

Part 4 Use

Chapter 4.1 The importance of the use of rivers

4.1.1 Introduction

Having considered the physical and legal usability of rivers attention is now turned to the actual use of the rivers. No attempt to quantify the historic demand for transport has been found, except for the supply of grain and fuel to London c.1300. This was based on the judicial and administrative records of the city of London and its formal customs; the taxation records; *Liber de Assissa Panis*, a record of wheat prices; chronicles; the purveyance accounts; records of land use and *Inquisitions post mortem*; monorial and other estate records.¹ These two studies did not include the movement of stone, reeds and rushes, iron goods, fish, fruit or people.

In this chapter the overall demand for transport is considered first and then the proportion that was carried on the rivers. Then three factors which may provide evidence of the importance of river transport are considered: the construction of canals, the importance given to river transport by the King and the location of wealth in the country. Finally it is shown that while for long distance transport of heavy or bulky goods river transport was cheaper than land transport, this was not the case for short journeys.

4.1.2 The amount of goods moved

It was shown in Part 3 that medieval authors wrote that their rivers were public whereas 19th century authors wrote that they were private. In a similar way some medieval authors wrote that there was much trade in agricultural produce² whereas some 19th century authors claimed of the medieval period that there had been a policy 'to do

¹ Bruce M.S. Campbell, *et al.* *A Medieval Capital and its grain supply*. Historical Geography Research Series No. 30. 1993.

James A. Galloway, *et al.*, 'Fuelling the City: Production and Distribution of Firewood and Fuel in London's Region, 1290-1400.' *The Economic History Review*. New Series Vol. 49, No 3. (1996), 447-472.

² Anon, *Senshauchie*. Pre 1307. In Elizabeth Lamond, *Walter of Henley's Husbandry*. London: Longmans, Green and Co. 1890, 97.

without trade as far as possible.’³ It has been shown that in the 13th century 17 out of 32 manors belonging to the See of Winchester sold more than half their grain and that ‘the peasants of the episcopal manors put more produce on the market than came from the demesnes.’⁴ This indicates that there was a demand for transport.

Gras considered that there was a considerable increase in the demand for the transport of grain in the period 1100 to 1300.⁵ His opinion was questioned by Postan⁶ but supported by Britnell⁷ and Dyer.⁸ The work of Gras now seems to be generally accepted. Also Masschaele has shown that the number of markets rapidly increased in the period 1150 – 1350.⁹ This would have caused an increase in the demand for transport. At these rural markets no tolls were charged on goods bought or sold for household provisioning rather than as a source of profit.¹⁰ The profit for the market owner came from stallage and tolls from traders who would take the goods out of the area.

The purchase of goods for the king and monasteries has been studied¹¹ but there are few records of the activities of the traders partly, perhaps, because traders were not welcome in the middle ages.¹² Few of their accounts have been found and few records have been printed concerning how the goods which the traders purchased were moved from the markets and fairs to their next destination. Yet these were the people who provided the profits from the dense system of rural markets.

There were not only markets but also fairs. Moore noted that ‘Thousands of lesser individuals crowded every major fair annually during the twelfth and thirteenth centuries,

³ W. Cunningham, ‘Introduction.’ In Elizabeth Lamond, *Walter of Henley’s Husbandry*. London: Longmans, Green and Co. 1890, xiii-xiv.

⁴ E.A. Kosminsky, *Studies in the Agrarian History of England in the Thirteenth century*. Ed. R.H. Hilton, Trans. Ruth Kisch, Oxford: Basil Blackwell. 1956, 324-5.

⁵ Norman Scott Gras, *The Evolution of the English Corn Market*. Cambridge: Harvard University Press. 1926.

⁶ M.M. Postan, *The Medieval Economy and Society*. (1st Edition 1972.) London: Penguin Books. 1975.

⁷ Richard H. Britnell, ‘Commercialisation and economic development in England, 1000-1300.’ In Richard H. Britnell and Bruce M.S. Campbell, *A Commercialising Economy*. Manchester: Manchester University Press. 1995, 7 – 26.

⁸ Christopher Dyer, *An Age of Transition?* Oxford: Clarendon Press. 2005, 30.

⁹ James Masschaele, *Peasants, Merchants, and Markets. Inland Trade in Medieval England*. New York: St Martin’s Press. 1997, 2.

¹⁰ *Ibid.* pages 69, 70.

¹¹ Eg. Miranda Threlfall-Holmes, *Monks and Markets*. Oxford: Oxford University Press. 2005.

¹² L.F. Salzman, *English Trade in the Middle Ages*. Oxford: Clarendon Press. 1931, 75.

transforming the fairgrounds into mid-sized cities for several weeks'¹³ and that 'another characteristic of all these great fairs is their location on rivers.'¹⁴

It seems likely that an urban community required a greater amount of transport than an equal sized rural community, but the difference is hard to quantify. Pallister wrote that:

Though some writers have put the urban proportion of the population at only 5 or 10 per cent as late as 1500, the best recent estimates are considerably higher; up to 10 per cent in 1086, 15 or more percent by 1300, 20 per cent in 1377, and after perhaps a fall in the fifteenth century a return to about 20 per cent by 1524.¹⁵

There was famine in England at the start of the 14th century and plague in, and after, 1348 when the population of England fell by between 30 and 50%.¹⁶ It might have been expected that these would have caused a reduction in the use of the rivers after the middle of the 14th century due to the lack of the supply of goods and the demand for them.¹⁷ It is known that on the Ant this reduction of transport only lasted for a short period.¹⁸ Dyer has written of the period 1350-1500:

Those who rely on institutions as a guide to trading activity would conclude that the economy was gripped by a crippling recession. However, other indices, such as per caput incomes and expenditure, the growth of more specialized and market-oriented production in agriculture, the amount of building activity, all point to a lively trading system.¹⁹

In the second half of the sixteenth century there was a rapid increase in the population.²⁰ There were also fundamental changes in agriculture with a move to 'freer, more mobile

¹³ Ellen Wedemeyer Moore, *The Fairs of Medieval England*. Toronto: Pontifical Institute of Mediaeval Studies. 1985, 1.

¹⁴ *Ibid.* page 11.

¹⁵ D.M. Palliser, 'Introduction.' In D.M. Pallister, Ed. *The Cambridge Urban History of Britain*. Cambridge: Cambridge University Press. 2000, 4.

¹⁶ Colin Platt, *King Death*, Toronto: University of Toronto Press. 1997.

¹⁷ Johann Heinrich von Thunen, *The Isolated State*. Ed. Peter Hall, Trans. Carla M. Watenberg. [*Der Isolierte Staat*.] London: Pergamon Press. 1966, 316-317.

¹⁸ *Public Works in Medieval Law. Volume 2*. Editor C.T. Flower. Selden Society. Vol. 40. 1923, 88-89.

¹⁹ Christopher Dyer, 'The hidden trade of the middle Ages: evidence from the West Midlands of England.' *Journal of Historical Geography*, Vol. 18, Part 2. (1992.), 153.

²⁰ D.M. Palliser, *The Age of Elizabeth. 2nd Edition*. London: Longman. 1992, 40.

conditions of agriculture carried on the basis of money and markets, the exchange of goods rather than services.²¹ Fisher considered that by the end of the sixteenth century ‘the larger provincial towns, the embryonic Black Country, the Tyneside mining area, the textile districts of Yorkshire, East Anglia and the west’ must all have been ‘of sufficient size and concentration to have considerable influence, as markets, upon both agriculture and the trade in agricultural produce.’²² These changes would have resulted in an increased demand for transport.

Thus it seems that the demand for transport increased steadily from 1189 to 1350, remained steady for 150 years and then increased throughout the 16th century.

4.1.3 The proportion of goods carried by river

River transport was only a fraction of the total transport and this fraction was not necessarily constant and its values are not agreed upon by historians. Farmer, like many other authors, wrote:

For heavy or bulky loads ... the waterways were more economical than the roads. ... Most English waterways flowed in the direction of trade, and by the early thirteenth century much of the produce of the countryside went to market by water.²³

Whereas Holt considered that rather than there being any development in water transport in medieval England a decline occurred as private, proprietorial rights outweighed perceptions of the public benefit to be derived from usable watercourses,²⁴ Blair placed the downturn in the use of rivers to about 1250 due to the improvement of roads, bridges, and haulage in the 13th century.²⁵

²¹ A.L. Rowse, *The England of Elizabeth*. (1st Edition 1950.) London: Sphere Books Ltd. 1973, 96.

²² F.J. Fisher, ‘The Development of the London Food Market, 1540-1640.’ *The Economic History Review*. Vol. 5, No. 2. (April 1935.), 46.

²³ David L. Farmer, ‘Marketing the Produce of the Country. 1200 – 1500.’ In Edward Miller, *The Agrarian History of England and Wales. Volume III. 1348-1500*. Cambridge: Cambridge University Press. 1991, 353.

²⁴ R. Holt, ‘Medieval England’s Water-Related Technologies.’ In P. Squatriti, Ed. *Working with Water in Medieval Europe: Technology and Resource-Use*. Leiden: Brill. 2000, 55-6.

²⁵ John Blair, ‘Introduction.’ In Blair, 2007, 1-18, 5.

No investigation as to how goods were carried to the markets has been found. Most goods went by land, cart, pack-horse or carried on people's backs. However fresh fish, firewood, withies, reeds and sedges would have been gathered by the rivers and where a market was on a river bank could more easily have been transported by boat. The Pipe Roll of the Bishopric of Winchester 1208-9 shows that agents of the Earl of Lincoln sold 1¾ million peat turfs at Whitgift in 1304-5.²⁶ It seems that these must have been moved by water transport. The water-bailiffs' accounts for Great Yarmouth show that some of the surplus agricultural produce taken to the port for sale in the early 15th century was transported by river and coastal craft.²⁷

In 1514 Acts were passed relating to the improvement of the Kentish Stour²⁸ and overcharging by watermen on the Thames and Medway.²⁹ In 1531 the Statute of Sewers³⁰ which related to navigation on all the rivers of England was passed as were Acts relating to obstructions on the Ouse and Humber³¹ and tolls on the Severn.³² These seem to indicate that there were people seeking to increase the use of the rivers.

Blair³³ and Langdon³⁴ refer to the fact that some rivers could only be used in a downstream direction and that the nature of the rivers was such that barges and boats must have been taken upstream empty. This is not such a great disadvantage as it might seem since, in general, towns and cities consume more than they produce and many towns are at the downstream end of the rivers. Thus most of the goods carried on non-tidal rivers would have been carried downstream. Possibly the proportion of boats and barges returning empty was no greater than the proportion of carts and packhorses which returned home with no load. However wine would have been carried on the water whenever possible because:

²⁶ Edward Miller and John Hatcher, *Medieval England: Towns, Commerce and Crafts 1086-1348*. London: Longman. 1995, 141.

²⁷ Terence R. Adams, 'Aliens, Agriculturalists and Entrepreneurs: Identifying the Market-Makers in a Norfolk Port from the Water-Bailiffs' Accounts, 1400-1460. In Dorothy J. Clayton *et al.* Eds. *Trade Devotion and Governance*. Stroud: Alan Sutton. 1994, 142.

²⁸ (1514.) 6 Henry VIII c 17.

²⁹ (1514.) 6 Henry VIII c 7.

³⁰ (1531.) 23 Henry VIII c 5.

³¹ (1531.) 23 Henry VIII c 18.

³² (1531.) 23 Henry VIII c 12.

³³ John Blair, 'Transport and Canal-Building on the Upper Thames. 1000-1300.' In Blair, 2007, 285.

³⁴ John Langdon, 'The Efficiency of Inland Water Transport in Medieval England.' In Blair, 2007, 126.

pack horses could not be used for the transport of tons of wine, and a cart conveying a ton of wine might require as many as six horses at a time. The rough roads damaged the wine and caused much leakage even when special precautions were taken and there seems little doubt that the great fragility of wine resulted in a generally high rate of carriage charges.³⁵

The cost of transport of wine up the Severn in 1308/9 was 0.4 pence per tun mile and 2.5 pence per tun mile for road transport in the West Midlands. The equivalent figures for 1452/3 were 0.6 and 3.2.³⁶ Clearly some goods were transported up some rivers and such movements could be significantly cheaper than transport by road.

The proportion of goods transported by river would have depended on the condition of the alternative, land transport. It is claimed in Appendix O that in general the surface of 'roads' would have been no better than unimproved meadow and, where the region was enclosed, worse. Walking, horse riding and the movement of carts over dry meadow is easier than on rutted roads. It is claimed that the concept of roads, rather than ways, between towns and cities is anachronous.

No evidence has been found that the proportion of goods carried on the rivers changed significantly during the period 1189 to 1600.

4.1.4 Canals

While details of the construction and use of canals is outside the scope of this thesis their remains and written evidence about them provide some information about the use of rivers. The medieval canals have been studied recently by Bond who has listed the dates of the construction of canals up to 1300.³⁷ This shows that in many places channels were dug to provide water transport for goods from rivers to towns and monasteries.

Table 10 Date of Construction of Canals.

³⁵ Margery Kirkbride James, *Studies in the Medieval Wine Trade*. Ed. Elspeth M. Veale. Oxford: Clarendon Press. 1971, 147 -148.

³⁶ Christopher Dyer, *Everyday Life in Medieval England*. London: Hambledon and London. 1994, 262.

³⁷ James Bond, 'Canal Construction in the early Middle Ages: An Introductory Review.' In Blair, 2007, 153-206.

<u>Date</u>	<u>Number</u>	<u>Length in km</u>
900-1000	2	12
1000-1100	2	14
1100-1200	7	27
1200-1300	8	61
1300-1600	No records have been found.	

The list is incomplete as it does not include the canals studied by Blair which are reported in the same book and there was a canal to Swaton in Linclonshire in 1240.³⁸ It seems likely that there was also a canal from the Parrett to Muchelney Abbey³⁹ and very possibly others.

The implication of these canals in terms of the use of the connecting rivers seems not to have been appreciated by most historians. Canals would only have been constructed where they could be connected to usable rivers at a time when use of the rivers was well established. They indicate that sufficient goods were transported to the monasteries or abbeys on the rivers to justify the cost of constructing the canals.

4.1.5 Royal support for river transport

Royal support for river transport may indicate its changing relative importance for those in power in the country. *Magna Carta* provided for a general prohibition of weirs in rivers. From the first this was never fully implemented. The King's weir at Chester was never removed. However Edward III seems to have made a genuine attempt to remove recent weirs and enhancements in 1350⁴⁰ and 1371.⁴¹ He was clearly not totally successful but his policy was continued by both Henry IV and V who also authorised the destruction of weirs.^{42, 43}

³⁸ Curia Regis Rolls, Volume 16, 21-26 Henry 3, 490.

³⁹ Inspection by present author.

⁴⁰ (1350) 25 Edward III, Stat. 3. c 4.

⁴¹ 1371, 45 Edward III, c. 2.

⁴² 1399, 1 Henry IV, c. 12.

⁴³ 1413, 1 Henry V, c 2.

It seems that in 1464 the manufacturers persuaded Edward IV to refuse a petition of the Commons to enforce the statutes of 1351 and 1371 relating to the Severn and its tributaries so that they could install weirs.⁴⁴ Nevertheless, in 1472, after his restoration, the shipping and mercantile interests prevailed and another Act⁴⁵ was passed.⁴⁶

Under Henry VIII in 1531 the Statute of Sewers was passed which provided for the removal of obstructions in rivers.⁴⁷ At first there was an attempt to vigorously enforce the statute. In the Letters and Papers of Henry VIII for the period August to December 1535 there are 27 entries relating to the destruction of weirs.⁴⁸ The Mayor and Citizens of Winchester wrote to Cromwell that ‘some of those who have executed the statute have been sore threatened by the great lords and their officers in these parts.’⁴⁹ It seems that this work was not due entirely to the influence of Thomas Cromwell, ‘himself of the merchant class,’⁵⁰ as it is recorded that the king was also enthusiastic about the clearance.⁵¹

In 1536 there was a proposal for an Act that ‘never weir nor water-mill shall hereafter be erected or made within this realm’⁵² but it seems that the Bill never reached the Commons. Queen Mary, seeking the support of the land owners, allowed the rebuilding of some of the weirs including those on the Itchen at Woodmill and on the Wye at Hereford.⁵³

Those who operated the boats were, in general, from the merchant class or below but they supplied people of all classes. Those who built the mills and fish weirs were land owners. Yet, it seems that, except in what has been called ‘the age of anarchy’ (1300-

⁴⁴ PROME, Edward IV, 1463, April, 60, v-569-570.

⁴⁵ (1472) 12 Edward IV, c. 7.

⁴⁶ I.S. Leadam, (The late) ‘Trade and Commerce.’ In H.W.C. Davis, Ed. *Medieval England*. Oxford: Clarendon Press. 1924, 612 – 3.

⁴⁷ (1531) 23 Henry VIII, c. 5.

⁴⁸ Letters and Papers Foreign and Domestic of the Reign of Henry VIII. Volume 9.

⁴⁹ Letters and Papers Foreign and Domestic of the Reign of Henry VIII. Volume 10, 24.

⁵⁰ I.S. Leadam, (The late) ‘Trade and Commerce.’ In H.W.C. Davis, Ed. *Medieval England*. Oxford: Clarendon Press. 1924, 613.

⁵¹ *The Lisle Letters. Volume Two*. Editor Muriel St. Clare Byrne. Chicago: The University of Chicago Press. 1981, 483.

⁵² Letters and Papers Foreign and Domestic of the Reign of Henry VIII. Volume 10, 92.

⁵³ Joan Fleming-Yates, *The River Running By*. Weddenburn Art Ltd. Undated, 96.

1500),⁵⁴ it was considered to be for the benefit of the country that the rivers should be kept clear.

4.1.6 Location

It has long been known that one reason why towns were built by rivers was the availability of river transport. ‘There is not any Town or City, which hath a Navigable River at it, that is poore; nor scarce any that are rich, which want a River with the benefit of Boats.’⁵⁵ Edwards and Hindle provided the names of twenty of the fastest growing medieval towns and stated that all except Coventry and Leicester were sea and/or river ports.⁵⁶ Yet Leicester did have a river flowing past the town which was used, although it may not have been directly linked to the sea.⁵⁷ Local produce could have been taken to the town by boat. Hindle and Edwards also stated that as the size of ships increased so trade moved from Winchester, Norwich and Lincoln to Southampton, Yarmouth and Boston.

In this section investigation is made as to whether water transport influenced the prosperity of the regions. If there is found to be a close correlation between them then water transport may have been one cause of prosperity. If the correlation is low then water transport is likely to have been of little importance, although other factors may also have been significant.

The Lay Subsidy of 1334 is possibly the most relevant reference to the wealth of the regions for most of the country in the 13th and 14th centuries although it contains no data for Cheshire and Durham and the figures for Cumberland, Westmorland and Northumberland need to be taken from the 1336 Subsidy. Willard suggested that ‘the goods taxed as movables at the Lay Subsidy of 1334 represented the surplus over and above the essentials that a family needed to live and work.’⁵⁸ This view has been

⁵⁴ Alan Harding, *The Law Courts of Medieval England*. London: George Allen & Unwin Ltd. 1973, 95.

⁵⁵ John Taylor, ‘A Discovery by Sea from London to Salisbury.’ In *All the Works of John Taylor the Water Poet*. London: James Boler. 1630, 187.

⁵⁶ James Frederick Edwards and Brian Paul Hindle, ‘The transportation system of medieval England and Wales.’ *Journal of Historical Geography*. Vol. 17. (1991), 123-134.

⁵⁷ *Records of the Borough of Leicester. Volume 1 1103-1327*. Editor Mary Bateson. London: C.J. Clay and Sons 1899, 244-245, 350-351.

⁵⁸ J.F. Willard, *Parliamentary Taxes on personal property, 1290-1334*. Cambridge Massachusetts: The Medieval Academy of America. 1934, 84-85.

supported by others from their study of county records of the tax.⁵⁹ This tax assessment continued to be used for about two hundred years. It may be claimed that ‘The surplus over and above the essentials that a family needed to live and work’ is, in agricultural areas, the amount available for selling to neighbours and for export from the area.

The weaknesses of this source include: evasion, undervaluation, extortion by officials and the exemption of certain groups including the Church and the poor.⁶⁰ Possibly a more serious weakness is the definition of the boundaries of the places - inevitable with this type of evidence. Glasscock wrote ‘For many reasons, but particularly because of the problem of the inclusion or exclusion of suburbs in tax quotas, it is not easy to construct an entirely satisfactory list of towns ranked in the order of their taxed movable lay wealth.’⁶¹ Places were boroughs, townships, parishes, hamlets or manors. The one hundred places with the highest assessments are listed in Appendix G and summarised in Table 11.

Table 11 Location of the 100 most prosperous places in 1334.

On a usable non-tidal river.	40
Fenland.	25
Sea Port.	21
On a river with no found record of use.	9
No access to water.	5

The Lay Subsidy records show that there was relative poverty in the counties north of a line from the Mersey to the Humber and in Devon and Cornwall. The only place in these regions which is included in the list and which is not a port is Penrith. There are fewer records of the use of rivers in these areas than elsewhere.

⁵⁹ A.T. Gaydon, ‘The taxation of 1297.’ *Bedfordshire Historical Record Society*, Vol. XXXIX (1959).
L.F. Salzman, ‘Early taxation in Sussex.’ *Sussex Archaeological Collections*. Vol. XCVIII (1960), 29-43 and XCIX (1961), 1 – 19.

R.E. Glasscock, ‘England circa 1334.’ In H.C. Darby, Ed. *A New Historical Geography of England*. Cambridge: Cambridge University Press. 1973, 140.

⁶⁰ *Ibid.* page 138.

⁶¹ Robin E. Glasscock, *The Lay Subsidy of 1334*. London: Oxford University Press for The British Academy. 1975, xxx.

Thus it seems both from the list of prosperous places and from the distribution of the regions where there were few prosperous places that it not unlikely that access to water transport, and its use, was one cause of prosperity and that its lack a cause of relative poverty.

4.1.7 Cost

Cost was not the only factor when deciding whether goods would be transported by river or by land. Speed, convenience, security and availability were other factors to be considered. Wharfs might not be available or roads might be impassable. Thus in 1648 three tons of cheese were portaged round sixteen mills on the Nene between Peterborough and Highham Ferrers when the road was impassable due to flooding.⁶² This mode of transport was cheaper than the normal transport by road but it appears that after the floods subsided road transport was used again as it was more convenient. Cost was not a factor in choosing the mode of transport when customary services required a villein to transport goods without payment. In 1304 grain was carried from Shillington, Cranfield, and Higham Gobion in Bedfordshire to London without charge.⁶³

In the past two methods have been used to try to establish the relative costs of water and land transport. Some authors have found written records of charges and have calculated the cost per ton mile by dividing the charge by the straight line distance and load. Using this method Duncan-Jones calculated the ratio for land : river transport cost in Roman times to be 8:1.⁶⁴ Other authors have calculated the cost of operating a cart or wagon and the load which could be carried. Using this method Selkirk calculated the ratio for land : river transport in Roman times to be 58:1.⁶⁵

Estimates of the relative cost of land and river transport which have been made by other authors are given in the following table. Costs have been converted to d. per ton mile.

⁶² Anon. 'Some Considerations of the River Nine, running from Northampton to Peterborow, and so to the Sea; shewing the Fesability and convenience of making it Navigable.' Pamphlet. Cambridge University Library. Bb*.11.50''(E). c.1653, 2.

⁶³ Galloway, J.A., Murphy, M. 'Feeding the City.' *London Journal*. Vol. 16, (1991), 7.

⁶⁴ Richard Duncan-Jones, *The Economy of the Roman Empire. 2nd Edition*. Cambridge: Cambridge University Press. 1982, 368

⁶⁵ Raymond Selkirk, *The Piercebridge Formula*. Cambridge: Patrick Stephens. 1983, 83.

Table 12. Estimates of Land : River transport costs.

Date	Author	Land	River	Ratio
1250-1450	Rackham. ⁶⁶	1.3	0.25	5
1290	Campbell <i>et al.</i> ⁶⁷	0.35	0.03	12
1301	Pelham. ⁶⁸ Wheat	0.9	0.3	3
	Oats	0.6	0.11	5.4
14 th century	Cook. ⁶⁹	0.5	0.3	1.7
1296-1352	Masschaele. ⁷⁰	0.9 – 2.3	0.6 – 0.9	1.5 – 2.5
1305-1346	Masschaele. ⁷¹	0.5 – 1.9	0.3 – 1.5	1.6 – 1.3
1308-09	Dyer. ⁷²	2.5	0.4	6.2
1452-53	Dyer. ⁷³	3.2	0.6	5.3

Most of these figures are based on the cost of transporting grain. Since stone is denser than grain it seems likely that the ratio would be higher for stone.⁷⁴ The ratios vary from 1.3 to 12. There are many reasons for the differences of which distance, loading and unloading costs, size of boat and level of demand for transport are among the most obvious.

Because of these variations no attempt is made here to establish either the actual cost or the relative cost of road and river transport. At any one time the charge for transport was not necessarily the same as the cost of providing the transport. In 1559 an order was made 'to provide carriage by water at reasonable rates for 6000 loads of wood stored at

⁶⁶ Oliver Rackham, *The History of the Countryside*. London: Phoenix Press. 1986, 264.

⁶⁷ Bruce M.S. Campbell, *et al.* *A Medieval Capital and its Grain Supply: Agrarian Production and Distribution in the London Region c 1300*. Historical Geography Research Series No 30, 60.

⁶⁸ R.A. Pelham, 'Provisioning the Lincoln Parliament of 1301.' *University of Birmingham Historical Journal*. Vol. 3. (1951), 24-32.

⁶⁹ Martin Cook, *Medieval Bridges*. Princes Risborough: Shire Publications Ltd. 1998, 12-13.

⁷⁰ James Masschaele, 'Transport Costs in Medieval England.' *Economic History Review*. New Series, Vol. 46, No. 2. (1993), 266-279.

⁷¹ James Masschaele, *Peasants, Merchants, and Markets*. New York: St. Martins's Press. 1997, 208-209.

⁷² Christopher Dyer, 'The Consumer and the Market in the Later Middle Ages.' *Economic History Review*. New Series, Vol. 42, No. 3. (1989), 309.

⁷³ *Ibid.* 309.

⁷⁴ See eg. L.F. Salzman, *Building in England down to 1540*. Oxford: Clarendon Press. 1952, 349-351.

T.W.T. Tatton-Brown, 'Building Stone in Canterbury c.1070-1525.' In David Parsons, Ed. *Stone Quarrying and Building in England AD 43-1525*. Chichester: Phillimore & Co. Ltd. in association with the Royal Archaeological Institute. 1990, 78-79.

Henley, Weybridge and elsewhere against the winter ... as the price of water carriage has been unreasonably advanced to more than half what it was.⁷⁵ The cost of transport varied with climatic conditions⁷⁶ and the current demand for agricultural use of the oxen or horses and men. Most goods were purchased in towns where the cost of transport was included in the price so relatively little data are available.

It seems likely that, where it was available, water transport was always cheaper for the movement of bulk goods of relatively low value over long distances. No one took coal from Newcastle to London by land. The isopleths on Landers' map of the cost of transporting grain to London in c.1300, while based apparently only on data from sixteen places, show that for long distances water transport was cheaper.⁷⁷

However it seems that some historians have assumed that transport by river was always cheaper than by land and that where land transport was used between two riverside locations the river must have been unusable.⁷⁸ The following calculation illustrates one possible method of determining the breakeven distance between the cost of land and water transport.

Eaton has estimated the cost of obtaining stone for Chepstow Castle.⁷⁹ He estimated that it took 0.4 mh per tonne (mh = manhour) to load or unload a cart and 0.8 mh per tonne to load or unload a barge. If the store was a safe distance from a river the second figure seems to be too low. 2 mh per tonne is used in this calculation. It is assumed that one man could lead an ox cart loaded with 1 tonne at 2 km hr⁻¹ and that four men controlled, or towed, a barge carrying 16 tonnes at a speed of 2 km hr⁻¹.

For a journey from quay to quay a cart was cheaper if

$$0.4 \times 2 + d/2 < 2 \times 2 + 4 \times d / (2 \times 16) \text{ where } d \text{ is the distance in kilometres.}$$

⁷⁵ Calendar of Patent Rolls, 1558-60, 25.

⁷⁶ Bart Ballaux & Bruno Blondé, 'Transport Prices in the Long Sixteenth Century.' www.lowcountries.nl/papers/2004-4_ballaux.pdf. Accessed 23/4/2007.

⁷⁷ John Landers, *The Field and the Forge*. Oxford: Oxford University Press. 2003, 92.

⁷⁸ eg. R.B. Peberdy, 'Navigation on the River Thames between London and Oxford in the Late Middle Ages. A Reconsideration.' *Oxoniensia*, Vol. 61. (1996), 311-340.

⁷⁹ Tim Eaton, *Plundering the Past*. Stroud: Tempus Publishing Ltd. 2000, 48-53.

Thus land transport was cheaper if the journey was less than 8.5 km.

With the same assumptions if the load needed to be transported a short distance by cart from a store to the barge and from the barge to the new store the cart was cheaper if

$$0.4 \times 2 + d/2 < 2 \times 2 + 0.4 \times 2 + 4 \times d / (2 \times 16)$$

that is if the journey was less than 10.5 km.

These estimates are crude. There also needs to be taken into account the problems of organising the transport, breakage, pilferage, the capital cost of cart and barge and the cost of maintaining and replacing the oxen.

However these estimates may explain why imported stone for Canterbury cathedral was transported from Fordwich by cart.⁸⁰ They may also explain why stone from Barrington, Cherry Hinton, Eversden and Haslingfield was transported to Cambridge by land although river transport may have been available from Granchester.⁸¹ For similar reasons barges taking goods from Ware to London would sometimes unload at Hackney or Stratford.⁸²

While this calculation may be considered suitable for the bulk transfer of goods it is not applicable for the movement of small quantities of goods. If a man collects firewood or reeds for his own use or takes goods to the local market the availability of horse or oxen and cart or of a boat would be of much greater importance.

Lee by studying college accounts has shown that in the early 16th century most of the food for the Cambridge colleges came from within 10 miles of the town and was transported by land. Barley was bought from Methwold by water. Wood was transported

⁸⁰ See Appendix C. Transport of Stone for Cathedrals and Colleges.

⁸¹ See sources quoted in Appendix C.

'*Collegium Sancti Hohannis Evangeliste in Cantabrigie.*' C17.23. Archives of St John's College, Cambridge.

Eg. 'The Eagle, Easter 1982.' *Journal of St John's College, Cambridge.*

I am grateful to Mr. Malcolm Underwood, Archivist for these two references.

⁸² Keith Fairclough, 'The River Lea before 1767: an adequate flash lock navigation.' *Journal of Transport History.* 3rd Series. Vol. 10. (1989), 136.

by land from the south-east from where river transport seems to have been unavailable.⁸³ The King's Hall Account Books show that turf was brought from Waterbeach, Swaffam and Bottisham in barges on the Cam.⁸⁴ Gray confirms that 'Traffic between Cambridge and Ely, down to very recent times, went almost entirely by water.'⁸⁵ It is unfortunate that the very full accounts of Peterhouse have not yet been published. It is the one college which had direct access to the river upstream of the mills.

Campbell *et al.* have shown that for London the theoretical circles of supply of Von Thunen's Isolated State were distorted by the fact that west of London river transport was cheaper than land transport.⁸⁶ The wharfs at Henley and at Queenhythe were conveniently located adjacent to the river.

It will be shown in Chapter 4.2 that stone for cathedrals was very seldom transported more than 12 miles by land. For such a dense material land transport was prohibitively high. Leland considered that the house built in Milbyri Parks to have been 'builde richely' when it required 'thre thousand lode of fre-stone to be fetched from Hamden quarre nyne myles.'⁸⁷

The wide variations which have been found in the comparative cost of land and river transport, the problem of determining the constituent elements in the total cost and the difference between average cost and marginal cost mean that extreme care is needed if any argument is to be based on the cost of transport. While cost would often have been a factor in the choice of mode of transport the reverse process of taking cost as evidence of the usability of rivers must only be used with great care.

Despite the failure to establish the amount, or the proportion, of goods moved on rivers it seems that river transport was important during the whole of the period 1189 to 1600 but

⁸³ John S. Lee, 'Feeding their colleges: Cambridge's food and fuel supplies, 1450-1560. *Economic History Review*, Vol. LVI, (2003.) 243 – 264.

⁸⁴ Alan B. Cobban, *The King's Hall*. Cambridge: Cambridge University Press. 1969, 215.

⁸⁵ Arthur Gray, 'The Ford and Bridge of Cambridge.' *Proceedings of the Cambridge Antiquarian Society*. Vol. XIV. (New Series VIII) (1909-1910), 132.

⁸⁶ Bruce M.S. Campbell, *et al.* *A Medieval Capital and its grain supply*. Historical Geography Research Series No. 30. 1993

⁸⁷ *The Itinerary of John Leland in or about the years 1535 – 1543. Volume 4*. Editor Lucy Toulmin Smith. Carbondale: Southern Illinois University Press. 1964, 73.

that care is needed when investigating the reasons for the use, or lack of use, of any section of a river.

Chapter 4.2 Archaeological evidence of use

4.2.1 Introduction

In Chapters 4.2 and 4.3 the subjects are the various types of archaeological and written evidence of the use of rivers. Many people have written about the historic use of rivers but their texts do not indicate that they have considered carefully how much data have been lost or how many river journeys were never recorded even by a mark on the river bank for boats leave no footprints. As one moved upstream it seems likely that use would have been less frequent and the boats would have been smaller. Both factors would have reduced the probability of the use being recorded. It is normally not possible to identify whether the existence of only a few records of use is due to there having been only infrequent use or the poor preservation of records of frequent use.

The completeness of the archaeological record is considered in this chapter in sections according to the different types of articles which have been discovered. The evidence of historic use which has been found has been listed in Appendix A. Since the evidence is not all of the same quality the total evidence for each section of river has been divided into two categories. The categories are wide and may be considered to correspond to evidence of 'probable' and 'possible' use.

- A. A record or report of the transport of goods or taking of tolls.
 A record of floating of timber.
 Investigation of, or removal of, obstructions to boats.
 A requirement that boats should be able to pass a bridge.
 A town being listed as a port or being granted right of toll on boats.
 A town where customs dues on exported items were collected.
 A distribution of pottery which indicates transportation by river.
 A record of a vessel owned by an inhabitant of a town.
 A record of a person having fallen from a boat into a river.
 A river known to have been used because it is listed in, or a licence was granted under, Elizabethan legislation.⁸⁸

⁸⁸ 1558. 1 Elizabeth c. 15. Timber not to be felled for making coals.

B. Secondary statements relating to the transport of goods or tolls.

A record of use or the discovery of a log-boat or anchor which is undated or outside the period 1189-1600 on an unmodified river.

A weir destroyed as a consequence of the 1532 Act of Sewers.⁸⁹

Place name evidence of a port or landing place.

Where a grading is given to one section of a river it is given to all downstream sections.

4.2.2 Boats and Barges

The probability of the remains of historic boats being found in any place depends on three factors: the number of boats used, the chance of a disused boat being preserved and the chance of such a boat being found, recognised and reported. McGrail has recorded about 180 logboat (boats made from one log of wood) remains which have been found in England. Most of these have not been dated but a significant number date from after 1189.⁹⁰ The location of the logboat finds is not analysed here as the information has been published by McGrail and because the location of the finds may depend as much on the preservation and recognition of the remains as on historic usage.

It is not known for what purpose these logboats were built but it would be wrong to assume that they were all used for fishing. In Sussex in 1583 'J and A were getting into a small boat worth 2s in a pond at Cuckfield to enjoy the water, by misadventure, the boat being weighed down, water entered into it, it immediately sank in the depths of the pond and J and A were drowned.'⁹¹ McGrail has analysed the boats on the assumption that they were used for carrying loads and/or people.

No collation of records of finds of other types of boats has been found. The planks of boats, like those of carts, rot quickly. The remains which have been found are those of boats which had been buried in silt. In the Dour a boat dating from about 1550 BC was found up a side creek of the river.⁹² A ship was found at Appledore 10 ft below the

⁸⁹ 1532. 23 Henry VIII c. 5. Act of Sewers.

⁹⁰ Sean McGrail, *Logboats of England and Wales. Part ii*. National Maritime Museum, Greenwich Archaeological Series No. 2. BAR British series 51(ii). 1978, Fig 207.

⁹¹ *Sussex Coroners' Inquests 1558-1603*. Editor R.F. Hunnisett. Kew: PRO Publications. 1996, 65-66.

⁹² www.dover.gov.uk/museum/boat/lab.asp. Accessed 01/05/2006.

present ground level.⁹³ Less than half of a small river boat was found at Caldecotte.⁹⁴ A small boat dating from 1540 was found 8ft below ground level when a sewer was being dug in a meadow (or in a riverbank) near Weybridge.⁹⁵ There have been disputes about the existence of the remains of boats at St Albans for the last four hundred years.⁹⁶ Hundreds of Roman ships' rivets have been found on the 23 metre contour round the now dry Lake Pickering.⁹⁷

Anchors have been found in the bed of a tributary of the Waveney at Weybread,⁹⁸ in the Fleet just north of Camden Town⁹⁹ and at Chilham on the Kentish Stour six miles upstream of Canterbury.¹⁰⁰ These anchors do not prove that the rivers were used at these places. Even less do they prove that the rivers were used at a particular time. However they are evidence that the use of rivers may not have been limited to those sections for which there is written evidence of use.

It seems that the archaeological finds of vessels and their equipment provide evidence of only a very small proportion of those which were used.

4.2.3 Lost loads

Eaton reported that in about 1900 'a Roman altar, pilaster fragment and other Roman stones' were recovered from the bed of the Tyne at Hexham. They may have fallen from a boat, or a boat may have sunk, when Hexham Abbey was built in about 675.¹⁰¹

Similarly Astbury reported that large roughly cut pieces of masonry were found in Whittlesea mere when it was drained in 1851. These may well have been intended for Sawtry Abbey.¹⁰² Similar reports refer to cargoes which have been found at Upware on the Cam and Prickwillow on the Lark. The latter load would seem to have been intended

⁹³ Harold Sands, 'Bodiam Castle' *Sussex Archaeological Collections*. Vol. 46. (1903), 118.

⁹⁴ Gillian Hutchinson, 'Boatfind at the Caldecotte Lake Site.' *Archaeology in Milton Keynes*. 1982, 7-8. Milton Keynes, Development Corporation archaeology Unit. Cited in Gillian Hutchinson, *Medieval Ships and Shipping*. London: Leicester University Press. 1994, 195.

⁹⁵ Gillian Hutchinson, *Medieval Ships and Shipping*. London: Leicester University Press. 1994, 198.

⁹⁶ See Appendix A.

⁹⁷ See Appendix A.

⁹⁸ Douglas R. Pluck, *The River Waveney, Its Watermills and Navigation*. Bungay: Morrow & Co. 1994, 15.

⁹⁹ N.J. Barton, *The Lost Rivers of London*. London: Phoenix House Press Ltd. 1962, 27.

¹⁰⁰ D. Gardiner, *Canterbury*. London: The Sheldon Press. 1923, 9.

¹⁰¹ Tim Eaton, *Plundering the Past*. Stroud: Tempus Publishing Ltd. 2000, 111.

¹⁰² A.K. Astbury, *The Black Fens*. Cambridge: The Golden Head Press Ltd. 1958, 44.

for Bury St Edmonds.¹⁰³ Barley reported that a boat-load of dressed stone was discovered in the bed of the Carr Dyke at Morton, 3 miles to the north of Bourne.¹⁰⁴

Unlike the anchors the lost loads do seem to be direct evidence of use of the rivers. The records from Hexham, Prickwillow and the Carr Dyke provide information of use of sections of rivers for which no other evidence has been found.

4.2.4 Wharfs

Wharfs by their nature are on the banks of rivers normally close to habitations or the source of raw materials. In towns most river banks have been redeveloped over the last four hundred years. Thus there are no visible remains of the quays in the college grounds upstream of Magdalene Bridge in Cambridge. The remains of medieval wharfs on the Thames, Severn, Great Ouse and Trent and at Lincoln and other riparian cities have not been investigated because there is adequate evidence of the use of these rivers from other sources. The archaeological evidence of medieval wharfs on the Fens, Somerset Levels, Humber Levels, Romney Marsh and Pevensey Marsh have been investigated by others.¹⁰⁵ Their number and locations indicate that the waterways in these areas were intensively used.

Reports of remains of wharfs on non-tidal rivers include: a prehistoric wharf on the Thames at Runnymede;¹⁰⁶ Roman wharfs at Kenchester, 6 miles upstream of Hereford;¹⁰⁷ Canterbury on the Kentish Stour;¹⁰⁸ Ilcester on the Yeo.¹⁰⁹ Selkirk states that a suspected Roman barge basin has been found at Mordon on the Skerne and jetties on the Og, a

¹⁰³ Sir Harry Godwin, *Fenland: its ancient past and uncertain future*. Cambridge: Cambridge University Press. 1978, 100.

¹⁰⁴ M.W. Barley, 'Lincolnshire Rivers in the Middle Ages.' *Lincolnshire Architectural & Archaeological Society Reports and Papers*, New Series, Vol. 1, Part 1. (1936), 17.

¹⁰⁵ See Appendix A.

¹⁰⁶ Stuart Needham, 'Holocene alluviation and interstratified settlement evidence in the Thames valley at Runnymede Bridge.' In Stuart Needham and Mark G Macklin, Eds. *Alluvial Archaeology in Britain*. Oxbow Monograph 27. 1992, 255.

¹⁰⁷ H.C. Moore, 'The supposed Roman Bridge in the grounds of the New Weir, Kenchester.' *The Transactions of the Woolhope Naturalists Field Club for 1893-4.* 1896, 56-60.

¹⁰⁸ H.T. Mead and K.H. Jones, 'Roman Site and Finds, Stour Street, Canterbury.' *Archaeologia Cantiana*, Vol. 48. (1936), 219.

¹⁰⁹ Charles Hadfield, *The Canals of South West England*. Newton Abbot: David & Charles. 1967, 83.

tributary of the Kennet.¹¹⁰ There were Viking docks at Willington 5 miles east of Bedford on the Great Ouse.¹¹¹

There was a concentration of medieval wharfs on the Cam and its tributaries upstream of the mills in Cambridge. A stone wall was built in the 14th century on the west side of Peterhouse which is upstream of the King's Mills. The College records show that the wall was built *juxta aquam* and there is a gate in the wall, now blocked up, with the arms of John Hotham, Bishop of Ely (1316-1337) above the gate on the outside and of John Alcock, Bishop of Ely (1486-1500) on the inside. The gateway appears to be part of the original construction. This would seem to imply that boats used the river upstream of the mills between 1316 and 1500.¹¹² There is a good stone wharf at the upstream end of Saffron Walden¹¹³ and a brick Water Gate at Walden Abbey, 'apparently of the 16th century'.¹¹⁴ Parker considers that blocks of stone may have been used for 'a small wharf or landing-stage' at Barrington.¹¹⁵ This appears to be a unique collection of wharfs in a lowland area where there are few other records of the use of the rivers.

The discovery of the stone wharf and slipway dating to the late 12th century at Skenfrith in 2003 on a river with a present mean flow of $6.0 \text{ m}^3 \text{ s}^{-1}$ and gradient of 1.9 m km^{-1} is, at present, unique.¹¹⁶ The wharf and slipway had previously been buried and their presence was totally unexpected. It is too early to know if similar structures will be found elsewhere. The discovery of the wharf and slipway at Skenfrith is of major importance for it provides evidence of the intensive use of a river having a pool and riffle form; a type of river for which little written evidence of use has been found.

4.2.5 Weirs and Fishtraps

¹¹⁰ Raymond Selkirk, *Chester-Le Street & its place in history*. Durham: Casdec Printcentre. 2001, 143.

¹¹¹ Dorothy Summers, *The Great Ouse*. Newton Abbot: David & Charles. 1973, 25.

¹¹² T.A. Walker, *Peterhouse*. 2nd Edition. Cambridge: W. Heffer & Sons Ltd, 1935, 10.

Robert Willis, *The Architectural History of the University of Cambridge. Volume 1*. Cambridge: Cambridge University Press. 1886. Reprint 1988, 14.

¹¹³ Haslam, S. M., Personal communication 2/4/2006.

¹¹⁴ Royal Commission on Historical Monuments, *An Inventory of the Historical Monuments in Essex. Volume 1*. HMSO 1916, 359.

¹¹⁵ R. Parker, 'Riverside Moated Sites at Barrington and Malton.' In Elsie M. Widdowson, *Cam or Rhee*. Cambridge. 1973, 30.

¹¹⁶ Phil Evans and Kevin Trott, 'Excavations at Skenfrith Castle, 2003.' Report of a CADW sponsored excavation. Paper unpublished at July 2008.

It might have been hoped that the discovery of the remains of medieval weirs and fishtraps would show which rivers were so obstructed that they could not be used. However the remains are so few¹¹⁷ that no pattern can be discerned. Similarly records of groynes built to direct flow into one channel and to cause increased siltation in another are too few to be analysed.¹¹⁸

The direct archaeological evidence is too sparse to provide more than occasional evidence for the use of rivers. However it does show that the use of boats was widespread.

4.2.6 Transport of stone

Heer wrote 'it has been argued that Romanesque churches were constructed near water because it "was holy, a direct means of communicating with the womb of the world where it lay in the depths of the earth"'.¹¹⁹ It is considered here more likely that cathedrals and large churches were built near rivers because of the low cost of water transport.

The technology existed throughout the medieval period to move stone from one end of the country to the other by land. Thus in the 14th and 15th centuries stone was moved from Taynton to Windsor Castle, a distance of 60 miles by land.¹²⁰ But this was the exception. It is generally accepted that normally when stone was moved a long distance it was transported on water.¹²¹ Some stone must have been moved by land where there was no suitable river.¹²² Other stone must have been moved on water, as for Caen stone.

¹¹⁷ See for example:- C.R. Salisbury, 'Primitive British Fishweirs.' In G.L. Good, *et al.*, Eds. *Waterfront archaeology*. Council for British Archaeology. CBA Research Report 74. 1991, 76-87.

D.J. Pannett, 'Fish Weirs on the River Severn.' *Folk Life*. (1987-88), 55-69.

D.J. Pannett, 'Fish Weirs on the River Severn.' In Trevor Rowley, Ed. *The Evolution of Marshland Landscape*. Oxford: Oxford University Department for External Studies. 1981, 144-155.

¹¹⁸ See for example: A.G. Brown, *et al.* 'Floodplain evolution in the East Midlands, United Kingdom: the Lateglacial and Flandrian alluvial record from the Soar and Nene valleys.' *Philosophical Transactions of the Royal Society. London. Series A*. Part 348. (1994), 261-293.

¹¹⁹ F. Heer, Translated by Janet Sondheimer. *The medieval world: Europe, 1100-1350*. London: Weidenfeld and Nicolson. 1962, 153.

¹²⁰ Alec Clifton-Taylor, *The Pattern of English Building*. London: Faber & Faber Limited. 1972, 22.

¹²¹ eg. J.L. Bolton, *The Medieval English Economy 1150-1500*. London: JM Dent & Sons Ltd. 1980, 152.

¹²² Eileen Roberts, 'Totternhoe Stone and Flint in Hertfordshire Churches.' *Medieval Archaeology*. Vol. 18. (1974), 66-84.

However no previous work has been found which attempted to assess the normal maximum distance for the transport of stone on land.

The cathedrals and colleges existing in 1600 have been chosen for investigation as they form a well-defined set, they have a wide geographical distribution, they are still in existence, except for the old St Paul's cathedral in London, and most have been well studied. For some stone there are records of the mode of transport, the Building Accounts of Exeter Cathedral being particularly good. The quality of the information for the other cathedrals is varied and many of the estimates which have been made here may be revised in the future. The estimates are listed in Appendix C.

The main challenge has been to assess whether the amount of stone from any source was significant. The object has been to list all sources of more than about twenty tonnes of stone, about twenty cart loads. However since in almost every building there is no record of the amount of each type of stone used, reliance has had to be placed on the available records to assess where in the structure the stone was used and hence an estimate has been made of the likely quantities. For some buildings the sources are given for single stones which might have been moved on horseback.¹²³ Where this has been identified the information is not included.

Appendix C shows that if the Beult, Mole, Kentish Stour and Windrush were used for transport, the only two places where stone must have been transported by land for more than one day's journey was the relatively small amount of stone taken from Selbourne to Winchester after 1300, even though the Itchen was still usable,¹²⁴ and some of the stone for the Oxford Colleges brought from Taynton for use in preference to the rotten local stone.

The normal meaning of journey (*journée*) from 1250 to about 1550 was one day's travel.¹²⁵ No study has been found of the normal distance that workmen travelled away from their homes in the period 1189-1600. The many studies of travelling folk and the

¹²³ Eg. 'One to ten blocks.' John F. Potter, 'The geology of London Basin churches: the Palaeogene rocks.' *Tertiary Research*. Vol. 19 (3+4). 1999, 117-138, 123.

¹²⁴ See *The Local Port Book of Southampton for 1439-40*. Editor Henry S. Cobb. Southampton: At the University. 1961, xiii-xiv.

¹²⁵ 'Journey.' *Oxford English Dictionary*. Electronic edition.

journeys of the rich may have hidden the fact that most people were very unwilling to sleep away from their homes.

These figures do seem to indicate that in general those who chose the sites of the cathedrals selected places which were accessible to what they thought were suitable supplies of stone, except for London whose position was determined by other factors. However some Oxford colleges and Chester, Litchfield and Carlisle cathedrals have suffered from excessive wear to the stonework due to the use of poor quality local stone.¹²⁶

The only comparable figures for the movement of stone, that have been found, are Eaton's record of the distance that stone was moved from Roman sites in Northumberland for reuse in a church building or castle. He found one example of stone being moved 9.4 km on the Tyne. The maximum distance that stone was moved by land fell steadily from 5.4 km in 1020 to 0.6 km in 1450. Eaton also listed the distances to sites from which Roman stone was not taken. These fell steadily from 6 km in 1180 to 1.8 km in 1430.¹²⁷

Hutchinson wrote that many castles were sited so that they could be reached by boat.¹²⁸ However the extent to which stone for castles, abbeys, monasteries and other buildings was transported by river has not yet been studied.

4.2.7 Transport of pottery

To study the movement of goods in the medieval period it is necessary to know where the item originated, where it was found and if possible how it was transported. Normally the third is not known. Vince has shown that medieval pottery production was carried out in a limited number of places. Thus the distribution of the fragments links the source to the finding place. He states that 'The distances over which pottery was carried vary from period to period but were actually as high or higher in the Middle to Late Anglo-Saxon

¹²⁶ Alec Clifton-Taylor, *The Pattern of English Building*. London: Faber & Faber Ltd. 1972, 87, 110, 125-6.

¹²⁷ Tim Eaton, *Plundering the Past*. Stroud: Tempus Publishing Ltd. 2000, 31-35.

¹²⁸ Gillian Hutchinson, *Medieval Ships and Shipping*. London: Leicester University Press. 1994, 125-126.

Period as in the 13th to 14th centuries.’¹²⁹ This may imply that the transport system was more efficient at the earlier date or that the number of production centres had increased by the later date.

Symonds claimed that the local distribution of pottery was normally by road but long distance transport was by river.¹³⁰ She wrote:

According to their [Edwards and Hindle] reading of medieval documents most of the rivers of Lincolnshire were partially navigable with the exception of the Bain. ... The distribution of pottery also suggests that the Bain was used to transport pottery from Tattershall up to Horncastle.

This is of particular interest as it is the only evidence which has been found that goods were taken to or from Horncastle by river.

It seems that Spoerry in his analysis of the distribution of pottery in the Fenland assumed that all the distribution was by water transport¹³¹ both because of the nature of the Fenland and because pottery is less likely to be broken when transported by river than by land.¹³² While the pottery of London has been well studied, at present, it seems no link has been found between sources and modes of transport.¹³³

4.2.8 Transport of timber and wood

It is convenient to consider here the evidence concerning the transport of timber and wood although the evidence is mostly written rather than archaeological. Rackham wrote that ‘When the twelfth-century monks of Abingdon (Berks) wanted timber, they sent twelve-ox wains 120 miles to North Wales, passing by on the way the third and fourth largest concentrations of woodland in England at the time.’¹³⁴ The original text stated

¹²⁹ Alan Vince, ‘Ceramic Petrology and the Study of Anglo-Saxon and Later Medieval Ceramics.’ *Medieval Archaeology*. Vol. 49. (2005), 219.

¹³⁰ Leigh Andrea Symonds, ‘Landscape and Social Practice.’ *BAR*. British Series 345. (2003), 23 and 128.

¹³¹ Paul Spoerry, ‘Town and Country in the Medieval Fenland.’ In Kate Giles and Christopher Dyer, Eds. *Town and Country in the Middle Ages*. Leeds: Maney Publishing. 2007, 101.

¹³² John Blair, ‘Introduction.’ In Blair, 2007, 14.

¹³³ A.G. Vince, ‘The Saxon and Medieval Pottery of London: A Review.’ *Medieval Archaeology*. Vol. 29. (1985), 25-89.

¹³⁴ Oliver Rackham, *The History of the Countryside*. London: Phoenix Press. 1986, 264.

that they went to Shrewsbury.¹³⁵ From this statement he made an inference which may be challenged. He wrote ‘There was little economizing in transport, and the documents refuse to support the theory that heavy materials were always of local origin or else were moved by water.’ While the records of the transport of stone by land show that it was normally limited to relatively short distances, timber was often transported over much greater distances. Thus studies of the timber in Salisbury cathedral have shown that it was brought from Ireland and Trivelles Forest near Kilpeck, Herefordshire in 1224 and from the forest of Dean in 1234.¹³⁶ Large good quality timber was only available from a very few sources. The existence of woodland did not mean that suitable timber existed within it and even less that the timber could be purchased.

There is, at present, a remarkable lack of information about the historic transport of timber but this may change if Simpson’s survey at Salisbury is repeated elsewhere.

In 1558 the burning of timber for charcoal was prohibited within ‘fourteen Miles of the Sea, or of any Part of the Rivers of *Thames, Severn, Wye, Humber, Dee, Tine, Teese, Trent* or any other River, Creek or Stream, by the which Carriage is commonly used by Boat or other Vessel to any Part of the Sea.’¹³⁷ Of itself this does not state which rivers were ‘commonly used’. However the second clause of the Act provides that the Act ‘shall not extend to the County of *Sussex* nor to the Weild of *Kent*, nor to any of the Parishes of *Charlewood, Newdigate* and *Ligh* in the Weild of the county of *Surrey*.’ This implies that Charlewood, Newdigate and Ligh were within fourteen miles of a ‘commonly used river’, that is that the upper parts of either the Mole, Wey or both were used by boats in 1558.

Other examples of evidence of the use of rivers for the transport of wood include a grant that was made in 1563 of a ‘licence to make cole from timber in Haye Chistelin alias Chistlin Haye parcel of the possessions of Ambrose, earl of Warwick.’¹³⁸ This seems to

¹³⁵ *Chronicon Monasterii de Abingdon, A.D. 201-1189*. Rolls Series London, 1858. ii. 150. Cited in L.F. Salzman, *Building in England down to 1540*. Oxford: Clarendon Press. 1952, 245.

¹³⁶ Gavin Simpson, ‘Documentary and Dendrochronological Evidence for the Building of Salisbury Cathedral.’ In Laurance Keen and Thomas Cocke, Eds. *Mediaeval Art and Architecture at Salisbury Cathedral*. The British Archaeological Association Conference Transactions. XVII. 1996, 14, 11.

¹³⁷ 1558 1 Elizabeth I. c.15.

¹³⁸ Calendar of Patent Rolls, 1560-63, 478.

imply that the Penk at Penkrudge was ‘commonly used by boats’.¹³⁹ There is also a record from 1332 of the appointment of William de Swynmor to convey timber and brushwood on the Conway from near Llanrwst to the sea¹⁴⁰ which shows that timber was moved on steep shallow rivers at that date.

While it is known that timber was floated down the Severn¹⁴¹ the only other four clear references which have been found to the floating of timber all come from Sussex. The Adur and the Ouse Navigation Acts¹⁴² provided for the floating of rafts of timber. In 1634 two men were ‘towing certaine tymber from’ Scots Float to Rye but the cocke overturned and they were drowned.¹⁴³ In 1771 timber was taken from Fletching to Landport near Lewes and then floated to Newhaven.¹⁴⁴

The supply of wood to London in the period 1290-1400 has been studied by Galloway *et al.*¹⁴⁵ They state that it was unusual to carry firewood more than ‘12 to 18 miles overland’ in the early 14th century. However their map shows that all sources of supply were less than 10 miles from water transport on the Thames, Medway, Lea, Colne or Wey in 1300 and 8 miles in 1400,.

In 1587 Harrison noted the shortage of wood at Cambridge which meant that it had to be brought from ‘Essex and other places thereabouts’.¹⁴⁶ Lee, from his study of college accounts, wrote that wood and charcoal had to be transported by land distances up to 15 miles and that turfs and sedge were brought from the fenland by barge.¹⁴⁷ It seems that to transport wood by land for this distance was unusual. For most other places it was either available locally or was transported by water.

¹³⁹ See Appendix A.

¹⁴⁰ Calendar of Patent Rolls, 1330-34, 367.

¹⁴¹ Calendar of Patent Rolls, 1281-92, 116.

¹⁴² 47 George III c. 117 and 1790 30 George III c. 52.

¹⁴³ *Sussex Coroners' Inquests 1603-1688*. Editor R.F. Hunnisett. Kew: PRO Publications. 1998, 82.

¹⁴⁴ T.W. Horsfield, *History of Sussex*. Volume 1. 377. Cited in *V.C.H. Sussex, Vol. 2*, 322.

¹⁴⁵ James A. Galloway, *et al.*, ‘Fuelling the city: production and distribution of firewood and fuel in London’s region, 1290-1400.’ *Economic History Review*, Vol. 49. (1996), 468.

¹⁴⁶ William Harrison, Georges Edelen, Ed. *The Description of England*. Washington; The Folger Shakespeare Library and New York: Dover Publications Inc. 1968, 67.

¹⁴⁷ John S. Lee, *Cambridge and its Economic Region 1450-1560*. Studies in Regional and Local History Vol. 3. Hatfield: University of Hertfordshire Press. 2005, 161.

Chapter 4.3 Written Evidence of Use

4.3.1 Introduction

For most river journeys in the period 1189-1600 there is not, and never has been, a written record. It is too much to expect that a diary of a boatman will be found from the 13th or 14th century. Even if such a record was found it is likely that it would record the journeys of a large barge and so give little information about the limits to which boats were taken.

The writings of the later middle ages varied in competence and extent. Flower has drawn attention to the lack of geographical balance in the records. He stated that it is impossible to determine whether this is due to the ‘peripatetic nature of the Court of King’s Bench’ or the location of the ‘important waterways’.¹⁴⁸ Dyer has shown that most written evidence is socially selective¹⁴⁹ towards the upper classes which is frustrating for Norden wrote that it was the ‘meaner’ who lived ‘by the barge, by the wherrye, or ferrye’.¹⁵⁰

Many written records are in a form which makes it impossible to know whether the use of a section of a river was intensive or occasional or if use was for a long period of time or short. In the case of the boats which floated over the churchyard wall in St. Neots in 1571¹⁵¹ the location does seem to indicate that this would have been only an occasional event. Some types of evidence show that part of a river was used but do not indicate which part.

At an early stage of the research for this thesis it was decided that original manuscripts would seldom be studied for three reasons. References to the use of rivers are scattered among other records and there are no unpublished records where it is expected that more than one record in a thousand would provide useful information. Thus time available for research was more usefully employed in studying printed records. Secondly, in most pre-17th century manuscripts there are problems of legibility, script and in extending

¹⁴⁸ *Public Works in Mediaeval Law, Volume I*. Editor Flower, C.T. Selden Society, Vol. 32. 1915, xxix..

¹⁴⁹ Christopher Dyer, ‘Documentary Evidence: Problems and Enquiries.’ In Grenville Astill and Annie Grant, Eds. *The Countryside of Medieval England*. Oxford: Blackwell. 1988, 12 ff.

¹⁵⁰ John Norden, Ed. Sir Henry Ellis, *Speculi Britanniae Pars. An Historical and Chorographical Description of the County of Essex. 1594*. London: Camden Society. 1840, xi.

¹⁵¹ C.F. Tebbutt, *St. Neots*. Chichester: Phillimore. 1978, 92.

abbreviations. Thirdly, the manuscripts are fragile and it seemed inappropriate to handle them with such a low proportion of relevant records. This has, in general, provided very little difficulty as photocopies are available from all the official depositories. They are however expensive and are not suitable for relatively random searches.

4.3.2 The Royal Rolls

Some historians seem to have assumed that the Calendars of Patent Rolls, Close Rolls and other Calendars, are complete records. These are, as their name implies, extracts from the manuscripts and some common lists have been omitted from the printed editions. In general what is needed has been extracted but in the case of pontage grants this may not have been the case. The initial grants have been listed at Appendix L. The pontage grants were sometimes tolls only on goods passing over the bridge. At other times and places the tolls were charged on goods passing both over and under the bridge. It is known that most of the rates charged on the various goods have been omitted from the printed Calendars.¹⁵² It seems likely that the information as to whether cargoes in boats were to be charged or not has also been omitted. This could be checked by examining the original documents but it would still not be known whether the scribe had copied a standard form of pontage grant or if the provisions were specific for a particular bridge.

A second problem with the Royal Rolls is that the type of information recorded in them changed over the years.¹⁵³ The early records include the appointment of commissioners to investigate the obstruction of rivers. Later this work was the responsibility of the Commissioners of Sewers whose records have mostly not survived.¹⁵⁴ The later Patent Rolls did not record the movement of goods for the king. By the reign of Elizabeth the Patent Rolls were mostly concerned with leases, pardons, pensions, presentations and similar topics. It is stated that the descriptions of land are generally left out of the calendars except for 'entries of special interest, such as those relating to property in London which are calendared in full.'¹⁵⁵ The entry for 1565 for pontage at Staines bridge

¹⁵² Calendar of Patent Rolls, 1327-30, viii.

¹⁵³ Matthew Johnson, *An Archaeology of Capitalism*. Oxford: Blackwell. 1996, 40-41.

¹⁵⁴ A.E.B. Owen, 'Records of Commissions of Sewers.' *History*. Vol. LII. (1967), 35-38, 36.

¹⁵⁵ Calendar of Patent Rolls, 1558-60, v.

includes the statement that a toll was to be paid on goods passing under the bridge.¹⁵⁶ This information may have been included in the Calendar because it was unusual or because the river at Staines was the responsibility of the City of London.

These changes in the nature of the Rolls make it impossible to make comparisons of the records of the use of rivers for different periods.

4.3.3 Accounts

Research has been carried out into the accounts of four Customs Ports by Uhler,¹⁵⁷ the Southampton Port Books by various authors,¹⁵⁸ and the national purveyance accounts for the period 1290 to 1348 by Langdon.¹⁵⁹ The building accounts for Exeter Cathedral and York Minster are extant and reports about them have been published. These reports have been studied and relevant details extracted.

However Elton stated that the mass of extant financial information about the state for the period 1200-1600 is so vast that he could not even describe it.¹⁶⁰ Almost any entry in these rolls could refer to the carriage of goods on a river. There also remain to be considered the building accounts of the other cathedrals, minsters, monasteries, palaces and stately homes and the accounts relating to their purchase of food and fuel.

There are in Appendix A a few records taken from the accounts or minutes of the Parish records. There are many other references to the movement of bells, stone and people by water which have not been found, extracted and listed.

¹⁵⁶ Calendar of Patent Rolls, 1563-65, 335.

¹⁵⁷ Sharron G. Uhler 'English Customs Ports 1275-1343.' Unpub. PhD thesis, Univ. of St Andrews. 1977.

¹⁵⁸ Southampton record Book Series.

¹⁵⁹ John Langdon, 'Inland water transport in medieval England.' *Journal of Historical Geography*, Vol. 19, (1993).

¹⁶⁰ G.R. Elton, *England 1200-1640*. London: Sources of History Ltd. in association with Hodder and Stoughton Limited. 1969, 46.

4.3.4 Eyres and Inquests

One of the more productive sources of historic records of the use of rivers is the records of people falling from boats into the water of a named river and drowning. The eyres received reports of all deaths by misadventure and some of their records are available for the period 1194-1348. Twelve printed records of visitations to counties by eyres have been examined. If it is assumed that the records are complete and that an eyre was held every seven years in each county then about 84 county-years have been examined.¹⁶¹ In addition a few coroners records for the sixteenth century have been printed. 181 county-years of these have been examined. There were 41 historic counties and over a period of 411 years there were a potential 16,851 county-years of records. Thus records of about 1.6% of the potential records of death may have been examined. The proportion of boat users who fell out of their boats and died each year is unknown.

There are two particularly interesting records from the eyres. Between 1235 and 1243 two men were drowned falling from boats into the Wear downstream of Durham and one man was killed by a boat falling on him. There are no other records from the 13th century of the use of this section of the river. Between 1255 and 1275 two men fell from boats on an eight mile section of the Teme and were drowned.

It has not been possible to investigate the records of boats in the probate inventories except for a few from Hampshire. Thirsk has shown that there are also records of boats for the Holland region of Lincolnshire¹⁶² and it seems possible that there may be many more records in County Record Offices and other repositories similar to those for the Kentish fishing communities analysed by Sweetinburgh.¹⁶³

A similar source of evidence is provided by the *post-mortem* accounts of Thomas West who traded on the Thames and died in 1573. Prior wrote a paper about these accounts

¹⁶¹ For a list of surviving rolls see: David Crook, *Records of the General Eyre*. Public Record Office Handbooks. Number 20. 1982, 13.

¹⁶² Joan Thirsk, *Fenland Farming in the sixteenth century*. Department of English Local History Occasional Papers No. 3. Leicester University Press. 1965, 26-27.

¹⁶³ Sheila Sweetinburgh, 'Strategies of inheritance among Kentish fishing communities in the later Middle Ages.' *The History of the Family*. 11 (2006), 93-105.

and listed the places at which West traded and the goods which he sold.¹⁶⁴ No other record of this type has been found.

4.3.5 Law Reports

The records of the Law Courts provide evidence of rivers being illegally obstructed and of some rivers which were not maintained to the required standard. There are more than four thousand extant rolls from the King's Bench, Common Pleas and Exchequer alone¹⁶⁵ and many records of the County and Manor courts. Only a very small fraction of these have been examined and printed. Many have provided evidence of the use of rivers.

4.3.6 Records of Tolls

It seems that tolls were charged on some rivers in the 13th century and charges were made for the release of water from weirs on the Thames in the 17th century, and some authors would claim before that date. However none of the account books for these has been found.

Only one record has been found which makes it possible to estimate the number of boats on one section of one river. There is a record in the *Rotuli Hundredorum*¹⁶⁶ that in 1273 Robert of Donham levied a toll of a halfpenny (more or less) per ship passing from Lincoln by Fosseydyke to Dunham. Dunham is a village on the Trent upstream of Torksey. In one year his receipts amounted to half a mark which means that about 160 ships paid a toll in the year. This figure would not include ships passing downstream from Torksey.¹⁶⁷

¹⁶⁴ Mary Prior, 'The Accounts of Thomas West of Wallingford, a Sixteenth-Century Trader on the Thames.' *Oxoniensia*, Vol. XLVI. 1981, 73-93.

¹⁶⁵ G.R. Elton, *England 1200-1640*. London: Sources of History Ltd. in association with Hodder and Stoughton Limited. 1969, 56.

¹⁶⁶ *Rotuli Hundredorum*, I, 320a.

¹⁶⁷ J.W.F. Hill, *Medieval Lincoln*. Cambridge: Cambridge University Press. 1948, 311.

For the period 1294 to 1348 Langdon found 26 references to boats used for purveyance on the Trent.¹⁶⁸ In those 55 years about 8,800 vessels would have passed Dunham. It seems that the use of boats for the supply of the army and Royal Household was only a small fraction of the total number of journeys on this section of the Trent.

This may be compared with the records of the use of boats to take people to milk cattle.¹⁶⁹ There is one record which has been found and if it is assumed that cows were milked on 250 days a year, twice a day, for 400 years by five families then there is one found record of historic use for a million journeys.

4.3.7 Maps

In general, maps from the period 1189-1600 show rivers but not roads between towns. This may imply that roads were less important or that they did not exist. (Appendix O.)

Maps drawn before 1570 do not portray the rivers clearly enough to provide any information about their condition. After that date big rivers are shown with double lines, streams as a single line. The available reproductions of the maps of Saxton¹⁷⁰ and Speed¹⁷¹ do not allow for any deductions to be made about the form of the rivers except for the location of ponds or lakes in their course or at their source. However Norden on his map of Essex draws the Pant at Radwinter and the Stort above Stortford with double lines. When compared with other rivers it would seem that the physical size of these two rivers has been considerably reduced since 1600. This may imply that they were usable.

¹⁶⁸ John Langdon, 'Inland water transport in medieval England.' *Journal of Historical Geography*, Vol. 19, (1993).

¹⁶⁹ William Camden, *Camden's Britannia*. Trans. and Ed. Edmund Gibson. London: F. Collins. 1695, 461.

¹⁷⁰ Christopher Saxton, *An Atlas of England and Wales. Engraved 1574-1578*. London: The Collectors Library of Fine Art. 1979.

¹⁷¹ John Speed, *Theatre of the Empire of Great Britaine, Parts I, II, III and IV*. (1st Edition 1611.) Facsimile London: Phoenix House Limited. 1953-4.

4.3.8 The limit of upstream use of rivers

The written records sometimes show that there was use of a river at a certain place but do not indicate how much further upstream the river was used. One example of this relates to the river Wensum. The City of Norwich exercised a wharfage monopoly from 1379.¹⁷² In 1671 the City of Norwich maintained a common quay for the unloading of vessels. The city claimed that there was a custom that every vessel passing through the river should pay a toll, whether it unloaded at the quay or not.¹⁷³ This implies that vessels went from upstream of Norwich to downstream of the city without stopping. The only other record of the use of the rivers upstream of Norwich is a statement that in 1295 Taverham, 7 miles upstream of Norwich, was included in a list of ‘maritime’ places.¹⁷⁴

Another example comes from the Trent where in 1738 it was held that there was an ancient public right of navigation through Nottingham and so also upstream of Nottingham.¹⁷⁵

Langdon found no evidence of the use of the Thames upstream of Oxford, Edwards found one record of use and yet Blair after his study of medieval texts and accounts wrote that at *Kyndelwere* ‘There must have been a great deal of coming and going around the mill with grain-laden boats, belonging both to tenants obliged to grind here and to other landowners who found it a convenient mill to patronize.’¹⁷⁶ In addition Blair found evidence for the regular passage of ships from Faringdon to the sea.¹⁷⁷

These examples show that three of the rivers upstream of cities were regularly used by boats but the written records do not indicate the limits of use or the intensity of use nor do they establish if other rivers were used in a similar way.

¹⁷² *The Records of the City of Norwich, Volume 2*. Editors W. Hudson & J.C. Tingley. 1910, 233-6. Cited in A. Carter, ‘Norwich.’ In Gustav Milne and Brian Hobley, Eds. *Waterfront Archaeology in Britain and Northern Europe*. CBA Research Report No. 41, 1981, 139.

¹⁷³ *Haspurt v Wills*, (1671), 1 Vent, 71.

¹⁷⁴ Calendar of Patent Rolls, 1292-1301, 169.

¹⁷⁵ *The Mayor and Burgesses of the Town of Nottingham v Richard Lambert*. (1738) Willes, 111-119.

¹⁷⁶ John Blair, ‘Transport and Canal-Building on the Upper Thames, 1000-1300.’ In Blair, 2007, 282.

¹⁷⁷ *Ibid.* page 260.

4.3.9 Place-Name Evidence

Place-name evidence for the use of rivers has recently been considered by Cole.¹⁷⁸ Most of the information relating to ports, hythes and other landing places confirmed usage which was previously known from other sources. However the fact that the name *lād* (the place-name term for an artificial watercourse) implies that there was not only an artificial waterway leading to a place but also a usable waterway at the other end of it and this confirms the intensive use that was made of the Fens and Somerset Levels.

Cole considered that the presence of *ēa-tūn* (the place-name term for a river settlement) in a name implied that the settlement had a special responsibility for the river. This interpretation is certainly significant. Cameron states that *ēa* ‘seems to have been used of a waterway larger than a brook or burn.’¹⁷⁹ Thus it seems to refer to a river on which boats might be able to be used. Cole wrote that the name might be linked with the maintenance of a ford or with responsibility for keeping the river open for navigation. The former suggestion seems to be unlikely because the places are mostly not on recognisable land routes. Cole preferred the latter because most places with the name *ēa-tūn* are on the upper reaches of major rivers or their tributaries.

If it is established that all places with *ēa-tūn* in their name were located where boats used the rivers then this would provide additional confirmation that the network of usable rivers was much more extensive in the medieval period than it is now.

4.3.10 Recreation

Fitzstephen described water jousting on the Thames in the 12th century¹⁸⁰ as did Stowe at the end of the 16th century.¹⁸¹ It seems likely that this sport is limited to those societies in which the use of boats is not uncommon.

¹⁷⁸ Ann Cole, ‘The Place-Name Evidence for Water Transport in Early Medieval England.’ In Blair, 2007, 55-84.

¹⁷⁹ Kenneth Cameron, *English Place Names*. New Edition. London: B T Batsford Ltd. 1996, 167.

¹⁸⁰ William Fitzstephen, *Descriptio nobilissimae civitatis Londoniae*. Cited in John Marshall Carter, *Medieval Games*. London: Greenwood Press. 1992, 128.

¹⁸¹ John Stow, *A Survey of London. Text of 1603. Volume 1*. Ed. Charles Lethbridge Kingsford. Oxford: Clarendon Press. 1908, 92, 94.

Taking one's leisure on the water is portrayed in medieval manuscripts, often with musicians in the boats, but where people took to the water and when is unknown. The first book on swimming was written in 1587 in the hope that it would reduce the number of young men at Cambridge who drowned.¹⁸² It would seem likely that these young men fell into the water from boats rather than from the banks of the rivers.

Carter considered that of 'sixty-six sport/recreation-related crimes in the thirteenth century, twenty-eight, or 43 percent, were water-related pastimes: bathing, boating, fishing, ice skating, swimming, and water tilting.'¹⁸³ However his division of activities between sport/recreation and commercial use may be challenged.

4.3.11 The Quality of the Evidence

In a study such as this each piece of evidence is noted and recorded. In this thesis evidence for each river has been placed in one of two categories according to its type. This is only a crude measure. Purbeck marble was taken from Dorset to Durham in 1170-76 and can be seen in the Galilee Chapel of the cathedral. It would be extraordinary if it was not taken by sea to Sunderland. Clifton-Taylor is considered to be reliable and he stated that the marble was 'brought up the river to the cathedral'.¹⁸⁴ But his main interest was the places where stone was used not how it was transported. It is possible that by writing 'brought up the river' he meant brought up the river valley rather than 'transported up the river in barges'. Again writing about the Wear Clifton-Taylor wrote that Frosterley marble was floated down the river to Durham.¹⁸⁵ Selkirk wrote that the marble was rafted down the river.¹⁸⁶ It has not been possible to enquire of the authors whether they have evidence that the transport was actually on the river nor to consult any extant cathedral records..

Some records do seem to be certain, as for example when the Durham Household accounts record that goods were taken to Durham in the 16th century '*a navi in 1 keyll*,

¹⁸² E. Digby, *De Arte Natandi*. 1595.

¹⁸³ John Marshall Carter, *Medieval Games*. London: Greenwood Press. 1992, 88.

¹⁸⁴ Alec Clifton-Taylor, *The Pattern of English Building*. London: Faber and Faber Limited. 1972, 180.

¹⁸⁵ *Ibid.* page 187.

¹⁸⁶ Raymond Selkirk, *Chester-Le-Street & its place in history*. Durham: Casdec Printcentre. 2001, 243.

*cum navigacione eorundem, 12d.*¹⁸⁷ [For transport by boat in one *keyll*, with freightage thereon, 12d.]

The written records of historic use vary in quality. In this thesis explicit reference is not made every time that the authenticity of a record could be queried because the boundary lines are vague.

¹⁸⁷ *The Durham Household Book: or, the Accounts of the Bursar of the Monastery of Durham, from Pentecost 1530 – Pentecost 1534*. Editor J. Raine. Surtees Society, Vol. 18, 1844, 63.

Chapter 4.4 Records of Historic Use by Regions

4.4.1 Introduction

In this chapter the historic records of use of all rivers are considered. During the last two hundred years there has been a steady increase in awareness of the historic use of rivers. In 1789 during a case in the Court of King's Bench Graham, counsel for a plaintiff, said 'Few of our rivers beside the Thames and Severn were naturally navigable'.¹⁸⁸ Woolrych in the first text on 'The Law of Waters' written in 1830 accepted this statement.¹⁸⁹

Table 13 shows the total length of non-tidal rivers which have been accepted as being navigable by previous authors and the increase in total length.

Table 13. The length of usable rivers.

	Date	Length miles	Increase miles
Graham ¹⁹⁰	1789	200	
Flower ¹⁹¹	1915	436	236
Edwards ¹⁹²	1987	1199	763
Langdon ¹⁹³	1993	391	
Evidence Category A	2010	2141	942
Evidence Category B	2010	3073	1857

It would be expected that as the records approach completeness there would be an asymptotic approach to the actual total length of the rivers which were used. Table 13 seems to indicate that this limit is not yet being approached. The length of the rivers for which there is evidence of historic use is 78% greater in this thesis than in the previous

¹⁸⁸ *per Graham. Ball v Herbert* (1789) 3 T.R. 254-265, 255.

¹⁸⁹ Humphrey W. Woolrych, *A Treatise on the Law of Waters and of Sewers*. London: Saunders and Benning. 1830.

¹⁹⁰ *per Graham. Ball v Herbert* (1789) 3 T.R. 254-265, 255.

¹⁹¹ *Public Works in Mediaeval Law, Volume I*. Editor C.T. Flower. Selden Society, Vol. 32. 1915, xxvi.

¹⁹² J.F. Edwards, 'The Transport System of Medieval England and Wales.' Unpub. PhD thesis Univ. of Salford. 1987.

¹⁹³ John Langdon, 'Inland water transport in medieval England.' *Journal of Historical Geography*, Vol. 19, 1. (1993), 1-11.

comparable thesis by Edwards written in 1987. For rivers other than the Trent, Great Ouse, Thames and Severn the increase is 108%.

4.4.2 Evidence of Use by Regions

Table 14 is a list of the total lengths of the rivers for which evidence of the historic use was found by Edwards and for this thesis.

Table 14 Regional Lengths of Historic Use.

Column 2 is the length of non-tidal river for which Edwards found evidence of use.

Column 3 is the length of river for which category A evidence has been found by the present author.

Column 4 is the length of river for which category B evidence has been found by the present author.

Column 5 is the length of river described as being usable in the *BCU Guide*.

Distances are measured in miles.

Region	Edwards	A	B	RLU
North East	31	96	143	117
Yorkshire	172	261	333	371
Trent	103	182	283	284
Lincolnshire Coast	93	123	152	61
Fenland	231	368	433	434
East Anglia	30	138	209	143
Thames	168	336	434	403
South East	80	169	239	187
South West	57	73	254	159
Severn	184	321	434	387
North West	52	74	159	182
Total	1201	2141	3073	2728

(The remainder of this section is a summary of the information in Appendix A.)

In the North East region the form of the rivers implies that use by barges was limited to the lower reaches of the rivers and other sections which had low gradient. Thus there are records of a ‘Stanbate’ (a boat used for moving stones) being used at Durham from 1336 to 1415.¹⁹⁴ The records of the Courts of Eyre show that on the Wear between 1235 and 1243 two people drowned falling from boats between Durham and the sea and one was killed by a boat which he was building at Durham falling on him. Thus it seems that at that time the use of the river was moderately intensive. Records have not been found for other periods. There are two records from the 16th century of goods being transported on the river upstream to Durham. It is, at present, impossible to know if the lack of evidence of the use of the river in the 15th century is due to the river being braided and so unusable, to the reduction in transport due to the reduced population, increased violence in the area or a reduction in extant records.

Similar comments could be made about the Tweed and Tyne but records of the use of the Tees between Whorton Falls and Cleasby are noticeably lacking. The names of the settlements on the Leven, Great Ayton and Little Ayton are of particular interest. As stated above, Cole suggested that settlements with these names had a responsibility for keeping the river open for navigation. If this is correct then the Leven was a more usable river when the settlements received their names than it is now.

No records of mills obstructing the use of rivers in the region have been found. It seems likely that this is because the rivers are liable to major floods and mills built on the main river would have been at risk of frequent destruction.

In the Yorkshire region many of the rivers are biconvex upwards. It would seem that use of the lower sections by barges was common because Camden records that in 1548 the Bishop of Durham told Henry VIII that within 10 miles of Haslewood, near Sherburn in Elmet, there were 5 navigable rivers.¹⁹⁵ In the 14th century there were several commissions appointed to investigate the obstruction of the lower sections of all the

¹⁹⁴ For references to the use of the Wear see Section 4.5.4.

¹⁹⁵ William Camden, *Camden's Britannia*. Trans. and Ed. Edmund Gibson. London: F. Collins. 1695, 730 [x].

rivers by fish weirs and mill weirs. This seems to imply both that there were many obstructions and also that there were people using the rivers whose journeys were hindered. The recent limits of use of the Wharfe and Ure are well upstream of the recorded limit of historic use. In the case of the Ure this is known to be partly due to a lack of records as it is known that vessels used the river upstream of Boroughbridge but the limit of their usage is not known.¹⁹⁶

The river traffic on the Trent was described in 1976 as being ‘singularly ill-documented’¹⁹⁷ and this is still the case today. In the 14th century it was considered that there was a public right of navigation over the full length of the river.¹⁹⁸ Edwards has established that there was regular use to Nottingham. There are few records from further upstream. It is recorded that ‘Primitive boats preserved in river silt have been found along the length of the Trent from the Humber Ferry to Abbey Hulton in Stoke-on-Trent.’¹⁹⁹ But it seems that braiding of the river may have stopped barges from going far upstream of Nottingham and that smaller boats were either seldom used or their use was seldom recorded. It seems likely that the lower tributaries of the Trent were used by boats as demand required as on other lowland areas. However knowledge of the use of the Tame, Anker, Sow and Penk, if it occurred, is almost totally lacking. The upper reaches of the Dove and Derwent would have been unusable due to their form but in the 17th century Isaac Walton wrote that the Dove was swelled before it fell into the Trent and was of such a breadth and depth as to be in most places navigable, were it not that the passage was frequently interrupted with fords and weirs.²⁰⁰

In the Lincolnshire region the Witham dominated the pattern of use but many other rivers were also used. The pottery evidence near the Bain seems to indicate that the written evidence of the use of the rivers is incomplete.²⁰¹ With the ready availability of boats and boatmen throughout the period it seems that there is no reason to think that any usable

¹⁹⁶ Duchy of Lancaster and Palatinate of Lancaster: Chanceries: Enrolments 1354-1509. DL 37/63 m. 71 d. Cited in Robert Somerville, *History of the Duchy of Lancaster. Volume 1. 1265-1603*. London: The Chancellor and Council of the Duchy of Lancaster. 1953, 313.

¹⁹⁷ W.G. Hoskins, *The Age of Plunder: King Henry's England 1500-1547*. London: Longman. 1976, 198.

¹⁹⁸ ‘Royal Commission to inquire into Obstructions of the course of the Trent at Colwick.’ (1383) In *Records of the Borough of Nottingham. Volume I* Editor W.V. Steveson. Nottingham: Corporation of Nottingham. 1882.

¹⁹⁹ Richard Stone, *The River Trent*. Chichester: Philimore. 2005, 4.

²⁰⁰ Izaak Walton, *The Compleat Angler*. Ed. Richard le Gallienne. London: John Lane. 1904, 295-296.

²⁰¹ Leigh Andrea Symonds, ‘Landscape and Social Practice.’ *BAR. British Series 345*. (2003), 23 and 128.

river was unused. The steady deterioration of the Witham has already been considered. Some of the other rivers would, it seems, have required regular clearance to avoid their becoming unusable. It is now extremely difficult to establish which of the rivers, if any, had retained their natural form and which were regularly, or occasionally, maintained. The distribution of the Domesday watermills seems to indicate that there would have been little interference between mills and river use.²⁰² The smaller rivers flowing off the Wolds were more suited to milling than transport and the rivers of Holland and other level areas were unusable for milling. Thus the only rivers which seem to have been obstructed by mills were the Upper Witham and Brant where the earliest complaint, which has been found, was made in 1328.

In much of the Fenland, boats were the main, or only, form of transport. The eastern tributaries of the Great Ouse seem to have been used almost to their sources. The historic form and use of the Cam upstream of the Silver Street bridge, and of the Rhee, Granta and Bourne remain to be established. The remains of wharfs contrast with the lack of records of historic use.²⁰³ Use of the Great Ouse by barges seems to have been obstructed by division of the channel below Bedford and use upstream of Bedford, if any, would have only been by small boats and so poorly recorded. It is difficult to know how much weight to put on the fact that a man drowned having fallen from a boat near Eaton on the Ouzel in 1271.²⁰⁴ It is clear that the river was then much more usable than it is now because the marsh has been drained. It seems likely that the upper sections of the Great Ouse, Ivel and Tove were also much more usable, and so more likely to have been used, than they are now. The extent to which the mills obstructed the rivers has been overestimated by some authors because they have failed to note that most mills were on small, steep tributaries. It seems that some traffic continued on the Ouse with loads being carried over or round the weirs²⁰⁵ but that on the middle and upper Nene the weirs were so frequent that latterly the upper section of the river became effectively unusable. It seems that after the dissolution of the monasteries even the lower Nene became impassable at times.

²⁰² Simon Pawley, 'Domesday Watermills in Lincolnshire.' In Stewart Bennett and Nicholas Bennett, Eds. *An Historical Atlas of Lincolnshire*. Hull: University of Hull Press. 1993, 44-45.

²⁰³ See Section 4.2.4.

²⁰⁴ *Calendar of the Roll of the Justices of Eyre, 1247*. Editor G. Herbert Fowler. Bedfordshire Historical Record Society, Vol. XXI. Published by the Society. 1939, 163.

²⁰⁵ Dispute relating to tolls on corn sold at St Neots. 1672. *Special Commissions and Depositions, P.R.O.* Cited in C.F. Tebbutt, *St. Neots*. Chichester: Phillimore. 1978, 84-86.

In the East Anglian region there seems to have been use of the rivers flowing to the north coast of Norfolk. No report of the form of these rivers in the medieval period has been found but if they were used then they must have been broader and deeper than they are now. There is evidence of the intensive use by barges of the rivers of what is now the Broads, transporting peat. The limits of historic use of the Yare, Wensum and Tud are unknown but are they known to be upstream of the limits of historic evidence. It seems that the Waveney was used to its source and that it formed a continuous waterway with the Little Ouse. There are records which show that some rivers were kept clear by the passage of boats and that others were regularly maintained.²⁰⁶ Similarly it seems that the rivers of Suffolk and Essex were regularly used. As in Lincolnshire the rivers of Norfolk most used by boats were not suitable for mills. However it does seem that the rivers of Suffolk and Essex may have become less usable as mills migrated downstream in the 14th and 15th centuries.

Of the Thames tributaries the Lea was a Great River, an important supply route to London.²⁰⁷ It seems that the tributaries as far upstream as the Brent were in fact used whenever they were usable. The extent to which they were blocked by rubbish is not known. There is evidence that most of the other tributaries were used and Blair has suggested that the Cherwell and Ray provided an important link between the Thames and Great Ouse.²⁰⁸ Large quantities of Reigate stone were used in the building of London. All the authors whose works have been studied state that the stone was taken to Battersea by land. There is no indication that any have considered that the stone might have been transported on the Mole. There seems to be no more information about carts or cartage than there is about rafts or barges. While the number of records for the tributaries of the Middle Thames are relatively few their quality is unusually high and mostly late in date.

In 1632 Taylor wrote of the Thame:

Poore *Tame* all heavie and disconsolate,
 Unnavigable, scorn'd, despis'd, disgrac'd,
 Having in vaine so many paces pac'd;

²⁰⁶ Eg the Ant. See Appendix A.

²⁰⁷ (1430) 9 Henry VI c 9.

²⁰⁸ John Blair, 'Transport on the Upper Thames.' In Blair, 2007, 268-270.

Despairing and quit desperate with these harmes,
 He hurles himselfe unwares in *Isis* armes;
 Nor closer can the barke be to the tree,
 Than their infolding and embracings be.²⁰⁹

The limit of recent usability of the Thame was at Aylesbury 31 miles upstream of the confluence. It seems that in 1632 the Thame must have been unusable due to the number of mills on the river. But such strong criticism of this, and only this tributary, does seem to imply that most of the other tributaries were usable and used.

For this thesis the rivers of the South East region have been more intensively studied than those of other regions and the limit of recent usability is upstream of the recorded limit of historic use only on the Medway, Western Rother and Salisbury Avon. Early maps show that the form of the Medway at Tonbridge and of the Test and Salisbury Avon were multi-channel but it has not been possible to assess how much this would have affected the use of the rivers. The Western Rother was modified for use by barges in the 18th century and is now deeply entrenched. The form of its channel in the period 1189-1600 is unknown. The use of the Eastern Rother was important for the market at Etchingam.²¹⁰ This might be taken as implying that the Kentish Stour, a wider and deeper river, would have been used to Ashford, another market town, but no records of use have been found. The quantity of use of a river depended on the demand which in turn depended on the location of the markets.

It is unfortunate that the building accounts of Salisbury Cathedral are not available for they might have shown if the building stone was transported from Tisbury by land or water. It is perhaps strange that some authors claim that rivers could only be used downstream and that they then claim that the limits of historic use were located at towns. Others might think that the towns would have been supplied with food and fuel from upstream farms and villages.

²⁰⁹ John Taylor, *Taylor on Thame Isis*. John Haviland. 1632. In *Works of John Taylor, The Water Poet. The First Collection*. The Spenser Society. Vol. 7. New York: Burt Franklin. 1967, 12.

²¹⁰ Calendar of Patent Rolls, 1348-50, 80, 177-78.

In the South West region there are few records of historic use for rivers in Dorset, Devon or Cornwall and these are mostly of Category B evidence. The form of the Dorset Stour, Axe, Exe and Dart are such that only small boats could have used them. It seems that the supply of transport in inland Devon and Cornwall was less than in other regions as the roads were also, apparently, difficult to use. Transport by sea was however plentiful. The rivers of the Somerset Levels were regularly used.

In the Severn region it seems that most, if not all, of the rivers were regularly used. The construction of the slipway and wharf at Skinfrith indicate that where required the rivers could be used on the sections which were of pool and riffle form as well as on the sections which were deep enough for boats to float along their full length.²¹¹ One of the questions which has apparently not yet been considered is why boats on the Severn normally could pass the weirs easily but on the Wye they were considered to be an obstruction.

The North West region was less affluent and had smaller home and overseas markets than other regions and lacks the manorial and monastic archives which are available for some other regions.²¹² In addition part of the area was regularly fought over. These are some of the reasons why the existing historic records of use of the Dee, Ribble and Eden are fewer than for comparable rivers in other regions. There were certainly boats on these and many of the smaller rivers but the extent to which goods were transported down the rivers is little known. Apart from the King's mill at Chester no evidence has been found of the rivers being obstructed by mills.

4.4.3 Observer Bias

In Appendix A for many rivers there is only one record of historic use. One reason for this is that at the midway point of this research a list was made of the rivers which would have been expected to have been used but for which no record was then held. Particular

²¹¹ Phil Evans and Kevin Trott, 'Excavations at Skenfrith Castle, 2003.' Report of a CADW sponsored excavation. Paper unpublished at July 2008.

²¹² N.J. Higham, *A Frontier Landscape*. Macclesfield: Windgather Press Ltd. 2004, 12.

David Hey, Ed. *The Oxford Companion to Local and Family History*. Oxford: Oxford University Press. 1996, 1.

attention was then paid to these rivers. When one record was found attention was redirected elsewhere.

No evidence of historic use was found for five rivers which are included in the *BCU Guide*. These are in the Trent Region: Derbyshire Wye, Churnet and Mease and in the South East Region: Eden and Teise. These two groups of rivers are near the homes of the two editors of the *Guide* and it is possible that they used a different standard of usability for local and distant rivers.

The ratio of the length of rivers for which historic records of use have been found by Edwards and for this present thesis, in excess of the lengths of the four main rivers, are shown in the following table:

Table 15 Observer Bias

	<u>Edwards</u>	<u>This thesis</u>	<u>Percentage</u>
		<u>Category A</u>	<u>Increase</u>
North East.	31	96	209
Yorkshire.	172	261	51
Trent.	103	182	77
Lincolnshire.	93	123	32
Fens.	231	368	59
East Anglia.	30	138	360
Thames.	168	336	100
South East.	80	169	111
South West.	57	73	28
Severn.	184	321	74
North West.	52	74	40
Total.	1201	2141	78

There are various possible reasons for the significant difference between the additional records found. Firstly, they come from different sources. Edwards' records are almost

all from State Records which may have been biased due to the peripatetic nature of the Court of King's Bench. The additional records are taken from a much wider range of sources. There may be similar reasons for bias in the additional records. Although the records are taken from different periods no obvious bias has been noted due to this. But it would be wrong not to note that Edwards lives in the North West and the present author has lived in East Anglia and the South East and his wife comes from the North East. The full records of the Sussex and Kent Archaeological Societies are available in the Sussex University library and the detailed information about the rivers near the Pevensy marshes in Appendix A does seem to indicate a certain geographical bias. This bias is not due to additional erroneous entries for the South East but the failure to identify records from other areas.

4.4.4 Conclusion

The Eastern Rother upstream of Etchingham is an overgrown, deeply incised river which if it was cleared would be usable for much of the year. Downstream is a clear, usable channel. It seems that responsibility for maintaining the channel changes at Etchingham.²¹³ The only reason why it is now known that the river was used as far upstream as Etchingham in the 14th century is that passage was blocked downstream and a complaint about the blockage was made to the king. There is no obvious reason why use of the river should have stopped at Etchingham. From inspection it would seem as likely that goods were taken downstream to the market as upstream. However it seems that the upstream section of the river was never obstructed so there is no evidence of use. Many other examples could be given of rivers for which the present limit of historic evidence does not coincide with the apparent physical limit of usability.

In 1989 Edwards found written evidence of historic use of 1201 miles on 68 rivers for the period 1200-1400. In this study evidence of historic use has been found for 2140 miles at Category A evidence and of 3029 miles at Category B evidence on 186 rivers for the period 1189-1600. It has been said that dwarfs see further than giants if they stand on the giant's shoulders. There is no doubt that there is more evidence to be found.

²¹³ Personal observation by the author.

Chapter 4.5 Particular Rivers

4.5.1 Introduction

In this chapter five sections of rivers have been chosen for special study. The first is a section which has frequently been discussed, the middle section of the Thames. The second is a minor river which, it seems, has not previously been studied, the Kentish Stour. The other three rivers are chosen because there have recently been disputes concerning the right of the public to use them.

4.5.2 Disuse of the Middle Thames [See also Appendix Q. Map 2.]

In this section consideration is given to a section of the Thames which has often been discussed in various journals due to the possible lack of use in and after the late medieval period. A summary of previous authors' conclusions is given in Table 16.

Table 16 The disuse of the Thames downstream of Oxford

Author	Limit places	Dates of disuse	Reason
Rogers. ²¹⁴	Henley – Oxford Burcot – Oxford	14 th C. – 1541 1541- 1600	No reference to cost of use found
Thacker. ²¹⁵	All river used at all dates		
Davis. ²¹⁶	Henley – Oxford	14 th C. – 1600	Too many weirs
Prior. ²¹⁷	Henley – Oxford Burcot – Oxford Culham – Oxford	Mid 14 th C. – 1600 1556 – 1600 1562 – 1600	Too many weirs and deterioration of winches at flashlocks
Edwards. ²¹⁸	All river used	Only studied to 1400	
Langdon. ²¹⁹	Seasonal use only	Only studied 1294 – 1348	No records of use
Peberdy. ²²⁰	Henley – Oxford Culham – Oxford	1458 – 1560 1458 – 1600	Lack of demand Increased size of boats

Peberdy in the most recent text posed the question ‘When did the navigation to Oxford cease and why?’ It seems not unreasonable to ask first ‘Did navigation to Oxford cease?’

There is ample evidence that weirs were built and altered which made the use of the river more difficult. There are records of some loads from Oxford to London which were taken to Henley by road and then transferred to boats. However there are certain strange omissions in the evidence. If the river was physically unusable for 150 years it is

²¹⁴ J.E.T. Rogers, *A History of Agriculture and Prices in England. Volume 5.* Oxford: Clarendon Press. 1887, 758.

²¹⁵ Fred S. Thacker, *The Thames Highway. Volume I: General History.* (1st Edition 1914.) Newton Abbot: David & Charles. 1968, 268-273.

²¹⁶ R..H.C. Davis, ‘The Ford, the River and the City.’ *Oxoniensis.* Vol. 38. (1973), 258-267.

²¹⁷ Mary Prior, *Fisher Row.* Oxford: Clarendon Press. 1982, 107-111.

Mary Prior, ‘The Accounts of Thomas West of Wallingford, a Sixteenth-Century Trader on the Thames.’ *Oxoniensis.* Vol. 46. (1981), 73-93.

²¹⁸ J.F. Edwards, ‘The Transport System of Medieval England and Wales.’ Unpub. PhD thesis, Univ. of Salford, 1987.

²¹⁹ John Langdon, ‘Inland water transport in medieval England.’ *Journal of Historical Geography,* Vol. 19, 1. (1993), 1-11.

²²⁰ R.B. Peberdy, ‘Navigation on the River Thames between London and Oxford in the Late Middle ages: A Reconsideration.’ *Oxoniensis.* Vol. 61. (1996), 311-325.

remarkable that no one stated that it was not usable, as opposed to difficult to use. No statement has been found as to the place, or places, at which it was not usable. Nor has any explanation been found as to how some sections of the river became usable again in the middle of the 16th century. Bishop in his 1585 list of the locks on the Thames did not distinguish between those above Burcot and those below. He gave no indication that one or more were impassable. Many of the authors who wrote about the use of the Thames refer to flashlocks yet no mention has been found of flashlocks before 1661.²²¹ Camden, Harrison and John Taylor all gave descriptions of the river but none mentioned the unusual practice of opening flashlocks in series to enable boats to ride down the river on the ensuing wave nor of the opening of one flashlock to enable a boat to pass a shoal.

Not all obstructions on the Thames were physical. In 1301 the Mayor and Citizens of London wrote to the Countess of Gloucester, daughter of the King, politely complaining that her bailiffs at Marlowe were detaining merchandise on the Thames which they said was causing distress to the people of London.²²²

It is questionable if the Thames was ever usable year round by barges. In c.1050 the river was diverted at Abingdon to make it more usable in summer.²²³ In 1348 it was claimed that only in times of abundance of water could ships pass to London.²²⁴ In 1632 Taylor reported that there were five barges aground downstream of Staines.²²⁵ In 1641 Taylor had to drag his 'small Scullers boate' over shoals between Marlow and Goring.²²⁶ If a river was difficult for a 'small Scullers boate' it would have been impassable at that time for a barge. It is difficult to establish to what extent the river was made less usable by the shoals which had formed above and below the weirs.

²²¹ Anthony Wood, "*Survey of the Antiquities of the City of Oxford*," composed in 1661-6. Ed. Andrew Clarke. Oxford: Clarendon Press. 1889, 431.

²²² Catherine Moriarty, Ed. *The Voice of the Middle Ages*. Oxford: Lennard Publishing. 1989, 102.

²²³ *Chronicon Monasterii de Abingdon*, Rolls Series 2., I, 480-1. Cited in R.H.C. Davis, 'The Ford, The River and The City.' *Oxoniensis*. Vol. 38. (1973), 263.

²²⁴ Parliamentary Records Of Medieval England, Edward III, 1348, para. 34, ii – 169.

²²⁵ John Taylor, 'Taylor on *Thame Isis*.' London, Printed by John Haviland. 1632, 25. Reprinted as *Works of John Taylor the Water Poet. First Collection*. The Spenser Society Vol. 7. New York: Burt Franklin. 1967.

²²⁶ John Taylor, *John Taylor's last Voyage*. London: John Taylor. 1641. Contained in *Works of John Taylor. Second Collection*. The Spenser Society 14. 1873. New York: Burt Franklin. 1967, 11.

In 1535 weirs were pulled up in Oxfordshire and Buckinghamshire to make the river more usable.²²⁷ The great timbers which needed to be removed could only be lifted by men working from a barge. If the barges could get to the weirs to remove timber it would appear that boats could have carried goods on those sections of the river. The above authors have not noted that there is a report that in 1555 lead was carried from Abingdon to Windsor²²⁸ and it is claimed that a pleasure boat went in the same year from Abingdon to Oxford.²²⁹

There may be a problem with the historical methodology of some of the authors. They looked for evidence of use and where they failed to find it they assumed that the river was unusable. A classic case of absence of evidence being taken as evidence of absence. It is suggested here that the river was never totally blocked but that use was seasonal, depending on the size of boat, and that movement was so hindered by weirs that at times the use of some sections of the river was uneconomic. This conclusion is supported by an apparently previously unnoticed grant of a parcel of meadow in ‘Clopcote by Walyngford’ in 1314 for the construction of a watermill with the condition that ‘ships passing there by the water of Thames be not hindered more than usual.’²³⁰

It seems likely that the Thames was not blocked in the section Burcot to Oxford but rather that for most people the use of the river was not economic at times. The distance from Burcot to Oxford is 7½ miles by land and 14 miles by water. Between Burcot and Oxford there were six weirs which would have caused delays. The return journey of 15 miles was less than a day’s journey for a horse and so would have been economic for horse drawn carts but possibly not for an ox-drawn cart. The introduction of horses in the 12th and 13th centuries may have made the maintenance of winches, which were required by barges, uneconomic, although the river may have continued to have been used by smaller boats which might have been portaged at the weirs. There is possibly a certain irony that John Langdon’s classic work on horse transport may provide a better

²²⁷ Letters and Papers, Foreign and Domestic, of the Reign of Henry VIII. Volume 9, 170.

²²⁸ David Gordon Wilson, *The Thames: Record of a Working Waterway*. London: B.T. Batsford. 1987, 30.

²²⁹ Alan Wykes, *An Eye on the Thames*. London: Jarrolds Publishers (London) Ltd. 1966, 114-118.

²³⁰ Calendar of Fine Rolls, 1307-19, 214.

explanation for the reduction in the use of the river between Burcot and Oxford than his work on the rivers.²³¹

It is suggested that it was the demand for coal which caused the improvement of the river by the construction of locks in the early 17th century. The economics of regularly moving large quantities of heavy, bulky goods may have justified the capital cost of the improvements.

There is further interest for this thesis in the methodology of some historians. It is reported that in 1448 stone from Taynton was carried by road to Culham from where it was taken by barge to Eton. After the river had been inspected from another barge later consignments were taken by land to Henley and there transferred to barges.²³² This information is said to come from 'John Keys' accounts.' However in the *The History of the King's Works* there is no record as to which, if any, appointment John Keys held. Some historians have been taken this report to be evidence that the river was unusable at this time. But there would not have been usable barges on the river at Culham and Abingdon about fifty years after the river became unusable. It is possible that the stone was to be moved at a season when the water was low or a special rate may have been available because of lack of business in the haulage industry. It seems that it is not necessary to assume that the river was unusable from Culham to Henley in 1448.

If Records of Historic Use are insufficient to establish where and when the Thames downstream of Oxford was usable then it seems that on other rivers lack of evidence of use is insufficient to establish that a river could not physically be used. This can only be established by direct evidence as is available for the Great Ouse and Exe.

²³¹ John Langdon, 'A Revolution in Vehicle Transport in Twelfth and Thirteenth-Century England?' *Past and Present*. Number 103. 1984, 62.

²³² R.A. Brown and H.M. Colvin, 'The King's Works 1272-1485.' In R. Allen Brown *et al.*, Eds. *The History of the King's Works. Volume I. The Middle Ages*. London: Her Majesty's Stationery Office. 1963, 282.

4.5.3 The Kentish Stour [See also Appendix Q. Map 3.]

In this thesis there is space only for a detailed study of one minor river. The Kentish Stour has been chosen because it was the first river, other than the four great rivers, for which a Navigation Act was passed.

The river rises near Lenham and flows south east, past Great Chart, to Ashford (14 km) where it is joined by the East Stour. It then flows north east past Wye (19 km) and Chartham (29 km) through Canterbury (38 km) to Fordwich (41 km), the tidal limit. Downstream of Ashford there is a flood-plain which continues to Fordwich apart from a short section through Canterbury.

The mean flow at Wye is $2.2 \text{ m}^3 \text{ s}^{-1}$ and at Canterbury about $3.5 \text{ m}^3 \text{ s}^{-1}$. The river is a chalk stream and is wider and shallower than most rivers with similar flow. The gradient of the river is unusual in that upstream of Ashford it is 2 m km^{-1} , downstream of Ashford it reduces to 0.7 m km^{-1} but after flowing through the gap in the North Downs it increases again to 2 m km^{-1} at the 10 m contour. The river divides immediately upstream of Canterbury. At present it is usable from Ashford.

It is likely that in Roman times the only river channel at Canterbury was to the north of the city.²³³ In 1100 the main channel of the river was through the centre of the city where there were Anglo-Saxon mills. In the 13th century the main flow was diverted back to the northern channel with reduced flow in the southern channel.²³⁴ Since then it seems that the river's course in the city has not changed except for the alteration to a few minor channels connecting the branches of the river.

There may have been changes in the hydrological regime in the area during the historic period as it is recorded that in 1272 'a great fount of water' suddenly sprang up in Canterbury which damaged a considerable number of houses.²³⁵ It would seem that much of the flood-plain from Ashford to Fordwich was at one time a marsh. The earlier

²³³ Frank Jenkins, 'Archaeological Notebook, Canterbury 1949-51.' *Archaeologia Cantiana*, Vol. 64. (1951), 63-73, 68.

²³⁴ *Liber Camera Civitatis*. Cited in William Somner, *The Antiquities of Canterbury*. 2nd Edition enlarged by Nicolas Battely. (1st Edition 1640.) London. 1703, 21. (Republished 1977.)

²³⁵ *Annales monastici. Volume 4. Osney, 1016-1347. Rerum britannicarum medii aevi scriptores*. Editor Henry Richards Luard. Public Record Office 36. 1869, 248.

name of Canterbury, *Durovernum*, seems to be derived from alder fort or a walled town by the alder-swamp.²³⁶ This swamp has now largely been drained. In Canterbury the ground level is now 6 to 9 feet above, and the river bed 3 ft above, the levels in Roman times.²³⁷

There was a Roman port at Fordwich²³⁸ and there is plentiful evidence of the use of the tidal river downstream throughout the period 1189-1600. There were four main reasons for this choice: it is the tidal limit; it seems that the river has always become narrower and shallower just above this place;²³⁹ there is solid ground on which buildings can be erected²⁴⁰ and there is plentiful fresh water.²⁴¹

In August 1264 the Minor Friars of Canterbury received a licence to build a bridge “over the water of Stour between the site of their house and their place called Brokmede,” but only on condition that “little ships (*navicule*) may pass under without impediment.”²⁴² In 1309 another licence was granted and this bridge also had to be of sufficient height to allow ‘a clear passage for boats underneath’.²⁴³ It would appear that this bridge replaced the 1264 bridge. Brokmede was an island upstream of King’s Bridge at a place where the river was divided into at least three channels.

It is recorded that in 1424 stone for the cathedral was transported by land from Fordwich to Canterbury.²⁴⁴ As shown above in Section 4.1.7 this may have been cheaper than loading the stone into small vessels and then reloading into carts for transport from the river to the cathedral.

²³⁶ Vistor Watts, Ed. *English Place-Names*. Cambridge: Cambridge University Press. 2004, 114.

²³⁷ See Appendix M.

²³⁸ F. Jenkins, ‘Recent Excavation in the Canterbury District. Sturry.’ *Archaeologia Cantiana* Vol. 62 (1949), 145-146.

²³⁹ E. Hasted, *Kent*. Canterbury: W. Bristow. 1800, 63.

²⁴⁰ D.S. Stafford, ‘A Possible Ancient Route in the Parish of Fordwich.’ In K.H., McIntosh. *Fordwich the Lost Port*. Canterbury: The author. 1975, 132.

²⁴¹ R.W. Paine, ‘How Fordwich Grew.’ In K.H., McIntosh. *Fordwich the Lost Port*. Canterbury: The author. 1975, 116.

²⁴² Calendar of Patent Rolls, 1258-66, 342.

²⁴³ Calendar of Patent Rolls, 1307-13, 178.

TNA, Inquisitions *Ad Quod Damnum* file **73, No 8**. Cited in *VHC Kent Vol. II*, 191

²⁴⁴ T.W.T. Tatton-Brown, ‘Building Stone in Canterbury c 1070-1525.’ In David Parsons, *Stone. Quarrying and Building in England. AD 43-1525*. Chichester: Phillimore in association with The Royal Archaeological Institute. 1990, 78.

It was reported that in c.1462 money was left for buying 300 foot of *Asheler* or *Folkstone* Stone to make a wharf near the King's Mill²⁴⁵ on what is now the High Street. In 1515 an Act was passed for making the River Stour navigable to Great Chart because the city was of late 'in great ruin and decay'.²⁴⁶ But it is reported that no action was taken to carry out the work at that time.²⁴⁷ In 1588 a 'large sum of money was laid out in scouring the River Stour.'²⁴⁸ In 1592 the Privy Council ordered the Kentish justices of the peace to put in present execution the Act of 1515.²⁴⁹ In 1594 there was a report of locks in the river at Sturry and Barton and of lighters going between Canterbury and Fordwich.²⁵⁰ In the same year the Chancery Court held that the river had been made navigable from Fordwich to Canterbury but was ruined by "great and sudden floods, that happened by extraordinary downfalls of rain."²⁵¹ In 1596 the Corporation spent nearly £1,400 on the river.²⁵²

A map dated 1573 by Braun & Hogenbury shows a waterlock, near St Mildred's Church on the east side of the river.²⁵³ This was a channel cut at right angles to the main river and appears to have been a haven for boats. A map of 1595 by Thomas Langdon shows another "Water Locke" to the south of the Black Friars' site, south of St Peter's Way.²⁵⁴

Jervoise wrote in the report of his survey of the bridges of England and Wales for the Society for the Protection of Ancient Buildings in 1930 that 'In the [Canterbury] museum is an interesting collection of engravings and etchings which show views of the city during the eighteenth century. Westgate and Blackfriars Bridges are depicted with pointed arches, as is also one shown alongside a large mill. This last one is difficult to

²⁴⁵ William Somner, *The Antiquities of Canterbury*. 2nd Edition enlarged by Nicolas Battely. (1st Edition 1640.) London. 1703, 24. (Republished 1977.)

²⁴⁶ 6 Henry VIII c 17

²⁴⁷ William Somner, *The Antiquities of Canterbury*. 2nd Edition enlarged by Nicolas Battely. (1st Edition 1640.) London. 1703, 22. (Republished 1977.)

²⁴⁸ Cyprian Rondeau Bunce, Minutes of the City of Canterbury. 1800-1804. Republished in *Ancient Canterbury*. Canterbury: Kentish Gazette and Canterbury Press. 1924, 8.

²⁴⁹ Acts of the Privy Council 1591-92. 535.

²⁵⁰ Cyprian Rondeau Bunce, Minutes of the City of Canterbury. 1800-1804. Republished in *Ancient Canterbury*. Canterbury: Kentish Gazette and Canterbury Press. 1924, 8.

²⁵¹ *Ibid.* 34.

²⁵² *Ibid.* 8.

²⁵³ Photocopy. Canterbury City Library.

²⁵⁴ Photocopy. Canterbury City Library.

identify.²⁵⁵ The bridges may have been pointed to allow boats to pass under as well as being cheaper to construct.

Six miles upstream of Canterbury an anchor was found at Chilham²⁵⁶ and Hoskins reported that 16th century records show that boats reached as high up the river as Wye, at least on occasions.²⁵⁷ Unfortunately he did not record his source. However as he was a visitor to Wye College in the 1950s it seems likely that he would have studied the college records at that time.²⁵⁸

Thus it is known that in 1264 and 1309 the Grey Friars were required to build their bridge in such a way that small boats could pass under them. This seems not to be a standard clause inserted by a clerk. There are very few other places where such a condition was imposed. It seems unlikely that these boats would only have been used for trading with Fordwich. By the time they had reached the bridge they would have passed the city market and the properties of Christ Church and the Black Friars. They would also have had to pass either Criene Mill or Hottemelne and also the King's Mill and Abbot's Mill. It seems much more likely that they would have been trading upstream with only the St Mildred Mill to pass.

If it is accepted that there was little use of the river from Canterbury to Fordwich because the section was too short to justify double handling then it seems likely that the same would apply to transport for short sections upstream. Chilham and Fordwich are about the same distance from Canterbury so it seems likely that the boats were going from Canterbury to Wye, Ashford and/or Great Chart.

No previous author seems to have considered why the Act of 1515 stated that the river was to be cleared to Great Chart. It seems likely that Great Chart would have been close to the physical upper limit of use of the unmodified river if the obstructions had been cleared. The Preface of the Act states that once the city of Canterbury was of great fame but the inhabitants had become impoverished. The proposal was that prosperity could be

²⁵⁵ E Jervoise, *The Ancient Bridges of the south of England*. Westminster: The Architectural Press. 1930, 42.

²⁵⁶ D. Gardiner, *Canterbury*. London: The Sheldon Press. 1923, 9.

²⁵⁷ W.G. Hoskins, *Fieldwork in Local History*. London: Faber and Faber Limited. 1967, 60

Also Raymond Selkirk, *On the Trail of the legions*. Ipswich: Anglia Publishing. 1995, 56

²⁵⁸ I am grateful to Mr D. Sykes for this information.

restored if action was taken to ‘deep, inlarge, cleanse, inhanse and scowr’ the river from Great Chart to Fordwich so that it could be used by Lighters and Boats. This seems to imply that restoration of prosperity depended on restoration of the ancient use of the river rather than a new initiative. If this is the correct interpretation then the Kentish Stour had at some previous date within historic memory been used upstream to Great Chart.

Support for this interpretation comes from the records which show that in 1311-12 oats were supplied to Canterbury Cathedral Priory from three home demesnes which lay within 10 miles of the priory and also from Great Chart, Little Chart, Hollingbourne and Appledore.²⁵⁹ Oats were a bulky, low value grain which were not normally transported over long distances. This transfer may have been economically viable because river transport was available from Great Chart and Ashford.

4.5.4 River Wear [See also Appendix Q. Map 4.]

The final three rivers are chosen because the right of access to them is disputed today.

The following information is known about the Wear:-

1. 1170s. It is reported that marble may have been taken up the river to Durham.²⁶⁰
2. 12th, 13th centuries. It is reported that marble may have been rafted downstream from Frosterley to Durham.²⁶¹
3. 1243-1250. The Durham Eyre Rolls record that a man died from a boat falling on him at Durham and two men died falling from boats into the river downstream of Durham.²⁶²
4. 14th century. The Durham Abbey Accounts show that a boat was used for carrying stone at Durham.²⁶³

²⁵⁹ Bruce M.S. Campbell *et al.*, *A Medieval Capital and its Grain Supply*. Historical Geography Research Series Number 30. 1993, 152.

²⁶⁰ Alec Clifton-Taylor, *The Pattern of English Building*. London: Faber and Faber Limited. 1972, 180, 187.

²⁶¹ Raymond Selkirk, *Chester-Le Street & its place in history*. Durham: Casdec Printcentre. 2001, 243.

²⁶² ‘Two Thirteenth-Century Durham Assize Rolls: Durham Eyre Roll, 27 Henry III.’ Editor K.E. Bayley. In *Miscellanea Volume II*. Surtees Society. 1916, 24, 62.

²⁶³ *Extracts from the Account Rolls of the Abbey of Durham*. Vols. 1,2,3. The Surtees Society, Vols. 99, 100, 103. 1898, 1899, 1900. pages 533, 536, 546, 552, 554, 560, 564, 583, 612.

5. 1361. Finchale Priory, downstream of Durham, bought a boat.²⁶⁴
6. 1440. The Muniments of the dean and chapter of Durham²⁶⁵ indicate that a boat was used 2 miles upstream of Durham for carrying soil.²⁶⁶
7. 1532, 1533. The Monastery of Durham Account Books indicate that food was carried at least twice in boats upstream to Durham.²⁶⁷
8. 1716. An Act stated that the river had lately become obstructed and the commissioners were given power to clear the river upstream to Durham.²⁶⁸
9. Nationally there are records of less than about 0.05% to 0.00001% of the river journeys. Records for Durham may be fewer due to the Palatinate records not being included in the Court Rolls.
10. There may have been changes in the form of the river due to sediment being washed downstream from mines as on the Tyne.
11. There were weirs on the river near Durham. It is not known if these were full-weirs or part-weirs.

It seems that there is adequate evidence to show that there was use of the river at times downstream of Durham during part of the period 1189-1600. The periods of use, and disuse, if any, can not be determined. Of the river upstream of Durham on the balance of probabilities it seems that there was some use of the river downstream of Frosterley.

4.5.5 River Teme [See also Appendix Q. Map 5.]

Green has summarised most the information available about the Teme and he also states that ‘Navigation on the River Teme is shrouded in mystery.’ He records that 25 miles upstream of Ludlow there is a pub called *The Wharf* at Felindre, which in Welsh means ‘Three Mills’. Lead may have been shipped down the river and corn brought back up. In the 14th century stone was brought from Caen for the mill at Ashford Carbonel, three

²⁶⁴ James E. Thorold Rogers, *A History of Agriculture and Prices in England. Volume II. 1259-1400*. Oxford: Clarendon Press. 1866, 567.

²⁶⁵ Muniments of the dean and chapter of Durham. Miscellaneous Charter 5828/9.

²⁶⁶ R.A. Skelton and P.A. Harvey, *Local Maps and Plans from Medieval England*. Oxford: Clarendon Press. 1986, 207.

²⁶⁷ *The Durham Household Book: or, the Accounts of the Bursar of the Monastery of Durham, from Pentecost 1530 – Pentecost 1534*. Editor J. Raine. Surtees Society, Vol. 18, 1844, 63.

Miranda Threlfall-Homes, *Monks and Markets, Durham Cathedral Priory 1460 – 1520*. Oxford: Oxford University Press. 2005, 184.

²⁶⁸ 1716. 3 George I c. 3.

miles downstream of Ludlow, using water transport all the way. In the 15th century there were problems with Ludlow's trade because there was not a viable connection to the navigable Severn.²⁶⁹

At the Worcester Eyre in 1275 it was recorded that 'Richard le Hoppere fell out of a boat into the Teme and drowned' and that 'William Fisher of Ankerdine Hill was trying to cross the Teme in a boat; he fell in and drowned.'²⁷⁰ Richard and Nina Muir recorded that in the 17th century there was a wharf at Bringewood Forge which is three miles upstream of Ludlow.²⁷¹ It is at least possible that that this wharf was in use at the end of the 16th century. A late 18th century lithograph shows a trow on the river.²⁷² There are two places on tributaries with the name Eaton which may indicate that they were responsible for keeping the river in a usable state.²⁷³

There were boats on the river but the upper limit of use is not at present known. Although the belief that the river was navigable has been challenged, those who made the challenge would not have known that a stone wharf and slipway were constructed on the Monnow at Skinfrith. There is some doubt as to whether evidence of use of one river implies a probability of use of another similar river. There can be no doubt that the technical ability to use one river is evidence that there would have been the technical ability to use a similar river. Thus it is considered here that there was use of the river but that the intensity and extent are unknown.

4.5.6 Salisbury Avon [See also Appendix Q. Map 6.]

Salisbury cathedral was built c.1200. In the cathedral there are 15,000 tons of marble which was transported from Purbeck. It was shown in Chapter 4.2 that this movement was probably on rafts or barges. It seems likely that the 400 tons of lead and the oak timbers from Ireland for the roof of the cathedral were also brought to Salisbury by

²⁶⁹ All Colin Green, *Severn Trader*. Lydney: Black Dwarf Publications. 1999, 33.

²⁷⁰ *The Worcester Eyre of 1275*. Editor Jens Röhrkasten. Worcestershire Historical Society. New Series Vol. 22. 2008, 434, 540.

²⁷¹ Richard and Nina Muir, *Rivers of Britain*. London: Guild Publishing. 1986, 127-128.

²⁷² Samuel Ireland, *Picturesque Views on the Severn*. Reproduced in Colin Green, *Severn Trader*. Lydney: Black Dwarf Publications. 1999, 34.

²⁷³ Ann Cole, 'The Place-Name Evidence for Water Transport in Early Medieval England.' In John Blair, *Waterways and Canal-Building in Medieval England*. Oxford: Oxford University Press. 2007, 81.

river.²⁷⁴ It is much harder to establish whether the 60,000 tons of stone which were quarried or mined at Tisbury were transported down the Nadder valley by cart or raft.

Crane Street in Salisbury was named after an inn but it seems likely that the inn was named after a crane on a wharf beside the River Avon.²⁷⁵ In 1339 it appears from the Sheriff's Accounts that grain was taken by river from Fordingbridge to Christchurch and then by the sea to Southampton.²⁷⁶

In 1372 the King ordered that a barge 'be made at Salisbury ... to resist the malice of his enemies of France'²⁷⁷ but in 1378 the people of Salisbury were given exemption from making another small barge as the earl of Salisbury had undertaken to 'provide the same in their stead'.²⁷⁸

In 1402 there was an inquisition to determine whose fault it was that the passage of ships and boats in the rivers of Wiltshire were hindered.²⁷⁹ Six years later the bailiffs of Gloucester were ordered to set free John Milbourne who had been imprisoned for obstructing the Avon with 'certain pales' in the bed of the river at New Sarum.²⁸⁰

After the passing of the Act of Sewers in 1535 a commission was appointed to remove all weirs and obstructions on the Avon.²⁸¹ As a result of this Sir Peter Philpot wrote to Cromwell confirming that the 'mills, weirs and fishgarths' would be plucked down as soon as possible and that by Whitsuntide the trees obstructing the river would be cut away and the 'shelpis scored'.²⁸² On the same topic John Husee wrote to Lord Lisle that the weirs would be removed.²⁸³

²⁷⁴ Bruce Purvis, *Salisbury*. Derby: Wiltshire County Council and Breedon Books. 2003, 30.

²⁷⁵ John Chandler, *Endless Street*. Salisbury: The Hobnob Press. 1983, 300.

²⁷⁶ TNA, E101/561/13. Transcribed in Sharon G. Uhler, 'English Customs Ports 1275-1343.' Unpub. B. Phil thesis Univ. of St Andrews. 1977, 274.

²⁷⁷ Calendar of Patent Rolls, 1370-74, 219.

²⁷⁸ Calendar of Patent Rolls, 1377-81, 108.

²⁷⁹ Calendar of Close Rolls, 1399-1402, 518.

²⁸⁰ Calendar of Patent Rolls, 1405-09, 332.

²⁸¹ Don Cross, *When Salisbury was a Seaport*. Salisbury. 2001, 3.

²⁸² Letters and Papers Foreign and Domestic of the Reign of Henry VIII. Volume 9, 286.

²⁸³ Muriel St. Clare Byrne, *The Lisle Letters. Volume 2*. Chicago and London: The University of Chicago Press. 1981, 628.

In 1590-1591 an order for the regulation of the River Avon made at the Salisbury Quarter Sessions stated that the free passage of boats had been obstructed and provides for the river to be kept open.²⁸⁴ A similar order of 1592 by the Commissioners of Sewers refers to the obstruction of the free passage of fish, swans and boats on the river between Harnham Bridge, Salisbury and Christchurch.²⁸⁵ In 1604 the Commissioners of Sewers stated that the ancient custom of this part of the river was that a passage was to be left free, fifteen feet wide, and twelve feet distant from either bank. This custom was confirmed by another commission in 1632.²⁸⁶

In 1623 John Taylor and his companions rowed a wherry upstream to Salisbury.²⁸⁷ And in 1632 the inventory of Joseph Warne of Bisterne, Ringwood included two boats.²⁸⁸

It seems that the river was usable downstream from Salisbury in the 13th and 14th centuries and the second half of the 16th century. There is insufficient evidence to establish if the river was unusable during the 15th and first half of the 16th centuries.

It is known that the Itchen was usable at least as far as Winchester in the middle of the 14th century. This would seem to imply that the Salisbury Avon, a very much bigger river, would also have been usable.

4.5.7. Conclusion

Some historians, since they had only seen evidence of the use of a few rivers, seem to have assumed that all other rivers were not used. Thus Threlfall-Holmes in her otherwise excellent book about Durham Cathedral Priory states on page 12 that ‘Durham was unable to take direct advantage of water transport, since the river Wear was not navigable

²⁸⁴ Hampshire Record Office. 24M82/PZ3.

²⁸⁵ Order of the Commissioners of Sewers for the Avon. Wiltshire and Swindon Record Office, PR/Salisbury St Martin/1899/223 - date 1592.

²⁸⁶ Henry Hatcher, *The History of Modern Wiltshire. Old and New Sarum, or Salisbury*. London: The Author. 1843, 460.

²⁸⁷ John Taylor, *All The Works of John Taylor the Water Poet. A Discovery by Sea from London to Salisbury*. London. 1630.

²⁸⁸ Hampshire Record Office 1632AD/87. Inventory of Joseph Warne of Bisterne, Ringwood, Hampshire, Yeoman.

from the sea.’ Yet on page 184 she quotes a transcription of the Durham Household Book for 1530-34²⁸⁹ which states that goods were brought up the river by boat.²⁹⁰

Table 13 shows that for almost a third of the length of rivers for which there is evidence of use the evidence is of Category B, ‘possible use’ rather than ‘probable use’. The upper limit of use is known to be unknown on the Thames, Kentish Stour, Wear and Teme. The Salisbury Avon is unusual in that no firm evidence of use has been found on the river upstream of Salisbury. At Scales Bridge, 25 miles upstream of Salisbury, it now has a flow of $1.48 \text{ m}^3 \text{ s}^{-1}$, gradient 1.2 m km^{-1} , a gravel bed and even though the width/depth ratio of is 27 it would be expected to be have been usable. At Salisbury it has a flow of $14.5 \text{ m}^3 \text{ s}^{-1}$ and gradient 0.82 m km^{-1} and a gravel bed which on most other rivers is adequate for use.

It is possible, or likely, that some sections of the rivers were usable, and used, at some dates but unusable at others. The assumption that there was no use of rivers for which there is, at present, no evidence of use, seems to be no longer tenable.

²⁸⁹ *The Durham Household Book: or, The Accounts of the Bursar of the Monastery of Durham, from Pentecost 1530 to Pentecost 1534.* Editor J. Raine. Surtees Society Volume 18. 1844, 63.

²⁹⁰ Miranda Threlfall-Homes, *Monks and Markets, Durham Cathedral Priory 1460 – 1520.* Oxford: Oxford University Press. 2005, 184.

Chapter 4.6 Physical Obstructions to Use

4.6.1 Bridges

While it is claimed in this thesis that there were no legal objections to the use of rivers there certainly were physical obstructions to their use during the period 1189-1600. Indeed it is records of these obstructions, and the disputes about them, which provide some of the evidence that the rivers were previously used. Since possibly more court records have survived, and have been printed, than any other type of document there may now be an over emphasis on obstructed rivers at the expense of other rivers which were used peacefully throughout the period.

In this chapter anthropogenic obstructions are considered: bridges, fords, weirs and water-mills. It is also convenient in this chapter to consider the estuaries. The use of estuaries, in general, is outside the scope of this thesis but their obstruction affected the use of the rivers reducing both imports and exports.

Blair wrote recently of the medieval period:

The investment that was now helping road transport to compete more strongly with waterways created another class of barriers across rivers. During the twelfth and thirteenth centuries, many fords and timber bridges were replaced by masonry arches and solid causeways. If the effects were occasionally beneficial to river traffic, by encouraging a faster and deeper flow through the arches, they much more frequently limited vessel size and encouraged the formation of silty, static pools.²⁹¹

This statement may be challenged. Speed showed several bridges with many ships on one side and few or none on the other as at Lancaster, Chester, York, Hull and Berwick on Tweed. At Newcastle he shows two large boats downstream of the bridge and ten smaller ones upstream.²⁹² Millerd showed a similar distribution of vessels at Bristol in

²⁹¹ John Blair, 'Introduction.' In Blair, 2007, 11.

²⁹² All - John Speed, *John Speed's England. Part IV.* (1st Edition 1611) London: Phoenix House Limited. 1954.

1673.²⁹³ These bridges were all at or about the tidal limit and had been built just beyond the furthest point that most seagoing ships with fixed masts would have reached. The first bridge was not always the upper limit of use for ships. Ships could pass through the drawbridge in London Bridge and at York the staith for St Mary's Abbey was upstream of the bridge.²⁹⁴

There are many records of bridges which were built so that boats could pass. Stow states that one arch of London Bridge 'was then readily to be drawn up, as well to give passage for ships to *Queenehith*, as for the resistance of any forraigne force.'²⁹⁵ Gibson amplified Camden's comment about the Torridge by adding to the text 'The river goes next to *Bediford*, mentioned by our Author for it's bridge. It is so high, that a ship of 50 or 60 tunn may sail under it.'²⁹⁶ Camden also records the drawbridge on the bridge over the Yare at Yarmouth.²⁹⁷ Salter reported that both South Bridge²⁹⁸ and the Magdalene Bridge at Oxford²⁹⁹ had sections which could be raised, possibly for defence and possibly to allow boats to pass through. At Snaith a bridge was built in 1442³⁰⁰ on the tidal section of the Aire with a draw-leaf 4 feet in breadth 'for the voiding thorough of the Mastes of the Shippes passage under.'³⁰¹ Jervoise records that a drawbridge was required when a bridge was to be built at Colchester in 1474 so that 'Sippes, boytez and oder Water-vessellez shall mowe passé there.'³⁰² Camden reported that at Boston there was a 'very high wooden-bridge' over the Witham³⁰³ presumably built to enable boats to pass under it.

²⁹³ Marc Boone & Peter Stabel, Eds. *Shaping Urban Identity in Late Medieval Europe*. Leuven-Apeldoorn: Garant. 2006, 219.

²⁹⁴ Baron F. Duckham, *The Yorkshire Ouse*. Newton Abbot: David & Charles. 1967, 30.

²⁹⁵ John Stow, Ed. Charles Lethbridge Kingsford, *A Survey of London*. (1st Edition 1603) Oxford: Clarendon Press. 1908, 25.

²⁹⁶ William Camden, *Camden's Britannia*. Trans. and Ed. Edmund Gibson. London: F. Collins. 1695, 41.

²⁹⁷ *Ibid.* page 388.

²⁹⁸ The Rev. H.E. Salter, *Records of Mediaeval Oxford Coroner's Inquests, the Walls of Oxford, Etc.* Oxford: The Oxford Chronicle Company, Ltd. 1912, 58, 61.

²⁹⁹ *Ibid.* page 50.

³⁰⁰ Wendy R. Childs, 'Moving around.' In Rosemary Horrox and W. Mark Ormrod, Eds. *A Social History of England. 1200-1500*. Cambridge: Cambridge University Press. 2006, 266.

³⁰¹ Rotuli Parliamentorum V, 44. Cited in M.W. Barley, 'Lincolnshire Rivers in the Middle Ages.' *Lincolnshire Architectural & Archaeological Society Reports and Papers, New Series*, 1 (1938), 3.

E. Jervoise refers to this bridge as being over the Don. The river was realigned. E. Jervoise, *The Ancient Bridges of The North of England*. Westminster: The Architectural Press. 1931, 111.

³⁰² E. Jervoise, *The Ancient Bridges of Mid and Eastern England*. Westminster: The Architectural Press. 1932, 131.

³⁰³ William Camden, *Camden's Britannia*. Trans. and Ed. Edmund Gibson. London: F. Collins. 1695, 462.

In 1189-1206 Simon le Bret gave the Abbey of Waltham permission to build a bridge in Wrangle and he specified that it should be built '*ita ut nauicule que turbam portant: subtus pontem transire possint*'.³⁰⁴ Dugdale wrote that the papers from the collection of Mountagu Comitibus de Lindsey stated that in 1571 Commissioners gave instructions that new bridges should be built over the sewer called Newdike at Rusgate Ee and Surflete in Lincolnshire 'of such heights as boats might well pass under'.³⁰⁵

When a bridge was to be built there was sometimes a requirement by the king that boats should be able to pass, as at Canterbury³⁰⁶ and the Mondenmeme (Hurn) to Bleadney bridge over the Sheppey.³⁰⁷ In 1574 a similar requirement was made relating to bridges at Newdike in Lincolnshire.³⁰⁸ It is not known why licences were required for these bridges and apparently not elsewhere.

However, as Blair indicated, there were some bridges which obstructed vessels. When a river was running high there could be too little headroom, as was reported on the Waveney at Beccles.³⁰⁹ There was a bridge over the Adur at Bramber which obstructed vessels but it is clear from Dugdale's *Monasticon* that the obstruction was illegal.³¹⁰ There were enquiries into the bridges at Stoke Ferry on the Wissey in 1291, a bridge downstream of Bawtry on the Idle in 1396 and a series of enquiries about a bridge over the Don at Thorne from 1324 to 1381. In 1392 a bridge over the Aire at Tunbridge was so low that 'no ship could pass beneath it'. The local people were told to 'raise and mend it'.³¹¹ Dugdale again wrote that the papers from the collection of Mountagu Comitibus de Lindsey stated that at Kyrton and Lichfeld in Lincolnshire the townships were ordered in 1574 to reform their bridges so that they were 'to be 12 feet in breadth, and of height

³⁰⁴ British Museum Library Cottonian Tiberius C ix, ff. 97d, 98. Cited in H.E. Hallam, *Settlement & Society*. Cambridge: Cambridge University Press. 1965, 171.

³⁰⁵ William Dugdale, *The History of the Imbanking and Draining of Divers Fens and Marshes*. 2nd Edition. London: Richard Geast. 1772, 241-242.

³⁰⁶ Calendar of Patent Rolls, 1258-66, 342.

Calendar of Patent Rolls, 1307-13, 178.

TNA, Inquisitions *Ad Quod Damnum*, file 73, No 8. Cited in *VHC Kent. Vol. II*. 191.

³⁰⁷ A. Watkin, Ed. 'The Great Chartulary of Glastonbury Abbey. Volume 1', *Somerset Record Society*, LIX, (1944). Cited in Michael Williams, *The Draining of the Somerset Levels*. Cambridge: At the University Press. 1970, 67.

³⁰⁸ William Dugdale, *The History of the Imbanking and Draining of Divers Fens and Marshes*. 2nd Edition. London: Richard Geast. 1772, 241.

³⁰⁹ Robert Malster, *Wherries and Waterways*. Lavenham: Terence Dalton Limited. 1971, 49.

³¹⁰ William Dugdale, *Monasticon*, vi, p.1083, no. ii. Cited in R.C. Van Caenegem, Ed. *English Lawsuits from William I to Richard I. Volume I. William to Stephen*. Selden Society. Vol. 106. for 1990. 132.

³¹¹ Calendar of Patent Rolls, 1381-85, 414.

sufficient for boats to pass under'.³¹² Arcott wrote that bridges at Cattawade, Stoke and Wilford may have effectively barred the upper reaches of the Suffolk Stour 'to anything but the lightest barge'³¹³ but possibly only light barges could have used the river at that time. Where these bridges obstructed boats it appears that the obstruction was illegal.

It seems that only on the Parrett were obstructions allowed. Green wrote that 'From early times, river traffic took place to Langport Bridge, where any goods destined for the wharves of Thorney, three miles upstream on the Parrett, or Ilchester, on the tributary River Yeo, had to be transhipped, because the bridge totally obstructed the navigation.'³¹⁴ Helm wrote that at the time of Richard I direct communication with the sea on the Parrett-Tone system ceased with the building of a bridge at Bridgewater.³¹⁵

Blair also suggested that at some bridges the width of the main arch restricted the size of the vessels which could pass.³¹⁶ On the Severn in 1387 a gap of 18 feet (5.5 m) was normally left open at weirs.³¹⁷ Harrison stated that the span of the arches on London Bridge was 'c.8 metres' but that in the medieval period arch spans were 'usually under 6 metres.'³¹⁸ Radcot bridge, which Blair used as an example, was constructed in the 14th century and had unusually narrow arches of 3.66 m. The next bridge downstream had arches 5.50 m wide.³¹⁹ It seems likely that the arches of bridges were built of such a width that the boats which used the section of the river could pass.

Bridges could cause sandbanks which obstructed vessels, as on the Lea in 1355.³²⁰ Blair suggested that the bridge at Grandpont, Oxford, may have caused changes to the bed which obstructed vessels.³²¹ However the state of the river prior to the construction of the bridge needs to be established before it can be known if passage became more

³¹² Dugdale, William, *The History of the Imbanking and Draining of Divers Fens and Marshes*. 2nd Edition. London: Richard Geast. 1772, 242.

³¹³ W.G. Arcott, *Orwell Estuary*. Ipswich: Norman Adlard & Co. Ltd. 1954, 104-105.

³¹⁴ Colin Green, *Severn Trader*. Lydney: Black Dwarf Publications. 1999, 23.

³¹⁵ P.J. Helm, 'The Somerset Levels in the Middle Ages.' *Journal of the British Archaeological Association*. Vol. 12. (1949), 47.

³¹⁶ John Blair, 'Transport and Canal-Building on the Upper Thames, 1000-1300.' In Blair, 2007, 254-286.

³¹⁷ C.T. Flower, Ed. *Public Works in Mediaeval Law, Volume I*. Selden Society, Vol. 32. 1915, 157-158.

³¹⁸ David Harrison, *The Bridges of Medieval England*. Oxford: Clarendon Press. 2004, 114-115.

³¹⁹ John Blair, 'Transport and Canal-Building on the Upper Thames, 1000-1300.' In Blair, 2007, 254-294, 285.

³²⁰ Calendar of Inquisitions Miscellaneous, 1348-77, 70-73.

³²¹ John Blair, 'Transport and Canal-Building on the Upper Thames, 1000-1300.' In Blair, 2007, 254-262.

difficult. The fact that there had previously been a ford may indicate that the river had always been difficult to negotiate.

It might be hoped that the medieval bridges would provide information about the width and flow of rivers at the time they were built. However this seems not to be possible because bridges change the form of rivers. Camden recorded that the Isis was 'kept in and restrained with Rodcot bridge.'³²² If a bridge was built with piers, where the bed material was of fine alluvial material, without altering the width of the river, then the piers would obstruct the flow of the river. The water would back up above the bridge. The flow through the arches would be faster. The bed would be degraded downstream. The degradation would migrate upstream until the piers were undermined and collapsed. This was the fate of a bridge at Hemington in the early 12th century.³²³ The only way to ensure stability was to widen the river at the place where the bridge was built and to ensure that the total width of the arches was equal to, or greater than, the original width of the river. Other changes to the river form were caused by the cuttings made in the bank above and below the bridges where barges and boats moored and unloaded.

Where a bridge was built on bedrock the configuration of the bridge normally depended on the location of the most secure bases.

There are several bridges where the end arches are now buried. This may be due to a multi-channel river being modified to one or two channels, as at Yalding on the Beult, or a reservoir being constructed upstream reducing the maximum flood, as at Kendall on the Kent. Jervoise recorded that at Salisbury 'at least one of the ancient arches [of the Fisherton Bridge] remains under the street alongside the County Hotel.'³²⁴ He also recorded that at Lower Eashing one arch of an ancient bridge over the Wey has been filled in.³²⁵ Cook reported that at Hebden it seems that one arch has been blocked.³²⁶

³²² William Camden, *Camden's Britannia*. Trans. and Ed. Edmund Gibson. London: F. Collins. 1695, 251.

³²³ A.G. Brown, 'Geoarchaeology, the four dimensional (4D) fluvial matrix and climatic causality.' *Geomorphology*. Vol. 101. (2008), 290-1.

L.P. Cooper, 'Hemington Quarry, Castle Donington, Leicestershire, UK: a decade beneath the alluvium in the confluence zone.' In Andy J. Howard *et al.*, Eds. *Alluvial Archaeology in Europe*. Lisse, Swets & Zeitlinger. 2003, 27-41.

³²⁴ E. Jervoise, *The Ancient Bridges of the South of England*. Westminster: The Architectural Press. 1930, 72.

³²⁵ *Ibid.* page 23.

³²⁶ Martin Cook, *Medieval Bridges*. Princes Risborough: Shire Publications Ltd. 1998, 30.

However some medieval bridges have been lengthened as Jervoise recorded at Holme Bridge over the Frome.³²⁷ All these changes are evidence that the form of some rivers have changed since 1600.

The cost of building a stone bridge was considerable. When planning a new bridge the cost would have increased with the number of piers and also with the span of the arches. Since the only examples of obstruction of rivers by bridges which have been found were illegal constructions and the bridges at Langport and Bridgewater it would seem that the law and the fear of wasted construction costs ensured that rivers remained usable through the bridges.

There is a further form of evidence from the records of medieval bridges. Pontage grants were made by the king to permit people to charge for the use of bridges so that money would be available for the repair of the bridges. Many of these grants are listed in the Calendar of Patent Rolls. The rivers which were to be crossed by bridges would normally have been too deep to be crossed conveniently by a ford and so would have been deep enough to be usable. For the majority of the places for which pontage grants were made there is evidence of use of the rivers. (See Appendix L. Grants of Pontage. 1229-1399.) However three bridges were over highland rivers which were deep but may have been difficult to use due to the boulders on their beds: the Eamont, Eden and Kent. Eight are considered to be usable now but no records of historic use have been found: Bristol Avon at Bradford on Avon and Chippenham, Dane at Holmes Chappel, Great Ouse at Stony Stratford, Lune at Stangerthwaite, Thame at Aylesbury, Ure at Ripon and the Wharfe at Wetherby. All of these rivers may have been used at these places. There were other rivers for which pontage grants were made but which are not in the *BCU Guide*: the Aln, Dane, Dearne and Worfe. The Dearne has been described as being ‘skinny but shallow in places’.³²⁸ It seems that the other rivers could be described similarly and that they may also have been used in the medieval period.

Thus it seems that no bridge which obstructed boats was legal except on the Parrett. No reason has been found for this exception.

³²⁷ E. Jervoise, *The Ancient Bridges of the South of England*. Westminster: The Architectural Press. 1930, 86.

³²⁸ Personal comment Chris Hawkesworth, British Canoe Union Facilities Officer. October 2009.

4.6.2 Fords

Bridges could, and it seems should, have been built in such a way that they did not obstruct the use of the rivers. This would have been difficult with fords. Those building fords worked to make the water as shallow as possible, exactly the opposite to what was needed by those using boats on the rivers. Very little information has been found concerning medieval fords.³²⁹ A consideration of their depths is given in Appendix I which concludes that most fords were not more than one metre deep.

There were three types of ford. There were places where a way led to a natural stream and out the other side. This was suitable for small streams and certain special locations like the estuary of the Sussex Ouse at Seaford and at Cuckmere Haven where the water flowing from upstream now spreads out and percolates through the shingle at low tide.

There were places where a stream was artificially widened and so made shallower to make the stream easier to cross. Sometimes the ford was immediately downstream of a mill where the flow of the water was held back much of the time by the refilling of the mill-dam. Parker wrote of the Cam or Rhee 'It will be noticed that it is virtually impossible to consider river-crossings without at the same time speaking of mills. The siting of the mill was in most cases determined by the existence of the crossing. In no case, I think, was the crossing determined by the siting of the mill.'³³⁰ The ford at Flatford on the Suffolk Stour as illustrated in Constable's 'Haywain' appears to have been of this type.

The third type of ford was across deeper rivers where a causeway was built on the river bed and the water allowed to flow over the causeway. It seems that all of these have been destroyed by the Environment Agency and its predecessors. Only one description has been found which is of a Roman causeway at South Stoke:

³²⁹ Eg. see S.M. Haslam, *The Historic River*. Cambridge: Cobden of Cambridge Press. 1991, 143-145.
S.M. Haslam, *The River Scene*. Cambridge: Cambridge University Press. 1997, 266.

³³⁰ R. Parker, 'River – Crossings.' In Elsie M. Widdowson, Ed. *Cam or Rhee*. Barrington Local History and Conservation Society. c. 1973, 39.

It spans the river's bed at right angles, a solid bar of flints and chalk, continuous save for a gap of some 8 or 9 feet in width immediately next to the eastern bank. The crown of it is perhaps 10 or 12 feet wide, and the sides batter outward at an angle of 45 degrees or so. On the up-stream side it rises a full 6 feet above the river's mid-stream floor, for scour has prevented any silting; on the down-stream side, where scour is less effective, the rise is about 3 feet only. These data were gathered in the half-hour between ebb and flood of a spring tide.³³¹

The scouring was greater upstream because in Sussex rivers the flood tide flows faster than the ebb. On non-tidal rivers the scouring would be downstream of the ford. The gap had been made at some time to allow boats to pass more easily.

This type of ford also caused an obstruction to the flow of water on the rivers and was equivalent to the 'landings and water gangs' which were forbidden on Romney and Pevensey marshes³³² and all other marshes where the laws of Romney Marsh applied.

Haliczer stated that 'England has 66 *ford* names in the 5,400 square miles of the Thames valley, 14 on the right bank and 52 on the left bank.' He found 306 ford-names on the half-inch O.S. maps of England but states that this list was 'probably not complete'.³³³ This is certainly a serious underestimation. Digimap Gazetteer gives 458 names including the letters 'f,o,r,d' for Devon, 69 for Norfolk and 58 for Sussex. While many of these will have more than one reference to each ford the total number of ford-names in the country may well exceed 2,000. Furthermore not every ford would have been recorded with a ford-name.

Fords would have caused little obstruction to vessels if rivers flowed at constant stage. They could have been one metre deep. This would have enabled people to walk over and most vessels to pass over. It was the variation of stage which caused problems. Land travellers who wanted to cross the rivers when the stage was high were liable to build causeways and boats wishing to pass when the stage was low would then demolish them.

³³¹ A. Hadrian Allcroft, *Water of Arun*. London: Methuen & Co. Ltd. 1930, 1.

³³² William Dugdale, *The History of the Imbanking and Draining of Divers Fens and Marshes*. 2nd Edition. London: Richard Geast. 1772, 32, 97.

³³³ J. Haliczzer, 'The Distribution of Place-names.' *Geography*. Vol. XXII. 1937, 200.

No court case has been found in which it was discussed whether land traffic or boats had priority at fords. Leland in about 1543 stated that the Irwell was not navigable in some places because of fords and rocks.³³⁴ John Taylor in 1641 complained that fords obstructed his journey up the Churn between Cricklade and Cirencester. Isaac Walton stated that the Dove would have been navigable were it not for the fords and weirs.³³⁵

There were other similar obstructions to the use of rivers. On the Lea Burnaby and Parker record that ‘the abbot of Waltham was accused of planting an ‘ayland’ in midstream, as was Sir John le Fiz Walter at Reydon.’³³⁶ Trenches were dug which diverted the water from the main stream.³³⁷

Some rivers at some times were obstructed by fords. At present there is not enough information to establish the legal priority between boats and the users of fords nor has it been possible to establish their number, location or dates.

4.6.3 Weirs

Part-weirs, Split-weirs and Full-weirs.

Bridges may possibly have delayed some vessels, some fords made the use of rivers difficult but it was the weirs which caused the most frequently reported problems. While it has been claimed that ‘inland river navigation often tended to stop sharply at the first mill-weir encountered’³³⁸ it seems more likely that most weirs did not block all movement, rather, in places, they made the use of the river more difficult or more dangerous.

There are reports of weirs on all four great rivers. On the Severn wherever there was weir there was also a bypass channel for boats. On the Trent there was a public right to use the river.³³⁹ There were inquiries into the obstruction of the river at Colwick in

³³⁴ *The Itinerary of John Leland in or about the years 1535-1543. Volume Four.* Editor Lucy Toulmin Smith. Carbondale: Southern Illinois University Press. 1964, 6.

³³⁵ Isaac Walton, *The Compleat Angler*. Ed. Richard le Gallienne. London: John Lane. 1904, 295-296.

³³⁶ J.G.L. Burnby and M. Parker, ‘The Navigation of the River Lee (1190 – 1790).’ *Edmonton Hundred Historical Society Occasional Paper*. New Series No. 36. (1978), 4.

³³⁷ Parliamentary Records of Medieval England. Henry VI 1427, iv-332.

³³⁸ John Langdon, ‘The Efficiency of Inland Water Transport in Medieval England.’ In Blair, 2007, 116.

³³⁹ Charter of King Henry II. 1189. Charter of King John 1200. Royal Proclamation 1382. All in *Records of the Borough of Nottingham*. Editor W.V. Steveson. Nottingham: Corporation of Nottingham. 1882.

1299,³⁴⁰ 1300,³⁴¹ 1302,³⁴² 1303³⁴³ and in 1383.³⁴⁴ It seems likely from the wording of the reports that the river was partially obstructed from 1229 to 1303 and that in 1383 the river was totally blocked but that the obstruction was quickly removed.

The Great Ouse was one of the rivers where continuous passage was available in 1189 but which was blocked by weirs after the reign of Edward I.³⁴⁵ Speed states that

To this Shire-Towne [Huntingdon], and benefit of the neighbour Countries, this river was navigable, untill the power of Grey, a mynion of the time, stopt that passage, and with it all redresse, either by law or Parliament.³⁴⁶

Jones recorded that upstream of St Ives goods were transported on the river by being backed over the weirs at each mill.³⁴⁷ The question as to whether the use of a river ends at the point where the first portage is required depends on the attitude of the writer. In Canada portaging was considered to be a normal activity for those travelling by water.

Table 17 is a list of weirs which, it seems, were an obstruction to boats.

³⁴⁰ Calendar of Patent Rolls, 1292-1301, 476-477.

³⁴¹ Calendar of Patent Rolls, 1292-1301, 533.

³⁴² Calendar of Patent Rolls, 1301-07, 94.

³⁴³ Calendar of Patent Rolls, 1301-07, 269.

³⁴⁴ Royal Commission to inquire into Obstructions of the course of the Trent at Colwick. (1383) *Records of the Borough of Nottingham*. Editor W.V. Steveson. Nottingham: Corporation of Nottingham. 1882.

³⁴⁵ Dorothy Summers, *The Great Ouse*. Newton Abbot: David & Charles. 1973, 28.

³⁴⁶ John Speed, *Theatre of the Empire of Great Britaine, Parts III*. (1st Edition 1611.) Facsimile London: Phoenix House Limited. 1953-4, Fol. 53-54.

³⁴⁷ Evan T. Jones, 'River navigation in Medieval England.' *Journal of Historical Geography*. Vol. 26 (1). (2000), 67.

Table 17 Weirs which apparently could not be passed

River	Place of Obstruction	Dates obstructed		Note
Kentish Stour	Fordwich	1189-1600		A
Dee	Chester	1189-1600	Mill	B
Cam	Cambridge	1189-1600		
Great Ouse	Outwell	(1272-1307)-1331		
Derbyshire Derwent	Borrowash	1268	Mill	
Great Ouse	St Ives-Huntingdon	1275-1600		
Itchin	Woodmill	1276-1535	Mill	C
Wye	Wyesham	1312		
Wye	Trellech	1315		
Exe	Topsham	c.1290-1600		
Great Ouse	Hemingford Grey	1370-1600	Mill	D
Trent	Cowick	1299	Mill	
Wye	Monmouth	c.1553-1600		E
Trent	Shelford	1592		

Notes

- A. Fordwich was the tidal limit and transhipment might have been required even if the weir had not been built.
- B. Boats may have passed over the weir at high tide.
- C. Fieldwork shows that there was an alternative channel.³⁴⁸
- D. The river may have been impassable by barges downstream of Bedford. Goods were backed across the weirs.
- E. Barges were dragged round the weir by oxen.

Thus on nine rivers there were weirs which stopped all vessels during some periods. Others may not have been identified. Most of these have been well known for some time. When it was thought that there were only about twelve navigable rivers in England it would have been thought that about three quarters of the navigable rivers had been

³⁴⁸ Christopher K. Currie, 'Early Water Management on the Lower River Itchin in Hampshire.' In Blair, 2007, 244-253.

obstructed by weirs. It is shown in Appendix A that over 150 rivers were used by boats. Thus about ten per cent of the rivers which were used are now known to have been blocked by weirs.

Most previous authors have failed to realise that there are three distinct types of weir. These are called here part-weir, split-weir and full-weir. To establish the effect of the weirs on river transport the differences between these types must be considered. The challenge in studying the written records about weirs is compounded by the fact that one word may describe different types of weir at different times and in different parts of the country.³⁴⁹ Also one type of weir may be described by two different words.³⁵⁰ Thus we have no description of the ‘navigable sluice’ at Salters Lode referred to by commissioners in 1605.³⁵¹

Some weirs stopped all vessels from passing. Some stopped all vessels at certain stages of the river. Some made the passage more dangerous, sometimes unacceptably dangerous. Some did not affect the channel which was used by vessels. Thus Thacker wrote that in 1404 a weir at Shiplake on the Thames was ‘of such height and width that all men with shouts and barges and kidels can pass therby without danger as of old time.’³⁵²

A part-weir was a weir which projected only part of the way across a river, or from one bank to an island. They were used to divert water into a leat, to provide a haven for fish or to direct the flow to protect banks. Cornish wrote ‘Fish and flour go together as by-products of nearly all our large rivers. The combination comes about thus: wherever there is a water-mill, a mill cut is made to take the water to it. This mill-dam holds the biggest fish.’³⁵³ In these cases it was the side stream which contained the mill-dam not the main channel.

³⁴⁹ Eg. ‘Sluice’ See M. Chisholm, ‘Navigation and the seventeenth-century draining of the Fens.’ *Journal of Historical Geography*. Vol. 32, No 4. (2006), 747.

³⁵⁰ Eg. Gortz and Lokkez.

³⁵¹ William Dugdale, *The History of the Imbanking and Draining of Divers Fens and Marshes*. 2nd Edition. London: Richard Geast. 1772, 384.

³⁵² Fred S. Thacker, *The Thames Highway. Volume II: Locks and Weirs*. (1st Edition 1920) Newton Abbot: David & Charles. 1968, 255.

³⁵³ C.J. Cornish, *Naturalist on the Thames*. London: Seeley and Co. Limited. 1902, 100.

A split-weir was one where two part-weirs projected from opposite banks and there was a relatively narrow gap between them. The water level upstream was raised and the flow through the gap was faster. Where the gap was wide there is no obstruction to traffic. Where it was narrow the passage downstream was dangerous and upstream impossible without a winch. Thus in the Patent Rolls for 1275 there was an order to the sheriff of Oxford and Berks requiring him to widen the water of the Thames because it had been 'so narrowed in divers places' that ships and barges were unable to pass.³⁵⁴ It seems likely that it was the gap in the split-weirs which had to be widened. In 1286 commissioners were appointed to investigate the 'narrowing and heightening of weirs on the Severn' as 'vessels cannot pass through as they were wont.'³⁵⁵ The use of the word 'narrowing' shows that this also referred to split-weirs.

A full-weir stretched from one bank to the other and normally raised the depth of the water upstream. Depending on the height of the weir, the flow over the weir and the size of a boat it may have been possible, when going downstream, to slide a boat over the weir. Full-weirs were normally major obstructions to upstream traffic.

Fish-weirs often had a V shape in plan with a basket or net at the vertex.³⁵⁶ If they were built across the full width of the river they were full-weirs. In the larger rivers they were sometimes built at the side of the river and did not affect the river traffic. Lennard considered that the existence of a *piscaria* or *piscina* in the fens implied the presence of a weir.³⁵⁷ However no report has been found of such weirs obstructing vessels using the fenland rivers.

In some places there would have been combinations of different types of weir. One channel blocked by a mill wheel, a second by a fish-weir and a third contained a usable split-weir.³⁵⁸ At other places a mill-weir may have replaced an earlier fish-weir.³⁵⁹

³⁵⁴ Calendar of Close Rolls, 1272-79, 216.

³⁵⁵ Calendar of Patent Rolls, 1281-92, 257.

³⁵⁶ C.R. Salisbury, 'Primitive British fishweirs.' In G.L. Good, *et al.* Eds. *Waterfront Archaeology*. CBA Research Report No 74. (1991), 76-87.

³⁵⁷ Reginald Lennard, *Rural England 1086-1135*. Oxford: Clarendon Press. 1959, 248-251.

H.C. Darby, *The Domesday Geography of Eastern England*. Cambridge: Cambridge University Press. 1971, 368.

³⁵⁸ Eg. 1786, Thames, Whitchurch Weir. A.W. Skempton, 'Engineering on the Thames navigation, 1770-1845.' *Transactions of the Newcomen Society*. Vol. 55. (1983-4), 153-176, 155.

The types of obstruction which were prohibited by legislation were:

- 1215 *Kidelli*.³⁶⁰
- 1351-1399 *Gortz molins, estanks, estaches & kideux*.³⁶¹
- 1402 *Gortz estakes & kidelx*.³⁶²
- 1413 *gors des moleyns estankes estakes & kideux*.³⁶³
- 1423 (Thames only.) *les Weres kydelles & trinkes*.³⁶⁴
- 1472 *gentz fishgarthez molyns milledammez estankez de molyns lokkez
hebbyngwerez estakez kideux hekkez flodegates & divsez atus
disto^rbauncez*.³⁶⁵

The Oxford English Dictionary defines a ‘kiddle’ as ‘A dam, weir, or barrier in a river, having an opening in it fitted with nets or other appliances for catching fish.’³⁶⁶ In 1610 on appeal it was held that a fish-weir built of stone is not a kiddle since they must be constructed of stakes and wattles.³⁶⁷ However this was a case involving the King’s weir at the time of James I and was not followed in a later case where it was held that such an obstruction in a river must be removed.³⁶⁸ The word *stagnum*, a dam, may refer either to the structure or to the pool of water created upstream of the structure.

³⁵⁹ Eg. Patrick Clay, ‘A Norman mill dam at Hemington Fields, Castle Donington, Leicestershire.’ In Stuart Needham and Mark G. Macklin, Eds. *Alluvial Archaeology in Britain*. Oxbow Monograph 27. 1992, 165.

³⁶⁰ Magna Carta and its many confirmations.

³⁶¹ 25 Edward III s 3, c 4.

45 Edward III c 2.

21 Richard II c 19.

1 Henry IV c 12.

³⁶² 4 Henry IV c 11.

³⁶³ 1 Henry V c 2.

³⁶⁴ 2 Henry VI c 12.

³⁶⁵ 12 Edward IV c 7.

³⁶⁶ ‘Kiddle.’ Oxford English Dictionary electronic edition.

³⁶⁷ *Chester Mill upon the River of Dee*, (1610) 10 Co Rep 137b.

³⁶⁸ *R v The inhabitants of Westham in Essex*. (1714) 10 Mod 159.

Most translators have translated *gortz* as ‘weir’³⁶⁹ leading readers to assume that the obstructions were full-weirs which vessels could not pass. Rather they appear to have been of varying types with the degree of obstruction and danger which they caused depending on their height, the width of their gap, if any, and the flow of the river. Many *gortz* in good repair could be passed by boats.³⁷⁰

It seems that at some *gortz* the riparian owner deliberately blocked the river. One complaint to the king was that:

many gortz which ought to be repaired so that boats might pass; are now so obstructed, restrained and barred, by bar and lock, by those who own them that no boat can pass without giving great toll to those who own the said gortz; whereby merchants often [have to] lie there two or three days before they can pass, untill they make redemption or agreement, and thus they lose their advantages, corn and other victual grow dear, and other damages to people ensue. ...

The King replied ‘[action should be taken] so that boats may pass as they reasonably ought and have anciently been used.’³⁷¹

Molyns are mills and also the channels in which the mill wheel was set.

Estanks are pools or fishponds and apparently the pool above a part-weir.

Estaches are ‘an arrangement of stakes for defence or a raft made of balks of timber, fastened together with chains, used to block up a channel’.³⁷²

Trinkes were a kind of fixed fishing-net formerly used in the Thames and other rivers.³⁷³

Lokkez. Wilson wrote ‘The term *lock* seems to have originally meant a narrow passageway for barges, for some bridge arches were also called locks, particularly at London Bridge.’³⁷⁴ The word was also used for ‘barriers on a river, constructed so as to be opened or closed at pleasure.’³⁷⁵

³⁶⁹ See Statutes at Large for the above Acts.

³⁷⁰ See next quotation.

³⁷¹ TNA, ? Temp. Edw II. Ancient Petitions, File 125. No 6201. Cited in Lucy Toulmin Smith, ‘Parliamentary Petitions Relating to Oxford.’ In Montagu Burrows, Ed. *Collectanea, Third Series*. The Oxford Historical Society. Vol. 32. 1896, 138.

³⁷² Oxford English Dictionary electronic edition.

³⁷³ *Ibid*.

³⁷⁴ David Gordon Wilson, *The Thames: Record of a Working Waterway*. London: B.T. Batsford. 1987, 18-19.

³⁷⁵ Oxford English Dictionary electronic edition.

Hekkez are ‘a grating or frame of parallel bars in a river to obstruct the passage of fish, or other solid bodies, without obstructing the flow of the water.’³⁷⁶

The weirs would have often needed repair and must have often been washed away. It is recorded that ‘Numerous manorial extents record the customary services of the servile tenants in repairing the watermill dam, sometimes specifying the number of days to be spent on that service.’³⁷⁷ In general weirs were constructed to preserve fish or to provide a head of water for a mill, the obstruction of traffic was incidental. However on the Exe at Topsham the Earl of Devon constructed an illegal weir apparently to force the townspeople of Exeter to use his wharf and to pay tolls for that use.³⁷⁸

Vessels went past weirs in different ways. Part-weirs and split-weirs with wide gaps presented no problem. All weirs on the Severn were built between an island and a bank and a ‘barge-gutter’ was left ‘eighteen feet in breadth’ for barges to pass.³⁷⁹ It was the law on some rivers that a gap, normally of two perches, should be left in all split-weirs and any other obstruction as on the Derbyshire Derwent³⁸⁰ and the Trent.³⁸¹ Hatcher wrote that there was an ancient custom that on the Salisbury Avon ‘a passage was to be left free, fifteen feet wide, and twelve feet distant from either bank.’ And that ‘This custom was confirmed by the commissioners in [1604 and 1632].’³⁸² Contemporary records show that on some rivers, like the Arun, the weirs were opened for boats at certain times of day.³⁸³ On other rivers, like the Kentish Stour, the boats seem to have operated either upstream or downstream of a weir. Peberdy has drawn attention to the fact that on the Thames downstream of Oxford all mills were between the bank and an

³⁷⁶ *Ibid.*

³⁷⁷ S.A. Moorhouse, ‘Cornmills.’ In M.L. Faull and S. Moorhouse, Eds. *West Yorkshire: an archaeological survey to AD 1500. Volumes I and III.* Wakefield: West Yorkshire Metropolitan County Council. 1981, 712.

³⁷⁸ John Vowell *alias* Hooker, *The Description of the Citie of Excester, c1600*. Exeter: Devon and Cornwall Record Society. 1919, 33.

³⁷⁹ D.J. Pannett, ‘Fish Weirs on the River Severn.’ In Trevor Rowley, Ed. *The Evolution of Marshland Landscape.* Oxford: Oxford University Department for External Studies. 1981, 144- 154.

D.J. Pannett, ‘Fish Weirs on the River Severn.’ *Folk Life.* Vol. 26, (1987-88), 55-69.

³⁸⁰ Calendar of Charter Rolls, 1226-57, 96.

³⁸¹ *Records of the Borough of Nottingham, 1155-1399.* Published under the authority of the Borough of Nottingham. Editor W.V. Steveson. London: Bernard Quaritch. 1882, 2.

³⁸² Henry Hatcher, *The History of Modern Wiltshire. Old and New Sarum, or Salisbury.* London: The Author. 1843, 460.

³⁸³ *A Description of the High Stream of Arundel.* (Written c.1637) Editor Joseph Fowler. Littlehampton: Nature and Archaeology Circle, Extra Publication, No. 1. 1929, 59.

island.³⁸⁴ Wilson, a lock-keeper, wrote that ‘Thames mills were constructed at the “tail” or downstream end of narrow channels at islands, and sometimes new cuts were dug. As the river pushed down the dammed off millstream, a ‘head’ of water built up to work the mill wheel. Later, dams were thrown across any other adjacent channels to provide a greater head for extra power.’³⁸⁵ This explains why ‘later’ the objections to the obstruction of the Thames increased. On the Lea there were nine mills at Stratford yet vessels went upstream without, apparently, any trouble since there were suitable alternative channels available.³⁸⁶

Thacker records that Strype wrote in 1574 that at some weirs it was normal for a vessel to be unloaded before it went down through the gap.³⁸⁷ Records of winches on the Thames to assist upstream passage through split-weirs have been found for Marlow, 1307 and 1314,³⁸⁸ Bisham, 1544,³⁸⁹ Hambledon, 1383³⁹⁰ and Rotherfield Peppard, 1395-99.³⁹¹ In other places, as on the Wye at Monmouth, it is reported that vessels were taken from the water and hauled upstream past a weir.³⁹² Since at many places it was normal to haul boats out of the sea and clear of the tide every evening³⁹³ it does not seem that it would have been a major problem to haul boats past a weir. At Cambridge in the 1950s boats were regularly pulled up a ramp beside the Silver Street weir.³⁹⁴ On the Dee at Chester it seems that shallow vessels could pass over the weir at high tide.³⁹⁵

³⁸⁴ R.B. Peberdy, ‘Navigation on the River Thames between London and Oxford in the Late Middle Ages: A Reconsideration.’ *Oxoniensia* Vol. 61, (1996), 335-339.

³⁸⁵ David Gordon Wilson, *The Making of the Middle Thames*. Bournemouth: Spurbooks Ltd. 1977, 64.

³⁸⁶ Stephen Pewsey, *Stratford*. Chichester: Phillimore. 1993, 1.

³⁸⁷ Fred S. Thacker, *The Thames Highway. Volume I: General History*. (1st published 1914.) Newton Abbot: David & Charles. 1968, 53.

³⁸⁸ TNA, C133/128, C134/42. Cited in R.B. Peberdy, ‘Navigation on the River Thames between London and Oxford in the Late Middle Ages: A Reconsideration.’ *Oxoniensia* Vol. 61, (1996), 335.

³⁸⁹ Fred S. Thacker, *The Thames Highway. Volume II: Locks and Weirs*. Kew: Fred S. Thacker. 1920. (Reprinted Newton Abbot: David & Charles. 1968.), 285.

³⁹⁰ TNA, C135/56 no. 13. Cited in R.B. Peberdy, ‘Navigation on the River Thames between London and Oxford in the Late Middle Ages: A Reconsideration.’ *Oxoniensia* Vol. 61, (1996), 336.

³⁹¹ C.T. Flower, *Public Works in Medieval Law. Volume II*. Selden Society Vol. 40. 1923, 125, 127.

³⁹² Joan Fleming-Yates, *The River Running By*. No address given: Wedderburn Art Ltd. c. 2005, 96.

³⁹³ Eg. at Brighton. John Bleach and Mark Gardiner, ‘Medieval Markets and Ports.’ In Kim Leslie and Brian Short, Eds. *An Historical Atlas of Sussex*. Chichester: Phillimore. 1999, 42.

³⁹⁴ Personal observation by the present author.

³⁹⁵ Richard Bennett and John Elton, *History of Corn Milling. Volume IV*. New York: Burt Franklin. 1904, 96.

New weirs were built throughout the period 1189-1600.³⁹⁶ Others were ‘heightened’ or ‘narrowed’ by their owners. Some weirs were washed away and others were pulled down. It would not have been unusual for passage of a weir to be difficult at low flow, dangerous as the flow increased and then easy when the level of the water in the river was well above the top of the weir.

Flash-locks

A simple flash-lock weir was a weir in which there were boards which could be removed when a vessel wished to pass. When the boards were removed the water stored above the weir flowed through the gap, boats and fish followed, the boards were then replaced and the water level upstream of the weir slowly rose again. On some rivers the boards were required to be removed on Sundays so that there was free passage for migrating fish on the day when the mill was not working as on the Arun in 1637.³⁹⁷

A flash-lock enabled a vessel to pass over a shoal, or shallow section of the river, by the quick release of a ‘flash’ or ‘flush’ of water which temporarily provided a cushion on which the boat could pass. It is reported that there were flash-locks on the Thames, Sussex Ouse, Parrett and Little Ouse but the date of their construction is uncertain.³⁹⁸

Flash-locks have been described by most authors who have written about the Thames. Some have claimed that they have existed for a thousand years.³⁹⁹ However no record has been found of any flash-lock prior to 1661⁴⁰⁰ when Wood wrote that there were weirs which caused ‘stoppages of water severall miles distant’ and ‘about Oxon’ some of which ‘give a shoote to vessels in their passage,’ but ‘though probably [the flash] might hasten them in their journey yet not without great expence.’ He added that ‘These with severall

³⁹⁶ Arthur J. Willis, Ed. *Winchester Consistory Court Depositions. 1561-1602.* Lyminge: Arthur J. Willis. 1960, 23.

³⁹⁷ *A Description of the High Stream of Arundel.* Editor Joseph Fowler. Littlehampton: Nature and Archaeology Circle, Extra Publication, No. 1. 1929, 59.

³⁹⁸ M.T.J. Lewis *et al.* ‘Flashlocks on English Waterways.’ *Industrial Archaeology.* Vol. 6. (1969), 218, 222, 235,244.

³⁹⁹ Fred S. Thacker, *The Thames Highway. Volume I: General History.* (1st Edition 1914) Newton Abbot: David & Charles. 1968, 8.

John Blair, ‘Introduction.’ In Blair, 2007, 10.

⁴⁰⁰ Blair’s translation of *gurgites* as flashlocks is not accepted here. They appear more likely to have been *gortz* as described above. John Blair, ‘Transport on the Upper Thames.’ In Blair, 2007, 264.

other annusanes if removed would breed noe small commodigy to our city.’⁴⁰¹ The next dated record of a flash-lock which has been found was in 1699 when a miller ‘sold to the waterman any gushes or floats of water to bring up their boats to Cambridge.’⁴⁰²

When flash-locks were used in series a boat could proceed a considerable distance down a shallow river. Thus Thacker records that in 1793 there were flushes on Saturday night and Wednesday morning on the Thames from Buscot to Bold Weir.⁴⁰³ If used singly they would scarcely seem to justify the cost of their construction and maintenance. It seems unlikely that such regular flushes of water down the Thames would have escaped the attention of Harrison, Camden or John Taylor if they had been used at the end of the 16th century or early in the 17th century. Thus it seems likely that the first flash-locks on the Thames were constructed at about the same time as pound locks were installed between Burcot and Oxford, 1635.

Thacker wrote of the flash-locks on the Thames that when the level of the whole of the upper reach was lowered for two miles by a considerable number of inches it needed, perhaps, several days to recover its normal depth.⁴⁰⁴ Later, possibly sarcastically, he wrote that ‘A fortnight’s leave, if such a privilege then existed, might easily have been spent in waiting, in a dry summer, to pass through any one of the “seventy locks”.’⁴⁰⁵ However this would have been very unusual. Let it be assumed that the several inches was 20 ins. (about 0.5 m). Thacker considered the length of the pound to be 2 miles. Just upstream of Reading the width of the river is now about 65 m. The mean flow at Reading is now $39 \text{ m}^3 \text{ s}^{-1}$. The average time to refill the pound would have been about 45 mins, assuming that the weirs were watertight. In summer if the flow was $5 \text{ m}^3 \text{ s}^{-1}$ (which is exceeded for 95% of the time) the original depth would have been restored in six hours. All except the largest vessels could have continued their journey before the pound was full.

⁴⁰¹ Anthony Wood, “*Survey of the Antiquities of the City of Oxford,*” composed in 1661-6. Ed. Andrew Clarke. Oxford: Clarendon Press. 1889, 430-431.

⁴⁰² Rev. Dr. Stokes, ‘The Old Mills of Cambridge.’ *Proceedings of the Cambridge Antiquarian Society*. Vol. XIV (New Series VIII) 1909-1910, 215.

⁴⁰³ Fred S. Thacker, *The Thames Highway. Volume I: General History*. (1st published 1914) Newton Abbot: David & Charles. 1968, 147.

⁴⁰⁴ *Ibid.* page 8.

⁴⁰⁵ *Ibid.* page 47.

All illustrations, which have been found, of boats passing through a flash-lock show a vessel the size of a punt. Most authors have failed to appreciate the problems involved in manoeuvring a barge down a river on a flash. It would seem to have been a most dangerous activity. No evidence has been found of flash-locks operating in the period 1189-1600. They are discussed here not because they existed during that period but because other authors have assumed that they did.

4.6.4 Water-mills

Modern authors make many references to mills obstructing rivers. Syson wrote of the ‘constant disputes over the water supply to the mill. Generally, these were caused by some hindrance to navigation or the prevention of fish passing up river.’⁴⁰⁶ Brandon and Short state that ‘rivers such as the Rother, Medway or Stour had riparian owners with weirs and mills which blocked them.’⁴⁰⁷ The purpose of this section is to establish the extent to which river transport was hindered by mills.

Domesday Book listed just over 6,000 mills in England in 1086.⁴⁰⁸ Holt by considering chiefly Domesday Book, the *Rotuli Hundredorum* and the *Red Book of Worcester* calculated that by 1300 there were between 10,000 and 12,000 mills in England.⁴⁰⁹ Langdon studied manorial records and calculated from these that about 80%, that is 8,000 – 9,000, were watermills.⁴¹⁰ He calculated that there was a fall in the number of mills of about 22% between 1440 and 1485⁴¹¹ after which there may have been an increase in the number of industrial mills. Thus he implied that the number of water-mills varied between about 6,000 and 10,000.

Langdon’s study of the mills was based on mills which belonged to manors. He estimated that the number of horse-mills was less than 3% of the total during the period 1300-1540.⁴¹² However there is evidence that private mills were much more often powered by horses. Bennett and Elton wrote that in Shrewsbury between 1267 and 1279 the right of culture was questioned. The four town mills should have been maintained

⁴⁰⁶ Leslie Syson, *British Water-mills*. London: B.T. Batsford Ltd. 1965, 45.

⁴⁰⁷ Peter Brandon & Brian Short, *The South East from AD 1000*. London: Longman. 1990, 166.

⁴⁰⁸ H.C. Darby, *Domesday England*. Cambridge: Cambridge University Press. 1986, 272.

⁴⁰⁹ Richard Holt, *The Mills of Medieval England*. Oxford: Basil Blackwell. 1988, 116.

⁴¹⁰ John Langdon, *Mills in the Medieval Economy*. Oxford: Oxford University Press. 2004, 37.

⁴¹¹ *Ibid.* page 31.

⁴¹² *Ibid.* page 35.

by the burgesses of the town but they were allowed to fall into disrepair. During this time twelve other mills were constructed ‘mostly horse- or ass-mills’.⁴¹³ Hoskins states that in Midland England ‘The old bakers frequently, if not invariably, ... milled their own corn on their own premises (usually by means of a horse-mill).’⁴¹⁴ Stokes wrote that in Cambridge there were three water-mills and at least four horse mills.⁴¹⁵ There are records of royal horse-mills at Lincoln and Windsor in the King’s Rememberancer accounts and records of a horse-mill at Peak in Derbyshire and of a hand-mill at Caernarvon in the Pipe Rolls.⁴¹⁶ In other places where the lord did not have right of multure it would seem possible that there would have been many private horse-mills.

It used to be thought that mills have seldom moved since the time of Domesday. Ellis wrote in 1833 ‘wherever a mill is specified, we generally find it still subsisting.’⁴¹⁷ However on closer examination it is found that while some sites were occupied throughout the period 1189-1600 other sites were vacated. Aston has shown that in Leicestershire the distribution of mills ‘shifted quite significantly from east to west’ during the 700 years after Domesday times.⁴¹⁸ The watermills also tended to migrate downstream. Holt wrote that in Huntingdonshire during the period 1086 to 1279 ‘at the same time as mills on the lesser watercourses had been taken out of use, ... where there was adequate waterpower the number of watermills was continuing to rise.’⁴¹⁹

The proportion of mills with horizontal wheels is unknown. Those which have been inspected in the Hebrides and Tibet by the present author were on small streams with a gradient in excess of 1:100 which could never have been used by boats. No reference has

⁴¹³ Richard Bennett and John Elton, *History of Corn Milling. Volume II. Watermills and Windmills.* (1st Edition 1899.) Wakefield: EP Publishing Ltd. 1973, 48-49.

⁴¹⁴ W.G. Hoskins, *Midland England.* London: B.T. Batsford Ltd. 1949, 73.

⁴¹⁵ Rev. Dr. Stokes, ‘The Old Mills of Cambridge.’ *Proceedings of the Cambridge Antiquarian Society.* Vol. XIV (New Series VIII) 1909-1910, 224.

⁴¹⁶ Cited in R.A. Brown and H.M. Colvin, ‘The Royal Castles 1066-1485.’ In R. Allen Brown *et al.* *The History of the King’s Works. Volume II.* London: Her Majesty’s Stationery Office. 1963, 705, 777, 875; and A.J. Taylor, ‘The King’s Works in Wales 1277-1330.’ In R. Allen Brown *et al.* *The History of the King’s Works. Volume I.* London: Her Majesty’s Stationery Office. 1963, 381.

⁴¹⁷ Sir Henry Ellis, *General Introduction to Domesday.* Cited in Mark Anthony Lower, ‘Notes on Watermills and Windmills in Sussex.’ *Sussex Archaeological Collections.* Vol. V. (1852), 268.

⁴¹⁸ Norman Aston, *Leicestershire Watermills.* England: Norman Ashton. 1977, 26.

⁴¹⁹ Richard Holt, *The Mills of Medieval England.* Oxford: basil Blackwell. 1988, 109.

been found that implies that mills with horizontal wheels obstructed boats.⁴²⁰ (The Tamworth mill was supplied by a leat at least 400 m long.)⁴²¹

In general authors have assumed that if Domesday recorded a mill in a vill then the mill was located on the largest river in the vill. Thus Darby stated that ‘The group of eight [mills] was at Meldreth on the upper waters of the River [Rhee]’⁴²² whereas all eight were on the River Mel, a much smaller stream.⁴²³ The Rhee at Meldreth was at times more than half a mile wide.⁴²⁴ It seems that there may have been few mills actually on the river between Guilden Morden and Granchester.

Williamson has drawn attention to the difficulty of mapping mills recorded in the Domesday Book because some of the mills were not physically located within the main geographical boundaries of the vill to which they are allocated.⁴²⁵

There were five methods of supplying water from a river, stream or ditch to a mill:- a storage pond, leat, divided stream, direct drive and weir. In some places a combination was used. In general, storage ponds or millponds were on small streams. They stored up the water during the night and allowed the mill to operate for some hours during the day, longer in winter than summer. Possibly the best known are the hammer ponds of the Weald. These were normally on streams which were too small to be used by boats.

A leat could be any length from 10 yards to 2 miles as at Robertsbridge. Often they did not interfere with the river traffic. Some leats had more than one mill on them before the water was returned to the river again as at Robertsbridge. The flow in a river is reduced by the flow in the leat for the section between the intake and outflow but due to the

⁴²⁰ See eg. Paul N. Wilson, *Watermills with Horizontal Wheels*. Society for the Protection of Ancient Buildings. No. 7. 1960.

⁴²¹ Philip Rahtz and Robert Meeson, *An Anglo-Saxon Watermill at Tamworth*. CBA Research Report No 83. 1992, 13.

⁴²² H.C. Darby, *The Domesday Geography of Eastern England*. 3rd Edition. Cambridge: Cambridge University Press. 1971, 309.

⁴²³ Cecil Chapman, ‘Watermills’. In Elsie M. Widdowson, Ed. *Cam or Rhee*. Barrington: Barrington Local History and Conservation Society. 1973, 46.

⁴²⁴ R. Parker, ‘River – Crossings.’ In Elsie M. Widdowson, Ed. *Cam or Rhee*. Barrington Local History and Conservation Society. C. 1973, 37.

⁴²⁵ Tom Williamson, ‘Domesday Industries: Mills, Salt Pans and Fisheries.’ In Trevor Ashwin and Alan Davison, *An Historical Atlas of Norfolk*. 3rd Edition. Chichester: Phillimore. 2005, 42-43.

annual variation in flow in the main stream this would, at most, only have been significant for a short periods of time.

Many mills were on divided streams blocking one channel but leaving the other(s) clear. There were examples at Guilden Morden,⁴²⁶ Winchester, Exeter and Bath.⁴²⁷ On some rivers an undershot drive wheel dipped into one side of the river leaving the other side clear, as at King's mill at Canterbury and in Salisbury.⁴²⁸

It has for a long time been recognised that rivers could be too large to be conveniently used for mills. In 1523 Fitzherbert wrote 'Commonly these mills be not set upon the great streams of these great rivers, but a great part of the water is conveyed out of the great stream by a mill stream made with man's hand ...' He criticises mills set 'on the one side of the great river and a weir made of timber and stone to hold up the water to the mill, the which is a great cost and many times it will stand in lack of water, that it may not well go at a great flood except the ground work be made very high.'⁴²⁹ Camden wrote 'And now the *Ise* [Exe] is grown bigger; but dividing into many streams vey convenient for mills, it flows to the City *Isca* [Exeter].'⁴³⁰

In London the mills were not on the Thames but as Fitzstephen wrote in 1180 'On the north side are fields for pasture, and a delightful plain of meadow land, interspersed with flowing streams, on which stand mills, whose clack is very pleasing to the ear.'⁴³¹

Writing about Domesday water-mills Hodgen has observed that '(although small-scale maps fail to present the facts clearly) the banks of the three great highway rivers, the Severn, Trent and Thames, were seldom regarded by mill builders as suitable sites for milling operations.'⁴³² Coates and Tucker writing about the Wye between Monmouth and Hay-on-Wye state that 'Although one or two possible mill-sites appear to be on the

⁴²⁶ *VCH Cambridgeshire. Vol. 8*, 106.

⁴²⁷ All three – John Speed, *Theatre of the Empire of Great Britaine, Parts I*. (1st Edition 1611.) Facsimile London: Phoenix House Limited. 1953-4.

⁴²⁸ *Ibid.*

⁴²⁹ John Fitzherbert, *The Boke of Surveying*. London: Thomas Marshe. 1523, fo. 49.

⁴³⁰ William Camden, *Camden's Britannia*. Trans. and Ed. Edmund Gibson. London: F. Collins. 1695, 30.

⁴³¹ William Fitzstephen, *Vita Sancti Thomae*. 1180. Cited in N.J. Barton, *The Lost Rivers of London*. London: Phoenix House Ltd. 1962, 13.

⁴³² Margaret T. Hodgen, 'Domesday Water Mills.' *Antiquity*. Vol. 13. (1939), 266.

Wye itself, all those which have been positively identified – with the exception of No 6, New Weir Forge [earliest reference 1754] – are on the tributaries.⁴³³

There are references to people removing weirs without first obtaining authorisation from the Courts as on the Ray in 1260,⁴³⁴ Thames c.1369⁴³⁵ and 1574,⁴³⁶ Buckfast on the Dart in 1371,⁴³⁷ Godmanchester on the Great Ouse c.1485⁴³⁸ and Shelford on the Trent in 1593.⁴³⁹ Regarding the obstruction of the Great Ouse Summers wrote that

Reginald de Grey and the abbot undoubtedly persisted in their course of obstruction through influence, and in general a strong presumption arises in favour of the public right [of navigation] from the pertinacity with which the local people insisted on their right of free passage on the river.⁴⁴⁰

This may well apply also to the other rivers.

Magna Carta confirmed the ancient right to the use of rivers. The next legislation relating to the obstruction of rivers was in 1351. Thus it seems likely that the rivers remained relatively clear of obstructions during the 13th century and that the obstructions occurred on a major scale from the start of the 14th century.

⁴³³ S.D. Coates and D.G. Tucker, *Water-mills of the Middle Wye Valley*. Monmouth: Monmouth District Museum Service. 1983, 5.

⁴³⁴ John Blair, 'Transport on the Upper Thames.' In Blair, 2007, 268.

⁴³⁵ Anthony Wood, "*Survey of the Antiquities of the City of Oxford*," composed in 1661-6 by Anthony Wood. Ed. Andrew Clarke. Oxford: Clarendon Press. 1889, 429.

⁴³⁶ British Library Lansdowne MS 18, fo. 137 (no. 62). Cited in John Langdon, 'Inland water transport in medieval England.' *Journal of Historical Geography*, Vol. 19, 1. (1993), 1-2.

⁴³⁷ *Select Cases of Trespass in the King's Courts. 1307-1399. Volume II*. Editor Morris S. Arnold. Selden Society, Vol. 103. (for 1987), 384-386.

⁴³⁸ Dorothy Summers, *The Great Ouse*. Newton Abbot: David & Charles. 1973, 28.

⁴³⁹ Stanley Revill, 'A 16th-Century Map of the River Trent near Shelford.' Reprinted from the Transactions of the Thoroton Society of Nottinghamshire. 1971. 81-90, 87.

⁴⁴⁰ Dorothy Summers, *The Great Ouse*. Newton Abbot: David & Charles. 1973, 28.

4.6.5 Estuaries

Changes in the condition of some estuaries affected river transport. Where ships were unable to access an estuary goods which might have been brought downstream in boats or barges could not be exported. Equally goods were not available for transport upstream. The record is confused by the fact that while some estuaries became shallower other estuaries were used less due to the increase in the size of ships.

On the Yorkshire Ouse there were three factors which reduced the use of the river downstream of York. In the 14th and 15th centuries the river was often obstructed by fishgarths and in the 16th century it seems that the river became shallower due to siltation.⁴⁴¹ In addition Hull was founded in the last decade of the 12th century and steadily drew trade from York. On the Trent at the end of the 12th century silt so obstructed the channels of the Idle, Done, Trent and other rivers that their free passage was blocked. Axholme was an island accessible only by boat. It seems that boats could still use the rivers but their size was limited.⁴⁴² Lambert and Walker reported that the estuary of the Witham was blocked in about the second half of the 15th century which stopped boats from going to Lincoln.⁴⁴³

There have been many changes to the course of the Welland, Nene and Great Ouse including the blockage of the Wisbech estuary before the end of the 13th century. However no record has been found of these changes stopping the use of the rivers. A record of 1202 implies that sea-going ships sailed from Cambridge to Norway and no record has been found of this route being closed before 1600.⁴⁴⁴ Dugdale wrote that a Commission which inspected the river channel of the Nene on 24 June 1605 stated that from Peterborough to the Old Ea was 'so grown up with earth and weeds, as that it serveth neither for passage of boats, nor draining, so hath been for a long time'.⁴⁴⁵ It

⁴⁴¹ Baron F. Duckham, *The Yorkshire Ouse*. Newton Abbot: David & Charles. 1967, 29-42.

⁴⁴² William Dugdale, *The History of the Imbanking and Draining of Divers Fens and Marshes*. 2nd Edition. London: Richard Geast. 1772, 141.

⁴⁴³ M.R. Lambert and R. Walker, *Boston, Tattershall & Croyland*. Oxford: Basil Blackwell. 1930, 59.

⁴⁴⁴ Pipe Rolls 1202 (Publications of the Pipe Roll Society New Series XV) 131. Cited in *VCH, Cambridge and the Isle of Ely, Vol. III*, 87.

⁴⁴⁵ William Dugdale, *The History of the Imbanking and Draining of Divers Fens and Marshes*. 2nd Edition. London: Richard Geast. 1772, 380.

seems that at least some of the many channels through the Fens were always usable but one could not always travel by the most direct channel.

It seems that the Yare was always tidal to Norwich. In the 12th century ships went direct to Norwich but later goods were transferred to barges and boats at Great Yarmouth. No evidence has been found that the River Yare became less usable due to siltation so it seems that the transfer of goods at Yarmouth may have been due to the increase in the size of ships.

On the Kentish Stour ships originally sailed to Fordwich but by the 14th century goods were transferred to barges at Sandwich. On the rivers which flow into the sea at Rye there have been many changes which can not easily be analysed.⁴⁴⁶

The estuaries of all the Sussex rivers have been altered greatly due to the drifting of shingle which first diverted the rivers to the east, then formed a bar, which was eventually broken through. Thus in 1586 Camden wrote of Sussex 'It has many little rivers; but those that come from the north-side of the County, presently bend their course to the sea, and are therefore unable to carry vessels of burden.'⁴⁴⁷ Yet in 1569 there was a boat of about 60 tons on the Arun at Arundel.⁴⁴⁸ In 1577 there was a ferry at Southease on the Ouse carrying a man, a boy and 58 sheep before it sank.⁴⁴⁹ Holland added to Camden's text the statement that 'From Lewis, the river as it descendeth, so swelleth, that the bottom cannot contain it, and therefore maketh a large mere.'⁴⁵⁰ It is hard to reconcile Camden's statement with the known use of the rivers. The extant records are insufficient to enable a calendar to be created showing when the rivers were usable by ships and when they were obstructed.

Leland records that he crossed the Axe at 'ebbe'. The river then had its mouth 'under the rootes of Whitecliff'. Upstream was a bridge of two stone arches which could not be passed over 'at high tydes'. This is the only record which has been found of a bridge

⁴⁴⁶ Jill Edison, 'Catastrophic Changes: A Multidisciplinary Study of the Evolution of the Barrier Beaches of Rye Bay.' In J. Eddison, *et al.*, Eds. *Romney Marsh: Environmental Change and Human Occupation in a Coastal Lowland*. Oxford University Committee for Archaeology Monograph No. 46. 1998, 65-88.

⁴⁴⁷ William Camden, *Camden's Britannia*. Trans. and Ed. Edmund Gibson. London: F. Collins. 1695, 167.

⁴⁴⁸ *Sussex Coroners' Inquests 1558-1603*. Editor R.F. Hunnisett. Kew: PRO Publications. 1996, 13-14.

⁴⁴⁹ *Ibid.* page 37.

⁴⁵⁰ William Camden, *Camden's Britannia*. Trans. and Ed. Edmund Gibson. London: F. Collins. 1695, 174, fn 13.

only passable at low tide. It seems likely that the river had changed its course since the bridge was built. At some stages of the tide the bridge must have obstructed river traffic.⁴⁵¹

The estuary of the Exe was obstructed by a weir at some date between 1317 and 1327.⁴⁵² Camden wrote:

But Exeter received not so great damage at these enemies hands, as it did by certaine dammes, which they call *Wears*, that Edward Courtney Earle of Denshire, taking high displeasure against the Citizens, made in the river *Ex*, which stop the passage so that no vessel can come up to the Citie; but since that time all merchandize is carried by land from Topesham three miles off. And albeit it hath beene decreed by Act of Parliament, to take away these Weares, yet they continue there still.⁴⁵³

He noted that the river was divided into many channels at Exeter, presumably for the mills. He also wrote that in the Dart ‘grit and sand out off the Tin-mines little by little choke up the channel’ and that below Totnes there were whole heaps of sand obstructing the river.⁴⁵⁴ It is not known if the river was usable before this sediment was deposited in the river.

Ranulph Higden, (c.1280-c.1363) a local man, wrote that on the Dee there was considerable trade ‘not only by importing but by return’.⁴⁵⁵ However Camden records that by 1586 the sea had ‘withdrawn it self’ from Chester so that the city had lost its harbour. This is likely to have reduced the trade upstream on the Dee.

⁴⁵¹ *The Itinerary of John Leland in or about the years 1535-1543. Volume One.* Editor Toulmin Smith, Lucy. Carbondale: Southern Illinois University Press. 1964, 243-4.

⁴⁵² *Local Customs Accounts of the Port of Exeter. 1266-1321.* Editor Maryanne Kowaleski. Devon and Cornwall Record Society. New Series, Volume 36. 1993, 1-7.

⁴⁵³ William Camden, *Britain*. Trans. Philemon Holland. London: Joyce Norton, and Richard Whitaker. 1637, 205, 203.

⁴⁵⁴ *Ibid.* page 210, 211.

⁴⁵⁵ William Camden, *Camden's Britannia*. Trans. and Ed. Edmund Gibson. London: F. Collins. 1695, 554.

4.6.6 Conclusion

It was shown in Part 2 that the physical usability of rivers varied during the period 1189-1600. To this may now be added the fact that some rivers became obstructed by bridges, fords or weirs and others became inaccessible from the sea.

The dates at which the first record of an obstruction on each river, which has been found, are listed in Table 18.

Table 18. Date of First Obstruction of Rivers.

<u>Date</u>	<u>Total</u>	<u>Weirs&Mills</u>	<u>Weeds Dirt etc</u>	<u>Fishing</u>
1200-1249	2	1		1
1250-1299	14	9	3	2
1300-1349	13	6	3	4
1350-1399	14	5	4	5
1400-1449	4	2	2	
1450-1499	2	1		1
1500-1549	5	4	1	
1550-1599	4	2	1	1

For the period 1200-1249 it is likely that many records are missing. In the 16th century complaints which were made would have been considered by the Commissioners of Sewers, most of whose records have been lost. The nature of the records makes it very difficult to know if the obstruction caused inconvenience or the total obstruction of the waterway and also normally it is not known if, or when, the obstruction was removed. Some reports referred to one river, others to many. Some complaints referred to more than one obstruction.

Throughout the period weirs and mills caused about half the complaints, and lack of maintenance about a quarter. Jones wrote that ‘commissions were also created to examine waterways, or stretches of waterways, where no evidence has been found that

open navigation even existed.⁴⁵⁶ This may be because the relevant records of use are missing. If Jones is suggesting that commissions were set up to investigate obstructions on rivers which had never before been used then this has interesting implications. Firstly it would imply that those making the claim considered that all physically usable rivers could be used legally. There would have been no advantage in obtaining the clearance of a river which could not then legally be used. Secondly it would imply that use of the rivers was so important that some people were willing to commit perjury to have the obstructions removed. Unfortunately Jones gives no examples of such commissions.

The reign of Edward II (1307-27) has been described as the beginning of almost two centuries of intermittent anarchy.⁴⁵⁷ There many reasons for this anarchy, including the absence of the king on military campaigns, the corruption of officials, the private armies of the magnates and the ineffectiveness of the commissions compared with the earlier Courts of Eyre.⁴⁵⁸ The lawlessness is shown both in the court records⁴⁵⁹ and the literature of the time.⁴⁶⁰ The anarchy did not suddenly start or finish. The Great Ouse downstream of Huntingdon was deliberately, permanently and illegally obstructed in about 1275 and the Exe at Topsham in 1317. It seems that some magnates used the opportunity to obstruct some of the rivers with weirs and fishing equipment. What is not known is how successful the authorities were in removing these obstructions.

The above table shows that there are many more records of complaints for the period 1250 to 1400 than before and after this period. The starting date is about when the records start to become available. The end date is harder to explain. The absence of later complaints may be due to the humble boatmen being driven out of business by the land-owners and so no longer complaining, or the realisation that justice was no longer available, or the various parties arriving at appropriate ways of working together, or just the loss of records or a combination of some, or all, of these reasons.

⁴⁵⁶ E. Jones, 'River Navigation in Medieval England.' *Journal of Historical Geography*. Vol. 26. 2000, 70.

⁴⁵⁷ Alan Harding, *The Law Courts of Medieval England*. London: George Allen & Unwin Ltd. 1973, 95.

⁴⁵⁸ John Bellamy, *Crime and Public Order in England in the Later Middle Ages*. London: Routledge & Kegan Paul. 1973.

⁴⁵⁹ Richard W. Kaeuper, *War, Justice, and Public Order*. Oxford: Clarendon Press. 1988.

⁴⁶⁰ Richard W. Kaeuper, 'An Historian's Reading of "The Tale of Gamelyn."' *Medium aevum*. Vol. 52. (1983), 51-62.

Some historians have emphasised the fact that some rivers were obstructed by powerful landowners as on the Exe and Great Ouse. They have perhaps underemphasised the extent to which such people were criticised for their actions even two or three hundred years later.⁴⁶¹

⁴⁶¹ Exe. William Camden, *Britain*. Trans. Philemon Holland. London: Joyce Norton, and Richard Whitaker. 1637, 205, 203.

Great Ouse. John Speed, *Theatre of the Empire of Great Britaine, Parts III*. (1st Edition 1611.) Facsimile London: Phoenix House Limited. 1953-4.

Chapter 4.7 Actual Use

Historians do not study the past; they study evidence of the past. The assessment of probabilities is essential in the historian's task for 'good' evidence is often lacking. Although some 'facts' have such a high probability that they are normally considered to be certainties,⁴⁶² the calculation of lesser orders of probability is an exercise which involves the assessment of the evidence and the application of probability theory.⁴⁶³ Fogel and Elton have criticised historians who lose themselves in details, piling fact upon fact without adding to the understanding of the actions which they seek to study.⁴⁶⁴ It is necessary to step back from the individual facts and to seek to establish the extent of river use.

Some authorities consider that the evidence needed to establish that a fact is proved on the balance of probabilities needs to be stronger when the event is thought to be unlikely compared with when the event is thought to be likely.⁴⁶⁵ Thus those historians who think that transport by water was common may consider that usability alone establishes a probability of use, those who consider that transport by water was uncommon may seek more evidence. Such subjective differences of opinion are difficult to avoid.

Ideally one would find the upper limit of usability, note the upper limit of historic records and then consider the probability of the use the section of the river between these two places. Regrettably this method cannot be applied. It has been shown that on the Thames the upper limit of usability varied from the source to Staines, 135 miles downstream, depending on the season of the year and type of vessel being used. The upper limit of historic recorded use has moved steadily upstream over the last hundred years. Historic usability and historic use probably did not correspond exactly. On a few days of the year the extreme upper reaches of some rivers, when in flood, were physically usable but there is no reason to assume that they were used.

⁴⁶² Richard Eggleston, *Evidence, Proof and Probability*. London: Weidenfield and Nicolson. 1978.

⁴⁶³ Philip R. Davies, *Memories of Ancient Israel*. Louisville: Westminster John Knox Press. 1989, 136.

⁴⁶⁴ Robert William Fogel and G.R. Elton, *Which road to the past?* New Haven and London: Yale University Press. 1983, 125.

⁴⁶⁵ *Re H and Others*. [1996] AC 563, 568-87.

Christopher Allen, *Practical Guide to Evidence*. 3rd Edition. London: Cavendish Publishing Limited. 2004, 133-135.

Martin Hannibal and Lisa Mountford, *The Law of Criminal and Civil Evidence*. London: Longman. 2002, 457-461.

The length of river used historically is known to be greater than the length for which there are historic records of use. It is not possible to establish which additional sections were used. However the implication of Cole's work on the place-name evidence for water transport seems not to have been fully appreciated.⁴⁶⁶ She suggested that an *ēa-tūn* had some special function relating to the river and that because most are located on the upper reaches of rivers the most plausible reason for the name is that the community was required to keep the river open for navigation. It seems likely that if thirty places were named *ēa-tūn* because of their responsibility for maintaining a river for transport other communities would also have had the same responsibility. The *ēa-tūn* names are widely spread within a circle through Sussex, Norfolk, North Yorkshire and the Welsh border region with four in Yorkshire, East and West Eaton and Great and Little Ayton, on streams which are now small. Their existence seems to imply that on many rivers the local community thought that the limit of historic usability was not acceptable and that increasing the usable length of the river was economically justifiable. If this is correct then river use, in general, extended well beyond the present limits of usability. Other evidence has not been found to support Cole's work which, it seems, must be considered to be provisional.

It has been shown that the distribution of logboat finds indicates that the use of boats was widespread. The fact that three people died in fatal accidents involving boats on the Wear in seven years⁴⁶⁷ and that Huntingdonshire Eyre rolls show that 22 people died in Huntingdonshire in 17 years⁴⁶⁸ indicates that the use of some rivers was intensive. The Fens have been described as the motorway of the medieval period.⁴⁶⁹ While most people travelled on horseback the fact that a lawyer went from Bishop Stortford to London by water indicates that water transport could be a more convenient mode of transport.⁴⁷⁰ It was shown that taxable wealth appears to have been higher where water transport was available and lower where it was not. Counties with good river transport sent supplies to

⁴⁶⁶ Ann Cole, 'The Place-Name Evidence for Water Transport in Early Medieval England.' In Blair, 2007, 55-84.

⁴⁶⁷ 'Two Thirteenth-Century Durham Assize Rolls: Durham Eyre Roll, 27 Henry III.' Editor K.E. Bayley. In *Miscellanea* Vol. II. Surtees Society. 1916.

⁴⁶⁸ Anne Reiber DeWindt and Edwin Brezette DeWindt, *Royal Justice and the Medieval English Countryside*. Toronto: Pontifical Institute of Mediaeval Studies. 1981, 65 ff.

⁴⁶⁹ Paul Spoerry, 'Town and Country in Medieval Fenland.' In Kate Giles and Christopher Dyer, Eds. *Town and Country in the Middle Ages*. The Society for Medieval Archaeology Monograph 22. 2007, 101.

⁴⁷⁰ Jacqueline Cooper, *Bishop's Stortford*. Chichester: Phillimore. 2005, 27.

the army in Scotland and France, those with poor river transport did not.⁴⁷¹ It was claimed that the blockage of a relatively small river, the Eastern Rother, caused ‘great damage to the king’ due to the reduced traffic at Etchingham.⁴⁷² There are several records of violence being used to remove obstructions to navigation.⁴⁷³ When the responsibility for the maintenance of rivers was unclear and the river became blocked there could be quick recourse to the courts.⁴⁷⁴ The sections of rivers upstream of major towns were used as well as those downstream.⁴⁷⁵ Thus it seems that the usable river network was extended, extensive and improved, and that in places it was intensively used, convenient, popular and apparently increased wealth.

‘There are of course some relevant facts which a judge or jury is entitled to know, without any evidence being called. These are facts of such notoriety that everyone is presumed to be aware of them.’⁴⁷⁶ Possibly one such fact used to be that most rivers were not used historically. Now possibly this needs to be reversed since it seems that most rivers were used historically.

⁴⁷¹ John Langdon, ‘Inland water transport in medieval England.’ *Journal of Historical Geography*, Vol. 19, 1. (1993), 1-11.

⁴⁷² Calendar of Patent Rolls, 1348-50, 80, 177-78.

⁴⁷³ See Part 4, Chapter 6.

⁴⁷⁴ Ant. See Appendix A. 1360.

⁴⁷⁵ eg. Oxford, Shrewsbury, Norwich, Nottingham, Canterbury.

⁴⁷⁶ Richard Eggleston, *Evidence, Proof and Probability*. London: Weidenfeld and Nicolson. 1978, 120.