

Appendix B

Mean Discharge Estimations

The purpose of Appendix B is to investigate under what conditions it is acceptable to estimate the value of mean discharge on the assumption that discharge is proportional to catchment area. Data have been taken from *Hydrological Data UK*.

Data have been selected from the following areas:-

1. Southern Region - the catchments used in determining the discharge at the mills in East Sussex.
2. The Wye Catchment - the catchments used in determining the discharge at the mills in the Lower Wye valley.
3. The North West Region - relatively high precipitation.
4. The North East Region - high variability of precipitation between source and outlet.
5. The Anglian Region - relatively low precipitation.

- | | |
|-----------|---|
| Line 1&2. | <ol style="list-style-type: none"> 1. River. 2. Place. 3. Catchment Area. (km²) 4. Mean annual runoff. (mm) 5. Maximum annual runoff. (mm) 6. Minimum annual runoff. (mm) 7. Recorded Mean Discharge (m³ s⁻¹) |
| Line 3. | <ol style="list-style-type: none"> 1. Ratio of increase in area. 2. Ratio of estimated mean discharge to recorded mean discharge. |

$$\text{Estimated Mean Discharge} = \text{Mean Discharge at A} \times \frac{\text{Catchment Area at B}}{\text{Catchment Area at A}}$$

Sites at which the estimated discharge is not within the range 80% - 125% of the recorded discharge are printed in italics.

‘Area’ indicates that the ratio of the catchment areas was greater than 2.

‘R.O.’ indicates that the ratio of the runoff’s at the two points is greater than 125%.

‘Abs’ indicates that there is artificial abstraction or augmentation on the river.

‘Eph’ indicates that the river is ephemeral.

Southern Region

Darent.	Otford.	100	186	460	80	0.59	
	Lullingstone.	118	176	351	61	0.66	
		1.18					1.05
	<i>Hawley.</i>	<i>191</i>	<i>100</i>	<i>198</i>	<i>17</i>	<i>0.61</i>	
		<i>1.91</i>					<i>1.75</i> Abs.
'Base discharges were greatly reduced by increasing ground water abstractions.'							
Medway.	<i>Weir Wood Res.</i>	<i>27</i>	<i>195</i>	<i>312</i>	<i>88</i>	<i>0.17</i>	
	<i>Chafford Weir.</i>	<i>255</i>	<i>381</i>	<i>626</i>	<i>161</i>	<i>3.08</i>	
		<i>9.81</i>					0.52 Area
	<i>Teston.</i>	<i>1256</i>	<i>278</i>	<i>562</i>	<i>150</i>	<i>11.09</i>	
		<i>4.93</i>					<i>1.37</i> Abs.
'Small net export.'							
Great Stour.	Wye.	230	303	475	166	2.21	
	Horton.	345	289	483	151	3.16	
		1.50					1.05
Cuckmere.	Cowbeech.	19	358	872	84	0.21	
	Sherman Bridge.	134	319	691	105	1.36	
		7.05					1.09
Ouse.	Gold Bridge.	181	387	721	163	2.22	
	Barcombe Mills.	396	321	652	123	4.03	
		2.19					1.21
Arun.	Alfoldean.	139	394	645	134	1.74	
	Pallingham Quay.	379	323	717	111	3.88	
		2.73					1.22
Rother.	Princes Marsh.	37	428	837	244	0.50	
	Iping Mill.	154	452	858	204	2.21	
		4.16					0.94
	Hardham.	346	461	750	226	5.05	
		2.25					0.98
Ems.	<i>Walderton.</i>	<i>41</i>	<i>56</i>	<i>146</i>	<i>0</i>	<i>0.07</i>	
	<i>Westbourne.</i>	<i>58</i>	<i>239</i>	<i>631</i>	<i>39</i>	<i>0.44</i>	
		<i>1.41</i>					0.22 Eph.
A ephemeral river over much of its length.							
Itchen.	Easton.	237	562	762	384	4.22	
	Highbridge.	360	465	670	317	5.30	
		1.52					1.21
	Riverside Park.	415	410	515	321	5.40	
		1.15					1.13

Test.	Chilbolton.	453	379	484	253	5.45	
	Broadlands.	1040	334	487	200	11.01	1.14
		2.30					
Eastern Yar.	Budbridge.	22	300	470	226	0.21	
	Alverstone Mill.	57	260	311	164	0.47	1.16
		2.59					
	Burnt House.	60	214	371	123	0.41	1.21
		1.05					

Welsh Region Wye Catchment

Wye.	<i>Pant Mawr.</i>	27	1927	2439	1351	1.66	
	<i>Rhayader.</i>	167	1169	1613	909	6.18	1.66 Area
		6.18					
	Ddol Farm.	174	1212	1918	780	6.69	0.96
		1.05					
	<i>Erwood.</i>	1282	914	1400	536	37.16	1.33 Area
		7.37					
	Belmont.	1896	788	1284	453	47.37	1.16
		1.48					
	<i>Redbrook.</i>	4010	582	976	314	74.06	1.35 Area
		2.11					
Ithon.	Llandewi.	111	741	996	480	2.62	
	Disserth.	358	717	960	444	8.14	1.04
		3.23					
Irfon.	Abemant.	73	1463	1917	927	3.38	
	Climery.	244	1321	2074	795	10.23	1.10
		3.34					
Lugg.	<i>Byton.</i>	203	624	877	360	4.02	
	<i>Butts Bridge.</i>	371	478	776	263	5.62	1.31 R.O.
		1.83					
	Ludwardine.	886	394	691	175	11.07	1.21
		2.39					
Frome.	Bishops Frome.	78	284	470	130	0.70	
	Yarkhill.	144	261	406	147	1.19	1.09
		1.85					

North West Region

Douglas.	<i>Rivington Res.</i>	39	307	800	119	0.38	
	<i>Wigan.</i>	55	669	973	426	1.17	0.46 Abs.
		1.41					
	Wanes Blades Br.	198	636	1018	495	3.99	1.06
		3.60					

There was apparently extraction from the Rivington Reservoir.

Ribble.	Arnford.	204	1125	1520	710	7.28	
	Henthorn.	456	948	1471	613	13.71	
		2.24					1.19
	Jumbles Rock.	1053	1004	1452	617	33.51	
		2.31					0.94
	Samlesbury.	1145	915	1381	598	33.23	
		1.09					1.10
Darwen.	Ewood.	39	953	1299	680	1.19	
	Blue Bridge.	128	1007	1436	696	4.09	
		3.28					0.95
Wyre.	Garstang.	114	924	1475	571	3.34	
	St. Michaels.	275	741	1217	448	6.46	
		2.41					1.25
Lune.	Lunes Bridge.	141	1391	1881	865	6.24	
	Killington.	219	1456	2171	931	10.11	
		1.55					0.96
	<i>Caton.</i>	983	1142	1621	732	35.61	
		4.49					1.27 Area
	Halton.	995	1069	1474	778	33.71	
		1.01					1.07
Kent.	Burneside.	74	1678	2132	1100	3.92	
	Sedgwick.	209	1351	1923	905	8.96	
		2.82					1.24
Leven.	<i>Newby Bridge.A.</i>	247	1773	2788	1174	13.89	
	<i>Newby Bridge.B.</i>	241	1634	1934	1208	12.49	
The different values are due to the different dates of operation of the gauges. Newby Bridge A 1939 – 2000 and Newby Bridge B 1970 -1976.							
Duddon.	Ulpha.	48	2055	2822	1620	3.12	
	Duddon Hall.	86	1776	2210	1234	4.82	
		1.79					1.16
<i>Ehen.</i>	<i>Bleach Green.</i>	44	1768	2752	1173	2.48	
	<i>Braystones.</i>	125	1295	1794	995	5.16	
		2.84					1.37 Abs.
'Low discharges dominated by compensation from Ennerdale Water.'							
Derwent.	Portinscale.	235	1620	2279	946	12.07	
	Ouse Bridge.	363	1457	2125	825	16.77	
		1.54					1.11
<i>Cocker.</i>	<i>Scalehill.</i>	64	1834	3218	1216	3.72	
	<i>Southwaite Br</i>	117	1439	2017	848	5.32	
		1.83					1.28 R.O.

Eden.	<i>Kirkby Stephen.</i>	69	1168	1646	763	2.57	
	<i>Temple Sowerby</i>	616	738	1044	444	14.42	
		8.93					1.59 Area
	Warwick Bridge.	1367	785	990	459	34.04	
		2.22					0.94
	Sheepmount.	2286	716	1000	389	51.91	
		1.67					1.10
Eamont.	<i>Pooley Bridge.</i>	145	1711	2357	861	7.87	
	<i>Udford.</i>	396	1208	1955	550	15.18	
		2.73					1.42 Area

North East

Coquet.	Bygate.	59	637	889	352	1.20	
	Rothbury.	346	519	741	264	5.69	
		5.86					1.24
	Morwick.	570	470	664	206	8.50	
		1.65					1.10
North Tyne.	Kielder temp.	27	952	1256	642	0.81	
	Uglydub.	241	1012	1270	798	7.75	
		8.90					0.93
	Tarset.	285	886	1220	537	8.01	
		1.18					1.14
	<i>Reaverhill.</i>	1007	657	906	354	20.99	
		3.53					1.34 Area
	Barrasford.	1044	537	653	486	17.78	
		1.04					1.22
South Tyne.	Alston.	118	1128	1751	864	4.24	
	Featherstone.	322	1039	1324	703	10.61	
		2.73					1.09
	<i>Haydon Bridge.</i>	751	771	1073	489	18.37	
		2.33					1.35 Area
Tyne.	<i>Riding Mill.</i>	2174	499	643	387	34.41	
	<i>Bywell.</i>	2176	653	971	375	45.06	

The different values are due to the different dates of operation of the gauges. Riding Mill 1989-2000, Bywell 1956-2000.

Derwent.	Eddys Bridge.	118	284	742	95	1.06	
	Rowlands Gill.	242	332	726	146	2.55	
		2.05					0.85
Ouse Burn.	<i>Woolsington.</i>	9	228	413	147	0.06	
	<i>Crag Hall.</i>	55	167	295	120	0.29	
		6.11					1.26 Area

Wear.	<i>Burnhope Res.</i>	20	903	1389	455	0.59	
	<i>Stanhope.</i>	172	681	1029	404	3.71	
		8.60					1.37 Area
	Witton Park.	455	544	799	349	7.84	
		2.65					1.25
	Sunderland Br.	658	541	822	294	11.28	
		1.45					1.01
	Chester le Street.	1008	460	693	271	14.70	
		1.53					1.18
Browney.	Lanchester.	45	392	585	209	0.55	
	<i>Burn Hall.</i>	178	302	491	139	1.71	
		3.96					1.27 Area
Tees.	<i>Cow Green Res.</i>	58	1547	2012	901	2.86	
	<i>Dent Bank.</i>	217	1114	1517	776	7.68	
		3.74					1.39 Area
	Middleton.	242	1163	1468	794	8.93	
		1.12					0.96
	<i>Barnard Castle.</i>	509	858	1238	558	13.85	
		2.10					1.36 Area
	<i>Broken Scar.</i>	818	651	925	362	16.89	
		1.60					1.32 Abs.
	<i>Low Moor.</i>	1264	469	780	284	18.79	
		1.55					1.39 Abs.
‘Augmentation by Keilder Transfer in drought years.’							
Skerne.	Bradbury.	70	171	301	50	0.38	
	Preston le Skerne.	147	177	324	57	0.83	
		2.10					0.96
	South Park.	250	199	336	75	1.58	
		1.70					0.89
Leven.	<i>Easby.</i>	15	405	650	177	0.19	
	<i>Leven Bridge.</i>	196	297	540	94	1.85	
		13.06					1.34 Area

East Anglia

Bure.	Ingworth.	164	210	285	144	1.10	
	Horstead Mill.	313	217	278	160	2.15	
		1.91					0.98
Wensum.	Fakenham.	162	169	264	79	0.87	
	Swanton Morley.	398	208	297	109	2.62	
		2.46					0.82
	Cotessey Mill.	571	220	318	105	3.98	
		1.43					0.94

Waveney.	Billingsford Br.	149	155	281	41	0.73	
	Needham Mill.	370	150	287	46	1.75	
		2.48					1.04
	<i>Ellingham Mill.</i>	670	27	38	7	0.57	
		1.81					5.55 Abs.

‘Between 1972 and 1996, when the Ellingham Mill gauge was operating, there was very considerable extraction from above the gauge.’

Gipping.	Stowmarket.	129	150	279	36	0.61	
	Bramford.	298	122	211	28	1.15	
		2.31					1.22
	Constantine Wr.	311	137	223	92	1.35	
		1.04					0.89
Stour.	Kedington.	76	351	8360	156	0.85	
	Westmill.	224	186	305	90	1.32	
		2.95					1.90
	Lamarsh.	480	158	276	65	2.41	
		2.14					1.17
	Langham.	578	160	279	78	2.94	
	1.20					0.99	
	<i>Stratford St Mary.</i>	844	115	267	37	3.09	
		1.46					1.39 R.O.
Brett.	Cockfield.	26	148	333	16	0.12	
	Hadleigh.	156	135	257	27	0.67	
		6.00					1.07
Colne.	Poolstreet	65	130	245	14	0.27	
	Earls Colne.	154	142	287	48	0.69	
		2.36					0.93
	Lexden.	238	136	242	48	1.03	
	1.55					1.04	
Blackwater.	Stisted.	139	184	279	131	0.81	
	Appleford Bridge.	247	161	246	105	1.26	
		1.78					1.14
	Langford.	337	128	248	37	1.37	
	1.36					1.25	
Chelmer.	Churchend.	73	153	292	39	0.35	
	Felstead.	132	159	232	56	0.67	
		1.81					0.94
	Springfield.	190	171	285	58	1.03	
	1.44					0.94	

Discussion

It is stated in *Hydrological Data UK 1996-2000* that

River discharges in the United Kingdom are often difficult to measure precisely – particularly in flood or drought condition – and can be substantially affected by artificial influences. These influences range from a large diminution in discharges caused by a major abstraction immediately upstream of the gauging station to the often subtle impact of land use change on river discharge patterns. ... An appreciation of these effects is necessary to exploit the archived data most effectively.

Estimates of naturalised river discharges (the discharge which would occur if there were no abstraction or augmentation of discharge) are slowly becoming available. They would be more suitable for work on the historic use of the rivers. However they are difficult to access and have not been used in this thesis.

When estimating areas of catchments it has been assumed that the hydrologic divide is mid-way between rivers. Topographic and phreatic (hydrological) divides have not been used.

The above data implies that where the following conditions were observed the estimated discharge was within 25% of the observed discharge provided:-

1. The ratio of the catchment areas is less than 2.
2. There is no significant abstraction or augmentation of the discharge.
3. The river is not ephemeral.
4. The variation along the river in precipitation is not so great that the runoff varies by 25%.

The annual variation of discharge of rivers varies. The ratio of the mean runoff to the maximum and minimum runoffs as given in the above data indicate that it is always greater than 25%. It is thus considered appropriate to estimate discharges providing the above four conditions apply.

Appendix C

Transport of Stone for Cathedrals and Colleges

This appendix is an initial listing of the form of transport used and distances over which stone was transported when the pre-17th century cathedrals and colleges were constructed. Records are only included for significant amounts of stone. This may be taken to be more than 20 tonnes or 20 horse-drawn cart loads.

In the table where part of the route was by one form of transport and part by another the relative distances are entered in each column. Where the first and last parts of the route were both by land or both by river the two separate distances are given with a plus sign between. Distances of less than one mile are ignored.

Distances by sea are approximate. Distances by river have been measured along the river. Distances by land are the straight distance since the land routes are in general not known. Where a type of stone came from a region rather than one quarry an average distance has been given. Where there is doubt as to which form of transport was used alternatives are given in italics.

The reuse of Roman stone as at Canterbury,¹¹¹¹ Carlisle,¹¹¹² London,¹¹¹³ Peterborough and Ripon¹¹¹⁴ has not been listed.

The range of dates used in this appendix is from 1080 to 1600, wider than in the remainder of the thesis. However it is considered that no rivers went out of use between 1080 and 1189.

Only one reference has been given for each source of stone.

Particular Notes

A. Bethersden is six miles west of Ashford where there is a usable river with mean discharge of $2.2 \text{ m}^3 \text{ s}^{-1}$. It is not known if the stone was transported from Ashford to Canterbury by land or river.

Also it is not known how the stone was taken to Rochester. Bethersden is close to the source of the Beult. The stone may have been taken by land to Headcorn or Yalding or Maidstone and then by river or it may have been taken the whole distance by land.

B. Merstham and Reigate are both close to the Mole. There is documentary evidence that for use in the London area the stone was moved from Reigate to Battersea, stored there and then distributed to many places in London normally by water transport. Stone for Canterbury was also supplied from Battersea. Tatton Brown states that 'Battersea

¹¹¹¹ Francis Woodman, *The Architectural History of Canterbury Cathedral*. London: Routledge & Kegan Paul. 1981.

¹¹¹² Nikolaus Pevsner and Priscilla Metcalf, *The Cathedrals of England. Middle, Eastern and Northern England*. Harmondsworth: Viking. 1985, 41.

¹¹¹³ Sir William Dugdale, *The History of St. Paul's Cathedral in London*. London: Tho. Warren. 1658, 6.

¹¹¹⁴ Tim Eaton, *Plundering the Past. Roman Stonework in Medieval Britain*. Stroud: Tempus Publishing Ltd. 2000, 127.

lies about 24-5 km due north of the Reigate quarry area, and all the stone must have been carted this distance by horse- (oxen-) drawn carts over the North Downs.¹¹¹⁵ Local boaters consider that it would have been possible to transport the stone down the Mole and Thames to Battersea.¹¹¹⁶ This would have been possible in winter with the river having a discharge in excess of $3 \text{ m}^3 \text{ s}^{-1}$. It would not normally have been possible in summer when part of the flow of the river is underground. There are few other records of the storage of stone for later distribution. It is possible that stone was stored because the transport to Battersea by water was only seasonal.

C. The Earl of Devon built a weir across the Exe between 1317 and 1327. Previously the stone may have been taken closer to the cathedral by boat.

D. It is assumed that Kentish Rag came from near Maidstone and that it was transported by river.¹¹¹⁷

E. The Taynton group of quarries are close to the Windrush. It is known that some of the stone was taken direct to Oxford by land and that some was taken to Eynsham by land and then to Oxford by river.¹¹¹⁸ It is not known whether some of the stone was transported on the Windrush. However with a mean discharge of $2.4 \text{ m}^3 \text{ s}^{-1}$ and gradient 1.2 it seems that this would have been possible especially in winter.

F. It is assumed that stone was transported upstream on the Salisbury Avon.

G. The Tisbury quarries are adjacent to the Nadder. With a mean discharge of $2.5 \text{ m}^3 \text{ s}^{-1}$ and gradient 2 m km^{-1} boats could have been used to transport the stone to Salisbury. There are now no building accounts at Salisbury from before the 15th century.¹¹¹⁹

H. The evidence in Appendix A shows that the Itchen was probably usable when the cathedral was built.

¹¹¹⁵ Tim Tatton-Brown, 'The Quarrying and Distribution of Reigate Stone in the Middle Ages.' *Medieval Archaeology*. Vol. XLV. (2001), 189-202, 194.

¹¹¹⁶ Kevin East. Personal comment. 4/8/08.

¹¹¹⁷ Rod Ugear, 'Underground Ragstone Quarries in Kent. A Brief Overview.' *Archaeologia Cantiana*. Vol. CCXVII. (2007), 407-419.

¹¹¹⁸ W.J. Arkell, *Oxford Stone*. London: Faber & Faber. 1947, 61.

¹¹¹⁹ Tim Tatton-Brown, 'The Building Stone for Salisbury Cathedral.' In 'Building with Stone in Wessex over 400 Years.' *The Hatcher Review*. Vol. V, Number 45. 1998, 39-47, 43.

Cathedral Colleges	Source of Stone	Sea Miles	River Miles	Land Miles	Note
Bristol.	Bath. ¹¹²⁰		19		
	Dundry. ¹¹²¹			5	
	Felton. ¹¹²²			7	
	Purbeck. ¹¹²³	420			
Canterbury.	Flint. ¹¹²⁴	Local.			
	Bethersden. ¹¹²⁵	Either or.		20 6	A
	Caen. ¹¹²⁶	290	16 22	6 2	
	Merstham. ¹¹²⁷	Either or.	60 106	16+5 5	B
	Purbeck. ¹¹²⁸	220	22	2	
	Quarr. ¹¹²⁹	140	22	2	
	Tournai. ¹¹³⁰	40	50+22	2	
Carlisle.	Wetherall. ¹¹³¹		5	5	
Chester.	Red sandstone. ¹¹³²	Local.			
Chichester.	Caen. ¹¹³³	170		2	
	Purbeck. ¹¹³⁴	80		2	
	Quarr. ¹¹³⁵	40		2	
	Sussex Marble. (Petworth) ¹¹³⁶			12	
	Ventnor. ¹¹³⁷	40			

¹¹²⁰ http://en.wikipedia.org/wiki/Bristol_Cathedral. 19/11/07.

¹¹²¹ *Ibid.*

¹¹²² *Ibid.*

¹¹²³ *Ibid.*

¹¹²⁴ North wall of the North Eastern Transept. Personal observation.

¹¹²⁵ Francis Woodman, *The Architectural History of Canterbury Cathedral*. London: Routledge & Kegan Paul. 1981.

¹¹²⁶ *Ibid.*

¹¹²⁷ 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, 70-82, 78-79.

¹¹²⁸ Francis Woodman, *The Architectural History of Canterbury Cathedral*. London: Routledge & Kegan Paul. 1981.

¹¹²⁹ *Ibid.*

¹¹³⁰ *Ibid.*

¹¹³¹ Alec Clifton-Taylor, *The Pattern of English Building*. London: Faber and Faber Limited. 1972, 126.

¹¹³² *Ibid.* 122.

¹¹³³ Tim Tatton-Brown, 'The Medieval Fabric.' In Mary Hobbs, Ed., *Chichester Cathedral*. Chichester: Phillimore. 1994, 25-46.

¹¹³⁴ *Ibid.*

¹¹³⁵ *Ibid.*

¹¹³⁶ *Ibid.*

¹¹³⁷ *Ibid.*

		Sea	River	Land	
Durham.	White Church. ¹¹³⁸	Local.			
	Durham. ¹¹³⁹	Local.			
	Frosterly. ¹¹⁴⁰		33		
	Purbeck. ¹¹⁴¹	600	24		
Ely.	Barnack. ¹¹⁴²		30	4	
	Purbeck. ¹¹⁴³	400	32		
Exeter.	Barley Stone. ¹¹⁴⁴	Local.			
	Beer. ¹¹⁴⁵	22		(3)	C
	Branscombe. ¹¹⁴⁶	21		(3)	
	Caen. ¹¹⁴⁷	170		(3)	
	Corfe. ¹¹⁴⁸	75		(3)	
	Heavitree. ¹¹⁴⁹	Local.			
	Portland. ¹¹⁵⁰	55		(3)	
	Purbeck. ¹¹⁵¹	67		(3)	
Salcombe Regis. ¹¹⁵²	20		(3)		
Gloucester.	Painswick. ¹¹⁵³			6	
Hereford.	Howe Caple. ¹¹⁵⁴		20		

¹¹³⁸ C.J. Stanks, *This Sumptuous Church*. London: SPCK. 1973, 6.

¹¹³⁹ *Ibid.*

¹¹⁴⁰ *Ibid.* page 22.

¹¹⁴¹ 'Marble pillars brought from far.' Sir William Dugdale, *The history of St. Paul's Cathedral in London, ... whereunto is added, a continuation ... to ... 1685. Likewise the northern cathedrals of York Durham and Carlisle*. London: Edward Maynard. 1716, 74.

'Brought by sea.' C.J. Stanks, *This Sumptuous Church*. London: SPCK. 1973, 14.

¹¹⁴² Eric Fernie, 'Architecture and Sculpture in the Norman Period.' In Peter Meadows & Nigel Ramsey Ed. *A History of Ely Cathedral*. Woodbridge: Boydell Press. 2003, 110.

¹¹⁴³ John Maddison, 'The Gothic Cathedral.' In Peter Meadows & Nigel Ramsey, Ed. *A History of Ely Cathedral*. Woodbridge: Boydell Press. 2003, 121.

¹¹⁴⁴ *The accounts of the Fabric of Exeter Cathedral. 1279-1353. Part 1 1279-1326*. Editor Audrey M. Erskine. *Devon and Cornwall Record Society*. New Series. Vol. 24, (1981), 9.

¹¹⁴⁵ Deryck Lomig, 'The Building Stone and its Quarry.' In Michael Swanton, *Exeter Cathedral*. Exeter: Dean and Chapter of the Exeter. 1991, 65.

¹¹⁴⁶ *The accounts of the Fabric of Exeter Cathedral. 1279-1353. Part 1 1279-1326*. Editor Audrey M. Erskine. *Devon and Cornwall Record Society*. New Series. Vol. 24, (1981), 9.

¹¹⁴⁷ *Ibid.*

¹¹⁴⁸ *Ibid.* 61.

¹¹⁴⁹ John Allan, 'A Note on the Building Stones of the Cathedral.' In Francis Kelly, Ed., 'Medieval Art and Architecture at Exeter Cathedral.' *The British Archaeological Association Conference Transactions*. Vol. XI for the year 1985. 1991, 15.

¹¹⁵⁰ *The accounts of the Fabric of Exeter Cathedral. 1279-1353. Part 1 1279-1326*. Editor Audrey M. Erskine. *Devon and Cornwall Record Society*. New Series. Vol. 24, (1981), 33.

¹¹⁵¹ Deryck Lomig, 'The Building Stone and its Quarry.' In Michael Swanton, *Exeter Cathedral*. Exeter: Dean and Chapter of the Exeter. 1991, 65.

¹¹⁵² *The accounts of the Fabric of Exeter Cathedral. 1279-1353. Part 1 1279-1326*. Editor Audrey M. Erskine. *Devon and Cornwall Record Society*. New Series. Vol. 24, (1981), 34.

¹¹⁵³ www.sherpavan.com. Accessed 29/2/2008.

¹¹⁵⁴ Herefordshire and Worcestershire Earth Heritage Trust, *Explore Hereford Cathedral*. Leaflet.

		Sea	River	Land	
Lichfield.	Red sandstone. ¹¹⁵⁵	Local.			
Lincoln.	Limestone. ¹¹⁵⁶	Local.			
	Alwalton. ¹¹⁵⁷	2	25+31		
	Purbeck. ¹¹⁵⁸	67	31		
London.	Caen. ¹¹⁵⁹	420			
	Reigate. ¹¹⁶⁰ Either		5	16	B
	or		51		
Norwich.	Barnack. ¹¹⁶¹	100	30+30	4	
	Caen. ¹¹⁶²	420	30		
	Clipsham. ¹¹⁶³	120	30+30	7	
	Purbeck. ¹¹⁶⁴	320	30		
Peterborough.	Alwalton. ¹¹⁶⁵			3	

¹¹⁵⁵ Richard Durman, *Ham Hill: portrait of a building stone*. Reading: Spire Books Ltd. 2006, 45-46.

¹¹⁵⁶ G.H. Varah, *Lincoln Cathedral Stone*. George Hugh Varah. 1987, 4.

¹¹⁵⁷ Jennifer S. Alexander, 'Building Stone from the East Midland Quarries: Sources, Transportation and Usage.' *Medieval Archaeology*. Vol. 39. (1995), 107-135, 112.

¹¹⁵⁸ G.H. Varah, *Lincoln Cathedral Stone*. George Hugh Varah. 1987, 4.

¹¹⁵⁹ John Stow, *A Survey of London. Volume 1. (1st Edition 1603)*. Oxford: Clarendon Press. 1908, 325.

¹¹⁶⁰ Tim Tatton-Brown, 'The Quarrying and Distribution of Reigate Stone in the Middle Ages.' *Medieval Archaeology*. Vol. XLV. (2001), 189-202, 189.

¹¹⁶¹ Eric Fernie, 'The Building: An Introduction.' In Ian Atherton *et al.* *Norwich Cathedral*. London: The Hambledon Press. 1996, 50.

¹¹⁶² *Ibid.*

¹¹⁶³ Francis Woodman, 'The Gothic Campaigns.' In Ian Atherton *et al.* *Norwich Cathedral*. London: The Hambledon Press. 1996, 170.

¹¹⁶⁴ *Ibid.*

¹¹⁶⁵ Jennifer S. Alexander, 'Building Stone from the East Midland Quarries: Sources, Transportation and Usage.' *Medieval Archaeology*. Vol. 39. (1995), 107-135, 119.

		Sea	River	Land	
Rochester.	Bethersden. ¹¹⁶⁶			22	A
	Boulogne. ¹¹⁶⁷	120			
	Caen. ¹¹⁶⁸	400			
	Maidstone. ¹¹⁶⁹		13		
	Reigate. ¹¹⁷⁰	Either	60	16	B
		or		106	
Salisbury.	Purbeck. ¹¹⁷¹	300			
	Taynton. ¹¹⁷²	Either	192	8	E
		or	200		
Wells.	Purbeck. ¹¹⁷³		45		F
	Tisbury. ¹¹⁷⁴	Either		12	G
		or		12	
Wells.	Chilcote. ¹¹⁷⁵			3	
	Doulton. ¹¹⁷⁶			6	
	Keinton Mandeville. ¹¹⁷⁷		13		
	Street. ¹¹⁷⁸		6		

¹¹⁶⁶ Bernard C. Worssam, 'The Building Stones of Rochester Cathedral Crypt.' *Archaeologia Cantiana*. Vol. 120. (2000), 1-22, 18,19.

¹¹⁶⁷ Bernard C. Worssam 'The Building Stones of Rochester Castle and Cathedral.' In Tim Ayers and Tim Tatton-Brown, Eds. *Medieval Art, Architecture and Archaeology at Rochester*. The British Archaeological Association Conference Transactions. XXVIII. 2006, 238-249, 242.

¹¹⁶⁸ Rev. Grevile M. Livett, 'Early Norman Churches in and near the Medway Valley.' *Archaeologia Cantiana*. Vol. XX. (1893), 137 – 154, 153, 154.

¹¹⁶⁹ Bernard C. Worssam 'A Guide to the Building Stones of Rochester Cathedral.' *Friends of Rochester Cathedral*. 1994/5. Report for 1995. 23-33, 23.

¹¹⁷⁰ Rev. Grevile M. Livett, 'Early Norman Churches in and near the Medway Valley.' *Archaeologia Cantiana*. Vol. XX. (1893), 137 – 154, 153, 154.

¹¹⁷¹ Bernard C. Worssam, 'The Building Stones of Rochester Cathedral Crypt.' *Archaeologia Cantiana*. Vol. 120. (2000), 1-22, 18,19.

¹¹⁷² Tim Tatton-Brown, 'The Building Stone for Salisbury Cathedral.' In 'Building with Stone in Wessex over 4000 years.' *The Hatcher Review*. Vol. V. No 45. (1998), 39-47, 45.

¹¹⁷³ *Ibid.*

¹¹⁷⁴ Tim Tatton-Brown, 'The Archaeology of the Spire of Salisbury Cathedral.' In Laurence Keen and Thomas Cocke, *Medieval Art and Architecture at Salisbury Cathedral*. The British Archaeological Association Conference Transactions. Vol. XVII. 1996, 63.

¹¹⁷⁵ Warwick Rodwell, *Wells Cathedral Excavations and Structural Studies. 1978-93*. English Heritage Archaeological Report 21. 2001.

¹¹⁷⁶ *Ibid.*

¹¹⁷⁷ *Ibid.*

¹¹⁷⁸ *Ibid.*

		Sea	River	Land	
Winchester.	Bath. ¹¹⁷⁹	480	20+16		H
	Beer. ¹¹⁸⁰	100	16		
	Caen. ¹¹⁸¹	200	16		
	Carr. ¹¹⁸²	35	16		
	Purbeck. ¹¹⁸³	60	16		
	Quarr. ¹¹⁸⁴	16	16		
	Selbourne. ¹¹⁸⁵			20	
Worcester.	Alveley. ¹¹⁸⁶		25		
	Bridgnorth. ¹¹⁸⁷		32		
	Cradley, Herefordshire. ¹¹⁸⁸			9	
	Cutsdean. ¹¹⁸⁹ Either			25	
	or		53	9	
	Highley. ¹¹⁹⁰		25		
	Hollington. ¹¹⁹¹		50		
	Holt. ¹¹⁹²			5	
	Ombersley. ¹¹⁹³			5	
	Purbeck. ¹¹⁹⁴	420	30		
Shelsey. ¹¹⁹⁵			9		
York.	Tadcaster. ¹¹⁹⁶		15		

¹¹⁷⁹ Tim Tatton-Brown, 'Building Stones of Winchester Cathedral.' In John Crook, Ed., *Winchester Cathedral: Nine Hundred Years*. Chichester: Phillimore. 1993, 37 – 46.

¹¹⁸⁰ *Ibid.*

¹¹⁸¹ *Ibid.*

¹¹⁸² *Ibid.*

¹¹⁸³ *Ibid.*

¹¹⁸⁴ *Ibid.*

¹¹⁸⁵ *Ibid.* page 43.

¹¹⁸⁶ Canon Wilson, 'Some Notes on the Building Stones used in Worcester Cathedral, and on the quarries from which they were brought.' *Reports and Papers of the Associated Architectural Societies*. Vol. XXXI. (1911-12), 259-70, 267.

¹¹⁸⁷ R.D.H. Gem, 'Bishop Wulfstan and the Romanesque Cathedral Church of Worcester.' In *Medieval Art and Architecture at Worcester Cathedral*. The British Archaeological Association Conference Transactions. 1978, 21.

¹¹⁸⁸ Canon Wilson, 'Some Notes on the Building Stones used in Worcester Cathedral, and on the quarries from which they were brought.' *Reports and Papers of the Associated Architectural Societies*. Vol. XXXI. (1911-12), 259-70, 267.

¹¹⁸⁹ *Ibid.*

¹¹⁹⁰ *Ibid.* page 262.

¹¹⁹¹ *Ibid.* page 268.

¹¹⁹² *Ibid.* page 267.

¹¹⁹³ *Ibid.* page 267.

¹¹⁹⁴ *Ibid.* page 267.

¹¹⁹⁵ *Ibid.* page 263.

¹¹⁹⁶ Nikolaus Pevsner and Priscilla Metcalf, *The Cathedrals of England. Middle, Eastern and Northern England*. Harmondsworth: Viking. 1985, 335.

		Sea	River	Land	
Cambridge.	Barnack. ¹¹⁹⁷		c70	3	
	Barrington. ¹¹⁹⁸			7	
	Burwell. ¹¹⁹⁹		12		
	Cherryhinton. ¹²⁰⁰			4	
	Clipsham. ¹²⁰¹		c70		
	Eversden. ¹²⁰²			8	
	Haslingfield. ¹²⁰³			5	
	Isleham. ¹²⁰⁴		28		
	Ketton. ¹²⁰⁵		c70		
	Reach. ¹²⁰⁶		11		
Tadcaster. ¹²⁰⁷	98	60			
Weldon. ¹²⁰⁸		c60			
Oxford.	Barrington, Burford, Taynton. ¹²⁰⁹	All land.		18	E
		Part river.	8	12	
		All river.	23		
	Headington. ¹²¹⁰			3	
	Wheatley. ¹²¹¹			5	

¹¹⁹⁷ Donovan Purcell, *Cambridge Stone*. London: Faber and Faber. 1967, 34.

¹¹⁹⁸ *Ibid.* page 26.

¹¹⁹⁹ *Ibid.* page 26.

¹²⁰⁰ *Ibid.* page 26.

¹²⁰¹ *Ibid.* page 40.

¹²⁰² *Ibid.* page 26.

¹²⁰³ *Ibid.* page 26.

¹²⁰⁴ *Ibid.* page 26.

¹²⁰⁵ *Ibid.* page 50.

¹²⁰⁶ *Ibid.* page 26.

¹²⁰⁷ *Ibid.* page 39.

¹²⁰⁸ *Ibid.* page 39.

¹²⁰⁹ W.J. Arkell, *Oxford Stone*. London: Faber & Faber. 1947, 61.

¹²¹⁰ *Ibid.* page 46.

¹²¹¹ *Ibid.* page 37.

Appendix D**Rivers made navigable by Act of Parliament**

The data in this appendix is an amended version of an appendix to D.J.M. Caffyn, 'The Right of Navigation on Non-tidal Rivers and the Common Law'. Dissertation for the Degree of Master of Laws by Research, Kent Law School, The University of Kent. August 2004.

In this appendix every river for which a Navigation Act has been found is listed. The date of the first Act referring to each river is stated. Evidence of use is given in Appendix A or implied in the wording of the Act as stated below.

The two rivers which were made navigable but for which no prior evidence of use has been found are listed at the end. Seven rivers for which an Act was passed but on which no work was carried out, or the work was never completed, are also listed at the end.

Rivers for which evidence of prior use has been found

Adur.	1807. ¹²¹²	An Improvement Act implying previous use.
Aire.	1698. ¹²¹³	
Alcholme.	1767. ¹²¹⁴	
Arun.	1785. ¹²¹⁵	
Avon. Hampshire.	1664. ¹²¹⁶	
Avon. Warwick.	1751. ¹²¹⁷	An Act for the better regulating the Navigation.
Avon. Bristol.	1699. ¹²¹⁸ 1711. ¹²¹⁹	
Axe.	1802. ¹²²⁰	An Act to alter and improve.
Beverley Beck.	1726. ¹²²¹	
Blyth.	1757. ¹²²²	
Bourn Eau.	1781. ¹²²³	Preamble to the Act, 'An Act for improving the Navigation of the River called Bourn Eau.'
Brandon. (Little Ouse.)	1670. ¹²²⁴	
Bure.	1773. ¹²²⁵	
Calder and Hebble.	1698. ¹²²⁶	
Cam.	1702. ¹²²⁷	An Act for making the River more navigable.
Chelmer & Blackwater.	1766. ¹²²⁸	

¹²¹² 47 George III c 117.

¹²¹³ 10 William III c 25.

¹²¹⁴ 7 George III c 98.

¹²¹⁵ 25 George III c 100.

¹²¹⁶ 16&17 Charles II c 22.

¹²¹⁷ 24 George II c 39.

¹²¹⁸ 11 & 12 William III c 23.

¹²¹⁹ 10 Anne c 2.

¹²²⁰ 42 George III c 58.

¹²²¹ 13 George I c 4.

¹²²² 30 George II c 47.

¹²²³ 21 George III c 22.

¹²²⁴ 22 Charles II c 16.

¹²²⁵ 13 George III c 37.

¹²²⁶ 10 William III c 25 and 31 George II c 72.

¹²²⁷ 1 Anne s 2 c 11.

Colne.	1623. ¹²²⁹	
Dec.	1698. ¹²³⁰	
Derwent. Derbyshire.	1720. ¹²³¹	
Derwent. Yorkshire.	1702. ¹²³²	
Don.	1726. ¹²³³	
Eden.	1721. ¹²³⁴	Preface states previous use.
Exe.	1539. ¹²³⁵	
Frome.	1699. ¹²³⁶	Act for better preserving the Navigation.
Gipping.	1790. ¹²³⁷	
Humber.	1531. ¹²³⁸	
Idle.	1720. ¹²³⁹	
Irwell.	1720. ¹²⁴⁰	
Itchin.	1664. ¹²⁴¹	
Ivel.	1757. ¹²⁴²	
Kennet.	1715. ¹²⁴³	Prior use is stated in the Act.
Larke.	1698. ¹²⁴⁴	
Lea.	1425. ¹²⁴⁵	
Lune.	1749. ¹²⁴⁶	An Act for improving the Navigation.
Medway.	1664. ¹²⁴⁷	
Mersey.	1720. ¹²⁴⁸	
Narr.	1751. ¹²⁴⁹	
Nene, Nyne, Nen.	1714. ¹²⁵⁰	
Ouse. Bedford.	1601. ¹²⁵¹	
Ouse. Sussex.	1790. ¹²⁵²	Act to improve part of the navigation
Ribble.	1806. ¹²⁵³	Act to improve implying previous use.
Rother. Western.	1791. ¹²⁵⁴	
Severn.	1503. ¹²⁵⁵	

¹²²⁸ 6 George III c 101.

¹²²⁹ 21 James I c 34.

¹²³⁰ 11 William III c 24.

¹²³¹ 6 George I c 27.

¹²³² 1 Anne c 14.

¹²³³ 12 George I c 38.

¹²³⁴ 8 George I c 14.

¹²³⁵ 31 Henry VIII c 4.

¹²³⁶ 11 & 12 William III c 23.

¹²³⁷ 30 George III c 57.

¹²³⁸ 23 Henry VIII c 18.

¹²³⁹ 6 George I c 30.

¹²⁴⁰ 7 George I s 1 c 15.

¹²⁴¹ 16 & 17 Charles II c 12.

¹²⁴² 30 George II c 62.

¹²⁴³ 2 George I s 2 c 24.

¹²⁴⁴ 11 William III c 22.

¹²⁴⁵ 3 Henry VI c 5.

¹²⁴⁶ 23 George II c 12.

¹²⁴⁷ 16 & 17 Charles II c 23.

¹²⁴⁸ 7 George I s 1 c 15.

¹²⁴⁹ 24 George II c 19.

¹²⁵⁰ 13 Anne c 19.

¹²⁵¹ 43 Elizabeth I c 11.

¹²⁵² 30 George III c 52.

¹²⁵³ 46 George III c 121.

¹²⁵⁴ 31 George III c 56.

Salwerp.	1662. ¹²⁵⁶	
Slea.	1794. ¹²⁵⁷	
Soar.	1766. ¹²⁵⁸	
Stort.	1759. ¹²⁵⁹	
Stour Kentish.	1514. ¹²⁶⁰	
Stour Suffolk.	1705. ¹²⁶¹	
Stour Worcester.	1662. ¹²⁶²	
Swale.	1767. ¹²⁶³	
Tees.	1808. ¹²⁶⁴	An Act to improve implying previous use.
Thames.	1423. ¹²⁶⁵	
Tone.	1698. ¹²⁶⁶	
Trent.	1698. ¹²⁶⁷	
Ure and Ouse.	1767. ¹²⁶⁸	
Waveney.	1670. ¹²⁶⁹	The Act implies previous use.
Wear.	1716. ¹²⁷⁰	An Act for the Preservation and Improvement.
Weaver.	1720. ¹²⁷¹	The Act states that a section was previously a public navigation.
Welland.	1570. ¹²⁷²	
Wey.	1671. ¹²⁷³	An Act for preserving the Navigation.
Witham.	1671. ¹²⁷⁴	
Wye and Lugg.	1662. ¹²⁷⁵	
Yare and Wensum.	1827. ¹²⁷⁶	

Rivers for which evidence of prior use has not been found

Douglas. (Asland.)	1720. ¹²⁷⁷	It has been suggested that the river was used during the Roman period. ¹²⁷⁸
Wreak and Eye.	1791. ¹²⁷⁹	

¹²⁵⁵ 19 Henry VII c 18.

¹²⁵⁶ 14 Charles II c 13.

¹²⁵⁷ 32 George III c 106.

¹²⁵⁸ 6 George III c 94.

¹²⁵⁹ 32 George II c 42.

¹²⁶⁰ 6 Henry VIII c 17.

¹²⁶¹ 4 Anne c 15.

¹²⁶² 14 Charles II c 13.

¹²⁶³ 7 George III c 96.

¹²⁶⁴ 49 George III c 48.

¹²⁶⁵ 2 Henry VI c 9.

¹²⁶⁶ 10 William III c 8.

¹²⁶⁷ 10 & 11 William III c 20.

¹²⁶⁸ 2 Edward IV Charter, The Lord Protector 1657, 7 George III c 93.

¹²⁶⁹ 22 Charles II c 16.

¹²⁷⁰ 3 George I c 3.

¹²⁷¹ 7 George I s 1 c 10.

¹²⁷² 13 Elizabeth I c 26.

¹²⁷³ 22 & 23 Charles II c 32.

¹²⁷⁴ 22 & 23 Charles II c 25.

¹²⁷⁵ 14 Charles II c 14.

¹²⁷⁶ 7 & 8 George IV c 42.

¹²⁷⁷ 6 George I c 28.

¹²⁷⁸ James Ellis Jones, *The Maritime and Riverine Landscape of the West of Roman Britain*. BAR British Series 493. 2009, 139.

¹²⁷⁹ 31 George III c 77.

Rivers on which work was not completed or no work was carried out.

Codbeck Brook.	1767. ¹²⁸⁰	Work not completed. ¹²⁸¹
Dane.	1720. ¹²⁸²	No work carried out. ¹²⁸³
Effra.	1664. ¹²⁸⁴	No work carried out. ¹²⁸⁵
Fal.	1678. ¹²⁸⁶	No record of any work being carried out.
Mole.	1664. ¹²⁸⁷	No record of any work being carried out. ¹²⁸⁸
Ravensbourne.	1664. ¹²⁸⁹	No record of any work being carried out
Worsley Brook.	1737. ¹²⁹⁰	No work carried out ¹²⁹¹

¹²⁸⁰ 7 George III c 95.

¹²⁸¹ Baron F. Duckham, *The Yorkshire Ouse* Newton Abbott: David & Charles. 1967, 68

¹²⁸² 7 George I c 17.

¹²⁸³ Joseph Priestly, *Historical Account of the Navigable Rivers, Canals, and Railways of Great Britain*. London: Longman, Rees, Orme, Brown & Green. 1831, 183.

¹²⁸⁴ 16 & 17 Charles II c 16.

¹²⁸⁵ N.J. Barton, *The Lost Rivers of London*. London: Phoenix House Ltd. 1962, 79

¹²⁸⁶ 30 Charles II c 11.

¹²⁸⁷ 16 & 17 Charles II c 12.

¹²⁸⁸ The reference in T.S. Willan, *River Navigation in England 1600 – 1750*. London: Frank Cass & Co Ltd. 1964, 29 to the River Mole being improved refers not to work carried out but to the First Reading of the Bill to make the river navigable, *Seventh Report of the Royal Commission on Historical Manuscripts, Part 1*. (London: Her Majesty's Stationery Office, 1879), 179

¹²⁸⁹ 16 & 17 Charles II c 12.

¹²⁹⁰ 10 George II c 22.

¹²⁹¹ Preface to 32 George II c 2.

Appendix E

Legislation relating to weirs

Introduction

In law 'A purpresture cannot be made legal by prescription.' That is to say, although an obstruction may have been placed in a road or river on which there is a public right of passage, it is never made legal by the passage of time.

In this Appendix petitions to parliament and the legislation relating to the use of rivers are quoted. The Acts include *Magna Carta* and some of the Acts confirming it, seven General Navigation Acts, the Statutes relating to Sewers and those concerning individual rivers. Some Acts were passed to make rivers more usable, some to improve drainage, some to preserve fish and some for more than one purpose. Only those relating to navigation are considered. The Acts, in general, required obstructions in the rivers to be removed and they also prohibited the construction or enlargement of new obstructions. The evidence considered is the wording of the Acts, the petitions which initiated the Acts and the commissions which were appointed to enforce the legislation.

The original text of the statutes is taken from *Statutes of the Realm* which is considered to be the principal edition of the pre 1713 Acts.¹²⁹²

Magna Carta

Chapter 33 of the original charter and chapter 23 of the reissued charters state that:-

Omnes Kidelli deponantur decetero penitus de Tamisiam & Medeweyam, & per totam Angliam, nisi per costeram maris.

The editors of *Statutes of the Realm*,¹²⁹³ and of *Statutes at Large*¹²⁹⁴ and the National Archives¹²⁹⁵ translate this as

All Weirs from henceforth shall be utterly put down by Thames and Medway, and through all England, but only by the Sea-coasts.

McKechnie,¹²⁹⁶ Thompson,¹²⁹⁷ Dickinson,¹²⁹⁸ Holt¹²⁹⁹ and Howard¹³⁰⁰ translate the last phrase 'except on the sea coast', 'except upon the sea shore' or an equivalent.

¹²⁹² Sir Carleton Kemp Allen, *Law in the Making. Sixth Edition.* Oxford: Clarendon Press. 1958, 428. footnote 2.

¹²⁹³ (1297) 25 Edward I. *Magna Carta.* c23.

¹²⁹⁴ (1225) 9 Henry III c. 23.

¹²⁹⁵ <http://www.nara.gov/exhall/charters/magnacarta/magtrans.html>. Accessed 16/10/01.

¹²⁹⁶ Eg. William Sharp McKechnie, *Magna Carta. Second Edition.* New York: Burt Franklin. 1958, 343.

¹²⁹⁷ Faith Thompson, *Magna Carta.* Minneapolis: The University of Minnesota Press. 1948, 23.

¹²⁹⁸ J.C. Dickinson, *The Great Charter.* London: The Historical Association. 1955, 23.

¹²⁹⁹ J.C. Holt, *Magna Carta. Second Edition.* Cambridge: Cambridge University Press. 1992, 461.

¹³⁰⁰ A.E. Dick Howard, *Magna Carta. Revised Edition.* Charlottesville: University Press of Virginia. 1998, 44.

Nisi had in Classical Latin the meaning ‘if not or unless’.¹³⁰¹ In Medieval Latin *Nisi* could have the meaning ‘only’.¹³⁰² The first of these translations seems to be excessively verbose. It seems extraordinary that the authors of the charter would have used the words ‘through all England, but only on the coast’ unless one is using the word ‘but’ in the sense of ‘except’.

It would seem strange to have banned *kydells* on the estuaries but to have allowed them in the rivers. But there is good reason for banning them in the rivers where they would have obstructed ships and boats. On the coast ships and boats could sail round the obstructions.

There are four extant copies of the charter, all in Latin.¹³⁰³ There is no contemporary translation into English. The copy of the confirmation of the charter sent to Dublin on 12 November 1216 by Henry III is of no help. In this the relevant chapter was ‘*Et omnes kydelli deponant^r do ceto p totam Auenlich & p totam Hybm nisi p costeram Maris*’.¹³⁰⁴

There is however a vernacular French text, apparently dating from 1215, in the cartulary of the lepers’ hospital of S. Giles at Pont-Audemer in Normandy. In this the relevant phrase was given as ‘*fors par la costiere de la mer*’.¹³⁰⁵ In medieval French ‘*fors*’ had the meaning ‘*dehors*’ or ‘*excepte*’.¹³⁰⁶ This seems to establish that the second translation is the correct one.

Magna Carta was, in general, the confirmation of earlier laws. This clause was an extension of two charters which had been purchased by the Corporation of London from Richard I and John for the right to destroy *kydelli* in the Thames and, for the second charter, in the Medway. In the two centuries after 1215 the charter was confirmed at least 44 times.¹³⁰⁷

General Navigation Acts

In 1302 a petition was made to Edward I by the merchants travelling by river between London and Oxford asking for the reissuing of a commission for the removal of obstructions. They stated that the commissions used to be appointed every seven years but that no commission had been appointed in the past twenty years.¹³⁰⁸

In 1348 the commons prayed ‘that whereas the four great rivers of England, that is to say, the Thames, Severn, Ouse and Trent, since antiquity used to be open and free to every ship passing with various merchandises, in aid of the realm and of the cities and good towns adjoining the said rivers, recently, and from day to day, the aforesaid rivers *estopez et transversez par goors, molins, piles et pales* placed by each lord on his own

¹³⁰¹ Charlton T. Lewis, *A Latin Dictionary*. Oxford: Clarendon Press. 1879, 1209.

¹³⁰² R.E. Latham, *Revised Medieval Latin Word-list*. London: Oxford University Press for the British Academy. 1980, 313.

¹³⁰³ J.C. Holt, *Magna Carta. Second Edition*. Cambridge: Cambridge University Press. 1992, 441.

¹³⁰⁴ Statutes of the Realm. Vol. 1, 16, fn. 1.

¹³⁰⁵ J.C. Holt, *Magna Carta and Medieval Government*. London: The Hambledon Press. 1985, 238, 239, 253.

¹³⁰⁶ R. Grandsaignes d’Hauterive, *Dictionnaire D’Ancien Francais*. Paris: Librairie Larousse. 1947, 299.

¹³⁰⁷ Faith Thompson, *Magna Carta*. Minneapolis: The University of Minnesota Press. 1948, 10.

¹³⁰⁸ [PROME = Parliamentary Rolls of Medieval England. CD version. 2005.]

PROME, Edward I, 1302, Petition 3, para. 90, i - 474.

land, so that no ship can pass except in great floods of water or at the great peril of the said ships ...' and requested that justices be appointed to remove the obstructions. The king replied that as many commissions should be granted as were needed.¹³⁰⁹

In 1351 an Act was passed which stated that:-

Whereas the common Passage of Boats and Ships in the great Rivers of England be oftentimes annoyed by the inhansing of [Gorces, Mills, Wears,⁹] Stanks, Stakes, and Kiddles, in great damage of the People; It is accorded and established, That all such [Gorces, Mills, Wears,¹] Stanks, Stakes, and Kiddles, which be levied and set up in the Time of King [Edward] the King's Grandfather, and after, (²) whereby the said Ships and Boats be disturbed, that they cannot pass [in such River⁴] as they were wont, shall be out and utterly pulled down, without being renewed; and thereupon Writs shall be sent to the Sheriffs of the Places where need shall be, to survey and inquire, and to do thereof Execution; and also the Justices shall be thereupon assigned at all Times that shall be needful.¹³¹⁰

Footnotes: ⁹ Wears, Mills,
 ¹ Wears, Mills
 ² in such Rivers *MS. Tr. 2.*
 ⁴ *MS. Tr. 2.* omits these Words here.
 (The misnumbering is in the original.)

Before discussing the 'great rivers' consideration is given to the 'great highways' of England. In the, so called, Laws of Edward the Confessor it is stated that there is a special peace belonging to the four roads: Watling Street, Foss Way, Icknield Way and Ermine Street.¹³¹¹ The laws of William the Conqueror provided that killing or assaulting a man travelling on any of these roads was a breach of the king's peace.¹³¹² The Laws of Henry I stated that a royal highway was one which was always open and which leads into a city or fortress or castle or royal town.¹³¹³

Pollock wrote

First, only the four roads are the king's; then every common road which leads to the king's city, borough, castle, or haven; and as most roads of any importance must, sooner or later, answer this description if followed far enough, the king's highway came to be, as it now is, merely a formal or picturesque name for any public road whatever.¹³¹⁴

¹³⁰⁹ PROME, Edward III, 1348, para. 34, ii - 169

¹³¹⁰ (1350) 25 Edward III, Stat. 3. c 4.

¹³¹¹ Laws of Edward Confessor, c. 12; cf. c. 27. Cited in Sir Frederick Pollock, *Oxford Lectures*. London: Macmillan and Co. 1890, 75.

¹³¹² Will. 1. 26. Cited in Sir Frederick Pollock, *Oxford Lectures*. London: Macmillan and Co. 1890, 80.

¹³¹³ *Leges Henrici Primi. Special Edition 1996*. Editor L.J. Downer. Oxford: Clarendon Press. 1972, 249.

¹³¹⁴ Sir Frederick Pollock, *Oxford Lectures*. London: Macmillan and Co. 1890, 82.

The only cases or petitions in which these roads are referred to are those in which the road is named in order to locate a certain place.¹³¹⁵ No petition or case has been found where the fact that some event occurred on one of the four named highways has affected the outcome of a case or the punishment inflicted.

Also in the 'Laws of Edward the Confessor' it is stated that 'another [peace is] held by the bodies of water on which victuals are brought by ship to cities and boroughs from various places.'¹³¹⁶

Flower stated that 'At the date of the Great Charter the Yorkshire Ouse, the Severn, the Thames and the Trent were recognised as the four great rivers of England.'¹³¹⁷ Some may think that the Ouse referred to the Great Ouse and not the Yorkshire Ouse. More recently Mark Ormrod, in considering the petitions at the November 1372 Parliament, wrote

In one sense the matter raised here [obstructions on the river Avon in Wiltshire and Somerset] could be said to have been of concern to more than merely those county communities, especially if the guarantee of free traffic upon rivers was extended to the country as a whole (as it was by Magna Carta and by various re-assertions of the principle in fourteenth-century statutes, including one made in the parliament immediately preceding this, in 1371.)¹³¹⁸

In 1352 the Commons stated that 'it was ordained at the last parliament that [all obstructions in the rivers] would be destroyed, yet still nothing is done.' They requested that 'the same statute shall be strictly put into execution. And that no man shall take anything for passage on the same water, in going or returning, except to places accustomed of right, and no more than is due of right.' The reply was that 'It pleases the king that it shall be so.'¹³¹⁹

Where the 1351 Act had referred to 'the great rivers' the Commons used the phrase 'the Thames, and in other rivers where ships and boats are accustomed to pass'. It seems that they considered the two terms to be equivalent. Thus it would seem that the use of the names of the four rivers in the petition of 1302 and the description of the rivers to which the 1351 Act applied were 'picturesque names' for all the rivers which were used for the transport of victuals and other goods to the towns and cities. The later petitions and statutes confirm this interpretation.

Petitions and Commissions

A commission was appointed in 1355 to enforce the statute of 25 Edward III for the removal of obstruction in the waters of Leye [Lea].¹³²⁰ A similar commission also referring to the 1355 Act was appointed in 1357 for 'the rivers in the county of

¹³¹⁵ Eg. A commission *de wallis et fossatis* refers to the king's highway called 'Watlyngstrete' which leads from Ferebrige to Worsop and the common way from Wossop to Dunham and from Dunham to the Ouse. Calendar of Patent Rolls, 1429-36, 280.

¹³¹⁶ 'The Laws of Edward the Confessor'. In Bruce R. O'Brien, *God's Peace and the King's Peace*. Philadelphia: University of Philadelphia Press. 1999, 168 - 171.

¹³¹⁷ *Public Works in Mediaeval Law. Volume II*. Editor C.T. Flower. Selden Society Vol. 40. 1923, xxiii.

¹³¹⁸ PROME. Mark Ormrod. 'Introduction to the Parliament of November 1372.'

¹³¹⁹ PROME. Edward III, 1352, January. 30, XX. ii - 240.

¹³²⁰ Calendar of Patent Rolls, 1354-58, 127.

Somerset'.¹³²¹ No river in Somerset, other than the Bristol Avon, would be considered great unless all rivers used for transport were considered great.

At the October 1363 parliament the Commons prayed

That whereas gorges and weirs are made in waters throughout the land, so that ships and boats cannot come to cities, boroughs and other towns in order to carry various victuals, as they were previously accustomed to do; may it please the said council to ordain that remedy be made thereon, and that justices shall be assigned in various counties where necessary to remove such gorges and weirs, in the manner which it used to be done in times past.

The reply was 'The statute made thereon shall be upheld, observed and duly executed.'¹³²²

In 1371 the commons prayed 'that all the rivers of the land by which the victuals of the country can be carried are blocked by mills, weirs or fisheries, to the great distress of the commonalty; ...' The petition was accepted and an Act passed confirming the 1351 statute and providing for a penalty for those who breached the statute.¹³²³

In 1372 the 'commons of Somerset and Wiltshire' petitioned that weirs on the River Avon between Bath and Bristol should be 'knocked down or removed so that the vessels and the boats can pass between the two towns'. The reply was that 'He who shall feel himself aggrieved shall pursue this, and justice will be done to him according to the form of the statute ordained in this case.'¹³²⁴

In 1376 the people of London complained that a new 'loke' called 'Hamelden Lok' [Hambleton Lock] had been newly built which was dangerous and that a man had died there.¹³²⁵

In 1377 and 1378 there were complaints about the obstructions on the Severn.¹³²⁶

In 1390 complaint was made about obstructions in the great rivers of England.¹³²⁷

In 1397 the preceding two Acts were confirmed and provision made for commissioners to be appointed to enforce the statutes and the penalty for breach of the statute was increased.¹³²⁸

In 1399 the new king Henry IV again confirmed the two Acts of Edward III and provided that 'sufficient Persons to be Justices in every County of England, where Need

¹³²¹ Calendar of Patent Rolls, 1354-58, 547.

¹³²² PROME, Edward III, 1363 October, 17, ii-277.

¹³²³ 1371, 45 Edward III, c. 2.

¹³²⁴ PROME. Edward III. 1372. November. 24. X, ii-312.

¹³²⁵ PROME. Edward III. 1376. April. 134. LXXV. ii – 346.

¹³²⁶ PROME. Edward III. 1377. January. 72. LV. ii – 372

PROME. Richard II. 1378. October. 65. iii – 46.

¹³²⁷ PROME. Richard II. 1390. November. 34. iii – 282.

¹³²⁸ 1397, 21 Richard II, c. 19.

shall be, to survey and keep the Waters and great Rivers there, and to correct and amend the Defaults, and to ...'¹³²⁹

In 1401 complaints were made about obstructions on the great rivers.¹³³⁰

In 1402 the statutes were again confirmed and provision made for the payment of expenses to the commissioners.¹³³¹

In 1410 the Commons on behalf of the counties of Somerset, Bristol, Wiltshire and Gloucestershire complained that the river was so obstructed that the cost of carriage had increased from 8d. per ten miles to 8s. It was agreed that a commission should be appointed in accordance with the statutes.¹³³²

In 1413 Henry V again confirmed the previous statutes.¹³³³

In 1415 a commission was appointed on the water of Wythum in counties of Lincoln and Nottingham from the town of Claypole to Lincoln and the water of Brant in the county of Lincoln touching offences against the statutes in Parliament of 25 and 43 Edward III and I Henry IV concerning the erection of weirs, mills stanks, poles and kiddles.¹³³⁴

In 1416 a similar commission was appointed for 'La Lye'[Lea].¹³³⁵

In 1421 complaint was made about obstructions in the Thames near the city of London and the mayor was instructed to observe his duty to keep the river clear.¹³³⁶

In 1423 provision was made for the removal of weirs in the 'Water of Thames' in the counties of Surrey, Kent and Surrey outside the Franchise of London.¹³³⁷

In 1423 a commission was appointed to remove obstructions in the River Ley[Lea].¹³³⁸

In 1425 the Chancellor of England was authorised to grant new commissions.¹³³⁹

In 1427 the Commons again asked for action with regard to the obstructions.¹³⁴⁰ (There were many other similar commissions at about this time for the River Lea.)

In 1424 a commission was appointed 'pursuant to the statutes of 25 and 45 Edward III and I Henry IV for the taking away of kidells and other obstructions in rivers to survey and keep the waters and great rivers in the county of Salop.' 'Rivers' is in the plural.

¹³²⁹ 1399, 1 Henry IV, c. 12.

¹³³⁰ PROME. 1401. January. 97. iii – 475.

¹³³¹ 1402, 4 Henry IV, c. 11.

¹³³² PROME, Henry IV, 1410 January, 58, iii-641.

¹³³³ 1413, 1 Henry V, c 2.

¹³³⁴ Calendar of Patent Rolls, 1413-16, 347.

¹³³⁵ Calendar of Patent Rolls, 1416-22, 78.

¹³³⁶ PROME. Henry V. 1421 May. 16. iv – 132.

¹³³⁷ 1423, 2 Henry VI, c 12.

¹³³⁸ PROME, Henry VI, 1423, October, 57, iv-259,260.

¹³³⁹ 1425, 3 Henry VI c. 5.

¹³⁴⁰ PROME, Henry VI, 1427, October, XIII, 40, iv-332.

In 1427 the Commons complained that people travelling on the Severn in ‘Wales and other privileged places’ were being attacked and their boats destroyed. They asked that the malefactors should pay damages of £40.¹³⁴¹ In 1429 there were two complaints one by the men of Tewkesbury the other by the Commons¹³⁴² and an Act was passed as a remedy for the inhabitants of Tewkesbury for the maintenance of the Severn navigation.¹³⁴³ In 1431 yet another complaint was made¹³⁴⁴ and another Act passed.¹³⁴⁵

In 1431 a commission *de kidellis* was appointed ‘pursuant to the statute of I Henry V [c.2] and previous statutes to ...[names] ... for the river in the county of Norfolk by the town of Bishop’s Lenn, extending from the bridge of Wygenhale called ‘Maudeleyn brygge’ to the high sea.’¹³⁴⁶ (Wiggenhall is about 4 km south of King’s Lynn.)

In 1431 the Commons asked that commissioners should be appointed to remove ‘a large number of ‘shelps’ in the river Lea’. It was claimed that these sand banks had been formed by the force and flow of the river. It was agreed that there should be a toll of ‘4 *d.* for every freight-ship and boat passing or going along the same river’.¹³⁴⁷ This is the first occasion that has been found when commissioners were authorised to charge the users of a river.

In 1433 a commission *de kidellis* was appointed ‘pursuant to the statutes of 25 Edward II and of 1 Henry IV to ...[names] ... for the water and great river called ‘Colneystreme’ between the towns of Woxebrigge and Stanes, in the counties of Buckingham and Middlesex.’¹³⁴⁸

In 1463 the Commons claimed that ‘the common passage of ships and boats in the great rivers of England’ was hindered by obstructions. They stated that ‘the passage of ships boats and other vessels in many of the common rivers of this realm is completely hindered and neglected, to the general inconvenience of the common people.’ They then stated that particularly the line way on the Severn was obstructed. They requested that the earlier statutes should be enforced. This petition refers for the first time to the common rivers. The reply was ‘The king will consider it further.’ It seems that this may be taken as a refusal.¹³⁴⁹

In 1472, after the restoration of Edward IV, the Commons again prayed

that where by the laudable statute of Magna Carta, amonges other, it is ordeyned, that all kidels by Thamys, Medewey, and by all this reame, shuld be put downe, but by the coostes of the see, which statute was made for grete wele of all this land, in avoiding the ^{stre}ytynes of all ryvers, so that shippes and bootes shuld have thryn their freee and large passage, ...

¹³⁴¹ PROME, Henry VI, 1427, October, XV, 42, iv-332,333.

¹³⁴² PROME, Henry VI, 1429, September, 30, iv-345. and 44, iv-351.

¹³⁴³ 1329. 8 Henry VI c. 27.

¹³⁴⁴ PROME, Henry VI, 1431, January, XI, 38, iv-379.

¹³⁴⁵ 1431. 9 Henry VI c. 5.

¹³⁴⁶ Calendar of Patent Rolls, 1429-36, 132.

¹³⁴⁷ PROME, Henry VI, 1431 January, XVI, 43, iv-381.

¹³⁴⁸ Calendar of Patent Rolls, 1429-36, 303.

¹³⁴⁹ PROME, Edward IV, 1463, April, 60, v-569-570.

... for asmoche as commen passages of shippes and bootes in the gr^{ete} ryvers of Englund, were so often tymes distourbed by rearing of, in grete hurt of the people, it was accorded and stablished, that all such weres, milles, pondes, stakes and kidelx which weere reised and sette in the tyme of Kyng Edward, son of Kyng Henry, and after, in such ryvers, by which shippes and bootes were destourbed, that they might not passe as they were wont, shuld be put away ...

...that the said statut of Magna Carta, and all other statutes concernyng the premysses, be duely observed and kept; ...¹³⁵⁰

In response an appropriate Act was passed.¹³⁵¹

There seems in this Act to be no implication that the preceding Acts applied only to a few rivers. Rather it seems that they applied to all rivers which were used by ships or boats.

In 1503 an Act was passed confirming the right of free passage on the River Severn except for tolls for which lawful title could be shown. The Act also provided that, when people haling or drawing boats caused damage, then fair compensation should be paid to the riparian owner.¹³⁵²

In 1531 an Act was passed for the 'pullinge downe and avoiding of Fisshegarthes, piles, stakes, heckes & other ingins sett in the Ryver & Water of Ouse and Humbre.'¹³⁵³

In 1531 the Statute of Sewers provided for the appointment of commissioners to repair rivers, river banks and sea walls because of flooding and because the passage of 'Ships, Balengers and Boats in the Rivers, Streams, and other Flouds' was obstructed.¹³⁵⁴

In 1535, a commission was appointed with the instructions that

'All weirs noisome to the passage of ships or boats, to the hurt of passages or ways and calceys [causeys] shall be pulled down; and those that be occasion of drowning of any lands or pastures, by stopping of waters, and also those that are the destruction of the increase of fish, by the discretion of the Commissioners; so that if any of the before-mentioned depend or may grow by reason of the same weir, then is there no redemption but pull them down, although the same weirs have stood since 500 years before the Conquest.'¹³⁵⁵

The only defence against having one's weir destroyed seems to have been that boats did not pass that way.¹³⁵⁶

¹³⁵⁰ PROME. Edward IV, 1472, October, 53, vi-158-159.

¹³⁵¹ (1472) 12 Edward IV, c. 7.

¹³⁵² (1503) 19 Henry VII, c. 18.

¹³⁵³ (1531) 23 Henry VIII, c. 18.

¹³⁵⁴ (1531) 23 Henry VIII, c. 5

¹³⁵⁵ *The Lisle Letters. Volume 2*. Editor Muriel St Clare Byrne. Chicago: The University of Chicago Press, 1981, 628.

¹³⁵⁶ *Letters and Papers Foreign and Domestic of the Reign of Henry VIII. Volume 9*, 299, 892.

Weirs were destroyed on the Avon at Christchurch,¹³⁵⁷ the Severn,¹³⁵⁸ the Wye,¹³⁵⁹ the Exe,¹³⁶⁰ the Thames,¹³⁶¹ and in the counties of Wiltshire,¹³⁶² Lancashire,¹³⁶³ Somerset and Devonshire,¹³⁶⁴ and Hampshire.¹³⁶⁵

In 1537 letters were sent into Kent touching weirs.¹³⁶⁶

In 1538 weirs were destroyed at Umberleigh on the Taw,¹³⁶⁷ Filleigh on the Bray,¹³⁶⁸ Yealding on the Medway,¹³⁶⁹ and also at 'Calabear, Exweke, Thorverton, Upexe, Bicklegh, Beawford and Hedde.'¹³⁷⁰ The river between Winchester and Southampton was also partially scoured.¹³⁷¹

In 1539 an Act was passed to authorise the removal of obstructions in the River Exe from Exeter to the sea.¹³⁷²

¹³⁵⁷ Letters and Papers Foreign and Domestic of the Reign of Henry VIII. Volume 9, 285,850. and *The Lisle Letters. Volume 2*. Editor Muriel St Clare Byrne. Chicago: The University of Chicago Press, 1981, 628.

¹³⁵⁸ Letters and Papers Foreign and Domestic of the Reign of Henry VIII. Volume 9, 49, 166, and 50, 169.

¹³⁵⁹ *Ibid.* pages 103, 302.

¹³⁶⁰ *Ibid.* pages 128, 384.

¹³⁶¹ *Ibid.* pages 170, 519.

¹³⁶² *Ibid.* pages 123, 364.

¹³⁶³ *Ibid.* pages 130, 393.

¹³⁶⁴ *Ibid.* pages 162, 498.

¹³⁶⁵ *Ibid.* pages 190, 571.

and *The Lisle Letters. Volume 2*. Editor Muriel St Clare Byrne. Chicago: The University of Chicago Press, 1981, 599.

¹³⁶⁶ Letters and Papers Foreign and Domestic of the Reign of Henry VIII. Volume 12.1, 409, 1151.

¹³⁶⁷ Letters and Papers Foreign and Domestic of the Reign of Henry VIII. Volume 13.1, 193, 515.

¹³⁶⁸ *Ibid.* and *The Lisle Letters. Volume 5*. Editor Muriel St Clare Byrne. Chicago: The University of Chicago Press, 1981, 37.

¹³⁶⁹ Letters and Papers Foreign and Domestic of the Reign of Henry VIII. Volume 13.1, 5, 12.

¹³⁷⁰ *Ibid.* pages 166, 454.

¹³⁷¹ *Ibid.* pages 458, 1240.

¹³⁷² 1539, 31 Henry VIII, c. 4.

Appendix F**The gradients of the Thames**

Contour height metres	Place	Grid Reference	Distance km	Gradient m km⁻¹
90	Kemble Mill.	40131951		
	Cotswold Water Park.		3	1.7
85	W. of Ashton Keynes.	40401942		
	Waterhay Bridge.		3.75	1.3
80	1km NW Cricklade.	40901946		
	Cricklade.		7	0.71
75	Castle Eaton.	41431958		
	Lechlade.		12.5	0.4
70	N of Buscott.	42331982		
	Radcot.		14.75	0.34
65	1kmW of Duxford.	43521996		
			19	0.26
60	2km E of Eynsham.	44552094		
	Oxford.		12.5	0.44
55	S of New Hinksey.	45222039		
			10	0.5
50	Abingdon Weir.	45051972		
			18.5	0.27
45	Shillingford Bridge.	45971920		
			19.75	0.25
40	Pangbourne Weir.	46331768		
	Reading.		15.25	0.33
35	Sonning.	47561759		
	Henley.		16.25	0.31
30	Medmenham.	48051836		
			12.5	0.4
25	Cookham Lock.	49041855		
			12	0.42
20	Eton Wick.	49491779		
	Windsor.			

Appendix G**The 1334 Lay Subsidy and River Transport**

The table lists the 100 places with the highest 1334 Lay Subsidy Assessments and whether the places were ports, in the Fens, on a usable river, on a non-usable river, or away from any river. The list of places and the valuation figures are taken from R.E. Glasscock, 'England *circa* 1334',¹³⁷³ except that the figures of Lyn and South Lynn have been combined into one entry.

Use of Rivers in 1334

2 nd Column.	County. (Lincoln. H = Lincolnshire Holland.)			
3 rd Column.	Valuation for Lay Subsidy 1334.			
4 th Column.	River on which the town lies:- F = Fenland settlement. P = Port. N = Not on a river.			
5 th Column.	Historic Use as Appendix A.	R = Record of use. X = No record of use.		
6 th Column.	Classification in 20 th C.	U = Usable. X = Not usable.		

1. London.	Middlesex.	£11,000	P		
2. Bristol.	Gloucester.	£1,900	P		
3. York.	Yorkshire.	£1,620	P		
4. Newcastle-u-T.	Northumb.	£1,333	P		
5. Boston.	Lincolnshire.	£1,100	P		
6. Norwich.	Norfolk.	£1,100	P		
7. Yarmouth.	Norfolk.	£1,000	P		
8. Bampton.	Oxfordshire.	£969	Thames.	R	U
9. Oxford.	Oxfordshire.	£914	Thames	R	U
10. Lincoln.	Lincolnshire.	£900	Witham.	R	U
11. Coventry.	Warwickshire.	£750	Sowe.	X	X
12. Lynn.	Norfolk.	£770	P		
13. Salisbury.	Wiltshire.	£750	Avon.	R	U
14. Shrewsbury.	Shropshire.	£700	Severn.	R	U
15. Pinchbeck.	Lincoln. H	£675	F		
16. Spalding.	Lincoln. H	£630	F		
17. Winchester.	Hampshire.	£625	Itchen.	R	U
18. Terrington.	Norfolk.	£607	F		
19. Canterbury.	Kent.	£599	Kentish Stour.	R	U
20. Wighenhall.	Norfolk.	£555	F		

¹³⁷³ R.E. Glasscock, 'England *circa* 1334.' In H.C. Darby, Ed., *A New Historical Geography of England*. Cambridge: Cambridge University Press. 1973, 181-182.

21. Hereford.	Herefordshire	£550	Wye.	R	U
22. Walpole.	Norfolk.	£533	F		
23. Southampton.	Hampshire.	£511	P		
24. Gloucester.	Gloucester.	£510	P		
25. Ipswich.	Suffolk.	£500	P		
26. Beverley.	Yorkshire.	£500	Hull.	R	U
27. Cambridge.	Cambridge.	£500	Cam.	R	U
28. Holbeach.	Lincoln. H	£495	F		
29. Whaplode.	Lincoln. H	£480	F		
30. Moulton.	Lincoln. H.	£465	F		
31. Gosberton.	Lincoln. H.	£450	F		
32. Tilney.	Norfolk.	£450	F		
33. Kirton.	Lincoln. H	£413	F		
34. Newbury.	Berkshire.	£412	Kennet.	X	U
35. Wisbech.	Cambridge.	£410	F		
36. Plymouth.	Devon.	£400	P		
37. Penrith.	Cumberland.	£398	Eamont	X	X
38. Walsoken	Norfolk.	£396	F		
39. Newark.	Nottingham.	£390	Trent.	R	U
40. Sutton St James.	Lincoln. H	£375	F		
41. Nottingham.	Nottingham.	£371	Trent.	R	U
42. Bury St. Edmunds.	Suffolk	£360	Lark.	R	U
43. Stamford.	Lincolnshire.	£360	Welland.	R	U
44. Leverington.	Cambridge.	£360	F		
45. Exeter.	Devon.	£350	P		
46. Northampton.	Northampton.	£350	Nene.	R	U
47. Luton.	Bedfordshire.	£349	N		
48. West Walton.	Norfolk.	£345	F		
49. Barking.	Essex.	£341	P		
50. Cottingham.	Yorkshire.	£330	Hull.	R	U
51. Sutterton.	Lincoln. H	£320	F		
52. Ely.	Cambridge.	£315	Ouse.	R	U
53. Old Leake.	Lincoln. H	£315	F		
54. Surfleet.	Lincoln. H	£315	F		
55. Derby.	Derbyshire.	£300	Derwent.	R	U
56. Hull.	Yorkshire.	£300	P		
57. Scarborough.	Yorkshire.	£300	P		
58. Worcester.	Worcester.	£300	Severn.	R	U
59. Swaffham.	Norfolk	£300	N		
60. Bramley.	Surrey.	£298	Wey.	R	U
61. Leicester.	Leicester.	£294	Soar.	R	U
62. Fulbourn.	Cambridge.	£293	F		
63. Grantham.	Lincolnshire.	£293	Witham.	X	U
64. Reading.	Berkshire.	£293	Thames.	R	U
65. Swineshead.	Lincoln. H.	£285	F		
66. Snettisham.	Norfolk.	£285	P		
67. Sudbury.	Suffolk.	£281	Essex Stour.	R	U
68. Castor.	Northampton.	£276	Nene.	R	U
69. Peterborough.	Northampton.	£275	Nene.	R	U
70. Huntingdon.	Huntingdon.	£270	Great Ouse.	R	U

71. Marshfield.	Gloucester.	£270	N		
72. Pontefract.	Yorkshire.	£270	Aire.	R	U
73. Fleet.	Lincoln. H	£270	F		
74. Abingdon.	Berkshire.	£269	Thames.	R	U
75. Barnack.	Northampton.	£269	Welland.	R	U
76. Banbury.	Oxfordshire.	£267	Cherwell.	X	U
77. Writtle.	Essex.	£267	Can.	X	U
78. St Albans.	Hertfordshire.	£266	Colne.	X	X
79. Waltham Abbey.	Essex.	£263	Lea.	R	U
80. Bridgewater.	Somerset.	£260	P		
81. Harrow.	Middlesex.	£257	N		
82. Campden.	Gloucester.	£255	N		
83. Doncaster.	Yorkshire.	£255	Don.	R	U
84. Frampton.	Lincoln. H	£255	F		
85. Paston.	Northampton.	£251	Nene	R	U
86. Cirencester.	Gloucester.	£250	Churn.	X	U
87. Colchester.	Essex.	£250	P		
88. Donington.	Lincoln. H	£250	F		
89. Leighton-Buzzard	Bedfordshire.	£249	Ouzel	R	U
90. Godalming.	Surrey.	£248	Wey.	R	U
91. Heacham.	Norfolk.	£248	P		
92. Barton-on-Humber.	Lincolnshire.	£246	P		
93. Bridgnorth.	Shropshire.	£244	Severn.	R	U
94. Tewkesbury.	Gloucester	£243	Severn.	R	U
95. Sleaford.	Lincolnshire.	£240	Slea.	R	U
96. Wyberton.	Lincoln. H	£240	F		
97. Wainfleet.	Lincolnshire.	£233	Steeping.	R	U
98. Louth.	Lincolnshire.	£230	Lud.	X	X
99. Yaxley.	Cambridge.	£227	Nene.	R	U
100.					
North Walsham.	Norfolk.	£225	Ant.	R	U

Appendix H**Dates of Obstructions of Rivers**

This table lists the obstructions of rivers which have been found. Repeated reports of the same or similar obstructions on one river are not included. It has prepared from the same sources as the 'Records of Use' in Appendix A but data for the 'well used' sections are included. References are only given when the corresponding entry is not in Appendix A.

Commenced	Period	River	Place	Cause
Obstructed				
pre1189	All	Cam	Cambridge.	Wier.
pre1189	All	Dee.	Chester.	Weir.
pre1189	All	Kentish Stour.	Fordwich.	Weir
13 th C.	All	Parrett.	Langport.	Bridge.
1227.	All	Thames.	Oxford, etc.	Weir. ¹³⁷⁴
1242.	nk	Axe.	Rackley.	Fishnets, Kiddles.
1260	115	Thame.	Islip.	Weirs.
1265.	27	Trent.	Thorkese.	Weirs. ¹³⁷⁵
1268.	<30	Hull.	nk	Fishnets, Kiddles.
1268-1591	nk	Nene watercourses.		Weeds, Dirt.
1268	>4	Derbyshire Derwent.	Borrowash.	Weirs.
1272.	35	Eastern Rother.	nk	Sluice.
1275.	325	Great Ouse.	Nr Huntingdon.	Weirs.
1275.	nk	Nar.	Setchey.	Weirs, Weeds, Dirt.
1290.	105	Ancholme.	Bishop's Bridge.	Dirt, Weeds.
1290.	310	Exe	Topsham	Weirs.
1290.	nk	Ant	Ludham/Irsted.	Wooden barrier.
1291.	nk	Wissey.	Stoke Ferry.	Bridge.
1299.	17	Trent.	Colwyck.	Weirs. ¹³⁷⁶
1301.	nk	Wye.	Hereford.	Not known.
1314.	c20	Nene.	Welle.	Weirs.
1322.	nk	Ure.	Boroughbridge.	King's enemies.
1326.	56	Don	Thorne.	Bridge, Weirs. ¹³⁷⁷
1331.	nk	Eastern Rother.	Bodiam.	Ballast.
1334.	nk	Fens.	Wide area.	Dirt, Weeds.
1338.	nk	Hedon.	Bondebrustewyk.	River diversion.
[c.1340.	c.1391	Yorkshire Ouse.	nk	Fishnets, Kiddles, Weirs.

¹³⁷⁴ For other obstructions on the Thames see Appendix A.

¹³⁷⁵ Calendar of Patent Rolls, 1258-66, 480.

Calendar of Inquisitions Miscellaneous, 1219-1307, 442.

Calendar of Patent Rolls, 1281-92, 520.

¹³⁷⁶ Calendar of Patent Rolls, 1292-1301, 476-77, 555.

Calendar of Patent Rolls, 1301-07, 94, 269.

Calendar of Patent Rolls, 1313-17, 431.

¹³⁷⁷ Calendar of Patent Rolls, 1324-27, 291.

Calendar of Patent Rolls, 1343-45, 91.

Calendar of Patent Rolls, 1381-85, 193.

[do		Hull. Aire. Derwent. Wharfe.		
[do		Ure. Swale. Nidd. Don.		
1342.	nk	Slea.	Dokdyk.	Dirt, Weeds.
1348.	nk	Eastern Rother.	nk	Sluice.
1351	nk	Ingrebourne.	Havering.	Dirt, Weeds.
1353.	12	Colne.	Colchester.	Weirs, Mills, Fishing.
1360	11	Ant	Stalham.	Dirt, Weeds.
1363.	>10	Idle.	Hayton.	Dirt, Weeds.
1364.	nk	Tone.	Monketon.	Trees
1365.	18	Bristol Avon.	Bath.	Weirs.
1367.	nk	Nene.	Deepings.	Floodgates, mills, pools. ¹³⁷⁸
1367.	nk	Welland.	Deepings.	Floodgates, mills, pools. ¹³⁷⁹
1371.	nk	Tyne.	Prudhowe.	Weirs.
1375.	nk	Wensum.	Norwich.	Sunk boat.
1375.	nk	Eau.	Scotter.	Weirs.
c.1377.	nk	Witham.	Hildike.	Dirt, Weeds. ¹³⁸⁰
1383.	nk	Taw.	Mollond.	Weirs, Fishing.
1396.	>1	Idle.	nk.	Bridge, Fishing.
1400.	nk	Eastern Rother.	Winchelsea.	Ballast
1414.	nk	Tone.	Below Taunton.	Weirs.
1423.	nk	Medway.	Maidstone.	Weirs, Fishing.
1427.	nk	Severn.	Bewdley.	Attacks
1452.	nk	Kennet.	Hungerford.	Fishnets, kiddles.
1490.	nk	Tone.	Ham.	Mills.
1529.	nk	Little Ouse.	Nr Thetford.	Dirt, Weeds.
pre1530.	nk	Gipping.	Ipswich.	Mills.
pre1535.	nk	Cherwell.	Water Eyton.	Weirs.
pre1535.	nk	Salisbury Avon.	Hampshire.	Weirs.
pre1535.	nk	Bray.	Filleigh.	Weirs.
1570.	nk	Welland.	Stamford.	Mills.
1586	nk	Welland.	Estuary.	Dirt, Weeds.
1592.	nk	Trent.	Shelford.	Weirs.
1592.	nk	Salisbury Avon.	Downstream. of Salisbury.	Not known.

¹³⁷⁸ William Dugdale, *The History of the Imbanking and Draining of Divers Fens and Marshes*. 2nd Edition. London: Richard Geast. 1772, 196.

¹³⁷⁹ *Ibid.* page 196.

¹³⁸⁰ W.H. Wheeler, *History of the Fens of South Lincolnshire*. Boston: J.M. Newcomb. 1868, 42.

Appendix I

Depth of Fords

There were various types of ford, swine-fords, sheep-fords, ox-fords, foot-fords, carriage-fords, horse-fords, fords beside footbridges. Possibly on the road from Norfolk to London there were goose-fords and turkey-fords. Except where otherwise stated the fords considered in this appendix are those used by people walking.

When the river stage increased many fords became impassable. It has been said that in Yorkshire the fords used by sheep could only be crossed at the end of the summer but that this was satisfactory as that was the season when the shepherds wished to move the sheep to market.¹³⁸¹ Thetford is at the confluence of two rivers. There were fords over both the tributaries and over the river downstream of the meeting point. Since the position of Thetford seems to have depended on these fords it would seem that the ford downstream of the confluence was a seasonal ford, but that the upper two fords could be used for much of the year.

There are two depths which are relevant when considering fords, (a) the maximum depth at which the ford could be crossed in comfort, (b) the maximum depth at which the ford could be crossed in safety. At fords where there was a causeway this would be the depth of the water above the firm surface. At fords where there were stepping stones it would seem that if the depth of water over the stones was not insignificant then the ford would be unusable.

In the coroners' enquiries as reported in the Eyre Courts' records of the 13th and 14th centuries there are a remarkable number of records including words to the effect that 'A was thrown from his horse into the waters of B and drowned.' It would seem that these accidents occurred not when the road ran alongside the river but at places where the rider was trying to ford the river.

The maximum depth for a person walking across a river in comfort was where the depth of water was less than that which would reach to a lady's knees.

(Cryrus) was so offended, that one of his knights whom he loved deerlie, was drowned and borne awaie with the water in his passage over the (Euphrates), that he sware a deepe oth yer long to make it so shallow that it should not wet a woman to the knees.¹³⁸²

Illustrations of St Christopher normally show him crossing a river with the water reaching to just below his knees. He carries a child on his shoulders and a stave in his right hand. His cloak seems to be gathered up to keep it dry.¹³⁸³ John Constable's *The Haywain* shows the water in the ford about 0.3 m deep. Bewick shows men wading through water reaching to their mid-thigh and waist deep. A lady following one of the

¹³⁸¹ Personal comment: Chris Hawkesworth, British Canoe Union Facilities Officer.

¹³⁸² Raphaell Holinshed, William Harrison *et al. The First and Second Volumes of the Chronicles. 2nd Edition.* London: J. Johnson *et al.* 1807, 89.

¹³⁸³ See for example:- Syndicates of Cambridge University Library. Illustrated in *Cam No 45 Easter Term 2005*, 15; Erasmus, *In Praise of Folly: A German Woodcut of the 15th century*: both illustrated in Robert Bartlett, Ed., *Medieval Panorama.* London: Thames & Hudson. 2001, 10 and 67.

men has her ankle-length skirt raised to her knees with the water apparently much deeper ahead of her.¹³⁸⁴

In films when horses are ridden into the sea or across rivers the water very seldom reaches the feet of the rider of the horse. On the other hand it would appear that cattle were often driven across a river with only their heads above the water. For a packhorse the maximum comfortable depth would have been less than the height of the base of the saddle bags.

Martin Cook wrote 'In the nineteenth century it was generally considered that the depth of fording for foot passengers should not exceed three feet, with an extra foot permitted for horse riders.'¹³⁸⁵

Gordon *et al.* state that 'It is a well-known rule of thumb that the depth (in metres) times the velocity (in metres per second) should not exceed 1.0 for safe wading.'¹³⁸⁶ Few small rivers flow at more than 2 mph (0.89 ms⁻¹).¹³⁸⁷ Thus it seems that a ford more than 1.1 m deep could have been dangerous because people could have been swept away.

In Scotland there were shallows between Loch Dubh and Loch Fionn. It was reported that when the water was knee deep it was considered to be a ford. Sometimes people walked across when the water came up to their middle. But it seems that if the water was deeper then they walked round one of the lochs.¹³⁸⁸

In the regulations for Romney March it was provided that 'it shall not be lawful for any man, thenceforth, to make any dams or fords, or other impediment, in any land-eas, water-gangs, ditches, or common water-courses, in the said marsh, whereby the right course of the waters may in any sort be hindered.'¹³⁸⁹ This implies that all fords were constructed by laying stones in the bed of the river which restricted the flow of the water.

There are records of fords being removed when the rivers were made usable by barges. It seems likely that this was because the bed of the river had been raised by depositing stones and gravel in the bed of the river. At these points where proprietors created a navigation by making a river deeper, and so not conveniently fordable, bridges were normally required to be constructed.

¹³⁸⁴ Thomas Bewick, *A History of British Birds*. Newcastle: Longman and Co., London. 1832, Volume I, 170, 285; Volume II, 186.

¹³⁸⁵ Martin Cook, *Medieval Bridges*, Princes Risborough: Shire Publications Ltd. 1998, 7.

¹³⁸⁶ Nancy D. Gordon, *et al.*, *Stream Hydrology. 2nd Edition*. Chichester: John Wiley & Sons, Ltd. 2004, 75.

¹³⁸⁷ Mike Davies-Shiel, *Watermills of Cumbria*. Clapham: Dalesman Publishing Company Ltd. 1978, 15.

¹³⁸⁸ *Mackenzie v Bankes* (1878) 3 A.C. 1324-1352, 1332.

¹³⁸⁹ William Dugdale, *The History of Imbanking and Draining of Divers Fens and Marshes. 2nd Edition*. London: Richard Guest. 1772, 32.

Appendix JMills in the Wye Valley and East SussexPresent day discharge at 14th century Mills of the Middle Wye Valley

Source of location of mills.:- William Rees, *Map of South Wales and the Border in the fourteenth Century*. Ordnance Survey 1932. Quoted in S.D. Coates and D.G. Tucker, *Water-mills of the Middle Wye Valley*. Monmouth: Monmouth District Museum Service. 1983.

Assumed runoff 350 mm.a⁻¹.

Hadnach.	Now only sinks.
Ganerew	Now no stream.
Whitchurch A.	0.09 m ³ s ⁻¹ .
Whitchurch B.	0.05 m ³ s ⁻¹ .
Marstow.	1.03 m ³ s ⁻¹ .
Michaelchurch.	0.01 m ³ s ⁻¹ .
Tretire.	0.29 m ³ s ⁻¹ .
Lenastone.	0.17 m ³ s ⁻¹ .
Lydbrook.	0.11 m ³ s ⁻¹ .
Walford.	0.34 m ³ s ⁻¹ .
Weston under Penyard.	0.17 m ³ s ⁻¹ .
Rosss.	0.28 m ³ s ⁻¹ .
Rudhall.	0.16 m ³ s ⁻¹ .
Burton.	0.07 m ³ s ⁻¹ .
Netherton.	0.06 m ³ s ⁻¹ .
Near Foy.	? On divided river.
Sellack.	Now no stream.
Dinedor.	0.07 m ³ s ⁻¹ .
Aconbury.	0.01 m ³ s ⁻¹ .
Hampton Bishop.	On river bank.
Bullinghope.	River bank or small stream.
Hereford.	Now no stream.
Eaton Bishop A.	0.25 m ³ s ⁻¹ .
Eaton Bishop B.	0.17 m ³ s ⁻¹ .
Eaton Bishop C.	0.17 m ³ s ⁻¹ .
Near Sugwas.	River bank or no stream.
Preston on Wye.	0.21 m ³ s ⁻¹ .
Near Byford.	River bank.
Yarsop.	0.03 m ³ s ⁻¹ .
Newchurch.	Small stream.
Bredwardine.	Small stream.
Eardisley.	0.16 m ³ s ⁻¹ .
Clifford.	0.09 m ³ s ⁻¹ .
Middlewood.	0.08 m ³ s ⁻¹ .
Clyro.	0.08 m ³ s ⁻¹ .
Clifford A.	0.08 m ³ s ⁻¹ .
Clifford B.	0.12 m ³ s ⁻¹ .
Hay. (3 mills.)	0.18 m ³ s ⁻¹ .

Present day discharge at Mills East Sussex

The list of mills is taken from Derek Stidder & Colin Smith, *Watermills of Sussex. Volume I – East Sussex*. Baron Birch. 1997.

River Ouse

Sheffield Mill.	0.08 m ³ s ⁻¹ .	
Fletching Mill.	2.1 m ³ s ⁻¹ .	1 st recorded 1574.
Sharp's Paper Mill.	2.24 m ³ s ⁻¹ .	Established 1813-16.
Boringwhell Mill.	0.04 m ³ s ⁻¹ .	
Maresfield Mill.	0.1 m ³ s ⁻¹ .	
Shortbridge Mill.	0.2 m ³ s ⁻¹ .	
Isfield Paper Mill.	0.26 m ³ s ⁻¹ .	
Isfield Old Mill.	0.37 m ³ s ⁻¹ .	
Plumpton Place Mill.	Spring fed.	Discharge not available.
Plumpton Upper Mill.	Spring fed.	Discharge not available.
Plumpton Mill.	Spring fed.	Discharge not available.
Barcombe Oil Mill.	4.03 m ³ s ⁻¹ .	Post 1700.
Barcombe Mill.	4.03 m ³ s ⁻¹ .	No record before 16 th C.
Germany Mill, Lewes Paper Mill.	Now no water supply.	

River Uck

Stone Mill.	0.05 m ³ s ⁻¹ .	
Huggett's Furnace Mill.	0.12 m ³ s ⁻¹ .	
High Hurstwood Mill.	0.07 m ³ s ⁻¹ .	
Buxted Mill.	0.35 m ³ s ⁻¹ .	
Pounsley Mill.	0.07 m ³ s ⁻¹ .	
Tickerage Mill.	0.15 m ³ s ⁻¹ .	
Upton's Mill.	0.15 m ³ s ⁻¹ .	
Hempstead Mill.	0.50 m ³ s ⁻¹ .	
Uckfield Mill.	0.53 m ³ s ⁻¹ .	
Isfield Mill.	1.17 m ³ s ⁻¹ .	Appears not to be ancient.
Halland Mill.	Spring fed.	Discharge not available.

Cuckmere Basin

Rushlake Mill.	0.03 m ³ s ⁻¹ .	
Twissell's Mill	0.04 m ³ s ⁻¹ .	
Cralle Mill	0.08 m ³ s ⁻¹ .	
Waldron Mill	0.06 m ³ s ⁻¹ .	
Horam Mill	0.015 m ³ s ⁻¹ .	
Hellingly Mill	0.4 m ³ s ⁻¹ .	
Stream Mill	0.18 m ³ s ⁻¹ .	
Horsebridge Mill	0.9 m ³ s ⁻¹ .	
Michelham Mill	1.0 m ³ s ⁻¹ .	Divided river.
Sessingham Mill	0.01 m ³ s ⁻¹ .	

Pevensey Haven

Wannock Mill.	Chalk catchment.	Discharge not available.
Polegate Lower Mill.	Chalk catchment.	Discharge not available.

Wallers Haven

Bucksteep Mill.	0.07 m ³ s ⁻¹ .
Ashburnham Mill.	0.24 m ³ s ⁻¹ .

Powdermill Stream

Farthing Mill.	0.02 m ³ s ⁻¹ .
Battle Powder Mills.	0.04 m ³ s ⁻¹ .
Peppering Eye Powder Mill.	0.05 m ³ s ⁻¹ .
Peppering Eye Lower Powder Mill.	0.05 m ³ s ⁻¹ .
Crowhurst Powder Mill.	0.33 m ³ s ⁻¹ .

Watermill Stream

Potman's Mill.	0.06 m ³ s ⁻¹ .
Catsfield Mill.	0.08 m ³ s ⁻¹ .

River Brede

Sedlescombe Powder Mill.	0.33 m ³ s ⁻¹ .
Brede Powder Mill.	0.05 m ³ s ⁻¹ .
Pickham Mill.	0.03 m ³ s ⁻¹ .

River Line

Beech Mill.	0.03 m ³ s ⁻¹ .
Whatlington Mill.	0.15 m ³ s ⁻¹ .

River Tillingham

Beckley Mill.	0.05 m ³ s ⁻¹ .
Conster Mill.	0.15 m ³ s ⁻¹ .

River Rother

Mayfield Old Mill	0.15 m ³ s ⁻¹ .	
Moat Mill.	0.30 m ³ s ⁻¹ .	
Potten's Mill.	0.36 m ³ s ⁻¹ .	
Merryweathers Mill.	0.08 m ³ s ⁻¹ .	
Mousehall Mill.	0.09 m ³ s ⁻¹ .	
Wadhurst Mill.	0.2 m ³ s ⁻¹ .	
Witherenden Mill.	0.8 m ³ s ⁻¹ .	
Bugsell Mill.	1.65 m ³ s ⁻¹ .	Supplied by leat.
Robertsbridge Mill.	2.1 m ³ s ⁻¹ .	Supplied by leat.

River Dudwell

Cox's Mill.	0.02 m ³ s ⁻¹ .
Park Mill.	0.30 m ³ s ⁻¹ .
Dudwell Mill.	0.31 m ³ s ⁻¹ .

Darwell Stream

Darwell Mill.	0.02 m ³ s ⁻¹ .
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Brightling Stream

Brightling Saw Mill.	0.01 m ³ s ⁻¹ .
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Kent Ditch

Bodiam Mill.	0.31 m ³ s ⁻¹ .
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Appendix K

The Watermills of Cambridgeshire 1086-1600

[The data for this appendix was collated by Suzanne Wilkins, 2006.]

In this appendix rivers unnamed on the Ordnance Survey maps have been identified by the name of a town on the river.

It has been assumed that the mills were on the largest available river consistent with the information available.

Numbers in brackets refer to the rental in 1086 as recorded in the Domesday Book.

Cambridge.

Domesday Book records that Picot built 3 mills (£9 a year) and in so doing destroyed 1 mill of the Abbot of Ely and another of Count Alan.¹³⁹⁰

Wetherley Hundred

Barrington: Rhee.

The Domesday Book states that there were 2.5 mills in Barrington in 1086. Of these, one and a half were held by the Church of Chatteris (32s.) and the other one by Robert Gernon (25s. 4d.). It has been suggested that the half-mill at Harlton was shared with one of the mills in Barrington, although it seems that this cannot be proved.¹³⁹¹ Cecil Chapman states that it is “almost certain that the Harlton half-mill was on the main river in Barrington parish.”¹³⁹²

Grantchester: Cam.

It is uncertain how many mills there were in Grantchester in 1086. The Domesday Book accredits two to Count Alan, (100s.), one to Count Eustace (40s.) and one to Robert Fafiton (40s.). The VCH does not mention those supposedly owned by Count Alan. Darby states that: “We cannot be certain that these were at Grantchester”.¹³⁹³

Harlton: Rhee.

See Barrington.

Haslingfield: Rhee.

Picot of Cambridge owned one mill in Haslingfield in 1086 (2s.). Chapman states that its most likely site as 413523.¹³⁹⁴

¹³⁹⁰ See also Rev. Dr. Stokes, ‘The Old Mills of Cambridge.’ *Proceedings of the Cambridge Antiquarian Society*. Volume XIV. (New Series VIII.) (1909-1910), 180-233.

¹³⁹¹ H.C. Darby, *The Domesday Geography of Eastern England. Third Edition*. Cambridge: Cambridge University Press. 1971, 309.

¹³⁹² Cecil Chapman, ‘Watermills’. In Elsie M. Widdowson, Ed., *Cam or Rhee Barrington Local History and Conservation Society*. c 1973, 40.

¹³⁹³ H.C. Darby, *The Domesday Geography of Eastern England. Third Edition*. Cambridge: Cambridge University Press. 1971, 307.

¹³⁹⁴ Cecil Chapman, ‘Watermills’. In Elsie M. Widdowson, Ed., *Cam or Rhee Barrington Local History and Conservation Society*. c 1973,44.

Shepreth: Rhee.

The Church of Chatteris (5s. 4d.) and Hardwin Scalers (7s. less 2d.) both owned a mill in Shepreth in 1086, whilst Geoffrey de Mandeville owned two (10s. 8d.). However, there is also an anomalous 1/6th of a mill owned by Count Alan. This is not mentioned in the VCH, but it is suggested by Cecil Chapman that “the other five sixths was incorrectly listed as one mill”.¹³⁹⁵

Childford HundredBabraham: Granta.

One mill is listed in the Domesday Book from 1086 (5s. 4d.), belonging to Count Alan. The VCH notes “the course of the river Granta as it runs through the parish has frequently been changed.”¹³⁹⁶

Linton (incorporating Barham): Granta.

Count Alan owned five mills in 1086, two in Great Linton (1s.), one in Little Linton (8s.) and two mills in Barham (5s. and 2s.).

Great and Little Abington: Granta.

Both Great and Little Abington had one mill listed in 1086, owned by Aubrey de Vere (9s.) and Count Alan respectively (6s. 8d.).

Hildersham: Granta.

Aubrey de Vere owned a mill (10s.) in 1086, and its location apparently did not move. The VCH states that the river Granta: “follows a winding course, occasionally dividing into branches, notably downstream near Hildersham mill”.¹³⁹⁷ A further clue to its location is also given: “East of the village a tongue of Linton parish penetrates between two channels of the river to include the former Hildersham mill.”¹³⁹⁸

Pampisford: Cam.

The Abbot of Ely held one watermill in 1086 (20s.) and its location apparently did not alter until it became disused in the 20th century. Its location is stated as being on the River Cam/Granta.¹³⁹⁹

Radfield HundredBalsham: None.

The Abbot of Ely held one watermill in Balsham (4s.). The VCH states that its location was probably outside the parish.¹⁴⁰⁰

¹³⁹⁵ *Ibid.* page 40.

¹³⁹⁶ VCH, Cambridgeshire and the Isle of Ely, Vol. 6, 19.

¹³⁹⁷ *Ibid.* page 81.

¹³⁹⁸ *Ibid.* page 60.

¹³⁹⁹ *Ibid.* page 109.

¹⁴⁰⁰ *Ibid.* page 132.

Whittlesford Hundred**Duxford:** Cam.

There were three mills listed in 1086: two belonging to Robert de Tosny (20s.), and one to Count Eustace, which is listed as being broken (12s.).

Hinxton: Cam.

There were three mills in 1086, one owned by the Bishop of Lincoln (8s.) and two by the Picot of Cambridge (21s. 4d.).

Ickleton: Cam.

There are two mills listed in 1086, belong to Count Eustace (30s.). However, the VCH suggests that one was situated in Brookhampton, whilst the other was in Ickleton itself.¹⁴⁰¹

Sawston: Cam.

There are four mills listed in 1086. One was owned by the Count of Mortain (26s. 2d.), one by Geoffrey de Mandeville (26s. 2d.) and the other two by Eudo FitzHerbert (30s. 8d.). It is possible that one of these was “mill at ‘Dereforda’ given with the vill of Stapleford by King Eadred to Ely abbey, c.955”¹⁴⁰²

Whittlesford: Cam.

There were three mills, all belonging to Countess Judith (60s.) in 1086. Of these, only one survived to 1279.¹⁴⁰³

Armingford Hundred**Bassingbourn:** Bassingbourn.

In 1086 there were four mills listed as being in Bassingbourn, although one of these was possibly in Kneesworth. Two were owned by Count Alan (20s.), the other two by the Bishop of Winchester (20s.). They are all listed as being on tributaries in Cecil Chapman’s article. One watermill was situated at 327443¹⁴⁰⁴.

Guilden Morden: Rhee.

One mill (4s.) in the Domesday Book belonged to the Picot of Cambridge in 1086. Cecil Chapman suggests that this was Hooks Mill, situated at 271453. He also states “It is not on the main river but on an artificial loop which incorporated a large storage pond.”¹⁴⁰⁵

Meldreth and Melbourn: Mel.

There are some discrepancies regarding the mills in these two places. The Domesday Book lists 8.5 mills in Meldreth and 0.5 in Melbourn, whilst the Darby places 1.5 in Melbourn and 8 in Meldreth. Cecil Chapman states “these mills were almost certainly all on the Mel”. He also places one as possibly being situated at 380449.¹⁴⁰⁶ The

¹⁴⁰¹ *Ibid.* page 241.

¹⁴⁰² *Ibid.* page 255.

¹⁴⁰³ *Ibid.* page 270.

¹⁴⁰⁴ Cecil Chapman, ‘Watermills’. In Elsie M. Widdowson, Ed., *Cam or Rhee* Barrington Local History and Conservation Society. c 1973, 44.

¹⁴⁰⁵ *Ibid.* page 43.

¹⁴⁰⁶ *Ibid.* page 45-46 .

owners and rentals are as follows: Abbey of Ely, 1 mill (2s. 8d.), Earl Roger, 2 mills (15s. 4d.), Count Alan, 2 mills (18s.), Hardwin de Scalers, 1 mill (5s. 4d.), Guy de Raimbeaucourt, 2 mills (10s. 8d.), Guy de Raimbeaucourt, 0.5 mills (2s. 8d.) and the Abbey of Ely, 1 mill (3s.).

Shingay: Rhee.

The VCH states that “there was a mill at Shingay in 1086, and a water mill was recorded in 1279 and in 1338 when there was also a windmill, not recorded later. The water mill stood where the road to Croydon crosses an artificially straightened branch of the river Rhee”¹⁴⁰⁷. This mill was owned by Earl Roger in 1086 (10s.). Cecil Chapman also states that this mill was placed at 318476 on the main river¹⁴⁰⁸.

Steeple Morden: Cheney Water.

There are five mills listed in the Domesday Book from 1086. Cecil Chapman states that “The main river does form part of the parish boundary, but so far away from the village centre that it is much more likely that all five mills were strung along Cheney Water between its source at Upper Galley Farm and Browse Wood on the parish boundary.” Of the five mills one was owned by the Bishop of Winchester (16d.), two others by Hardwin de Scalers (2 orae) and the other two by the Bishop of Winchester in a separate listing (32d.).

Tadlow: Rhee.

In 1086 there was one mill owned by the Picot of Cambridge (10s.). The VCH suggests that “it probably stood close to the bridges over the river, for the miller’s misconduct could flood the common meadows”¹⁴⁰⁹. Cecil Chapman agrees giving the location of the mill as at the current Tadlow Bridge at 283464.¹⁴¹⁰

Wendy: Rhee.

Two mills were recorded in the Domesday Book in 1086. These were both owned by Count Alan (45s.). Possible sites for these are at 321477 and 322479.¹⁴¹¹

Whaddon: Rhee.

One mill in 1086 owned by Count Alan (12d.).

Thriplow Hundred

Fowlmere: Fowl.

There was one mill in 1086 owned by Robert Gernon (10s. 8d.). However, it is unlikely to have been at the site of Fowlmere Mill at 403460.¹⁴¹²

¹⁴⁰⁷ VCH, Cambridgeshire and the Isle of Ely, Vol. 8, 126.

¹⁴⁰⁸ Cecil Chapman, ‘Watermills’. In Elsie M. Widdowson, Ed., *Cam or Rhee* Barrington Local History and Conservation Society. c 1973, 43.

¹⁴⁰⁹ VCH, Cambridgeshire and the Isle of Ely, Vol. 8, 132.

¹⁴¹⁰ Cecil Chapman, ‘Watermills’. In Elsie M. Widdowson, Ed., *Cam or Rhee* Barrington Local History and Conservation Society. c 1973,43.

¹⁴¹¹ *Ibid.* page 43.

¹⁴¹² *Ibid.* page 46.

Foxton: Rhee.

In 1086 the mill was shared between the Abbot of Chatteris and Geoffrey de Mandeville, rendering them 10s. 8d. each.

Great Shelford: Cam.

There were two mills in 1086, both owned by the Abbot of Ely and paying a combined rental of 45s. The VCH states: "By 1086 the two rivers (Cam/Granta and Rhee) were turning at least one water-mill in each parish (of Thriplow)." ¹⁴¹³

Harston: Rhee.

There was one mill in Harston in 1086 (30s.), owned by the Picot of Cambridge, which according to Cecil Chapman is "almost certainly at the site of the existing Harston Mill". ¹⁴¹⁴

Hauxton: Cam.

In 1086 there were three mills in Hauxton, two belonging to the Abbey of Ely (50s.) and one to Hardwin de Scalers (20s.). The VCH gives the location of one of these as "far to the west on a bend in the Rhee and a mile north of Harston." It also adds: "from the 14th century to the 16th its miller was regularly accused of flooding Harston's meadows to its south by raising his mill dam too high." ¹⁴¹⁵

Trumpington: Cam.

William de Warenne held one mill in 1086 (20s.). The VCH gives its possible location as south-west of the village. ¹⁴¹⁶

Papworth Hundred

Lolworth: None.

Lolworth is listed as having one mill in 1086, owned by the Picot of Cambridge, but it was worth nothing. There is no other information available for this mill.

Swavesey: Great Ouse.

Swavesey had one mill owned by Count Alan in 1086. This was worth 40s., which as the VCH points out, was higher than average. ¹⁴¹⁷

Staploe Hundred

Badlingham: Kennett.

Count Alan owned two mills in 1086, one of which rendered 6s., the other milling for the demesne.

¹⁴¹³ VCH, Cambridgeshire and the Isle of Ely, Vol. 8, 154

¹⁴¹⁴ Cecil Chapman, 'Watermills'. In Elsie M. Widdowson, Ed., *Cam or Rhee* Barrington Local History and Conservation Society. c 1973, 44.

¹⁴¹⁵ VCH, Cambridgeshire and the Isle of Ely, Vol. 8, 201.

¹⁴¹⁶ *Ibid.* page 261.

¹⁴¹⁷ VCH, Cambridgeshire and the Isle of Ely, Vol. 9, 390.

Burwell: Burwell Lode.

There were two mills in 1086, one owned by Count Alan, the other by the Church of Ramsey. They were both worth 6s. 8d. The VCH states "A Ramsey mill near the Holms ceased working, 1130 x 1150, for lack of water."¹⁴¹⁸

Fordham: Snail Lode.

King William held two mills in 1086, which rendered 16s.

Isleham: Lark.

King William held three and a half mills (22s. 8d.), the other half being held by the Bishop of Rochester (2s. 8d.).

Kennett: Kennett.

William de Warenne held one mill in 1086, although it rendered nothing.

Snailwell: Snail.

The Domesday Book states that there were four mills in 1086; all owned by Hugh de Port and rendering 14s. 4d. The VCH, however, states that there were only three mills here which "were presumably watermills powered by the Snail."¹⁴¹⁹

Soham: Soham Lode.

In 1086 King William held two mills in Soham (24s.).

Wicken: New River.

In 1086 Count Alan held three watermills worth 28s.

Staine Hundred

Bottisham: Swaffham Bulbeck Lode.

Walter Giffard held four mills in 1086 (14s.). One of these "stood c1365-80 on the stream north-east of the village" whilst another "was near Goose green."¹⁴²⁰

Great Wilbraham: Little Wilbraham.

There were two mills in 1086, one owned by King William and worth 10s, the other by Count Alan and worth 5s 4d.

Stow cum Quy: Quy Water.

The VCH states of the four mills here in 1086 "Two belonged to Quy manor, which shared a third with Stow manor, the fourth mill to the Richmond fee."¹⁴²¹ However, the Domesday Book states that 0.5 mills were owned by the Abbey of Ely worth 40d. with the half being made up in the 2.5 mills owned by the Picot of Cambridge worth 22s. The final mill was owned by Count Alan and was worth 18s.

Swaffham Bulbeck: Swaffham Bulbeck Lode.

Five mills are placed here in the Domesday Book; three owned by Walter Giffard and worth 30s. less 4d. and one owned by Count Alan worth 4s. 4d. Aubrey de Vere is

¹⁴¹⁸ VCH, Cambridgeshire and the Isle of Ely, Vol. 10, 347-56.

¹⁴¹⁹ *Ibid.* page 482-85.

¹⁴²⁰ *Ibid.* page 205-14.

¹⁴²¹ *Ibid.* page 238-42.

listed as owning one mill in Swaffham Prior in Chevely hundred, worth 7s., however the VCH lists all these mills as in same entry.¹⁴²²

Flendish Hundred

Cherry Hinton: None.

There were 4 mills here in 1086, owned by Count Alan (25s.).

Fulbourn: Tributary of the Little Wilbraham.

There was one mill in 1086, held by Count Alan (20s.). The VCH gives its location as: "It stood south-east of the village, between Mill yard and Mill pen, on a watercourse running off the Great Wilbraham river."¹⁴²³

Horningsea: Cam.

The Abbey of Ely held one mill in 1086 (10s.). The VCH states that by c.1540, there were two mills in the parish, one at Horningsea, the other at Clayhithe.¹⁴²⁴

Chevely Hundred

Little Wilbraham: Little Wilbraham.

Aubrey de Vere held one mill in 1086 (22s.).

Swaffham Prior: Reach Lode.

See Swaffham Bulbeck.

¹⁴²² *Ibid.* page 258-65.

¹⁴²³ *Ibid.* page 143-49.

¹⁴²⁴ *Ibid.* page 165-67.

Appendix L**Grants of Pontage 1229-1600**

This appendix is a list of the first grant of pontage for each bridge as recorded in the Calendar of Patent Rolls.¹⁴²⁵

Bridges over tidal sections of rivers are not included.

- A. Category A evidence of use.
- B. Category B evidence of use.
- N. No evidence of use found.

			Record of Historic Use
1228.	Ferrybridge.	Aire.	A
1228.	Staines.	Thames.	A
1252.	Fordingbridge.	Salisbury Avon.	A
1256.	Evesham.	Warwick Avon.	A
1257.	Nantwich.	Weaver.	B
1259.	Shrewsbury.	Severn.	A
1284.	Montford.	Severn.	A
1279.	Huntingdon.	Great Ouse.	A
1286.	Wheatley, Oxon.	Thames.	A
1295.	Malton.	Yorkshire Derwent.	A
1297.	Maidenhead.	Thames.	A
1300.	Carlisle.	Eden.	A
1301.	Holland.	Witham.	A
1302.	Walton-le-Dale.	Ribble.	B
1306.	Cockermouth.	Cumberland Derwent.	A
1307.	Windsor.	Thames.	A
1310.	Marlow.	Thames.	A
1307.	Wychnor, Staffs.	Trent.	A
1310.	Nr. Waltham Cross.	Lea.	A
1311.	Nottingham.	Trent.	A
1311.	Doncaster.	Don.	A
1312.	Radcot.	Thames.	A
1315.	Attingham, Salop.	Severn.	A
1316.	Kegworth.	Soar.	A
1316.	Wetherby.	Wharfe.	N
1318.	Buildwas.	Severn.	A
1322.	Pershore.	Warwick Avon.	A
1322.	Longford, Salop.	Severn.	A
1323.	Burford, Oxon.	Windrush.	A
1324.	Bridgnorth.	Severn.	A
1325.	Swarkeston, Derbys.	Trent.	A
1325.	Cosford by Snifnal, Salop.	Worfe.	N
1325.	Derby.	Derbyshire Derwent.	A
1327.	Corbridge.	Tyne.	A
1328.	Wisbech.	Nene.	A
1328.	Stone.	Trent.	B

¹⁴²⁵ Records prior to 1399 are extracted from Alan Cooper, *Bridges, Law and Power in Medieval England. 700-1400*. Woodbridge: The Boydell Press. 2006, Appendix 2.

1328.	Oxford.	Thames.	A
1330.	Brandon. Suffolk/Norfolk.	Little Ouse.	A
1330.	Leicester.	Soar.	A
1331.	Cossington.	Soar.	A
1331.	Sudbury.	Suffolk Stour.	A
1331.	Saltersford, (Holmes Chappel)		
	Cheshire.	Dane.	N
1332.	Atherstone, Warwicks.	Anker.	N
1333.	Wansford.	Nene.	A
1333.	Croft on Tees.	Tees.	B
1334.	Peterborough.	Nene.	A
1334.	Hereford.	Wye.	A
1335.	Northampton.	Nene.	B
1335.	Nuneaton.	Anker.	N
1336.	Haydon Bridge, Northumb.	Tyne.	B
1336.	Appleby in Westmorland.	Eden.	N
1337.	Newcastle under Lyme.	Trent.	B
1338.	Lechlade.	Thames.	A
1344.	Wallingford.	Thames.	A
1345.	Wakefield.	Calder.	B
1346.	Bolton upon Dearne.	Dearne.	N
1346.	Kelham, Notts.	Trent.	A
1346.	Tadcaster.	Wharfe.	A
1349.	Bedford.	Great Ouse.	A
1349.	Stony Stratford.	Great Ouse.	N
1350.	Bradford upon Avon.	Bristol Avon.	N
1351.	Stafford.	Trent.	B
1352.	Oundle.	Nene.	A
1358.	Northallerton.	Wiske.	N
1358.	Ripon.	Ure.	N
1359.	Ferriby, Lincs.	Ancholme.	A
1362.	Taunton.	Tone.	A
1364.	Kirkby Lonsdale.	Lune.	A
1369.	Thrapston.	Nene.	A
1372.	Biggleswade.	Ivel.	A
1372.	Darlaston, Staffs.	Trent.	B
1374.	Warwick.	Warwick Avon.	B
1375.	Chippenham.	Bristol Avon.	N
1376.	Kendal.	Kent.	N
1376.	Newark.	Trent.	A
1377.	Alnwick.	Aln.	N
1377.	Yedingham.	Yorkshire Derwent.	B
1379.	Stangerthwaite.	Lune.	N
1379.	Lowther and Eamont Bridge.	Eamont.	N
1380.	Newport Pagnell.	Great Ouse.	B
1380.	Walshford.	Nidd.	A
1380.	Wolseley	Trent.	B
1381.	Dorchester, Oxon.	Thames.	A
1383.	Fenny Stratford.	Ouzel.	A
1383.	Brigg.	Ancholme.	A

1384.	Aylesbury.	Thame.	N
1384.	Skipton.	Swale/Aire.	A
1385.	Retford.	Idle.	B
1388.	Wilton, Wilts.	Nadder.	N
1390.	Newbury.	Kennet.	A
1394.	Burton upon Trent.	Trent.	A
1399.	Stopham, Sussex.	Arun.	A
1399.	Cambridge to Barton.	Cam.	A
1399	Hulbrigge.	Hull.	A ¹⁴²⁶
1402	York.	Foss.	A ¹⁴²⁷
1403	Holandbrigge to Donyngton.	Hammond Beck	A ¹⁴²⁸
1405	Attlebrig.	Wensum.	A ¹⁴²⁹
1408	Weybrigge in Fleg, co Norfolk.	Bure or Ant.	A ¹⁴³⁰
1410	Walton by Aylesbury.	Thame.	N ¹⁴³¹
1442	Tamworth.	Tame.	A ¹⁴³²
1444	Walmesford. [Wansford.]	Nene.	A
1451	Hareford Bridge by Whatle co Oxford. [Wheatley.]	Thame.	A ¹⁴³³

1402 Gretford. Although the name Gretford (Lincolnshire) was used 1178-1613¹⁴³⁴ the ford is not on a major road and the location seems to be uncertain.¹⁴³⁵

¹⁴²⁶ Calendar of Patent Rolls, 1399-1401, 85.

¹⁴²⁷ Calendar of Patent Rolls, 1401-05, 166.

¹⁴²⁸ Calendar of Patent Rolls, 1401-05, 235.

¹⁴²⁹ Calendar of Patent Rolls, 1405-08, 84.

¹⁴³⁰ Calendar of Patent Rolls, 1405-08, 461.

¹⁴³¹ Calendar of Patent Rolls, 1408-13, 195.

¹⁴³² Calendar of Patent Rolls, 1441-46, 104.

¹⁴³³ Calendar of Patent Rolls, 1446-51, 413.

¹⁴³⁴ Victor Watts, *The Cambridge Dictionary of English Place-Names*. Cambridge: Cambridge University Press. 2004, 260.

¹⁴³⁵ Calendar of Patent Rolls, 1401-05, 181.

Appendix M

Level of the Kentish Stour in Canterbury

In 1640 Somner wrote that the river seldom flooded because

the City lies higher now than at the first, having in all parts of it been much raised at several times, as Cellar-diggers, and such like, who are much hindred in their Work by old Foundations which they meet with in their digging, daily find; occasioned (as I conceive) by the many vastations of the City in the *Danes* time, and lastly about the Year of our lord 1160, by casual Fire.¹⁴³⁶

In 1703 Battely wrote that ‘Roman Antiquities are to be searched for from 6 to 9 Foot under Ground’¹⁴³⁷ indicating that the ground level of the city had risen since the Roman times. This change in height is visible at Waterstone’s bookshop in St Margaret’s Street where the foundations of a Roman bathhouse are visible in the basement.

Sea level in East Kent has been rising at an average rate of about 0.3 m a century for the last 2,000 years.¹⁴³⁸ It has not been possible to assess the effect which this has had on the non-tidal section of the river. The present 10 m contour crosses the river just to the west of Canterbury. Both in the city and downstream the river has been so modified that any natural changes which would have occurred over the last two thousand years are not easily recognisable.

Mead and Jones claimed that in 1935 they found a Roman quay 18-20ft below the present ground level off Stour Street. They say that it was composed of a large number of baulks of oak timber and that other material on the site indicated an occupation which ‘began about A.D. 70 and continued steadily till about A.D. 300, when it ceased.’¹⁴³⁹ This identification has since been questioned by Jenkins who wrote ‘From our latest evidence it would appear that this structure was not, as once thought, a Roman jetty, but something of more recent date. If it is not a medieval wharf it might perhaps be the first bridge erected in the late 13th century, to give access to the Grey Friars establishment on the opposite bank.’¹⁴⁴⁰ It must be considered doubtful that a large number of baulks of timber would have been needed for a footbridge. Jenkins has noted that ‘today the Roman levels are much water-logged, a condition which apparently did not prevail in Roman times.’¹⁴⁴¹ Detailed consideration of the use of the river in Roman times is outside the scope of this thesis.

¹⁴³⁶ William Somner, *The Antiquities of Canterbury*. 2nd Edition enlarged by Nicolas Battely. (1st Edition 1640.) London. 1703, (Republished 1977), 21.

¹⁴³⁷ *Ibid.* page 192.

¹⁴³⁸ J.A. Steers, *The Coastline of England and Wales*. Cambridge: Cambridge University Press. 1964, 649.

¹⁴³⁹ H.T. Mead and K.H. Jones, ‘Roman Site and Finds, Stour Street, Canterbury.’ *Archaeologia Cantiana*, Vol. 48 (1936), 219.

¹⁴⁴⁰ Frank Jenkins, ‘Archaeological Notebook, Canterbury 1949-51.’ *Archaeologia Cantiana*, Vol. 64 (1951), 71.

¹⁴⁴¹ *Ibid.* 67.

During excavations in the city centre in 1951 it was found that the medieval river bed lies 13 ft. 6in. below present day ground level, that is 3 ft below the present river bed and 5 ft. 6in. below the Roman land surface.¹⁴⁴²

There were in the city in c.1135 twelve mills which caused the usual disputes about water rights. In the time of Henry II (1154-1189) a complaint was made that the mills belonging to the monks of Christ Church were harmed by the raising of other mills since the time of Henry I (1100-1135) and it was ordered that the mills 'within and without the city' should be lowered to the height which they were at in the time of Henry I.¹⁴⁴³

The present layout of Canterbury dates back to at least the 12th century. However 'The only points where medieval streets correspond with those of the Roman period are just within and just without the gates which, of Roman origin, force the streets for a short distance into an ancient axis.'¹⁴⁴⁴ Thus the present street layout tells us nothing of the river's course before the 12th century.

In 1244-1278 Archbishops Boniface and Kilwarby diverted part of the river for the bettering of their mill at Westgate. 'The Channel to Westgate then (it seems) became enlarged.'¹⁴⁴⁵ In 1275 an inquisition found that the Black Friars had enlarged their island to the injury and hindrance of King's mills.¹⁴⁴⁶

¹⁴⁴² Frank Jenkins, 'Archaeological Notebook, Canterbury 1949-51.' *Archaeologia Cantiana*, Vol. 64 (1951), 68.

¹⁴⁴³ William Somner, *The Antiquities of Canterbury*. 2nd Edition enlarged by Nicolas Battely. (1st Edition 1640.) London. 1703, 23. (Republished 1977.)

¹⁴⁴⁴ William Urry, *Canterbury under the Angevin Kings*. London: The Athlone Press. 1967, 185.

¹⁴⁴⁵ William Somner, *The Antiquities of Canterbury*. 2nd Edition enlarged by Nicolas Battely. (1st Edition 1640.) London. 1703, 21. (Republished 1977.)

¹⁴⁴⁶ Robert H. Goodsall, *The Kentish Stour*. London: Cassell and Company Ltd. 1953, 135.

Appendix N

Official Reports since 1973

In this appendix the actions taken by official bodies to clarify the law relating to access on rivers since 1973 is described.

In 1977 the Severn-Trent Water Authority commissioned research which was based on the concept that the law of navigation 'is essentially a right to pass and re-pass, akin to the right of passage over highways on land'.¹⁴⁴⁷ An assumption held to be incorrect by the House of Lords in 1989.¹⁴⁴⁸ In the analysis of the right of navigation on five rivers it was concluded that there was a statutory right of navigation on two rivers, the Derbyshire Derwent and the Soar. On the Trent it was considered that from Kings Mills to Burton the river was 'possibly navigable at common law but not proven' and that it was 'very unlikely' that there was any public right of navigation upstream of Burton. On the Warwickshire Avon it was considered that there was 'a possible right of navigation' upstream of the junction of the Sowe and on the Teme a similar possible right downstream of Powick Bridge. Thus on the unregulated rivers there was no certainty as to the limits of the right of navigation.

Between 1980 and 1982 there was an investigation funded by the Sports Council and Water Space Amenity Commission which was published in 1985.¹⁴⁴⁹ This was a detailed study of sections of seventeen rivers considering the evidence of historic use on them. There is space here to consider their findings on only two Hampshire rivers. On the Salisbury Avon they considered that there was a statutory right of navigation downstream of Salisbury. This right has consistently been denied by several riparian owners since then.¹⁴⁵⁰ The authors of the report failed to consider how marble was taken from Purbeck, stone from Tisbury or timber from Ireland in the 13th century to the cathedral. More seriously they made no reference to the requirement at the end of the 16th century by the Quarter Sessions and the Commissioners of Sewers for the river to be kept open for boats.¹⁴⁵¹ On the Itchen they found that '(ii) on the balance of probabilities, there is a common law right of navigation from Woodmill to Winchester over the original course of the river; (iii) there is a common law right of navigation from Winchester to near Alresford either from time immemorial or by virtue of implied dedication.'¹⁴⁵² Again the riparian owners have not accepted this opinion.

The Countryside and Rights of Way Act 2000 explicitly excluded the use of vessels and swimming from the provisions of the Act.¹⁴⁵³

In 2001 a report commissioned by the Department for Environment, Food and Rural Affairs (DEFRA) into the availability of water for recreation.¹⁴⁵⁴ The report defined

¹⁴⁴⁷ A.E. Telling, and Sheila Foster, *The Public Right of Navigation*. Report for the Severn Trent Water Authority. 1977.

¹⁴⁴⁸ *A-G ex rel Yorkshire Derwent Trust v Brotherton* [1992] AC 425.

¹⁴⁴⁹ Arthur Telling and Rosemary Smith, *The Public Right of Navigation*. London: English Sport Council. Study 27. 1985.

¹⁴⁵⁰ Various personal correspondence.

¹⁴⁵¹ For references see Appendix A.

¹⁴⁵² Arthur Telling and Rosemary Smith, *The Public Right of Navigation*. London: English Sport Council. Study 27. 1985, 23.

¹⁴⁵³ Countryside and Rights of Way Act 2000. Ch 37. Schedule 2, 1. (b) and (i).

major rivers as those wider than 4 metres and considered that their total length in England is 14, 862 km (9,288 miles) and considered these to be suitable for recreational boating. It has not been possible to obtain the details of these rivers in order to compare them with the data in this thesis.

In 2003 the Scottish Parliament provided that there is to be a public right of access on all rivers in Scotland.¹⁴⁵⁵

In 2004 the Brighton University Consortium were commissioned to negotiate access agreements on four rivers with a total length of 76.6 km at a budgeted cost of £911,000.¹⁴⁵⁶ Agreements were successfully negotiated on the Waveney, where there had been an earlier agreement, and the Mersey where there had been no angling due to pollution. No agreement was negotiated on the Wear or Teme.¹⁴⁵⁷

On 16 June 2010, the Sustainability Committee of the National Assembly for Wales reported on the provision of access to rivers in Wales.

¹⁴⁵⁴ Brighton University Consortium, *Water-Based Sport and Recreation: the facts*. 2001.

¹⁴⁵⁵ Land Reform (Scotland) Act 2003, 2003 asp2.

¹⁴⁵⁶ The Countryside Agency, 'A feasibility study on improving access for canoeing by voluntary agreement.' Research Notes CRN 79. 2004.

¹⁴⁵⁷ Neil Ravenscroft, *et al.* 'Putting Pilot Canoe Access Agreements in Place.' Eastbourne, University of Brighton. 2006.

Appendix O

Roads – An invisible feature in the landscape?

Introduction

The extent to which river transport was used depended partly on other available means of transport. If these were quick, cheap and efficient river transport would seldom be used. If they were expensive, slow and inconvenient, where suitable river transport was available, it would be used. Flower wrote ‘There was in the Middle Ages little provision for communication by road where water transit was available, and rivers played a far more important and useful part in this direction than they do now.’¹⁴⁵⁸

It is unfortunate that so few modern historians or geographers have had the opportunity to walk, ride horses or travel in wheeled vehicles across country where there were no roads. The challenges are the same today as in the 12th century - rivers, marshes, forests and steep slopes.

Once again it is necessary to define the terms used. A road is defined here as ‘a path beaten by use, or paved, of fixed width usually one wide enough to admit of the passage of vehicles as well as of horses or travellers on foot.’ People using a road would normally have been constrained by fences. The word ‘fence’ is used to refer to fences, walls, hedges and ditches any of which might be used to fix the boundaries of a road.

Where journeys were regularly made from one place to another, this is referred to here as a ‘way’. But the way might be as much as a mile wide or it might divide. The route taken from Eastbourne to Lewes might be along the ridge of the Downs in winter, along the foot of the scarp in summer and both in spring and autumn. A way is equivalent to Taylor’s medieval ‘zone of communication’ which was ‘made up of countless trackways criss-crossing each other, quite unlike what survives today.’¹⁴⁵⁹ The word ‘route’ is used of the actual line followed by an individual or group on one journey. Drove roads are not considered here. It was always cheaper to drive animals rather than to use river transport, except in the Fens and other places where there was no land way which could be used by the animals.

Hindle has written recently:-

The nature of these new medieval roads differed from that of Roman or modern roads; essentially the road was not a physical entity, a thin strip of land with definite boundaries; rather it was a right of way, an ‘easement’, with both legal and customary status, leading from one village or town to the next.¹⁴⁶⁰

This statement seems to be correct. But another statement in the same book may be challenged. He wrote ‘The various itineraries of the medieval period provide evidence of the movement of individual people, and by implication, of the simple physical

¹⁴⁵⁸ *Public Works in Mediaeval Law*. Editor C.T. Flower. Selden Society Vol. 32. 1915, xxvi.

¹⁴⁵⁹ W.G. Hoskins, Editor and Commentary Christopher Taylor. *The Making of the English Landscape*. (1st Edition 1955.) London: Hodder and Stoughton. 1988, 196.

¹⁴⁶⁰ Paul Hindle, *Medieval Roads and Tracks*. Princes Risborough: Shire Publications Ltd. 2002, 6.

existence of roads.’¹⁴⁶¹ Land travel does not require roads. Stenton in one of the first articles on the Road System of Medieval England described where people went. It is only subsequent authors who have assumed that people only went where there was a road.¹⁴⁶² Willard first demonstrated the frequent use of carts but he did not consider whether they were used on roads or for cross-country transport.¹⁴⁶³

Webb and Webb wrote ‘We may perhaps date from the opening of the seventeenth century the beginning of any considerable use of the roads by wheeled vehicles.’¹⁴⁶⁴ Taylor claimed that coaches were first introduced in 1564.¹⁴⁶⁵ In the period 1189-1600 men who were rich would normally travel on horseback and those who could not afford a horse would walk.¹⁴⁶⁶ Ladies either rode horses or travelled in wagons.¹⁴⁶⁷ Goods were carried on people’s backs, on pack-horses or in carts or wagons.

Saul has compared the combined royal itineraries of John, Henry III, Edward I and II with the ‘road system shown on the Gough map’. He wrote ‘It is remarkable how little the two overlap. The road system linked towns, the kings’ itineraries centered on palaces and hunting lodges.’¹⁴⁶⁸ He seems to have assumed that there were many long-distance roads and that they were a conspicuous feature in the landscape for those travelling.¹⁴⁶⁹ It is claimed here that the first assumption is only partly true and the second false. There were fixed points like fords or bridges which had to be used. Between these points travellers could, in unfenced country, choose the most convenient and safest route for their journey.

Unfenced Ways

At a hunt when the riders travel across open country they do not follow one route. They vary their route according to their ability at jumping obstacles, their assessment of the state of the ground and their wish to avoid other riders.¹⁴⁷⁰ Cobbett described a journey across unfenced country in 1825. ‘Our point of destination was this village of Burghclere, which lies close under the north side of the lofty hill at Highclere, ... We saw this hill as soon as we got on Winchester downs; and without any regard to *roads*, we *steered* for it, as sailors do for a land-mark.’¹⁴⁷¹ On the main road between Sleaford

¹⁴⁶¹ Paul Hindle, *Medieval Roads and Tracks*. Princes Risborough: Shire Publications Ltd. 2002, 21.

¹⁴⁶² F.M. Stenton, ‘The Road System of Medieval England.’ *The Economic History Review*. Vol. VII. Part 1. 1 – 21.

¹⁴⁶³ James F. Willard, ‘The Use of Carts in the Fourteenth Century.’ *History*. Vol. XVII. (1932-3,) 246 – 250.

¹⁴⁶⁴ Sidney and Beatrice Webb, *The Story of the King’s Highway*. London: Longman’s Green and Co. 1913, 69.

¹⁴⁶⁵ John Taylor, ‘The World runnes on Wheels.’ In John Taylor, *Works of the John Taylor. Part II. The Folio Edition of 1630*. The Spencer Society 43. New York: Burt Franklin. 1967, 240.

¹⁴⁶⁶ Edwin A. Pratt, *A History of Inland Transport and Communication*. (1st edition Kegan Paul Trench Truber & Co Ltd. 1912.) Newton Abbot: David & Charles. 1970, 16.

¹⁴⁶⁷ Janet Backhouse, *Medieval Rural Life*. London: The British Library. 2000, 54, 43.

¹⁴⁶⁸ Nigel Saul, *Historical Atlas of Britain*. Stroud: Sutton Publishing Ltd. 1997, 156.

¹⁴⁶⁹ Eg: J.J. Jusserand, *English Wayfaring Life in the Middle Ages*. (1st published Ernest Benn Ltd 1889.) London: Methuen & Co Ltd. 1961, 17

¹⁴⁷⁰ Personal observation.

¹⁴⁷¹ William Cobbett, *Rural Rides*. London: J.M. Dent & Sons Ltd. 1912, Volume 1, 293.

and Lincoln is an inland lighthouse 'built in 1751 to guide travellers across what was then an empty open and desolate countryside.'¹⁴⁷²

Some examples may be given of ways used today which are not roads. In southern Algeria and in the Sinai people riding camels down a valley or across a plain spread out each taking their own route. In Tibet in many places there are no tracks to be followed yet people move from place to place. In the period 1965-75 in Kenya the white settlers' estates and the Africans' smallholdings were fenced and people did not walk through them. Elsewhere outside of the towns people walked freely across the country.¹⁴⁷³ Huxley wrote of Kenya in 1913 that 'The road was not a thing that had been made, it had simply arisen from the passage of wagons.'¹⁴⁷⁴

In England, prior to the use of motor transport, horse or ox drawn-carts were used to collect corn from the fields. They used to go to all parts of the fields which were as rough as unenclosed pasture.¹⁴⁷⁵ They did not need tracks to travel on as they were strong enough, and their wheels were large enough, to enable them to go on most surfaces. In earlier times carts of similar design would have been capable of travelling over much of the country. There were three types of country where carts could not go. The areas of permanent or seasonal marsh were avoided by carts but where a way was flooded or muddy due to lack of maintenance of the drains the local people were required to repair and cleanse them.¹⁴⁷⁶ After 1285 there was a statutory requirement to maintain a way four hundred foot wide through forests and woodlands.¹⁴⁷⁷ In mountainous areas pack-horses were used for transport rather than carts.¹⁴⁷⁸

It is claimed that there were zones of communication, ways, not roads, in the unfenced areas of England from 1189-1600.

Fenced Roads

Some fenced roads did exist in the medieval period. In towns the area between the fronts of the houses formed a road or street. Where fields were ploughed farm tracks led to the pasture, waste or open country beyond. Close to bridges, fords, man-made tracks up hillsides and at a natural narrowing of the way people would pass over one strip of land making it into a road. There were causeways across swampy ground which could be substantial. Maud's Heath causeway near Chippenham in Wiltshire was 3 metres broad, 2.4 metres high and 7 km long.¹⁴⁷⁹

Some Roman roads survived but in many places later roads developed alongside the remains of the Roman roads because travellers shunned the hard surface for the softer

¹⁴⁷² W.G. Hoskins, *The Making of the English Landscape*. (1st Edition 1955.) Editor and Commentary Christopher Taylor. London: Hodder and Stoughton. 1988, 202.

¹⁴⁷³ All personal observation. Malmberg is misleading on this point. Torsten Malmberg, *Human territoriality*. The Hague: Mouton Publishers. 1980, 76.

¹⁴⁷⁴ Elspeth Huxley, *The Flame Trees of Thika*. London: Chatto & Windus. 1959, 7.

¹⁴⁷⁵ Personal observation.

¹⁴⁷⁶ *Public Works in Mediaeval Law. Volume I*. Editor C.T. Flower. Selden Society Vol. 32. 1915, 7, 8, 9, and many other references, see index.

¹⁴⁷⁷ (1285) 13 Edward I. s. II. c. 5.

¹⁴⁷⁸ David Hey, *Packmen, Carriers and Packhorse Roads*. Leicester: Leicester University Press. 1980.

¹⁴⁷⁹ Paul Hindle, *Medieval Roads and Tracks*. Princes Risborough: Shire Publications Ltd. 2002, 45.

ground alongside¹⁴⁸⁰ as on the way between Alconbury and Wansford where there were two ways alternative to the Roman road.¹⁴⁸¹ Some Roman roads may have continued in use but they did not form a national network as in the Roman era.

Masschaele records the names of four roads which passed through or alongside the village of Great Gidding in 1541. They had the names 'the way to Huntingeton', 'way from Stamforde', 'way from Yaxley' and 'Oundle Way'.¹⁴⁸² Close to the village these roads may even have been maintained by the villagers tired of going to their fields through a quagmire. Away from the village they must have become wider.

There were parts of the country which had always been enclosed and where passage was limited to enclosed roads. Emery showed that the areas which were over 70% enclosed by 1600 were in the south-east, south-west and north of the country.¹⁴⁸³ It would seem that it would normally be fairly easy to move between enclosures where less than 70% of the total area was enclosed. However Everitt wrote that common land was 'most extensive in those parts of England where the classic common-field system, ... did not exist.'¹⁴⁸⁴ Thus it seems the greater the area of enclosure the greater the area of commons. Thus ways could be found in most areas over the commons.

Hoskins wrote of rural Devon that 'Practically all the thousands of farm names printed on the modern map would have been on the earlier map, could it have been drawn; and nearly all the thousands of miles of lanes and by-roads would have existed also.'¹⁴⁸⁵

Taylor described such roads where they ran over heavy clay.

Here we can see exactly what a main medieval route looked like on heavy clay land. It consists of a holloway over six feet deep, four feet wide across the bottom and some thirty-five feet across the top running obliquely down the valley side. Today it looks pleasant enough, covered with fine short turf, but in Edward's time it would have been extremely difficult to traverse, especially when wet weather turned the bottom into a quagmire and made it quite impossible for travellers actually to pass each other.¹⁴⁸⁶

Rye Hill in Sussex was described as being nothing more than a deep ravine, furrowed out between two high hills by the waters, which, in wet seasons, found their way down it to the sea.¹⁴⁸⁷ On the Weald 'The first piecemeal clearances led to an irregular pattern of small fields and winding, minor lanes.' These lanes are described as 'notorious for the difficulties and discomforts of travelling in winter and other wet periods.'¹⁴⁸⁸ In

¹⁴⁸⁰ Paul Hindle, *Medieval Roads and Tracks*. Princes Risborough: Shire Publications Ltd. 2002, 33-34.

¹⁴⁸¹ Christopher Taylor, *Roads & Tracks of Britain*. London: J.M. Dent & Sons Ltd. 1979, 121.

¹⁴⁸² James Masschaele, *Peasants, Merchants, and Markets*. New York: St. Martin's Press. 1997, 193-194.

¹⁴⁸³ F.V. Emery, 'England circa 1600'. In H.C. Darby, *A New Historical Geography of England*.

Cambridge: University Press. 1973, 256.

¹⁴⁸⁴ Alan Everitt, 'Common Land.' In Joan Thirsk, Ed., *The English Rural Landscape*. Oxford: Oxford University Press. 2000, 214.

¹⁴⁸⁵ Cited in Christopher Taylor, *Roads and Tracks of Britain*. London: J.M. Dent & Sons Ltd. 1979, 109.

¹⁴⁸⁶ *Ibid.* page 116.

¹⁴⁸⁷ William Holloway, *The History and Antiquities of the Ancient Town and Port of Rye*. London: John Russel Smith. 1847, 456.

¹⁴⁸⁸ Peter Brandon and Brian Short, *The South East from AD 1000*. London: Longman. 1990, 55 and 13.

Derbyshire a track was already so worn by the first decade of the 13th century that the hamlet alongside it had taken the name of Holloway.¹⁴⁸⁹

There were certainly areas where the only routes were along enclosed roads. There is no evidence that these were good roads.

Contemporary Descriptions of Roads

Leland travelled widely around England in c.1535-43.¹⁴⁹⁰ He noted every bridge that he passed or crossed, always counting the number of arches. The bridges were recorded with reference to the rivers flowing under them. He normally did not note where the route over the bridge came from or went to. He often recorded the names of rivers on a certain stretch of his journey or in a county.¹⁴⁹¹ Thus he noted the River Sherbourne at Coventry a town which is often said to have no river flowing through it. He never listed the roads in any area.

He often described the country he travelled through, 'The soyle is sandy, bettar for wood and pasture then corne',¹⁴⁹² 'enclosyd ground',¹⁴⁹³ 'champaine ground';¹⁴⁹⁴ 'by the medowes on Charwelle'.¹⁴⁹⁵ Only two statements about the state of the roads have been found, 'in dede a pore thrwge' and 'a meane thorough fare'.¹⁴⁹⁶ References to streets in towns are not uncommon.¹⁴⁹⁷ Leland portrayed the country prior to enclosure. The structure was provided by the rivers. These were crossed in places by bridges, ferries or fords. He only once recorded that his route joined another way, that from Dorchester to Weymouth.¹⁴⁹⁸

Further evidence of the lack of roads comes from descriptions of England. Harrison in *Holinshed's Chronicles* wrote one hundred and seven pages about the rivers and three and a half pages about the roads and these only for their antiquarian interest, the four Ancient Royal Highways.¹⁴⁹⁹ William Camden in his description of Britain wrote a chapter for each county. Within almost every county he followed the valleys of the rivers from source to the sea or the county boundary. He wrote 'Now let us treat of the Promontories, Cities, and Rivers, whereof ancient writers have made mention: For, this is my principall project.' No case has been found where his description of a county followed roads.¹⁵⁰⁰

¹⁴⁸⁹ David Hey, *Packmen, Carriers and Packhorse Roads*. Leicester: Leicester University Press. 1980, 20.

¹⁴⁹⁰ All references to Leland's journey refer to Lucy Tomlin Smith, Ed., *The Itinerary of John Leland in or about the years 1535-45. Volumes I, II, IV, V*. Carbondale: Southern Illinois University Press. 1964.

¹⁴⁹¹ Volume IV, Richmondshire, 30, Volume V, Buckinghamshire, 7; Worcestershire, 9; Warwickshire, 11; Shropshire, 16;

¹⁴⁹² Volume II, near Tamworth, 105.

¹⁴⁹³ Volume II, near Meriden, 106.

¹⁴⁹⁴ Volume II, near Banbury, 109.

¹⁴⁹⁵ Volume II, near Islip, 110.

¹⁴⁹⁶ Volume V, near Caer Sws, 9; from Stanford to Bitchfield, 33.

¹⁴⁹⁷ Volume II, Banbury, 39; Stratford-upon-Avon, 48-49.

¹⁴⁹⁸ Volume I, Dorchester to Weymouth, 249.

¹⁴⁹⁹ Raphaell Holinshed, William Harrison *et al.* *Holinshed's Chronicles of England, Scotland and Ireland. Volume I. (1st Edition 1586.)* London: J. Johnson *et al.* 1807, 74-181, 189-192.

¹⁵⁰⁰ William Camden, *Britain*. Trans.Philemon Holland, London: Ioyce Norton and Richard Whitaker. 1637, 187.

Lambarde in the first English County History gave a full description of the Medway and Kentish Stour and their tributaries. He described Watlingstreete as an antiquity but mentioned no other road.¹⁵⁰¹ Speed was more explicit ‘we will dissect and lay open the particular Members, Veins & Joynts, (I mean the Shires, Rivers, Cities and Townes).¹⁵⁰² The veins were the rivers not the roads.

The courts have held that when fences have been erected with reference to a highway then it may be assumed that the highway extends from one fence to the other.¹⁵⁰³ Recently it was stated that ‘Where a right of way crosses open land and no evidence is available as to the width habitually used, then there is no presumption that the way has any defined lateral limits on the ground.’¹⁵⁰⁴ In 1679 it was held that ‘if a way be so foul as is not passable, I may then justify the going over another man’s close next adjoining.’¹⁵⁰⁵ Thus the width of the right of way was not just the distance between the fences but, if the way was impassable, it included also the nearest section of a close.

Road Repairs

Blair wrote recently of ‘The improvement of roads, bridges, and haulage in and around the thirteenth century, which recent research has demonstrated very clearly and convincingly.’¹⁵⁰⁶ There was certainly improvement in bridges¹⁵⁰⁷ and haulage.¹⁵⁰⁸ As his authority for the improvement of the roads Blair refers to Hindle who wrote ‘There was to be no more large-scale road maintenance [from the end of the Roman era] until 1555.’¹⁵⁰⁹ It seems that Blair’s opinion about the improvement of roads may be challenged.

The records show that the ‘persons who had to come to the aid of the King in time of war and on other occasions, were allowed for travelling twenty miles a day. ... For persons walking, this would be an easy rate, even where there was no track at all; and for persons riding on horseback, it would seem to indicate that there must have been great delays on the route.’¹⁵¹⁰ In addition ‘on at least three occasions in the fourteenth century, Parliament had to adjourn because, owing to the state of the roads, not a sufficient number of members were present to go on with the business.’¹⁵¹¹ ‘It was the prelates, earls, barons, and other lords and knights of the shires, as well as the citizens

¹⁵⁰¹ William Lambarde, *A Perambulation of Kent. (1st Edition 1570.)* Chatham: Baldwin, Cradock and Joy. 1826, 198-9, 260-1, 241 ff.

¹⁵⁰² John Speed, *The Theatre of the Empire of Great Britaine.* London. 1627, 1.

¹⁵⁰³ *A-G v Benyon* (CA) [1970] Ch 1, [1969] 2 All ER 263.

¹⁵⁰⁴ *Secretary of State for Defence v Percy* (Ch D) [1999] 1 All ER 732.

¹⁵⁰⁵ *Absor v French* (1679) 2 Show. K.B. 28.

¹⁵⁰⁶ John Blair, ‘Introduction.’ John Blair, Ed., *Waterways and Canal-Building in Medieval England.* Oxford: Oxford University Press. 2007, 1.

¹⁵⁰⁷ See:- David Harrison, *The Bridges of Medieval England.* Oxford: Clarendon Press. 2004.

Alan Cooper, *Bridges, Law and Power in Medieval England. 700-1400.* Woodbridge: The Boydell Press. 2006.

¹⁵⁰⁸ John Langdon, ‘A Revolution in Vehicle Transport in Twelfth- and Thirteenth-Century England?’ *Past and Present.* Number 103. (1984), 37-66.

¹⁵⁰⁹ Paul Hindle, *Roads and Tracks for Historians.* Chichester: Phillimore & Co. Ltd. 2001, 7.

¹⁵¹⁰ W.T. Jackman, *The Development of Transportation in Modern England. Third Edition.* London: Frank Cass & Co. Ltd. 1966, 9 fn. Referring to *Rot. Parl.*, VI, p. 525.

¹⁵¹¹ Price, *Leeds and its Neighbourhood*, p. 114. Cited in W.T. Jackman, *The Development of Transportation in Modern England. Third Edition.* London: Frank Cass & Co. Ltd. 1966, 9 fn.

and burgesses of cities and boroughs who were unable to travel.¹⁵¹² Jackman sums up his opinion of the roads in medieval times by writing ‘There probably were all over the kingdom quite passable bridle-paths, but we must not mistake these for good roads.’¹⁵¹³

There are few descriptions of the surface of the roads or ways. In 1642 Abbot Rucellai described the excellent [*buonissime*] roads of Lombardy ‘which, because they have not been flattened by anyone passing along them on account of any war, are full of grass and barely distinguishable.’¹⁵¹⁴ Later in 1868 Wheeler wrote of the ‘reclaimers of the fens of our generation, who deemed it sufficient to leave a wide space and call it a road.’¹⁵¹⁵ It is suggested here that ways were no more than wide strips of open country at their best when covered in grass.

After a study of public works in the medieval period Flowers deduced that ‘a road could be left to itself or to unregulated local effort.’¹⁵¹⁶ Masschaele found only evidence of drainage and the removal of obstacles from the roads of Huntingdonshire.¹⁵¹⁷ Webb and Webb wrote ‘The idea of road maintenance in the Middle Ages, and indeed, down to much later times, did not include anything in the nature of construction of a special road surface.’¹⁵¹⁸ There is evidence that ways had to be kept clear.¹⁵¹⁹ The abbot of Chertsey was in court for allowing two wells to exist in the road between Egham and Staines, not because he failed to maintain the road, ‘but because a hapless man had drowned in one of the holes, and the Abbot had claimed his goods.’¹⁵²⁰

Rogers mostly studied prices. However his understanding of transport seems to have been weak. He wrote ‘Water carriage is by sea, as from Newcastle to Durham, by sea and river as from Norwich to Yarmouth, by river as from London to Henley, the farthest point to which, before locks were erected, the Thames was ordinarily navigable.’¹⁵²¹ Two errors and a doubtful statement in three lines should be unusual for an author of his standing. From his study of prices he concluded that ‘that the cost of carriage was low, and that the roads were therefore, *prima facie*, good.’ In his records of prices there is no mention of a road being repaired except for New College Lane, Oxford, which is a town road and the date of the repair probably after 1600.¹⁵²²

¹⁵¹² Rolls of Parliament, ii. p. 107. Quoted in J.J. Jusserand, *English Wayfaring Life in the Middle Ages*. (1st published Ernest Benn Ltd 1889.) London: Methuen & Co Ltd. 1961, 44.

¹⁵¹³ W.T. Jackman, *The Development of Transportation in Modern England. Third Edition*. London: Frank Cass & Co. Ltd. 1966, 9 fn.

¹⁵¹⁴ Un’Ambasciata, *Diario dell’abate G.F. Rucellai*, p. 32. Quoted in Antoni Maczak, *Travels in Early Modern Europe*. Cambridge: Polity Press. 1995, 5.

¹⁵¹⁵ W.H. Wheeler, *History of the Fens of South Lincolnshire*. Boston: J.M. Newcomb. 1868, 12.

¹⁵¹⁶ *Public Works in Mediaeval Law, Volume 1*. Editor C.T. Flower. Selden Society Vol. 42. 1915, xxv.

¹⁵¹⁷ James Masschaele, *Peasants, Merchants, and Markets*. New York: St. Martin’s Press. 1997, 193-195.

¹⁵¹⁸ Sidney and Beatrice Webb, *English Local Government, The Story of the King’s Highway*. London: Longmans, Green and Co. 1913, 6-7.

¹⁵¹⁹ G.D.G. Hall, *The Treatise on the Law and Customs of the Realm of England commonly called Glanvill*. Oxford: Clarendon Press. 1965, 113-114.

¹⁵²⁰ Paul Hindle, *Roads and Tracks for Historians*. Chichester: Phillimore. 2001, 41.

¹⁵²¹ James E. Thorold Rogers, *A History of Agriculture and Prices in England. Volume IV. 1401-1582*. Oxford: The Clarendon Press. 1882, 692-694.

¹⁵²² James E. Thorold Rogers, *A History of Agriculture and Prices in England. Volume V. 1583-1702*. Oxford: The Clarendon Press. 1887, 761.

There are many records of bridges and causeways being maintained by bequests and at the expense of the local people. No reference has been found of expenditure on the repair of roads between towns. The streets in some towns were repaired by the income from paving.¹⁵²³ In some villages the tenants were required to mend the road 'next to his land'.¹⁵²⁴ When a land owner dug a ditch beside a road he was responsible for clearing the ditch so that the road did not become flooded.¹⁵²⁵ But, in general, outside of the towns there is no evidence that roads were repaired. 'We can say at once that in most places (upkeep and repair) was negligible or nonexistent.'¹⁵²⁶

Before Parliament made arrangements to repair rural roads it gave authority to move them. An Act of 1523 authorised the rerouting of roads in the Weald of Kent which were 'so depe and noyous by wearyng and Course of Water and other occasions that people cannot have their Cariages or Passages by Horses upon or by the same but to their great paynes parill and jeopdie.'¹⁵²⁷ These provisions were extended to the whole of Sussex in 1534.¹⁵²⁸

The first legislation relating to the repair of rural roads was passed in 1555.¹⁵²⁹ Most authors have failed to see the link between enclosure and the start of road maintenance. In 1586 Harrison complained that some highways

within these five and twenty years have been in most places 50 foot broad according to the law, whereby the traveller might either escape the thief or shift the mire or pass by the loaden cart without danger of himself and his horse, now they are brought into 12 or 20 or 26 at the most, which is another cause also whereby the ways be the worse and many an honest man encumbered in his journey.¹⁵³⁰

'Such comments were echoed by Camden, Speed, Pepys, Thoresby and Fiennes, among many others.'¹⁵³¹

There is little or no evidence that the condition of the roads improved between 1555 and the end of the century. The first text which describes the duties of the Surveyors of Highways, which has been found, was written in 1591¹⁵³² and the next in 1660.¹⁵³³ The first text describing the highways was printed in 1655¹⁵³⁴ and the first description as to how they should be repaired in 1695.¹⁵³⁵ An Act of 1691 required that every cartway

¹⁵²³ W.T. Jackman, *The Development of Transportation in Modern England. 3rd Edition.* London: Frank Cass & Co. Ltd. 1966, 10-11.

¹⁵²⁴ Warren O. Ault, *Open-Field Farming in Medieval England.* London: George Allen and Unwin Ltd. 1972, 117.

¹⁵²⁵ *Public Works in Mediaeval Law Volume I.* Editor C.T. Flower. Selden Society Vol. 32. 1915.

¹⁵²⁶ Christopher Taylor, *Roads and Tracks of Britain.* London: J.M. Dent & Sons Ltd. 1979, 150.
¹⁵²⁷ (1523) 14 & 15 Henry VIII c.6.

¹⁵²⁸ (1534) 26 Henry VIII c. 7.

¹⁵²⁹ (1555) 2 & 3 Philip and Mary c.8

¹⁵³⁰ William Harrison, *The Description of England.* Edited by Georges Edelen. Washington: The Folger Shakespeare Library and New York: Dover Publications, Inc. 1994, 444.

¹⁵³¹ Paul Hindle, *Roads and Tracks for Historians.* Chichester: Phillimore. 2001, 49.

¹⁵³² William Lambarde, *The duties of Constables ...* London: Ralph Newberie. 1591.

¹⁵³³ Edmund Wingate, *The exact constable ...* London: H. Brome. 1660.

¹⁵³⁴ W. Burton, *An almanack for the yeare 1655.* Oxford: Hen. Hall. 1655.

¹⁵³⁵ W. Mather, *Of repairing and mending the highways.* London: Samuel Clark. 1696.

leading to a market was required to be 8 feet wide and every horse causey 3 feet wide.¹⁵³⁶ The ways were very different from modern highways.

It is suggested here that once land was enclosed the width of the ways was limited by permanent fences and the traffic was forced into a narrow path and could no longer 'maintain itself'. In the first extant book about roads, written in 1610, there is a description of 'great hurt and spoil of fences and grounds, with riding and going over the corn and such like, by shifting and seeking the best way diversely.'¹⁵³⁷ It seems that people were used to spreading out across the land when travelling and initially rebelled against being forced to use a floundering way. This seems to receive support from Coke's Reports which surprisingly seem to have been ignored by most historians of transport. Coke wrote in c.1630 that the owner of land beside a highway had a responsibility for cleansing the ditches but not for repairing the way except where there was a customary duty. However Fraser in his commentary on Coke's Reports written in 1826 quoted subsequent cases in which it was held that when a person enclosed a highway he thereby became responsible for maintaining the road and further that if he enclosed one side where there was ancient enclosure on the other side he must then maintain the whole road.¹⁵³⁸

In Ghana in 1954 it was considered that if a trail was used by 5 vehicles a day it needed to be drained, if used by 30 vehicles a day it needed a good gravel surface, and if by over 150 vehicles a day a bitumen seal.¹⁵³⁹ Similar figures are not available for England but the basic fact remains that it is impossible in most places, and especially in winter and on clays, for a road to be narrow, heavily used, have no surface maintenance and to have a good surface.

The Evidence from Maps

It is possibly useful to start with an analogy. If a biologist wishes to study the habits of ants she may place some small piles of food on a clean plate and observe how an ant moves. She will observe the routes the ant takes. A map or plan of these routes would not imply that there is any physical feature on the plate corresponding to the routes. Some geographers have mapped the routes of the medieval kings or bishops and then assumed that these routes implied that there were roads along the routes. The fact that a route is passable does not imply that there is a road. Delano-Smith and Kain wrote of the maps of the time of Henry VIII. 'One would expect a topographical map showing towns and villages, ... We would not expect it to show roads, for the army, like all travellers at that time, was expected to make its way from one place to the next by whichever of the local tracks the army's scouts [or travellers' guides] advised should be used.'¹⁵⁴⁰

¹⁵³⁶ (1691) 3 & 4 William and Mary c. 12.

¹⁵³⁷ Thomas Proctor, *A Profitable Work to this Whole Kingdom concerning the Mending of all the Highways*. 1610. Quoted in Sidney and Beatrice Webb, *English Local Government: The Story of the King's Highway*. London: Longmans, Green and Co. 1913, 6.

¹⁵³⁸ John Henry Thomas and John Farquhar Fraser, Eds. *The Reports of Sir Edward Coke*. London: Joseph Butterworth and Son. 1826, 433-437.

¹⁵³⁹ H.P. White and M.L. Senior, *Transport Geography*. London: Longman. 1983, 23.

¹⁵⁴⁰ Catherine Delano-Smith & Rover J. P. Kain, *English Maps: A History*. London: The British Library. 1999, 159-160.

Edson wrote ‘Until the recent revolution in the history of cartography, medieval maps were looked upon as quaint, amusing, and quite simply WRONG.’¹⁵⁴¹ It was not that they were wrong but rather as Taylor said ‘(the diagrammatic character of mediaeval maps) is not always, even by geographers, and certainly not by historians, fully understood. We know that the modern map has to be interpreted according to a number of rigid conventions, but the same is true of the mediaeval map also. ... (The mediaeval mapmaker) was putting on to a sheet of parchment the things he wanted to express.’¹⁵⁴²

The history of maps gives an insight into how people saw the country at different times. The early world maps showed an outline of the countries, the location of a few towns¹⁵⁴³ and in the case of the Hereford Map about 14 rivers.¹⁵⁴⁴ In c.1250 Matthew Parris drew in his commonplace book a diagram showing the ‘four pre-Roman paved roads built, as related by Geoffrey of Monmouth (History of the Kings of England, c.1136), by King Belinus’.¹⁵⁴⁵ This shows the roads intersecting at one point, which they do not. However his four maps of Great Britain show an itinerary from Dover to Newcastle with the remainder of the country sketched in. They show towns and rivers. On only one of the four maps is the road to be followed shown as a line and even that for only part of its length.¹⁵⁴⁶ There are no other roads shown on the maps.

It used to be considered that the map of Great Britain known as the Gough Map from c.1360 showed roads.¹⁵⁴⁷ More recently these red lines on the map are described as ‘a selection of routes’ or ‘distance lines’.¹⁵⁴⁸ The red lines are sometimes drawn across the rivers. Sometimes the lines have a gap at the river crossing. There are no signs for fords, bridges or ferries. The line joining London to Norwich passes through a marsh at the source of the River Tud. The red lines are all straight between towns. They never have a bend where some obstruction needed to be avoided. Harvey notes that ‘the distances from one place to another are in local (and very variable) customary miles, but the lengths of the roads on the map itself bear no fixed relation either to these figures or to the distances expressed by a standard measure.’¹⁵⁴⁹ It is as if the maker of the map said ‘You need to stop at these places. You need to travel these distances. Find the most suitable route.’

¹⁵⁴¹ Evelyn Edson, *Mapping Time and Space*. London: The British Library. 1997, vii.

¹⁵⁴² Professor E.G.R. Taylor, in ‘Early Maps of Great Britain: Discussion.’ *The Geographical Journal*, Vol. 81, No 1. 1933, 43-45, 44.

¹⁵⁴³ Anonymous World Map. c1000; *Giraldus Camrensis*. c.1200. In Royal Geographical Society, *Early Maps of the British Isles. A.D. 1000 – A.D. 1579*. London: Royal Geographical Society. 1961.

¹⁵⁴⁴ Richard of Haldingham. c 1300. In Royal Geographical Society, *Early Maps of the British Isles. A.D. 1000 – A.D. 1579*. London: Royal Geographical Society. 1961.

¹⁵⁴⁵ Catherine Delano-Smith & Rover J. P. Kain, *English Maps: A History*. London: The British Library. 1999, 17.

¹⁵⁴⁶ *Four Maps of Great Britain designed by Matthew Paris about A.D. 1250*. London: British Museum. 1928.

¹⁵⁴⁷ E.J.S. Parsons, *The Map of Great Britain circa A.D. 1360 known as the Gough Map*. Oxford: Oxford University Press. 1958, 10.

Also see works like: Michael Aston, *Interpreting the Landscape*. London: B.T. Batsford. 1985, 143.

¹⁵⁴⁸ Catherine Delano-Smith & Rover J. P. Kain, *English Maps: A History*. London: The British Library. 1999, 48, 159.

¹⁵⁴⁹ P.A. Harvey, ‘Local and Regional Cartography in Medieval Europe.’ In J.B. Harvey and David Woodward, *The History of Cartography. Volume One*. Chicago: The University of Chicago Press. 1987, 496.

A plan of the Isle of Thanet also from the late 14th century is in the style of the Gough map.¹⁵⁵⁰ It shows the coastline, thirteen ecclesiastical buildings, a *cursus cerve* (the course of a hind), 12 king's highways, a small boat carrying two people across the Wensum, a man carrying a monk across the Wensum and a few other features. The names of all the ecclesiastical buildings are entered as are the names of other communities. The *cursus cerve* is a green line from north to south of the island with about 46 corners, mostly right-angled, and about 1/3 of the length being curved. The cartographer wrote 'the green line indicates the running of the deer, turning hither and thither across the ground, which line contains three feet in breadth without break and is wholly preserved.' It was described as a 'linch' which is a ridge or an unploughed strip serving as a boundary between fields. The line was, in fact, the boundary between the land of St Augustine's Abbey and Christ Church, Canterbury.

One of the red lines indicating the king's highway follows the foreshore. The other red lines joining ecclesiastical buildings or communities are mostly straight but they are curved when they pass round intermediate churches. The red lines differ from those on the Gough map in that where there are three buildings roughly in line the road is shown as passing round the middle one whereas the Gough map shows two lines joining 1st - 2nd and 2nd - 3rd. One road has the name Dunstret written against it four times. The other roads are unnamed. In four short sections the green and red lines coincide. The difference between the green and red lines may be one of convention. The property boundary was the main subject of the map and the highways may only have been indicated as straight lines for convenience.

The Andrews and Herberts' map of Kent of 1769 shows the straight 'Old Roman Road' from Ickham to Richborough on the mainland but no straight roads on the island. The map drawn by Andrews and Herbert shows no bypasses round the towns and the lanes are more sinuous even than the modern roads.¹⁵⁵¹

On the 14th century map some of the ecclesiastical buildings have no highway leading to them which indicates that the red lines were not a complete record of all the rights of way. Whether those which were omitted were local rights as opposed to the king's highway or whether they were omitted because they were less used is not known. Whether the red lines represent a track three feet wide like the green line or a wide band of land over which people were free to move seems to be impossible to establish. No other map has been found which uses straight lines to show the distance between towns before the map of John Adams printed in 1692.¹⁵⁵²

A map of Sherwood Forest of c.1400 shows four rivers as wide bands. About six road names are entered on the map, *royde of Boluel*, *Rede Royde Hil*, etc. but there are no lines to show where the roads went to or from.¹⁵⁵³ A map of Dartmoor of c.1500 shows the rivers as bands about 15 mm wide and roads at most 3 mm wide. It appears that of the six bridges three have roads leading to and from them and three have not. From

¹⁵⁵⁰ F. Hull, 'Isle of Thanet, Kent, late 14th century x 1414.' In R.A. Skelton and P.D.A. Harvey, Eds. *Local Maps and Plans from Medieval England*. Oxford: Clarendon Press. 1986, 122, Plate 8.

¹⁵⁵¹ In Andrews and Dury & Wm Herbert, *A Topographical-Map of the County of Kent. 1769*.

Reproduced by Harry Margary, Lympne Castle, Kent. 1968.

¹⁵⁵² R.V. Tooley, *Maps and Map-makers*. (6th Edition.) London: B.T. Batsford Ltd. 1978, 50.

¹⁵⁵³ M.W. Barley, 'Sherwood Forest, Nottinghamshire, late 14th or early 15th century.' In R.A. Skelton and P.D.A. Harvey, Eds. *Local Maps and Plans from Medieval England*. Oxford: Clarendon Press. 1986, 131-140, Plate 10.

these maps it is clear that to the cartographers rivers were of greater importance than the roads.¹⁵⁵⁴

During the 15th and early 16th centuries the depiction of the line of the coast and of the rivers on national maps became closer to reality.¹⁵⁵⁵ From the middle of the 16th century an increasing number of county maps were produced at first some were very rough sketches¹⁵⁵⁶ but their accuracy rapidly improved and the amount of detail increased. In c.1574 Saxton started a survey to produce maps of each of the counties.¹⁵⁵⁷ Harvey has written of these maps 'There was, however, room for improvement - the maps did not show roads.'¹⁵⁵⁸ There can be little doubt that Saxton was capable of surveying anything which existed on the ground. Either he chose not to show roads or the roads were not then well defined on the ground.

The first cartographer to show some roads on some of his county maps was John Norden who started work in c.1590.¹⁵⁵⁹ However the roads were omitted when his maps were used to illustrate Camden's *Britannia* and Speed's *Theatre of the Empire of Great Britaine*. It was not until after the publication of Ogilby's strip maps in 1675¹⁵⁶⁰ that roads began to be shown regularly on county maps.¹⁵⁶¹ Ogilby was also the first person to show which roads were fenced on both sides, one side or neither.

The most notable feature of the pre-1650 national maps is their emphasis on the rivers. This is also the case with maps and plans of smaller areas. Leland in his sketch of 'Parts of East Yorkshire and Lincolnshire' showed only rivers.¹⁵⁶² Skelton and Harvey have reproduced 26 medieval maps and plans. Several are plans of rivers. On most of the maps the rivers are much more prominent than the roads.¹⁵⁶³

¹⁵⁵⁴ J.V. Somers Cocks, 'Dartmoor, Devonshire, late 15th century or early 16th century.' In R.A. Skelton and P.D.A. Harvey, Eds. *Local Maps and Plans from Medieval England*. Oxford: Clarendon Press. 1986, 293, Plate 26.

¹⁵⁵⁵ See for example:- Totius Britanniae Tabula Chorographica c 1400; Pietro Coppo 1520; Claudius Ptolemaeus 1513; Angliae Figura 1534-1546; Sebastian Munster 1552; George Lily 1546; Abraham Ortelius 1570; Humphrey Lhuyd 1573; Saxton 1579. In Royal Geographical Society, *Early Maps of the British Isles. A.D. 1000 – A.D. 1579*. London: Royal Geographical Society. 1961.

¹⁵⁵⁶ Laurence Nowell, Parts of Sussex and Kent, c1562. In Royal Geographical Society, *Early Maps of the British Isles. A.D. 1000 – A.D. 1579*. London: Royal Geographical Society. 1961.

¹⁵⁵⁷ Sarah Tyacke & John Huddy, *Christopher Saxton and Tudor map-making*. London: The British Library. 1980.

¹⁵⁵⁸ P.D.A. Harvey, *Maps in Tudor England*. London: The Public Record Office and The British Library. 1993, 60.

¹⁵⁵⁹ Eg. Included: Essex, 1594, John Norden, *Speculi Britanniae Pars; Historical and Chorographical description of the county of Essex*. London: Camden Society. 1840.

Excluded: Hampshire, c1595, *Two Hundred and Fifty Years of Map-making in the county of Hampshire*. Lympne Castle: Harry Margary. 1976, Map 5a.

¹⁵⁶⁰ John Ogilby, *Britannia, Volume the First: or, an illustration of the kingdom of England*. (1st Edition 1675.) London: The Author. Republished by Osprey Publications Ltd, Reading. 1971.

¹⁵⁶¹ A.B. Craven, *Surveyors and Map Makers*. Leeds: Yorkshire Branch of the Royal Institution of Chartered Surveyors and Leeds City Libraries. 1955, 15.

¹⁵⁶² *The Itinerary of John Leland in or about the years 1535-45. Volume IV*. Editor Lucy Tomlin Smith. Carbondale: Southern Illinois University Press. 1964, opposite page 180.

¹⁵⁶³ R.A. Skelton and P.D.A. Harvey, Eds. *Local maps and plans from medieval England*. Oxford: Clarendon Press. 1986.

Conclusion

In 1752 Carter stated that 'it is as rare to see a coach at Littleport as a ship at Newmarket'.¹⁵⁶⁴

It is only in the last ten years that it has been suggested that:

In early centuries, it was by no means always clear on the ground precisely which was 'the road'. Before enclosure and the 'privatisation' of land, the laws of the ancient common-field farming system could accord travellers way-leave over manorial land, and the tracks which eventually became our 'roads' were in essentials only the most commonly trodden strip of ground. Travellers might deviate from the track, especially where it became impassable in bad weather, or elect to pick their way over the fields - along the headlands and between the furlongs of cultivated openfield - a practice permissible provided no damage was done to the land or to crops.¹⁵⁶⁵

It is an error to assume that where people travelled on land there was a road. People could walk, horses could be ridden, carts and wagons could be pulled across most areas of unfenced ground. Thus until the construction of turnpike roads during the second half of the 17th century it seems that rural roads were an insignificant feature in the landscape.

¹⁵⁶⁴ Rev Edward Conybeare, *Highways and Byways in Cambridge and Ely*. London: Macmillan and Co., Limited. 1910, 389.

¹⁵⁶⁵ Catherine Delano-Smith & Roger J.P. Kain, *English Maps: A History*. London: The British Library. 1999, 172.

Appendix P

Natural and Given Rights

Introduction

While there has been considerable discussion in Scots law¹⁵⁶⁶ as to the history of the law of trespass to land with regard to ‘implied licence’, a given right, and ‘customary access’, a natural right, little has been found which relates to these subjects under English Law. It is considered that there has been considerable misunderstanding of the historic public rights in England. In studying the sources of rights of access to land it is convenient to divide these rights into three types. The ‘statutory rights’ all post-date 1600 and are not considered here. A ‘given right’ is a right given by the owner of the land called here ‘a right *donatus*’. A right which exists because of the nature of the land is called ‘a right *in principio*’.

For a property owner the rights *donati* may include easements and prescriptive rights and licences. The rights *in principio* include the right of support and flow of water and the negative right not to have polluting smoke blowing across the property.¹⁵⁶⁷

The current legal texts consider that the public rights *donati* over land include rights of way, rights of common and rights of village green, although this opinion is disputed in this thesis. The standard legal texts scarcely consider the public rights *in principio*. Simpson wrote of them ‘It is true that the distinction between such natural rights and servitudes *stricto sensu* is already [at the time of Bracton] appreciated - natural rights arise through operation of law, they are ‘of common right’, and do not depend upon express grants or prescription.’¹⁵⁶⁸

Blackstone wrote ‘the law of England ... has treated every entry upon another’s lands, (unless by the owner’s leave, or in some very particular cases) as an injury or wrong, for satisfaction of which an action of trespass will lie.’ Rights *donati* correspond to Blackstone’s ‘by the owner’s leave’ and rights *in principio* to the ‘very particular cases’.¹⁵⁶⁹

It is considered that a clearer perspective is obtained by placing the rights of the public on rivers in the context of the history of the other six rights *in principio*. The public rights *in principio* considered are access to:-

¹⁵⁶⁶ eg Jeremy Rowan-Robinson and Andrea Ross, ‘The Freedom to Roam and Implied Permission.’ *Edinburgh Law Review*, Vol. 2, (1998) 225-233.

Alan Blackshaw, ‘Implied Permission and the Traditions of Customary Access.’ *Edinburgh Law Review*, Vol. 3, (1999), 368-380.

Alan Blackshaw, ‘Customary Freedoms of Scottish Access.’ *John Muir Trust Journal* Winter 2003. www.jmt.org/news/2003/34/34_access.html. Dated 07/04/2006.

Scottish Parliament Justice 2 Committee. Monday 14 January 2002 (Afternoon). Reported at www.scottish.parliament.uk/business/committees/historic/justice2/or-02j202-0. Dated 07/04/2006.

¹⁵⁶⁷ E.H. Burn, *Modern Law of Real Property*. London: Butterworths. 2000, 580.

Possibly better defined in Australian Law: Peter Butt, *Land Law*. Pyrmont: Thomson Legal and Regulatory Group. 2005, 420.

¹⁵⁶⁸ A.W.B. Simpson, *A History of the Land Law*. 2nd Edition. Oxford: Clarendon Press. 1986, 107.

¹⁵⁶⁹ Sir William Blackstone, *Commentaries on the Laws of England. Book the Third. Chapter 12*. 11th Edition. London: T. Dadell. 1791, 209-210.

- | | |
|-----------------------|--|
| 1. Air | Never lost. |
| 2. Tidal waters | Never lost. |
| 3. The foreshore | Restored. Marine Act 2009 (c.23). 296 - 309 |
| 4. River Banks | Apparently lost 1789 due to impossibility of use. ¹⁵⁷⁰ |
| 5. Lakes | Apparently never lost. |
| 6. Non-tidal rivers | Disputed. |
| 7. The Right to Roam. | Restored. Countryside and Rights of Way Act 2000 (c.37). (Considered in Part 3.) |

Since these are public rights they can only be claimed in the name of the Attorney General who sets strict rules as to which cases he will allow to be brought in his name. However if a person is accused of trespass then a land-owner needs no permission to commence an action in the courts.

Public rights can only be extinguished in three ways:- (1) by statute, (2) by statutory authority, (3) by it becoming impossible for the right to be exercised, as when a river changes its form and becomes unusable. Public rights are not lost by lack of use for a long period of time.

1 Air

It was said in 1588 that the maxim *cuius est solum eius est usque ad coelum et ad inferos* (the owner of the land owns everything from the heavens to Lower World) was known from the time of Edward I.¹⁵⁷¹ This maxim has never been rejected. However it has been held that the right of ownership is subject to the public right to pass through the air above a person's land. In 1815 it was held that balloons may fly over a person's land¹⁵⁷² and in 1978 it was held that aircraft may fly through the space above owned land.¹⁵⁷³

Thus there is, and always has been, a right *in principio* to fly through space, air, owned by another.

2 Tidal Waters

With regard to tidal waters Schultes wrote in 1811:

The early writers on the common law of England agree with the institutions; and subsequent writers on the common law, civil, and feudal law, justify this inference, that the supreme dominion or jurisdiction of the sea belongs to the sovereign, as head and representative of his people; and that the free and universal right of fishing and navigation, ... belongs to the subject.¹⁵⁷⁴

In 1830 and 1851 Woolrych wrote 'that the sea, in a word, is open and common to all for the accomplishment of lawful and useful undertakings, is so familiar to every one, as

¹⁵⁷⁰ *Ball v Herbert* (1789) 3 TR 253.

¹⁵⁷¹ *Bury v Pope*, (1588) Cro Eliz 118.

¹⁵⁷² *Pickering v Rudd*, (1815) 4 Camp 219.

¹⁵⁷³ *Berstein of Leigh (Baron) v Skyviews & General Ltd.*, [1978] Q.B. 479.

¹⁵⁷⁴ Henry Schultes, *An Essay on Aquatic Rights*. London: W. Clarke and Sons. 1811, 5.

to need no further confirmation nor authority.¹⁵⁷⁵ This was the traditional understanding of the law whether the soil of the land under the water was owned by the crown on behalf of the people or by an individual.¹⁵⁷⁶

In 1604 Grotius claimed that the sea was always a public place.¹⁵⁷⁷ In 1635 Selden claimed that a country could have ownership of the high seas.¹⁵⁷⁸ In 1761 Bathurst praised Selden's work and implied that his policy meant that all places could be enclosed.¹⁵⁷⁹ Further consideration of this dispute is outside the scope of this thesis but it is significant that for the period 1189-1600 no suggestion has been found that either seas or rivers could be enclosed.

3 The Foreshore

The foreshore is a strange place. It moves due to accretion and dereliction. Its ownership has often been disputed.¹⁵⁸⁰ When the tide is in there is a public right of navigation on the water¹⁵⁸¹ but it was held in 1821 that when the tide is out there is no right to walk on the foreshore.¹⁵⁸²

Bracton wrote 'Of natural right all these things are common: flowing water, air and sea, and the shores of the sea, as being as it were approaches to the sea. For no one is prohibited from approaching to the sea provided he abstains from the villas and buildings, for the shores are by the right of nations common, like the sea.'¹⁵⁸³ Lord Chief Justice Parker said 'As to the authority of Bracton, ... there is no colour to say, that it was not law at that time.'¹⁵⁸⁴

Holdsworth wrote:

Both the MSS. and the text-books written on the law of England show us that "for a century or thereabouts our English lawyers were steeped in Bracton." Thus is it ultimately to Bracton and to Bracton alone that we must look for an

¹⁵⁷⁵ Humphrey W. Woolrych, *A Treatise on the Law of Waters and of Sewers*. London: Saunders and Benning. 1830, 4. 2nd Edition 1851, 4.

¹⁵⁷⁶ (1349) 22. *ass.* 93.

(1619) *Da. Piscar. Ban.* 56.

Henry Rolle, *Un Abridgment des Plusieurs Cases et Resolutions del Common Ley*. London: A. Crooke and others, 1668, 2. 169, para 5.

Lord Chief-Justice Hale, *De Jure Maris*. Contained in Hargrave, Francis. Ed. *A Collection of Tracts relative to the Law of England* London: T. Wright, 1787, 36.

¹⁵⁷⁷ Hugo Grotius, 'Mare Liberum' in *De Domino Maris*. 1604.

¹⁵⁷⁸ John Selden, *Mare Clausum*. Londini. 1635.

See Thomas Wemyss Fulton, *The Sovereignty of the Sea*. Edinburgh and London: William Blackwood and Sons. 1911. Reprinted New York: Kraus Reprint Co. 1976.

¹⁵⁷⁹ (1654w) in *Literary Remains* ed. T. Warton (1761) p. 292. Quoted in James Turner, *Politics of Landscape*. Cambridge, Massachusetts: Harvard University Press. 1979, 128.

¹⁵⁸⁰ See:- Stuart A. Moore, *A History of the Foreshore*. London: Stevens & Haynes. 1888.

¹⁵⁸¹ *Fitzhardinge (Lord) v Purcell*, (1908) 72 J.P. 276.

Denaby and Cadeby Main Colliers v Anson, [1911] 1 K.B. 171.

¹⁵⁸² *Blundell v Catterall*, (1821) 5 B. & Ald. 268.

¹⁵⁸³ *Henrici de Bracton de Legibus et Consuetudinibus. Volume I*. Editor Sir Travers Twiss. London: Longman & Co. 1878, 57.

¹⁵⁸⁴ (Lord Chief Justice 1710-18.) Fortescue, p. 408. Quoted by Best J. in *Blundell v Catterall*, (1821) 5 B. & Ald. 268, 282.

account of this period of the vigorous growth of the common law. In his works it is summed up and passed on to future generation.¹⁵⁸⁵

Best J. in a minority opinion in *Blundell v Catterall* said ‘The shore of the sea is admitted to have been at one time the property of the King. From the general nature of this property, it could never be used for exclusive occupation. It was holden by the King, like the sea and the highways, for all his subjects. The soil could only be transferred, subject to this public trust; and general usage shews that the public right has been excepted out of the grant of the soil.’¹⁵⁸⁶

However the opinion of the majority of the judges was that there had been no previous case relating to access to the foreshore and so they should consider the ‘public good’ in determining the case. They considered that the most important factor was the importance of ensuring that bathing by males and females was discreetly supervised and separated and that land-owners were the people most suited to ensure the morality of the bathers. Thus the legal right of access to the foreshore was lost.

Since 1821 the public have regularly accessed the foreshore. Howarth wrote ‘walking, bathing, beachcombing and an infinite variety of other coastal recreations are generally tolerated by the Crown and other owners of the foreshore, they continue to be exercised in the absence of any legal rights possessed by the public.’¹⁵⁸⁷ Lord Justice Harman said ‘It is notorious that many things are done on the foreshore by the public which they have no right to do.’¹⁵⁸⁸

Only one medieval map has been found where the cartographer states that ‘the red lines (*rubee linee*) show the king’s highway of the island from one parish to another...’ This is the c.1400 map of the Isle of Thanet.¹⁵⁸⁹ On this map there is a red line along the shore all around the island. This seems to be strong confirmation that the foreshore was a public place at that time.

No evidence has been found relating to the period 1189-1600 which would imply that there was not a public right of access to the foreshore during that period and so it is considered that there was right *in principio* to walk on the foreshore during that period.

It seems that the provisions of the Marine Act 2009 when implemented will effectively restore this public right.

¹⁵⁸⁵ W.S. Holdsworth, *A History of English Law. Volume II.* 3rd Edition. (1st Edition 1903.) London: Methuen & Co. Ltd. 1923, 286-287.

¹⁵⁸⁶ *Blundell v Catterall*, (1821) 5 B. & Ald. 268, 287.

¹⁵⁸⁷ William Howarth, ‘Access to the Foreshore: *Blundell v. Catterall* reconsidered.’ *Rights of Way Law Review.* (1992), 11-15.

¹⁵⁸⁸ *Alfred F. Beckett v Lyons*, [1966] 2 W.L.R. 421, 430.

¹⁵⁸⁹ F. Hull, ‘Isle of Thanet, Kent, late 14th century x 1414.’ In R.A. Skelton and P.D.A. Harvey, Eds. *Local Maps and Plans from Medieval England.* Oxford: Clarendon Press. 1986, 122, Plate 8.

4 River Banks

Bracton wrote in c.1260:

All rivers and ports are public, ... The use of the banks is also public by the right of nations, as of the river itself. It is free to every person to moor ships there to the banks, to fasten ropes to the trees growing upon them, to land cargoes and other things upon them, just as to navigate the river itself, but the property of the banks is in those whose lands they adjoin, ... and this is to be understood of perennial rivers, because streams, which are temporary, may be property.¹⁵⁹⁰

Callis said in 1622:

The ownership and property of the Sea Bank and Banks of great Rivers, be to them whose grounds are next thereto adjoining, ... but the use of the Banks is common to all the King's liege people, as to tie the ships and Boats to the Trees, and to tow them to and fro, and to lade and unlade their merchandizes thereon, ... I cannot more aptly compare a Bank of the Sea, or of a navigable River, than to a High-way, for that the property thereof is to him whose ground is next adjoining, and the use thereof is common to all men.¹⁵⁹¹

In about 1660 Hale wrote that there was a right to tow on the banks of all rivers and creeks. In some places the right was by custom and so free of charge and in others places *sub modo* and so a charge could be made for damage done.

A similar right to tow from the bank of the Severn was confirmed by statute in 1528 with provision for 'reasonable recompense and satisfaccion for such hurtes and offenses as he or they having such londis or medes adjoynnyng to the seid Streame or Water shall susteyne by reason of eny such goyng or drawing of any such Trow Bote or Vessell.'¹⁵⁹² In 1532 the law was reviewed and the charge removed.¹⁵⁹³

In the Statutes passed prior to 1600 no provision was made for creating tow paths. It appears that it was assumed that there was a right to pass on the banks of the rivers.¹⁵⁹⁴ In 1280 it was held that there was a right to tow from the bank of the Parrett between 'Brugewat' and Langport'.¹⁵⁹⁵ In 1704 Chief Justice Holt stated that 'if one have land

¹⁵⁹⁰ *Henrici de Bracton de Legibus et Consuetudinibus Angliae. Volume I.* Editor Sir Travers Twiss. London: Longman & Co. 1878, 58-59.

¹⁵⁹¹ Robert Callis, *The Reading of the Famous and Learned Robert Callis, Esq; Upon the Statute of 23 H.8. cap. 5. of Sewers: As it was delivered by him at Gray's Inn in August 1622.* 2nd Edition. London: Thomas Basset. 1685, 73-74.

¹⁵⁹² (1528) 19 Henry VIII c. 18.

¹⁵⁹³ (1532) 23 Henry VIII c. 12.

¹⁵⁹⁴ (1423) 2 Henry VI c. 9. Thames.

(1425) 3 Henry VI c. 5. Lea.

(1503) 19 Henry VII c. 18. Severn.

(1514) 6 Henry VIII c. 17. Kentish Stour.

(1570) 13 Elizabeth I c. 26. Welland.

¹⁵⁹⁵ *Somerset Record Society*, xlv: 'Somersetshire Pleas from the Roll of the Itinerant Justices', p. 119. Quoted in P. Helm, 'The Somerset Levels in the Middle Ages.' *Journal of the British Archaeological Association.* Number 12. (1949), 47.

adjoining on a *navigable river*, everyone that uses that river has, if occasion be, a right of way by the brink of the water over that land, or farther in if necessary.¹⁵⁹⁶

Thus it seems that there was a right *in principio* of access on both banks of all usable rivers prior to 1600.

A Note on the general Law relating to Inland Waters.

Inland areas of water are regarded by the law as areas of land covered with water.¹⁵⁹⁷ With regard to rivers ‘the general rule in relation to the ownership of the bed of non-tidal rivers is that the riparian owners of the banks are presumed each to own half the bed of the river *usque ad medium filum*’.¹⁵⁹⁸

While these statements correspond to entries in other law commentaries they scarcely do justice to the subject. While in Scotland and England the material of the bed of a lake belongs to the riparian owner in Scotland it has been held that the right to use a boat on the surface is common to all who have the right to use any part of the lake.¹⁵⁹⁹ It seems that this is also the law in England. If this is correct it would seem also that if one has the right to use a boat on one side of a river one has the right to use it on both sides. Certainly in Scotland, and probably in England, an angler may cast ‘his fly or lure as far as he could in accordance with ordinary practice even if this meant that the fly went across the *medium filum*’.¹⁶⁰⁰ The law relating to access to inland waters is not the same as for land.

Trespass on water would normally be ‘simple trespass’ since a boat does not even leave footprints and rivers can not be enclosed and were never included in the Inclosure Acts.¹⁶⁰¹

5 Lakes

There were many more lakes in 1600 than there are now. John Speed’s maps show them especially in the Fens, Somerset and Cheshire. Boats travelling to Peterborough would have crossed Ramsey Meere, Ugg Meere and Wittlesey Meere on their way upstream.¹⁶⁰² In 1769 Pennant noted that ‘The East Fen is quite in a state of nature and gives a specimen of the country before the introduction of drainage: it is a vast tract of morass, intermixed with numbers of lakes from half a mile to two or three miles in circuit, communicating with each other by narrow reedy straits.’¹⁶⁰³

¹⁵⁹⁶ *R v The Inhabitants of Culworth*, (1704) 6 Mod 163; Holt 339.

¹⁵⁹⁷ Nigel P. Gravells, *Land Law*. London: Sweet & Maxwell. 1999, 6.

¹⁵⁹⁸ William Howarth, *Wisdom’s Law of Watercourses*. 5th Edition. Crayford: Shaw & Sons Limited. 1992, 17.

¹⁵⁹⁹ *Per* Lord Blackburn, *Mackenzie v Bankes*, (1878) 3 A.C. 1324, H.L.

¹⁶⁰⁰ *Fotheringham v Kerr or Passmore and Another*. (1984) 48 P. & C.R. 173.

But see also *Lovett and Another v Fairclough*, (1990) *The Times*. 10 March 1990.

¹⁶⁰¹ See eg. *Ecroyd v Coulthard*, [1897] 2 Ch. 554-573; [1898] 2 Ch. 358-377.

And *Simpson v Scales*, (1801) 2 Bos. & Pul. 496.

¹⁶⁰² Thomas Badeslade, *History of the Ancient and Present State of the Navigation of the Port of King’s Lynn* London: J. Roberts. 1725, 72.

¹⁶⁰³ Thomas Pennant, ‘Tour in Scotland,’ 1774, p. 10. Quoted in H.C. Darby, ‘The Human Geography of the Fenland Before the Drainage.’ *Royal Geographical Society Journal*. Vol. 80, Number 5. (1932), 420-435, 421.

Paul Spoerry wrote of the Fenland communities in the Middle Ages ‘The water, rather than isolating island communities, became a conduit for economic contact and advancement, not just within the Fenland basin, but with towns and communities throughout the east midland river systems.’ He described the Fenland as ‘the motorway of the age’.¹⁶⁰⁴ This waterway system was not neatly divided into rivers and lakes. In winter parts of the country were covered by water. The extent of the meres varied with the seasons of the year. It is difficult now to know which water bodies were natural meres and which resulted from peat extraction.¹⁶⁰⁵

It is recorded that when the land was flooded boats went over the land. Dugdale wrote of Lincolnshire in 1625:

not only in winter, but even in the summer times, boats laden with plaister have passed over that part thereof, called Hatfield chase, to a place called Hollen brigge, near Hatfield Woodhouse, the water upon the drowned grounds being about three foot deep. ... Neither was Haxey carr less over-whelmed, large boats laden with xx quarters of corn, usually passing over it, from the river of Idle to Trent bank; men rowing also with lesser boats ...¹⁶⁰⁶

In 1505 at North Curry, in Somerset, it was said that ‘in winter season the medewes be so filled and replenysshed with water, that the bootes may go over at every place.’¹⁶⁰⁷ In 1613 boats went ‘direct over the soil from Lynne to Terington.’¹⁶⁰⁸ Malster records that on the Waveney ‘Masters of small wherries returning downstream without cargo would sail across the flooded marshes, regaining the river below Beccles.’¹⁶⁰⁹

The distribution of logboats which have been found indicate that they were used on lakes, ponds and meres as well as on rivers.¹⁶¹⁰ Three medieval logboats have been found in the meres in the Mersey basin at Astbury, Cholmondley and Oakmere.¹⁶¹¹ Hadfield wrote about the Somerset Levels ‘There was, of course, also local traffic in corn, fish, wine and other needs of the abbey, not only on the Cut, but on the network of minor drainage and navigation waterways round Meare Pool [in Somerset].’¹⁶¹²

¹⁶⁰⁴ Paul Spoerry, ‘Town and Country in the Medieval Fenland.’ In Kate Giles and Christopher Dyer, Eds. *Town and Country in the Middle Ages*. The Society for Medieval Archaeology Monograph 22. 2007, 94, 101.

¹⁶⁰⁵ Sir Harry Godwin, *Fenland: its ancient past and uncertain future*. Cambridge: Cambridge University Press. 1978, 116.

¹⁶⁰⁶ William Dugdale, *The History of the Imbanking and Draining of Divers Fens and Marshes*. 2nd Edition. (1st Edition 1662.) London: Richard Geast. 1772, 143.

¹⁶⁰⁷ Wells MSS. Chapter Act Book, ff. 115 et seq. Quoted in P. Helm, ‘The Somerset Levels in the Middle Ages.’ *Journal of the British Archaeological Association*. Number 12. (1949), 48.

¹⁶⁰⁸ William Dugdale, *The History of the Imbanking and Draining of Divers Fens and Marshes*. 2nd Edition. London: Richard Geast. 1772, 277.

¹⁶⁰⁹ Robert Malster, *Wherries and Waterways*. Lavenham: Terence Dalton Limited. 1971, 49.

¹⁶¹⁰ Sean McGrail, *Logboats of England and Wales. Part ii*. National Maritime Museum, Greenwich Archaeological Series No. 2. BAR British Series 51 (ii). (1978), figure 207.

¹⁶¹¹ Sean McGrail and Roy Switsur, ‘Medieval Logboats of the River Mersey-A Classification Study.’ In Sean McGrail, Ed. *The Archaeology of Medieval Ships and Harbours in Northern Europe*. National Maritime Museum, Greenwich, Archaeological Series No. 5. BAR International Series 66. 1979, 102.

¹⁶¹² Charles Hadfield, *The Canals of South West England*. Newton Abbot: David & Charles. 1967, 76.

Under Roman law there was a public right of navigation on all permanent lakes.¹⁶¹³ With regard to Ullswater Lake it was found in 1863 that ‘as far back as human memory went, all persons having property on the lake, or having lawful access to it, were accustomed to use the privilege of going and being conveyed on the lake in boats, with or without goods and landing where they may.’¹⁶¹⁴ On Hickling Broad it was found in 1892 that there was a public right of way over the whole of the Broad.¹⁶¹⁵ However the legal commentaries are unanimous in their opinion ‘the public do not have a right to navigate on non-tidal lakes, but a right to navigate thereon may be acquired by dedication, immemorial use or under statute.’¹⁶¹⁶

It seems that there was from 1189-1600 a right *in principio* to passage on all natural lakes to which the public had access. The loss of that right, if it was ever lost, occurred after 1600. The close relationship between the rivers and lakes would seem to indicate that the law relating to access was the same on lakes and rivers.

6 Inland Rivers

The law relating to the right of passage on non-tidal rivers before 1600 has been considered previously by the present author.¹⁶¹⁷ The contemporary writings of historians and lawyers, Magna Carta and other statutes, the State records, the use made of many rivers and the lack of opposition to the use of the rivers which are discussed elsewhere in this thesis all indicate that there was a legal right of navigation on all rivers which were physically navigable.

¹⁶¹³ Digest Book 39, Title 3, Section 24, Paragraph 3. Quoted in Eugene F. Ware, *Roman Water Law*. St. Paul, Minnesota: West Publishing Co. 1905, 72.

¹⁶¹⁴ *Marshall v Ulleswater Steam Navigation Company Limited*, (1863) 3 B.& S. 732, 739-740.

¹⁶¹⁵ *Micklethwait v Vincent*, (1892) 67 L.T. 225, 230.

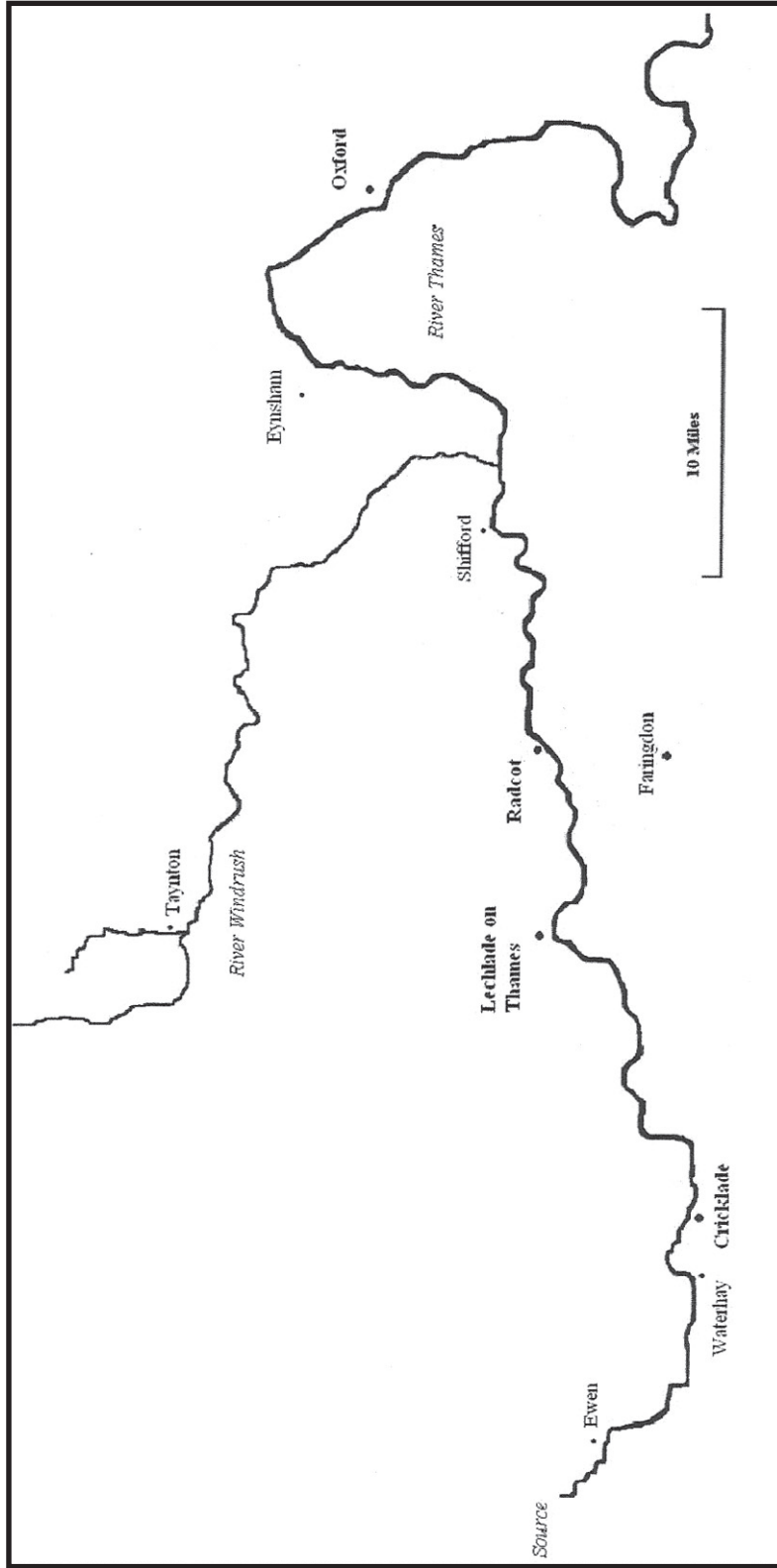
¹⁶¹⁶ William Howarth, *Wisdom's Law of Watercourses*. 5th Edition. Crayford: Shaw & Sons Limited. 1992, 22-23.

¹⁶¹⁷ Douglas Caffyn, ‘The Right of Navigation on Non-tidal Rivers and the Common Law.’ LLM Dissertation, Univ. of Kent. 2004.

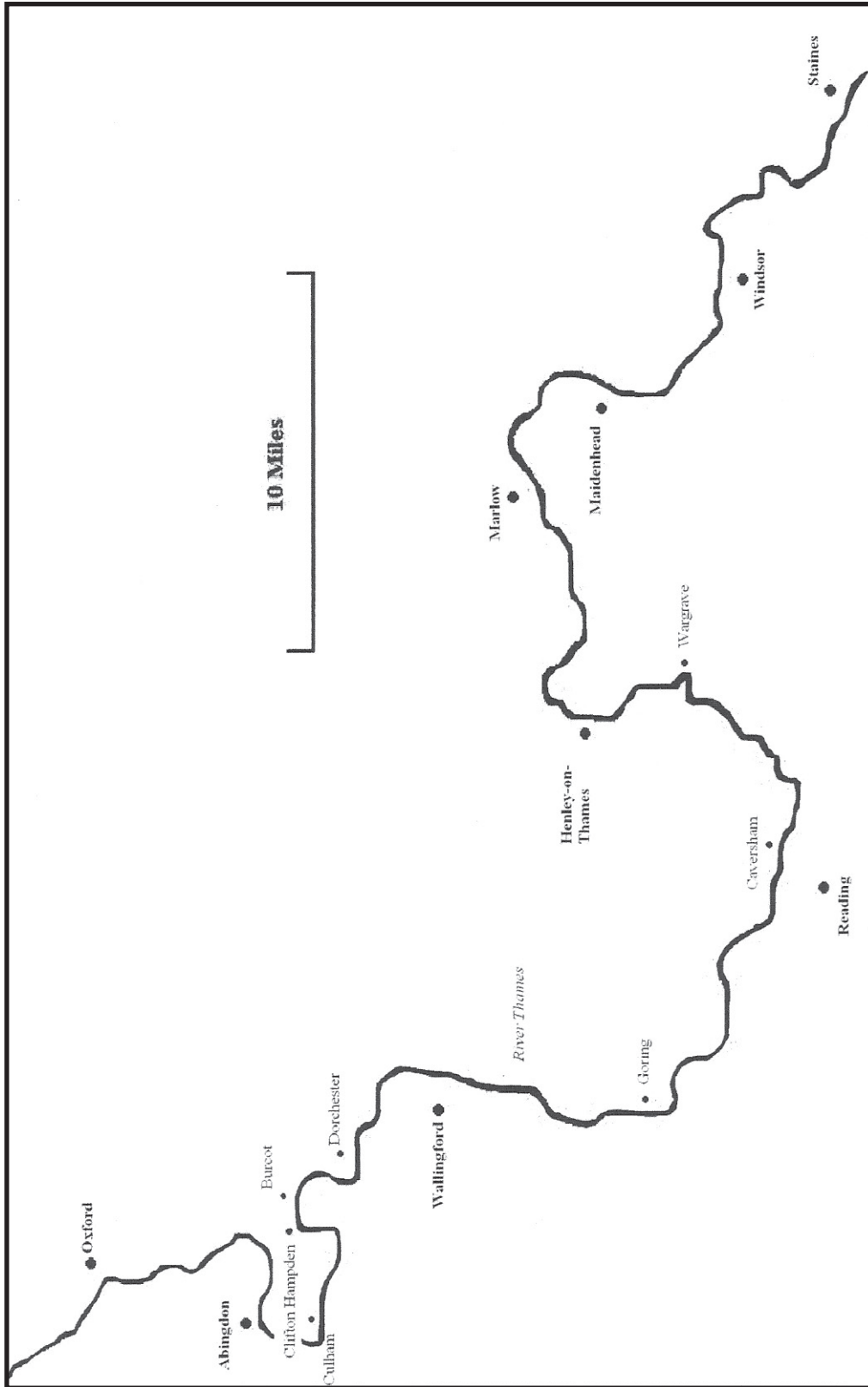
Appendix Q**Maps**

Maps of rivers:-

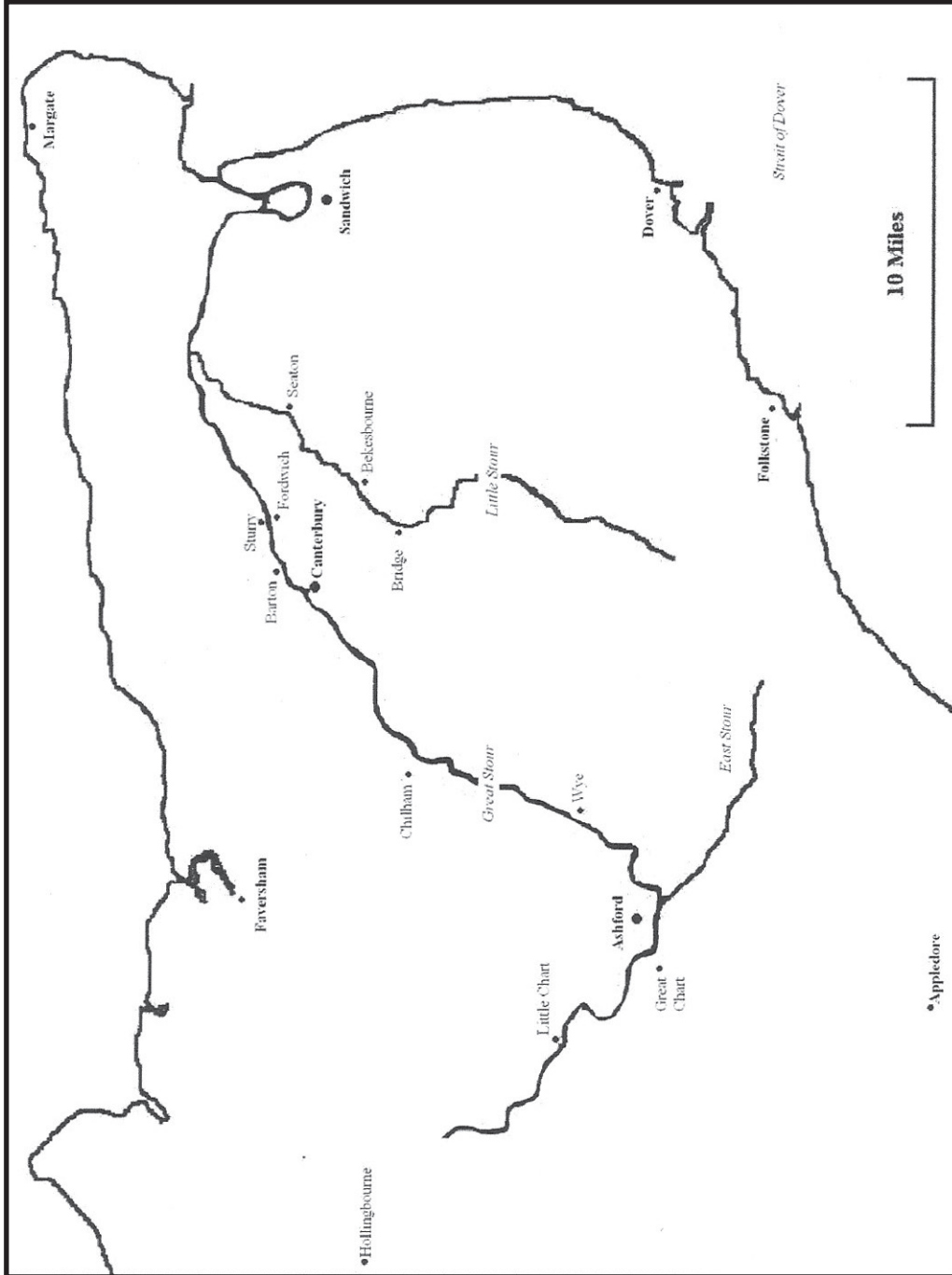
	<u>Page</u>
1. Upper Thames	505
2. Middle Thames	506
3. Kentish Stour	507
4. Wear	508
5. Teme	509
6. Salisbury Avon	510



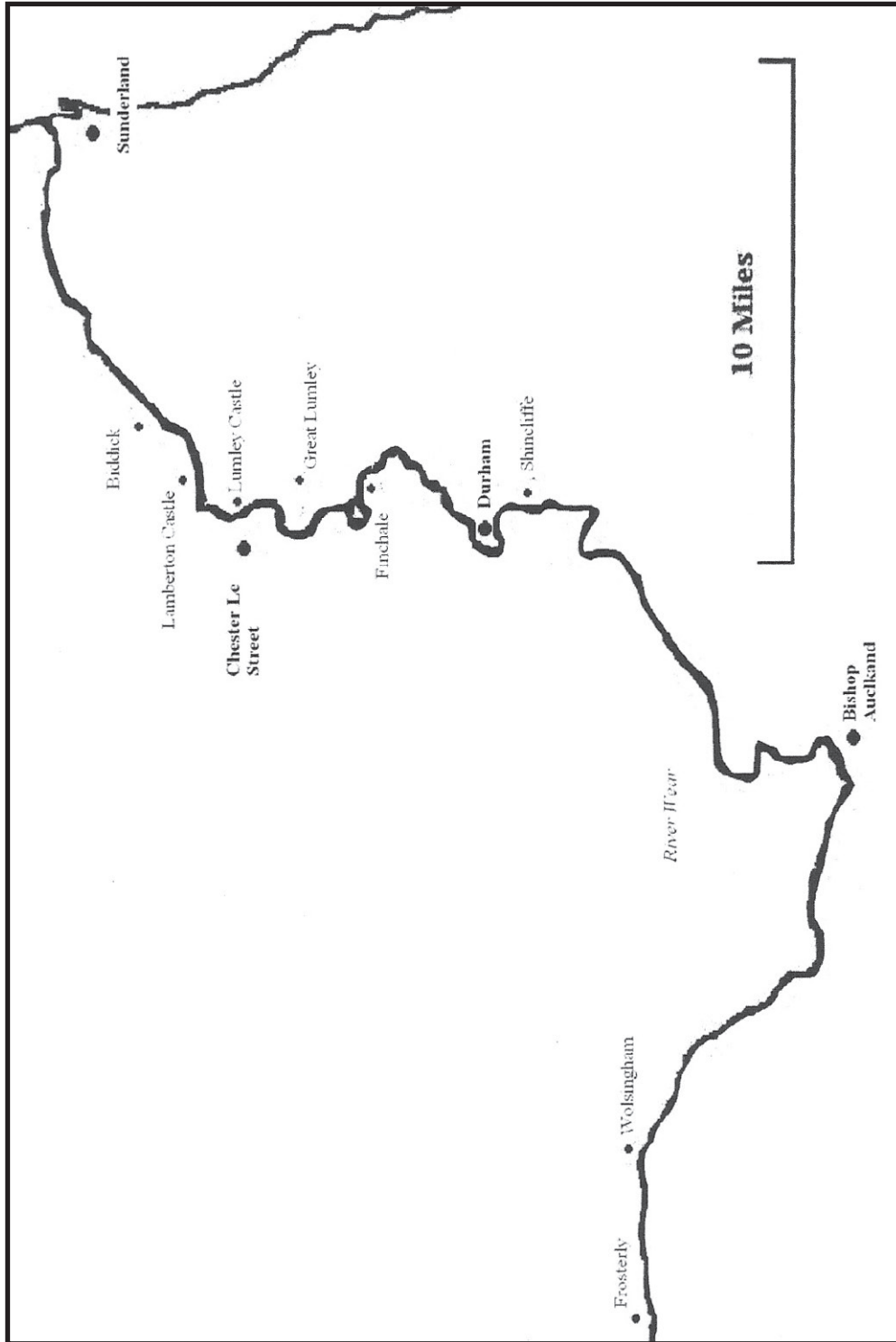
Map 1. Upper Thames



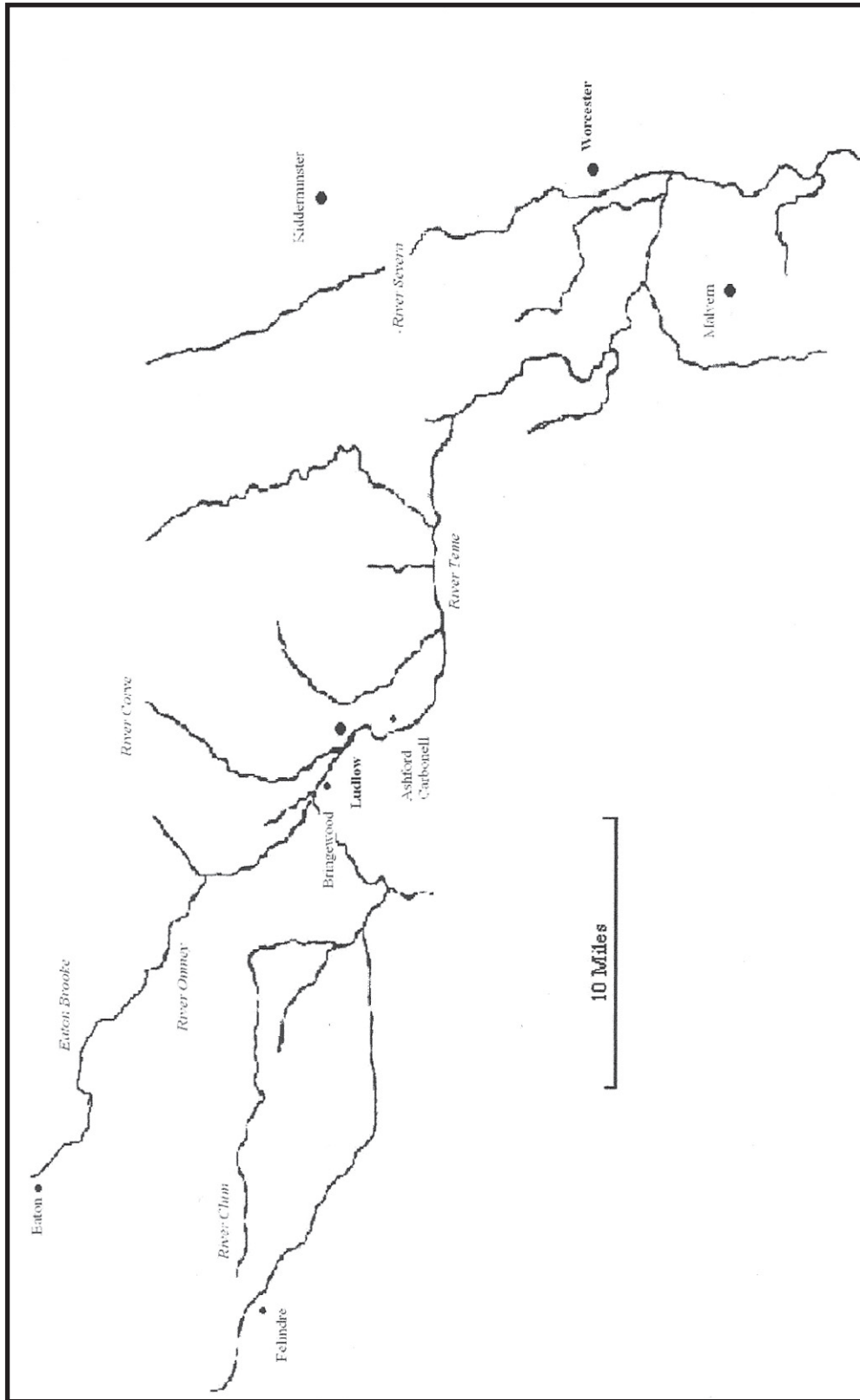
Map 2. Middle Thames



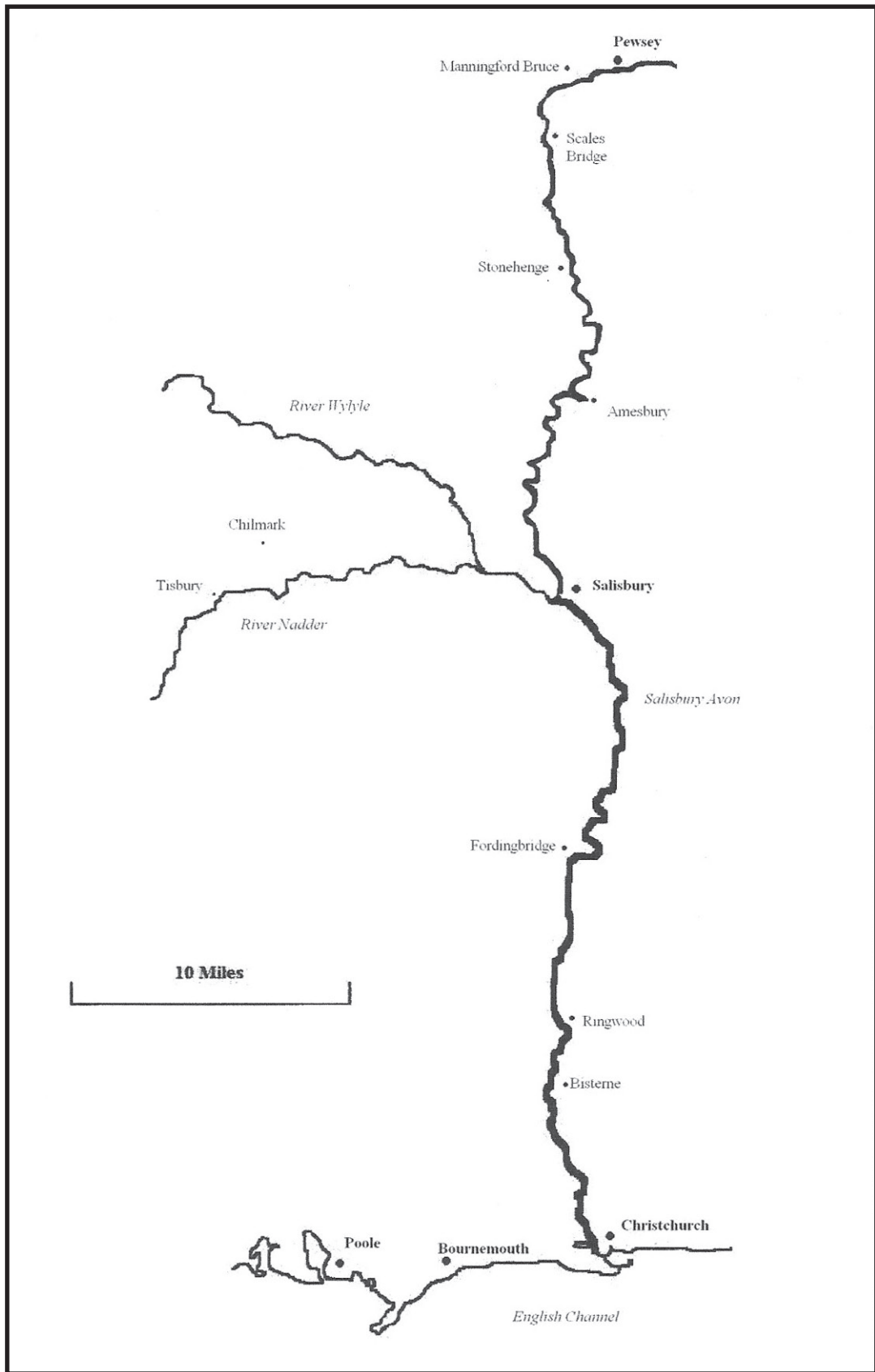
Map 3. Kentish Stour



Map 4. River Wear



Map 5. River Teme



Map 6. Salisbury Avon

Appendix R**Illustrations.****(The illustrations are not included in the electronic edition of the thesis.)**

- Illustration 1 Page iiiA.
 Title: “Shrewsbury. Late 16th century.”
 Source: P.D.A. Harvey, *Maps in Tudor England*. London: The Public Record Office and The British Library. 1993, 70-71.
 Copyright: © British Library Board. Royal MS 18. D. iii, ff.89v-90.
 Note: Showing various sizes of barges, boats and rafts at Shrewsbury.
- Illustration 2 Page 5A
 Title: “Transport as illustrated in the Luttrell Psalter. 14th century.”
 Source: *The Luttrell Psalter*. Commentary by Michelle P. Brown. London: The British Library. 2006, 160, 162r, 173v, 181v-182r, 186v
 Copyright: © British Library Board. Add. MS 42130.
 Note: Showing a wagon and carts with studded wheels and a boat.
- Illustration 3 Page 5B
 Title: “Boats being paddled. Early 15th century.”
 Source: Janet Backhouse, *The Sherbourne Missal*. London: The British Library. 1999. 23, 34.
 Copyright: © British Library Board. Add. MS 74236.
 Note: Showing the use of two boats on inland waters in the early 15th century.
- Illustration 4 Page 7A
 Title: “John Constable. *The Valley Farm*. 1835.”
 Source: Download from Tate Gallery website.
 Copyright: © Tate Gallery Board. N 00327.
 Note: Showing a man punting a boat with a lady passenger on a shallow river.
- Illustration 5 Page 7B
 Title: “John Constable. *The White Horse*. 1819.”
 Source: Michael Rosenthal, *Constable. The painter and his landscape*. New Haven and London: Yale University Press. 1983, 118.
 Copyright: © Frick Collection. New York.
 Note: Showing a barge carrying the tow horse on a narrow river.
- Illustration 6 Page 7C
 Title: “W Milne Black. *Crannog and logboat use*.”
 Source: Robert J.C. Mowat, *The Logboats of Scotland*. Oxbow Monograph 68. From Scots Pictorial, 29 October 1898.
 Copyright: © Trustees of the National Library of Scotland. NLS shelf mark CB.2/13(10-).
 Note: Showing a small logboat being used to transport a hog.

- Illustration 7 Page 16A
 Title: “Part of John Norden’s map of Surrey c.1580.”
 Source: William Camden, *Britain*. Translator Philemon Holland, London: Joyce Norton and Richard Whitaker. 1637, 294.
 Note: Showing the Mole as flowing underground from Dorking to Norbury.
- Illustration 8 Page 81A
 Title: “Part of the ‘Gough Map’. Mid 14th century.”
 Source: The Map of Great Britain *circa* A.D. 1360 *known as* The Gough Map.
 Copyright: © The Bodleian Libraries, University of Oxford. MS. Gough gen. Top. 16.
 Note: Showing rivers, including the Thames, as having their sources in ponds or lakes.
- Illustration 9 Page 81B
 Title: “Part of Christopher Saxtons’ map of Gloucestershire. c.1580.”
 Source: William Camden, *Britain*. Translator Philemon Holland. London: Joyce Norton and Richard Whitaker. 1637, 356.
 Note: Showing a pond at the source of the Thames in 1590.
- Illustration 10 Page 81C
 Title: “Part of John Speed’s map of Suffolk. c.1607.”
 Source: John Speed, *Theatre of the Empire of Great Britaine, Parts III*. (1st Edition 1611.) Facsimile London: Phoenix House Limited. 1953-4.
 Note. Showing a ford between the Little Ouse and Waveney.
- Illustration 11 Page 81D
 Title: “The River Ouzel at Eaton Bray, Beds.
 Source: Photograph by the author.
 Note: Showing the river which is now normally not more than 15 cm deep into which in 1271 William Whiteside fell from a boat and was drowned.
- Illustration 12 Page 88A.
 Title: “Part of Christopher Saxton’s map of Northamptonshire. c.1580.”
 Source: William Camden, *Britain*. Translator Philemon Holland. London: Joyce Norton and Richard Whitaker. 1637, 504.
 Note: Showing Kelmarsh separating the Avon from Avona (River Nene). Distance approximately half a mile.
- Illustration 13 Page 92A
 Title: “Part of Richard Budgen’s map of Sussex. 1724-5.”
 Source: Peter Barber and Tom Harper, *Magnificent Maps*. London: The British Library. 2010, 131
 Copyright: © British Library Board. Maps K. Top 43.3.8 TAB END
 Note: Showing Etchingam ‘Essential for use in 1348’ and Bodiam ‘Limit of navigation in 1720.

- Illustration 14 Page 120A
 Title: “Collecting sedges.”
 Source: The National Trust, *Wicken Fen*. London: National Trust (Enterprises) Ltd. 2002, 6, 25
 Copyright: © National Trust.
 Note: Showing sedges transported on boats.
- Illustration 15 Page 122A.
 Title: “The 1334 Lay Subsidy. Places with assessed wealth of £225 and over.”
 Source: R.E. Glasscock, ‘England *circa* 1334.’ In H.C. Darby, Ed., *A New Historical Geography of England*. Cambridge: Cambridge University Press. 1973, 180.
 Copyright: © Cambridge University Press.
 Note: Showing the concentration of places with high assessed value around the Wash.
- Illustration 16 Page 146A.
 Title: “Part of Matthew Paris *Abbreviatio Chronicorum Angliae*, St Albans, 1250-59.”
 Source: *Four Maps of Great Britain designed by Matthew Paris about A.D. 1250*. London: Trustees of the British Museum. 1928.
 Copyright: © British Library Board. Cotton Claudius MS D. VI, 12v.
 Note: Showing rivers depicted as bands and no roads shown in a 13th century map.”
- Illustration 17 Page 146B.
 Title: “Part of the Gough map. Mid 14th century. Thames to Wash / Severn to East coast.”
 Source: The Map of Great Britain *circa* A.D. 1360 *known as* The Gough Map.
 Copyright: © The Bodleian Libraries, University of Oxford. MS. Gough gen. Top. 16.
 Note: Showing rivers depicted as bands and no roads shown in a 14th century map.”
- Illustration 18 Page 146C
 Title: “John Leland, *Map of part of East Yorkshire*, c. 1550.”
 Source: Lucy Toulmin Smith, *The Itinerary of John Leland in or about the years 1535-1543. Volume 4*. Carbondale: Southern Illinois University Press. 1964, 180.
 Note: Showing rivers depicted as bands and no roads shown in a 16th century map.”
- Illustration 19 Page 146D.
 Title: “Part of John Norden’s map of Essex. c. 1584.”
 Source: John Norden, *Speculi Britanniae Pars: Essex*. (1st Edition 1594.) London: Camden Society. 1840.
 Note: Showing the River Pant depicted as being wide.

- Illustration 20 Page 148A
 Title: “Places with ‘*ea-tun*’ names.”
 Source: Cole, Ann, ‘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, 55-84, 79.
 Copyright: © Oxford University Press. 2007.
 Note: Showing the distribution of places with ‘*ea-tun*’ names some of which were located on small rivers.
- Illustration 21 Page 149A.
 Title: “Armoured Knights Jousting. 1325-53.”
 Source: Joe Flatman, *Ships & Shipping in Medieval Manuscripts*. London: The British Library. 2009, 79.
 Copyright: © British library. Queen Mary’s Psalter, England, c.1325-53; BT, Royal MS 2 B. VII, f.159r
 Note: Showing recreation on a river in the 14th century.
- Illustration 22 Page 149B.
 Title: “Recreation. Late 16th century.”
 Source: Joe Flatman, *Ships & Shipping in Medieval Manuscripts*. London: The British Library. 2009, 55.
 Copyright: © British Library. Book and Hours and Calendar. Bruges or Ghent, c 1500; BL, Add MS 35313, f.3v. Hours of William, Lord Hasting. Bruges or Ghent? C.1480; BL, Add MS 54782, f.54r.
 Note: Showing recreation on a river in the late 15th century.
- Illustration 23 Page 172A
 Title: “Samuel Ireland. *Picturesque View on the Severn*. Late 18th century.”
 Source: Colin Green, *Severn Trader*. Lydney: Black Dwarf Publications. 1999, 34.
 Copyright: © Ironbridge Gorge Museum Trust.
 Note: Showing a boat leaving the River Teme in the 18th century.
- Illustration 24 Page 176A
 Title: “William Smith, *View of London from the south, showing the River Thames*. 1588.”
 Source: British Library Postcard.
 Copyright: © British Library. Sloane 2596.
 Note: Showing ships downstream of London Bridge and boats upstream.
- Illustration 25 Page 176B
 Title: “Boats in John Speed, *England*. 1611.”
 Source: John Speed, *Theatre of the Empire of Great Britaine, Parts II, IV*. (1st Edition 1611.) Facsimile London: Phoenix House Limited. 1953-4.
 Note: Showing boats upstream of bridges in Newcastle, Norwich and Chester.

- Illustration 26 Page 177A
 Title: “John Constable, *A view of the Stour near Dedham*. 1822.”
 Source: Michael Rosenthal, *Constable. The painter and his landscape*. New Haven and London: Yale University Press. 1983, 141.
 Copyright: © Henry E Huntington Art Gallery.
 Note: Showing that bridges were constructed to accommodate barges.
- Illustration 27 Page 182A
 Title: “Crossing rivers in Bewick’s woodcuts.”
 Source: Thomas Bewick, *A History of British Birds. Volumes I and II*. Newcastle: Longman and Co. 1832, Volume I, 170, 285, 375; Volume II, 62, 186.
 Note: Showing people crossing rivers by wading, on slits and on floats.
- Illustration 28 Page 195 A
 Title: “A Tibetan horizontal watermill”
 Source: Photograph by the author.
 Note: Showing that the horizontal mill was located on a small stream.
- Illustration 29 Page 199A
 Title: “A water mill as illustrated by Thomas Bewick.”
 Source: Thomas Bewick, *A History of British Birds. Volume I*. Newcastle: Longman and Co. 1832, 263
 Note: Showing a mill on a wide river which did not obstruct the navigation.
- Illustration 30 Page 206A
 Title: “Paul Spoerry’s Medieval Motorways.”
 Source: William Camden, *Britain*. Translator Philemon Holland. London: Joyce Norton and Richard Whitaker. 1637, 485.
 Note: Showing a large number of interconnected waterways.
- Illustration 31 Page 213A
 Title: “River use today.”
 Source: Peter Knowles, *Pub Paddles*. Keswick: Rivers Publishing. 2010, 44.
 Copyright: © Peter Knowles. 2010.
 Note: Showing the popularity of a present day river.