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Water and the Urban Fabric: a study of towns and waterscapes in the Roman period

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Summary

This paper highlights the ways in which components of waterscapes – rivers, lakes, pools, wetlands and waterfronts – formed elements of the urban fabric in the Roman period. Urban archaeology has focused mainly on features relating to land whilst nautical archaeology, encouraging studies of rivers, ports and harbours, trade and seafaring, reminds us of the importance of watery contexts. By examining waterscapes in the urban setting we can start to break down some of the traditional dichotomies in archaeology between land and water. Water could form an integral part of the lived environment and acquire cultural meanings that can be studied archaeologically.

Keywords

Waterscapes; settlement archaeology; Roman towns; materiality; urban experience; Lincoln

Introduction

Water is a subject of major importance today with some key issues including the accessibility and cost of water, its excess in some localities and shortage in others, climate and landscape change, sanitation, water pollution, water power and the exploitation of seas and rivers for resources. These themes can have an impact on the urban experience. The expansion of urban centres, for example, has major economic and ecological implications connected with water as land is engineered, natural resources are exploited and water supplies and drainage facilities are installed (cf. Benton-Short and Short, 2008; Kahn, 2006). The flooding of towns and cities remains an issue that affects many countries and it is these events – which can still sometimes be difficult to predict – that can be such a dramatic reminder of the continued presence of water in the urban context today. There are some areas of archaeological study that specialize in the human relationship with water including nautical archaeology, with its particular interests in ships, ports, harbours, travel, exploration and trade, and wetland studies which engages in human lifeways in wetland areas and the examination of material from wetland contexts. The themes relating to these specialisms, however, can also add to our understanding of urban experiences and it is important that the specialisms are not studied in isolation but form part of broader developments within both archaeological method and theory. By taking a broader perspective it is possible to start breaking down traditional conceptual dichotomies between water archaeologies, such as maritime, nautical and wetland studies, and the archaeologies of land. It is also possible to challenge perceptions of the distinction between ‘nature’ and ‘civilization’ in archaeological studies where obvious artificial elements such as buildings, walls, roads, pipelines and material culture are separated off from other features such as rivers and lakes in archaeological thought. We now have a very useful resource of studies of Roman period water supply and drainage infrastructures in urban and other contexts (e.g. Burgers, 2001; De Kleijn, 2001; Taylor, 2000), but we can also examine the way in which water could form a significant element of towns, and their material record, in the form of rivers, lakes, pools, waterfronts and wetlands. These features were acted upon through human activities and experiences and as such they can be studied archaeologically. Indeed, it is through human actions and experience of the water that waterscapes are created: values are applied to different contexts in which water is found.

It was to consider the urban relationship with water, the way in which water formed elements of towns, in the Roman period that a British Academy funded research project was established. It is the purpose of this paper to demonstrate some of the ways in which watery contexts formed elements of the urban settlement structure and address how these might be studied in terms of their social significance and their impact on the urban experience. Whilst waterfront zones especially, such as ports and harbours, have been studied in the urban context, it is important that the various components

of waterscapes, and their relationship with towns, are not just considered as features by themselves but also as part of a whole.

Water and materiality

In 1973 Helen Clarke published an important article in this journal on the changing riverline of the town of King's Lynn (Norfolk) in medieval times. In her paper she emphasized the economic importance of the town's location on the eastern bank of the River Great Ouse about 4.8 km from its mouth and the North Sea. Clarke also demonstrated the importance of the river and riverfront as a significant element of the urban topography of King's Lynn including in the way in which the river course, and thus the urban relationship with the river, has altered over time as a result of both natural and artificial actions. This was one of the first focused studies of an urban waterfront in Britain and was a good demonstration of the potential there is in examining the archaeology of waterfronts and rivers in urban settings. King's Lynn is a town with medieval origins but this study was soon followed by a series of publications on the waterfront archaeology of a variety of periods including Roman settlements (e.g. Goodburn et al. eds., 1991; Milne and Hopley eds., 1981). The discovery of important waterfront remains relating to the port of Roman London in the 1970s (Milne, 1985), though earlier finds had been made (e.g. Price, 1870), also raised a new awareness of the potential of waterfront archaeology and the way in which waterfronts could form a significant aspect of the urban topography. Economic perspectives are important in interpreting rivers and waterfront structures in these settings – with issues including shipping and trade routes – (and the economy was also embedded in social action and behaviour) but there are further factors that can also be considered when examining their significance as part of the urban structure and urban experience.

Rivers and waterfronts, moreover, were not the only way in which water could form a significant element of the urban fabric. The full relationship between settlement and water can be highly complex with a range of different watery features forming aspects of the urban topography. These features include rivers, streams, lakes, pools, springs, wetlands, waterfronts and islands. Like built space, watery contexts are socialised and can form meaningful elements of settlements. Through its physical properties, use, control, management and distribution (cf. Strang, 2008), water has a materiality and, like buildings and monuments, it has to be investigated through the methodologies and theories relating to archaeological practice.

The distinction between the 'natural' and the 'artificial' is not straightforward: despite being a 'natural' substance, water forms part of the humanized landscape where it is acted upon and is an aspect of human experience and knowledge. A feature apparently unaltered by human action – such as a lake, river or pool – will have been used, experienced and incorporated into the socialized world and

consciousness of local people (cf. Insoll, 2007) so can be studied from archaeological perspectives. We do not usually think of water in the same way as an object or material culture but it does have physical properties and these can change – especially when it freezes or evaporates (cf. Strang, 2004: 50-1; 2005). Water is also often found in relatively well-defined physical contexts such as river channels or lake basins. With the scientific definitions of water that we have today, we tend to assume that water itself and the contexts in which it is found are familiar to us. Similarly, within archaeology we tend to translate archaeological evidence into something that we can understand and we assume that it was the same, and experienced in the same ways, in earlier periods (cf. Shanks and Tilley, 1987: 115-7). This dilemma in our understanding of material from the past is of equal relevance to our consideration of features relating to water. Water and watery contexts have biographies or life-stories which can be considered alongside other elements of the archaeological record.

Architecture as a form and entity is imbued with symbolism: through architecture, spaces and monuments are created, landscapes are changed and materials are manipulated in new ways (cf. DeLaine, 2002; Dobres, 2000; McFadyen, 2006; Revell, 2009; Tilley, 1994). Human engagement with watery contexts can also have an architectural element with the construction of waterfront installations, river revetments, bridges and areas of reclaimed land. Rivers, lakes and other components of waterscapes can also be considered to have architectural form themselves as they acquire social meaning and are incorporated into the socialised landscape and settlement structure. They will have been used over long periods of time being transformed through human action but also having an impact on and transforming human behaviour; like person and object, they are tied up with each other (cf. Gosden and Marshall, 1999: 169). Studies of architecture are increasingly placing emphasis on the social meanings and organization of space including in studies of medieval buildings (e.g. Graves, 2000; Johnson, 2002), prehistoric monuments (e.g. Bender 2001; Tilley 1994) and Roman structures (e.g. Favro, 1996; Gardner, 2007; Revell, 2009). It is also useful to include water in considerations of structured space (cf. Johnson, 2002; Richards, 1996). Like buildings, the biographies of lakes, rivers and other watery features relate to human action and experience but they can also change form on their own accord.

The subject of materiality is an important theme within anthropology and archaeology especially in studies examining the relationship between material culture and identity (Miller ed., 2005; 2010). Like architecture and material culture, water will also have acquired social meanings beyond those associated with its functional uses and these meanings will have had an impact on space. In many social contexts, for example, water was, and still is, imbued with religious meaning (e.g. Burdon, 2004; Edlund-Berry, 2006; Kamash, 2008; Kosso and Scott eds., 2009; McNiven, 2003). Sailing on water in Roman times invoked reactions relating to the dangers involved and the contact that was being made with the deities (Braund, 1996). Both historical and mythological events, moreover, could

become associated and combined with particular bodies or contexts of water; the Tiber in Rome, for example, was central to the origin myth of the city relating to the importance of the river in local consciousness (P. Jones, 2005; Wiseman, 2004). Within the specialism of nautical/maritime archaeology there is also an increasing awareness that the scientific rigour needed in the subject should not mean that the material, such as shipwrecks, cargoes, waterfront installations and other finds, is studied in isolation from its social context; because it is well preserved, and apparently recognisable to us, it does not mean that it can necessarily provide easy answers about the past (cf. Flatman, 2003; Westerdahl, 1992; 2005). Water and watery contexts could form as much a part of the townscape – involving people, events, memories and myths – as buildings or open spaces. It is also important that the social significance of watery features in towns – such as their involvement in people's actions, events, memories and myths – is considered alongside practical and economic factors and that we do not make assumptions about the nature of the material evidence.

The archaeology of waterscapes: water in the settlement context

Waterscape is a term that refers to the wide range of contexts, often interconnected, in which water is found in the landscape including rivers, streams, lakes, ponds, pools, springs and the large variety of different types of wetland areas. Waterscapes can alter at different times of the year with flooding events or drought and they can change over the long-term through, for example, alterations in river channel courses. The nature of the water within different components of the waterscapes can also vary according to a number of factors: flowing water in rivers or still water in lakes and wetland contexts; whether the water is fresh or salty; whether it is clear or opaque – the colour depending on the material in which the water is carrying; and the habitats in which the water is able to contribute (cf. Acreman ed., 2000; Brown, 1997; Burgis and Morris, 1987). Waterscape, however, also refers to the fact that people attach values to the different watery contexts and to the various characteristics that the water can have and these values are often beyond the practical uses of the water (cf. Strang, 2008; Van de Noort, 2011; Van de Noort and O'Sullivan, 2006).

There have now been some initial attempts, for instance, to discern whether various types of watery context attracted different kinds of behaviour in prehistory represented by religious actions such as ritual deposition. Such studies have been undertaken with Bronze Age metalwork from the East Anglian Fenland (Yates and Bradley, 2010) and material from the Humber Estuary and its tributaries (Van de Noort, 2002) and it appears that there was a complex cultural understanding of waterscapes in prehistory. It has also been recognized, however, that ritual deposition also took place in dry land contexts and that the distinction between water and land as elements of socialized and ritualized space was less clearly defined as has sometimes been assumed (cf. Bradley, 1998; Hill, 1995).

The cultural values that could be placed on various contexts, both land and water, raises important questions about how we study settlement sites in archaeology. Waterscapes formed important elements of the urban space, evolving over time as the towns evolved. They will have been involved in the practical aspects of the working town but the way in which they were used and treated will also have been associated with the social conditions and attitudes of the time; and this also has important implications for our understanding of urban spaces and the urban experience.

Rivers

Rivers are an obvious element of urban settlements, with most towns in Roman Britain being situated in close proximity to a river, as towns and cities are today. It is unfortunate, then, that rivers typically form such a minor element of most studies of Roman urbanism. Their presence can perhaps be taken for granted with the assumption that we know how they would have been used and benefitted settlements without more detailed considerations of the ways in which they formed part of the urban experience. Rivers, of course, were often of importance for the movement of people and goods in Roman times (cf. J. Jones, 2009), for the water itself that they provided and for the resources from the water; they could also be altered through waterfront constructions and canalizations to aid access and use. Rivers also provided a focus for many social activities such as religious actions. The riverscape can include not only the main river channel but also its tributaries and streams which can provide a complex of interactions between land and water. This interaction can alter considerably over time as the urban space develops and changes. At London, for example, a number of additional streams and water channels on both sides of the Thames are known to have existed in the Roman period. Each of these will have had its own distinct biography from prehistory into Roman, post-Roman and modern times and formed a significant element of the local settlement. The subject of the 'lost' rivers of London has been a popular area of study (e.g. Barton, 1962; Foord, 1910; Ormsby, 1928) and excavations within London since the 1950s have been able to provide considerable additional information on the nature of the watercourses that existed in the Roman period (Cowan et al., 2009; Maloney, 1990; Wilmott, 1991). Detailed examinations of watercourses can be used to reconstruct significant elements of settlements and the way in which they interacted with the landscape.

Lakes, ponds and pools

Other components of waterscapes that could form a part of the urban settlement include bodies of standing water. Britain has thousands of contexts of standing water ranging from small ponds and pools to large lakes (Bailey-Watts et al., 2000: 180). Lakes are water-filled hollows inland from the sea but they cannot be isolated from the land around them; they are integral parts of the whole landscape (Burgis and Morris, 1987: 1-3). The term pond is usually used to denote a smaller body of water perhaps between 1 m² and 2 ha in area (Bailey-Watts et al., 2000: 185). Lakes and ponds can be productive and provide resources in terms of plants and animals depending on the nutrients within the

water and the environmental conditions (Burgis and Morris, 1987: 24-43); but as part of the landscape they could also acquire social meanings. In their local context many of the bodies of water will have acquired meanings and biographies. Lakes or other bodies of water could form part of the urban fabric, as at Lincoln with the Brayford Pool and other smaller pools in the area ([see below](#)). Many of the lakes and pools such as the Brayford Pool – which was connected to the Rivers Witham and Till – will have been used by boats and for resource procurement forming part of the taskscape and socialised landscape of the local area.

Wetlands

Wetlands are also a significant part of the landscape of Britain and include a diverse range of habitats including marshes, fens, bogs, swamps, wet grasslands, carrs, floodplains and mudflats (Acreman and José, 2000: 204). They can be considered in terms of transitional zones between permanently wet and generally drier areas and they share some of the characteristics of both but cannot be classified as either aquatic or terrestrial; they are areas of land saturated with moisture. The ambiguity between land and water will have added significance to these locations and reminds us of the problems of thinking in terms of categories that are too strictly defined. Each wetland has unique characteristics and it is the presence of water that creates the soils, its micro-organisms and its plant and animal communities (ibid.: 204-5). The hydrological conditions are important for determining the characteristics of each individual wetland and the slightest of changes, such as through human intervention, can influence the nature of the wetlands (Mitsch and Gosselink, 1993). Floodplains are the flat areas adjacent to rivers that are liable to flooding but within this definition there are a number of specific types of landforms which are studied by geographers, geologists and geoarchaeologists (cf. Brown, 1997). River channel change can also have a major effect on floodplain sedimentation and the corresponding nature of the floodplain; they are continually changing over time creating a dynamism to impact on the lived landscape.

Wetlands can also be rich in natural resources and exploited for food and plant materials, salt and peat amongst other things. They can also be traversed in small vessels or by constructing timber causeways across them (cf. Van de Noort and O'Sullivan, 2006). They can be important foci of activity generating specific behaviours and experiences. Wetlands – especially those relating to the river floodplains – could form a significant aspect of the urban fabric with each one having its own characteristics relating to the nature of the land/water relationship and the resources and wildlife present. The prominence of the floodplain in the urban settlements of Roman Britain is especially noticeable in the towns at Winchester, Cirencester, Canterbury, Lincoln, London, Exeter and Leicester. The manner in which the floodplain formed part of the settlement and the settlement adapted to its presence is an important aspect of urban development. At Canterbury, for example, a branch of the River Great Stour flowed through the Roman town and its floodplain creating marshy

conditions in large parts of the western and northern parts of the settlement. Excavations at the St Mildred's Tannery site in the western area have demonstrated that this part became increasingly wet and was eventually mostly abandoned of settlement (Pratt and Sweetinburgh, 2004). The floodplain zone, however, appears to have attracted activity from as early as the late Iron Age when there are traces of a possible Iron Age shrine here where a later temple complex and forum-basilica were constructed (Frere, 1977: 423; Haselgrove, 1987: 444-53). This waterscape was imbued with meaning despite not always proving 'convenient' for settlement.

From the Roman period onwards, wetland areas were acted upon through drainage and land reclamation activities. River floodplains continued to form significant elements of the towns and cities into medieval and modern times, shaping the development of the urban spaces, and many are still vulnerable to flooding today.

Islands

Within wetlands, bodies of water and rivers there can also be islands formed by raised areas of land providing additional aspects of the local topography. Islands could form significant components of the urban settlement but in most cases the landscapes have now been transformed to such an extent the islands no longer exist as distinct entities. At Winchester the central part of the Roman town was apparently founded on a small island within the floodplain of the Itchen formed from a natural deposit of chalk tufa (Zant, 1993), whilst at Cirencester the town was founded on a thin area of land in between two river channels which effectively created an island (Reece, 2003). The area of Southwark in London once consisted of a number of islands and low-lying areas and there has been a lot of work through excavation and other forms of analysis attempting to reconstruct this landscape as it was in prehistoric and Roman times (cf. Cowan et al., 2009). At Lincoln there were islands of raised land within the Brayford Pool and floodplain of the River Witham (see below; Jones and Stocker, 2003). The importance of islands within the urban setting also relates to the social significance that could be associated with these small areas of land that were isolated by water for all or at least part of the year. This unique characteristic of islands appears to have attracted attention in prehistory and later periods providing foci for religious beliefs and other activities (cf. Brown, 2003; Webster, 1995). That these also became part of the urban topography is an indication of the complexity of cultural values that could be associated with urban spaces.

Waterfront installations and other structures

Waterfronts whether on rivers or seas, as Clarke's (1973) study demonstrated, are also important elements of waterscapes – as they are the physical links between land and water. They can also be imbued with meaning through their marginal location in between water and the land (Westerdahl, 2005: 10-11). They are liminal places at points of transition and can be associated with the dangers

also belonging to water and water travel. Waterfronts attract different types of behaviour and experiences from those further inland or out in the water (Rainbird, 2007; Van de Noort, 2011). Waterfront structures can be utilitarian, providing an easier access to the water and enabling waterfront activities to take place, but their construction can also be imbued with symbolism and cultural meanings as the relationship between land and water is altered (cf. Rogers, 2011). Waterfront installations, such as ports and harbours, can also be monumentalized beyond functional needs representing the significance of the human presence at these locations. The act of building bridges could also be imbued with meanings beyond function; they were conquerors of rivers and provided new forms of relationship with them; like waterfronts, they could also be monumental constructions (cf. Braund, 1996; O'Connor, 1993). It is important to consider the social meanings behind waterfront structures – relating to specific cultural contexts – as well as their practical functions. Bridges were also significant for how they altered the way in which movement was conducted through waterscapes and some known Roman place-names in Britain, and elsewhere, appear to reflect the importance of bridges at particular locations including Tripontium in Warwickshire, referring to three bridges across the River Avon and its tributaries, the fort Ad Pontem ('at the bridge') in Nottinghamshire and the settlement Pontibus ('at the bridges') at Staines in Middlesex (Rivet and Smith, 1979: 241, 441, 476).

Local specifics: the example of Lincoln and its waterscape

Lincoln in the East Midlands is a good example for the variety of waterscape components that could form integral parts of a settlement and be acted upon by human behaviour and experience. The city has been much studied (e.g. M. Jones, 2002; Steane, 2001; 2006; Stocker ed., 2003), and it is useful to bring some this knowledge together to examine the theme of waterscapes and urbanism. Human activity in the Lincoln area in prehistory was associated not only with land but also water – the rivers, wetlands and pools were used for transport, resources and ritual activity. In Roman and later periods the waterscape remained important as the urban settlement developed and human activity increasingly contributed to and altered it through the construction of waterfront installations, drainage activities and land reclamation.

The Roman town, then, will be examined here in the context of the local waterscape – an aspect which is unique for each town. It is important to consider these components as socialized elements of the settlement and not simply as background features of the landscape. A Roman legionary fortress was founded at Lincoln in the AD 60s on a Jurassic limestone ridge known as the Lincoln Edge at the point at which the ridge was pierced by a glacial gap (the Witham Gap), apparently created by an early course of the River Trent in the Pleistocene period but later occupied by the River Witham (May, 1976: 16). The fortress overlooked the Witham Gap and from this site there is a significant decline down a clay hillside towards the valley floor where the Witham flows. The river system is

slow-moving here and it is still unstable (M. Jones, 1988: 145). Within a few decades a colony was founded on the site of the fortress remaining within its original walled area but what is generally referred to as the 'Lower City' developed outside the walls and down the hillside towards the river (M. Jones, 2003; Steane, 2006). Across the river there was another area of settlement from the Roman period onwards which became known as the Wigford suburb in medieval times.

The clay hillside contains a number of natural springs, many of which are still active today, which have influenced drainage conditions in the area and created problems with surface water (Jones and Stocker 2003: 18). It is the valley floor, however, that has many components of the local waterscape including the River Witham, the River Till/Fosdyke, the Brayford Pool and other pools, the marshy river floodplain and a number of small islands. These were accompanied by additional elements integral to the waterscape including drainage channels, bridges and waterfront installations (Figs 1-2).

FIGURES 1 AND 2 HERE

The River Witham is a shallow, slow-flowing river prone to flooding and also to tidal surges coming up from the Wash. The Witham has been subject to considerable physical change over the course of two millennia relating to the settlement here especially in the way in which its channel has been narrowed by land reclamation and canalization (Fig. 3). At Lincoln the River Till/Fosdyke connects with the Witham via the Brayford Pool. The Fosdyke is the canalized version of the River Till which links the River Witham with the River Trent at Torksey in Lincolnshire. Its easternmost 5 km were formed by canalizing the River Till which connects with the Brayford Pool and River Witham at Lincoln (M. Jones, 2003: 116). A completely new cut was made to link this river to another canalized stream which flows into the Trent (*ibid.*). Unfortunately there is very little information available on the nature of the original course of the River Till or the date at which the canal was created. It has been thought that it was a Roman creation but there is as yet no positive evidence to support this. A Roman period bronze statuette was found in the river at Torksey but this cannot be used to date the creation of the canal because it was found in the natural riverbed (M. Jones, 2003: 116; Whitwell, 1970). The Fosdyke was important in the medieval period when it was part of a large network of inland waterways in the Midlands and it appears to have been re-cut at least once in medieval times and then again in the 18th century (May, 1988: 51-2; Vince, 2003a: 235; Whitwell, 1992: 58). It has been argued that a similar system of canals may have operated in the Roman period but there is as yet no good evidence to support this. It might be expected that Roman Lincoln would have received goods such as pottery from the Trent Valley and further north, such as Crambeck ware, had the canal been in existence but Trent Valley wares do not appear in large quantities in Lincoln until the 10th century (M. Jones, 2003: 116). Further work is needed on the dating of these elements of the canal network to establish more clearly when they were created. What is clear, however, is that these events changing the river system formed part of a long history of human action on the riverscape.

FIGURE 3 HERE

The body of water known as the Brayford Pool formed naturally at the junction of the slow moving waters of the Rivers Witham and Till but its form is now greatly altered and its size reduced from the way in which it appeared in the pre-Roman and Roman periods. Through its use and incorporation into the settlement structure it was far from a 'natural' feature and activity here from prehistory onwards indicates that it formed an important part of the socialized landscape. It is known from archaeological, topographical and historical work in this area that there were once also further pools in the vicinity including Cuckoo Pool and Swanpool, the latter surviving today in a reduced form (Jones and Stocker, 2003: 17). A small river the Prial Brook used to flow into the Swanpool but its course was artificially altered in the 19th century by the Lincoln Drainage Scheme (Vince, 2003a: 349).

Excavations to the east of the present day edge of the Brayford Pool have demonstrated that the pool was originally far greater in size and it contained a number of small islands of terrace sand which formed another important element of the waterscape. It is surely significant that the earliest stratified material identified in the immediate area of the city has come from what was once an island that lay within the Brayford Pool excavated at 181-3 High Street. The evidence of activity on the island included early Roman timber structures of uncertain function. It has been suggested that the structures may have been military in nature but another possibility is that they had a religious function (M. Jones, 2003: 104). Large quantities of sherds of 2nd and 3rd-century AD drinking vessels were also found on the site (*ibid.*: 99), and there is a possibility that they represent some kind of religious activity taking place here. There were also traces of Iron Age activity although the exact nature of this is unclear because of the poor survival of the material (Steane, 2001: 123). It might be that this island attracted activity in prehistory because of the meanings imbued in its location (*cf.* Brown, 2003; Webster, 1995) and that these continued in the Roman period providing an area of particular significance within the town.

Surrounding the River Witham and the Brayford Pool was a large area of wetland created by low-lying ground in the floodplain of the river. South of the island and the Brayford Pool the Fosse Way and Ermine Street approaching the Roman town converged and continued as one road into the settlement crossing the marshy land of the Wigford area. The road was drained by roadside ditches and built up on a timber platform probably in the second half of the 1st century AD (M. Jones, 2003: 97). The Wigford area was a suburb of Lincoln in the medieval period but there is also considerable evidence of Roman period settlement here. This area lay to the south of the town across the Witham in a marshy area which was gradually reclaimed and drained from the Roman period onwards. In prehistory, however, it appears that the main route of travel may not have been the course of the Wigford Causeway but instead a path through the narrowest point of the Witham Valley which lies

about 1 km to the east, in the vicinity of the modern Stamp End lock (*ibid.*: 22). It is at Stamp End that many of items of prehistoric metalwork, including the Witham Shield and Sword, were found in the 19th century during the construction of the lock (Stocker and Everson, 2003). It has been argued that there was originally a causeway here, probably originating in the Bronze Age, and that this causeway, along with others in the Witham Valley, remained an important part of the religious landscape into medieval times. In a number of cases, it is known that churches were built near known causeways and artefacts of medieval date are also found as votive deposits (*ibid.*). This continuity of religious significance associated with the waterscape will also have had an impact on the relationship between the urban settlement and water.

The Wigford area beyond the Brayford Pool was low-lying and marshy and under threat of flooding by the Witham, especially in the winter. The Sincil Dyke is still an important feature of the Wigford area today and it is probably an artificial channel constructed for the drainage of the marshy floodplain (Steane, 2001: 1). There has been some debate regarding whether it could have been of Roman origin, or perhaps even originating as a natural stream, but there is as yet no evidence for this and more work is needed here to establish its history (cf. M. Jones, 2002: 109; Vince and Steane, 2001: 317); it seems most likely, however, that it was of medieval origin (Vince, 2003a: 245). The low-lying Wigford area has been subject to land alteration since the Roman period. In Roman times settlement gradually transformed this marshy area with the construction of drainage channels and land reclamation activities. This continued in the medieval period so that the area has now changed substantially.

There have now been a number of excavations of sites in the Wigford area. On most of these there was no evidence of early Roman occupation because the area appears to have been too wet. On the St Mark's railway station site, for example, river silting was observed dating up to the mid-2nd century but then a substantial drainage channel was identified that had been dug into the land (Steane, 2001: 206). This was in use up to the late 2nd or early 3rd century AD, before being backfilled in the mid-3rd century. This drainage channel appears to have been one of a number of such channels in this area. Following the drainage activities there were landfill operations to build up the ground and then stone-founded 'strip' buildings were constructed gable-ended on to Ermine Street with what appears to have been a hard-standing behind them leading down to the water (*ibid.*). It appears that these buildings were demolished at the end of the 4th century and further dumping activities took place to keep the water from encroaching onto the area.

A similar sequence was observed at the St Mark's church site here with the earliest phases marked by riverine silts indicating waterlogging and inundations. There is then evidence that by the mid- to late 2nd century a series of parallel north-south ditches and gullies were constructed close to the road which appear to include roadside drainage ditches forming part of a wider effort to drain this area. By

the mid-3rd century the flooding in this locality was under more control and three or four adjacent timber aisled buildings were constructed on the site which remained in use to the end of the 4th century and possibly beyond. Through these excavations we can build up a picture of the biography of this watery area and the way in which it was used and altered over time as part of the socialized landscape (*ibid.*: 268). In the medieval period the Wigford area was drained more intensively with the construction of the Sincil Dyke to the east and a dyke known as the Great Gowt which divided the suburb into Upper and Lower Wigford (Vince, 2003a: 245).

Another important element of the waterscape is the waterfront – the interaction between land and water. The exact location and nature of the waterfront around the Brayford Pool has been difficult to identify because of the landscape alterations over time. Some evidence relating to the mid-2nd to mid-3rd century indicates attempts to artificially alter the waterfront including the construction of timber banks and posts (Vince and Steane, 2001: 311). There is no evidence of any artificial waterfront construction here before the Roman period and altering the land/water interface must have had considerable social as well as practical implications (*cf.* Rogers, 2011).

The early Roman waterfront on the north side of the River Witham now lies well inland as a result of later land reclamation and the gradual size reduction of the Brayford Pool and River Witham. What were interpreted as traces of a stone built Roman period dock, however, were identified in the 1950s by F. H. Thompson (Thompson, 1955; *cf.* Cleere, 1978: 38; Fryer, 1973; Whitwell, 1970: 43). Thompson's excavation at the junction of St Rumbold's Street and Broadgate outside the south-eastern part of the Roman town uncovered a 6 m long length of stone wall running east-west just to the east of the lower town walls (Thompson, 1955: 131). It was a faced stone wall on a rubble foundation and it is possible that it was used as part of a dock for boats on the River Witham. Built in stone, it was also a statement of some monumentality and represented presence and power within the landscape. Thompson noted that to the south and west of the wall there was black silt on clear sand which had probably been deposited by the moving river indicating that the water came up to this location in the Roman period; and current understanding of the course of the River Witham suggests that it would have passed this location before it was narrowed in later times and moved further away from the site of the Roman town (M. Jones, 2003: 99).

The Roman course of the Witham and the location of the Brayford Pool indicates that water would have originally run close by the side of the south wall of the Lower City leaving little room for waterfront installations. Excavations in 1975 on the north side of the Brayford Pool to the west of the medieval High Bridge demonstrated that this too had originally extended most of the way up to the Lower City walls. At the Waterside North site excavated in 1987-91 to the east of the High Bridge there were some traces of what may have been a shelving 'beach' here for small boats but no major waterfront features (Chitwood, 1991: 173; M. Jones, 1999: 109). On the eastern side of the Brayford

Pool excavations at Brayford Wharf East discovered the remains of hurdles or stake-built waterfront structures which were later than the stone quay on the other side of the river and were probably of 3rd-century date (Vince and Steane, 2001: 65-8); there were traces of flooding on the site in the earlier Roman period indicating that this area was marshy in the earlier Roman period (ibid.).

It is possible that these waterfront structures may have been intended more to hold back the reclamation dumping that took place here as the settlement expanded, but they could also have been used as waterfront installations for boats. Excavations close to the head of the Brayford Pool, indicated that in the mid-Roman period this area was probably at least partly under water with the molluscan assemblage suggesting slowly-flowing water conditions (Steane, 2001: 166). Here there was evidence of a bank and upright timber posts which may have been connected with activity relating to the water margins, possibly acting mooring posts for small boats and also creating stability for the waterfront (ibid.). Apart from the construction of the probable stone docks area, it was in the second half of the Roman period that there appears to have been more substantial alterations of the waterscape and construction activity. There were the large reclamation deposits extending the area of land between the town and the waterfront and the construction of a hard-standing (cf. Dobney et al., 1995). It has also been suggested that the land reclamation activities could have channelled and deepened the river to allow better access for boats (M. Jones, 2002: 108). There were also the land transformations around the Wigford area. As the land changed so would behaviours and experiences within it. The waterscape went on to be altered considerably through reclamation, the narrowing of rivers and the construction of waterfronts and monumental bridges in post-Roman times especially from the 10th century onwards (Fig. 4; Steane, 2001: 166; Vince, 2003a; 2003b). The continued alteration of the waterscape in the medieval period was a sign of economic success as the town became an important wool trading and cloth making centre. There was also a greater willingness to alter the land as social attitudes changed and there was greater emphasis placed on its economic potential.

FIGURE 4 HERE

From this example it is clear that in an urban setting there can be considerable archaeological material relating to the waterscape and how it formed part of the socialized space of the Roman town. Waterscapes also remained elements of the urban experience into modern times. It is important to use this rich resource of evidence to see what it can tell us about the development of towns in Roman Britain and the continued human experience of these places in later periods. The waterscape at Lincoln was already a focus of human action before Roman times with the construction of causeways, use of resources and acts of religious expression. It was with the foundation of the fortress, and development of the *colonia*, however, that saw the first major acts of construction within this landscape; this intensified further in the medieval and post-medieval periods as the city grew. These

developments can not only be considered in terms of structural and technological changes but they represent social attitudes towards the relationship between water and land. They also indicate what was considered possible and desirable to do to the waterscape.

With the foundation of the legionary fortress this waterscape was already an important focus of religious activity. It is noticeable that there were not at first significant attempts to develop the waterfronts to facilitate use of the river channels. It might be that the location of the fortress was related less to river connections than to the pre-existing religious and political importance attached to this waterscape (cf. Rogers, 2008). There may also have been significant tensions involved in developing major waterfront installations at this location. As the Lower City developed down the hillside to the river it appears to have left no space for riverfront facilities which may instead have been elsewhere at this time if there were any at all. It might be that the relationship of the settlement with the river was important but not so much for economic purposes; this could be given further credence if the Lower City represented a part of the urban settlement that was organised more by local people than incoming officials. A comparable situation can be seen at Leicester where we know that an important Iron Age site focused near the edge of the River Soar where the Roman town then developed (Cooper and Buckley, 2003). The town had its western wall coming right up to the riverfront with apparently no space for waterfront facilities. The relationship with the water could have been important or alternatively it could be that the actions represent attempts to place official control over this waterscapes and its pre-existing significance.

In Roman times, especially the second half of the Roman period, the extent to which the relationship between land and water was altered at Lincoln greatly increased with events connected with waterfront development, settlement expansion, land drainage and reclamation and river narrowing. We can see these as utilitarian developments, but they will also have been related to cultural values. It could well be that cultural attitudes were changing with local people being increasingly prepared to carry out alterations to the waterscape which had previously been too culturally sensitive. This does not mean that religious associations with the waterscape necessarily diminished but people's ideas of their identity and their relationship with the landscape would not have been static. Waterscape, and the wider landscape, relates to people's actions, experiences, identities and ideas of the world which will have been subject to continuities and changes.

Conclusions

Archaeological research can form a significant part in demonstrating the importance of considering the waterscape in urban studies. The various and interconnected components of waterscapes can be studied archaeologically because they formed important aspects of the lived landscape: they influenced human behaviour and experience; they were involved in resource procurement, water transport and other activities that formed a functional part of daily life (but were also deeply

embedded in social identities); and they were acted upon through the creation of waterfront installations, revetments, land reclamation and drainage. This paper has attempted to illustrate the variety of features that can be found relating to waterscapes in the urban context and show that they can be associated with different human behaviours and meanings and that they could be treated in different ways. Through human action they were socialized entities and as important within urban spaces as the buildings, roads and other aspects of the settlement and of urban life. The way in which waterscapes were acted upon and influenced behaviour, and are represented in the archaeological record, must be approached through theoretical perspectives like other aspects of archaeological study. The case study of Roman Lincoln has demonstrated that there is considerable potential in the social analysis of the archaeology of waterscapes and what they can tell us about towns and people's actions and experiences within them.

The British Academy research project is seeking to evaluate the evidence of waterscapes in Roman urban contexts and the way in which they formed part of human behaviour and experience and were acted upon and changed through human activity. The archaeological study of land transformation has tended to focus on rural and coastal areas; there have been a number of important studies of coastal wetland transformation in Roman and later times, for instance, (e.g. Rippon, 2000). There is considerable potential, however, in examining the waterscapes of urban contexts and how they formed part of the urban fabric. Land change can be considered through practical and economic perspectives but it will also have been imbued with meanings relating to the social context in which it was enacted. These actions formed an important part of the urban experience that we need to examine to contribute to our understanding of settlement.

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FIGURE CAPTIONS

Figure 1: Plan of the waterscape at Lincoln as it was at the time of the foundation of the Roman town with the main sites mentioned in the text (drawn and adapted by A. C. Rogers from Stocker ed., 2003).

Figure 2: Plan of the wider setting of Lincoln within the context of the Witham Valley and nearby rivers, wetlands and coastal areas (drawn and adapted by A. C. Rogers from Stocker ed., 2003)

Figure 3: Photograph of the River Witham in its current narrowed form approaching the medieval High Bridge at Lincoln (photograph by A. C. Rogers).

Figure 4: Photograph of the 12th-century High Bridge and 14th-century structures at Lincoln (photograph by A. C. Rogers).