, 21). The long standing dispute between the Exeter city council and the earls of Devon over water rights in the Exe resulted in much expensive and largely fruitless litigation (City of Exeter Misc. Rolls 3.ii-iii circa 1317; transcribed and translated by the Historical Manuscripts Commission 1916, 385). Also, whereas the great ecclesiastical foundations had been gifted the ownership of, or the right to use, water and lands beyond the curtilages of their religious houses, towns rarely received such benefits. A council therefore needed to acquire the right to access water beyond the town boundary. It may be because of the practical and legal difficulties which this entailed, that it was the King and not members of the council who, in the 13th century, requested the owner of Tyburn Springs to permit the City of London to extract water for a proposed conduit (Schofield and Vince 2003, 92). Even if rights of extraction could be successfully negotiated, the
council had to obtain further permits to bring the water across land to the town boundary. The right to buy land had been severely curtailed by the Statutes of Mortmain (1279 and 1391) and, in any event, unincorporated councils had problems with the ownership of, and succession to, real property. Councils also had to expend time and money on acquiring easements, mollifying protestors and being represented at inquisitions into the appropriateness of the proposed scheme (Magnusson 2001, 40-43).

The overall effort, expense and on-going maintenance involved in the installation of water conduits (and, to a lesser extent, public wells) to which the poor had access, raise interesting questions about the motivation of the burgesses in those councils which undertook such ventures. Councils in both England and Scotland tended to be increasingly oligarchic in character and they certainly held no legal or political accountability to the lower social classes (Kowaleski 1990, Britnell 1986, Mitchell 2005, 1). However the extent to which they were motivated by philanthropy or self-interest or a mixture of both, is impossible to determine as the reasons underlying a course of action are rarely straightforward. Furthermore medieval urban water management may have had purposes and meanings beyond the purely pragmatic. The next sub-section therefore considers some more abstract concepts which may be relevant to this study.

2.4. Some medieval concepts of the symbolism of the town or city and its water features

Later medieval writings about the symbolic significance of towns seem to have had two principal sources of inspiration, the classical idea of cities as a mark of a civilised nation and the Christian idea of the city as a symbol of religious truths. The first is exemplified by Giraldus Cambrensis who saw towns as the sign of a progressive and civilized nation (Forester 2000, 70). If the civic leaders of British towns thought in a similar way they had models to emulate in the great cities of continental Europe and Byzantium, which far exceeded their own in size, grandeur and amenities. The magnificent City of London Guildhall is perhaps the finest example of British civic leaders stating, through grand architecture, the wealth and importance of their city and its values. Those values are reflected in the statues set above the lofty 15th-
century porch, where the statues below the figure of Christ were not of saints but were symbols for the abstract concepts of law, learning, discipline, justice, fortitude and temperance (Barron 1974, 27). It may therefore be that the provision of water-fed conduits by the council was partly motivated by a desire to demonstrate another sign of the progress and status of a city, which they hoped would one day rival those in continental Europe.

Secondly, for at least some medieval people, the urban landscape was imbued with mystical Christian significance. One does not have to go as far as Lilley’s hypothesis that the later medieval town was deliberately designed “as a model of celestial geography [upon which was] imprinted the very layout of the city” (2009, 12), to accept that a town or city could be perceived as containing some sacred properties in aspects of landscaping and water features. Thus Lucian, a late 12th century monk from Chester, described his city as having “two straight streets in the form of the blessed cross” (transcribed and translated by Lilley 2005, 243). This kind of thinking may have informed the idealised 15th-century plan of Bristol where the four main streets met to form a cross, at which point stood the huge market cross which dominates the picture (fig. 2.5).

![Fig.2.5. Plan of Bristol circa 1480 by Richard Ricart from the Bristol Records Office (Delano-Smith and Kain 1999, plate 14).](image-url)
Jehan Henry, writing *circa* 1484, used elaborate symbolic imagery when describing the hospital on the island of Notre Dame, Paris as “a refuge of mercy ... situated on an island surrounded by the water of tears and pits, which create a stream of healing grace over which one must pass to enter” (transcribed and translated by Rawcliffe 2005, 252). Even the town itself could be periodically transformed into a stage set upon which different biblical scenes were enacted in the guild mystery plays.

Thirdly water had ritual and mystical properties which were of fundamental importance to ecclesiastical and lay people, as it touched upon two of the essentials of medieval life, namely good spiritual and physical health. The discovery and excavation in Bristol in 1987-8 of an underground medieval Jewish *mikvah* (ritual bath) illustrates that the ritual use of water for spiritual cleansing in later medieval Britain was not limited to Christians. The *mikvah* bath was fed from a clear water spring which emerged from a fissure in the rock and the complete inscription, of which only part remains, is believed to have read “flowing water”, which was considered to be superior to rainwater in purity and, therefore, was the best quality for purification (Emanuel and Ponsford 1994, 75). The perceived desirability of flowing water is likewise a theme in Christian religious writing and is neatly summarised in an extract from a book of 14th-century sermons which state: “As long as water moves and runs it is naturally kept fresh and retains its freshness; but when it is stagnant, it turns foul and corrupt and grows vermin” (transcribed and translated by Wenzel 2008, 421).

Monastic fountains were also used not only to provide pure, running water for ritual and domestic supply but also as an aid to contemplation because they were seen as “an earthly image of the *fons vitae*” (Kinder 2002, 137). An illustration in the 12th-century St Alban’s Psalter (*fig.2.6*) demonstrates how this particular symbol was envisaged in the mind of one medieval monk. Using a text from Isaiah xii, 3: “You shall draw waters with joy out of the saviour’s fountains”, a figure is shown drawing water from an entirely imaginary fountain emerging from the foot of the cross.
The extent to which complicated religious allegorical thinking about water and water features percolated into the consciousness of the common people is bound to remain speculative. Were, for examples, urban public fountains seen as anything other than a convenient source of domestic water? In any event, the concept that certain water features or water itself could have symbolic meaning is a familiar one today, as we regularly use objects as symbols to convey both religious and secular ideas. What is harder to grasp is the medieval belief that a substance could actually be changed into something different through religious ritual or contact with a holy relic. Thus the bread and wine of the Mass became the actual body and blood of Christ. Water itself could be transformed, by contact with a saint or a sacred object, into a substance which could cure physical illnesses. Thus the water emerging from St Catherine’s Well at Liberton, near Edinburgh, was believed to have been transformed into a healing balm through having had sacred oil from Sinai dropped into it in the 11th century (Williams 2000, 1). Similarly, the ampoules brought back by pilgrims from Canterbury, which contained holy water mixed (allegedly) with a drop of Thomas a Becket’s dried blood, were often inscribed with the words “Thomas is the best doctor in the world” (Alexander and Binski 1987, 218). The miraculous properties of holy water, however, seem to have acted on two levels in that it could, for the believer, heal the body of disease and, at the same time, cleanse the soul of impurities. This process is explained in The Little Flowers of St Francis, written in the mid-13th century, where the washing of a leper by the saint externally cured the victim’s disease and also internally cleansed
his soul from sin (Armstrong 1999, 608). In similar vein Richard Fitzralph preached a sermon in 1338 in which he asserted that only ritually blessed baptismal water could rescue humans from “the pain of damnation” which they were otherwise doomed to endure (transcribed and translated by Wenzel 2008, 208).

The complexity of medieval thought about the properties of water can be illustrated by considering the belief in the magical powers of certain wells and springs to heal and grant requests (Bond 2001, 100). Such beliefs predated Christianity but were given a Christian context and were firmly held throughout the later Middle Ages by people from all strata of society. Both Richard II and Henry V made pilgrimages to the famous St Winifred’s Well at Holywell (Flintshire) which, in addition to granting favours in battles, was allegedly capable of curing blindness, deafness and other bodily diseases, provided the supplicant had sufficient faith and performed the right rituals (Seguin 2003). Less prestigious holy wells were to be found up and down the land, with some sited near or within towns. The extent to which these had a dual purpose as a source of domestic supply and of healing water is unclear.

Whilst the importance and complexity of medieval beliefs about the sacred and symbolic properties of water and its sources are interesting aspects of the subject of water management, there is a danger of making generalisations from specific examples and to assume that everyone thought in the same way. An excellent example of a more rational and sceptical approach was that adopted by Bishop Ralph Ergham of Salisbury who, in 1385, expressed the opinion that the healing of a man’s inflamed eye, by bathing it in holy water at Bisham well, was no more than “a natural result of the wholesome application of cold water”, rather than the miracle it was claimed to be (cited in Brown 1995, 6).

This mixture of a fatalistic attitude to life’s vicissitudes and a more pragmatic approach to the causes and cures for illnesses may be relevant when considering the extent to which there was perceived to be a need for clean water as a health measure. If such a perception existed, what qualities in the water were considered necessary in order for it to be considered “pure”? The next sub-section therefore considers this problem as it necessarily impacts on what type of water supply and waste management was regarded as appropriate.
2.5. The concept of pure water

Whilst pure and flowing water was perceived to be desirable for certain religious and healing rituals, it does not necessarily follow that it was similarly valued for secular purposes or that the same criteria of “best quality” were applied. Part of the difficulty in attempting to unravel the medieval approach to cleanliness and its relationship to the causes of disease is that religious ideas percolated into everyday thinking in ways which is alien to most modern western Europeans. The extent to which classical ideas of the causes and cures for illness were accepted as valid is beyond the scope of this summary but certainly they were well known, at least amongst the educated classes. Thus references in Chaucer’s 14th-century poem The Knights Tale, to humours and to Saturn as “the bringer of all ills” needed no explanation for the reader (Wright ed. 1986, 28, 36, 62). These ideas were first formulated in the 5th century BC and linked diseases to the four humours, mirrored in the four elements of earth, air, water and fire and ruled by the zodiac (Voigts 2000, 47). This deterministic understanding of illness was nevertheless tempered by Greek physicians, who encouraged the following of a healthy way of life based on diet, moderate drinking, exercise and sleep (Voigts 2000, 47).

These beliefs intermingled with equally confusing Christian concepts. On the one hand it proclaimed that sin caused disease and that both prevention and cure were by “prayer, penitence and the invocation of saints” (Magee 1997, 606). This thinking reached its zenith in the fatalism preached by the Franciscans in the mid-13th century. St Francis is alleged to have enjoined his followers “not anxiously to seek medicines to cure illnesses ... [but rather to remember these were] given by God in this world for salvation of the soul” (transcribed and translated by Armstrong 1999, 146; 608). On the other hand there was a strong element of self help through the adoption of good practices and the use of medicine and surgery.

Within the monastic setting there was a clear understanding of both the sacred and practical necessity for clean water. When the Friars Minor of Oxford petitioned Edward III for leave to build a conduit, they explained that their well water was “very corrupt” and unsuitable both for mixing with sacramental wine and for drinking and mixing with food (Magnusson 2001, 22). Similarly the nursing sisters at St Katherine’s hospital,
London, were admonished for pursuing the “inner purity” of patients at the expense of personal hygiene (Rawcliffe 1984, 10). Adequate drainage, good standards of domestic cleanliness, pure air and a supply of fresh water were all recognised as beneficial to patients’ physical well being (ibid. 9-11).

In the secular world also, religious fatalism and belief in miracles were tempered by a more rational and pro-active approach. Like many other prosperous people in the 14th century, the Paston family of Norfolk believed the plague could be avoided by fleeing to a place where there was no sickness (Castor 2004, 240) and lepers were isolated in an attempt to avoid the spread of the disease. The popularity of the health manual “Governayle of Helthe”, published in 1489, can be judged by the fact that over 250 copies are still in existence (Voigts 2000, 49). The measures advocated by those who promoted good practices for healthy living were often sensible and potentially effective, although the reasoning underlying the advice was often fallacious. There was a widespread belief, held until the mid-19th century, that infection was spread through the air and that a bad smell was therefore an indication of unwholesome air. “Putrid exhalations” from the river Fleet were alleged in 1290, to have killed many monks (cited in Magnusson 2001, 28) and Edward III complained about the “abominable smell” which emanated from the dung and manure left in the streets of York. This he ordered to be removed “for the protection of the health of the inhabitants” (cited in Sheeran 1998, 160). As well as giving off potentially lethal fumes dirty water itself was sometimes identified as a carrier of disease if ingested. Thus in 1374, some nuns in Norwich were alleged to have died as a consequence of using water polluted by “dung and filth” for drinking and cooking (cited by Magnusson 2001, 28). Theories about the transmission of disease and its prevention seem therefore to have accepted both the ideas of infection through inhaling foul air and through the ingestion of contaminated substances, although the former seems to have been regarded as the greater danger. An Italian doctor, writing to his sons in 1315, urged them to find lodgings “well away from foul air, since breathing that is much more dangerous and likely to cause infection than is contaminated food and drink” (transcribed and translated by Pheby 1996, 32).

The recognition of a causative link between contaminated food and water and illness and that good standards of hygiene were prophylactic, were probably two of the
motivating forces behind the stream of council regulations which endeavoured to keep streets and water courses clean. The identification of what amounted to a contaminant was, however, difficult in the absence of an understanding of the mechanisms involved. Some examples will illustrate the point. On the one hand excrement from humans and animals and waste from dead animals were believed, quite rightly, to pollute water, so that it was appropriate to pass regulations which banned the washing of animal carcasses in public wells (Britnell 1986, 156); punished butchers who deposited offal in rivers (Sheeran 1998, 161) and ordered watercourses, streets and wells to be kept free from dung and leaking cess pits. On the other hand, the link between polluted water and illness was sometimes wrongly made. Such misattribution could lead to periodic outbursts of hysteria and violence when outbreaks of plague or leprosy were believed to have been caused by wells having been (somehow) poisoned by Jews or lepers (Magnusson 2001, 28). In fact, as we now know, neither of these diseases is water borne. However, although the response of the mob was misinformed and cruel, it is nevertheless interesting that even the lower classes of medieval society were aware that there could be a connection between the spread of disease and polluted water.

What is more problematic is whether there was also an appreciation of the dangers of passing on illness through undetectable contaminants carried on the hands or left on surfaces where food was prepared. Although it seems to have been known that raw sewage in water created a health hazard, water from heavily polluted rivers and ponds was collected for domestic use. Even if it was used mainly for cleaning and washing, either the risks were not appreciated or were ignored out of necessity (Watts 2005, 227). There is ample evidence that later medieval people, at least those with ready access to water, bathed in large tubs, washed their hands before meals and washed their dishes (figs.2.7; 2.8); but from whence such water was generally sourced is unknown. Even if apparently clean water had been used for such tasks it could still be dangerously contaminated and infect the human food chain through contact with hands, cloths and platters.
Figs.2.7; 2.8. Washing hands and dishes as depicted in a medieval manuscript (left) and a 15th-century misericord (right) (McCarthy and Brooks figs.53; 50).

2.6. Summary and discussion

It is clear from the conceptual outline that the theoretical structures and beliefs of later medieval British society were complex, fluid, evolving and sometimes inconsistent. Superficial resemblances between the appearance and functioning of medieval and modern towns mask some fundamental differences of perception about the purpose and government of towns, the structures of society and the role of religion. These need to be understood in order to begin to interpret the nature of medieval urban water management and why water related features took the form which they did.

The two case studies which follow will examine not only what water management features can be identified in both cities but also how they relate to the wider social and political fabric of urban society and the concepts on they were based. Issues which will be addressed include the water management practices of the two cities, their differences and similarities; the extent to which the providers and users of the various supply systems worked together or competitively; the effect of social hierarchy on the ways water was supplied and accessed; whether there is any evidence that water which was used for secular purposes was imbued with any symbolic meaning and whether any light can be thrown on the medieval concept of clean water and its relation to the methods of supply and disposal of waste.
Chapter 3: Exeter – A case study in water management 1066-1540

3.1. Introduction, methodology and sources

The case study is intended to give a contextual overview of Exeter’s later medieval water management systems and to examine what insights can be gained about the relationship between the structures and beliefs of later medieval society and the ways in which water was managed. For clarity and to give a guide to the developmental chronology of water management in Exeter the chapter has been divided into four broad time scales; with the proviso that the boundaries between each period are fluid and dating can be problematical. Each section contains a short summary of the main historical and administrative changes of that period in order to provide a context for an account of what is known about different aspects of water management and waste disposal. A concluding section summarises and discusses the principle findings of the case study.

Literature sources were researched to provide political, economic and social historical material for the contextual framework. The Cambridge Urban History of Britain (Palliser 2000) and The Medieval Town (Holt and Rosser 1990), for example, supplied general information about the place of Exeter within the wider structure of medieval Britain. More narrowly focussed books concentrated on the history of the city and these ranged in date from the early 19th century to the present day. Jenkins’ The History and Description of the City of Exeter (1801) and Oliver’s The History of the City of Exeter (1861) were both based on research into original archives, so that they remain important sources of information. These books formed the foundation for the later works such as Exeter (Freeman 1901); Old Exeter (Hoskins 1952) and Two Thousand Years in Exeter (Hoskins 1960) which also contain further material relevant to the case study. However Hoskins, in particular, sometimes failed to annotate his sources so that it is impossible to assess the reliability of evidence which would otherwise have been significant. Other secondary sources which have been consulted have encompassed a wide range of literature on specific aspects of Exeter’s history which are too numerous to particularise but which are referenced in the narrative. Interperative and post medieval maps have been reproduced from modern books and from the Ordnance Survey digital map web site.
Exeter is fortunate in still retaining a substantial number of surviving original later medieval parchment documents and those which have been translated and published have been used as a source of material for the case study. The earliest scholar to record and translate these documents was John Hooker in the late 16th century and some of his work was edited and published in 1916 by the Historical Manuscripts Commission. He also drew a plan of Exeter, as he observed it, in about 1600. The author was fortunate to be permitted to photograph one of the surviving copies of this document which had been removed from an atlas published by Braun and Hogenburg in 1618 and kept in the archives of the Devon and Exeter Institution. The Historical Manuscripts Commission (1916) also published translations of Exeter’s surviving later medieval receivers’ accounts; deeds; charters and letters patent and miscellaneous rolls; all of which have provided examples for the case study. Another important primary source consulted was Moore’s edition (1871) of the Shillingford Letters which were written in English by the mayor of Exeter to report on the progress of the hearing of a legal case brought by the bishop, dean and chapter of the city against the mayor and citizens in 1444.

Published archaeological information has been sourced from site reports which have recorded some later medieval discoveries (often amongst finds from other periods) and from articles in various academic journals from the mid-19th century to the present day. There have been two large open area excavations, one undertaken in the 1970s in the area which now houses the Guildhall Shopping Centre and the other in 2005-6 when Princesshay was re-developed. In respect of the latter the only published work is an unreferenced illustrated booklet (Green 2009) in which the principal findings are briefly described. The author was unable to view the original documents for this or any other relevant excavations undertaken by Exeter Archaeology, as these are presently being used to write a book on the Underground Passages. However the Visitor Centre at the underground passages displays some artefacts, diagrams and photographs from the excavation which the author was given permission to photograph.

Notebooks and daybooks relating to the Guildhall Shopping Centre site excavation remain unedited and are temporarily stored in the Devon Record Office during the refurbishment of the Royal Albert Memorial Museum in Exeter. Access to them was
made possible with the kind assistance of the museum’s archaeologist Tom Cadbury. Other unpublished archaeological material was made available, for the purposes only of this dissertation, by Andrew Pye the archaeological officer for Exeter City Council. This included draft sections of papers written by Juddery and Stoyle about the history of the underground passages (which were based in part on excavation records which the author was unable to see); a history of Lower Mills, Exeter (Collings 1996) and information stored on the Exeter Urban Archaeological Database Monument Record 1999/2000.

After completing the initial literature research the author made several visits to Exeter to locate, record and photograph any traces of the later medieval water supply and to examine and photograph the accessible areas of the underground passages. Unfortunately the section of cathedral’s stained glass east window depicting St Sidwell could not be photographed without specialist equipment.

To make the narrative clearer, two maps have been included at the beginning of the case study, one which shows how later medieval Exeter may have been laid out and the other is a modern street plan of approximately the same area which includes many of the streets referred to in the case study.
Fig. 3.1. Reconstructed map of Exeter circa 1220-1540. The small crosses mark the sites of churches or chapels; M marks a mill; H marks a hospital (Kain and Ravenhill 1999, map 61.3).
Fig. 3.2. Map of modern central Exeter (Ordnance Survey EDINA Digimap).
3.2. 1066 – 1200. Exeter’s Anglo-Saxon origins and the impact of the Conquest

*Anglo-Saxon Exeter*

Apart from a few artefacts, environmental waste and some vestigial street patterns, all traces of Anglo-Saxon life in Exeter have vanished from the archaeological record (Higham 2008, 171). However, contemporary documentary sources show that by the mid-11th century the walled burh of Exeter had developed into a regional centre “which ranked amongst the greatest cities of England” (Todd 1987, 280) and which already had a strong ecclesiastical presence (Higham 2008, 170-1). Although the Roman walls were still visible, the Roman grid street pattern had been largely obliterated except for the two main roads leading through the four gates. There is no evidence of any continuity of occupation or urban function between the Romans leaving and the Anglo-Saxon re-occupation (Todd 1987, 282). It is therefore likely that the conduit which had once brought water to the Roman bath house in the centre of the city (Holbrook 1991, 9) had long fallen into decay (Henderson 1998, 1). Thus, although the coins made at the Exeter mint in the reign of King Athelstan followed the model of Roman currency and bore upon them the words “EAXANIAE CIV[ITAS]” (Todd 1987, 283), the extent to which the citizens were conscious of their Roman heritage is impossible to determine.

Such a city would have required some form of administration and a system must have been in place to collect and deliver the revenues which Domesday recorded as being owed by the burh to the king and the local earl (Reichel 1906, 396). Furthermore, on a date which is uncertain, the burgesses seem to have been given land outside the city and lying to its north-west by (possibly) King Athelstan and to which reference is made in Domesday (Freeman 1901, 45). How the tenure was held in legal terms is unknown but the evidence, though flimsy, suggests that the burgesses were deemed to possess some kind of collective identity on behalf of the citizens.

*The immediate impact of the Conquest*

When William the Conqueror took the city by force in 1068 there was therefore already in place a fortified and prosperous burh with some form of civic administration. The most visible change was the erection, on a ringwork, of a castle
and within it was ensconced a sheriff whose duty it was to collect all dues owed to the king by the citizens. Streets and houses over a wide area were obliterated to make room for the castle and Domesday noted that 49 of the 447 citizens’ tenements were in ruins; presumably as a result of the occupation (Henderson 1999, 487). The owners of the remaining tenements included the king, various bishops, ecclesiastical foundations and members of the nobility, all of whom were Norman (Reichel 1906, 397).

Occupying a pivotal and powerful position within the walls lay the cathedral which had been built on the site of the former Roman civic centre and which was richly endowed with income derived from its 100,000 acres of episcopal estates (Higham 2008, 107). Its principal office holders were now replaced by high ranking Normans such as Bishop Warelwast, the Conqueror’s nephew, who initiated the re-building of the Saxon cathedral in 1114 (Hoskins 1952, 14).

The administration of the city

Although there is no evidence of the existence of any permanent body representing the citizens, civic office holders began to be appointed from at least the mid-12th century. It was during the reign of Henry II (1154-1189) that reference was first made to a reeve or provost and the names of the office holders indicate that the Anglo-Saxon and Normans had intermarried (Freeman 1901, 58). Hoskins has also suggested (without quoting sources) that a Guildhall existed by 1160, possibly on the site of an earlier Saxon one (1952, 8). The status of this shadowy civic body was enhanced when, on dates around 1162, King Henry II issued two writs which granted to the citizens of Exeter “the rights and customs of London freely, honourably and fully, as they ever had them” since the time of Henry I (1100-1135) and, more specifically, freedom from “toll, lastage and passage” (Freeman 1901, 56). Whilst the economic benefits of these concessions were doubtless valuable, perhaps the symbolic significance of the charter was equally important to the burgesses. Indeed it was probably soon after the granting of these charters that the civic seal came into existence (*fig.3.3*). It was made from silver and its donor’s name, William Prudum, appeared on it reverse side. The engraving may represent an actual building but equally it may be symbolic, perhaps representing “the castle and the city walls guarding the ecclesiastical and civic
institutions of the city” (Lloyd Parry 1909, 2). Its survival to the present day, together with a number of other civic seals of slightly later dates, indicates the significance that was attached to them.

Fig. 3.3. The civic seal of Exeter (Hoskins 1952, 8; from a drawing by Browne).

Like the royal seal and regalia, these portable symbols of office were “a means of projecting an important image of authority to a wider audience” (Steane 1993, 23 & 34) and they thus acted as a visible witness of municipal status and a silent challenge to the powers of the overlord and the bishop.

The castle’s water supply

One of the few surviving records relating to 12th-century Exeter is an account of the siege of the castle in 1136 during the Anarchy Period, which was recorded in the Gesta Stephani. The outcome of the siege was a victory for King Stephen and a defeat for the overlord Baldwin, who nevertheless remained in power (Rose-Troup 1942, 28-30). Of particular relevance is the account of the suffering caused to those penned up in the castle by lack of water. After detailing the length and cost of the siege the anonymous author described a vigorous debate between those who believed in divine intervention and providence and those who adopted a more rational and pragmatic approach. The passage reads as follows: “But God, the disposer of all things, wishing to end [the besiegers’] labours, dried up the two wells of the castle as well as the springs which until had always plentifully supplied both men and beast. ... Some asserted that the bubbling up of the waters was lessened by the great heat of the sun; others, that through some accident in the bowels of the earth, their course had been diverted. But I, myself ... loudly protest that the drying up of the wells was through the power of
Divine Providence, because during all preceding centuries, with even greater heat, they had always inexhaustively abounded” (transcribed and translated by Rose-Troup 1942, 28).

The reference in the text to both springs and wells suggests that there were two separate types of underground sources of supply but an archaeological investigation of the castle in the 1960s uncovered only one well in approximately the same place the extant Victorian well (Vatchell 1966, 342). However, a stone trough was also discovered lying close to the northern wall, which was interpreted as a rain-catchment cistern. This was described as having a rough outer face and a smoother inner face constructed in “fair stonework” (ibid.). For how long this trough had been in place is not known. Thus, even if the details are unclear, it seems likely that the castle had its own independent water supplies from an early date and a plan, drawn in 1617, still showed the well house in about its original position; although the structure is likely to have been repaired or re-built over time (fig. 3.4).

![Fig. 3.4. Part of a facsimile plan of the castle precinct, with the well clearly marked, drawn by Norden 1617 (British Museum manuscript 6027, reproduced in Oliver 1850, 139).](image)

The cathedral aqueduct of St Sidwell

About a century later the cathedral authorities developed a private water supply which was delivered through a newly constructed aqueduct, known as St Sidwell’s Conduit (Juddery and Stoyle 1995, i). The earliest documentary evidence of its existence is a deed dated 1226 whereby the cathedral authorities granted a third share of the supply to St Nicholas Priory (ibid. and Allen 2004, 9). Stone bases and capitals from a circular lavabo or fountain house at the priory have been dated by their style to about 1170-80 (Exeter Urban Archaeological Database 1999-2000, 11054; fig.3.9.). As the lavabo
(lavatorium) is believed to have required a supply of running water it has been proposed that this came from an early extension to the cathedral conduit and, if correct, this evidence would date the first conduit to the third quarter of the 12th century or even earlier (Allen 2004, 9). Although details of the construction methods of the aqueduct and its precise course are largely unknown, archaeological excavations in 1983 in King William Street uncovered three sections of a 20m trench, lying approximately 30m west of St Sidwell’s church, which may have been part of this first aqueduct (Exeter Urban Archaeological Database 1999-2000, 11020.00). The trench was up to 3.3m deep and embedded in its clay lined interior lay a piece of melted lead which was interpreted as part of one of the lead pipes which had conveyed water through the first cathedral aqueduct (Juddery and Stoyle 1995, 2). The remainder of the piping may have been dug out when the conduit was de-commissioned circa 1347-9 and the lead re-used for the pipes in the 14th-century Headwell Conduit (Exeter Urban Archaeological Database 1999-2000, 11020.00).

The source of the supply was probably one of several springs which emerged from the flank of a ridge situated “on rising ground ... some 150m north-east of St Sidwell’s church, in present day Well Street” (Juddery and Stoyle 1995, 2; fig. 3.11). It was from this area that water for the Roman aqueduct is believed to have been taken (Henderson 1998, 1) and documents dated 1226, 1267 and 1346 all refer to St Sidwell’s as the source of the cathedral conduit (Juddery and Stoyle 1995, 2). There is no doubt that there already existed, in the same area, a holy well by that name. Early medieval Christians had identified this as the site of the martyrdom of the saint, at the close of the 5th century AD, from whose body water is said have flowed to create the holy well named after her (Allen 2004, 7). A depiction of this event appears in one of the surviving panels in the great 14th-century stained glass window in the cathedral and the well itself, with its domed roof, can be seen below the saint’s elbow (fig.3.5). St Sidwell’s shrine is listed in an 11th-century manuscript as one of the two places in Devon associated with a saint’s resting place and which therefore became a cult centre (Higham 2008, 136). It is perhaps surprising to find that the dean and chapter (to whom the fee of St Sidwell belonged) commandeered the holy waters of this sacred well and place of pilgrimage for their conduit, but there is no evidence to suggest that there were two wells of the same name. If the well house depicted in the stained glass
window is accurate it was probably built for the conduit rather than as an act of piety to protect the well’s holy water. Possibly the same building (or a replacement on the same site) appears in a later map of the area (fig. 3.6).

Fig. 3.5. Part of the east window in Exeter Cathedral (circa 1380) showing St Sidwell and a domed well house beneath her right elbow (Brooks and Evans 1988 fig. x).

Fig. 3.6. Plan showing St Sidwell’s Conduit house (starred) standing on the site of present day Well Street near its junction with York Road; as drawn by Hooker circa 1600 (Harte 1911, 100).

Access to the head well-house would probably have been obtained through a locked door and the interior would have contained a cistern and exit pipe to collect and remove the spring water (Magnusson 2001, 60). It is not known whether pilgrims were denied all access to what were doubtless believed to be healing waters, or what happened to any public access when the conduit was de-commissioned in circa 1346-8 (Exeter Urban Archaeological Database 1999-2000, 11020.00).
When the conduit reached the city wall the aqueduct probably turned south-east to follow the defensive ditch outside the wall until it reached a point half way between the east and south gates where, according to three documentary entries dated 1281, 1284 and 1299, it turned into the city by passing through a round tower (Juddery and Stoyle 1995, 2; Exeter Urban Archaeological Database 1999-2000, 11071.00). Once inside the city, the route probably ran as much as possible through land owned by the cathedral (ibid.). The conduit terminated near the cathedral where access was gained at a well-house known as St Peter’s Conduit. The domed building depicted in Hooker’s plan is possibly a reasonably accurate representation of this building and its position; although later repairs and re-building may have altered its original design (fig. 3.7).

![Fig.3.7. St Peter’s Conduit (centre) which gave access to the cathedral conduit, as depicted by Hooker circa 1600 (Harte 1911, 60).](image)

Although nothing has survived of the interior features of this building, other conduit houses have been found and although there was no uniformity of design they all contained a cistern or tank from which water could be collected. Sometimes continuation pipes took the supply to secondary collection points (Magnusson 2001, 61-3). The lead cistern at Wells was described in a grant of 1451 as being 5’ (1.6m) in diameter and 4’ (1.3m) deep (Wells’ Calendar 433, cited ibid. 61).

*The civic water supply*

Other domestic and industrial water came from public and private wells and sources such as springs, streams, ponds and the river Exe. Waterbeer Street (which presently runs parallel to the High Street and behind the Guildhall) was, in some later medieval documents, written as *Waterberestrete* (Lega-Weekes 1915, 22) and it is believed to have been the place where the water carriers came to sell water (Portman 1966, 16). There were also several streams proximate to, and within, the city such as the
Longbrook, which followed a course roughly parallel to the north-east wall along the route of the present day street of that name.

There is no firm evidence for the existence of any public wells in this period but it is possible that Townwell had an ancient origin and was certainly in existence in the 13\textsuperscript{th} century. This well was situated in the southern area of the city near St John’s church and close to the priory. St Martin’s Well (which may be the one which still exists beneath the Well House Tavern in the Close) may have existed from at least the early medieval period and might have been associated with the nearby pre-Conquest church of the same name (Higham 2008, 81). As it may have been a holy well, with possibly restricted access, it may not have been used for domestic water. Although so many wells have disappeared without trace and dating those which remain is often problematic, it is likely that at least some of the well sites, to which reference will be made later, were in use at this period, even if the wells themselves had been re-built.

3.3. 1200 to 1300. Post-Conquest recovery and the expansion of the city

The creation of the office of Mayor and the emergence of councillors

At an unknown date in the first decade of the 13\textsuperscript{th} century the office of mayor was created, a position becoming of sufficient importance and authority to have its own seal (\textit{fig.3.8}) which was in existence by 1306 (Gidley 1862, 257; Wilkinson and Easterling 1931, XXXI).

\textit{Fig.3.8. The seal of the mayor of Exeter depicting the city’s patron saint, St Peter holding in his right hand a church which may be the cathedral (Gidley 1862, 256).}

The mayor had (initially) six office holders to advise and support him (Freeman 1901, 58; Wilkinson and Easterling 1931, XXXI). Together they were responsible for upholding the trading privileges granted by the charters and imposing good order in
those areas of the city under their authority. Inevitably the bishop, the prior of St Nicholas and the prioress of Polsoe were exempted from the city’s jurisdiction over tolls (Schopp and Easterling 1925, 17-23). It is also from about the early 13th century that the word *communitas* (communality) first appeared in legal documents, usually in conjunction with the titles of Mayor and Bailiffs. This has been defined as “an organised body possessing rights and property in common” and who would today be described as “freemen” (Stubbs 1890, 537; Freeman 1901, 59). Although it was pragmatically recognised as being capable of acting on behalf of the citizens, there is no evidence that this body had a “permanent or clearly defined” role within the city administration (Wilkinson and Easterling 1931, 4-5). It was not until 1296 that a memorandum set out more formally the duties of the councillors which included the preservation of civic liberties, observation of the city’s statutes and the maintenance of law and order (*ibid.* 1931, 31). The growing confidence of the mayor and council inevitably resulted in various disputes arising between them and the cathedral authorities over jurisdictional matters such as “the collection of tallages, arresting malefactors and legal jurisdiction over tenants of the dean and chapter living in the city” (Curtis 1932, 17). These grievances were settled, at least for a while, by an agreement reached in 1249 (City of Exeter Misc.Rolls 33, 1249; transcribed and translated by the Historical Manuscripts Commission 1916, 384).

Other acrimonious and bitter disputes periodically arose between the earls of Devon and the council (of which more detail will be given later) and it was perhaps fortunate for the city that in 1231 the earls had lost their power base within the city walls. This happened when the custodianship of the castle was taken from them and given to Henry III’s brother, the Duke of Cornwall (Freeman 1901, 78). Little is recorded thereafter of any serious discord between the overlord and the city and in 1259 Richard, Earl of Cornwall, designating himself “King of the Romans”, granted to the citizens and their heirs the right “to hold the city of Exeter in fee-farm forever, rendering the accustomed fee-farm” (City of Exeter Royal Charters and Letters Patent XI, 1259; transcribed and translated by the Historical Manuscripts Commission 1916, 1).
The domestic water supply for ecclesiastical and civic purposes

Although the council’s relationship with the cathedral authorities was periodically acrimonious that with St Nicholas’ Priory was generally cordial. In about 1226 some form of agreement (the details of which are unknown) was reached to extend the cathedral conduit to the priory and from there, by means of a branch pipe, to take some of the monastic supply to Townwell (Juddery and Stoyle 1995, 4). Whether there was an economic as well as a philanthropic motive for the prior’s generosity to the city is an interesting aspect of the arrangement. There is ample evidence that the upkeep of the aqueducts was expensive (Magnusson 2011, 116-127) and a contribution from other users would doubtless have been welcomed. There is some support for this proposition contained in two 14th-century documents. In 1342/3 it was recorded that the city paid 6s 3d to the prior “for the repair of the common well” and in 1348/9 the tenants of Cricklepit Mill were stated to have “previously been accustomed to pay 4s per annum to the prior of St Nicholas for maintaining the water supply of the “fons Townwill” (cited by Juddery and Stoyle 1995, 2). In any event, it is highly likely that the poorer citizens would have had free access to the well; a view which is supported by the repeated documentary references to this well as “the common well”.

Possibly taking water through an exit pipe leading from the cistern (Magnusson 2001, 61) the conduit may have followed a route which led out of the cathedral land into and along the upper part of South Street, turned left into Fore Street and then right along Mary Arches Street, from where it cut off left into the rear buildings of the priory (Henderson 1999, 490; fig. 3.11). No archaeological evidence of this conduit has been found but, amongst the rubble left when the priory was demolished in the mid-16th century, were many ornately carved stones (fig.3.9). These may have once been part of an elaborate lovebo or fountain in the centre of the cloister and which would have needed a conduit to provide the mechanism for the upward trajectory of water (Allen 2004, 9). The style of carving indicates a date of around 1170-80 (ibid). Its design is conjectural but it is possible that a stylistic drawing on an early seal could be a representation of the building (fig. 3.10).
Limited access for the laity to St Peter’s Conduit may have been allowed as there is some tenuous documentary evidence which might be so interpreted. Three late 13th-century documents refer to the conduit as “the communal water of the city” and a bequest (1267) by John of Dawlish, which was to be used “for the repair and maintenance of St. Sidwell’s Well”, might have been intended to benefit the city as well as the church (ibid. 3-4). There is further slight evidence in a deed of grant of 1281 by which the mayor and council permitted the cathedral canons to “occupy a place at the head of St. Martin’s Street next to the city wall” for an annual rent of one penny; provided the city had “free passage” to the wall for defensive purposes and “for the repairing of the aqueduct running through [St Martin’s] tower” (cited by Lega-Weekes, 1915, 98). The immediate question which arises from this extract is why the city wanted to repair the cathedral conduit? It is unlikely that lay people would have been granted unfettered access to its water because “medieval in-take systems were designed to supply a limited amount of high quality water [and therefore] ... would have been carefully rationed” (Magnusson 2001, 63). Perhaps there was some limited sharing of the supply with favoured citizens, in return for a financial contribution.

There is, however, better documentary evidence of a lay person having had access to water from the conduit belonging to St Nicholas’s priory. In 1260, Martin Derling was granted (presumably at a price) a right to draw water from it for his nearby private
house in Friernhay Street (Exeter Urban Archaeological Database 1999-2000, 11076). Traces of pipe work at a house excavated in that street in 1981/2 by Youngs and Clark have been interpreted as possibly being from this supply (ibid.).

The next aqueduct to be built was for the Dominican Order of Black Friars when, in 1244, Peter Le Wayner and his wife granted the Order three springs “in Chadescofte and Pudewill” for this purpose (cited in Lega-Weekes, 1915, 137). The precise location of these springs is uncertain but it is believed, from documentary references, to have been in the area marked “F” on the plan at fig.3.11 (Henderson 1999, 489). From the city’s Eastgate the route probably followed that of the earlier Cathedral Conduit which tracked alongside the circumference ditch. However, instead of using a tower to breach the city wall, the friars adopted a more sophisticated design whereby the pipe was taken through a short (1.6m) subterranean vaulted passage (Exeter Urban Archaeological Database 1999-2000, 15290; 11020). There is no archaeological evidence to confirm the conjectured route of the conduit after it emerged from this passage, but it was probably buried until the point where it entered the friary precinct (ibid.). Documentary references and excavations both attest to the practice of burying conduits in shallow trenches beneath city streets (Magnusson 2001, 78-83). As this conduit was a private monastic supply terminating within the friary it is unlikely that there would have been any public access to the supply, although Bishop Bronescombe obtained permission, as early as 1258, to take some of the water from it and convey into his palace; presumably for his personal use (Lega-Weekes 1915, 137).

Townwell was not the only supply which seems to have suffered from a shortage of water because, in 1260-70, the cathedral authorities extended their conduit a further 250m to the east of St Sidwell’s Conduit in order to tap into a source at a place thereafter appropriately named Headwell. It is possible that this supply joined that coming from the older conduit at St Sidwell’s (Juddery and Stoyle 1995, 4). The extension is that shown in fig. 3.11 and lay between points A to E.
Fig. 3.11. Scale 1:1500. Plan of the conduits circa 1270 showing the possible route of the Blackfriar’s aqueduct, built around 1240 and running from points F to G. The first cathedral aqueduct and its extensions are also marked (Henderson 1999, 489 and map 61.9, drawn by Jones).

Another well, unconnected to the conduit system, which may have been in existence at this time was in Queen Street, proximate to the medieval industrial area which now lies beneath the Guildhall Centre. This was excavated in 1978-9 but the report is unfortunately very brief and lacking in detail, although it was recorded that the well was stone-lined and lay approximately 6m below the late medieval surface. The potsherds, which were said to be late medieval but otherwise undated, were found in the bottom 0.4m of the well and consisted mainly of broken jugs and “presumably most were used in collecting water from the well, and broken on ascent or descent” (Allen 1984, 67). The excavation notes do not record any industrial waste and the
implication is therefore that this was a well for domestic water, but whether for public or private use is unknown.

A further source of water emanated from a spring which emerged close to the north east corner of the Norman cathedral. In 1953 Sir Cyril Fox led an excavation around the area of the spring with the intention of discovering whether the remains of the Saxon monastery and monastic school, founded by St Wulfheard in the 7th century, could be identified.

During the course of the excavation a springhead was uncovered in the area where the north wall of the bishop’s palace met the south buttress of the cathedral’s great gable and which contained a feature which Fox interpreted as a well-pool formed by “damming up a copious spring” (ibid.17; fig.3.12). This pool measured approximately 3m by 2.5m (ibid.) and excess water from it overflowed into a semi-circular basin and then into a rill running in a southerly direction along a natural gully which was about 0.77m deep. The spur walls strongly suggested to him that there had been an inhabited building on the site in both Roman and Norman times and that the retention of the crude stone-work had been deliberately left when it was re-developed in the 12th and 13th centuries (ibid.). He also believed that a niche immediately above the spring once (possibly) contained a statue of the Virgin Mary and that the Church would have regarded the water “as of first importance” (ibid.7-8). Whilst some of this

Fig.3.12. Sketch of the site of the well-pool and rill flowing from it (Fox 1953, fig.1).
interpretation is speculative, the evidence that this feature was purposely built around a spring seems compelling. However these findings were re-evaluated when the area was again uncovered for repair in 2005. It was then decided that the structure was probably a stair recess, although no reasons are given for this conclusion (Brown 2010, 32-33).

Even if Fox has misattributed his discovery it seems likely that the spring was absorbed into the cathedral buildings at least by the close of the 13th century and possibly much earlier. Although there is today no trace of the water course, the lower part of it can be identified on Hooker’s map where it can be seen emerging from the Close and running into the Exe near Westgate (fig. 3.13). The route of this stream is retained in the modern street pattern of Palace Gate and the appropriately named Coombe Street (fig.3.1), which now leads steeply downhill to the subway beneath Western Way. It is likely that at least this part of the water course was available for public use.

In addition to the wells associated with the conduits there were also some privately owned wells, although how extensive these were is impossible to evaluate because so few houses have been excavated which date from this period. Wells which have been found associated with domestic dwellings often lack dateable features because they are not always an integral part of the house and deposited artefacts do not necessarily indicate the whole period the well was in use. An example of the problems of accurately dating for wells can be illustrated by the excavations in 1976 at Frog Street (outside Westgate) where artisans’ houses were discovered which dated to between
the 13\textsuperscript{th} and 16\textsuperscript{th} centuries (2010, Brown 22). A stone lined circular well was uncovered in the back-yard of one of the tenements but no date was attributed to it.

\textit{Waste disposal}

To what extent, during the 13\textsuperscript{th} century, open streams became clogged with waste cannot be accurately assessed although such a practice was common throughout the period (and into modern times). A clue to the deliberate tipping of human and animal excrement into water courses in Exeter is said to be found in the name of a river (no longer visible) called the Shitbrook (Hoskins 1960, 48). This stream once emerged from a spring near St Anne’s Chapel at the top of Sidwell Street (\textit{fig.3.14}; \textit{fig.3.6}); probably in the area where there is a modern drinking fountain which lies close to the perimeter of the chapel precinct. Hooker’s map (\textit{ibid.}) showed the brook passing first beneath Paris Street and then Magdalen Street and finally flowing by the leper hospital in the direction of the Exe.

However, the attribution of the name of the brook may be erroneous. In a 12\textsuperscript{th}-century deed, which recorded the founding of the Magdalen leper hospital, the river was spelt “Shutebroke” (Russell 1976, 1) and in later documents as Shitbroke, Schytebroke and Shutebrok (Wylie 1961, 264-5). The name may therefore be derived from the word \textit{chute}, one of the meanings of which is “a sloping channel for conveying things to a lower level” (Oxford English Dictionary 2001, 255). The memory of this stream may be preserved in modern day Shute Street, the route of which approximately follows the upper part of the former watercourse. The totality of the evidence therefore suggests that the Shitbrook was so called because it descended steeply and not because of any association with excrement. If this interpretation is right it solves the problem of why a leper hospital, which valued the symbolic and practical uses of clean water, should have been built on the banks of an open sewer. It is, of course, possible that the medieval love of word play and puns caused the name to change its meaning as the stream became increasingly polluted with the expansion of the population.
Fig. 3.14. Shitbrook emerging from a spring and conduit house (arrowed) and flowing towards the Exe; part of a plan by Hooker circa 1600 (Harte 1911, 101).

Fig. 3.15. Reconstructed map showing the presumed route of Shitbrook superimposed over a modern map. The source of the river is marked with a star (Exeter Urban Archaeological Database 1999-2000, Map MD4).

The Exe was almost certainly the recipient of human and animal waste of all types either from purposeful deposition or from the polluted streams and drains running into it. The owners of the houses built, from the mid-13th century onwards, on the Exe
Bridge (Lloyd-Parry 1909, 8) and those living near its banks, probably used the river as both a source of water and as a handy way of removing refuse and ordure. Whether the quantity of effluence was sufficiently great to have created a serious health hazard is impossible to assess but potentially the weirs which were constructed downstream from Exeter reduced the cleansing effect of tidal surges.

A number of documents, dated around 1285, show clearly that in medieval Exeter people were well aware of the unpleasant odours of cess and other waste deposits around them and which they linked causatively (albeit mistakenly) to illness. A clear example can be found in one relating to Greyfriars which originally stood on low lying land between High Street and the city wall below Northgate (fig. 3.1). According to the content of a petition (undated) by the friars to Edward I they sought permission to enclose a short stretch of public road to prevent its use “as a sort of cess of the whole neighbouring street”; the stench from which was alleged to have been so bad that men rarely used the passageway (City of Exeter Public Record Office, ancient petitions 15428, transcribed and translated by Little and Easterling 1927, 14; 56). The petition was granted but the closure of the street seems not to have cured the problem because, when Edward I visited the city in 1285, he learned from the Earl of Hereford (who was then lodging at the friary) that situated there was “a horrible drain, where the place smelt indoors and out, and that within two years nine brothers had died” (City of Exeter Misc. Deeds 698; 701-2; ibid. 15; 54; 55). The solution sought and eventually accomplished was the removal of the friary to a new site on higher ground beyond outside the walls near Southgate, on the far side of the city ditch.

Human excrement, food waste and broken pottery were also all purposely disposed of in pits. Two examples illustrate the point. In 1975 several small houses of the poor were excavated in Rack Street, in the west quarter of the city, which revealed numerous waste pits. These dated from the later 12th century onwards and contained many cheap quality potsherds and general organic waste (Allen 1984, 67). An examination of faunal remains from waste pits, uncovered during excavations on a site proximate to the Roman Basilica in 1975, found evidence of animal bones from consumed meat products (especially beef) from several periods, including the 13th century (Maltby 1979, 22).
Evidence of more sophisticated latrines is harder to find but one was identified when a bombed site in Chapel Street was excavated by Ralegh Radford in the mid 1940s. Amongst the confusion of rubble, drains, cesspits and slate tips he found an area “of soft silt which represented the position of a truncated cone-shaped erection”. This he interpreted as being the remains of a timber latrine which rose above floor level to a height of 12” (0.3m) to 15” (0.38m) and on which seating had once been placed (Greenfield 1964, 355). It was situated in a lean-to structure against the wall of a house and the total depth from floor level was 2’-10” (0.87m). Its use was dated from potsherds to the 13th and 14th centuries and (ibid.). If this attribution is correct it is likely that similar latrines were installed, but it is impossible to judge how commonplace they were, how often they were cleaned out or what became of the deposits on removal.

Not all unsavoury detritus ended up in pits or thrown into water courses or streets because medieval people were adept at re-cycling any usable waste. There is ample evidence (City of Exeter Deeds 79, 109, 116, 123a, transcribed and translated by the Historic Manuscripts Commission 1916, 263-5) that during the study period there were open spaces within and just beyond Exeter’s walls which were cultivated as private gardens, orchards and hop gardens and on which manure and composted food waste could have been spread. Urine for the fulling process was a collectable product and animal horn could be fashioned into saleable products.

*Water for industrial use in mills and the creation of leats*

Water power to drive mill wheels came from the Exe and whether or not the first leat and mill at Cricklepit had Anglo-Saxon origins (Hoskins 1960, 24) there was, by the early 13th century, a corn mill on the site, with further mills added during and beyond the study period (Collings et al 1996, 2). The leat for the mill (known as Higher Leat) was about 900m in length and probably followed the same course as that depicted on Hooker’s map (Exeter Urban Archaeological Database 1999-2000, 11550.00; fig. 3.16). The leat and the restored post-medieval mill remain in existence although no milling is presently undertaken (fig. 3.17). Interestingly otters have now returned to live there.
Using contemporary records the history of the mill has been traced (Collings et al 1996, 4-7) and it vividly illustrates the industrial importance of the Exe in the later medieval period and the struggle which ensued between the city and the earls of Devon for control over it. Cricklepit mills were built on a site adjacent to the river which initially belonged to the earls of Devon as part of their manor. Around 1220 the incumbent earl built (or perhaps re-built) the Cricklepit corn mill. Shortly thereafter he sold it to an ambitious merchant, Nicholas Gervase, who wanted the rental income from the mill to fund the upkeep of a new bridge he planned to have constructed across the Exe (Collings et al 1996, 4). Work was begun in about 1228 and is said to have cost 10,000 marks, raised from donations solicited by Nicholas’s son Walter; the principal donors being cardinals and bishops (Hooker cited in Hoskins 1960, 29). The toll income belonged to the city and was collected by the Wardens of the Exe Bridge, in whom the administration had been vested in 1257 (Youings 1968, 1-2). The remainder
of the land in and around Exe Island continued to belong to the earl of Devon as part of his manor (Collings et al 1996, 5) and many, but not all, of the mills which later proliferated in this area probably belonged to him.

Although there seems, at first, to have reasonable accord between the city and the earls of Devon over access to the leats, the relationship between the parties seriously deteriorated from about 1239. The initial dispute arose between the city council and Earl Baldwin de Revers when he constructed a timber weir which stretched across the river and blocked the vital shipping route from the sea to the quay. In order to remedy this perceived injustice the citizens, led by the mayor, took the law into their own hands and broke up the central portion of the weir to make a 30m navigable gap (ibid.5). This weir remained in place until 1262 when Isabel, sister of the last earl, inherited the title in default of a male heir. Sometime thereafter between 1272 and 1284 she had the weir replaced in stone but continued to leave a 30’ lock so that ships could still reach Exeter; albeit, perhaps, with less facility (Freeman 1901, 84; City of Exeter Misc.Rolls 3iii, circa 1317; transcribed and translated by the Historical Manuscripts Commission 1916, 386; Exeter Archaeology 2001, 1). The present day area of Exeter known as Countess Wear (sic) probably commemorates this event and the survival of the name may reflect the deep impact its original construction had on the local population.

**Water for other industrial use and the disposal of industrial waste**

One of the areas within the city where there seems to have been a long history of industrial use now lies beneath the present Guildhall shopping complex. In 1970s the area was excavated by Collis and although no site report has been published, the records have been preserved at Exeter’s Royal Albert Memorial Museum. Several sketch plans are amongst the archive. The excavation uncovered evidence of a 12/13th-century lime-burning pit in Trichay Street (Allen 1984, 75) together with large quantities of later medieval iron slag, iron panning debris, wood and lumps of charcoal, all from Goldsmith Street (Collis 1971, GS 13-90.8, 37.48.17 & 33.88.6-7). The position of a possible well is shown in fig. 3.18 as a large circle in the centre left of the sketch. The excavation notebook dated this pit or well as later medieval (possibly late 12th century) and noted that it held a water-logged complete stave-built barrel, minus top
and base, which was packed into the side of the pit with clean pink clay. It contained “much iron panning” but no pottery finds were recorded (Collis 1971, GS 33.48.10-26; Allan 1984, 309). The implication of this evidence, although inconclusive, suggests that the well (if such it be) was used solely, or mainly, for industrial purposes. However there is documentary evidence that there were domestic dwellings in this area because a deed referred to tenements in nearby St Paul’s Street (now Paul Street) (City of Exeter Deeds 131, circa 1225; transcribed and translated by the Historic Manuscripts Commission 1916). Furthermore cess and assorted domestic garbage, together with industrial iron waste, was uncovered in pits on the site and dated to the late 12th and early 13th centuries (Collis 1971, GS 33.48.10-26; Allan 1984, 309).

![Diagram](image.png)

*Fig. 3.18. A sketch plan, not to scale and with no orientation, dated 16.8.71, being the day following the initial scraping of the site in the area of Goldsmith Street. A possible well is marked by an arrow (Collis 53/2005).*

Similar evidence exists of houses in other industrial areas such as Smythen Street, where the smiths worked (City of Exeter Misc. Rolls 53, 1285; transcribed and translated by the Historical Manuscripts Commission 1916, 385), and Frog Lane, where industrial waste from leather working was buried close to houses and their well (Brown 2010, 22). Whilst it is therefore impossible to determine the extent to which industrial (and potentially toxic) waste percolated into the domestic supply, it is likely that this occurred.
Although fulling was probably undertaken during the 12th century, it was on a much smaller scale than in later centuries (Carus-Wilson 1963, 5 and Collings 1996, 3). There are no surviving records of fulling mills existing before the mid-15th century, so possibly vats were used instead (Collings 1996, 3). The fulling process required water to remove unwanted grease and oils for woven wool. First the cloth was soaked in a solution of fuller’s earth, urine and soap and then pounded and kneaded. When the cloths had been removed for stretching and drying, the dirty water from the vats was emptied (probably) into the Higher Leat from where it ran back into the river (ibid.3). The butchering of live animals and the disposal of those parts of the carcasses which could not be used was another potentially water polluting process. There is no archaeological evidence for the slaughtering of beasts within the city walls as the area where it may have been undertaken (around what is now Market Street) has never been excavated. However, in this area a street called “the Shambles” is marked on the Hooker map (circa 1600) and there is a note by Izacke (circa 1681-93) that in 1658 the corn market was moved to the site of “Olde Shambles” (cited by Harte, undated, 18).

The disposal of human corpses

By the 13th century there may have been, within the city walls, as many as 29 churches and chapels in addition to the cathedral, a priory, three friaries and two hospitals. Outside the walls lay the leper hospital, St Thomas’s church and three more friaries (Lepine and Orme 2003, 6-11). Most of these would have had burial grounds attached to them and in 1177 the prosperous Jewish community was also allowed to have a cemetery, provided it was built outside the walls (Adler 1931, 222). This would have been abandoned when the Jews disappeared from the city after 1290 (Sussex 1993, 266). All these burial grounds would have contained corpses but there is no evidence that the risk of contamination to shallow wells or open water courses was a cause for concern. This contrasts with the serious view which the church authorities took of any desecration of consecrated ground. This is well illustrated by their response to the recurring problem of human blood being spilled in the cathedral cemetery, which was also used as a recreation area by the laity, amongst whom fighting frequently broke out (Lepine and Orme 2003, 18). Each such incident resulted in the immediate suspension of burials until such time as the land could be cleansed by the Rite of
Some critical events which occurred at the close of the 13th century

After a period of relative peace between the city and cathedral authorities, the last twenty years of the century witnessed a serious deterioration in their relationship. The quarrel took place against a backdrop of ecclesiastical expansion which the city leaders must have regarded with some concern. It was around 1280 that bishop Quivel embarked on an ambitious and costly plan to re-build the cathedral on a grand scale. For reasons which are now lost, a dispute arose between the bishop and the dean and chapter which culminated in the murder of the precentor in 1283. The mayor of Exeter was somehow implicated in the incident and in 1285 Edward I tried the case, pronounced the mayor guilty and ordered him to be hanged (Hoskins 1960, 32-33).

The following year the dean and chapter, perhaps taking advantage of recent events, were able to extract a licence from the mayor and commonalty which enabled them to make an enclosure of the cemetery and erect gates which were to be closed at night (City of Exeter Misc. Rolls 29-31, late 13th century; translated and transcribed by the Historical Manuscripts Commission 1916, 384). Further intervention by the king in 1297 led to an agreement between the parties regarding the vexed question of civilian access through the gates and posterns (Freeman 1901, 85). The exact relationship between the enclosures of the cemetery and the whole of the Close and the nature of the barrier or barriers which were erected, have been the subject of academic debate (Lega-Weekes 1915, 19-28; Hoskins 1960, 33). However, for the purpose of this study, the symbolic significance of the enclosure is perhaps the most important aspect of this event because there now existed a visible barrier, perhaps consisting of a mixture of buildings and walls, around a substantial portion of central Exeter. Henceforth, and beyond any doubt, this area was within the exclusive jurisdiction and control of the bishop. The message was further reinforced as, within this zone, the magnificent new cathedral was beginning to arise. Although this quarrel was not about water rights the continuing acrimony between the citizens and the cathedral may, as will be investigated later, have been a factor in the development of a civic conduit separate from that of the cathedral.
Summary

By the close of the 13th century Exeter had taken the form which defined its central layout, in broad outline, to the present day. Although the castle was still a formidable presence, it was the new cathedral which was rising to dominate the city and compel recognition of its spiritual and temporal authority. Although there was now in place the foundation of a civic administration, with its own jurisdictional ambitions and symbols of authority, it was too weak to challenge successfully the two great powers of the earls of Devon and the bishops of Exeter.

3.4. Exeter 1300-1400

Historical Introduction

The first half of the 14th century witnessed widespread climatic changes which caused hardship and death, by starvation and disease, in many parts of Britain (Britnell, 2000, 118). Whilst there is little surviving evidence to show how seriously affected Exeter was by the famines of 1315 and 1318, the number of funerals recorded in the Cathedral obituary accounts rose from an average of 33 per year (1307-14) to 53 in 1315 and 84 in 1316 (Lepine and Orme 2003, 14). As those buried at the Cathedral were the wealthier members of society it is likely that the mortality rate amongst the poor would have been greater; but what percentage of the population died or how quickly the dead were replaced by in-comers is impossible to determine.

The Black Death possibly reached Devon in 1349 and there is some evidence that the mortality rate in the city increased sharply, as the yearly average of 4.3 wills lodged in the mayor’s court rose to 55 in 1349 and then dropped back to 12 in 1350 and 8 in 1351 (Lepine and Orme 2003, 14). However the cathedral’s fabric rolls recorded only one relevant entry, namely the receipt, in 1348/9, of £10 from various sources including fees for “burials in the time of mortality” (cited by Hope and Lloyd 1973, 21). Otherwise there are no records of any new burial grounds having been consecrated around this time (Lepine and Orme 2003, 15-16) and no mass burials have been discovered during the course of archaeological excavations. An examination of faunal remains from sites in Exeter did not produce enough statistically significant features “to indicate what effect, if any, the plague had on the diet of the inhabitants” (Maltby 1979, 20). On the other hand “it seems likely that the plague brought construction [of
the cathedral] to a halt” (Allen and Blaylock 1991, 102) as the detailed cathedral building accounts failed to record any payments for masonry construction between 1348 and 1353 and the original scheme of sculptures for the west image screen remained unfinished (ibid.). It is therefore perhaps surprising that the building of the new cathedral conduit between 1347 and 1350 seems to have continued throughout the height of the epidemic (Juddery and Stoyle 1995, 5).

The Hundred Years War, which broke out in 1337, added further physical and economic suffering for those affected by the appalling natural disasters. Fortunately both Exeter and Topsham escaped the devastating enemy raids which burned and wasted several ports along the south-west coast between 1340 and 1401 (Kowalski 2000, 468-69; Slater 2000, 604). However the city failed to take advantage of the opportunities afforded by the misfortunes of other ports to increase its share of the (diminished) wine trade. Although wine imports accounted for about 70-80% of the value of all of Exeter’s overseas imports, this represented less than 1% of the total being shipped to England in the late 14th century (Kowaleski 2000, 480). The bulk of Exeter’s trade was therefore mainly locally generated, with goods travelling either by coastal or inland routes. Furthermore, with its coarse Devon wool, Exeter was not able to follow the example of places such as Salisbury and Wells, and take advantage of the increased overseas demand for fine woollen cloth (Carus-Wilson 1961, 6). In the later years of Richard II’s reign, only 1% of England’s wool exports was shipped out of Exeter (ibid).

The French wars eventually became so costly that King Richard II raised a Poll Tax in 1377 and this may have been one of the catalysts which led to the Peasants’ Revolt in 1381 (Dobson 2000, 281). Exeter remained physically unaffected by the insurrection, perhaps because it was largely untroubled by the absentee lord, the Duke of Cornwall and had more freedom than the tightly controlled ecclesiastical boroughs where the revolt took paricular hold (Dobson 2000, 281). Also, unlike London (which was pillaged by the rebels) its relationship with Richard II seems to have given mutual satisfaction. Thus in 1378 the King confirmed the city’s fee farm payment and in return the city built a balinger (a small sea-going vessel) for his navy (City of Exeter Royal Charters and Letters Patent XXI-II, 1378; transcribed and translated by the Historic Manuscripts Commission 1916, 2).
The civic government of the city

Despite the nationwide disasters of the 14th century the period can be viewed as one of recovery for the civic leaders, whose political and economic aspirations had been seriously weakened by the execution of the mayor, the extension of ecclesiastical control over a substantial area of the city centre and the partial loss of navigation rights over the Exe. Although the city received few new privileges, several charters re-granted previously held civic rights similar to those of London. These included the right to have property and contract disputes heard exclusively by the mayor and bailiffs (1332) and the right to be free from all fee farm burdens in return for an annual payment of £20 (1332) (Royal Charters and Letters Patent XVII; XVIII: XX; transcribed and translated by the Historical Manuscripts Commission 1916, 1-2).

Perhaps the most significant development in local government was the creation of a permanent council in 1345 which gave its members more control over the powers of the mayor and a greater role in decision making (Wilkinson and Easterling 1931, 3-31; Wylie 1961, 388). Whilst the strengthening of local government and the receipt of new charters must have helped to restore civic confidence, Exeter could no longer be counted amongst the greatest cities of England. In an estimated ranking of cities by wealth, based on the subsidy of 1334, it is placed twenty-eighth and therefore far poorer than Bristol, for example, with a wealth assessment of £1,900 as compared with Exeter’s £350 (Dyer 2000, 55-6).

Economically weak and with an “administration [which] operated ... within clearly defined limitations” determined by the earl of Devon and the bishop (Youings 1968, 7), the mayor and councillors must have struggled to provide amenities for that area of the city over which they had some jurisdiction (fig.3.15).

The relationship between the city and the Cathedral

In the early years of the 14th century the relationship between the citizens and the cathedral authorities entered a relatively tranquil phase, although some disputes seem to have rumbled on concerning rights of access to the Close, which were settled by agreements in circa 1322 (City of Exeter Misc. Rolls 31, circa 1322; transcribed and
translated by the Historical Manuscripts Commission 1916, 384; John Hooker’s Books f78, circa 1590; transcribed by the Historic Manuscripts Commission 1916, 343).

The bishop had, at least for the time being, established his pre-eminence as both a spiritual and temporal power which was beyond challenge. The new cathedral was being built on an epic scale and when completed it would, Bishop Grandisson wrote in 1327, “surpass every Gothic Church in England and France” (Hoskins 1952, 14). The awesome image screen on the west front (figs.3.19; 3.20) was not only a sculptural masterpiece but also “a perpetual reminder of the indissoluble relationship of church and monarchy, with the lower tier of demi-angels supporting an upper tier of full-length statues of some of the kings of England” (Steane 1993, 20).

**Fig.3.19.** Copper engraving of part of the west front of Exeter cathedral as it appeared in 1794, before the carvings became seriously eroded (Gray 2001, fig.97)

**Fig.3.20.** Part of the west front of Exeter cathedral as it appears today, after some restoration (photograph by the author).
Further disputes between the city and the earls of Devon concerning rights over the Exe and allied matters

In *circa* 1311 the 30’ lock at Countess Weir was blocked by Hugh de Courtenay, earl of Devon. Shipping could therefore no longer reach the city and merchants were compelled to unload their cargoes four miles lower down the river at the earl’s port of Topsham and to store their goods (presumably at a price) in his warehouses. From 1316 onwards this event, together with other alleged wrongs, were periodically examined by inquisitions (City of Exeter Misc. Rolls 3, various dates 1317-1422, transcribed and translated by the Historical Manuscripts Commission 1916, 86-7), although none produced a positive outcome for the city. The earl’s motive for removing the channel is never explained in the records, beyond an accusation by the city council that he had a “malicious mynd” (*ibid.*). The most likely reason was to increase his income from his port at Topsham and, perhaps, also to maximise water power for his mills.

Other grievances concerned fishing rights and the encroachment of the earl onto land running down from Westgate to the river, which the city believed was within its jurisdiction. The citizens’ (fruitless) petition of 1317 claimed that whereas “the water of Exe was common was and ought to be common to any of the citizens to any fishing ... and the sand there deposited by the overflowing of water was and ought to be common to any of the citizens ... for the repair of their houses and other buildings ... [the earl had] reserved and appropriated [these] to himself” (City of Exeter Misc. Rolls 3 i, 1317, transcribed and translated by the Historical Manuscripts Commission 1916, 86).

The construction of a conduit for Greyfriars around 1316 and its up-grade in 1347

The new Greyfriars’ now lay just beyond the city walls proximate to Southgate (fig.3.1). In 1316 the friars obtained a grant from Queen Isabella to take water from a spring inside the city walls. This was to be carried in pipes laid beneath Bolehulstrete to the city walls, from whence it could either go through an opening in the wall or pass beneath Southgate (Magnusson 2001, 48). The spring was described in the grant as being “within a dwelling place of the bishop of Exeter” in Bolehulstrete [Bolehille] (Little and Easterling 1927, 19; *fig. 3.1*) and this could be the one near Palace Gate.
referred to in a deed, *circa* 1398 (Magnusson 2001, 48). However, there is a watercourse in the same area which appears above ground on Hooker’s plan, *circa* 1600 (fi3.13), and therefore either the friars used a different spring or the conduit pipes were later removed to allow the stream to re-emerge. In any event, the spring soon proved unsatisfactory because, in 1347, Edward III made a further grant to enable water to be taken from two additional springs. These emerged from a ditch which lay beyond the city wall between Eastgate and Southgate (now Southernhay) and their water was taken through pipes laid underneath the ditch and then across Quay Street to the monastery (Magnusson 2001, 48). It is not known whether the construction work began immediately on receipt of these grants and therefore, respectively, during the height of the Great Famine and then the Black Death. In the absence of any evidence to the contrary it seems likely that this conduit was for the exclusive use of the monks.

*The building of a new cathedral conduit*

The re-building of the cathedral conduit was a significant development in the history of Exeter’s water supply because it involved a tri-partite agreement, entered into in 1346, between the dean and chapter, the prior of St Nicholas and the civic authority (Juddery and Stoyle 1995, 5). There is some inconclusive evidence which supports the idea that a further party may have been the prior of St John’s (whose priory and hospital lay close to the route of the conduit) because two surspirals and two shafts still exist in the area beneath which any priory fountain would have been sited. A 15th-century document also noted that the prior had the responsibility for keeping the head well of the entire system in repair (*ibid.*). The terms of the agreement are of great interest because of the light they shed on the relationship between the city and the dean and chapter of the cathedral. The civic authority, despite its lack of corporate identity, limited jurisdiction and economic weakness, was considered to be a sufficiently well defined and significant entity to be a signatory to the agreement. The cost and responsibility for the construction and maintenance the conduit was undertaken by the cathedral and in return the city agreed to pay eight shillings a year rental for a one third share of the supply. It further undertook to maintain the subsidiary pipe, which was to take water from the Close to St Nicholas’ Priory and Townwell. If any party broke the terms of the agreement the defaulter had to pay to each of the other parties
the sum of 40d (ibid). The mechanism whereby the water supply was divided into three parts was not explained. Perhaps it was separated into one larger and one smaller pipe at St Peter’s Conduit and again divided within the priory. Although each member of the council retained personal responsibility for the city’s financial involvement, their individual risk was low as the city’s financial contribution and on-going responsibilities were modest. However, as the major contributor to the scheme, the dean and chapter continued to control the supply both at its source and at the termination of the main conduit in the Close.

Fig.3.21. Plan showing the routes of the old and new cathedral main conduits (Allen 2004, 11).

Whilst the agreement represented a new willingness by the city council and the dean and chapter to co-operate over the critical issue of water supply, there remain a number of questions to which no firm answers can be given. The citizens clearly gained from the conduit continuing to supply water to Townwell, but what were the benefits to the dean and chapter? Was it an act of Christian charity or was it because they needed the co-operation of the city to take the conduit through and under civic land and thereafter get ready access to it? Did they no longer want to be responsible for the maintenance of the conduit extension? Was control over an important part of the city’s water supply actively sought by the dean and chapter? Perhaps it was combination of some or all of these possible motives.
Work began on the conduit in 1346 and was completed three years later. The well head for the first cathedral conduit at Headwell Mead was re-built but, instead of following the original route, the new conduit twice crossed the Longbrook valley, proceeded downhill (now Pennsylvania Road and Longbrook Street) and then, using gravity flow, turned uphill to reach the city wall (Fox 1951, 172). It passed through the wall and into the grounds of St John’s hospital. From there the builders created a system of underground passages which conducted the pipes beneath buildings and streets (now Princesshay and Catherine Street) to St Peter’s Conduit where the supply emerged (Kain and Ravenhill 1999, 489-90; Allen 2004, 11). The agreement allowed for a further extension to the priory and (presumably) Townwell, although this does not appear on the suggested route in fig. 3.21. It is possible that the old pipes continued in use but with their maintenance now being passed to the city.

When the well house and well at Headwell Mead were demolished to facilitate the building of the railway in 1857-8, detailed drawings and a plan were made of the remains of the medieval construction (Tucker 1858, 316; figs.3.21; 3.22). The water for well H came from a smaller spring than that for well A and appeared to be, from an examination of the masonry, of “very remote antiquity”. It was a square construction 7’6” deep and had been covered with a heavy elm plank. A lead pipe took the water to the other well, where it entered “beneath the stone platform (Tucker 1858, 314). None of the modern plans of the conduit system shows a second well and its age and earlier purpose cannot be further ascertained.

Fig.3.22. The well house as it appeared in 1857-8. (Devon Record Office and reproduced in Allen 2004, 4).
EXPLANATION OF THE DIAGRAMS.

A. A. Stone building over the well, 11 ft. 6 in. by 10 ft., its foundations resting on an oak platform. It was rebuilt, in 1836, on the original site.

B. Brick well; diameter 3 ft. 6 in., depth 15 ft.

c. c. Puddled clay; depth about 6 ft., 10 feet thick around the well, and resting on the red sandstone rock.

D. D. Circular disc of lead; diameter 10 ft.; into the centre of which a stand-pipe is soldered, conveying the water into the well: the disc rests on a platform of stones, in two layers, diameter 6 ft. 4 in., with radiating and concentric channels.

e. Second spring, covered by a lead disc; diameter 5 ft., with a pipe (r) soldered into it, connecting it with the well (a). The disc rests on a platform of stone, of one layer, with channels on the under surface.

f. Iron service-pipe, laid down in 1836, conveying the water to the Cathedral Yard.

H. Ancient square stone well, depth 7 ft. 6 in., covered with elm plank.

I. Pipe, connecting the well with the spring and well (a).

K. Remaining portion of the original stand-pipe, cut off in 1836.

L. The leaden disc, covering the principal spring, as shown in section at D. D.

M. Platform of Broadclyst stone, laid in five concentric circles, in two layers, the stones channeled on their under surfaces. Upon this platform the leaden disc rests.

N. Leaden disc, covering the smaller spring, and resting on a stone platform (o).

P. P. Red sandstone rock, from which the springs issue forth. A coin of Nero found here.

Q. R. Level of the railway, constructed 1858.

a. a. Position of the original cistern, destroyed in 1836.

b. b. Ancient stand-pipe, ascending into the cistern.

c. Original service-pipe conveying the water to the city, previously to 1836.

Fig.3.23. A sectional plan of the well head design in 1857-8, as drawn by Dawson (Tucker 1858, 316).
The first carefully recorded survey of part of the underground system was in 1931 when some of the original lead pipes were then still in position and running along the floor of the passage (Fig.3.24).

Fig.3.24. A section of 14/15th-century lead piping found in 1931 and now on display at the underground passages visitor’s centre (photograph by the author).

Further excavations in 1950, conducted under the supervision of the Ministry of Works, found part of the conduit system in the area of St John’s hospital (now Bedford Street/Princesshay). The internal measurements of the passageway were 2’ 4” (70cm) wide and 5’ (150) high and had first been dug as an open trench into the natural soil. The next step had been to line the trench with single blocks of Exeter volcano stone (trap) set in mortar and along which a 3” (7.5cm) pipe had been laid. Pottery from the site enabled a date of mid-14th century to be suggested (Fox 1951, 178; fig.3.25).

Fig.3.25. Scale drawings made during the 1950 excavation of the new cathedral conduit. The sewer trench is modern (Fox 1951, 172).
Part of the cathedral conduit, including several suspirals (vent shafts to prevent air locks forming), were again uncovered during recent excavations in Princesshay (figs. 3.26-8).

![Plan of the excavation site in Princesshay, Exeter 2005-6. Scale 1:10,000 (Green 2009, 5).](image)

![A suspiral in the cathedral passage taken from beneath (photograph by Young for Exeter Archaeology).](image)
The new monastic conduit for St Nicholas’ Priory

The last conduit which is believed to have been built during the 14th century was for St Nicholas’ Priory (circa 1387) (Juddery and Stoyle 1995, 11; fig.3.15). The earliest arrangement for the priory supply had been the extension to the first cathedral conduit and it had later been a term of the 1346 agreement that the city authority would take over the responsibility for this branch pipe, which also supplied “the common fountain” (Townwell). If this pipe had not been renewed when the cathedral updated its conduit it could have deteriorated to the point where there were frequent leakages and breakdowns of supply. Conjecturally this could have been one of the reasons why the prior sought a new and independent source of supply.

The route of the conduit started from a well in Paul Street (which had passed into the ownership of the priory) and it is likely to have run along Paul Street to Northgate and thence into the priory (ibid.). Permission was granted by the council for the streets, to be dug up for the laying of the conduit and for the prior to re-open the street from time to time, in order to repair the pipes. He had, however, to reinstate the roads and pavements and compensate any injured pedestrians who had the misfortune to fall into the workings (ibid.). Although it is not known exactly where the well was situated, it would have been within the area where archaeological investigation has shown the land may have been contaminated by metal working, other industrial debris and
waste/cess pits (Collis 1971). Presumably the monks were sufficiently satisfied with the water quality to use this supply.

The building of this new conduit raises an interesting question about Townwell supply. Did the totality of the water from the older pipe henceforth go to the civic well or did the priory have two sources of supply or did the old pipe cease to function? The records do not provide answers, but if the supply to Townwell had wholly or partially dried up, this misfortune could have provided one of the motivations for the building of the first civic conduit.

*Other possible conduits*

Amongst the city archives there are two references to expenditure for the upkeep of a conduit in the Northgate area. One is a note of costs incurred in 1377-8, before the priory’s conduit was built, “for the keeping of the conduit near Northgate” (City of Exeter Account Roll xijd, 1377-8; translated and transcribed by Wright 1862, 314). The later entry, made in 1480/1, referred to monies spent for soldering lead pipes at Northgate, which might relate to the same conduit (Juddery and Stoyle 1995, 11). Thus there may have been another (possibly short) civically owned conduit about which there is no further information. There is also a reference to costs having been incurred “for keeping the conduit near Crikelpit” (City of Exeter Account Roll vjd, 1377-8; transcribed and translated by Wright 1862, 314) but again nothing more is known about it and it may simply be part of the leat system.

*Wells*

The 14th-century conduits were built primarily to provide a limited quantity of clean water for ecclesiastical use. Most of the inhabitants would therefore have continued to rely on traditional sources of water, with wells probably providing the most readily accessible and convenient supply. Although information about the few wells which can be firmly dated to this century is generally inadequate, it is still possible to gain some limited insights into their locations and function.

Two excavated wells have been dated to the later 14th century but the only details of their discovery are notes which accompany the potsherds which are retained in the collection of the Royal Albert Memorial museum in Exeter (Allan 1984, 83). The author
was advised that the notes relating to the discovery itself cannot now be traced. The first was excated around 1950 and is known as Wyman’s Well and was sited “near the western side of St Stephen’s Church close to High Street and may have been at the rear of premises” (ibid). The sherds were found at a depth of 20’ (6.1m) and one piece has been identified as “the upper part of a highly decorated spouted pitcher” circa 1390 (ibid). The second well was discovered at Mr Knott’s house in South Street in 1999 and potsherds were again recovered from the bottom of the well at a depth of 20’ (6.1m) and dated circa 1380-87 (ibid.). The water may have been collected from these quite deep wells by letting pitchers down to the water level, perhaps using a rope. Although the evidence is not conclusive it seems likely that these wells were for private use and that the only (known) public well within the city was Townwell. The poor may also have lost traditional sources of relatively clean water when springs to which they had hitherto had access were taken by the conduit builders.

The management of waste

Some records concerning waste disposal have been preserved and whilst they indicate that these matters were a constant source of concern, prevention seems to have been by bye-law and prosecution rather than any direct action by the council. An examination of the reports of cases heard at the city’s Court of Justice in 1302, for example, found numerous instances of prosecutions for throwing rubbish into the streets and other public places; including certain fishmongers punished for throwing entrails of fish into High Street (Wright 1862, 309).

Court records also showed that public drains and ditches were frequently used as a illegal depositories for refuse. One such was Crolle [Crol or Crulle] ditch into which surplus water from the bishop’s palace grounds was channelled through an open culvert (Lega-Weekes, 1915 98 and Wright 1862 307). This ditch lay just outside the walls where modern Southernhay now passes (Kain and Ravenhill 1999, 488), but when it was excavated in 2005-6, “very little general rubbish from the medieval period was found in [its] vicinity” (Green 2009, 24). One interpretation of that finding was that “the discouragement to desist from tipping refuse had been effective” (ibid.). An alternative explanation might be that rubbish had been cleared out in the post-medieval period; for example during the defensive improvements in the Civil War
period in the mid-17th century (Green 2009, 40). The state of this ditch is further complicated by a contemporary reference to the purchase of a “skylingstole” and payment for its carriage to the Crolleditch in 1385 (Wright 1862, 315). If this item was, as Wright conjectures, a ducking stool then the ditch must have had sufficient depth of water to immerse it. If the ditch had additionally been full of rotting rubbish and excrement the punishment would have been particular unpleasant and potentially injurious to health.

Further malodorous waste came from the indoor latrines which were probably a feature of the larger houses in Exeter in the later part of the century. However, the evidence from both archaeological and documentary sources is limited to a few examples. Thus excavations on the site of a 14th-century house in Milk Street uncovered a latrine, inserted into the wall of the solar, to which entry was gained through a “sort of cupboard door” and a shaft (unannotated reference in Hoskins 1960, 47). Another private house with a latrine was at 2, Catherine Street, where it was situated in the unventilated cellar and accessed by an internal stair-ladder (unannotated reference in Portman 1966, 15). The cathedral accounts also noted the purchase of twelve boards, costing three shillings, for a latrine in one of their tenanted properties (Dean and Chapter Record 5151, 1379-80; quoted in Portman 1966, 15). The gift of part of a house, in 1345, by a mason and his wife to their son-in-law, included “half the solar with a certain latrine in the same” (unannotated reference in Portman 1966, 16).

Other court cases concerned leaking gutters which spilled over from one house onto to the house or garden of the next-door neighbour (Wright 1862 307). Although not a health hazard in itself this overflow must, on occasions, have mixed with lying waste, drained into streams and compounded the problems of water pollution. There is, however, no evidence that rain water was harvested in troughs, either for human or animal use, although it is hard to believe that this simple, ready source of water was ignored.

Whilst these examples provide an insight into the type of environment in which everyday life was being conducted, it impossible to know how widespread the problem of refuse dumping was, how often cess-pits were emptied or where their contents
were deposited. The court cases show that there was a desire to try and keep the city clean by making individuals responsible for removing any public nuisance they caused. However, even if these measures were partially successful, they cannot have been very effective in respect of those whose cramped houses had no land available for cess or waste pits. There was, therefore, probably little the medieval town dweller could do but stoically tolerate the smells from unventilated latrines, unemptied cess pits, animal waste and rotting garbage, until such time as the civic authorities took a more proactive approach.

*Industrial water management*

Although the right to control the Exe had been successfully claimed by the earls of Devon, the city still retained an interest in Cricklepit mill and records suggest that the Exe Bridge wardens utilised the site to maximum financial advantage. In 1349-50, even in the midst of the Black Death, the mills continued to produce for them an annual income of £9 out of a total, from all rents and tolls, of £24.12.3 (Collings 1996, 2). The city also continued to retain its interest in the Duryard Estate which is believed to have been granted to the burgesses by King Athelstan (Freeman 1901, 45). The estate lay about 1.5 kilometers beyond the north-west corner of the city boundary and rose upwards from the east bank of the Exe behind where the university is now sited. The exploitation of a watercourse in this area is evidenced by items of expenditure recorded in the city rolls for 1377-8. These refer to the costs of “turning a watercourse at Duryurd”; “rebuilding of Duryurd Mill” and “the making of a weir”. The last entry does not state a location but it is likely to be connected with the work at Duryard undertaken around this time (City of Exeter Misc.Rolls 6 M 9-12, 1377-8; transcribed and translated by the Historical Manuscripts Commission 1916, 388). If the water course referred to were the Exe, then the city must still have retained some rights over the higher part of the river.

*Exeter at the close of the century*

The overall impression of Exeter at the close of the 14th century is of a modestly prosperous small city which had successfully weathered the major adverse events of the century. It now possessed an established civic authority which, within the constraints of limited income and jurisdiction, maintained the fabric of the city and
encouraged commerce. However, with an estimated population of around 3000, it had about a quarter the number of those living in York and Bristol (Carus-Wilson 1963, 5); had lost its position as one of the pre-eminent cities of Britain and now ranked far behind the great merchant ports of England (Kowaleski 2000, 476-485).

3.5. Exeter 1400-1540

Historical Introduction

The extent to which British towns suffered a serious decline in the late Middle Ages is a complex issue upon which historians fail to agree. The consensus seems now to be that whilst numerous towns and cities in England and Scotland, including large regional centres such as York, Coventry and Norwich, all sustained economic contraction others, such as Exeter, expanded; especially in the latter part of the 15th century (Dobson 2000, 284-5; Dennison and Simpson 2000, 730). Exeter’s growth was fuelled by a welcome overseas demand for finished coarser wool cloth and, as the focal point for this trade and itself a cloth producer, the city “enjoyed an unprecedented boom [and] ... a big increase in population from migration”, particularly between 1480 and 1510 (Dobson 29-30).

Exeter was fortunate that during the Wars of the Roses (1455-85) neither the fabric of the city nor its economy were seriously damaged; perhaps because the council was pragmatically prepared to support whichever monarch was on the throne. Loyalty to the reigning monarch also brought practical benefits to the city. Thus in 1463 Edward IV granted the city the important and valuable right to receive all fines and confiscated property of felons convicted by the city courts (City of Exeter Royal Charters and Letters Patent XXVIII, 1463; transcribed by the Historic Manuscripts Commission 1916, 2; translated by Youings 1974, 6). The money received was said to have been used to pay for the front and chapel of the new Guildhall in 1466 (Lloyd-Parry 1936, 11). When the king visited Exeter in 1470 he was given a lavish reception during the course of which the mayor symbolically handed him the keys of the city and the ceremonial maces, which were then duly handed back (Hooker cited ibid. 8-9).

During the uprising of Perkin Warbeck in 1497 the city again supported the king (Henry VII) and initially held out against the imposter’s forces (ibid.15). Although the rebels eventually broke through Eastgate and burned down Northgate they fled at the
approach of Edward Courtenay (Hooker cited by Oliver 1861, 86). In recognition of the citizens’ loyalty the king visited Exeter in 1497 but, on forming the opinion that the city was not being well run, he ordered a review of the constitution of the council. Accordingly in 1509, by a writ of privy seal, new arrangements were put in place so that henceforth the city would be administered by a permanent council of 24 life members (aldermen) selected from the “most sufficient and discreet citizens” (Youings 1974, 7).

The council’s powers were further increased in 1535 when the mayor and aldermen were granted the right to sit as justices of the peace within the city and in 1537 this jurisdiction was expanded to include the newly formed county borough which had come into being in the same year (City of Exeter Royal Charters and Letters Patent XXXII; XXXIII, 1537; transcribed and translated by the Historical Manuscripts Commission 1916, 2; MacCaffrey 1958, 27). There were, however, still two separate entities, the county of Exeter and the “mayor, bailiffs and commonalty”. It was not until 1550 that this second entity, whose functions and jurisdiction had hitherto been ill-defined, was finally granted formal incorporation to became “one body perpetual and incorporated and one commonality in manner and name” (Youings 1974, 7).

The first civic conduit 1420-30 and improvements to it 1430-50

Despite the political, administrative and financial limitations suffered by the council its members were nevertheless prepared, at the beginning of the century, to embark on a bold and costly scheme to provide a civic conduit for the benefit of the citizens. At least some of the impetus seems to have come from individual merchants who, as prominent local citizens and council members, were in the habit of leaving part of their personal fortunes (albeit only a small percentage) for a variety of public schemes which were to be administered by the city; such as the repair of bridges and charitable relief for prisoners and the poor (Lepine and Orme 2003, 129). A bequest in 1411 was, however, unusual because Simon Grendon left £20 in his will “to conduct water to the Carfax [a junction of cross roads in central Exeter]” (Juddery and Stoyle 1996, 9).

Two years later £10 and the income from a croft were bequeathed by William Wilford for the purpose of “erecting and maintaining a conduit” (Juddery and Stoyle 1996, 9). There was, however, no such conduit in existence, so presumably the possibility of
such a venture must have been mooted because otherwise these legacies make little sense. According to Hoskins (who does not cite his authority) this benefactor had acquired his fortune when the ship of which he was part-owner raided the Brittany coast and seized large quantities of oil and wine (1960, 39-42). In 1420 a further legacy came from the estate of John Talbot, another wealthy citizen, who left the profits of a house (the Eagle) on High Street towards the costs of “conducting” the city’s conduit and the maintenance of its pipes and cisterns (Juddery and Stoyle 1996, 9).

These testators must have had confidence that the council would embrace a scheme which would be far more adventurous than anything which it had previously undertaken. Although the city’s records for the later years reveal a willingness and ability to embark upon larger building and water management schemes, including the re-construction of the Exe Bridge (City of Exeter Misc. Rolls 6 M32-3, 1388-9; transcribed and translated by the Historical Manuscripts Commission 1916, 388), nothing on the scale of a conduit had hitherto been attempted. Why some of the more wealthy freemen were motivated to organise, and partially fund, the construction of a conduit is a fascinating question to which there are no easy answers. One might have supposed that the civic leaders would have been reluctant to embark on a scheme which involved complex organisation, serious practical difficulties and personal economic risk; but the benefits to them and the city must have outweighed the disadvantages. Perhaps the one-third supply from the cathedral conduit to Townwell was no longer working satisfactorily and an alternative source needed to be found, preferably free from ecclesiastical control. Interestingly one of the council members was John Shillingford who later led the city’s legal defence against the cathedral’s claim to exclusive jurisdiction over the Close. His early support for the civic conduit was recorded in a receiver’s roll of 1422 which noted that he had received £4 “as his bonus for making a new water conduit” (Curtis 1932, 74). The initial problem for the conduit planners would have been to find a site for a head well and then obtain easements across land outside the city walls, over which the city had no jurisdiction. The spring which was selected was in Cake Lane, very close to the cathedral’s head well. Whether it was with the cathedral authorities or some other person that the city council had to negotiate to obtain rights over this water source is not known.
However, there was an agreement made with John Hull in 1420, whereby he allowed the city to build a trench for the conduit over his land, which lay to the east side of Longbrook Street (Juddery and Stoyle 1995, 9). Various mayors and other civic dignitaries with the surname Hull appear in several documents around this time (Oliver 1861, 230; 235). It is therefore likely that the signatory to the agreement was one of the city’s elite who was a supporter of the scheme and therefore willing to provide the necessary easement.

The pipe was carried in a buried trench until it reached Eastgate where, after crossing the route of the cathedral pipes, the city ditch was traversed using a hollowed out tree trunk to carry it over a spanning bridge with stone abutments at either end (Juddery and Stoyle 1995, 13). Solid masonry in the bridge abutments was removed and, in the voids created, two hollow stone chambers were built through which the pipes passed. A door, which is still visible from the underground passages, was provided to facilitate maintenance from ground level (Fig. 3.29). The design of the gun ports in the structure makes 1420 a “perfectly plausible” date for its construction. (Juddery and Stoyle 1995, 13).

![Fig. 3.29. The former entrance to the small inspection chamber below Eastgate as it presently appears in the underground passages (photograph in Allen 2004, 17).](image)

The pipes continued along a narrow tunnel bored through the solid masonry of the abutments and one of these pipe routes has been preserved in a re-used block of some in underground passages (Fig. 3.30). Once within the city walls the conduit continued beneath the edge of High Street until it emerged at a cistern near St Stephen’s Church (Exeter Urban Archaeology Database 1999-2000, 11201.00).
Around 1429/30 the system was improved by adding a further source of water from a new head well, close to the earlier well head, and known as Higher Well (Juddery and Stoyle 1995, 10). The improved water supply enabled the conduit to be extended to the Carfax, which may have been its intended termination point when the plan was first mooted. The original Carfax conduit was replaced in 1534-5 but its position remained unaltered. There was also an intermediate stand pipe built at the Guildhall (Exeter Urban Archaeological Database, 1999-2000, 11201.00); presumably for the benefit of the burgesses and other users of the building.

It is likely that the three “houses” of the New Conduit, referred to in the receiver’s accounts for 1463 as each possessing a lock and key, were the buildings which contained the Carfax cistern, St Stephen’s cistern and the well head at Cake Lane (Juddery and Stoyle 1995, 10). As there was no public access to the head well this house may have been locked most of the time but the other conduits would doubtless have been locked at night, as was the case in other cities.

In 1440-1 further improvements were undertaken which may (as records of the nature and cost of the work suggest) have involved the entire system being taken up and re-laid, perhaps in order to replace the original pipes with those of a larger bore (ibid.). Part of the cost was paid from a collection from the citizens totalling £84, a large amount at a time when a labourer’s wage was around £5 a year (Hoskins 1960, 42) and which might be an indication of the popularity of the conduit.

One particular interesting aspect of this work is that it was undertaken in collaboration with Blackfriars; possibly to assist with the cost and to benefit from monastic
expertise. The reasons why the friars abandoned their conduit (which was supplied from the Podewille spring) is not known, but presumably it was malfunctioning. A discussion between the parties took place on February 10th, 1440 (or possibly 1441) and was attended by a lead worker from London. The city also paid 13s. 4d. to Friar Robert Cole for his expenses in riding to London “about the business of the aqueduct” (City of Exeter Misc. Rolls 19-20, Hen.VI; cited by Little and Easterling 1927, 38-9). Why the parties went to the considerable expense of seeking assistance from Londoners is unknown, but perhaps it was because of the expertise which these craftsmen had acquired when building the capital’s many conduits. Another curious aspect of this collaboration is the possible involvement of the Courtenay family, who had lodgings at the friary and who, it has been suggested, may have been benefactors of the project (Little and Easterling 1927, 39). This conduit was completed by 1449, as this was when the city engaged a plumber to attend to its maintenance as and when necessary (Juddery and Stoyle 1995, 11).

Litigation between the city and the bishop of Exeter 1432-14

Whilst apparently co-operating successfully with Blackfriars over the installation of the new conduit, the council’s relationship with the cathedral authorities had again deteriorated and it reached crisis point in 1445-8. Although the dispute between the parties related primarily to the long-standing jurisdictional problem of the cathedral as an independent entity within the city, an outline of the events gives a context to other developments within the city at around the same time.

Renewed hostilities seem to have broken out in 1432-3, when the bishop brought an action against the city for an infringement of his liberties in connection with St Sidwell’s fee (the particulars and outcome of this case are obscure). The legal costs of £25.12.6. were claimed to have been so heavy that the city was unable to pay the part of the fee farm due to the prior of Holy Trinity, London (Moore 1871 xiv; Curtis 1932, 20). Unfortunately for the city a further lawsuit was initiated in 1444 by the bishop, dean and chapter against the “maier and comunalte” (ibid.). The city was still unincorporated and the mayor, John Shillingford, was therefore in a particularly vulnerable position as one of the named defendants. The complaint involved an alleged assault on a servant of the cathedral’s chancellor. The assailants had been
trying to effect an arrest of the victim, on behalf of the city authorities, within the cathedral precincts and thus, it was alleged, in an area outside the city’s jurisdiction (Moore 1871, xiv; Curtis 1932, 23).

The following year the case was heard in London by the Lord Chancellor and most of the parties’ respective written submissions have been preserved, together with the letters of the mayor, John Shillingford, who conducted the case on behalf of himself and the city. The surviving court documents and his letters show that he employed considerable vigour and determination, which seem to have pleased the Lord Chancellor, who adopted “an indulgent attitude” towards him (Moore 1871, xx). However, the complexities of the arguments led to the Judge urging the parties to settle out of court. The agreement which was ultimately reached was largely in favour of the bishop, who retained his independent jurisdiction and immunities but with some minor concessions to the citizens (Curtis 1932, 41). Although the agreement lasted until the Reformation, from the city’s perspective the outcome was a costly failure and a serious set-back to its ambitions (ibid. 43).

Notwithstanding all these upheavals and the cost of the litigation, the city was still able to continue the conduit improvement work undertaken in conjunction with Blackfriars. However it may be that one of the immediate consequences of the litigation was the inability of the council to find £2000 for the urgent repair of Exe Bridge, for which cause Shillingford raised money by soliciting donations (City of Exeter Misc. Rolls 3 vi 1447; transcribed and translated by the Historical Manuscripts Commission 1916, 86; Oliver 1861, 60). Perhaps as a way of healing the rift with the city, Bishop Lacy instructed “all the faithful” not only to earn indulgences by contributing to the cost of a new belfry for St Edmund’s church on the bridge but also assist with “the repairs, reconstruction and maintenance of the bridge itself” (Regulations vol.iii. folios. 307-317; translated and cited in Oliver 1861, 60).

By 1451 the parties seem to have composed their differences sufficiently to join together in welcoming Henry VI to the city. The civic leaders had, by the mid-15th century, acquired sufficient status not only to participate in the religious pageantry but also to be permitted to devise ceremonies of their own. These, interestingly, culminated at the Great [Carfax] Conduit (marked “R” on fig.3.33) which had been
draped with expensive decorated cloth and from which wine flowed from two lead cisterns which had been concealed inside it (Oliver 1861, 80; Juddery and Stoyle 1995, 11). Although no description of the design and appearance of the conduit has been preserved it is known, from account records, that there was built for it a “substantial stone cistern” (ibid.) and perhaps this held the lead cisterns full of wine; the normal water supply having been somehow diverted.

Improvements to the city conduit 1450-1540

The funding of the first civic conduit had been a co-operative venture between the city council, the citizens (by personal donations and public subscription) and Blackfriars. This pattern of joint funding continued as improvements and extensions to the system were undertaken. Two private citizens, one a saddler and one a former mayor, made donations to the city in 1450 and 1461: one gave land near Cake Lane, so that a new spring could be tapped there, and the other paid for a lead roof for the Carfax conduit house (Juddery and Stoyle 1995, 12-13).

However, general repairs to leaking pipes and other parts of the infrastructure were paid for by the council. For example, the cistern at Headwell was raised in 1483/4; Little Conduit House at St Stephens was refurbished in 1487/8 and Townwell was re-built in 1488/9 (ibid.10). Was Townwell (which was not part of the civic system) therefore still receiving supplementary water from the cathedral conduit’s extension to the priory, even though the priory had long since built its own supply? Alternatively was the well’s original supply (which was presumably an underground spring) enhanced by another conduit of which all trace has now been lost?

It is possible that the conduited water supply (which was still being shared with Blackfriars) was, by the mid-1480s, proving inadequate to cater for the rapid increase in the number of the city’s inhabitants and visitors. The pipes for the first civic conduit had, perhaps for reasons of economy and simplicity of construction, been laid in earth-filled trenches which ran beneath busy streets (ibid.). This made them vulnerable to ruptures and leaks and gaining access to them for repair could be troublesome; so probably the time had come to construct underground passages for parts of the conduit. The growing prosperity of the city may have now put the considerable cost of
this venture within the financial ability of the council and perhaps also there was a desire to emulate, or even surpass, the cathedral scheme.

The first part of the work was probably begun in 1492/3 and involved the replacing of the existing small tunnel (which carried the pipes through Eastgate) with underground passages or vaults. The vault is believed to have been built within Eastgate and to have been about 18m long (ibid. 14). Part of the structure was excavated and recorded by members of Exeter Excavation Committee in 1931 (fig. 3.31). On leaving Eastgate the vault passed under the High Street for about 17m and possibly terminated in the area of the Chapel of St John and St Bartholomew’s church (ibid.).

![Sketch plan showing the remains, found in 1931, of the complex conduit system beneath Eastgate, installed in 1420 and up-graded during the 1490s (Exeter Excavation Committee 1931, plate 4).](image)

At about the same time, and again in collaboration with Blackfriars, a further head well was chosen at a site referred to in contemporary documents as “Marepoll” and which probably lay somewhere along Longbrook Street in the area of Marypole Head (Juddery and Stoyle 14; fig. 3.33). Details of the agreement have been lost but there is an entry in the city’s account rolls for 1493/4 recording a payment of £1 to a Ralph Hyll for a grant of land (presumably an easement) through which the new conduit (known as the Little Conduit) was to pass (ibid.15). The spring water was channelled into a new cistern and brought through new pipes (which may have been laid using the same infrastructure and route of the earlier city conduit) along Longbrook Street to Eastgate. To assist the flow the vault inside the gate was lowered about a metre so that in lined
up with a new second vault. This had been built outside Eastgate in 1495-7; possibly to accommodate the new Blackfriars’ Conduit and possibly to facilitate access for maintenance (ibid).

Having entered the city the conduit went along the High Street with a subsidiary pipeline running to the friary along Bickleigh Lane (later known as Bampfylde Street). The short stretch of underground passage leading from the end of the lane and beneath the gateway to the friary was probably built at this time to facilitate access for repairs. Once within the precincts the pipes were linked up to those of the existing ones and the aqueduct probably ended at a secure well house for which a key was bought in 1524/5 (ibid. 15 & 16). A new civic conduit house was built to the east of the old St Stephen’s Conduit (which seems to have fallen into disuse) at a cost of £5. 6. 0. and was completed around 1501/2 (ibid.). It probably appears on Hooker’s map as the small building close to St Lawrence’s church (fig. 3.32).

Whilst the civic conduit houses were doubtless designed to fulfil a functional purpose, their aesthetic appearance was not neglected. The city’s receiver’s rolls for 1487/8 note the cost of purchasing and transporting stone which was to be carved into stone figures to be erected at the Little Conduit (ibid. 16). Unfortunately no evidence of the appearance of these carvings has survived.

Further new vaults and extensions of the passageways are recorded as having been paid for on various dates between 1524 and 1538, so that eventually they may have reached a point about 34.15m east of St Stephen’s church. Additional short stretches of passageway were built near the Guildhall and by St Stephen’s church, probably to
aid access for repair to problem areas, but these were not linked into the main system (ibid. 16).

Fig.3.33. Reconstructed plan of all the conduits believed to have been in existence circa 1500 (Kain and Ravenscraft 1999, map 61.9).

A rescue excavation undertaken in 1950 led to uncovering and recording of parts of the underground passageways around the area which is believed to have been their terminus and from whence the conduit proceeded to Carfax along a simple earth trench (ibid. 16). The excavated part of the tunnel measured 5’ (1.54m) in height and 3’ (0.92m) wide and lay close to a manhole which lay about 3’ (0.92m) to the west (Fox 1951, 174-5). This section was built using single blocks of Heavitree stone and was roofed by a segmented arch. The original floor had been removed but as no damage to the surviving stonework could be seen it was concluded that the lead pipes had been laid on clay (ibid. 175).
As the tunnel was buried in clay soil (unlike other parts nearer to Eastgate which had been tunnelled through rock) the archaeologists concluded that it had probably constructed by first digging an open trench at least 12’ (3.7m) wide and in which the workman could stand to build the stone walls (Fox 1951, 176; fig. 3.34).

*Fig.3.34. Cross section and plan of the High Street conduit drawn on site in 1950 by the city engineer and surveyor (Fox 1951, fig.2).*
The final major work on the civic conduit system took place in 1534/5 when Great Conduit at Carfax was re-built in Dartmoor stone at a cost of almost £50 and with a new lead cistern and roof. Ornamentation included eight iron crosses, the “vanys” of which were gilded with £5 of plate (Juddery and Stoyle 1995, 31). The word “vanys” in this context might be derived from the Middle English word *fane* meaning a banner rather than weather vanes (Oxford English Dictionary 2001, 1585). More is known about the appearance of this edifice as engravings have survived which show it around the time of its demolition in 1770 (fig.3.36). Moreover Jenkins, writing in 1806, described it (either from his own recollection or that of others) “as a beautiful edifice ... decorated with pinnacles in four corners, on which were (anciently) vanes: but they had long since fallen victims to time, and weather; also niches in the East and West fronts, in which were mutilated statues. On the top of the architrave, at the corners, were two lions and two unicorns ... It was likewise adorned with cherubs and armorial bearings, which were much injured by time, that only those of the Courtenay family could be distinguished” (214-5). It is possible that the mutilated statues were religious figures which had been deliberately attacked for this reason (perhaps in the Civil War) and the presence of cherubs, together with the iron crosses mentioned in the earlier
text, suggest that religious symbols had been an important part of the decoration. The Courtenay coat of arms is also likely to have been an original feature as the family fell from grace in 1539 and, despite the history of the acrimonious relationship of the city with the earls of Devon, the city council must have considered it prudent to include their emblem.

Figs. 3.36; 3.37. Two engravings of Great Conduit made shortly before its demolition in 1770 (Gray 2002, 10 and Jenkins 1806, 215).

Wells and other sources of domestic water supply

Although some 15th- and early-16th century medieval houses have survived many early features have been destroyed or incorporated into later building work, so that an accurate reconstruction of the original design of a house, its infrastructure and water supply is rarely possible. Some elite houses probably had their own wells and a study of Exeter houses 1400-1700 cited examples in courtyards at 10, The Close and 166, Fore Street and wells in cellars at 17, Cathedral Yard; 4, The Close; 16, Cathedral Yard and 47, High Street (Portman 1966, 17). These wells were stated to have been generally “about 10’ (about 3m) deep”. However this information was taken from Hoskins who did not reference his sources, although he claimed to have seen the (undated) well in the cellar of Messrs. Commins’ shop in the Close (Hoskins 1952, 5). The well at the Well House Tavern in the Close still has an (undated) well within the premises.
There is one detailed survey of a house which began life in the later medieval period. This was undertaken in 2006 at 2, Broadgate (near the former main entrance gate into the Close). The property had undergone many alterations over time but it was still possible to identify some of the original features, including the site of the three storey, early 16th century, house belonging (probably) to the high status Wilsford family (Foster 2007, 240; fig. 3.45). Although the cellar was excavated, no well or evidence of any pipe work is mentioned in the report and the cramped nature of the site would have probably precluded any well in an outside space near the property.

There is better archaeological evidence for private wells being a feature in buildings designed for communal living, such as monasteries, hospitals and almshouses. In 1945-6 two wells were uncovered, one proximate to site of the Vicars Choral college in Kalendarhay, South Street and one within St Catherine’s almshouses (Fox 1952, XVI and XX). The Vicars’ Choral hospice and chapel were possibly built about 1387-8 and were certainly in existence by 1422 (Lega-Weekes 1915, 49). In the Obituary Book of the dean and chapter an entry dated 1497 referred to the great expense incurred in bringing water to the hospice after “a licence [had] been obtained from the dean and chapter for the making of the aqueduct and well” (cited by Lega-Weekes 1915, 49). If the well discovered in 1954 was that referred to in the document it suggests that water for it may have been obtained from the cathedral conduit. No details of the well are given in the site description but from the plan it appears to have been circular with a diameter of just under a metre (fig.3.38).

St Catherine’s almshouses and chapel were first built around 1450 and a stone well lay in the north wall of the courtyard. This was approximately 1m square and it was excavated to a depth of 6’ (1.85m). Although stated to be medieval no further information appeared in the site report (Fox 1952, 46). The site of the well can still be seen and its position and external measurements accord with the plan (figs.3.39; 3.40).
Fig. 3.38. Plan showing the site of the medieval well of the Chapel of the Vicars’ Choral (Fox 1952, plate XVI).

Fig. 3.39. Plan showing the site of the medieval well of St Catherine’s almshouses (Fox 1952, plate XX).

Fig. 3.40. The well as it appears today looking from Catherine Street towards the Chapel (photograph by the author)
Wynard’s hospital in Magdalen Street is believed also to have had a well within the precinct since about the time it was built, circa 1435, by the Recorder of Exeter (Hoskins 1960, 43, but no authority given). The site of a well, now covered over and protected by a post-medieval well house (possibly dating from the reconstruction of the property in 1856) gives a general impression of how the courtyard may once have appeared (fig. 3.41).

A capped well also still exists in the courtyard off the much renovated, but originally Norman, kitchen of St Nicholas’ Priory; but as no information about it appears in the literature outlining the history of the priory, its later medieval date is conjectural.

During the recent rescue excavations (2005-6) undertaken prior to the Princesshay re-development (fig.3.26), a medieval well was found in the area of Blackfriars’ monastic complex (Green, 2009, 33). The pottery fragments (which exceeded 3000 pieces) had, by 2009, been partially analysed, with 50 vessels having been re-constructed including several 15th-century jugs (Green, 2009, 33; fig.3.42). The presence of these broken water jugs suggests that the well was in regular use long after the friars first had a conduit in the 13th century, but the extent it continued in use after the new conduit was installed in the mid-15th century is unknown. An alternative explanation is that broken jugs had been deliberately thrown in the well when it was closed; perhaps when the new conduit came on stream. This would account for the presence of such numbers of high quality decorated table ware being found in the well, as one would not have expected the friars to use such fine vessels for water collection. A more
appropriate way would surely to have let down a bucket or large coarse pottery pitcher.

Fig.3.42. Two of the reconstructed jugs found in the Princesshay well and now on display in a cabinet at the Underground Passages Visitors’ Centre. Exact dimensions unknown but they have an estimated height of 20-25cm (photographed behind glass by the author).

Because so few wells which can be firmly dated to the study period have survived to the present day it is impossible to estimate their numbers and distribution patterns, but the position in the late 15\textsuperscript{th}/early 16\textsuperscript{th} centuries is likely to have been similar to that appertaining at the time Hooker was writing in the late 16\textsuperscript{th} century. With, perhaps, a degree of hyperbole he described Exeter as “sett upon a little hill amonge many hills [which] ar commonlie drie yet nature is so beneficial to this little hyll that it is in everie quarter full of water springe: and by that meanes the whole Citie is throughlie furnished w\textsuperscript{th} wells and Typitte (deep wells or pits)” (transcribed by Harte 1911, 30). He also explained that these wells were so abundant that even when the city’s conduits were cut off during a siege in 1549 they were able to satisfy the people’s needs. Whilst this may be a broadly accurate statement it seems to imply that all the wells were sourced from ground water, whereas some (probably only a small proportion) were a fed from conduits.

It is likely that the Exe also continued to provide an important source of portable water, although for what precise purposes it was used is not known. However there is some evidence (albeit later than the close of the study period) that it was used domestically because, in order to provide piped water to private houses, a large water engine was built on the Exe at New Mill Leat in 1695 (Oliver 1861, 149). Even if the water was sourced upstream to limit pollution there must have been a high risk of that some contaminated water would get accidently ingested.
Whilst it is impossible to know whether well and river water was habitually used for cooking there is some evidence to support the view that water from wells may have been considered inferior to that from a conduit. Hooker made an interesting comment about the quality of the conduited waters which were, he wrote, “of most pryce because by the carriage thereof theye ar purified and made lighter, than ar the other waters springing wthin the Citie: and by that means more meete for dressing of meate” (Harte 1911, 31). Meat in this context possibly meant food in general. As there had been no major developments in understanding about water-borne disease it is likely that the opinion he was expressing was one which had appertained in the later medieval period. One would therefore have expected the elite to have had this valued commodity piped into their houses and although there is no evidence that this was the case during the 15th century, there are the examples (previously quoted) for earlier dates and Hooker also recorded that, in the late 16th century, water from St Peter’s Conduit was supplied “to sundrie of the Cannones howses as also of late unto the Bishhopes howse” (ibid.39).

Waste disposal and water pollution

One of the difficulties in assessing just how insanitary the living conditions were is the inclination of medieval writers to exaggerate in order to bolster a point of view. On the one hand Hooker described the late 16th-century city as “verie pleasaunte” because it sloped towards the south west so that “be the streete never so foule or filthe: yet wth a shoure of rayne they are cleansed and made sweete” (transcribed by Harte 1911, 30). On other hand a very different account of the state of a street around the area of Blackfriars was contained in an indenture document of 1458, part of which reads (in translation from the Latin) as follows: “It often happens that by reason of rain water and other waters issuing from the hospital of St John the Baptist and from places intermediate ... and running down [Chapel Street] ... those waters, owing to obstruction, swell and spread into a great marsh ... and owing to their longstanding, as well as owing to the mud and filth that is borne along even by the attrition of the waters in their descent, and sometimes owing to dead bodies cast into them, become fetid and corrupt the air, so that it becomes a serious source of harm, and danger of infection, to those who happen to come that way” (ibid.169). In order to remedy the problem the cathedral precentor, after much negotiation with the city council, agreed
to fund “out of his own pence and others” the removal of “putrid matter” from the area and build a stone gutter to channel the water through the city wall and into the city (Crolle) ditch (ibid. 37-8). Although this agreement removed what was perceived to be the health risks caused by the vapours emanating from the stagnant pond, the polluted water still ended up in the city ditch from whence at least part of it might have ultimately found its way into the Exe.

The Shillingford papers provide another source of contemporary information about the problems of inadequate waste disposal arrangements in the mid-15th century which were caused partly by jurisdictional divisions within the city. Although the examples he chose were specifically designed to support the defence case and were vehemently denied, the descriptions provide a graphic, if perhaps overstated, picture. In Article VII of the mayor’s “Complaints” against the bishop, dean and chapter, Shillingford set out an account of the recurring problem at the end of Freren Lane, near Southgate, where there was a locked postern gate in a tower in the city wall. He alleged the bishop, dean and chapter had, on more than one occasion, “right spyefully broke up” this door and then used the space in the tower to deposit “donge and myche other ungodly thynge” (Moore 1871, 87-8). Further causes of complaint against the clergy appeared in Article VIII. This described further incidents which also occurred in Freren Lane, onto which abutted the backs of several of the canons’ houses. Back doors had been built in these properties without “license of the Maier and Comminalte”, who owned the Lane as part “of theire fe ferme and wey to the towne wallis for the repair of them”. Through these doors, it was alleged, “moche erthe robill and donge and other fylthis of their places” was carried out into the lane, which was thereby rendered so dirty “that no man ther yn may well ride ne lede carriage to the wallis”. Another grievance related to the gutter which ran down this lane and which was intended to take “reyne water and other of Strike street and of many other divers placis and mansions grete”. It also passed alongside the houses of certain (named) clergy who, for reasons unspecified, were said to have broken the gutter and removed the stones so that the gutter ceased to function, thereby causing “grete hurte and noysaunce” to the citizens (ibid.).

Open gutters like the one described by Shillingford probably ran down the centre of most paved streets although few have survived. However one such feature can still be
seen at Stepcote Hill, which uniquely in Exeter retains many of its medieval features. Although doubtless repaired and restored over time it still gives an impression of the design and appearance of a medieval street (figs.3.43; 3.44).

Figs.3.43; 3.44. The drain which still runs down the centre of Stepcote Hill. The run-off would have emptied into the nearby Exe, which was closer to the end of the street than its present course (photographs by the author).

Garderobes continued to be a feature in some of the more elite properties although they are believed to have declined in popularity after 1500, when timber–framed houses became fashionable (Portman 1966, 16). The remains of one early 16th century example were found built into the 1m thick walls on the second floor of 2, Broadgate (Foster 2007, 240; fig.3.45). Presumably the waste was collected in a cess pit in the cellar from where it would have been periodically emptied. As there was no sewage treatment the contents would either have ended up as garden manure or been buried in a pit or possibly thrown in the Exe.
Fig.3.45. Section of the existing building at 2, Broadgate showing the position of the 16th century garderobe recess on the first floor (plan by Exeter Archaeology in Foster 2007, fig.2).

As well as polluted water draining into it from the city the Exe also became the repository for untreated sewage which was deliberately emptied into it from two public latrines. One is said to have been built around 1467 on Horsepool Bridge over a leat near Edmund Street, which lay just outside the city wall on the south side of Westgate (un-annotated reference in Hoskins 1960, 47). Another latrine is believed to have been placed on Exe Bridge, perhaps when it was rebuilt in the mid-15th century (Gray 2002, 3). Known as the Pikshay, Pixey or Fairy House it was described by Jenkins in 1806 (some 40 years after its demolition) as having been “an open space ... in the centre [of the bridge], where a doorway, and a flight of steps ... led to a long, vaulted room” (Jenkins 1806, 216). This is visible in the print accompanying the text and situated in the pillar between the rounded and pointed arches (ibid. 217; fig. 3.46). The remains of the latrine site can still be seen today (figs. 3.4; 3.48).
Fig. 3.46. Part of a print (undated) which shows the Old Bridge before its demolition in 1770 (Jenkins 1806, 217).

Figs. 3.47; 3.48. The remains of the Old Bridge where the waste exit for the latrine appear still to be visible (photographs by the author).

Another important contaminant of the river came from waste liquid deposited from the growing number of fulling mills; although many of these were situated lower down the Exe and therefore away from the convenient river access points at Westgate and Watergate (Collings 1996, 5).

River management and the continuing dispute with the earls of Devon

Either shortly before, or in the early part of the 15th century, the Lower Leat was cut through Exe Island to the south of Higher Leat, crossing land reclaimed from the river after the construction of the Exe Bridge. It followed a winding course over a distance of about 720m (Exeter Urban Archaeological Database 199-2000, 11551.00), re-joining the river about 120m upstream from where the Custom’s House now stands. Several mills were built along the new leat in the 15th century including Weeke’s Mill and Edge Mill, which may have been fulling mills, and Bonhay Mill and Cuckingstool Mill which
may have been corn mills (Collings 1996, 7). These were probably built by the earl as he owned (or claimed to own) this area of river bank. The city therefore had to maximise the limited opportunities afforded by their mills at Cricklepit and it was recorded that £77.4.6 was spent on rebuilding and repairing the complex between 1414 and 1416; presumably to improve their letting potential (ibid.). It is possible that the city also owned or leased Andrew and Palmer’s fulling mills on Higher Leat, as there is a reference to them in the Exe Bridge Wardens’ accounts for 1452-1553 (ibid.3). The dating and purpose of all the Exe mills which were in existence at the close of the study period is a subject which is outside the ambit of this study but a plan, reconstructed from a detailed study of the history of the later medieval Exe mills, summarises their distribution along the leat (fig.3.49).

![Reconstructed plan of the mills on Lower and Higher Leats 1452-1651.](image)

**Fig. 3.49. Scale 1:1250. Reconstructed plan of the mills on Lower and Higher Leats 1452-1651.**

Cricklepit1-4; Andrew and Palmer 5; Weekes 6. The line of waste water is the probable route of the channel returning water to the Exe (Collings et al 1996, fig.3).
In 1442 the city sent another petition to the crown (Henry VI) requesting him to restore their right of navigation on the Exe and retelling the account of its loss at the hands of Hugh Courtenay (City of Exeter Misc. Rolls 3 XVII, 1422; transcribed and translated by the Historical Manuscripts Commission 1916, 386).

Once again the petition failed to be acted upon and in 1445 the earl obtained, from the same king, a grant “of the conservancy of the river Exe” (City of Exeter Misc. Rolls 91, 1445, translated and transcribed by the Historical Manuscripts Commission 1916, 405). However, when Thomas Courtenay was beheaded for treason by order of Edward IV, the city seized the chance to make yet another petition to the king seeking redress, but this also went unanswered (cited by Clew 1984, 3). The grievance rumbled on and a document in the city’s archives from the time of Henry VII contains (for reasons unknown) “a rememberance of certayne maters consernyng the Porte of Exeter, the stoppyn of the Rever of Exe that shipps and vessels coyd not resort to the Cetie” (City of Exeter Misc. Rolls 92, 1445; transcribed and translated by the Historical Manuscripts Commission 1916, 405). Finally in 1539 the attainder and execution of the earl gave the city the opportunity to right this long-held grievance. Losing no time the city translated and transcribed by council, in the same year, petitioned not the king but Parliament for the right to “plucke downe, ... [all] noysaunces whatsoever they be
in the saide river ... and make all other things requisite ... whereby the said shippes ... may have their sure course and recourse ... to and from ... [the] cittie “(cited by Clew 1984, 3). This time the request was granted and an Act of Parliament, in the terms sought, was passed and given the royal assent. In fact the city council decided to leave the river unaltered and to build a navigation canal instead, which, after some false starts, was eventually put in hand in 1563 (Oliver, 1861, 249).

The grant of conservancy of the Exe to the earl in 1445 seems also to have been set aside around 1539 as there was a note appended to the original record that the grant was, on the attainder of the earl, declared to be void (City of Exeter Misc. Rolls 91, 1445; transcribed and translated by the Historical Manuscripts Commission 1916, 405).

The Reformation and beyond

The Reformation finally destroyed the power of the city’s main rivals for control over its water management. The earl of Devon had forfeited his rights over the Exe and the monastic water conduits had passed into the hands of the city (now an incorporated county borough). Although the cathedral retained its own conduit, the bishop had lost any power he had formerly held over the civil jurisdiction of the city. In broad terms, however, the structure of the water supply remained basically that of the later medieval period until after the cholera epidemics of the mid-19th century. The failure to build any more conduits and instead to rely on untreated river water to cater for increased domestic need could be regarded as a retrograde step. Waste management also remained at a basic level, although the city organised paid scavengers to clean the streets and gutters (Izacke circa 1681-93 and cited by Harte, undated, 16; 19).

3.6. Summary and discussion

The two principal purposes of the case study were first to give a chronological and contextual overview of Exeter’s later medieval water management systems and secondly to examine what insights can be gained about the relationship between the structures and beliefs of later medieval society and the ways in which water was managed. Using the evidence which has emerged from the case study this section summarises and discusses the extent to which these objectives have been achieved.
Technical achievements and limitations

This study is a broadly based overview of the many influences which formed the urban water management structures of later medieval urban water management rather than a detailed account of the technical workings of later medieval hydrology. These have, in any event, already received expert academic attention (Holt 1998, Bond 2001, Magnusson 2001). Nonetheless an appreciation of the main strengths and weaknesses of the technology is an essential part of the wider picture. The case study has therefore highlighted some of the impressive achievements of the medieval hydrologists who, without the use of pistons, employed gravity flow, reverse siphons and suspirals to bring spring water into the heart of the city. Although the archaeological evidence indicates that the engineers were constantly experimenting with innovative ideas to overcome natural impediments and rectify design faults, they were unable to construct pipes which were not prone to recurring leaks at their joints. They responded to this problem by building, at considerable expense, underground passages and inspection chambers beneath the main streets in order to give the pipes some protection from vibration and enable repairs to be quickly put in hand. This solution was probably too costly and difficult an undertaking for it to have been used to expand the network of pipes more widely around the city. Another factor which curtailed the expansion of conduits was the limited and variable sources of spring water which fed them. Although the flow of water was enhanced over time by the construction of wider pipes, once the springs which could be reached by existing technology had all been used to their maximum capacities, there was no alternative but to return to the river to boost the supply.

The extent to which effective water management was impeded by a fragmented administration, an underdeveloped jurisprudence and conflicts between different users within a hierarchical society

Effective water management requires an administration with sufficient political power, well ordered structures and income to put the infrastructure in place and maintain it. Although the Council which had evolved in Exeter by the mid-16th century was far more effective than its 11th-century counterpart, it still lacked a form which would have enabled it to provide the services which today we take for granted.
Although Exeter’s surviving civic documents often referred to “the mayor, bailiffs and communality” of the city there was, in reality, no such identifiable administrative or legal entity. Whereas today this inchoate body could never hold title to land, receive rights or enter into binding legal agreements, this seems not to have been the case in later medieval Exeter. Charters and agreements named this body as the recipient of a range of rights and obligations and usually declared that they were given “in perpetuity”. However, in practice, this was not the case because the same, or similar, rights were often repeated in subsequent charters; hence the need cultivate the goodwill of the monarch in order to retain these benefits. It was also this body which was described as the contracting party in formal agreements, including those concerning water management schemes, the fulfilment of which was probably more dependent on trust and co-operation than on any legal enforceability.

Whilst this pragmatic approach probably worked to a limited extent, it must have become increasingly difficult for the unincorporated city administration to meet effectively the greater demands which an increasingly complex society put upon it. The legal proceedings described in the Shillingford papers graphically illustrated the vulnerability and weakness of those who ran the city’s affairs. Although Henry VII endeavoured to reform what he identified as the unsatisfactory structure of Exeter’s council, he failed to grant the city a charter of Incorporation which would have strengthened its position.

The political weakness of the council, the power of the great magnates and an underdeveloped theory of water rights, all combined to prevent the city succeeding in its dispute with the earls of Devon. The river Exe was an integral part of the water supply and waste removal arrangements and provided substantial economic benefits from industrial use, trade and transport. The loss to the city of the port of Exeter and other riparian rights were a serious set-back for its advancement, but they could not be resolved within the limitations of existing political and legal systems.

One of the features of Exeter’s medieval water supply is how it mirrored the structure of society. Within a modern urban settlement water is distributed and waste removed in largely the same way for all its citizens, regardless of rank or wealth. In medieval Exeter this was not the position. Each strand of society largely made its own
arrangements and although there are examples of co-operation there was no unified approach to water management. Those living at the castle had independent sources of supply; the cathedral authorities looked primarily after themselves and some of the wealthier elite had their own wells (and possibly limited access to piped water). Until the mid-15th century the poorer citizens had to rely on water from open watercourses, from Townwell and communal private wells.

The rigid stratification of society, which created physical and jurisdictional divisions within the city, caused one of the most intractable problems for the council. The castle was within, but above and on the periphery of, the city whereas the bishop of Exeter exercised an independent jurisdiction over a separate and distinct part of the central area of the intramural city. This led to periodic and bitter jurisdictional disputes breaking out between the city and the cathedral, although no challenge was ever made to the teachings of the Church. A careful reading of the Shillingford papers makes it clear that whilst the city rested its case on very ancient customs this argument could not prevail against the right of the cathedral to control its own affairs within the Close and to exercise jurisdiction over its clergy and tenants. Whilst many of the grievances on which the mayor relied did not go to the heart of the legal case, they nevertheless clearly demonstrated the unfortunate consequences and unfairness of a divided jurisdiction; including problems over drainage and waste disposal.

Jurisdictional problems and lack of legal rights also caused difficulties over the water supply. Apart from the Duryard Estate the city had no control over land beyond its walled boundary and had no authority to source or carry water from beyond the city walls. Furthermore the aquifers required to supply any conduits were in the fee of St Sidwell which belonged to the church. The purchase of extra-mural land by wealthy citizens in the later years of the study period was probably an important factor in the building of the city’s aqueducts because access to springs and the granting of easements were thereby facilitated.

The difficulties which originated from separate jurisdictions and enclaves within the city were not limited to the lay citizens because the cathedral and monastic authorities had either to plan a route for their conduits which avoided as much as possible going beneath streets controlled by the city or they had to negotiate rights of passage and
access. There are occasional examples, from the earlier part of the study period, of the monarch granting permission for pipes to be conducted through the city, but in later years the civic authority seems to have become the acknowledged grantor. Despite the bitter disputes between the city and the cathedral, neither party had any realistic option but to co-operate over aspects of water management, although the mayor and council were always in the weaker position.

Those monasteries which owned land within and without the city walls held less temporal power than the bishop and their relationship with the citizens was generally positive, with many instances of mutual co-operation over water supply and drainage. The monasteries (and perhaps the cathedral) may have regarded assistance with the provision of water for the citizens as a charitable obligation, but there is little evidence that this was in fact the case. The agreements were therefore probably motivated largely by the practical benefits they gave to the ecclesiastical signatories. There is, for example, no evidence that poor laity had direct access to St Peter’s Conduit or to any of the monastic conduits houses. Whilst a charitable motive may have played a part in St Nicholas’ priory granting part of the water from its conduit for Townwell, the documentary sources indicate that the agreement may also have been a means of getting some financial assistance for its upkeep from the city.

Townwell is the only documented public well and the evidence suggests that its water supply and maintenance were regarded as a civic duty. If this is a correct interpretation it means that the exclusive group of elite citizens who held office in the city and controlled its (small) budget were prepared, from an early date, to undertake this obligation. The building of the civic conduit in the mid-15th century took this a step further when council members committed themselves to a risky venture which not only benefitted themselves, but also gave the poor access to piped water delivered to a conduit within the city walls. However complex the motivation behind the construction of this and later civic conduits may have been, one of the undeniable consequences was that substantial practical and public health benefits were provided for those who were able to make little, if any, financial contribution. It could be plausibly argued that the pride which the council had in Great Conduit was not just because it was a symbol of the city’s economic and political status but also because it demonstrated the council’s concern for the well-being of all the city’s inhabitants.
The concept of water cleanliness

One of the themes of the case study is the complex relationship between scientific knowledge, religious beliefs and how clean water was defined and recognised in later medieval Britain. In particular, was clean water valued and, if so, what qualities did it have to possess to be considered ‘clean’? There is no doubt that in the later medieval period the inter-relationship of Exeter’s many water sources and the failure to manage sewage disposal effectively caused them to become polluted by contaminants which were deliberately or accidentally introduced into the supply. The case study has provided examples of a link having correctly been made between lying garbage, stagnant ponds and disease; although it was erroneously believed that the hazard lay from inhaling malodorous vapours and not from hidden contaminants seeping into the water supply. If Hooker’s view was a commonly held one in the later medieval period (as seems likely), the value of a conduit was that it cleansed water by movement through the pipes. Thus water which smelt pleasant and was relatively free from visible debris was considered clean and was used, according to Hooker, for cooking.

It is impossible to know to what extent the enforcement of bye-laws, passed to deter the indiscriminate tipping of waste, made any appreciable difference to the cleanliness of the city. In any event, even if surface garbage was reduced, without an understanding of the invisible hazards caused by the seepage of untreated sewage appropriate preventive measures could not have been taken. Nevertheless, although the reasoning was flawed, the attempts to keep public places free from garbage and the preference for cooking with piped spring water must have reduced the risks to health. It would be interesting to know whether the Great Conduit, where water was taken from pipes at its base, was so designed simply as a means of speeding up collection or whether it was also intended to avoid the introduction of dirt and debris from vessels being dipped into the supply.

The effect of religious beliefs on the concept of cleanliness

Whilst medieval people valued clean water (as they understood it) for practical use there was another aspect to their thinking which related to the symbolic and magical powers of water. This subject is too complex to be other than outlined in this study but it nevertheless adds an interesting dimension to our understanding of the purposes of
medieval water supply. What has emerged from the case study is that surviving written sources have to be approached with a degree of caution. Although the truths of the central tenets of the Christian faith were accepted without serious challenge, their interpretation and practical applications were by no means uniform. There was a conflict between those who preached a belief that everything was in God’s hands and that He could and would intervene in human affairs and those who adopted a more rational approach which sought to link cause and effect and seek solutions. Whilst leading Franciscans taught the need for the mortification of the flesh and the acceptance of illness and suffering as the will of God, those friars living in Exeter made strenuous efforts to move their monastery away from a stinking area of bog because it was considered unpleasant and hazardous to health. The drying up of the castle well might have been seen by some as God’s hand at work or by others as simply the result of a long, hot summer.

St Sidwell’s well in Exeter was probably the most prestigious holy well in the area and yet the evidence points to the spring that sourced it having been tapped into for the cathedral’s first conduit. Although some of this water may have been used for rituals most of it was probably taken for mundane domestic purposes and even, possibly, sold to elite citizens. Furthermore whilst ‘clean’ water from spring-fed conduits was valued by the ecclesiastical communities for its symbolic purity, for the more important rituals it only became effective when it had been blessed by an appropriate level of priest. Thus the spiritual uncleanness of the cathedral’s sanctified burial ground, caused by the spilling of blood, could only be removed by the scattering of water which had been ritually blessed by the bishop.

Whilst the Church used the symbolic meaning of water in its teachings and for rituals of spiritual cleansing, is there any evidence from the case study that the civic authorities acknowledged the religious symbolism of water in the city’s supply system? The problem with attempting to answer this question is that much of the physical evidence has been destroyed and little is known, for example, about the details of the decoration on well houses or conduits. There are some written and pictorial records which suggest that whilst St Stephen’s conduit house was plain and undistinguished, the Great Conduit of 1534-5 was generously ornamented by a variety of religious
symbols. However emblems of temporal authority were also prominent and the significance of the religiously inspired decoration should not be overstated.

Although religious rituals and beliefs were deeply embedded in medieval life it is impossible to make any accurate assessment of the extent to which the ideas about the symbolism of water, articulated by some scholarly theologians, permeated the harsh realities of everyday life for most of Exeter’s clergy and laity. There is certainly no evidence that any reverence for water and its sources ever stood in the way of practical needs.
Chapter 4: Salisbury - A case study in water management 1066-1540

4.1. Introduction, methodology and sources

Whereas the complex evolution of Exeter’s water management is best understood by interweaving it within an historical and conceptual chronological framework, this approach is unhelpful for the case study of (New) Salisbury where the water supply system, which was laid down about the time of its foundation as an ecclesiastical borough in the early 13th century, remained largely unchanged for over 600 years (Rogers 1969, 5). This chapter has therefore been divided into three main sections. The first outlines the historical, topographical and conceptual contexts which led to the foundation and design of (new) Salisbury and which are relevant to an understanding of the city’s water management. The second section examines what is known about the practical arrangements for, and limitations of, the city’s water supply and waste disposal arrangements. The final section summarises and evaluates the evidence disclosed in the two earlier sections and discusses the similarities and differences between the water management systems of Exeter and Salisbury.

Secondary sources have provided contextual information about the political, social, economic and administrative history of Salisbury, its foundation and the possible reasons for the removal from Old Sarum. The earliest book which specifically focussed on Salisbury’s history was An Historical and Descriptive Account of Old and New Sarum (Hatcher) published in 1834. Much of the evidence for this work was obtained from original documents so that this it has continued to provide useful material, although some of it is now believed to be wrong. For example Hatcher dated the watercourses to the 16th century, although there is now good evidence (which is reviewed later) that most were built at about the same time as the city was laid out. Subsequent publications which have furnished details about Salisbury’s medieval history have included Endless Street – A History of Salisbury and its People (Chandler 1983); Our Chequered Past (Borthwick and Chandler 1984); Salisbury Cathedral (Spring 1987) and two Royal Commission Reports Ancient and Historic Monuments of Salisbury (Anon. 1980) and Salisbury: The Houses on the Close (Cocke and Kidson 1993). Chapters on aspects of the history of Salisbury in more general works of synthesis have also provided useful material and works consulted have included The History of Modern
Wiltshire (Hoare, 1843); volumes 5 and 6 of the Victoria County History of Wiltshire; Maps and Plans of Towns and Cities in the British Isles, with Historical Commentaries (1957: 1962) and volume 1 of the Cambridge Urban History (Palliser (ed.) 2000).

Where evidence has been referenced these leads have been followed up and the source traced back as far as possible; although without attempting to gain access to original and un-translated later medieval manuscripts. There are, however, a number of translations of contemporary documents which have been provided evidence which is as close as possible to the primary source. Examples include Salisbury’s First General Entry Book 1387-1452 (transcribed and translated in Carr 2001) and a translation (Torrance 1960) of Henry D’Avranches’ 13th-century poem, written to celebrate the removal of Salisbury Cathedral from Old Sarum. Furthermore, as the arrangements for water supply and sewage disposal remained largely unaltered until the mid-19th century, primary sources have also been used for descriptions and pictures of post-medieval Salisbury between the late 16th to the mid-19th centuries.

One of the areas which this study has investigated is the importance of symbolism in later medieval Britain, especially in relation to water and cleanliness. The case study of Salisbury has therefore included research into this topic using secondary sources such as Popular Piety in Late Medieval England: The Diocese of Salisbury 1250-1550 (Brown 1995) and translations of, and commentaries on, contemporary poems and sermons.

Archaeological information about Old Sarum has been sourced from two recorded excavations undertaken in 1911-15 and 1947 and summarised in the Archaeological Journal (Montgomerie, 1947). In respect of Salisbury there has been a wealth of archaeological work undertaken and that between 1954 and 2004 has been compiled, with an historical outline, in An Archaeology of Wiltshire Towns: An Extensive Urban Survey: Salisbury (Cave-Penney 2004). Using the references in the bibliography to this work and in the Wiltshire and Swindon Sites and Monument Record (http://history.wiltshire.gov.uk) it has proved possible to group the material into three categories namely excavation site reports, summaries of otherwise unpublished site reports in various journals and unpublished excavation, watching brief and desk-bound reports compiled on behalf of building developers. The first two categories proved relatively easy to source, but in respect of the third category (the majority of which
had been prepared by Wessex Archaeology) it was only possible to have access to those reports which had been lodged at the Wilshire and Swindon History Centre in Chippenham, Wiltshire, as the remainder were (the author was advised by Wessex Archaeology) held by the developers who had commissioned them. More recent archaeological evidence has been obtained from site reports published on the World Wide Web.

Assistance was sought from the Graham Keevill, the cathedral archaeologist, who was helpfully able to suggest a number of written sources to consult but otherwise neither he, nor his predecessor in office whom he consulted on my behalf, had any information about the medieval water supply for the Close. Unfortunately several requests made to Salisbury and South Wiltshire Museum to enquire whether the author could visit the museum to have access to archaeological reports prepared by them and to discuss the medieval artefacts which were held there (including the items from the 19th-century Drainage Collection), were not responded to. However, the later medieval material which was on display at the museum was examined and photographed. Several visits were also made to Old Sarum and Salisbury in order to better understand the topography of the area and to observe and record traces of the later medieval water supply and waste disposal systems.
4.2. The foundation of New Salisbury and its government

The reasons underlying the ecclesiastical abandonment of Old Sarum and the founding of New Sarum/Salisbury and how water played an important role

Old Sarum was a Norman royal borough situated approximately 2.5km from the centre of the modern city of Salisbury (Rogers 1969, 1; Spring 1987, 6). Archaeological evidence indicates that the raised mound on which William I built his ring-work castle may have had Iron Age origins with Roman and Anglo-Saxon periods of occupation, but on a much smaller scale than at Exeter (Rogers 1969, 1). The Norman borough typically consisted of the castle; a cathedral (first built 1075-92) and a civic settlement, the existence of which is well documented (Stroud, 1986, 120-126; fig. 4.1). Some remains of this settlement were uncovered in the east suburb by Stone and Charlton in 1935 (ibid. 123). In the early 12th century the cathedral was substantially re-built by Bishop Roger who had already acquired the castle as part of his substantial property portfolio, but when he fell from royal favour the custodianship of the castle reverted to the crown (Spring 1987, 8).

Fig.4.1. Reconstructed plan of the significant features of Old Sarum, circa 1150 (Stroud 1986, fig.1).
The plan (fig. 4.1) illustrates the problems with which the bishop had to contend. The cathedral site was cramped, with little room for the expansion which was necessary to reflect his growing status. Furthermore, the castle’s physical domination would have been a daily reminder of where the seat of power lay. A decision was therefore taken, at the close of the 12th century, to obtain the consent of the king and the pope to relocate the cathedral to a new site. Compelling and carefully crafted reasons needed to be advanced which would not overtly challenge the authority of the king but would engage the sympathy of the pope, whose relationship with the English monarchy had reached a nadir with the papal interdict against King John (1198-1216).

Part of the protracted correspondence related to the litany of complaints which the bishop, dean and chapter advanced and which centred on the physical drawbacks of the site and interference with the conduct of devotional processions (Rogers 1969, 1). One important grievance was the alleged shortage of water. In 1217 a petition was presented to the pope which described how water for the clergy had to be fetched, “at great expense”, from the river which lay some distance away from the cathedral precinct (cited by Spring 1987, 8). Peter de Blois, an ecclesiastical scholar, wrote a letter of support to the dean and chapter in which he described the site of Old Sarum as “barren, dry, deserted and mean” (transcribed and translated by Frost 2005, 156).

The contemporary poet Henry d’Avranches (circa 1190-1260) composed a long poem in which was described the piteous sufferings of the clergy and laity who lived in Old Sarum (transcribed and translated by Torrance 1960, 242-3). On the arid site the “winds howled, the chalk soil ... dazzled the eyes” (ibid. verse 2) and the shortage of water caused “the lungs ... to burn with thirst (ibid. verse 11). Although the poem is too long to quote in its entirety verse 12 in particular gives a unique insight into how an educated 13th-century scholar could combine the practical and spiritual values of water to plead his cause. This reads as follows:

“Water quenches the thirst, and extinguishes fires. Boats and ships float upon water, carrying a wealth of merchandise. It washes away dirt and stains. It gives life to grass and flowers and new life to birds and little fish. Water is white and clear, soft, and smooth to the touch. To the taste it is sweet and refreshing. Water re-invigorates old men and women. It cleanses from guilt and sin and drives away the plagues of devils.
Because by itself it can nourish people none of the other elements is necessary. What then will be the state of a city which lacks water for its people? When that which is more beneficial is absent, then the greatest harm must ensue. There can be no greater evil for a city than drought” (ibid.).

By way of contrast to the site of Old Sarum he likened the well-watered valley of (New) Salisbury to an earthly paradise akin to the garden of Eden (ibid. verse 22) and where the cathedral was to be built “alongside a spring ... whose sparkling waters ... flow clearer than crystal, purer than gold, sweeter than ambrosia” (ibid. verse 21).

Whilst it is plausible that a growth in the number of inhabitants could, particularly in times of drought, have led to competition for limited water supplies, the archaeological record, although possibly presenting an incomplete picture, shows that both the castle and the cathedral had convenient access to wells. Excavations undertaken 1911-1915 uncovered the great well in the castle and, 40 yards (37m) to its south, a second unfinished well and a third well in the north-west quarter (Montgomerie 1947, 139; figs. 4.2; 4.3).

The great well of the castle was situated in the inner bailey close to the south-east angle of the Great Tower (ibid.) Its shaft was 5’ (1.54m) in diameter, was ashlar-steined as far the old hill level and thereafter it then continued through solid chalk until (presumably) it reached the water table. It was not possible to measure its the total depth. This well was given a Norman date whereas the second, unfinished well, was said to be post-13th century (ibid.). If this dating is accurate the building of the second well occurred when the population of the town was gradually diminishing and the ecclesiastical community had departed (Clapham 1947, 143). The reasons for attempting to sink another well for the castle and then abandoning the project after digging down about 12’ (3.7m) cannot rise above speculation.

Although the site of the cathedral’s great well was noted on excavation plans (fig. 4.2) no details about its construction are given. However, the well is still visible and has an inner diameter of about 3m, (fig. 4.3).
Figs.4.2; 4.3. Old Sarum cathedral and adjoining buildings showing the location of cathedral well and the well as it appears today (Mongomerie 1947, fig.8, taken from plans drawn during the excavations of 1909-15; photograph by the author).

To what extent, therefore, the complaint about a severe shortage of water was valid will never be known but it can be plausibly argued that other factors of a more political nature lay behind the decision to re-locate. This is hinted at in contemporary literature. Peter de Blois, writing on a date between 1182 and 1206, compared the move to that of the Israelites escaping captivity in Egypt and coming down to the river Jordan in the fertile land of Israel. He eulogised about the freeing of “the church of Salisbury from captivity on that hill” and the release of the “local people from the burden of extreme servitude [and from the] yoke of tyrannical oppression” (transcribed and translated by Frost 2005, 163). Certainly the re-location of the city freed the cathedral from the control of the earls of Sarum.

Although water featured largely in the elaborate language and biblical analogy to justify the move from Old Sarum, once that had been successfully accomplished there is little evidence that the waters which ran through and around the city were treated by the church authorities or the citizens as other than a utilitarian resource. This is discussed further in section 4.2.
The topography of (New) Salisbury and its possible symbolism

Having obtained the consents of both the pope and the king to move the cathedral, practical matters of site and plan became critical. Bishop Richard Poore selected a large level area situated approximately two miles from Old Sarum. It lay at the confluence of four river valleys and was bounded to the west and south by the river Avon and to the east and north by chalk ridges (Rogers 1969, fig. 4.4). Whilst the bishop claimed to have been guided to the site by a divine vision (Spring 1987, 9) the choice was probably decided by more pragmatic considerations. One of the disadvantages of a low-lying site, only about 46m above sea level, was that it was prone to flooding (Currie and Rushton 2005, 225). This was, however, off-set by the convenience of building on fertile land which was already owned by the bishop and upon which only a few small settlements were already located (Rogers 1969, 3). Additionally there was access to the main road from Winchester to Wilton (Cave-Penney 2005, 286) and to a good road to the port of Southampton (Rogers 1969, 3).

Fig. 4.4. The site chosen for the construction of New Sarum (Royal Commission for Historical Monuments 1980, xxx).
The foundation stone of the cathedral was laid in 1220 and, save for the detached bell tower and the spire, work was completed by 1260 (Spring 1987, 8-9). At about the same time the new town of Salisbury was laid out in a grid or chequer pattern on land outside the cathedral gates and it is likely that as early as 1219 an embryonic settlement had already formed because a charter to hold a market there was granted in that year (Rogers 1969, 3). By 1300 the basic layout of the city was in place although the development of less economically well-placed streets may have been a gradual process, as certain streets were not mentioned in contemporary documents until the 14th century (Cave-Penney H. 2004, 17). The intra-mural city covered 105ha in total; of which the cathedral and Close occupied 33.6ha and the civilian town 48.5ha (Slater 2000, 599).

Fig. 4.5. Salisbury circa 1300 (plan by K. Knowles in Hinton, 2000, fig. 10.6).
The bishop obtained permission in 1227 to enclose the city with ditches (Hatcher 1834, 45), but it is not known exactly when these were begun or whether their purpose was defensive or to define the boundary or perhaps to fulfil both functions (Cave-Penney H. 2004, 66). Although there is both documentary and archaeological evidence to confirm their existence, their exact route and extent remain conjectural (ibid.; Algar 1973, 137; Wiltshire and Swindon Sites and Monuments SU12NW516). Leland, writing after his visit in circa 1542, observed that the ditch “was dug by the inhabitants when Bishop Simon [circa 1315] ... granted the burgesses permission to strengthen the town with a battlemented wall” (Chandler 1993, 492). Although he saw two stone gateways (which are probably those which appear on Speed’s plan of 1611) he believed that the stone wall had never been built (ibid.). Stone fragments, but no structural remains, of the East Gate were observed by archaeologists with a watching brief during redevelopment in Winchester Street in 1972 (Sites and Monuments record SU13SW505; anon. 1973, 137).

The reasons why the bishop chose a grid pattern and water channels for the city’s ground plan are unknown but some interesting ideas have been suggested which indicate that the choice may have been a complex mixture of practical and symbolic considerations. The regular design made it easy to lay out uniform burgess plots of 7 x 3 perches, which could later amalgamated or sub-divided as required (Slater, 2000, 599). It has, however, been noted that the grid was not perfectly formed and it may be that this asymmetry reflected both pre-existing features and the need to maintain suitable gradients for the water courses (Rogers 1969, 4; Wessex Archaeology 1996 report 7196/1/0). There is some persuasive evidence that for practical and symbolic reasons, the bishop may have looked to the ancient and prestigious city of Winchester to provide a model for both the administrative framework and the ground plan of his own new borough (Keene 1985, 63). When, in 1225, the bishop gave a charter to the burgesses of Salisbury it specifically stated that their privileges were the same as those enjoyed by the citizens of Winchester (Slater 2004, 599). More pragmatically both cities occupied low-lying sites where flooding was a recurrent problem (Keene 1985, 57; Cave-Penney, 2004, 22, 31, 57, 77). Potentially, therefore, the methods employed by Winchester to regulate the flow of water through the city could have attracted the interest of the bishop. The earliest Winchester channels may date from the Roman
period of occupation but the scheme which the bishop of Salisbury may have observed was laid down (probably) in the 9th century, when a grid pattern of streets was constructed (Keene 1985, 56). The lesser streams which were originally created to run through city may have been intended to provide mill leats and a “cleansing flow of water through monastic precincts” (ibid.). However by the 13th century they were also providing water for a variety of domestic and industrial purposes. In the boggy, lower-lying southern district, streams ran down the middle or side of the streets where they were traversed by a number of bridges (ibid. 63-4). There are therefore marked similarities between the two cities’ town plans and, even if this were purely coincidental, information about the use of Winchester’s water courses can provide useful analogies for Salisbury.

An interesting approach to understanding “the primary ordering” of the plan of Salisbury has been developed by Frost (2009). Using modern and 17th- and 18th-century maps he prepared a plan of later medieval Salisbury onto which he placed the main medieval buildings and the processional routes taken at the Rogation period when crops were blessed and the bounds were beaten (ibid.). These processions, he believes, may have been devised to reinforce the connection with Old Sarum, where they had originated, and to re-enact the ceremonies which had marked the foundation of the new cathedral and city (ibid.112-7). Although the meandering way the processions moved through the city enabled key vistas to be revealed, this “visual ordering of the city [did not follow] any rigid geometrical order” (ibid.). He therefore considers it unlikely that Lilley’s theory of “sacred geometry” (Lilley 2005, 238-243), whereby “the medieval city ... acquired its cosmological symbolism through its special form” (Lilley 2009, 12), applied to Salisbury. For Frost the symbolic order at the heart of Salisbury was not geometrical but “was revealed by the choreography of movement through the city” of the processions (2009, 100). Whilst this is an attractive theory, the symbolic importance of water, so stressed at the time of Salisbury’s foundation, is not discussed by him, although one might have expected it to have played a part in ceremonies designed to the bless of the land and remember the origins of the city.
The city’s government and its economy

The ritual of the foundation ceremony for the new cathedral in 1220 was a potent symbolical statement of where power in the city was vested and where it would remain until 1612 (Pugh 1962, 103). The first three stones were laid by the bishop on behalf of the pope, the cardinal archbishop of Canterbury, and then himself, whilst the remainder of the stones were laid by members of the nobility in order of rank, including the earl of Sarum (Spring 1987, 11). The enormous cost of building and maintaining this vast edifice would be partially met from the income which the bishop doubtless intended to acquire from the exploitation of the economic potential of the civilian city. In the furtherance of this aim the 13th-century bishops encouraged the letting of burgess plots and the founding of merchants’ guilds. They also developed markets and assisted trade by the construction of a great stone bridge over the river Avon, which diverted traffic from Wilton to Salisbury, (Rogers 1962, 124). The resultant success of these initiatives can be gauged, in broad terms, by the Poll Tax returns of 1334, 1377 and 1545-5. Although the unreliability of these statistics means that they can only been used as a rough guide to the ranking of towns, they nevertheless indicate that Salisbury was counted amongst the great cities of England, being ranked 12th in 1334 and rising to 7th and 8th in the two later polls (Dyer 2000, 755-761).

However, whereas the periodic disputes which arose between the cathedral and the council of Exeter related mainly to the bishop’s jurisdiction over the area of the Close and certain tenements within the city, those in Salisbury were generated by bishop being the overlord of the entire city, its government and its economy. It was the bishop who granted the first borough charter to “his free citizens” in 1225 (Rogers 1969, 3) and although the charter was confirmed by the king some two years later, the terms of the grant acknowledged the bishop’s ultimate control (Slater 2004, 599). Although the citizens were given the same generous “privileges and customs as those enjoyed by Winchester” (Pugh, 1962, 94) these could not be exercised without the prior consent of the bishop and it was the bishop and not the citizens who held valuable licence to hold markets, the right to alter the courses of rivers and to build bridges (Rogers 1969, 3). From the inception of the city, therefore, the embryonic civic authority was in a weaker political and economic position than that in an ancient, royal borough such as Exeter. It owned no land, had no claims over any watercourses, had
no protector other than the bishop and its ability to raise income through, for example, market and bridge tolls was severely limited. Even the annual Rogationtide processions have been interpreted as having, as one of their purposes, a reinforcing of the cathedral’s right to control the use of urban space beyond the Close (Frost 2009, 112). The bishop also had control over the city court; owned the city gaol; was a royal judge with the right to try numerous crimes and civil disputes and, from 1462, had the power to appoint justices of the peace and two coroners (Pugh 1957, 14, 21, 60).

The office of mayor was in existence by 1249 and although the burgesses were permitted to elect him, his subordinate position was repeatedly demonstrated as each incumbent swore an oath of allegiance to the bishop, whose over-lordship was confirmed by letters patent in 1472 (Street 1916-7, 190-1). There was also a council of 12 members by 1261 (Hatcher 1834, 695) and this expanded over time so that, by the 15th century, there were two assemblies of 24 and 48 citizens (ibid.). Although the first civic seal is now lost its appearance is known from early documents dating from 1298 (Pugh 1962, 178; fig. 4.6). The depiction on it again underlined the subservience of the citizens to the ecclesiastical overlord as it showed the patron saint of the cathedral (the Blessed Virgin Mary holding the infant Christ) and a mitred bishop with his hand raised in blessing. The walled building with its two turrets was, presumably, an idealised depiction of a medieval city because Salisbury never had a stone perimeter wall (Rogers 1969, 5) and the Close wall was not built until the early 14th century (Spring 1987, 15).

Fig.4.6. An engraving on the city’s first seal (Hoare 1834, xvi).
The surviving records of civic finances indicate that the council’s pre-occupations were with day-to-day matters relating to street cleanliness, fire regulation, bridge repairs, running the market and such like (Carr 2001, xxxv-vi). In order to fulfil these duties the mayor and convocatio were permitted to pass regulations and enforce them through the mayor’s court (ibid. xv). However, even these mundane matters remained under the watchful eye of the bishop who claimed the right to appoint one of the three sarjeants (sic), one of the three key-holder of the city’s chest and generally oversee the work of all the elected council officers (Street 1916, 208-10). Even the Guildhall was owned by the bishop and although he permitted the councillors to use it from time to time they never had a permanent meeting place. The council house, which is named in documents from 1416, seems to have been primarily a depository for council records and money (Pugh 1962, 97). In 1452-3 a petition for incorporation was rejected (ibid.).

Inevitably the secular authority of the bishop was resented by the citizens and over a period of some 300 years the mayor and council periodically raised challenges, but on every occasion these failed, leaving the council both financially and politically weakened. Street (1916, 185-257; 320-365) gave a detailed account, based upon her study of original documents, of the numerous disputes between the parties of which two examples illustrate the point. In 1306 an unsuccessful challenge to the bishop’s right to extract tallages from the burgesses led to a forfeiture of other privileges which were only restored on payment of 200 marks and the signing of 28 articles. This documented the limited powers which the bishop was prepared to delegate to the city (ibid. 203-219). In summary, the citizens “acknowledged the bishop’s claims as lord of the soil and the complete jurisdiction of his court [and] agreed [that] their commercial privileges were dependant on his grant [and] regulated by his will” (cited ibid.219).

Perhaps the most bitter of all the disputes arose between 1465 and 1474 when the citizens “made a determined attempt” to extract more privileges and independence from Bishop Beauchamp (ibid.233-256); including the securing of “all liberties and privileges” in return for a fee farm (Hatcher 1834, 762-4). As the bishop’s claims were legally indisputable, the attempt inevitably failed and the mayor and citizens were compelled to sign a deed of submission in which they agreed to “submitte us in everich and in all materes” to the bishop (cited by Street 1916, 253).
However the civic leaders, whilst not enjoying the same privileged relationship with the king as those in a royal borough, learned the value of supporting the monarchy, especially with monetary contributions. By this means they were able to extract from Henry IV the right to hold property to the value of 100 marks, contrary to the Statutes of Mortmain; which right was confirmed by Edward IV in 1473 after years of opposition and lawsuits initiated by the bishops (Street 1916, 229-231). The right to hold land was an important privilege as it doubtless encouraged wealthy benefactors to leave property and rents to the council to be used for various community projects in return for being remembered in yearly obituaries (Brown 1995, 162-167). The bequests were typically for gifts to the poor and for improvements to roads and bridges (Brown 1995, 24; 198). More prestigious ventures seem to have been left to the wealthy merchant and craft guilds to finance, including (*circa* 1440) works to complete of the great ditch around the city (Ransome 1962, 133-135) and the foundation and maintenance of hospitals and almshouses (Brown 1995, 192). Thus, although the mayor and council made little headway in persuading or compelling the bishop to hand over any significant rights, they and the guilds with which they were closely associated (Rogers 1969, 6) undoubtedly increased their presence in the city. This they did through the acquisition of property, by organising mystery plays (Frost 2009, 112) and processing through the streets dressed in livery and carrying the civic regalia (Pugh 1962, 178-9).

Despite the tensions which underlaid the relationship between the bishop and the city’s elite, the need to enhance the economic prosperity of the city was a common goal which required co-operation to maintain good order and uphold the fundamental structures of society. It was therefore the civic authority which, in 1450, quelled the riots (inspired by Jack Cade’s rebellion) during which Bishop Ainscough had been brutally murdered (Bettey 1986, 106). Perhaps to underline where their loyalties lay the council arranged for a quarter of Jack Cade’s dead body to be brought from London and put on public display in Salisbury (Brown 1995, 15).
4.3. The city’s water supply

Introduction

The man-made water channels of Salisbury cannot be studied effectively without putting them within the wider context of rivers and dry ditches with which they were linked by topography and use. Unfortunately, the terminology is often used quite loosely so that the word “ditch” may refer to a feature which had been constructed for defensive or drainage purposes or be part of the system of water supply channels. An additional complication is that a water channel might have provided domestic water and acted as a drain and/or a depository for waste, either at the same time or sequentially. Furthermore, much of the physical evidence remains buried below the present day city with only fragments being periodically unearthed and recorded. However, by combining evidence obtained through the previously described sources and by using analogies from other cities, a partial picture can be re-constructed. Archaeological site reports and surveys often identified sites by referring to the names of streets and chequers and, where the names referred to in the narrative have changed over time, the alternative name is included in square brackets. To assist with the narrative of this section five plans have been included. Fig. 4.7 is a layout of the town chequers and main streets; fig.4.8 is a contour map on showing the possible routes of the main ditches and water courses; fig. 4.9 is of the Close and its principal buildings; figs.4.10 and 4.11 are respectively Speed’s plan of 1600 and Naish’s plan of 1716 and fig. 4.12 is a plan of modern central Salisbury.
Fig.4.7. Reconstructed plan of the chequers of Salisbury. The visible stretch of the ramparts is marked in the top right-hand corner (Royal Commission on the Historical Monuments of England: Ancient and Historical Monuments of the City of Salisbury 1980. Vol.1, fig.3).
Fig.4.8. Reconstructed plan of later medieval Salisbury showing the location of the main buildings and the suggested routes of Town Ditch, Close Ditch and other watercourses. The land below the 150' contour is believed to have been originally marshland (Royal Commission on the Historical Monuments of England: Ancient and Historical Monuments of the City of Salisbury 1980. Vol.1, fig.4).
Fig. 4.9. Reconstructed map of the Close in the later medieval period. Waterchannels are marked by arrows (Royal Commission on the Historical Monuments of England: Ancient and Historical Monuments of the City of Salisbury 1980. Vol.1, fig.2).
Fig. 4.10. Speed’s plan of Salisbury circa 1600 showing the watercourses, main buildings and with the Council House in the left corner (an early but undated copy kept behind glass and reproduced with the kind permission of the Wiltshire and Swindon History Centre).
Fig. 4.11. Naish’s plan of 1716 showing the central area of the city and its watercourses (Brimacombe 1997, 19).
Fig. 4.12. Map of modern central Salisbury (Ordnance Survey EDINA Digimap).
Defensive/boundary ditches

When the city was first built a ditch probably marked the boundary (Rogers 1969, 4), but this must have been considered inadequate because in the early 14th century the bishop enlarged it (Rogers 1969, 5). In 1378 the council successfully petitioned the king for financial help to complete the improvements to the earthwork and provide a wooden fence upon it. However, despite several more attempts by the civic authority throughout the next century to complete the work it remained unfinished, probably due to lack of funds (Dale 1962, 88; Cave-Penney 2004, 35). When Leland visited the city circa 1542, he observed that “the great long ditch is still to be seen there” (Chandler 1995, 498). The only stretch of the rampart which is still visible is in the grounds of Bourne Hill House (anon. 1980, 50b; fig. 4.7). One section of the rampart briefly re-appeared during salvage operations in the early 1970s in the aptly named Rampart Road (Barnard’s Cross Chequer). It then measured approximately 18m wide by 5.5m high and with a 2m deep ditch, but it was estimated that, in the later medieval period, it would have been about 12m wide with a 6m deep ditch (Algar 1973, 137). Although no water was deliberately channelled into this ditch it was probably water-logged from rain and general drainage.

As well as the perimeter ditch around the whole city, the cathedral also had its own ditch which delineated the area reserved for the exclusive use of the cathedral and its clergy and also provided limited security (Cave-Penney 2005, 59). However, unlike the perimeter ditch, it was fed by water from a mill stream from which it flowed from a point below Bishop [Town] Mill (Cave-Penney 2005, 286; fig.4.8). In 1329-31 permission was granted to strengthen the defensive capacity of the ditch by building a crenellated wall next to it, using stone taken from the cathedral at Old Sarum (Spring 1987, 15). The wall was begun about 1345 and, although it was probably never completed on the side adjacent to the river, it was a substantial construction with four stone gates (Cocke and Kidson 1993, 39-40). Together the great cathedral and the Close wall were potent symbols of the spiritual and temporal might of the bishop.

Drainage ditches and watercourses

Through the city ran a deep channel known in the later Middle Ages as Town Ditch (or Common Ditch) and later as New Canal (Currie and Rushton 2005, 214 and Fig. 4.8).
This may have “served as the main canal for the drainage system within the town” (ibid. 214). By implication, therefore, it would have built at about the time the city was laid out (Anon. 1980, xxxvi). However, the date(s), details and purposes of its construction are speculative (Barber 2005, 165). The suggestion by Dale (1962, 90) that it was built, circa 1345, by the city council when they obtained land near Piddock’s Inn for the purpose of making a watercourse there, is probably wrong. The date is too late and, apart from work on the defensive ditch, the council has no history of undertaking large scale community projects. The reference could therefore be to a small section of additional channelling. A short stretch of the western wall of Town Ditch was revealed during an excavation in Trinity Chequer during archaeological excavations by Jenkins on the west side of Trinity Chequer. The ditch was 0.55m thick and made of undressed chalk blocks set in a clayey matrix (Wessex Archaeology report W227: 1992, 20). Town Ditch entered the city near Fisherton Bridge and contained water taken from the mill leat just before it rejoined the Avon below Bishop’s [Town] Mill (figs. 4.13; 4.14).

Figs. 4.13; 4.14. The possible remains of Town Ditch (visible behind the handle of the discarded umbrella) as it left the mill leat to head east and a modern map showing the location of the photograph (photograph by the author; Ordnance Survey Edina digimap).

Its route probably ran along the southern part of the Market Place [New Canal Street] and into Milford Street where it turned south to sub-divide the western area of Trinity Chequer between Brown Street and Gigant [Gigor] Street). In certain places it may have briefly run underground as a will of 1432 described a property at 32, Milford Street (Trinity chequer) as standing “where the water of the common ditch runs under
the chamber” (cited by Currie 2005, 215). It then proceeded through Marsh Chequer, Bugmore and eventually drained into the Avon (fig. 4.11). The western part of its course closely tracked what is believed to be the approximate line of the marsh. The irregular layout of some of the streets, especially New Canal Street, may indicate that it followed, at least in part, an existing boundary ditch which may once have divided drier gravel to the north from the marshy alluvium land to the south (Rogers 1969, 4; Wessex Archaeology 1996 report 7196/1/0). However, shortly after it had crossed Brown Street, it turned sharply south to pass in a straight line, which could indicate that around this point the utilisation of the existing ditch ceased and a newly dug ditch constructed; perhaps to assist with the drainage of the low-lying land in the south-eastern quarter.

That this was an area which required draining and raising before it could be built on, is confirmed by archaeological excavations undertaken at the corner of 34, Gigant Street/36, Milford Street (Trinity Chequer) in 2002 where signs of repeated pre-development flooding at the lowest level of the site led the archaeologists to conclude that this area “may once have formed part of the flood plain of the Avon” (Currie and Rushton 2005, 225). Further evidence of “long episodes of repeated flooding” emerged during a field evaluation study at the corner of Carmelite Way and Friary Lane in the south east area near the river (McConnell 2004, 11). In order to alleviate flooding and make these low-lying places suitable for housing, chalk and gravel was deliberately dumped to build up the levels at Gigant Street (Currie and Rushton 2005) and at the corner of Brown Street and Ivy Street (Antelope Chequer) (Rawlings 2000, 27). So high was the water table in St Martin’s graveyard (just outside the city ditch in the south-easterly corner of the city) that a sump pit was laid in the 13th-century in an attempt to prevent water percolating into the graves (unpublished watching brief 2003, cited by Cave-Penney 2005, 291).

Whilst it can therefore be conjecturally put forward that one of the principal purposes of Town Ditch might have been drainage (Rogers 1969, 5), this cannot have been its sole function as it was also deliberately filled with flowing water from the mill stream. As the mill for which the stream (leat) was (presumably) constructed is believed to pre-date the foundation of New Salisbury (Dale 1962, 90) it is unlikely that it would initially have done other than return to the Avon around the area of Fisherton Bridge, as any
alternative route would have served no ascertainable purpose before the town was built. If this reasoning is correct, the mill stream was deliberately re-routed to flow into Town Ditch and through the newly planned town; perhaps to flush out the ditch to prevent its water from becoming stagnant and to remove any rubbish. It could possibly also have been intended, or subsequently used, to provide a convenient source of domestic and industrial water supply. The extent to which Town Ditch and other water courses were used to supply water and/or remove refuse will be further considered later in the chapter.

Individual buildings within the town may also have had their own smaller drains and these occasionally appear in archaeological site reports. During the course of building works in 1992 at Old George Mall (New Chequer) archaeologists excavated a number of evaluation trenches and had a watching brief over the site. They reported the finding of a square drain made of pitched limestone tiles 0.4m x 0.4m which was dated from its context to the 13th/14th century (Wessex Archaeology report 37697, 1996, 9). The purpose of the drain is uncertain but it may have been for household use (ibid.). Where it led to is not recorded but it could have emptied into the Town Ditch. The likelihood that this ditch was sometimes the recipient of domestic drainage is supported by an entry in a council manuscript in 1315 (Dale 1962, 90 footnote 51). This recorded an agreement to build a house in Winchester Street [New Canal and Milford Street] which included the right to convey water “by gutters into a certain ditch there”. As Town Ditch ran along this street that was probably the ditch referred to in the entry, but whether this guttering conveyed domestic water or run-off after rain or a mixture of both is unknown.

There is also some evidence for the existence of drainage channels in ecclesiastical premises. Part of the remains of the Franciscan [Grey Friars’] friary in St Ann Street, founded circa 1220, were first excavated in 1963 (anon. 1964, 129). A section of what was described as a “wood-lined drain” came to light in a water-logged area trial trench near the southern precinct wall and proximate to where it was likely (from the fragments of fresco recovered) the chapel had lain. The drain contained two 13th-century pots. A later excavation in 1972 (anon. 1972, 177) recorded the discovery of what may have been another section of open drain which ran parallel to St Ann Street, almost immediately outside the north wall of the friary. It lay 2m below the present
ground level and was 1.7m wide with the timber stakes (which had supported one side) still preserved below the water level. At the lowest level were a few (undated) medieval sherds. The monastic use of open conduits to act as drains and sewers was a widely used practice, but those channels which have been preserved have been lined either with stone or clay-lined (Bond 2001, 93-4) and not with wood.

The cathedral site has also produced evidence of drainage systems, but again the exact purpose of these is unclear. The cathedral was built on a gravel terrace on low-lying land just above the flood plain of the Avon and close to a number of watercourses both natural and artificial (Wessex Archaeology 2009, 1-2; fig.4.8). Its situation inevitably led to periodic flooding of parts of the cathedral and other buildings in the Close. For example, excavations near the bishop’s stables found a “black, peaty layer ... 6” (15cm) thick [and] a grey sandy silt 9” (22.5cm) thick” (Musty 1963, 452). This was interpreted as being from the severe flood of 1319 which was recorded as having risen to the height of the cathedral’s high altar. Inundations on this scale were, as they still are, impossible to prevent but smaller scale incursions of water and a tendency for land to become boggy and soft in wet weather are problems which can be ameliorated by good drainage and appropriate foundations. The chalk raft and chalk filled logs which archaeologists discovered in 2008, close to the site of the Beauchamp Chapel, were probably laid down for this purpose (Wessex Archaeology 2009, 24-5; fig. 4.15).

Ground penetrating radar was used during the same investigation and in areas 1, 2 and 3 features were identified which might have been drainage culverts installed within the Liberty of the Close (ibid. 7-8). These have not been dated save for the two drains uncovered during excavations in trenches 1 and 2, which were both post-medieval. Another drain was discovered in 1996 in the churchyard and, although again not dated, it may be later medieval as it was replaced by an underground drain during improvements undertaken in the area in the later 18th century (unpublished report by Tatton-Brown, cited by Cave-Penney 2004, 12). A more complete picture of a large drain emerged in 2011 when an evaluation trench was put in on the site of Bishop Wordsworth School in the Close (Blockley 2011). A length of wall with “fragments of chalk bonded in buff lime mortar” was dated, by its context, to the later medieval period (section 4.2.2). It was interpreted as being “the north side of a substantial stone-lined drain extending east-west across the area of the Close” (ibid.). The angling
observed in upper level of the wall was considered to be “the springing level of a vaulting over the drain” which would have been necessary to enable it “to pass through the Close wall to feed into the Close ditch which was situated on the east side of the Close wall” (*ibid.*). No details of the dimensions of the drain or analysis of its contents are given.

*Fig.4.15. Site plan, trench locations and areas covered by the evaluation survey at Salisbury Cathedral. Scale: 1: 2857 (Wessex Archaeology report 28741.01: 2009, fig.1).*

Close Ditch also received water draining from the watercourse which divided the bishop’s grounds into a northern and southern section (Cocke and Kidson 1993, 53; *fig. 4.17*) and possibly also from the houses around the Close which backed onto it (Anon. 1980, xxxvi).
In addition to Town Ditch and Close Ditch there were numerous other water channels, sourced from two hatches on the Avon west of Castle Street, which had been deliberately constructed to run through many of the city’s streets (figs. 4.8; 4.9).

In medieval times the conduit, as it entered into Castle Street, ran through the garden of house number 45 on its north side until, in the mid-18th century, it was enclosed and incorporated into the house (anon. 1980, 149-50). The watercourses then diverged through the main streets but re-converged at the junction of Ivy Street and Trinity Street (fig. 4.12) in order to flow across Bugmore and back into the Avon (fig. 4.10). As the watercourses followed the line of the streets it is thought that they were probably constructed at approximately the same time as the grid pattern was laid out (Slater 2000, 600; Cave-Penney 2005, 286). However, there is no certainty either about the date they were built or whether they were all built at the same time or whether they were contemporary with Town Ditch. As they ran at a higher level than Town Ditch and Close Ditch (Dale 1957, 90) it would be logical for them to post-date these deeper ditches, which could have been built (or re-built) to aid drainage before the streets were laid out. The deflection of the eastern Close Wall near St Ann’s Gate (fig. 4.9) by the line of Close Ditch may also reflect the early date of this ditch (Cocke and Kidson 1993, 38-9).

Prior to the water courses being filled in during the 19th century their routes, which followed established road patterns, probably remained largely unaltered and therefore post-medieval plans, pictures and descriptions are a useful, but perhaps not a wholly accurate, guide to how they might have appeared in earlier times. Leland, visiting the city in 1542, wrote that “all Salisbury’s streets are similar in having little streamlets and channels of water drawn from the Avon flowing through them” (cited by Chandler 1993, 492). A similarly observation was made by John Evelyn in 1654 when he commented that “most of the streets are watered by a quick current and pure stream running through the middle of them” (cited by de Beer 1955, 115). These are pictured on both Speeds plan of 1600 (fig. 4.10) and Naish’s plan of 1716 (fig. 4.11), but the deeper and shallower channels are not differentiated.

The dimensions of the channels and the materials used for their construction are problematical as site reports usually describe them in quite general terms. For
example, an evaluation report in 2000 by Coleman and Collard in Gore Chequer, near the junction of Bedwin Street [Rolveston] and Endless Street (fig.4.7), noted “a north-south orientated ditch 1.2m deep and at least 2.8m wide, with stake holes on its eastern edge ... [which] may be the watercourse known to run through this part of the city (unpublished report by Cotswold Archaeology, cited by Cave-Penney 2004, 26). Unfortunately, no further details are given, but the stake holes might be the remains of a wooden revetment similar to that uncovered in a watercourse and observed during a watching brief to the east of Castle Street Gate (Algar 1973, 137). Moreover, entries in the Winchester court rolls described water-courses there as having been reinforced with timber (Keene 1985, 65). It is also possible that the previously described wooden lined “drain” found at Grey Friars (anon.1964, 129) could in fact have been an open water supply conduit; perhaps branching off one of the main conduits. The totality of the evidence, although far from conclusive, therefore indicates that at least some of the higher water channels may have been wood lined.

Both Town Ditch and these watercourses were sufficiently deep and wide to need bridges to cross them. The locations of some of these can be ascertained from bequests in wills which referred to bridges near the churches of St Mary, St Thomas and St Nicholas (1310), to three bridges in Market Place (1407) and to one at the end of Drakenhall Street (1407) (Hatcher 1834, 95). Other bridges are known, from documentary sources, to have crossed Town Ditch in St Ann Street and Trinity Street (Dale 1962, 89). A report of the watercourses in 1615 described them as being “knee deep” (Saunders 1986, 2).

No pictures showing the appearance of the water channels exist before the early 19th century but, as no major changes to the layout of Salisbury occurred until the mid-19th century, these give an impression of how the streets might have looked during the later medieval period (figs.4.16-18). One difference, however, was that around 1737 the channels were re-routed through brick beds which lay along the side, rather than through the middle of, the streets (Cave-Penney 2004, 16).

Whilst it is therefore possible to reconstruct an outline of how the water channels may have appeared in the later medieval period it is more difficult to ascertain the purposes for which they were first built and whether they were in fact used in
different ways from those originally intended. Further investigation of these issues is deferred until later in this chapter when the evidence about wells and rubbish disposal is examined.

Fig. 4.16. Part of an engraving depicting Silver Street by John Knox and dated 1.12.1829. Note how a workman appears to be stirring the water with a pole (Ball 2000, 43).

Fig. 4.17. A view of Minster Street showing the watercourse and bridge and taken from a mid-19th-century oil painting by Thomas Shotter Boys (photograph by the author and reproduced with the kind permission of Salisbury and South Wiltshire Museum).
Fig. 4.18. Part of an engraving by W. H. Bartlett of Castle Street in 1829. Sheep and horses are passing close to the watercourse running to the right of the street and women appear either to be extracting water in buckets or perhaps doing their washing (Saunders 1986: 4; 11).

Wells

Many histories of later medieval Salisbury state that the high water table and availability of open spaces to the rear of the burgess plots facilitated the sinking of numerous wells (Rogers 1969, 5; Rawlings 2000, 57; Cave-Penney 2004, 68 and others), most of which have disappeared without trace. Although a relatively small number of wells have periodically re-appeared in the course of archaeological
excavations or have been noted in watching briefs, detailed information about them is often lacking. However, some further assistance can be obtained from references in contemporary documents and, by combining the two sources, it has proved possible to gain some insight into the design and role of wells in medieval Salisbury.

In 1988 archaeologists uncovered a chalk-lined well at the rear of a site on Winchester Street (Three Swans Chequer) which was 1.10m in diameter, “of unknown depth [and of] almost certain ... medieval date” (Core 1988, 32). A similar chalk-lined well (dimensions not reported) was excavated in 1972 (Algar 1973, 137) in backlands near a bell-foundry behind Guilder Lane/Milford Street. Within the well pottery fragments were found which were used to re-construct a large later medieval (but otherwise undated) green-glazed strap-handled jug (Fig. 4.19).

![Fig.4.19. A reconstructed strap-handled jug (on the left of the picture) found in a well behind Guilder Lane and described as later medieval. Its size is not given but it is about 30cm tall (photograph by the author and reproduced with the kind permission of Salisbury and Wiltshire Museum).](image)

Although Radborde’s land survey of 1584 (anon. 1980, xliv) post-dated the study period, it included a graphic description of a group of much decayed properties (possibly of medieval origin) fronting onto Blue Boar Row. These stood on either side of a long narrow courtyard and each property had a shop on the ground floor with a chamber above, an open-roofed hall, a kitchen with a well, stables and several ancillary buildings; suggesting that once they had been occupied by people of middle-ranking status (ibid.).

Archaeological evidence indicates that possibly not all of Salisbury’s later medieval town properties enjoyed access to either a private or a shared well. For example, an excavation was undertaken in the late 1990s (Rawlings 2000, 20-62; fig. 4.20) at a site at the junction of Brown Street and Ivy Street (Antelope Chequer). Documentary records had indicated “that both street frontages [had] been lined by cottages during
the later medieval period” and that these had been humble dwellings \(\textit{ibid.} 26\). This was confirmed by the modest dimensions of their foundations and from an analysis of the material discovered from cess pits which did “not appear to originate from high status households” \(\textit{ibid.} 50\).

\[\text{Fig. 4.20. Plan showing the site of the excavation at the junction of Brown and Ivy Streets and other sites excavated by Wessex Archaeology between 1884-1990 (Rawlings 2000, fig.9).}\]

Although backland areas were excavated the only well which was discovered was probably post-medieval \(\textit{ibid.} 27\).

Six similar two roomed single storey cottages of 14\textsuperscript{th} century date and with “no particular signs of high status” were identified during archaeological excavations of a site to the west of Gigant Street (Trinity Chequer) \(\text{(Barber 2005, 180; 206)}\). Again no
well came to light, but this might have been because there had been little opportunity to investigate the backland area (*ibid.* 206). Another explanation for the lack of wells could be that these dwellings were little more than hovels, which were probably sub-let without the provision of a well. As there is never any reference to a public well in Salisbury it is possible than none such existed, so that those with no access to a private well had presumably to source water from street channels or directly from the river.

Rather surprisingly no well was discovered during the excavation of a substantial high status stone house and its backlands (built around 1350) at the junction of 36 Milford Street and 34, Gigant Street (Trinity Chequer). Only one chalk-lined well of post-medieval date was found (Currie 2002, 11). Unfortunately, there has been little opportunity to excavate the area around the Market Place where it is believed that that the most exclusive burgess houses lay (Cave-Penney 2004, 25). However the likelihood that the houses of the more wealthy citizens would have had access to a private well is supported by a testator’s bequest, in 1405, of one of his houses “except for a ground floor room ... granted for life to John Michael ... with free exit and entry to hall, kitchen, garden, well and latrines” (Chandler *circa* 1405-17 in Timmins (ed.) 1984, 135).

Evidence for ecclesiastical wells is disappointingly poor, partly through lack of opportunity to investigate buried sites and partly because wells within standing buildings of medieval origin will have been destroyed. One monastic well was, however, discovered when Grey Friars (built around 1224) was excavated in the second half of the 1930s (Little 1937, 36).

*Fig.4.21. The chalk-lined well (undated) found beneath the late 15th-century medieval chimney at Grey Friars (Little 1937, plate V, fig.1).*
In a room which lay about 10’ (3m) to the east of the refectory, a fireplace was uncovered and adjudged as having been probably installed between 1485 and 1509. This fireplace had been built over a surface well which was about 6’ (1.8m) square (fig. 4.21). No evidence of an alternative source of water supply to replace this well was found (ibid. 51).

The Dominican friary (1281-1538) lay just outside the city boundary near Fisherton Bridge and its visible remains were finally demolished when the site was re-developed in the 19th century (Godfrey 1947, 149). There were, nevertheless, sufficient vestigial remains for its ground plan, which included a double infirmary, to be plotted in 1947 (ibid.). No features relating to water supply or drainage were identified. However, a further limited excavation of the site was undertaken by Borthwick in 1978 when a few artefacts which were recovered and dated to the 13th and 14th centuries (Wiltshire and Swindon Sites and Monument Record Information SU 13SW481). Although no well was found the vestigial remains of a lavatorium (undated) were noted which, if correctly identified, indicates that some piped water had once been installed (ibid.).

Whilst there has been little archaeological research of monastic buildings, accessible parts of the cathedral and the Close have been carefully surveyed by both historians and archaeologists, but with limited information having been found about any wells which may once have existed. In 1937 contemporary documents were used to “re-create the possible lay-out and ownership” of the 47 houses in the Close which had formerly been occupied by an (estimated) 400 secular canons and their households (Edwards 1938, 60). No wells were identified in the survey, possibly because it was based on an observation of standing buildings and information obtained from contemporary records.

A more extensively researched study of the houses in the Close was conducted by Cocke and Kidson for the Royal Commission on the Historical Monuments of England in 1993, but neither the text nor any of the plans give any indication of where wells might have been situated. Although no well appears on the reconstructed plans of the Old Deanery in this publication, one is clearly marked on a similar plan drawn during an open excavation of the house in 1959, prior to the commencement of extensive restoration work (Drinkwater 1964, 41-116; fig. 4.22). This substantial property had a
generously sized kitchen close to which a well had been built which possibly dates from around the time this part of the building was erected in the late 15th century (Drinkwater 1964, 44).

Fig. 4.22. Plan of the ground floor of the Old Deanery showing the site of the well (undated) but within late 15th-century buildings. (Source: Drinkwater 1964, 48; fig. 1).

A number of excavations and watching briefs have also been undertaken from 1962 to the present day in discrete areas in and around several buildings within the Close (Wessex Archaeology 2009, 1.4). As the scale of each operation was quite limited, it is perhaps unsurprising that no wells were recorded as having been found. However, a much more intensive recent archaeological investigation of part of the Close also failed to reveal any features which could be interpreted as possible wells (ibid. 1.3.13). Its purpose was to enhance knowledge about the history of the Close by combining the use of non-intrusive geophysical technology (ground penetrating radar, magnetic and resistance surveys) with the excavation of four small trenches dug within the surveyed areas (Wessex Archaeology 2009; fig. 4.15). Three of the four areas investigated were the sites of demolished later medieval buildings, namely Bell Tower, Hungerford Chapel, and Beauchamp Chapel and the fourth area was another small part of the
bishop’s palace (ibid.4.2). Perhaps the lack of wells could be simply because none had been sunk in an area in which there were many burials dating from circa 1219 to 1789 (ibid.1). However one well, called Our Lady’s Well, was recorded in 15th-century documents as having existed somewhere within the western walled area of the cathedral and its auxiliary buildings. All trace of it has now disappeared (Cocke and Kidson 1993, 8).

Whilst it is difficult to come to any firm conclusions about the number, distribution and construction of wells in Salisbury, a contemporary document, housed in the Cathedral library, gives a unique insight into the significance of wells in the secular and spiritual life of medieval people. The voluminous treatise (transcribed and translated in Brandeis 1890) was probably written by a well-read parish priest around 1440 and the Salisbury manuscript is a copy written by several scribes (ibid.ix). Whether it was ever used for preaching, as may have been its intended purpose (ibid.), is unknown, but what is of particular interest is that the sentiments expressed in it must have resonated with the cathedral clerics who considered it worthy of preservation.

The treatise was built on a text from John iv.6-15 which recounted a conversation between a woman from Samaria and Jesus by Jacob’s Well, during the course of which Jesus said to her “Whosoever drinketh of this water shall thirst again: but whosoever drinketh of the water I shall give him shall never thirst; but the water that I shall give him shall be in him a well of water springing up to everlasting life” (verses 13-14: Authorised Version). Based on this text the medieval writer created a complex series of allegories in which he compared the human body, with its “pit” full of the “stinking ooze of deadly sin”, to a well which had to be thoroughly cleansed of its “stinking and corrupt water” (ibid.68; 172). Just as a well cleaner used “the utmost exertion” and many different implements, such as shovels, spades and pick-axes, to reach every corner of the well and remove the mire, so should the sinner cast out his sins by employing the “skeet of contrition, the scavel of confession, the shovel of satisfaction [and] the spade of cleanliness” (ibid.2). A skeet is later described as a “deep, long-handled shovel” used to scoop out “stinking and corrupt water” (ibid. 168). The treatise also advised on the best way to dig a well. First, sand and gravel should be removed and the well dug to reach “a kindly spring of sweet water” to which the seven virtues “the gifts of the Holy Ghost” were compared (ibid.vi). It should be of sufficient
depth to require a windlass, a three stranded rope and a bucket and should be lined with stones (*ibid.*; 227). What is of particular interest is the awareness which the writer (and presumably the audience he was intending to reach) had that “clean” well water was highly prized and worth considerable effort to achieve. Clean water seems to have been recognised by its appearance and smell, as it is variously described as being “sweet” and “limpid” (*ibid.*; vi; 227) as opposed to “stinking” and “corrupt” (*ibid.*; 68).

The manuscript is therefore a clear indication that at least some later medieval people appreciated the benefits of water sourced from rigorously scoured wells and from springs; but to what extent good practices of water hygiene were put into effect is problematic. Accordingly the next sub-section examines the evidence of pollution caused to wells and other water sources by the poor maintenance and inadequate waste control.

**4.4. Waste disposal and the risk of pollution**

Although medieval Salisbury was a city divided into two distinct areas of town and Close, each with its own responsibility for waste management, they shared the same problems of controlling nuisance and minimising what were perceived to be the risks to health from malodorous substances. Despite this common interest and the inevitable cross-pollution which must have occurred, there is little evidence of any sustained mutual co-operation or joint ventures. When the council decided, in 1452, to form a committee to oversee various improvements to the state of the town’s cleanliness, the minutes recorded that the issue of the “condition of the common ditch was to be discussed with the bishop” (cited by Carr 2001, xxviii); perhaps to ensure his approval to the proposed scheme rather than to seek any positive assistance.

Medieval urban waste was generated from households, industrial premises and street debris and Salisbury’s civilian population seems to have followed the common pattern of using a mixture of disposal practices. These included burying it in pits, dumping it at ground level within the curtilage of the premises or throwing it into nearby streets, ditches or water courses. Pits were used for organic and non-organic rubbish of all kinds but archaeologists have commented on the under-representation of such pits in Salisbury. Suggested reasons for this being the high water table and/or the ease of
dumping in watercourses (Rawlings 1994, 59; Currie 2002, 14; Cave-Penney 2004, 72; Barber 2005, 206). The Wiltshire Urban Survey of Salisbury named ten different sites where refuse pits have been uncovered and which contained food waste, broken pots and debris from various industrial processes (Cave-Penney, 2004). These pits were dug in the backlands of properties and, where their contents have been dated, they have been attributed mainly to the 13th and 14th centuries. By way of example, William and Hawkes’ excavations at Belle Vue House in 1989 found a “large number of roughly circular rubbish pits” filled with (unidentified) “greyish-brown and grey matter … and ceramic fragments dating from between 1250 to 1350” (Wessex Archaeology W290, 1996, 38). 14th-century butchery waste and broken ceramics were also identified buried in a pit in a back garden at 71, Culver Street (between Rolfe’s and Barnard’s Cross Chequers) (anon. 1973, 137). However, surveys and excavations undertaken in the Close in 2009 (to which reference has already been made) recorded no evidence of rubbish pits; although these could have existed in the unexcavated garden areas of properties.

The careful burying of domestic waste and ordure was not, however, universally practised, as an excavation in Gigant [Gigor] Street (Barber 2005, 165-212) discovered. The site contained a sequence of low status dwellings dating from about 1250 onwards. By the 14th century there were six narrow houses occupying what had originally been two burgage plots (ibid. 205). Samples taken from the earthen floors contained dog coprolite, mouse-sized bones and plant remains “perhaps suggestive of trampled cess” and the middens behind the houses showed “that a substantial amount of refuse was simply thrown out of the back doors” (ibid. 206). The habit of leaving waste on the floor was confirmed in excavations of houses at 49/51, Brown Street and Old George Mall (New Street Chequer) where layers of domestic and industrial rubbish were allowed to accumulate and then periodically buried under a layer of clay on which a new hearth was built (Wessex Archaeology W227, 1990; 20; Wessex Archaeology Report 37697, 1996, 7).

Other domestic rubbish may have been dumped in Town Ditch and other water courses because Salisbury’s First General Entry Book 1387-1452 recorded several regulations passed by the council to penalise those “who obstructed or fouled the watercourses running through the middle of the city” (Carr 2001, xxviii).
When deep sewers were laid in 1854 a considerable number of small, mainly metal, objects were found dating from the 13th century onwards; including 450 door keys, assorted cutlery, pins, tools and other small objects. Today these comprise the Drainage Collection (Saunders 1986) and some of the best preserved examples of which are on display at the Salisbury and Wiltshire Museum (fig. 4.23). Whether these objects were lost by careless owners or deliberately discarded is impossible to determine, but it is likely that they represent a fraction of the waste which ended up in convenient ditches, watercourses and open land around the town.

Cess pits occur more frequently in the archaeological record than do general rubbish pits and they been found mainly in the open backlands (Cave-Penney, 2004, 24, 26 36). The evidence indicates that they probably “started out in the medieval period as rounded, unlined excavations into the basal gravels but by the 15th century these were replaced by well-built square or rectangular pits lined with ashlar chalk blocks” (Rawlings 1994, 59). Outside cess pits or privies may have been housed within small sheds because a deed of 1309 gave a householder the right to enter a neighbour’s land so that he could repair the roof of his privy (Rogers 1969, 5).
Not all cess pits were, however, outside because one of the houses in Brown Street, which was larger than the others, had an internally accessible one (late-13th/early-14th century). This had been “cut partially through the edge of the southern wall of the rear extension” (Rawlings 1994, 26). Internal latrines were also a feature of several stone-built clergy houses and visitors’ lodgings in the Close (Cocke and Kidson 1993, 15, 17, 40, 90, 125). It is likely that some private latrines were built over, or drained into, ditches in the town, as this practice is known to have occurred in the Close. Thus Vicars’ Hall had, at least by the 15th century, two privies which had “been built to take advantage of the [nearby] Close Ditch” (ibid. 43). Whether the latrine shown on the engraving (fig. 4.24) as discharging directly into Close Ditch is later mediaeval or early modern is not known but in any event the picture illustrates how this type of feature might have appeared during the study period.

Figs. 4.24; 4.25. An engraving by Thomas Hearne (circa 1790) shows a latrine out-shute (which once emptied into a ditch) at the rear of a house in the Close near St Ann’s Gate. A faint outline of the shute (marked by white lines) may still be indistinctly visible on the Close wall adjacent to St John’s Street (Saunders 1986, 5; photograph by the author).
Even the porter manning the Close’s North Gate had his own privy, which led off the staircase to the first floor (*ibid.* 45); the position of which can still be seen on the outside of the gatehouse (fig. 4.26).

![Fig. 4.26. The remains of the out-shute of the medieval latrine in the North Gate gatehouse. The small window near the top of the arrow may have once been for the privy (photograph by the author).](image)

The responsibility for the upkeep and cleaning cess pits and latrines probably lay with the householder so that when, in 1416, Canon Harborough was allowed to build a privy on Close wall it was conditional “upon his maintaining it” (*ibid.* 1993, 40b). Evidence that Close Ditch was periodically cleaned out is supported by the lack of medieval and later finds from a limited excavation of part of it in 2001 (Cave-Penney 2004, 23).

The volume of waste generated in the town was probably greater and the problems of managing it more intractable, than for the Close. The surviving evidence presents a losing battle, over the centuries, to keep the town clean and its watercourses fresh and free-flowing. The general state of ditches and water channels probably resembled those in Winchester, where court rolls recorded a litany of public nuisance offences such as tipping offal, entrails, industrial and household waste or ordure into them (Keene 1985, 64). A vivid picture of the noxious quality of the watercourses in Winchester emerged during a court case brought by a laundress in 1299 (*ibid.*), by which she sought to prevent other citizens from hindering her washing and scouring her clothes in a water channel. Whilst her plaint succeeded on the ground that “water had always been common to all” the jury went on to state that people should not put into the watercourses woad-waste, hides being tanned, sheepskins, entrails, human or
animal blood and that they should also desist from washing babies’ nappies in it and from discharging garderobes or gutters into it (*ibid.*).

Various solutions were tried by Salisbury town council to control the problem of dirty watercourses and ditches, including the periodic passing of various regulations directed to improving the behaviour of the local inhabitants and effect temporary improvements. For example, in 1416, the council imposed penalties on those found fouling “any common ditches”; Town Ditch was to be re-made and the willow trees which were growing in it, removed. Officials were also appointed to ensure the “ordering of ditches” (Carr 2001, xxviii-iv.), but whether these officials supervised some form of communal effort similar to the annual “repairing, stalling and scouring ... of the brooks” by householders in Winchester (Keene 1985, 63) is not recorded. In any event fouling continued because in 1461 householders living near “the ditch” (unspecified but possibly Town Ditch) were ordered clear it of filth in anticipation of a royal visit (Pugh 1962, 100). Poorly maintained privies created a further recurring nuisance and one of the duties of the town council committee, formed in 1452, was the “ordering of privies”. It therefore seems that either householders were neglecting the obligation to keep their privies clean or it was a reference to common privies as, by the early 15th century, there was at least one common latrine. One is, for example, noted in a deed of 1427 as abutting a butcher’s tenement near Fisherton Bridge (Dale 1962, 87).

The problem was further exacerbated by the slaughtering of cattle and disposing of animal entrails and rotten fish in the market area (Carr 2001, xxiv). The council made periodic attempts to control this problem by passing regulations (for which records survive from the mid-15th century onwards) to curtail noxious butchering activities (*ibid.* xxiv). Another approach was tried in 1438 when the council sought permission from the dean and chapter to dig a refuse pit in the market square (*ibid.* xxvii- xxviii), but whether this was ever done and, if so, whether it was successful in curbing this nuisance is not known. Even if any organic remains had been so buried, they would have probably seeped into the shallow water table and from thence into nearby wells. Additional contamination to open conduits would also have come from domestic animals, horses and other livestock which were regularly present in the streets (*fig. 4.18*).
The only evidence of the council employing men to undertake cleansing was sometime in the late 14th or early 15th centuries (exact date unrecorded) when four men were appointed to collect “ordure” in two carts; but the cost of this “was to be borne by all the town’s inhabitants, subject to the discretion of the stewards” (ibid. 76). Even if some of the most noxious and unpleasant ordure and other waste was collected and removed from the town (and perhaps periodically also from Close Ditch and Town Ditch) there remains the interesting question of where it was tipped. In some cities such as London (Ackroyd 2000, 60) and Hull (Sheenan 1998, 161), the dung carts emptied their contents into the river. Whilst this might have occurred in Salisbury there is no evidence of such a practice and, alternatively, the material could have been tipped or buried on waste ground beyond the city boundary. In any event, this scheme cannot to have been very successful because the minutes of the council assembly of 1452 gave a graphic account of the appalling state of town when noting the reasons for appointing officials to oversee improvements. Their job was to supervise “the paving of the streets [and the ordering] of common privies, ditches, sewers and gutters emitting their filth into the common ditch, so that ... the sewers and gutters may be stopped up ... [and that they may be] so cleansed and repaired that they may be kept in their state of well-being to the adornment of the city” (transcribed and translated by Carr 2001, 164). What is not explained is how the “filth” was to be managed so that it did not find its way back into the ditch.

Conditions must have been made even worse when periodic floods caused the watercourses to overflow and bridges to collapse (Carr 2001, xxviii-xxix). A scheme was put into operation in 1458 to control flooding by building flood gates across the water course as it entered near Castle Gate. However this was later abandoned and the gates were removed so that river water could again pass freely through the streets (Pugh 1962, 100); presumably inundating then from time to time. Such flooding would have released contaminants from the shallow cess pits, ditches and watercourses and doubtless the unlucky inhabitants would have found themselves wading through raw sewage and other unpleasant waste (fig.4.27). The problems resulting from the inadequate maintenance of the town’s open watercourses and the council’s failure to adequately control waste disposal and flooding continued beyond the study period. There is, for example, a record of the council passing yet another order in 1628 “for
cleansing the common rivers and watercourses [which run] through the streets and other parts of the city, which ... [have] become so foul that the current was in many places stopped” (Benson 1843, 335). Once again this decree must have been ineffectual because John Evelyn, visiting the city in 1654, observed that “the most considerable parts of the city, the market Place, which together with the most part of the streets are watered by a quick current and pure stream running through the middle of them, but are negligently kept, when with a small charge they might be purged and rendered infinitely agreeable, and [become] one of the sweetest towns in Europe; but as ‘tis now, the common buildings are despicable and the streets are dirty” (de Beer 1955, 115). A stagnant economy, outbreaks of plague and no significant growth in population meant that the city remained little changed in layout from late 16th century until the 19th century, when the population began to rise (Cave-Penney 2005, 287). Although in the early part of 19th century the water channels were arched over they were later opened up again when the enclosure was wrongly identified as a cause of the cholera epidemic (Middleton 1850, 5).

Fig. 4.27. An engraving taken from the Illustrated London News dated 11.12.1852 showing the effects of flooding around Fisherton (Ball 2000, 54).

The rapid growth of the city in the 19th century must have exacerbated water management problems and the findings of those wishing to implement change make interesting reading as they described a situation and opinions which had probably persisted for hundreds of years. One of the most vociferous champions of better public hygiene was Dr. Middleton, a member of the Royal College of Surgeons, who, in 1850 made an impassioned public address to the general population of the city (which was later printed in a pamphlet). He also wrote three letters to the Salisbury and
Winchester Journal between 1864 and 1868 which were subsequently incorporated in a booklet entitled “Salisbury: The English Venice”. By the time he was writing cholera had arrived in Salisbury and had killed 200 people in a three month period in the summer of 1849 (Chandler 1983, 227). Although he could not identify its precise mode of transmission he believed in the prevention of this and other diseases through improved public hygiene and good drainage (1850, 4; 1868, 1). In order to argue his case he described the water supplies of Salisbury as he found them. He observed that the wells were shallow, being often “mere surface water” and that, after testing them, he found that they were contaminated by an “admixture [of] impurities ... [from] dung-heaps [and] cess-pools” (1850, 5). Shallow wells close to graveyards were, in his opinion, also being contaminated by seepage from “animal organic matters, especially after any considerable fall of rain” (1850, 12). Although wells were the most common source of water supply he noted that that many of the poor had no access to wells or privies and that they were therefore living in extremely filthy conditions which were “constant seats of disease” (1850, 5). The streamlets which he believed had originally been intended for a water supply had “become the only sewers of the city” whilst “still ... performing for many poor people ... the two-fold duty of a fountain and a sewer” (1864, 5). Although his campaign to close the open watercourses and provide a public water supply and sewage system ultimately prevailed, it is pertinent to note how much opposition he encountered from slum landlords and other city worthies on the council to the idea of raising money through a scheme of a property taxation (1868, 18). Even some doctors were prepared to argue that “neither nature nor art could have possibly formed channels better adapted to effectively carry away the sewage of the city than those which already exist[ed] (1868, 18). Fortunately Middleton views eventually prevailed and underground sewers and separate water supply pipes were laid. In order to achieve this level the water table was lowered, leading to a reduction in the frequency of flooding (Chandler 1983, 230).

4.5. Sacred water

As a new foundation in a low-lying rural landscape the city probably had no inheritance of any holy wells or springs and it has been suggested that that Our Lady’s Well (the earliest reference to which was in a 15th-century document) was “probably no more than an attempt to glorify one of the springs of water that surround the cathedral”
It may therefore have been developed as an attraction for pilgrims who sought miracles from the Blessed Virgin, the cathedral’s patron saint, and from St Oswald who had, after many years of ecclesiastical endeavour, eventually been canonized in 1457 (Brown 1995, 58; Spencer 1990, 34). Apart from this one possible holy well the only other source of water in Salisbury which may have had sacred meaning is the river Avon. The deposition of valuable objects in rivers and springs has a long history and even today people superstitiously cast coins into wells and fountains. This ritual may therefore explain why “the vast majority” of the few thousand later medieval pilgrim badges which have been found in Salisbury have been recovered either from the Avon or the millstream in between Fisherton Bridge and Crane Bridge (Spencer 1990, 12; figs.4.28; 4.29).

The total number of religious souvenirs, including both badges and ampoules, amounted to 199 in 1990 (ibid.68) and were mainly found between 1975 and 1987. Spencer, who has made a detailed study of these items in Salisbury and elsewhere, believes that the “bulk of pilgrim badges may have found their way into rivers as propitiatory gifts or thank-offerings, thrown there by returning or returned pilgrims” in the 14th and 15th centuries (1990, 11). Whether the same explanation can be given for the 126 livery and other secular badges which have been similarly recovered is more problematic. On the one hand it has been suggested that these badges had originally had a religious connotation and had acquired a power to bring good fortune and wealth to the wearer (Spencer 1990, 95), whilst a contrary view is that all these objects, including pilgrim souvenirs, were simply lost when they had “became
detached from their fragile pins and [had fallen] into the waters of the mill stream” (Saunders 1986, 9). However it seems strange that so many cherished possessions, brought from as far afield as Rome itself, would have carelessly lost over the side of a bridge. On the other hand, all the 200 badges displayed on the Portable Antiquities Scheme Database (http://finds.org.uk/database/artefacts/record) were found by metal detectorists on cultivated land. Another list of 51 badges and ampoules recorded a variety of find spots, only some of which were located at waterfront sites (Alexander and Binski 1987: 214-220). The explanation for the finds at Salisbury thus remains uncertain but the interesting possibility remains that they were deliberate depositions in a sacred river.

Fig. 4.29. A typical pilgrim badge depicting the head of St Thomas of Canterbury as archbishop and recovered from the Avon at Salisbury in 1971. Early 15th century. Height 44mm (Spencer 1990, 20; photograph by the author taken from behind glass at the Salisbury and South Wiltshire Museum with the kind permission of the Trustees).

Fig. 4.30. A similar St Thomas of Canterbury badge found on cultivated land at the Mumbles, Swansea in 2010. Early 15th century. Height 61mm (Portable Antiquities Scheme Database ID no. PUBLIC A5C6B7).

4.6. Summary and Discussion

The case study of Salisbury has examined how, within its historical context, a planned later medieval city made arrangements for water supply and waste management, from its foundation in the early 13th century to the close of the study period. As the city was
built on a virgin site, the ecclesiastical planners could impose on it their own ideas of
the ideal city and it therefore makes an interesting contrast with Exeter which was
already a developed regional centre when the Normans arrived. This concluding
section summarises the evidence about the systems and purposes of water
management in Salisbury; considers the relevance of medieval ideas and beliefs about
water; discusses the relationship between water management and the political and
social structures of the city; and concludes by drawing comparisons with Exeter.

_The vision for the new city of Salisbury_

Although a desire to escape the dominance of the Norman overlord was probably the
primary motivation for the move from Old Sarum, its protagonists chose, possibly for
reasons of political expediency, to present their case in the form of a visionary plan for
a new city in which water was to play a practical and symbolic role. Even if the
shortage of water at Old Sarum was overstated (and possibly untrue) it provided an
uncontroversial reason for re-locating to the well-watered valley of the Avon. The
descriptions of the future city as a Garden of Eden, where the water “would flow
clearer than crystal, purer than gold, sweeter than ambrosia” (Henry d’Avranches
transcribed and translated in Torrance 1960, 244), may have been the unrealistic
visions of overwrought ecclesiastical minds. Nonetheless, the size and design of the
cathedral and the generous scale of the town plan indicate that the bishop intended to
create a magnificent and awe-inspiring city. It would be a reflection of the glory of
God, His church on earth and, doubtless, the bishop’s own status. Whilst this
ambitious scheme was largely fulfilled, there lay beneath the city’s visual beauty
practical difficulties in relation to water and waste management which continued for
over 600 years.

_Problems arising from the topography of Salisbury_

Although the abundance of water was initially perceived to be a great benefit, in
reality the low-lying site with its high water table and proneness to flooding created
challenges for the designers and builders which they were never fully able to solve.
Marshy ground to the south of Town Ditch and around the cathedral was drained and
built up with imported chalk and wooden rafters; measures which were probably
adequate for small domestic buildings but which made the construction and
maintenance of the cathedral particularly troublesome (Spring 1987, 17). The problems caused for builders by the excess of water on the site make it likely that Close Ditch, Town Ditch and at least some of the smaller drains which have been identified during archaeological investigations, had land drainage as one of their functions.

Periodic flooding was a recurrent hazard and an attempt to ameliorate the problem by inserting closable gates near the start of the town watercourse was abandoned for reasons which were not recorded. Furthermore, the high water table meant that wells were necessarily shallow and were, therefore, vulnerable to contamination from the cess pits, middens and low-lying graves. Although there is no direct evidence of wells being so contaminated during the later medieval period, the later findings of Middleton can be used to support the likelihood that this was a long-standing problem, even if the degree of pollution cannot be ascertained.

*The provision of a water supply, the concept of clean water and the risks from contamination*

If d’Avranches’ poem (Torrance 1960) is factually accurate there was a spring near the cathedral and perhaps this later fed Our Lady’s Well in the 15th century. Although there may have been other springs within the city boundary (Cooke and Kidson 1993, 94 note 6) nothing seems to be known about them. Also there were no convenient aquifers like those which had supplied water to Exeter since at least Roman times. The main sources of water supply available on the site would, therefore, have been the river Avon; ponds; shallow wells; man-made watercourses and possibly (although there is no record of these) rainwater collection troughs.

Whilst the purposes for which the watercourses were designed cannot be ascertained with any degree of certainty, it would accord with the overall vision for the city for some of them to have been built as channels of clean water which would be aesthetically pleasing, a reminder of spiritual values and a source of domestic water supply. Evidence that these watercourses were timber revetted and that efforts were made by the city council (albeit with little lasting effect) to keep them free from debris, may support the view that they were originally intended to be open conduits of “clean” water. Although English monastic water supply conduits were rarely open to
the air, one such system had been installed at Stanley Abbey in Wiltshire and completed by 1214 (Bond 2001, 94).

The planners may even have tried to emulate the monastic practice of separating sewage from the domestic supply (Bond 2001, 104) by diverting water from the Avon through Town and Close Ditches in order to flush ordure and waste through them and out of the city.

Clear, “sweet” water was praised in both in d’Avranche’s early 13th-century poem and in the mid-15th-century treatise on the subject of Jacob’s Well. There is also ample evidence that the inhabitants of Salisbury were not unmindful of the need to scour out their wells, bury their rubbish and cess and keep the watercourses and privies clean. Despite having an appreciation of good quality water and a dislike of the nuisance and health risks caused by malodorous rubbish and its noxious fumes, many people lived in serious squalor, caused by leaving human and food waste to rot in their houses or in middens near their back doors. Whilst it could be argued in mitigation that perhaps the poorest inhabitants had little choice, as they may have had no access to cess or rubbish pits, the same excuse cannot be given for the butchers, fish mongers and other artisans who threw their industrial waste into the watercourses. Possibly such people were acting in much the same way as those who, today, throw their litter in the streets and fly-tip their rubbish on public land.

Evidence about waste and sewage management within the Close is very limited, but such as remains indicates that Close Ditch was periodically cleaned out and that latrines and privies (which probably emptied into it) were required to be kept in good order. The houses seem to have been substantial and well appointed and it is unlikely that the type of squalor which existed in poor parts of the town ever pervaded the Close. However, even if waste management within the Close was better controlled than in the town, there remained the problem of household water coming from an open conduit and/or from wells. The wooden revetting of the conduit would, if properly maintained, have limited seepage but externally introduced pollutants from humans, animals and birds would have been hard to prevent. Similarly, the shallow wells (which probably existed in far greater numbers than those we presently know about) may have been contaminated from seepage from the numerous graves around
the cathedral and from buried waste; although no rubbish or cess pits have yet been found within the Close.

There is, however, better evidence of domestic and industrial waste and ordure disposal practices in the town. Whilst these are similar to those found in all the larger towns of Britain, the consequences for Salisbury’s water supply may have been worse than in those cities which enjoyed better natural drainage and had a geology which allowed deeper wells to be sunk and springs to emerge to feed closed conduits.

*The symbolic and sacred meaning of water*

Water and its symbolism played an important part in the case put forward to justify the re-location to (New) Salisbury, but once this had been accomplished the vision of an earthly paradise with crystal clear waters seems soon to have faded. Thereafter, there is little surviving evidence that the Avon and its diverted watercourses were regarded with any special reverence; although the watery location of the pilgrim badges might indicate a superstitious belief in the magical properties of the river. The spring to which d’Avranches’ early 13th-century poem refers might have become the source of water for Our Lady’s Well, but it is not known when it was constructed, whether it was regarded as a holy well or whether its water was used for baptisms and other church rituals. Apart from these possible, but not convincing, examples there is no evidence that, once the city had been built, the unconsecrated waters of Salisbury were regarded by either the laity or the clergy as having any symbolic meaning or healing properties. Water which had been blessed for sacramental purposes was, of course, treated with reverence as the surviving 13th to 15th-century piscinae and fonts testify (anon. 1980, 34, 35, 41, 566).

*Daily life in Salisbury*

One of the areas which has been investigated is the extent to which the need of an urban population for water supplies and sanitation was met during the study period. Although the conclusions drawn from the incomplete archaeological and documentary record can only be tentative there seems to be, as one might expect, a correlation between slum properties, squalid living conditions and a lack of access to wells, privies and rubbish pits. There is no record of a public well and the poorest people probably
had to get their water, as they did in the early 19th century, from the polluted watercourses. Some may have had access to cess pits but others may have had no option but to live with their rubbish or dump it in watercourses. By way of contrast there is some, albeit limited, evidence that the most affluent clergy and laity had their own wells and latrines and the middle-ranking citizens may have had communal wells and privies. The site of one public latrine was recorded as existing in the later part of the study period (Dale 1964, 87) and there was also a reference, in council records, to “common privies” supervised by overseers (Carr 2001, 164).

The comparison with Exeter

Although both cities relied on wells and rivers (and possibly rainwater troughs) for some of their water supplies and had similar methods of waste and ordure disposal, the chronological table (17-22) highlights one important difference between them. Both cities had water conveyed through made-made conduits but the open channels in Salisbury remained largely unchanged throughout the study period whereas the more technically complex and costly closed ecclesiastical and civic conduits of Exeter grew and developed. Although neither of the city councils of Exeter and Salisbury had been successful in their legal challenges to ecclesiastical power, the former had more political independence from overlordship and more control over the civilian areas of the city than had the latter. Effective urban water management requires an effective civic administration and without more powers having been delegated to Salisbury council by the bishops, substantial improvements to the citizens’ water supply were unlikely. However whilst being an ecclesiastical (as opposed to a royal) borough may be one of the reasons why Salisbury’s city council failed to improve the civilian water supply, it cannot explain why the ecclesiastical water supply was not upgraded nor why the whole system remained largely unaltered until the 19th century, long after the bishops had lost their temporal powers. Indeed one of the curious and puzzling features of Salisbury’s water management is why the open water channels, which seem to have become choked with detritus and become seriously unpleasant for citizens and visitors alike, changed so little in over 600 years. Whilst the topography and geology of Salisbury may have made a similar system to that of Exeter impossible to install with the technology then available, it is hard to explain why, for example, neither the town nor the cathedral enclosed any of the open watercourses. Such a
scheme would probably have been achievable as many medieval monastic water supply conduits were so enclosed, as was the river Fleet in London. Indeed this step was eventually successfully undertaken in Salisbury in the early part of 19th century; although the covers were later removed when the enclosure was wrongly identified as a cause of the cholera epidemic. Speculatively the reason may simply be a lack of incentive to pay for improvements to a system which the city’s elite may, like their 19th-century successors, may have regarded as basically satisfactory. The problem of explaining why some cities had piped water supplies whilst others did not is further addressed in the concluding chapter.
Chapter 5: Conclusion

The conclusion summarises the main findings of the research and evaluates the extent to which its main objectives have been achieved. These were, in brief, to provide a multi-disciplinary overview of later medieval British urban water management systems; to assess its contribution to our understanding of the complexities of medieval urban society and to consider whether the approach adopted in this study could be profitably used to gain insights into other urban societies. The introduction posed a number of questions (page 15) which have been addressed during the course of the study and these are also further discussed in the sub-sections which follow.

5.1. The main sources of urban water supplies; the problems caused by the multiple uses of water and how these affected the lives of the citizens

The benefits and problems created by the rapid growth of many towns throughout the British Isles during the study period can be likened, albeit on a much reduced scale, to those which flowed from the industrial revolution of the late 18th and 19th centuries. In both eras water played a vital part in the development of industrial processes, as a provider of power and as a means of transport. At the same time water was needed for many household purposes, for religious rituals and to remove contaminated waste. One aspect of the study was to take an overview of the complex interaction between the sources of water, the multiple purposes for which it was needed and the difficulties of keeping clean and polluted water separated.

Rivers and other natural watercourses were probably the most exploited source, with a wide range of (sometimes conflicting) uses which included passage for shipping; power for mills; supplies for domestic and industrial processes; fishing and the removal of waste and raw sewage. Open man-made channels had similar uses and suffered from the same pollution problems as the natural watercourses from which they drew their water. How extensive these conduits were and when they were laid down is difficult to assess as they have mostly vanished from sight. However contemporary documentary references, archaeological excavations, plans and post-medieval paintings all prove that they were probably a common feature in many towns and cities. Moreover it can hard to distinguish, as the case study of Salisbury illustrated, whether the channels were originally built to provide water for mills, for drainage, for
domestic use or the removal of waste. In any event, whatever may have been their primary purpose, man-made urban open water courses, like natural ones, usually degenerated into waste depositories and were a regular cause of complaint.

Closed conduits were installed in a limited number of towns and cities and they probably provided the safest quality of domestic water for those who were permitted access to them. Several meticulous investigations have described in detail the sophisticated and innovative technology employed by the medieval hydrologists, but what is of equal interest is why and by whom the decision was taken to build them. One of the benefits of reviewing water management within a British context is that it has highlighted the fact that whilst the main types, design and uses of urban water supply were similar in all four countries, it was only some English cities and Dublin (which was firmly under Anglo-Norman political and ecclesiastical domination) that had systems of water supply which included closed conduits. The reasons for this are complex as each country had different political and cultural contexts. Also, within each country, every town had a unique interplay between the types of water supply which different sections of society required and the ability of councils and others to meet those needs. It is also necessary to distinguish piped water supplies to urban castles, cathedrals, monasteries and private houses (which were for the exclusive use of their inhabitants) from those to which the ordinary citizens had access; possibly as shared facility with a friary. The totality of the evidence considered has indicated that those towns and cities which installed a civic closed conduit had to possess several (but not all) of a number of critical factors which are listed below, in no particular order of priority.

(i) A need to find new water supplies to meet an expanding demand.

(ii) A secular rather than an ecclesiastical borough.

(iii) Located in England or within a prosperous Anglo-Norman enclave.

(iv) A flourishing economy and a council which had established a degree of autonomy from overlordship.
(v) Civic leaders and supportive citizens who wanted the convenience (and possibly quality) of piped water and who were prepared to accept the practical and financial risks of installing it.

(vi) Access to at least one source of spring water which lay at a sufficiently high level for the conduit to be gravity controlled, but not too far from the proposed termination point.

(vii) Civic leaders who were able to negotiate and fund rights of access to the spring(s) and easements for passage across extra-mural land.

(viii) A good relationship with a local friary which was willing to co-operate over the installation of a shared system.

(ix) A wealthy and prosperous merchant class which was both able and prepared to assist with funding; perhaps partly motivated by religious/philanthropic motives.

(x) A strong sense of civic pride and a desire to further the economic interests and status of the city by providing amenities.

Evidence from archaeological excavation and contemporary records and plans has revealed that the installation and maintenance of a civic or ecclesiastical closed conduit required formidable technological knowledge and building skills. However lack of reservoirs, steam powered pumps and large foundries inevitably limited what the later medieval hydrologists could achieve.

There is no record (except for castles) of free-standing cisterns being used at any time during the later medieval period to collect and store rainwater, although it is likely that such a simple and convenient method would have been adopted. Much more, however, is known about urban wells, although references to them are often lacking in detail and their significance is rarely discussed. These were an essential feature of urban life and were used to provide water for household, industrial, religious and miraculous purposes. Unfortunately, both the archaeological and documentary evidence is often limited to a brief reference, precise dating is difficult and it is likely that the surviving examples are a tiny fraction of the total number of later medieval urban wells which once existed. The methodology used in the study has enabled a more complete picture to be given of the different types of wells, their technology,
distribution and their place in the social ordering of society; although the conclusions which can be drawn are tentative. The simplest type of well was sunk in soft open ground where the water table was high and the method of construction, as demonstrated from excavations in Cambridge, Salisbury, Southwark and Perth, involved lining a round or square hole, sometimes only a metre deep, with a bottomless wood barrel or with wattle or stone. These wells were probably used as a shared facility by people living in the modest properties nearby. Those who lived in the most cramped tenements, such as those excavated in Antelope Chequer in Salisbury, were probably the very poor who seem to have had no immediate access to a private well and were, therefore, reliant on a communal well or open watercourses.

By way of contrast, and provided a supply of water could be found, the larger houses of the wealthy, ecclesiastical premises and urban castles probably had their own wells; the degree of sophistication of which partly depended on the depth of the source. These wells were situated either within the building or in the open courtyards where they were protected by a well house or roof. Where very deep wells were required and there was sufficient money to install them, the medieval builders were technically inventive both in the construction of the shafts and in the use of ropes and pulleys to raise water from many metres below ground. Knowledge of these has come mainly from castles although the deep wells uncovered in the late 19th century in the Pithay district of Bristol may have been public civic ones. The extent to which well water was contaminated depended in part on how many pollutants were able to enter the supply from seepage. Although there is no direct evidence of the degree of pollution in medieval urban wells, the much later investigation of water quality in the shallow wells of mid-19th century Salisbury provides a possible analogy because water management in the city had remained largely unchanged since the close of the Middle Ages. The two safest sources of supply were, therefore, either deep wells or those fed from spring water carried through closed conduits.

The evidence, though not conclusive, therefore indicates that the higher up the social scale a family or ecclesiastical household was positioned, the more likely it would have been that it would have had its own private and convenient source of domestic water. However it did not necessarily follow that water used by the elite was always less polluted than that available to the poor. For example, in the mid-15th century the
merchants of Salisbury probably drew their water from shallow and potentially contaminated wells, whereas the humble artisans of Exeter fetched theirs from wells supplied by piped spring-water.

5.2. The management of water and waste disposal within the context of the developing urban administration

One of the issues which was addressed in the study was the extent to which effective water and waste management was impeded by the fragmented and evolving nature of national, local and legal administrative structures. Although the councils in secular boroughs were generally in a stronger position than their ecclesiastical counterparts, they still had to contend with competing jurisdictions over the city which limited their administrative effectiveness. Exeter had no less than three bodies (the council, the bishop and the overlord) each of which had control over aspects of the administrative and legal jurisdictions within the city. Much of the land and watercourses beyond its boundary were controlled by the earls of Devon. The case study gave examples of how the citizens were periodically in conflict with both the bishops and the earls; how these affected aspects of water and waste management and how the citizens’ repeated legal challenges never prevailed.

The lack of any over-arching secular administration and limited civic income resulted in urban water supplies and waste disposal being a rather anarchic mixture of individual self-help and co-operative ventures. Cities such as London, Exeter and Bristol had a maze of inter-connecting underground conduits and a mixture of private and public wells which were all maintained by different groups or individuals. Waste disposal was likewise a mixture of private cess and rubbish pits; private privies and latrines; some public latrines; some civic collection of ordure and much general dumping. Although councils made attempts to regulate the worst excesses by passing by-laws, the repeated nature of these suggests they were largely ignored. It was not until the mid-19th century that civic corporations had in place sufficiently robust administrative structures, supported by a developed national Government and legal system, to enable them to begin the huge and expensive task of organising, funding and installing effective water management systems. Taking into account the limitations of jurisdiction and income and the recurring horrors of wars, famines and plagues, it was
brave and far-sighted of a number of councils to install, sometimes as co-operative ventures, complex closed water conduits, flood defences and improved port facilities.

5.3. The conceptual framework

The purpose of the conceptual framework was to investigate other, more abstract, reasons which might partially explain the form of later medieval urban water management and some of the difficulties which were encountered. In order to have a structure of local government which was sufficiently effective to put in place an advanced system of water supply and sewage removal, it was necessary to develop the legal fiction of corporate identity. This enabled a city or town, although acting through its mayor and council, to be an independent “person”, with its own legal rights and responsibilities. Although this concept evolved during the later part of the study period, many councils remained unincorporated and their members faced particular difficulties if, like Exeter in the first half of the 15th century, the town became embroiled in litigation. It was also difficult for councils to manage water effectively without a clear jurisprudence of water and riparian rights which determined how conflict between owners and users should be resolved. These were never formulated in Britain during the later medieval period and the long running dispute between the city of Exeter and the earls of Devon exemplified the problems this could cause.

One of the most interesting issues which has been investigated was the possible influence of certain medieval beliefs and ideas on the ways in which water and waste were managed. There is a commonly expressed opinion that medieval people, unlike the Romans, were content to live in squalor and were indifferent to both personal hygiene and the need for clean water. The study has showed this to be fallacious. All town councils adopted a variety of regulations in an attempt to control the nuisance caused by the indiscriminate dumping of waste and the inadequate disposal of ordure. Some even set up limited waste removal schemes and installed public latrines. Such endeavours raise the interesting question of what purposes they were intended to fulfil. Whilst civic pride and an improved quality of life may have been considerations, were the measures also regarded as a way of safe-guarding the health of the community? The study has sought to answer this question by drawing evidence from a number of contemporary documents and historical works of synthesis to examine
some of the medieval ideas about the link between disease, clean water and good practices of general hygiene.

Whilst the widespread belief that the inhalation of noxious fumes emitted by rotting and insanitary waste caused diseases was wrong, it was nevertheless a conclusion which had been reached by trying to make logical connections based on observation. On the other hand, there were beliefs which were a complex and confusing mix of religious fatalism, superstition and classical theories of medicine (which themselves were a combination of logical insights, astrology and paganism). Amongst the more rational ideas was that good practices of hygiene, medical intervention and the use of pure/clean water could help to prevent and alleviate illnesses. Clean water was identified by using the senses of smell, sight and taste. Several contemporary documents advised that such water was best sourced close to the head of a spring or from a deep well. Running water was considered of superior quality to still, but if the latter came from wells, then these should be regularly scoured out. There is, however, one curious and recurring belief that even if water seemed in all respects clean it could still contain hidden health hazards. This was a factually correct deduction, but the reasoning is hard to follow as was based on the idea that well water could be somehow poisoned by Jews, lepers or a besieging enemy. Presumably this was effected by the surreptitious introduction of an undetectable and unidentified substance into the water.

Although it is impossible fully to understand how medieval people could hold so many irreconcilable and strange ideas at the same time, even today many educated and seemingly rational people believe in horoscopes, lucky numbers, mascots and crystals. It is therefore likely that whilst some individuals stuck rigidly to one point of view, many others adopted a more pragmatic approach of combining good practices of hygiene with additional help from prayers and miracles.

If the link between stinking waste and illness was one which was widely held and if most citizens had a pride in the appearance of their town, it remains hard to explain why the regulations to curtail the indiscriminate dumping of rubbish and ordure seem to have been so widely ignored. Perhaps there was simply nowhere to tip rubbish safely or perhaps some individuals adopted the same kind of cavalier attitude which
today leads to fly-tipping and poor personal hygiene. In any event, even better waste disposal would have not have prevented some contaminants reaching the domestic water supply. Two vital steps were needed to be taken to remedy the problem, namely the total separation of sewage and waste from domestic water and a piped water supply which came from uncontaminated sources. These were not undertaken until the mid-19th century but, as the case study of Salisbury showed, the changes there came about as the result of careful observations which pointed to a causative link between the spread of cholera and polluted water; although the precise method of transmission was not understood. What possibly, therefore, stood in the way of medieval thinkers reaching similar conclusions was not a lack of complete scientific appreciation of the causes and transmission of diseases, but rather a mindset which prevented the making of logical deductions from experimentation and observation. New theories might have challenged long-held beliefs, supported by the church, and even if these were often irrational and sometimes contradictory, it took many centuries before they were finally abandoned.

The confusions and contradictions of later medieval ideas make it difficult to know exactly why, for example, closed water conduits were installed. The earliest evidence of their use was in ecclesiastical establishments where clean, pure water was needed for religious reasons. This was not however the motivation for installing civic conduits. Additional considerations, for both religious foundations and civic councils, would doubtless have been the convenience and status of having piped water. There also seems to have been an understandable preference for taking water from a moving source which appeared clean. Accordingly piped water which came from the mouth of a spring would have been appreciated, even if the consequent health benefits were only dimly glimpsed.

Both Christians and Jews regarded water as a symbol of spiritual cleanliness and, conversely, of dirt and filth being analogous to sin and spiritual impurity. Whilst evidence of these beliefs can be identified in the good water and waste management practices in many religious establishments these seemed to have ended at the boundary of the premises. Thus the occupiers of houses in the Close at Exeter had no compunction about tipping their waste into the city’s streets, whilst the Abbey of St
Werburgh in Chester and several of the clergy houses of Salisbury emptied their latrines into nearby ditches.

Furthermore, whilst it is possible than some later medieval towns were deliberately designed to be symbols of Christian beliefs, there is little evidence, within the secular areas of the towns, that water had any significance beyond the utilitarian. Although none of the fountains erected in some English towns as part of a piped water supply have survived, there is some evidence of what the Great Conduit of Exeter might have looked like. It was said to have been decorated with some religious symbols but also with secular ones. Furthermore, the solid style of the building, whilst impressive, was unlike the more ornamental fountains with their free-flowing water which could be found in monasteries. Similarly it is possible that leper hospitals were sometimes deliberately built close to streams and rivers because of the spiritually cleansing and miraculous healing qualities of water. Equally their siting could have been because a plentiful and convenient supply of water was needed for practical reasons; although perhaps the symbolic meaning was also appreciated.

Finally, there is the question of whether any water features played a part in the general symbolism of civic identity and pride, as exemplified in guildhalls, civic regalia, seals and livery. A civic piped water system probably added to the status of a city and the Carfax (Great) Conduit in Exeter, which took pride of place in city’s welcome to Henry VI in 1451, might have been regarded as a symbol of the city’s importance. However, no purely ornamental water features, like those found in some castles and palaces, seem to have been installed in any urban public places, possibly because of the expense and difficulty of providing and maintaining a status symbol with no practical function. There is also no firm evidence that the actual water which supplied a city had any symbolic or sacred meaning until it had been religiously blessed. It nevertheless remains possible that the finding of the many pilgrim badges in the Avon at Salisbury might indicate that the river had some kind of sacred meaning which is now lost to us.
5.4. Changes over time

The methods of water supply; the technology to undertake large scale hydraulic works and the means used to dispose of waste and ordure did not alter in any major ways throughout the study period. This does not mean that these remained totally unchanged and examples have been given of improvements in the technology of conduit construction in Exeter; to the linings of domestic wells in Cambridge and the development of public latrines. However perhaps the most important change during the study period was the spread of the more sophisticated systems of conduits, internal piped water, indoor latrines and the like amongst the wealthier urban ecclesiastical and secular elite and then onwards to the more humble citizens. The study has provided examples of individuals from the emerging middle class of prosperous merchants and skilled craftsmen using their personal funds to provide their own wells, indoor latrines and to pay for personal access to piped water in ways similar to those provided for the upper classes. However these people were also the mayors and burgesses of their cities who, as outlined in the historical framework, were sometimes able to provide the leadership, vision and personal philanthropy to provide civic conduits, public wells and public latrines for the benefit of the poorer urban classes. Developing conceptual ideas about the purposes of local government, corporate identity and rights over land and water also probably contributed to the expansion of complex civic water supplies, port developments, leats and flood prevention schemes in many, but not all, towns and cities. It can be plausibly argued that changes and improvements to urban water management were directly related to developments in the wider political, administrative, economic, legal and social structures of later medieval Britain. However one important idea never altered and that was the belief that diseases were spread by noxious fumes and whilst this remained unchallenged there was no need fundamentally to alter the ways water was supplied and waste disposed of.

5.5. Control, co-operation and conflict

Control, co-operation and conflict are three key words which encapsulate many of the themes of the study. The development of urban life required a combination of the physical control of water through technology and administrative control of its
distribution. However, the structures of medieval national and local government divided control of water management systems between competing jurisdictions. This, in turn, led to recurring physical and legal conflicts which an underdeveloped jurisprudence of water and riparian rights was unable to resolve. Conflicting ideas about the part played by water in the causes of and cures for diseases and how clean water should be defined, may also have affected the ways in which it was supplied and contaminated waste disposed of.

Although control and conflict were inter-related and recurring themes in this study there were examples of positive co-operation over, for example, the installation of closed conduits. Furthermore, overarching all the conflicts between the rival power groups was a pride in the town or city which manifested itself in the presentation of a united front on ceremonial occasions and in co-operation in the face of external threats and internal disorder. As water was vital for the existence of a town, conflicts over it were never allowed to escalate to the point which might undermine the town’s basic stability and economy.

5.6. Understanding the modern city

The two case studies, in particular, have shown how echoes of the old water management systems can still be found in modern cities, even when all visible traces have vanished. There may, for example, be clues in the names of some of the streets and old taverns; in the sometimes peculiar routes of some of the streets and in other puzzling aspects of the topography. Moreover, by tracing what can still be found of the old water courses, leats, weirs, wells, conduits, drains and latrines, one is able not only to appreciate better a vital aspect of everyday medieval urban living but also to reach a greater awareness of how the past life of the city has shaped its present,

5.7. Interpreting the evidence

Perhaps the most rewarding but difficult task for archaeologists is to interpret their discoveries in ways which will help to re-create past societies, including their social, political and legal structures, their religious beliefs, technical skills, scientific knowledge and so forth. One of the purposes of the research was to test the proposition that a multi-disciplinary study of urban water management systems could
assist with this exercise and this is discussed in this final sub-section. Amongst the benefits of researching aspects of later medieval Britain are the accessibility, quantity and variety of primary and secondary written sources which can be used to supplement and illuminate the archaeological material. By using these sources in an imaginative way one can begin to see the world through the eyes of people with a different body of knowledge and different perceptions from our own. This understanding needs to be reflected in the interpretation of the archaeology. For example, without the advantages of modern scientific knowledge the medieval concept of clean/pure water was necessarily different from our own. Accordingly it would erroneous to conclude that a system of closed conduits was intended to provide water which was largely free of disease-bearing contaminants even if this might have been the consequence. Furthermore, as diseases were believed to be spread by noxious fumes rising from rotting garbage and ordure, it would have considered entirely appropriate for such material to be buried in shallow pits or deposited in rivers.

Archaeological evidence and literary sources have demonstrated that all classes of urban medieval society had to contend with the unpleasantness of living amongst rotting garbage and raw sewage. However contemporary documents dispel any notion that medieval people were indifferent to either the consequent health risks (as they saw them) or to the squalor of their surroundings. Complaints were made in graphic terms and councils struggled to put in place effective and lasting waste disposal measures. These seem largely to have failed because of the limitations of the political, administrative, legal and social structures.

The question remains whether the research method adopted for this study could furnish similar insights in respect of urban societies in other periods and places where there is sufficient archaeological evidence and preferably accessible contemporary written sources. Water management in the larger urban settlements in Roman Britain is one such possible area of research and this could perhaps be compared with that of later medieval Britain. There are, however, also many excavations of settlements whose occupants either have left no written material or whose scripts have yet to be deciphered. In these circumstances could the remnants of water management systems supplement insights given by other archaeological material? The answer is
probably in the affirmative, provided the remains are sufficiently extensive and carefully recorded. For example, the traces of a city’s system of piped spring water conduits may be indicative of a society which possessed sufficiently advanced administrative structures and technical skills to build and maintain them. Their sources of supply, the routes they took, their access points and ultimate destinations could provide clues about the ordering of society and the extent to which those who inaugurated their construction accepted an obligation to provide for the needs of the poorer citizens.

This study has relied heavily on contemporary records and additional secondary written sources to provide a context for, and assist with, the interpretation of the archaeological evidence. This approach has undoubtedly produced many useful insights but it also illustrates a paradox which lies at the heart of this study, namely that the more evidence which is collated the more nuanced, multi-dimensional and sometimes puzzling becomes the attempt to fully comprehend the complex functioning of a past society.
Archive source material

*Primary documentary sources - later medieval (transcribed, translated and edited) and early modern (later 16th and 17th centuries) written documents and plans*


Hooker’s plan of Exeter *circa* 1600: Devon and Exeter Institution map collection and removed from an atlas by Braun and Hogenburg 1618.


Speed’s plan of Salisbury *circa* 1600: An early but undated copy kept behind glass and reproduced with the kind permission of the Wiltshire and Swindon History Centre.


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