

The River Lea 1571-1767: a river navigation prior to canalisation

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THE RIVER LEA 1571-1767:
A River Navigation prior to canalisation

by

Keith Roland Fairclough

A thesis presented for the degree of Doctor of Philosophy
at the University of London, 1986



ABSTRACT

In pre-industrial England river navigations were subject to improvement by canalisation, the introduction of artificial navigation cuts and pound locks. Along the Lea this did not happen until 1767. Before that the navigation, except for one short period, relied upon a less efficient technology, the provision of flashes from fishing weirs, turnpikes and mills. Yet the river was still an important transport route, particularly for the supply of grain, meal and malt to London. It had been this during the mediaeval period, but not by the middle of the sixteenth century. Then in 1571 the City of London sponsored legislation to construct a canal from the Lea to London. Parliamentary opposition thwarted the original ambitious scheme, so two cheaper, shorter canals were considered, but never built. Instead an ambitious and unique river improvement scheme was successfully implemented. This experimental navigation (reducing reliance on flashes to a minimum) survived 20 years, before persistent and violent opposition from land carriers closed it. A Star Chamber case upheld the rights of the bargemen, but the experimental navigation was not restored. Instead the traditional flash-lock navigation re-appeared, and was to last, with only minor improvement, until 1767. In the intervening years the navigation continued to expand and prosper. This despite the admitted problems of relying on flashes and tides, and despite a series of major disputes with the New River Company, the millers, fishermen and riparian land-owners. Conflict there certainly was, but also compromise. Ultimately all parties were prepared to accept the conflicting rights of other users, provided they could defend their own. Commissions of Sewers provided an effective administrative forum to effect and authorise such compromise, even after the appointment of a body of Trustees in 1739. That the Lea was an adequate navigation before canalisation, despite a 'second-best' technology and an unpaid part-time administrative structure means that a valid comparison with the concept of Appropriate Technology, discussed in modern-day development theory, is possible.

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PREFACE

In the final preparation of this thesis I have benefitted greatly from the supervision of Dr John Miller, who became my tutor on the retirement of Dr K.G.T. McDonnell.. This thesis is an unplanned development of an unexpected hobby. I owe a lot to several people who have helped along the way. To Dr Dennis Smith, at whose night classes on Industrial Archaeology I first grew interested in the river Lea. To Ted Lyons at Melody Maker and Dr Elisabeth Muller at CDS, managers who were kind enough to accomodate my need for time off mid-week to research. To Dr Shirley Jarman, for being there with encouragement at a time I needed it. To Janet Levy, for her assistance when typing up an earlier draft. To Roberta Lewis, for drawing many maps for me. To Professor S. R. Dennison, who taught me at Newcastle University many years ago, and who played an essential role in commenting on my earlier draft and in acting throughout as a moral tutor.

Documentation of the Lea and its environs is spread over several depositories. I should like to thank the archivists, librarians and staff at several locations, for their help on visits and for their replies to letters:- Miss Betty Masters at the City of London Record Office; Miss J. Coburn and Mrs Joan Kenealy at the Greater London Record Office; Mr Peter Walne at the Hertfordshire Record Office; Mr Victor Gray at Essex Record Office; Mr Harcourt-Williams, archivist to the Marquis of Salisbury; Mr M. Lovett and Mr M. Damonsing of the Thames Water Authority; Mr P.N. Turner of the Borough of Enfield Library Services; staff at the Bodleian Library, the Surrey, Hampshire and

Northamptonshire Record Office; at the local history sections of libraries in Tower Hamlets, Stratford, Leyton, Hackney, Walthamstow and Cheshunt; and of course at the Public Record Office at Chancery Lane and Kew.

In addition several people have courteously replied to unsolicited letters, some of which have been lengthy:- Mr. R.R. Aspinall, Librarian to the Port of London Authority; Dr. Ken Bascombe; Major General Mark Bond; Mr Ralph Broadhurst of the Society of Dyers and Colourists; Dr Colin Brooks; Miss A. Corbishley, Record Officer to the Treasury Solicitor; Professor Kerry Downes; Mr Charles Hadfield; Mr Michael Handford; Mrs D.M. Hetherington; Mr Anthony Kirby; Mr K.G. McKenna, Executive Officer to the Law Society; Mr John Montgomery, Clerk to the Salters Company; Mr Charles Marmoy of the Huguenot Society; Dr Valerie Pearl; Mr David Perman of the Ware Society; Miss M.L. Robertson, Curator of Manuscripts to the Huntington Collection; Dr Violet Rowe; Dr Joan Thirsk; Mr Alan Thompson, Mrs Jane Whaley of Harrowby Mss Trust; and Mrs Elizabeth Wood. A couple of replies have not been retained in my files, and I apologise for omitting their names from the above list.

There are three more names to be added, but they also provided me with unexpected treats. Professor A.W. Skempton, who pointed out a map I had missed, the survey of the river between Hertford and Ware made by Whittenbury in 1733 (Figure 7); Professor Bernard Rudden, for showing me that Christopher Wren's survey of the Lea could still be found, when previous enquiries had proved fruitless; an officer of the Thames Water Authority, whose name I have

mislaid, who told me that some records of the Lea Commission of Sewers had been found in a disused sewage works and deposited with Enfield Library Services.

There is some debate about the proper spelling of the river's name. Indeed during the period under review it was often known as Ware River. Throughout I have used the spelling Lea, except when it is necessary to use the legal spelling, Lee, as adopted in the Acts of 1739 and 1767. Thus the river Lea, but the Trustees of the River Lee appointed in 1739, and the Lee Navigation for the canalised river after 1767.

At points in the text an asterisk has been used to indicate words or phrases explained in the Glossary(Appendix 2). All quotes retain their original spelling and punctuation. In the period of Old Style dating, the year is taken to begin on 1 January. Also some attempt has been made in footnotes to provide biographical information of some of the maltsters and barge-owners whose names occur in the text. The pursuit of biographical information is very much a work in progress.

One final important point, this is for my mum and dad.

Plaistow, July 1986

I should like to thank the Trustees of the S T Bindoff Bursary and the Trustees of the University of London Historical Research Fund for grants towards the costs of compiling and presenting this thesis.

SECTION ONE

THE RIVER LEA:
AN ELIZABETHAN PROJECT
FOR
TRANSPORT IMPROVEMENT

CHAPTER ONETHE LEA & ITS EARLY HISTORY

The original river Lea was about 70 miles long. It rose near Luton, flowed eastwards to Hertford and Ware, and then southwards through Stanstead, Waltham, Enfield, Hackney and Stratford to enter the Thames at Blackwall. Only the lower 40 miles were navigable, and considered to be one of the 'great rivers of the realm'. The head of the navigation was either Hertford or Ware, but it was the latter which was always the most important inland port along the river.

The present course of the navigation is substantially different from that existing before 1767, which is the subject of this thesis. In that year an Act of Parliament was obtained to canalise the river, and subsequently several artificial navigation cuts were built, reducing the navigation to about 30 miles, and pound locks were introduced in place of the existing flash locks. Further acts authorised additional changes.¹

Thus much of the traditional river channel is no longer used for the navigation, and these stretches either remain as narrow streams or ditches along the upper river or have disappeared beneath the series of reservoirs which line the eastern side of the valley below Enfield Lock.

The traditional river navigation, as it was in 1741, is reproduced as Map 1 in the folder at the end

of this work.² There were times when the navigable channel, or the number and location of the locks and weirs, was different from that shown on this map, for the system was subject to constant change. Some of these are noted in the subsequent text, but there must have been many of which no record now remains, and little is known about such changes during the mediaeval period in particular.

It must be emphasised that these changes arose from minor natural changes to the river regime, or from the deliberate action of other interested parties such as millers, fishermen, or riparian landowners and land-users, who wished to enhance their own interests, at the expense of others if necessary. Only rarely were changes the result of deliberate attempts to improve the navigation.

Any river navigation dependant upon flashes from locks, weirs and mills required the constant co-operation of these other interested parties, for the withdrawal of such co-operation by even only one person could lead to serious delays, increased costs, and on occasion the complete stoppage of barge traffic.

It was the bargemen themselves who had to take the initiative to preserve their rights of passage, against constant encroachment and natural decay. If they did not, the river would quickly become impassable, and once such rights lapsed, it could be more difficult to restore them.

The precise way in which the compromise of the flash-lock navigation first emerged is not known, but the right to navigate along the great rivers of the realm was one of the ancient rights re-affirmed by the

signing of the Magna Carta in 1215, and such rights always applied to the Lea. Indeed there are frequent references to commercial navigation along the Lea from the twelfth century onwards.³

Legislation in 1350, and subsequent amending Acts, once more re-affirmed these rights, based on the concept of maintaining navigation by achieving a balance between competing interests along the rivers. Millers and fishermen were allowed dams and weirs in the navigable channel only if they could prove an ancient property right which predated the reign of Edward 1. Such weirs and dams had to be built in such a way that barges could pass through them. Commissions were authorised to protect the rights of navigation and achieve the necessary compromise.⁴

Along the Lea full advantage was taken of this legislation, and commissions were issued in 1355, 1364, 1366, 1380, 1382, 1415, 1416, 1423, 1427, 1428, 1430, 1433, 1434, 1436, 1440, and 1482. Initially no specific title was mentioned, but from 1423 onwards they were called 'commissions de kidellis'.⁵

Another body of legislation affecting rivers was that dealing with Commissions of Sewers, bodies primarily responsible for the problems of flooding and land drainage. Initially a response to specific problems along the coasts, they came to be issued for marshlands and rivers as well. In 1427 an Act codified existing practice, subject to later amendment.⁶

Such commissions, called 'commissions de walliis et fossatis',* were issued for the marshlands along the northern banks of the Thames, and those which lay along

the lower tidal Lea came within their purview. The prime intent of these bodies was to ensure adequate drainage, but some of their measures must have affected the navigation along the lower Lea as well.⁷

Towards the end of the fifteenth century, terminology, but not practice, began to change. In 1477 and 1502 'commissions de walliis et fossatis' were issued for the navigable Lea below Ware rather than the usual 'commissions de kidellis'. Other commissions from this date were called Commissions of Sewers.⁸ This tendency was formalised, not first authorised, by the Statute of Sewers in 1532.⁹

A separation of function was still maintained however. Separate Commissions of Sewers were issued for the navigable Lea and the marshlands along the lower river. The practice and intent of these different commissions was distinct, and was to remain so. Thus emerged the administrative structure which was to supervise the navigation until the mid-eighteenth century.

The records of these mediaeval navigation commissions are scarce,¹⁰ though still better than those for the seventeenth century, but it is obvious that the traditions and practices which evolved were of great import for the conduct of the commissions from 1600 onwards, and it was only the commission appointed in 1575 that was an exception.

Another theme which was important in the history of the Lea was also evident during the mediaeval period, the importance of the London market. Struggles between

Hertford and Ware in the thirteenth century were dominated by attempts to capture the lucrative road and river traffic down the valley to London. In 1247 London merchants built their own granary at Stanstead, and in 1300 'industrial action' by Lea bargemen caused sufficient supply problems to the capital to warrant an investigation by jurors from Essex and Hertfordshire.¹¹

Similar factors influenced a period of intense interest in improving the Lea in the early years of Henry VI's reign. Between 1424 and 1440 several commissions were issued and two acts of parliament obtained to this end. The second act, in 1430, authorised the commissioners to collect tolls for a period of three years in order to finance the proper scouring and cleansing of the river bed.

Despite all this interest, however, the river in 1440 was described as 'being a great river, by which boats used to go down from Ware to the Thames, and would still do so but for faulty weirs, mills, stanks, stakes and kidels*therein'.¹²

Much more research is necessary to properly evaluate the role of the Lea during the mediaeval period, but it is probable that it was not in continuous intensive use, and that its role in supplying London varied greatly throughout the period, depending much on the vagaries of the national and local economy. For a factor greatly influencing the development of the Lea was that road transport provided an effective and competitive alternative.

Road routes to the capital were shorter and more

direct. The total distance between Ware and London was only about 21 miles, so the cost advantages enjoyed by river carriers over any distance were not that great, and could be outweighed by the increased transshipment costs which were involved.

In particular the circuitous river route to London, down the lower tidal Lea and up the Thames, brought delays and other problems which can only have worsened the competitive position of the bargemen. Many must have loaded and unloaded along the lower river, even when dealing with London customers.

Whatever the position during the mediaeval period, by the middle of the sixteenth century the Lea did not play an important role in supplying the London markets. Evidence to a Commission of Sewers in 1551 does show regular use of the river, but does not suggest a major role in supplying London. There is also evidence of a decline in traffic as a result of policies pursued during the late 1530s.

William Prentiss, a Stratford miller, told the commissioners that 'for threescore yeares past he hath seene passe up the same ryver to Ware Boats of Oysters, Muscells Sprattes and other kinde of fish And alsoe...Come downe againe to Bowe bridge loden with Timber Woode Corne and all kinde of Graine'. Other witnesses confirmed this picture, and mentioned other cargoes such as salt, 'Kinges stufte', and charcoal.

Two bargemen also gave evidence. John Churchman

recalled that 'for fortie years and six and thirtie years past his father...and his Brother...and he went upp to Waltham and Ware with Whitinges Spratts and Eeles and other kind of fish dyvers tymes in the year'. John Younge of Chingford stated that he and his father had for many years carried 'tyle woode and tymbar from Chinkeforde...to London', but added that he had heard his father say that 'dyvers other men did occupie the same trade the self same tyme there was weares kept uppon the ryver'.¹³

This last was a reference to an earlier commission, most probably during the 1530s, when those who 'did occupie Carriadge with the Consent of the Gentillmen of the Contrie did sewe out a Commission that the Weares should be putt downe And then there was other takinges that the Wares should not be stopped from our Lady daie tel Lamas for the savegarde of the Marshes and Meddowes'.¹⁴

This is the only reference found to such a commission along the Lea at this date, but it suggests that the Lea was affected by the concerted campaign during the 1530s to get weirs removed from rivers.¹⁵ The effect along the Lea seems to have been harmful to the navigation, bringing about a decline in the traffic.

Whatever, it is obvious that the Lea was no longer the important river it had been during the mediaeval period. It was the potential to be so once more that attracted the City aldermen, and which led to the important developments along the river during the 1570s.

CHAPTER TWOTHE ACT OF 15712.1 The genesis of the idea

The preamble to the act of 1571 stated that the City of London had sponsored it in order to improve grain supplies to the capital. The population of London was expanding rapidly, and supplies of food from further afield were necessary. The problems were such that the city authorities feared that the normal market mechanisms might not always suffice, so they took steps to ensure adequate supplies in times of dearth and to try and control price levels.¹

A further response was this interest in improving the river Lea, whilst similar motives stimulated efforts to increase traffic down the Thames from the west.²

The earliest evidence of interest in the Lea is that in June 1560 the aldermen appointed a committee to survey the river to its head to see whether it might be cleansed to allow barges to bring fuel, corn, hay and other necessaries down river to London. Within a couple of months the committee reported that it would be beneficial if the river were improved from Ware downwards.³

The members of this committee were alderman Thomas Lodge, Richard Springham, a mercer, John Dymock and Thomas Wheeler, both of whom were drapers. In addition Lodge and Springham were also Merchant

Adventurers and members of the Muscovy Company, Dymock also being a member of the latter. Wheeler was most probably already the Clerk of the City's Works.⁴

During their investigations the committee had hired two surveyors, Garrett Honrighe and Adryan Tymberman, both of whom were described as 'alyens and strangers born'. Nothing more is known of Tymberman, but Honrighe was also giving the aldermen advice on supplying the city with water from the Thames. On this occasion he was described as a Dutchman, and the identification is definite, but it seems probable that he was also the Gerrard Honrick, a German captain, who brought the secret of making saltpetre to this country in 1561, and the Gherard Henrick of 'Weste freseland' who sought a patent to drain mines in England in 1578.⁵

The precise recommendations of this committee no longer exist, but thirty years later bargemen stated that they had been credibly informed that Lodge had surveyed the Lea 'to seeke reformacon of the annoyance by force of the anncient lawes'.⁶ If correct this would imply that the committee concerned themselves solely with improving the river and did not formulate any canal plans. The minuting of their report in the Repertories, although brief, confirms this.

The next recorded development is that in September 1566 a Commission of Sewers was issued for the Lea, from Ware down to the Thames. This commission had 91 members, comprising of several courtesy members, landed gentry from the three riparian counties, and

representatives of the City. These latter included the Lord Mayor, the Recorder, six aldermen and several citizens. Of the committee appointed in 1560 only Richard Springham was nominated as a commissioner.⁷

The description and membership of this commission suggest no unusual features except that the City had more representatives than normal. However in October 1566 the aldermen described this commission as being for the 'survey and conveyance of the Ryv of Lee unto the Cytie'.⁸ It is possible this description means that a canal was already under consideration at this date, but further evidence is necessary.

One development was that in April 1567 the aldermen approached Sir Thomas Lodge to ask for information about the survey of 1560.⁹ Another was that in February 1567 the Duchy of Lancaster ordered an investigation into all weirs and milldams along the river between Hertford and Waltham.

As owners of the manor of Hertford the Duchy had long enjoyed the right to tolls from road traffic using bridges across the Lea at Hertford, Ware and Stanstead. They were now interested in reviving claims to jurisdiction over the upper reaches of the river, rights which they had enjoyed during the medieval period, but which had since lapsed. These claims had been investigated in 1548 and were not finally relinquished until the late 1580s. However the claims do not seem to have been prosecuted with any vigour, and the Duchy made no attempts to thwart the canal and river improvement schemes which were

considered during these decades.¹⁰

Other than that nothing is known of events during the 1560s. The work of the Commissioners of Sewers, the discussions in the city which led to the adoption of a canal rather than a river improvement scheme are nowhere recorded. All that can be assumed is that it was the City which continued to take the initiative.

The next recorded development is that on 25 April 1571 the aldermen approved the draft of a bill about the river Lea before it was submitted to Parliament.¹¹

The bill was then first presented to and passed by the Lords. Then during the morning session of 26 May it received its first reading in the Commons, at which stage a committee was appointed to consider it further. Yet the second and third readings of the bill were rushed through that same afternoon, before the committee can have had time to deliberate.

It was not until the following day that further provisos, presumably the work of the Commons' committee, were thrice read and passed. The altered bill was then returned to the Lords, who gave their consent to these changes. By the end of the month the bill had received the Royal Assent.¹²

The bill had been rushed through in this manner because the parliamentary session was nearly over. This speed meant that the final act was badly drafted, for the various provisos were tacked on, they were not properly integrated, and indeed some clauses were

confused and contradictory.

2.2 The bill and the act

Fortunately a copy of the original bill does exist,¹³ so the changes made by Parliament can be ascertained. The act is reproduced as Appendix 1, and an attempt has been made there to indicate the changes. Quotes in the text below are from the bill except where specifically stated.

The bill first states why it was sought:-

For as much as yt ys perceivd by many grave and wise men aswell of the Citie of London as of the Contrie that yt were comodius and profitable bothe for the Citie and the contrie that the river of lee otherwise called Ware River mighte be broughte wthin the lande to the Northe parte of the saide citie of London... for the cariage and conveyinge aswell of all M'channdizes corne and victualls as other necessaries frome the towne of Ware and all other places nere the said River unto the saide Citie of london, and from the saide Citie to the saide places and the towne of Ware, and also for tiltbotes* and wherries* for conveyinge of the Quenes Subiectes to and fro

To attain these ends two proposals are made. The City were to build a canal, and a Commission of Sewers were to improve the river between Ware and the canal.

The course of the canal is not specified in the bill, but certain details of the scheme do emerge. The City wished to obtain a strip of land which was nowhere to exceed 160 feet in width. This strip was to contain the canal and allow wide towpaths of 50 or 60 feet to be laid out on both sides of the canal.

This land on either side of the canal was also to have an important function during the actual course of its construction:-

all wch convenient breadithe of grounde on bothe sides is thought needfull...aswell for the layinge of the earthe that shalbe castowte of the saide trenche to serve in the lower groundes, and especiallie nere the saide River to make Substanciall Banckes for the preservacon and kepinge of the contrie frome Inundacons when fludds shall ariese as also for waye to passe with trouckes and cartes wch mist carrie awaye gravell and other earthe in verie greate quantitie frome the hills, whereas the Cutt must be Verie Deepe, to suche places as shalbe conveniente to helpe to make upp the saide banckes...that the whole grounde on bothe sides of the saide River maye lye in one levill

This quote shows that the City intended to use cut and fill techniques to build their canal on one level so that no locks were required along its course.

No alterations were made by Parliament to these technical proposals, except to insist on additional safeguards to protect local property owners. The City had proposed to build hedges between their towpaths and adjacent property, but Parliament insisted that they also provide roads and bridges over the canal, accept responsibility for repairing any breaches, and pay compensation to any mill which suffered a reduction in its water supply.

Such was only fair, as was the addition of a clause insisting that the canal be finished within ten years. However other changes to the bill do suggest that some Members of Parliament had far greater doubts or were strongly opposed to the City's scheme.

The City had proposed to acquire the land in perpetuity at a fixed rent, the level of which was to be determined by the then prevailing market rates:-

mayor Comonaltie and citizens and their Successors for ever shall have the saide groundes alongest all the saide whole lengithe to be holden of the Lordes and onors of the soyle and Soyles aforesaide in fee Ferme for ever payinge suche rente for the same...as the same shalbe lett for by and after the rente of an Acre, at the tyme that the saide Mayor Comonaltie and citizens shall take in the same

It was also proposed that any disagreement over the rents should be settled by a commission with twelve members, six representing the City and six the landowners.

In a time of high inflation such proposals were advantageous to the City, at the expense of the landowners. A Parliament dominated by the latter was unlikely to allow such a precedent. These clauses were rewritten so that the City were merely empowered to obtain the land on whatever terms they could negotiate, and it was stipulated that all the land had to be acquired before construction could begin.

The arbitration commission was also altered so that it had sixteen members, only four of whom represented the City. The other twelve were to represent the three riparian counties of Middlesex, Essex and Hertfordshire.

Such alterations increased any estimated costs of construction, but also allowed any landowner to delay or permanently thwart the whole scheme by refusing to negotiate. The exact powers of the arbitration commission in such a case are not clear.

A further set-back for the City was that Parliament added the following clause:-

That all the Queenes Subjectes theyr Boates and Vessells shall have free Passage through the said Ryver, aswell the newe Cut as the older Ryver, without interruption molestacon by reason of or for his or theyre Passage, as in other comone Ryvers and Waters they lawfully may do

In the following century the bargemen argued that this clause was intended to ban the collection of tolls along the river(see 11.2), but it more likely that Parliament were insisting that once built the canal must be forever maintained by the City, that they could not close it down or allow it to decay. If the venture failed, and nothing is known of how the City intended to finance the canal, then the City had no way of divesting themselves of the liability.

The bill also included proposals for improving the river between Ware and the mouth of the canal. The exact improvements were not specified, but they were to be effected by a commission with members representing the three riparian counties, but not the City. Members were to be the local sheriffs and J.P.s, and any others chosen by the Lord Chancellor or the Lord Keeper of the Great Seal. Such was the normal format for a Commission of Sewers, but the name is not mentioned in the bill, nor was it to be in the act.

It was proposed that this commission should scour and cleanse the river so that boats using the canal would have no difficulty using the river. To achieve this end the commission were to remove all buildings and obstacles which 'maye be founde impeachements or lettes to this good worke'. This implied powers greater than those normally associated with any Commission of

Sewers.

Parliament made two changes to these arrangements. They specified that the commission could not improve the river until the canal had been completed, and added a proviso that no building or obstacle should be removed if a majority of the commission felt that it did not impede the passage of barges.

However other changes to the bill confused this situation. The arbitration commission, proposed by the City merely to settle disputes over acquiring land for the canal, were given powers by Parliament to scour and cleanse the river between Ware and the mouth of the canal. Thus the act empowered two separate commissions, with a differing membership, to carry out the same task of improving the river.

The confusion was then compounded by the addition of a clause which stated that the act awarded no powers to improve the river beyond those 'compellable by the Lawe or by the Statute of Sewers', a direct contradiction of an earlier clause. Such slipshod drafting can only be explained by the speed with which the bill was rushed through Parliament.

It should be noted that the bill made no provision for navigation along the river below the mouth of the canal. Since the proposed canal left the Lea at Hoddesdon, this was a substantial neglect of the rights of communities further downstream. Parliament made no provision to protect these rights.

2.3 Parliamentary opposition

The Commons' committee which changed the bill

had thirteen members. Two were London members responsible for guiding the bill through Parliament, Sir John White and Thomas Norton. Two were officials of the Duchy of Lancaster, Sir Ralph Sadler, the Chancellor, and William Humberstone, Surveyor of the North Parts. Four more were active parliamentarians with no specific local interest, Sir Henry Gate, Thomas Boyer, Edward Grimston and William Holstock.

It is probable that the two Duchy officials were concerned to protect any Duchy property rights affected by the scheme. In addition the five remaining members all had their own private property rights to look after. Robert Wroth's family owned Enfield Mills and a manor in Enfield. Edward Bashe owned the manor of Stanstead, Stanstead Mills, and several fisheries along the river. George Dacres and Henry Cock owned manors in Cheshunt, whilst Cock also owned the manor of Broxbourne. Finally Thomas Wilson possessed property in Edmonton.¹⁴

Such interest in properties along the river or through which the intended canal might pass would explain the sensible safeguards which were added to the bill, but does not necessarily explain the changes which effectively emasculated the bill. Of the faction which must have opposed the scheme in committee only Robert Wroth and Henry Cock can be identified as possibles.

Wroth was later to emerge as the champion of the road carriers who violently opposed the river improvement scheme introduced later in the decade (see 7.1). It is reasonable to assume that he opposed the

canal scheme in 1571. In 1587 Henry Cock was interviewed along with Wroth about their opposition to the barge traffic. Cock may also have opposed the bill.¹⁵ They must have had the support of other members, but further evidence is necessary if the parliamentary struggle is to be properly determined.

CHAPTER THREEIMPLEMENTATION OF THE ACT:WHAT WAS NOT DONE3.1 No canal was built

It must be stressed that no canal was ever built as a result of the act of 1571, nor were any navigation cuts made along the lower stretches of the river. Such a firm statement is necessary both because the City later established the mistaken opinion that they had built a 'new cut' along the lower Lea at this date (see 12.1), and because many historians have stated or assumed that either a canal or a navigation cut was built by the City.¹

That no such were ever built can be definitely established from contemporary evidence. In 1592 petitioners stated without contradiction that no canal had been built to the north side of London.² With regard to the cut along the lower Lea, documents dated 1551 and 1589 delineate exactly the same course for the lower Lea, whilst a survey in 1576 or 1577 notes that the channel which was later to be called the 'new cut' was and had been in existence for many years.³ Furthermore the City never carried out any improvements to the river at this date, the act gave them no such powers.

Although never implemented, the various canal schemes considered by the City are of considerable interest. When they obtained the act the City intended to build the most ambitious canal then ever considered in this country, and one of the most ambitious to emerge before the start of

the Canal Age in the 1750s and 1760s. Furthermore, after this scheme had been thwarted, they advanced two other less ambitious schemes, both of which were still far in advance of contemporary English development.

3.2 The original scheme

In 1571 the City intended to build a canal by cut and fill techniques* to run on one level without locks from Hoddesdon in Hertfordshire to fields in Islington known as the Commandery Mantells. It was then to be extended to join the river Fleet near Holborn Bridge, thus opening up communication with the Thames. Such a canal was about 17 or 18 miles long.⁴

This route had been surveyed earlier in 1571 by James Basendyne, a Scot who had become a naturalised Englishman in June 1562, and who in the late 1580s was involved in a voyage along the northern coast of Russia beyond the river Pechora. To effect this survey Basendyne had to make his own instruments to take the levels between the stations* along the proposed course. In this task he received the help of a Mr Thomas, the late servant of Albert Stuges. It is obvious that this scheme tested existing surveying techniques to their limit.⁵

In addition, maps, now no longer extant, were prepared by Jaques Furrier and James Aldaye. Furrier was French, and had come to England in the 1560s to avoid religious persecution.⁶ Aldaye had been the chief assistant to Sebastian Cabot, and was also involved in

trade and exploration in Russia and Morocco.⁷

Since Basendyne was paid for only three days work on the survey it is possible that he was merely checking or amplifying earlier work. However, whoever was responsible for the original idea had sufficient skill to note the eminent suitability of the terrain. This suitability allowed the construction of the New River, and encouraged the promotion of other canal and water supply schemes in the ensuing centuries.⁸

Of particular interest is the New River scheme. This was an artificial channel built to convey drinking water from springs near Ware down the Lea valley to the Commandery Mantells in Islington, from whence it was distributed by gravity flow to customers throughout the capital. The City sponsored acts in 1606 and 1607 to authorise the construction of this channel, and it was completed in 1613 by Hugh Myddelton who took over the scheme from the City.

No evidence has been found to prove a connection between the City's canal scheme in 1571 and the New River. However the similarities are so great that it is impossible not to believe that the canal scheme provided at least the germ of the idea that inspired the construction of the New River.

The New River was an easier technical challenge than the canal would have been. It was narrower, shallower, and followed a more circuitous route in order to lessen the amount of expensive cutting and embanking. One critic of this last policy argued 'it is best to bringe this river the nearest waie...eyther

by reasonable deepe digging in some places(as namely in Cheshunt field) or indifferent high bankinge, as at Enfield parkes and some other such like places'.⁹ Such a comment illustrates the obstacles to be overcome by proponents of the canal scheme in 1571.

Further speculation about this original scheme is possible. The head of the canal was to be Hoddesdon, an important market already supplying London, with a potential for further expansion. Another factor may have been that there was an additional supply of water for the canal besides that to be taken from the Lea.

In the early 1600s a scheme to supply water to Theobalds House involved the purchase of the Lynch Mills in Hoddesdon so that the springs which drove the mills could be diverted and taken by canal to Theobalds. This canal was to be built by cut and fill techniques at an estimated cost of 1000 marks, was to be 6 miles long, 12 feet wide and 5 feet deep, and was to take in additional water from other springs along its course.¹⁰ The scheme was never implemented, but it is worth speculating that it repeated ideas that were first generated during the planning of the canal scheme of 1571.

One query about this original scheme must remain unanswered. How did the City intend to finance it? Where was the investment capital to be raised, and was it to be repaid?.No evidence has been discovered.

3.3 The first alternative

The response of the City to the frustration of

their original plan was to consider a canal across the Isle of Dogs between the Lea just below Bow Lock and the Thames at Limehouse. This canal was surveyed in 1573 by a Dutchman called either Anthony Trapper or Anthony Trotter, the name is recorded differently in the two sources. His plan is reproduced opposite as Figure 1.

There are problems in interpreting this map,¹¹ but what is definite is that it shows at least one proposed route for a canal between the Lea and Limehouse. Such a proposal was a sensible response to the limitations imposed by Parliament.

It was much shorter than the original canal, required the purchase of less expensive land, and did not incur any compensation payments to mill-owners. It thus required far less finance. Yet it still offered great advantages. Barges bringing grain and malt down river to the capital wasted much time waiting for favourable tides and winds both to navigate the lower Lea down to the Thames and then round the Isle of Dogs and up the Thames to London. The proposed canal would have substantially reduced this wasted time.

A major problem with this proposal was that the City had no authority to build such a canal. It did not fall within the terms of reference cited in the Act of 1571. Further legislation would have been necessary. Perhaps this is sufficient explanation why the proposals were not pursued.

It remains to note that it is surprising that such a good idea is not encountered again until the 1750s,¹²

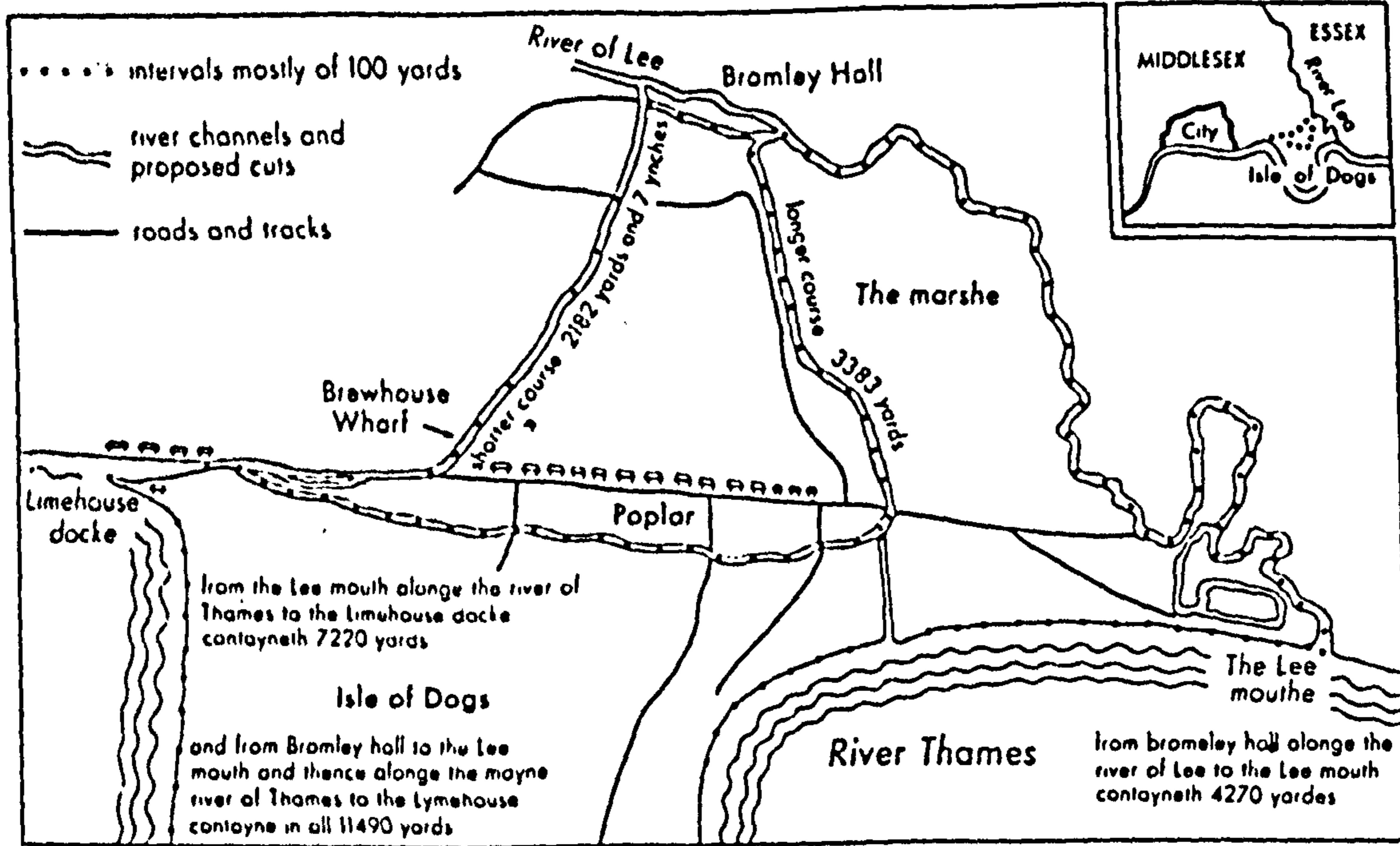


FIGURE ONE: ISLE OF DOGS CANAL, 1573

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Endorsed (defaced)
 First of the plat made in
 the pliamens Lyne for the
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 of Lea to London

W^{ch} said Cut is in longitude from
 the Ryver of Leay to Moregat

22734 fotes (sic)

W^{ch} is { 7378 yards
 4546 ?

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 be by the Last plat in November 1577
 is in longitud 7547 yardes w^{ch} is
 547 yards more then the first

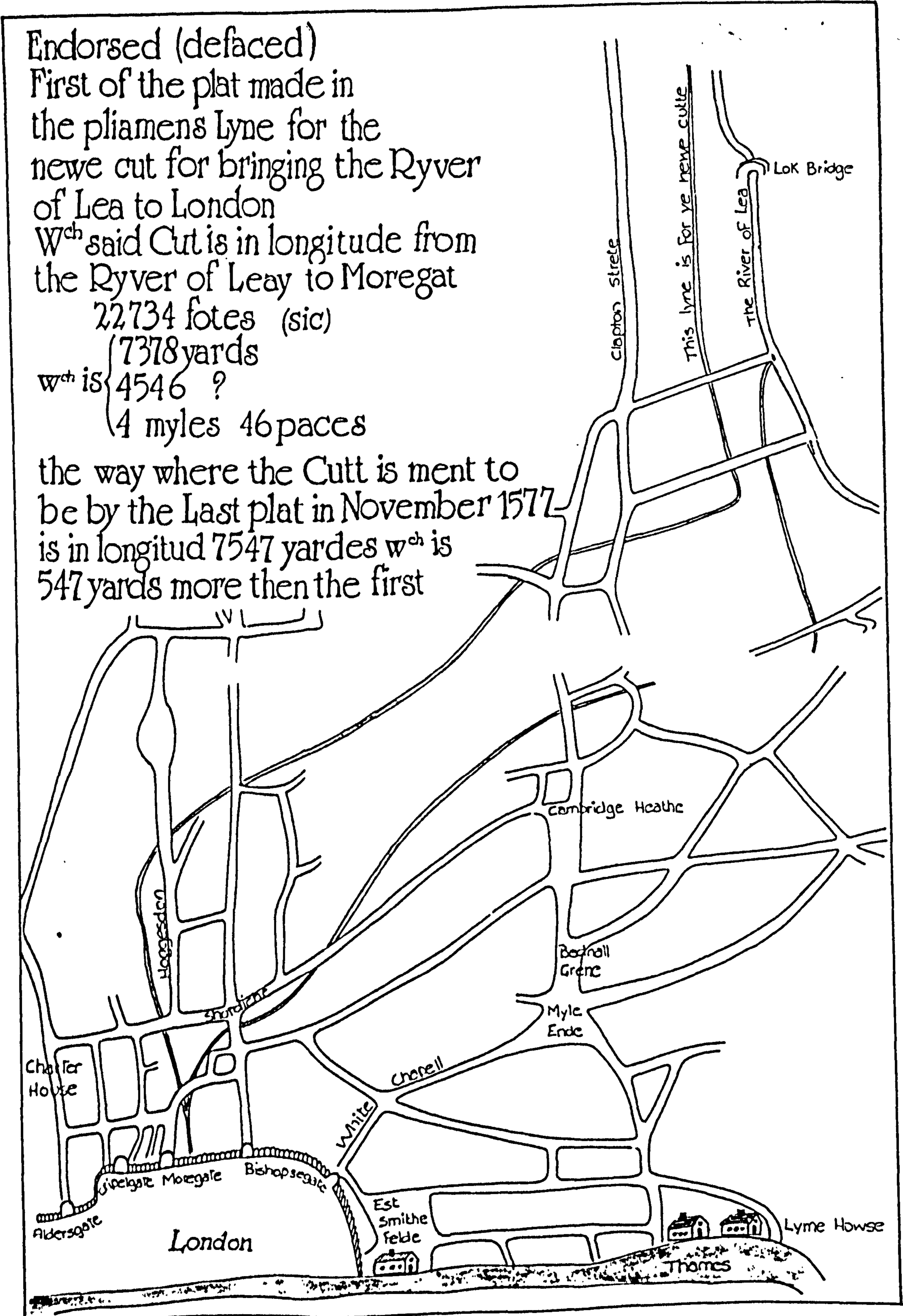


FIGURE TWO: CANAL TO MOORFIELDS, 1576-77.

and that when such a canal was authorised in 1767 it was as an afterthought to Smeaton's original proposals. Furthermore the Limehouse Cut which was opened in 1770 was less ambitious than that proposed by Trapper in 1573. He had proposed that it be built for use at all times, the canal opened in 1770 could only be used at high tides. It was not until further improvement in the middle of the nineteenth century that Trapper's standards were achieved.¹³

3.4 The second alternative

The next canal scheme to be considered by the City did fall within the terms specified in the act, but it too was a much shorter and cheaper proposal than that originally favoured. In October 1577 Burghley was informed that the City were considering a canal from the Lea to just outside the city walls at Moorgate, and that they intended to produce a 'platt of ground and debyt'. The 'debyt' no longer remains, but the 'platt' is reproduced opposite as Figure 2.¹⁴

This plan shows that two alternative routes were considered. The longer and favoured route left the Lea near Tottenham Mills, whilst the alternative rejected route left the river in the vicinity of the present day Lea Bridge between Hackney and Walthamstow. Nothing else is known of this scheme, and it seems improbable that anything was actually done.

A major reason must have been that by this date there was less incentive to build a canal. The City

had proposed a canal to provide cheap regular transport facilities down the Lea valley. This same objective was by 1577 being accomplished by a Commission of Sewers, who concentrated on improving the river itself. A canal would seem superfluous.

There is in fact no evidence that the City ever again considered building a canal. All that is known is that in 1607 Thomas Procter suggested that the canal from Lock Bridge to Moorgate, the City's last scheme, would be a valuable undertaking.¹⁵ After that the City's proposals disappear altogether. They cannot be said to have stimulated any schemes elsewhere in the country.

CHAPTER FOURIMPLEMENTATION OF THE ACT:WHAT WAS DONE

In the absence of any initiative from the City in starting to build their canal, a fresh initiative arose which concentrated solely on improving the navigable river between Hertford and the Thames. John Norden was later to ascribe this initiative to 'the instant suyte of the inhabitantes of Hartfordshire',¹ but no other comment can be made on the events which led to the issuing of a Commission of Sewers on 27 September 1575.² It was this body which was to substantially improve the river during the ensuing years of the decade.

Commissions of Sewers were traditionally forums where a compromise between the conflicting interests of the bargemen, fishermen, millers and riparian landowners could be effected and maintained, but this commission deliberately gave precedence to the interests of the navigation. Other interests were accomodated, but were subordinated to those of the bargemen.

This bias arose because the commission was not restoring and preserving the traditional flash lock navigation, they were instead introducing a novel and radical experiment in river improvement.

This experiment is nowhere precisely described, it emerges from a careful consideration of the

available documentation. Briefly stated it was that the commissioners either issued orders or reached agreement with millers and landowners along the valley whereby the amount of water flowing out of the river was restricted and controlled. Artificial embankments and other measures were introduced to train this increased amount of water into a defined narrower navigable channel, from which all obstructions such as shoals, osier beds and fishing weirs were removed. The only exceptions were that there were flash locks at Stanstead and Broxbourne and a pound lock at Waltham. A tidal lock at Bow was also left in situ.

This policy had two aims. Firstly the barges would be able to pass up and down the river without relying upon flashes every two or three miles, thus avoiding the delays that this involved. Secondly it was hoped that the removal of the weirs and the training of the flow of water into a narrower channel would increase the current's scouring action and so prevent the formation of shoals and preclude the need for constant dredging.

Without further evidence the conception of this policy cannot be determined. Had it first been proposed by Honrighe and Tymberman in 1560? Had the City considered such a policy when they obtained the act of 1571? Or had fresh advice been taken since then? What can be said is that this experiment was unique. There is no evidence to suggest it was ever attempted elsewhere in England at this date or later.³

4.1 The creation of the navigable channel⁴

A traditional task of any Commission of Sewers was to remove the shoals which built up on the bed of the river wherever the current slackened, at bends or above and below obstructions such as fishing weirs and milldams. Indeed many fishermen and millers assisted this process by dumping earth and rubbish into the river, thus ensuring that a flash was requested by the bargemen.

The newly appointed commissioners pursued this task with a thoroughness which may not have been displayed by earlier commissions, for the creation of a well dredged channel was an integral part of their policy. If any shoal could be attributed to a particular weir or piece of land, then the owner of that property was made responsible for scouring the shoal at his own expense. However many shoals could not be so attributed. These were removed by the officials of the commission and the cost was met out of a general rate levied on the local inhabitants.

A further development was that in October 1577, after two years work, a special survey was made of the river. A barge was loaded at Ware with two tons and sent down river. The draught of this barge was 18", and it managed to make the trip without running aground. Nevertheless it did touch the bottom on several occasions and note was taken of these spots so that further dredging could be undertaken.⁵

Even fords at Sewardstone and Chingford were removed in pursuit of this policy. Contemporary

records show that several people drowned at Chingford during the ensuing years whilst attempting to ford the river!⁶

Other natural obstructions impeded navigation, so orders were issued to cut down willow trees which grew in or overhung the river, and to remove osiers or other reeds from the navigable channel. One effect of such measures was to allow water to flow down river more quickly, thus increasing the scouring effect of the current.

To further ensure the free flow of an adequate supply of water measures were introduced to restrict and control the amount of water flowing out of the designated navigable channel. One such measure was that the alternative channels or 'by waters' which flowed down the opposite side of midstream islands were blocked off.

Another was the policy adopted towards the numerous ditches which flowed into and out of the river. Such ditches were important to the riparian landowners for they acted as drains, supplied water to surrounding meadows and fields, and functioned as cheap fences. Their frequency however did pose a problem for any policy designed to control the flow of water in the river.

An order issued in 1576 implies that the commissioners wished to see most of these ditches blocked off, but that sufficient opposition had been aroused to force a compromise:-

where any gutter water Course or Ditch
 yssuinge from the said Ryver to the land
 shalbe stopped uppe if that the same maie
 be any hinderance to any pson...for the
 wateringe of theire groundes it shall...be
 lawfull for any suche...to lay in the
 Said gutte water Course or ditch at there
 owne Chardge one thorough or trough of
 tymber iij foot from the Channell of the
 Said Streame so the same...be not above x
 ynches...at thende next the Said Ryver

Other sources show that earth dams or wooden piling
 were placed across the mouths of these ditches, and
 that either pipes or holes in these structures allowed
 water to flow into the channels behind. The picturesque
 term 'pysser' was used to describe these pipes, a usage
 not found in the O.E.D.⁷

Having ensured by these measures a greater supply
 of water for the navigation, the commissioners then
 erected artificial embankments to train this water
 into a designated navigable channel.

Unfortunately the few remaining records of this
 commission make no reference whatsoever to such
 embankments, they are only mentioned in reports about
 the 1581 riots. Reference is then made to 'A banke or
 Juttie [jetty] newly made at Susterneforde [Sewardstone]
 for the narrowing of the water for the better passage
 of boates', and a similar bank in Cheshunt.⁸

There is no indication as to how frequent such
 artificial embankments were. If only because of the
 cost it seems unlikely that they were built all along
 the river. It seems more probable that they were built
 only at strategic points where they could best narrow
 and train the navigable channel and increase the
 strength of the current's scouring action.

Besides this improved navigable channel, the commissioners introduced other measures to ease the passage of the barges. Several footbridges were either removed or raised by 2', whilst road bridges at Ware, Stanstead, Waltham, Higham Hill and Hackney were also raised. Before this the bridge at Waltham stood only 2' 8" above the water level, but the bridges seem only to have been raised to about 4' above.⁹ Bow Bridge at Stratford was also rebuilt, but this was to replace the derelict old bridge not to facilitate the passage of the barges.¹⁰

The banksides were also cleared of trees, bushes and other obstructions so that the bargemen could walk along without interruption when haling their barges. This was a traditional measure, but this commission also introduced 'low bridges for towyng' so that the bargemen did not have to wade across the millstreams. Many of these bridges were pulled down as soon as they were built.¹¹

4.2 Policy towards the fishing weirs

There had long been questions over the rights of fishing weirs, over whether they harmed the navigation, over whether they destroyed the fry and brood of fish, and over whether they caused floods by penning back too much water. In Henry VIII's reign there had been a nationwide campaign to remove them(see Chapter 1). In 1566 two bills were introduced to Parliament to remove them from the Thames and other rivers.¹² Both failed, but they illustrate the continuing prejudice.

The policy of the newly appointed commissioners

was unequivocal. All fishing weirs were to be removed from the navigable channel whether they laid claim to ancient rights or not. Their removal was an essential part of a policy to introduce a navigation which did not rely on the provision of flashes.

Indeed in one sense the policy can be seen as a response to the prevailing prejudice against weirs. If weirs were removed, for whatever reason, then there must have been situations where this brought more harm than benefit to any navigation. Evidence to a Commission of Sewers in 1551 suggests that this may have been the case along the Lea.¹³ In the absence of weirs, positive steps were needed to protect the navigation. The experimental policy introduced along the Lea in the 1570s was one such response.

The removal of the weirs was amongst the first tasks undertaken by the commissioners. The early survey noted five weirs between Waltham and Stratford. One was found to be standing 5' into the river and it was removed and 'sett even with the river bancke', the others were just removed. Then in June 1576 a jury presented that within the parish of Tottenham there was a 'hobling(?) made with Stakes + bushes over the River saving the bredthe of vii or viii foote which was as we suppos done by the Earle of Rutlandes fyshermen'. This too was removed.¹⁴

Notwithstanding such determination the commissioners met with delays in complying with such orders. In October 1576 they complained that despite their former decrees piles, stakes and other parts of weirs were

still standing in the navigable channel, and they ordered that such obstructions be removed within a month otherwise their owners would be fined 3s 4d for every stake, pile or piece of timber still standing. It seems reasonable to assume that these orders were complied with for the survey in October 1577 does not mention this problem.¹⁵

4.3 Policy towards the mills

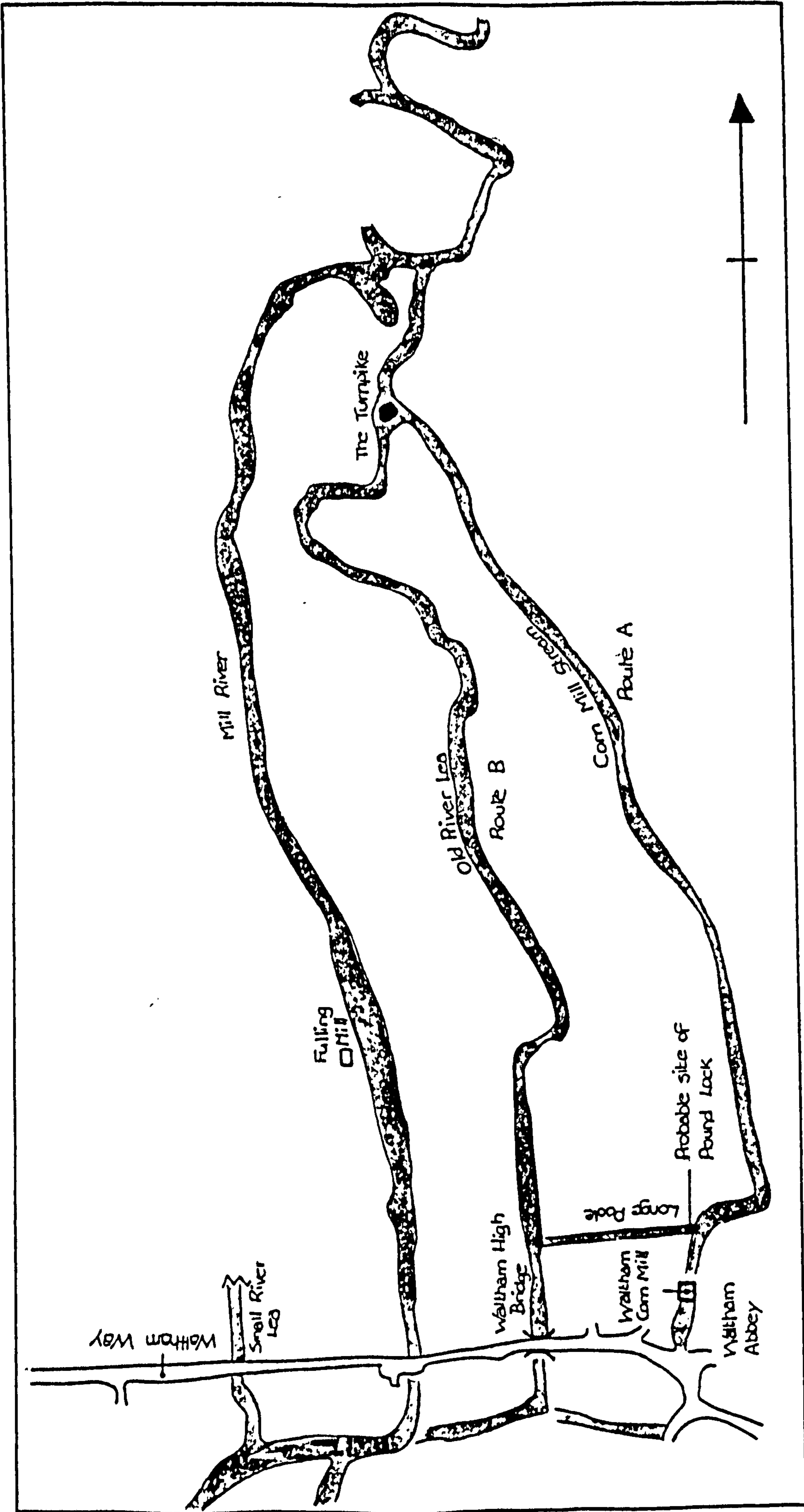
For any improvement policy to succeed, agreement had to be reached with the millers along the valley, and any such agreement had to acknowledge the fact that the mills were expanding in size in order to exploit the growing London market as well as the needs of the local populace. Unfortunately the remaining records of the commission provide little information, the policy adopted towards the mills has to be pieced together from other sources.

In the 1590s the bargemen defended this policy against accusations that the mills had suffered:-¹⁶

it hath ben with Care and discreacon soe ordered...that all the mills might stand and have sufficient water...without greate difficultie, saving att Stanstide Broxborne and Waltham where the owners of the mylnes ...have ben pmitted to divert the Queenes streame by lockes to their mylnes soe longe as they Will maintaine passage for the Barges by Bye streames

The policy was thus that the commissioners agreed that three mills along the upper river were to keep locks in the navigable channel, albeit with major changes to previous arrangements, whereas other mills were not, and other arrangements were introduced at these

FIGURE THREE: NEW ROUTE AT WALTHAM, 1576



SCALE
2000 feet
feet 0

mills to control the water available for milling and for the navigation.

The fact that only three milldams were left in situ along the non-tidal river does not necessarily mean that several were removed by the commissioners. Some mills would not have had dams in the navigable river to remove. In fact far too little is known of the previous arrangements to allow a proper evaluation of the changes introduced by the commissioners. All that can be done is note the measures introduced, where these are known.

Of the three locks that were authorised, the best documented is the famous pound lock at Waltham. Briefly stated, I have presented the detailed evidence elsewhere,¹⁷ the commissioners opened up a new route (Route A on Figure 3) and closed off the traditional river route (Route B) by a lowshare*.

The new route took barges down the head stream of Waltham Abbey Corn Mills to a point just above them, they then turned into a new cut, dug on the commissioners' orders, which took them back into the traditional river channel just above Waltham High Bridge. At the entrance to the new cut from the mill stream the first pound lock in this country with mitre gates at both ends was built.

Such a policy was presumably adopted so that the improvements to the navigation also brought increased benefits to the mill by making more water available. Such a policy would have been necessary both to justify the fact that the owner of Waltham Abbey Corn Mills bore the cost of this work, and to

Hatfield House,
CPM supp 20
no scale no orientation

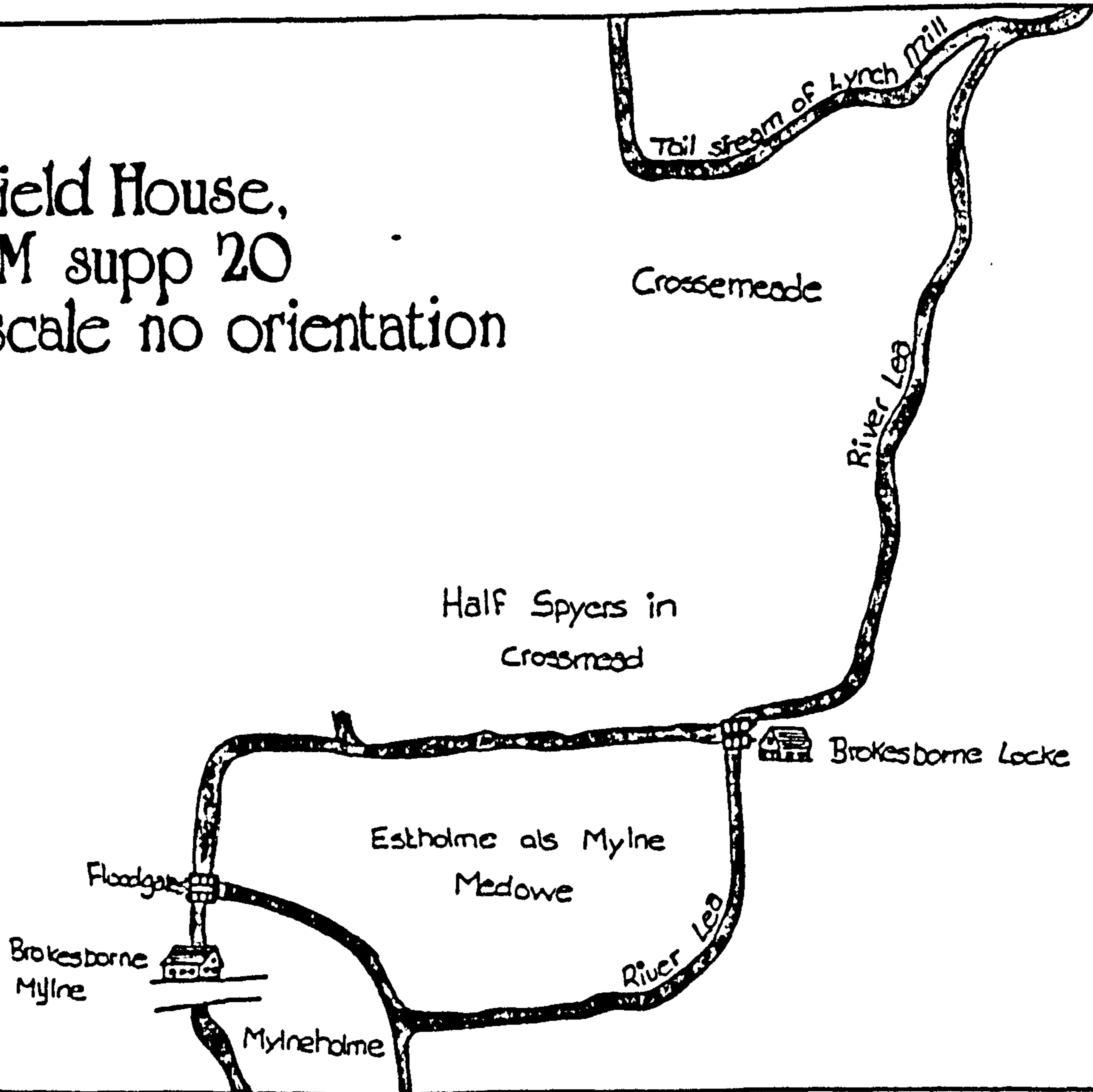
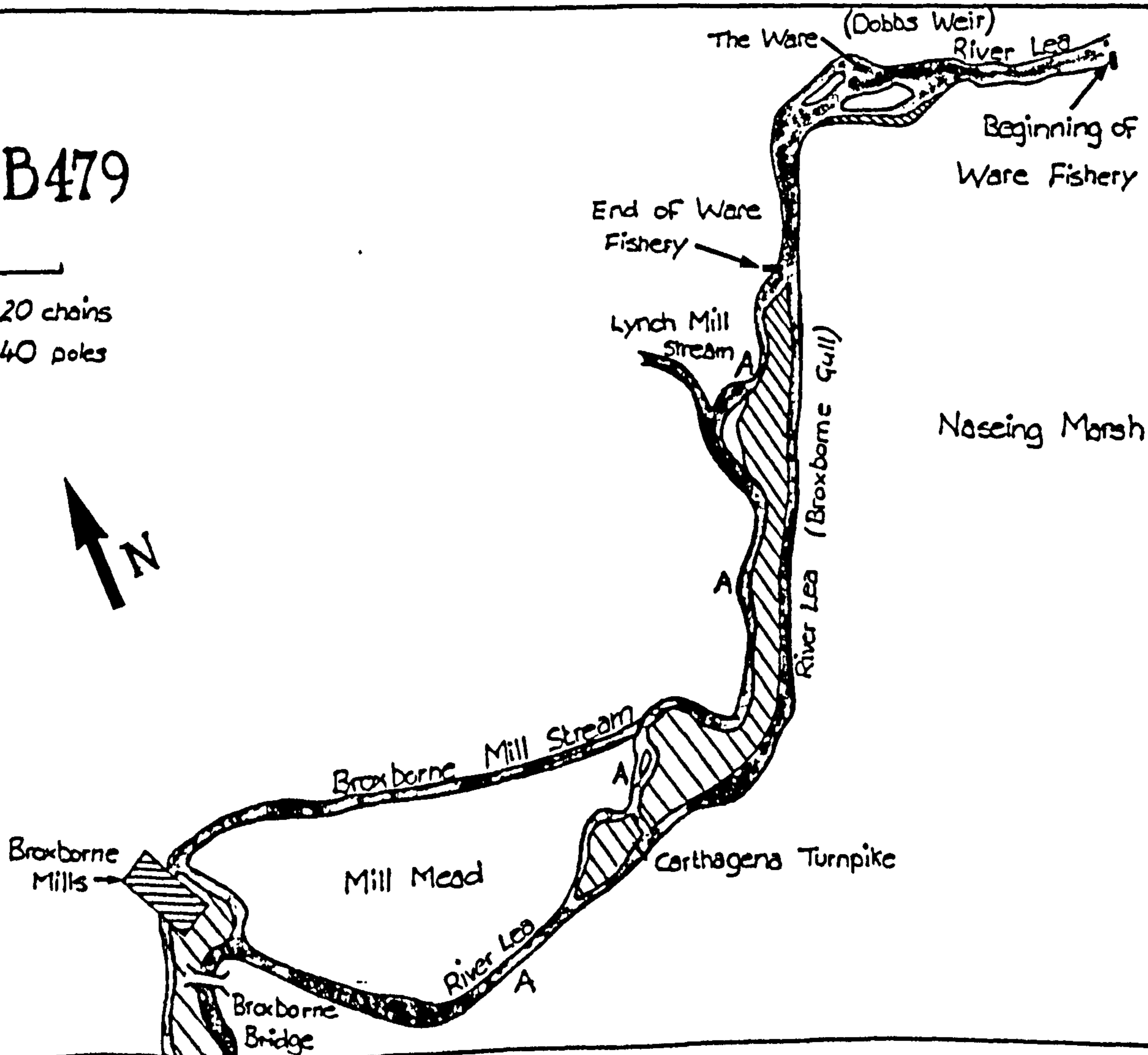


FIGURE FOUR: PROBABLE NEW ROUTE AT BROXBORNE, 1570s

HRO, B479

a scale of 20 chains
or 40 poles



alleviate the usual fears among millers that navigation improvements harmed their interests. Such principles presumably influenced the new routes opened at Stanstead and Broxbourne Mills, and the arrangements at other mills along the valley. The surprising absence of opposition from millers, except at Enfield and later Waltham, seems to substantiate this.

No contemporary evidence remains about the arrangements introduced at Stanstead and Broxbourne other than that new routes were opened and that locks were erected. Since the observant swans in Vallan's poem¹⁸ made no comment about these locks it seems reasonable to assume that normal flash locks were built rather than the new type of pound lock that was built at Waltham, which the swans did note.

Some indication of the new arrangements at Broxbourne can be obtained from a comparison of the two maps reproduced opposite as Figure 4. The top map shows the situation shortly before 1576, the bottom map the altered channels as they existed during the first half of the eighteenth century. It can definitely be established that the alterations had been made before 1641.¹⁹ Since there is no evidence to suggest that such alterations could have been made to the channels at any other date in the intervening period, it seems sensible to assume that the alterations were part of the new arrangements introduced by the commissioners during the 1570s.

Based on this surmise the commissioners opened

a new route, shown as Route A on the bottom map of Figure 4. This new route took barges down what had been the lower parts of the tail stream from Lynch Mill in Hoddesdon, then down a new cut into the head stream of Broxborne Mills, then down part of this head stream before entering another new cut which took the barges back into the traditional river.

If the arrangements at Waltham can be used as a guide, it might be expected that the lock would have been erected along the cut between the head stream and the Lea in order to provide a flash, and that a lowshare would have been built across the traditional river channel just below what was the beginning of the new route. Such arrangements would have made more water available to the mill as well as improving the navigation.

About the arrangements introduced at Stanstead only even more tenuous surmise is possible. Arguments in the first half of the eighteenth century(see 11.5 & 16.4 and Figure 9)centred on the fact that the miller was forcing the bargemen to use his head stream and then pass down a cut back into the Lea with the assistance of a flash from a lock in this cut. It seems likely that the miller was taking advantage of an alternative route first opened by the commissioners during the 1570s, for it reflects the same principles which were introduced at Waltham and Broxbourne.

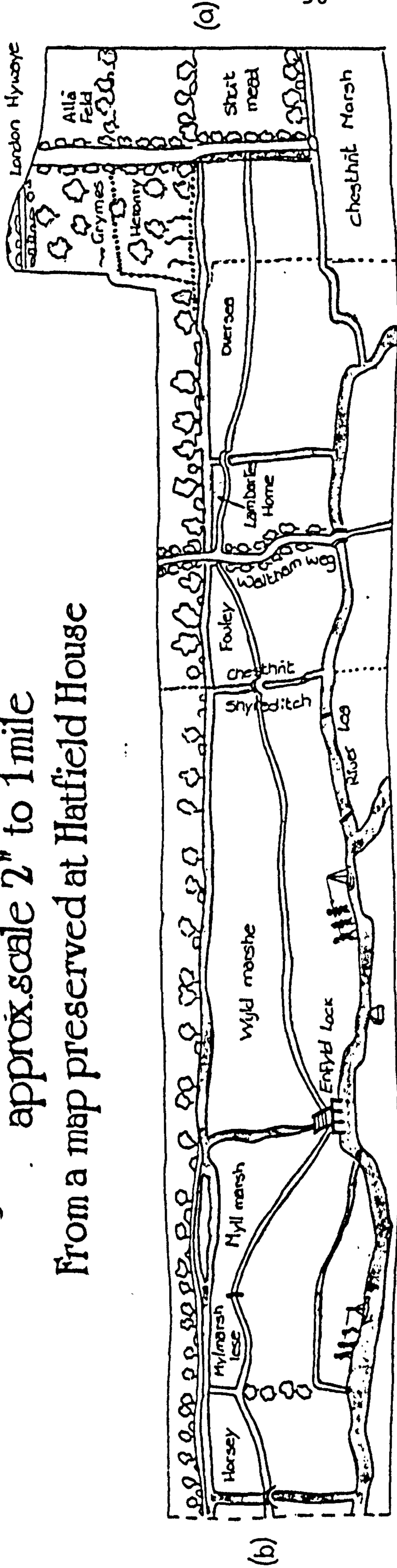
. Another mill where the arrangements introduced by the commissioners can be pieced together is Enfield Mills, the property of the Wroth family. These mills

FIGURE FIVE:

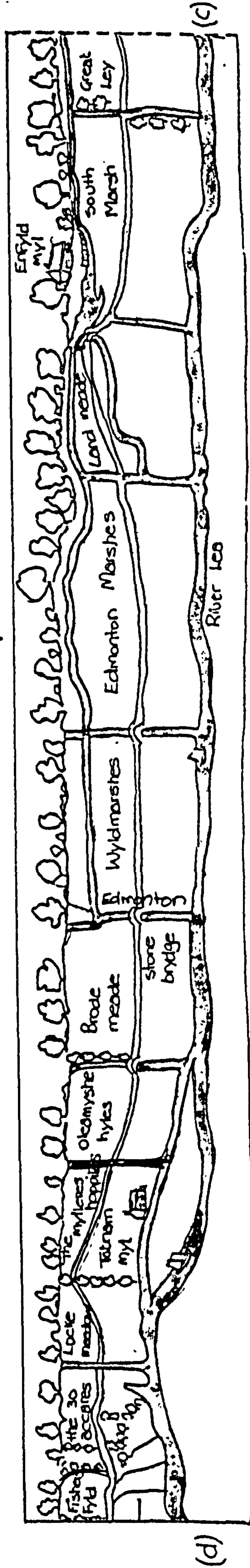
The River Lea from Cheshunt to Tottenham.

approx. scale 2" to 1 mile

From a map preserved at Hatfield House



Map to be read:- a, b, c, d



(c)

(d)

were rebuilt and enlarged in 1572 so that the mill stream was made 'greater and larger then the high river'. In 1562 there was a lock near the mouth of the mill stream, and it is most probably this lock, or a rebuilt version, which in 1581 was described as 'Ladie Wrothes olde locke'.²⁰

The commissioners' new arrangements were that this lock was dismantled and the mouth of the head stream blocked up. A new entrance to the head stream was then dug, and across its mouth was erected the lock shown in Figure 5 opposite.

This lock was a frame into which boards could be inserted to make it a dam. These boards were usually left out so that water could flow into the head stream, but when barges approached the boards were inserted. This cut off the supply to the mills but increased the amount of water in the navigable channel whilst the barges passed. Afterwards the boards were removed and the supply to the mills resumed.²¹ It should be noted that Enfield Lock worked on the same principle in the eighteenth century.

The fact that there was a lock near the mouth of the head stream in 1562 suggests that the commissioners modified existing rather than introduced new arrangements. It seems likely that the Wroth family's opposition to the navigation improvements arose partly from their anger that the alterations they made to the millstream in 1572 were nullified by the commissioners' orders.

The precise arrangements introduced at other mills

cannot be determined, but their owners, like those of mills already considered, would all have reached agreement or received orders concerning the width and depth of their head streams. Such measures were traditional, but they were still an important part of any policy designed to restrict and control the amount of water available for the navigation.

Similarly arrangements would have been made for the shutting down of the mills, for the opening and closing of their gates, and any other measures which would have made the greatest amount of water available to the navigation whenever it was desired. No details of such arrangements remain.

Under usual circumstances the millers would have been entitled to a toll for such co-operation, but there is a possibility that tolls were not allowed, for no reference to their existence at this period is known.

If such was the case there were other means of obtaining the miller's co-operation. Careful control of the river regime could allow more water for the mills as well as the navigation, as at Waltham. The improved navigation offered benefits to millers who wished to deal in meal themselves.

Finally there is a possibility(see 4.4) that the passage of barges was restricted to certain days of the week. Thus any interruptions to the mills would have been concentrated, and a determined pattern of working could be assayed.

4.4 The overall experiment

The measures so far described were part of a determined policy. The interests of the weir-owners and the riparian land-owners were definitely subordinated to those of the navigation, and novel departures were considered to reach accomodation with the millers.

The commissioners were attempting to control the river regime so that more water was available for the navigation. They were training this water into a defined narrower navigable channel, using artificial embankments where necessary, from which all but a few obstructions were removed.

An important and novel feature of this policy was the attempt to prevent the formation of shoals, relying on the scouring effect of the stronger uninterrupted current to achieve this end:-²²

The lenger it is traveled, the more Navigable it is: as hetherto experience doste shew. The often passage of boates keepeth open the Chanell, and by the helpe of the Streame by often workinge, Dryveth the Shelves Downe into the depthes: And would doe more to the perfection of the same, yf malicious persons would suffer the river, to retayne the full water, that of right appertayneth

Preventing the formation of shoals was important for the continuous passage of barges, especially since they no longer had flashes of water to carry them over such shoals. It would also mean less frequent scouring of the river.

Whether the commissioners were successful in achieving these ends cannot be determined for lack

of evidence. It can be noted that later writers made similar proposals for the problems of shoals.²³

Another aim was to obtain a more regular and speedier navigation than that associated with the reliance on frequent flashes of water. A description of the navigation by Burghley in 1588 suggests that the commissioners were successful:-²⁴

They lade on Saturday, on Monday go down to Boo bridge to tarry the tide. From ye Boo with the tyde they will pass in 4 houres, if they roo away. They com on to London with fludd, and return at an ebb to the creke mouth, and then with a flood...They come from the Boo to Waltham in 6 houres, and from Waltham to Ware in another 6 houres

This description may imply a fixed pattern of travelling on certain days of the week. Complaints in 1587 and descriptions of the riots in 1592 both seem to confirm that barges travelled together on one or two days of the week only.²⁵ Further evidence is necessary to be certain about such a pattern, but it would be a sensible compromise with the millers whose co-operation was necessary for the experiment to be successful.

It is unfortunate that more information is not available about this policy, for it was an unusual approach to the problem of improving a river navigation. The normal method of improvement was the introduction of pound locks and the construction of navigation cuts. The policy introduced along the Lea was a unique attempt at a different approach.

4.5 The river above Ware

Contemporaries always cited Ware as the main beneficiary of the improved navigation, but there is evidence that the river between Hertford and Ware was also improved at this time, and there was even a proposal to improve the river a further five miles above Hertford.²⁶

There is no contemporary evidence about the improvements above Ware, but in 1647 elderly inhabitants of Hertford recalled that 'within 60 yeres there was a turne Pyke at the Hedye of blacke ditch' (see Figure 8) and that barges carried wheat and malt from Hertford to London.²⁷

Inhabitants of Hertford were named as barge owners in 1581 and 1588, but on the second occasion it has to be noted that the size of their barges was only 26 quarters carrying capacity compared to the 36-40 quarters of barges owned by inhabitants of Ware. This suggests that the improvements above Ware were somewhat limited compared to those below.²⁸

During the winter of 1594-5 major flooding along the river destroyed Ware Bridge and the turnpike at the head of the Black Ditch. Thomas Fanshawe, lord of the manor of Ware and a major instigator of the improvement scheme along the Lea, took advantage of this natural disaster to close down the navigation above Ware. Instead of rebuilding the turnpike he ordered that a dam be built across the mouth of the Black Ditch. It was over 50 years before the navigation between Hertford and Ware was once more

improved.²⁹

It is not clear who was responsible for these improvements above Ware. Theoretically the Commission of Sewers had no jurisdiction over the river above Ware. However there was a Court of Sewers at Hertford in October 1578,³⁰ so perhaps they were responsible. There is no evidence that the work was carried out by either the Duchy of Lancaster or the Borough of Hertford.

4.6 The lower tidal river

The lower tidal Lea below Hackney was the responsibility of the Commissioners of Sewers. The problems along this stretch of the river were different from those of the non-tidal river, so it is unlikely that the policy was identical.

Of the measures introduced, it is known that the commissioners made a special investigation of which channel 'at the partinges benethe temple milles³¹ of ij Streames' was the traditional river channel. There is also evidence that the river bed was scoured, for the miller at St Thomas Mills wanted his rent reduced to compensate for the fact that the removal of a shoal from the river bed reduced the amount of water flowing to his mills.³²

Since there was sufficient water along this part of the river, and the problems of flooding were more important, it seems likely that the commissioners concentrated on scouring the river bed and defining and strengthening the existing banks. Such was the

traditional policy of any commission, there was no need for the novel measures adopted further up river.

Bow Lock had been rebuilt in 1573 by the miller as part of normal maintainance procedures.³³ There is no evidence that the commissioners interfered with these arrangements. It must also be emphasised once more that no navigation cuts were built along these lower stretches(see 3.1 and 12.1).

CHAPTER FIVEIMPLEMENTATION OF THE ACT: HOW IT WAS DONE5.1 The Commission of Sewers: membership

This radical experiment in river improvement was authorised and supervised by a Commission of Sewers. This in itself is an interesting feature, for the experiment necessitated an approach and a use of powers beyond those normally associated with such bodies.

Owing to a certain inefficiency in Chancery enrollment procedures during Elizabeth's reign no entry for this commission appears in the Patent Rolls, and other recording procedures had not yet been developed.¹ It is known that the commission passed the Great Seal on 27 September 1575, and a document dated 1589 implies the traditional² limits of jurisdiction, Ware to the Thames.

No complete list remains, but the names of 42 commissioners can be obtained from various sources. In October 1587 a list of members 'of the last Commission' provides 22 names; in 1589 a list 'of the olde Commissioners that be yet lyvinge' notes 18 names, 3 of which are not found in the 1587 list; and an additional 17 names appear in the attendance rolls of the five Courts of Sewers for which records remain.³

Of the names so obtained, all are either important state officials, representatives of the

City of London, or landed gentry from the three riparian counties of Essex, Middlesex and Hertfordshire. The membership is thus typical of the expected composition of such bodies.

What was not typical is that the initiative and support for the improvement scheme came from the highest levels. On the eve of the commissioners' appointment, William Vallans informed his father

nothing doubting but that hereafter, when all thinges be finished, that by meanes of the Lord Treasurer, maister Fanshawe, and other worshipfull men be in hand for the amendment and scowring of that river, you and I both shall see...good big boates and vessels passe too and fro betwixt London and Ware

Later an opponent of the improvement scheme, Robert Wroth, made veiled references to 'the Lordes of the Counsell' who had been responsible for the work.⁴

Dr Joan Thirsk has emphasised the role that state officials played in the numerous new projects which were encouraged during Elizabeth's reign. The improvement scheme for the Lea can be seen as another example of these developments.⁵ In particular, two names are closely associated with improvements along the river, those of Thomas Fanshawe and Lord Burghley.

Fanshawe, the Queen's Remembrancer, had close links with Ware. He had completed the purchase of the local manor in 1574-5, and was to purchase Ware Mills in 1587. He also helped the townsmen erect a new market house and apply for new annual fairs.⁶

Fanshawe played an important role in the work of the commission. He wrote to Burghley informing him of decisions and reporting progress, he took

part in surveys, and met local residents to discuss problems. Later he was to lead investigations into the riots in 1581 and 1592, and was to defend the bargemen when their interests were threatened by the road carriers.⁷

His close involvement with the fortunes of the town of Ware must explain much of his interest in the efforts to improve the Lea. In fact opponents of the scheme attacked him personally, accusing him of acting solely out of motives of personal gain. To such accusations he replied:-⁸

the making of that passage hath cost me above one hundreth markes and I receyve onely this comoditie that I have London beere brought hyther for my money for caryage, and all other carrage better cheape by half than by land carrage and other profytt I have none for all the houses be holden by a certyn rente eyther by chartes or copies so as for any thing I see I and my sonne after me shall not have my charge in lx yeres

Despite such protestations, his closure of the navigation above Ware in 1595(see 4.5) suggests a greater regard for the interests of Ware than for the navigation as a whole. His support may have been a matter of prestige rather than profit.

Burghley's close interest is also much in evidence. Indeed Camden stated that it was he 'to whom more particularly this river is obliged for the recovery of its ancient channel'. His attendance is recorded at several meetings of the commissioners despite pressing affairs of state. He was kept informed of developments, and seems to have vetted the commissioners' orders before they were issued. In

addition he made notes on the navigation and amendments to maps of the river in his keeping.⁹

Burghley had a reputation for interest in and support for new projects, and he too had close links with the area. He had just completed the rebuilding of Theobalds House in Cheshunt. It may not be mere coincidence that the family also had property at Stamford on the river Welland, another river for which ambitious improvements were proposed at this date.¹⁰

Burghley may have had divided loyalties. His neighbours at Theobalds were amongst those who most resolutely opposed the improved navigation. These neighbours always appealed to him for help, and on one occasion specifically referred to his sympathetic hearing of their grievances, but to no avail.¹¹

Besides these two, there were several other prominent statesmen who were sufficiently interested to attend meetings of the commissioners:- Sir Walter Mildmay, Chancellor of the Exchequer; Henry, Lord Hunsdon, a Privy Councillor; Sir Ralph Sadler, Chancellor of the Duchy of Lancaster; Sir Francis Walsingham, Principal Secretary; George Freville, Second Baron of the Exchequer; Sir William Wynter, a Principal Officer of the Navy Board; Thomas Powle, Clerk of the Crown; Henry, Lord Compton and Thomas, Lord Wentworth.

Some of these ex-officio members may have had particular interests they wished to defend or enhance,

but interest in the project must also have been a strong factor in encouraging their attendance.

The City of London were also well represented. Sir Ambrose Nicholas, when Lord Mayor, William Fleetwood, the Recorder, and George Heaton, the Chamberlain all attended. In addition Sir Rowland Hayward, a senior aldermen who had been the Lord Mayor in 1571, and two other aldermen, Edward Osborne and John Marshe, were also members. Hayward, Fleetwood and Marshe were also M.P.s, whilst Osborne had similar aspirations.¹²

Another body represented was the Duchy of Lancaster, presumably because of their interest in the upper river. Besides the Chancellor, two other officials were also members:- John Purvey, Auditor of the South Parts, and John Taylor, the Receiver for the Home Counties. Both had local interests too. Purvey, a Hertfordshire J.P, was married to the daughter of the lord of the manor of Wormley, and lived there. Taylor lived at Enfield.¹³

Many of the other members were also local J.P.s,¹⁴ but not all. They were however the normal local gentry to whom the tasks of local administration were entrusted.

5.2 Commission of Sewers: administration

If ever formal minute books were kept, they no longer remain, but sufficient records are extant to give some idea of how the commissioners worked, but major gaps do remain.

For instance, commissioners met formally at Courts of Sewers, and there is record of such Courts being held in the Star Chamber, at 'Mr Marshes dwelling house in Bromley', at the Four Mills in Bromley, and at unspecified venue at Hertford.¹⁵ However nothing can be said about how frequent such meetings were, about how the meetings were conducted, or about how they coped with the differing functions of surveying the river, hearing objections to their orders, checking whether their orders had been obeyed, and discussing the financial arrangements. In addition some of Fanshawe's letters imply that informal groups of commissioners were often responsible for pursuing the work.¹⁶

Evidence does remain of how an appeal was handled. In October 1576 the commissioners ordered that a stream on the east bank, the property of a Mr Hicke, should be blocked off before 20 November, or else a fine of £5 would be levied. Hicke appealed, and four commissioners, including Robert Wroth, were ordered to take another view. They compromised, and allowed Hicke to take water out of the river through a pipe inserted in the dam.¹⁷ The right of such appeal was specifically mentioned when the commissioners issued their orders,¹⁸ but how often advantage was taken cannot be ascertained.

More is known of how the orders were implemented once decisions had been taken. What emerges is the important role played by officials known as dikegraves.* Such officials were involved in fen drainage schemes,¹⁹

but there is no evidence of their involvement along the Lea at any date either before or after this particular commission. Perhaps the different approach of this commission stimulated fresh administrative initiatives, even if the name seems inappropriate to a river navigation.

All orders made by the commissioners were sent to the local dikegraves, who seem to have been appointed at the parish level. The dikegraves first responsibility was to have the orders read out at church as soon as possible, and they were then to see that the orders were obeyed and that the commissioners were kept informed of developments.

If particular property owners had not fulfilled the orders within the specified time, and if there were no extenuating circumstances such as flooding, then the dikegraves had authority to carry out the work and bill the recalcitrant landowner. As a last resort they had powers of distraint if the bill was not paid.

The dikegraves were also responsible for ensuring that general orders, those which could not be issued to a particular property owner, were carried out. To meet the costs of this work they could summon four of the 'Jurates within your precinctes' to estimate and confirm their expenses, and fix a local rate based on the amount of land held which was 'subiecte to the Surroundinge of the Said Water of Ley'. This information was then sent to the commissioners, who had the power

to levy such rates. The dikegraves were then responsible for collecting them.²⁰

An important and arduous task. The names of four are known, John Englestone(or Egleston) and Thomas Penyngton were the dikegraves for Tottenham, whilst Thomas Pyckeringe represented Stepney and Henry Freeman Stratford at Bow. All were of the status of gentlemen.²¹ This suggests that most parishes along the river must have had such officials, but whether they were appointed by the commissioners or by the parish cannot be ascertained.

Less is known of the other officials of the commission. A reference to a Mr Lovell implies that he was the clerk,²² and John Dudley and John Taylor are described as 'Survayores over the dikegraves'.²³ Taylor was the official of the Duchy of Lancaster who lived at Enfield, whilst Dudley was most probably the resident of Hackney who died in 1593. Both are listed as commissioners in attendance at one Court of Sewers even though they were not mentioned in the lists compiled in 1587 and 1589. This evidence suggests that their role was to provide an additional link between the commissioners and the dikegraves, to ensure that the latter carried out their duties properly.²⁴

There are some aspects of the administration about which no proper evaluation can be made. One such is the role of juries. The instructions sent to the Tottenham dikegraves in 1576 were based on the findings of a jury during a survey, a jury was used to fix a

local rate at a Court of Sewers at Limehouse, but no jury was summoned to consider Hicke's appeal against the commissioners' orders, a function they were particularly to fulfil on later commissions.²⁵ No other references remain, their exact role at this date cannot be determined.

Little is known also of the financing of this improvement scheme. The act of 1571 specified that the river could be improved 'at the costes and charges of the countrie alongest the saide River', and advantage was taken of this authorisation. However much of the work was financed by particular property owners, on the orders of the commissioners. The costly arrangements at Waltham were borne by the owners of Waltham Mill, Hickes paid for the lowshare at the mouth of his ditch, and many shoals, osier beds and trees were removed at the expense of adjoining property owners.²⁶

In addition it is known that local rates were fixed, most probably at parish level all along the river. Of these local rates only that fixed for Stepney and Stratford remains. In 1576 the dikegraves there were ordered to collect £16 18s from owners of the local marshes and £2 from the inhabitants of Stratford at Bow. Only part of this sum was to be used to improve the Lea, the remainder was to be used for normal drainage and flood protection measures.²⁷

Besides this it is known that Fanshawe paid at least 100 marks towards the improvements,²⁸ but whether as rates or what is not known. There is some evidence

to suggest that the costs were high. Road carriers in 1581 complained that the improvements had been and still were 'a greate and contynuall charge to the contrye', and in 1587 Lord Hunsdon argued that since the improvements had cost the counties of Essex and Hertfordshire a great deal of money it would be a shame if this investment was lost by the closure of the navigation.²⁹

No actual costs of the work are available however. Nor is it known whether a county rate was fixed in addition to parish rates or whether voluntary contributions were solicited. What can be dismissed are statements that building the canal and improving the river cost the City of London £80,000.³⁰

5.3 The Commission of Sewers: its legal position

The Act of 1571 had authorised a commission, albeit with some confused drafting(see 2.2), to improve the river between Ware and the mouth of a canal built by the City of London, only after that canal had been built. No canal was ever built, and the membership of the Commission of Sewers issued in 1575 was not identical to either of the commissions specified in the act.

Yet it was stated by both Lord Burghley in 1580 and Lord Hunsdon in 1587 that the improvements had been carried out under the authority of the Act of 1571.³¹ One opponent of the improvements did refer in 1581 to an unspecified 'erre in the lawe of passage by the river', but it was not until 1592 that one of the numerous petitions from the road carriers actually argued

that the improvements were illegal because the canal had not been built. By this date the bargemen were more interested in protecting their rights to use the river rather than maintain the navigation that had been introduced during the 1570s, so they made no specific response to this point.³²

The legal authority of this improvement commission is worth considering, for they introduced a novel policy using powers greater than those which were later to be allowed to Commissions of Sewers.

In the first years of the seventeenth century attempts were made by such bodies to improve the Medway, the Dee and the Wye, but these attempts were thwarted by local landowners who argued that the commissioners were exceeding their powers. Legal opinion concurred. In 1618 a book providing advice to justices of the peace emphasised the limited powers of Commissions of Sewers, stating that they could not make new cuts or try new inventions.³³

Yet the Commissioners of Sewers along the Lea had built new cuts, and had tried new inventions such as the pound lock at Waltham. A strict reading of the Act of 1571 does not provide sufficient authorisation for such measures. The improvement scheme along the Lea was not only a technical innovation, it seems to have been a successful administrative innovation as well, even if it was never to be pursued elsewhere. It may not be coincidence that the Parliament of 1571 which authorised two river improvement acts involving an extension of the powers of Commissions of Sewers

also passed an act altering the powers of such bodies³⁴
in order to make them more effective.

A final point to note about the legal authority of this improvement commission was that it automatically expired after ten years in September 1585. Furthermore it was never renewed. Renewal was considered in 1587, 1588 and 1589, but no commission was issued, and it was not until 1607 that another Commission of Sewers was³⁵
issued for the Lea.

CHAPTER SIXTHE SUCCESS OF THE EXPERIMENT6.1 The development of the barge traffic

The Commission of Sewers was appointed in September 1575. Within a few years, and definitely by early 1580, they had improved the navigation to the extent that a substantial downstream traffic in malt, meal and grain had developed. For the first time in many years the Lea was an important artery supplying London, the very result that the City had sought when they began their investigations in 1560.¹

L
Precise quantitative data is not available, but in 1585 road carriers stated that 'threescore thousand quarters of mault' were brought to London every year by the Lea bargemen, whilst in 1591 officials of the Duchy of Lancaster were told of 1000 quarters of corn a week being carried down river.² Confirmation of these figures is provided by a list of barges compiled in 1588 (see Table Two below). The 32 barges listed had a total capacity of over 1000 quarters, and the journey to London and back could be made within a week.

Less information is available about the back carriage. Smiths, brewers and limeburners all benefitted from the cheaper carriage of coal, paying 6s 4d a chaldron for the carriage. Smiths also had iron brought up river, Fanshawe had London beer brought to Ware Park, and salt was another probable back carriage.³ No quantities were ever mentioned.

Besides the vastly improved navigation, the major factor encouraging these developments was the cost advantage enjoyed by the bargemen compared to the road carriers. In 1585 the latter advocated a tax of 1s 4d per quarter on all malt carried down the Lea, arguing that this was the cost advantage enjoyed, but the bargemen countered that their advantage was in fact only 6d or 8d per quarter. This last is confirmed by a road carrier who in 1581 defended his attempts to destroy the navigation on the grounds that 'he sawe one sell a quarter of Malte caried by water better cheape then he could sell a quarter caried by land by a vid'.⁴

A further element in the expansion of this barge traffic must be the concerted effort of the townsmen of Ware to capture a greater share of the trade to London at the expense of Hoddesdon market where the road carriers of Enfield, Cheshunt and Waltham were dominant. However, although Ware did emerge as the most important barge centre, communities further downstream also took advantage of the improved navigation, including Enfield and Waltham.

6.2 The barge owners

Further evidence of the response to the new opportunities offered by the improved navigation can be obtained from two lists of barge owners which were compiled during this period. The first, reproduced as Table 1, was compiled during investigations into the riots of 1581, whilst the second, Table 2, was compiled in 1588 when there was much discussion over the future

List of bargeowners, endorsed September 1588

<u>Bargeowner(s)</u>	<u>Residence</u>	<u>Name of barge</u>	<u>Capacity(qtrs)</u>
Richarde Brooke	Ware	greate blue lyon	42
Richarde Brooke	Ware	litle blue lyon	28
Edward Parker Roger Parker	Ware Ware	Hynde	36
Thom Whiscot	Ware		38
Beniamin Buckehurste	Amwell		30
Thom Pomfret Beniamin Buckehurste	Newechippinge Amwell	Grayhounde	38
William Pyke Beniamin Buckehurste	Amwell	Primarose	38
Thomas Hud, baker	Islington	Mermayde	26
Thom Shelly Thom Leonarde, miller	Ware Ware	Cocke	38
Gyles Shelley	Ware	Feysante	30
Richarde Stringer	Amwell	Pacocke	38
Augustine Walker, & son-in-law, Wm Cocke	Baldocke Baldocke	Nightingall	28
Thomas Tyler	Stansted	Swan	28
Thomas Butler Edwarde Scale	Ware Broxaburne	Swallow	28
William Thorpe Richard Waters	Hodsedon Waltham Abbey	Talbot	38
John Spencer	Ware	whitehorse	40
Roger White	Ware	goulden lyon	30
James Croyen	Ware	George	27
Thom House Thomas Fage	Amwell Baldocke	Mary (oblit)	40
Francis Bearapacke Willm Hafeheade	Broxaburne Yardley	Baptiste	40
Francis Bearapacke Willm Hafeheade	Broxaburne Yardley	Harte	40
Francis Bearapacke Roger James	Broxaburne St Catheryns, London	Rams heade	40
Richard Barber Thom Barber	Amwell Bow	Angel	30
Thom Matheson	Ware	Phame	38
Thomas Hillan	Broxaburne	Unicorne	36
Thomas Springam	Harteforde	Antelop	26
Michaell Kettle Hugh Bottm	Harteforde Harteforde	Rose + Scales	26
Thom Godarde Willm Bishop	Enfielde Waltham Abbey	Tygre	30
Richarde Hickeman	Waltham Abbey	Beare	24
Thomas Curtys	Enfielde	Oulde Faulcon	36
Henry Loft	Enfielde	New Faulcon	38
Robert Doe	Enfielde	Maltesacke	38
Finche	Waltham Abbey	Oulde Cocke	Timber barge

of the navigation. At the bottom of this second list Burghley made several notes about the navigation.⁵

TABLE ONE: LIST OF BARGE-OWNERS, 1581

'The names of such as have barges uppon the River'

Barges of Hertford	Thomas Hoode	1
	Thomas Jurye	1
	Thomas Springham	1
of Ware	Robert Leonarde	1
	Rychard Brooke	1
	John Mathysonn	1
	John Whykhood	1 boate
	John Spencer	1 boate
	Richard Sibborne	1 bardge
of Braughing	Thomas Colte	1
of Stansted	Andrew Gyf	1
	Thomas Tyler	1 bote
of A		
of Broxborne	Mr Garner	1 bardge
	John Barber	1
of Waltham	Robert Eaton	1
	William Hudde	1
	Crosse	1 boate
of East Smithfield in London	Edward Parker	1 bardge
	John Stead	1
of London	Richard Pegram	1
of Enfield	John Orysmen	1 boate
	Francis Bond	1 bardge

The boats were most probably smaller than the barges, but exact capacities in the above list are not known. It is known that about 100 men were employed on the boats in 1581,⁶ whilst 118 men were employed on the barges listed in Table 2. The largest barge in 1588 needed five men, barges with a capacity between 36 and 40 quarters and the timber barge needed four men, whilst the smallest barges needed only three. Of these, one was

the steersman, the rest were hired to hale the barges from the bankside or to row when in tidal waters.

A comparison between the two lists does suggest a continued growth in the barge traffic during the 1580s, although it cannot be said just how complete the two lists were. Whether joint ownership was a later development cannot be said, such information might not have been considered relevant for the purposes of the earlier list.

From the additional information available of some of those appearing in these two lists it can be discerned that two differing groups of barge owners developed. There were those who acted as carriers, most probably dealing on their own account as well, and those who invested in barges as an extension of their dominant economic activity, particularly the milling and brewing trades.

Of those of whom it is possible to identify as being of the first group it is difficult to provide sufficient or informative detail. However it can be said that Richard Brooke was a prominent member of this group. He was named in both lists, and with two barges in 1588, he had the greatest carrying capacity at his disposal. He acted as a spokesman for the bargemen in the aftermath of riots in 1581 and 1592. In 1604 Brooke, described as a carrier and bargeman, was involved in a legal dispute with a Hitchin maltster, William Hurste. It is clear from the evidence that Hurste expected Brooke to use his initiative in disposing of the malt that Brooke was

carrying from Ware to London on his behalf. Brooke was still a bargeman in 1606. It can be noted that in 1592 and 1597 court clerks listed him as a yeoman.⁷

Another bargeman, John Whykhood(Whiskerd) was similarly described as a yeoman,⁸ whilst others, Thomas Springham and Francis Bearapacke, were sometimes described as husbandmen.⁹ Two others, Richard Stringer and Thom House described themselves as bargemen when they made their wills, but Stringer was also described as a labourer.¹⁰

Further evidence of the activities of this group has not been discovered. It is not known how they financed the construction of their barges, whether there was much economic differentiation amongst the group, or just how secure their position was. It is difficult to establish just how they worked. The initiative allowed Brooke would suggest that many must have been more than mere carriers, for it was in dealing rather than in carrying that the profits were to be made.

Perhaps several of this group developed their activities by entering long term contracts to supply the expanding London brewing industry.¹¹ Such contracts would have given them security, and scope to expand their own trading activities. On the other hand, several of the London brewers themselves invested in Lea barges.

An example of this group is the Roger James of St Katherines listed in 1588, who could be either the father or the son of that name involved in a brewery

near the Tower.¹² Other identifiable members of the London brewing community include Thomas Pomfret who was apprenticed to the Brewers Company in the 1570s,¹³ and Edward Parker of East Smithfield who may have been a London brewer in 1581 before taking up the trade in Ware later in the decade.¹⁴ Complaints from the badgers would suggest that more London brewers were involved in this traffic.¹⁵

The barge owning group easiest to discern and describe are the millers. Most of those working mills along the upper river invested in barges to carry meal to London, being part of a trend whereby country millers expanded their activities to exploit the London market. To such an extent in fact that there was at times insufficient grain for the mills near the City to grind. Legislation did exist prohibiting millers from trading on their own account, but such laws had long fallen into disuse.¹⁶

An example of this group was Thomas Hudde, whose name is found in both lists. Between December 1580 and September 1583 he held the lease of the Town Mills at Hertford, and in 1582 he was also recorded as being the miller at the Dicker Mills in Hertford. He in fact owned a bakery at Islington, and obviously used the Lea as a means of supplying this enterprise. In 1581 he was the author of a strongly worded petition in favour of the improved navigation.¹⁷

The Leonard brothers of Ware, Robert, John and Thomas, were another important milling group who invested in barges. Robert owned Ware Mills in 1581

when he mortgaged them with Thomas Fanshawe, but he was unable to meet his commitments and in 1587 Fanshawe purchased the mills. He continued to lease the mills however until his death in 1597, after which brother John took over the lease. John had inherited Ware Westmill in 1581 and was still the owner in 1613, but it should be noted that in 1596 it was his brother, Thomas, who was listed as the owner and occupier. In addition Robert and John inherited Edward Parker's Ware brewery in 1592. It would be interesting to discover whether they were also related to Peter Leonard the elder and his son, Peter, who were Dutch brewers working in London during James' reign.¹⁸

In addition to these, other millers who invested in barges included those working Broxborne Mills¹⁹, another miller at Hertford Town Mills,²⁰ and possibly a miller at Waltham Abbey Corn Mills.²¹ Such was the development of this traffic that one of the promises the Privy Council made to Denny and the badgers in 1592 (see 7.4) was that they would investigate the abuse whereby millers were investing in barges.²² Whether the prohibitive legislation was ever brought into force on this occasion cannot be determined.

6.3 Flattery by imitation

An obvious indication of the success of the improvement scheme is the very ferocity and persistence of the opposition it aroused amongst the road carriers. They obviously feared that the cost advantages enjoyed

by the bargemen threatened their position. Yet there are indications that some badgers were prepared to exploit the advantages offered by water transport themselves.

Enfield and Waltham badgers are amongst those listed as barge-owners in 1581 and 1588. In 1585 one group of badgers felt it would be beneficial to extend the navigation a further 5 or 6 miles above Hertford so that traffic to London from Bedfordshire and west Hertfordshire could be tapped.²³

Such evidence illustrates conflicting attitudes amongst the badgers, they were not a homogenous group. Yet there is also evidence of conflicting attitudes amongst the very badgers who led the opposition to the navigation.

In 1593, after the badgers actions had effectively closed the navigation above Waltham, several badgers and inhabitants of Hoddesdon, including two who had been implicated in the 1581 riots, petitioned Lord Burghley to obtain his support for a scheme to improve water transport facilities at the town. They wanted the tail stream of the Lynch Mill at Hoddesdon to be made navigable so that barges could load and unload at wharves close to Hoddesdon market.²⁴

Not only did the badgers fear the cheaper costs of the bargemen, they feared that the town of Ware was capturing traffic that formerly came to their local market, Hoddesdon. Further research is necessary to establish the relative growths of these communities at this date, the development of the river must be an important influence effecting their growth. It is probable

that the town of Ware in particular must have expanded as a result of these developments.

CHAPTER SEVENOPPOSITION TO THE EXPERIMENT7.1 The opponents

Further evidence of the success of the scheme is the very strength and persistence of the opposition it aroused. Millers, fishermen and landowners all had cause for resentment, but the main opponents of the improved navigation were the land carriers, the badgers and mealmen, who acted as middlemen between the country and the London markets. It was the persistence of their opposition which was to play a major part in the ending of this experimental improvement scheme during the 1590s.

The commissioners' policy radically altered existing arrangements along the river, so it is surprising that there is so little evidence of opposition from those whose traditional rights were curtailed. For instance there is no evidence of formal protest from the riparian landowners, either about the policy or its cost.

Similarly, opposition from the milling community was somewhat muted. Indeed many, particularly along the upper river, both welcomed and took advantage of the improved navigation. However millers at Enfield, Cheshunt and Waltham were involved in the riots of 1581 and 1592, and during these riots millers at Stratford were less co-operative over the working of Bow Lock.¹

Nevertheless the numerous petitions from the road carriers during the early 1580s made no mention of millers' problems, even though the road carriers were intent on extending their complaints to as wide a circle as possible. It is only in 1587 that specific complaints were made about problems at Enfield Mill, to be followed by more general complaints in 1592 when the road carriers were more confident.² Such reticence suggests no concerted opposition from the millers, even though the Wroth family, owners of Enfield Mill, were staunch opponents.

Another injured party omitted from the catalogue of the road carriers' complaints were the fishermen. Even though all fishing weirs were removed from the river, no formal protest from the fishing interest remains. All that is known is that investigators into the 1581 riots noted that Thomas Perrott of Waltham Abbey had erected a weir near Enfield Lock, in contravention of the commissioners' orders.³ Even in 1592 complaints about the removal of the weirs concentrated on the consequent loss of winter flooding, not on any harm to the fishing.⁴

Such lack of concerted opposition from the fishermen may be partly explained by the fact that several weirs and fisheries were owned by those responsible for implementing the improvement scheme. Fanshawe owned Ware weir and adjacent fisheries, Burghley purchased a weir at Waltham in 1572.⁵ Also fishing continued, it was just that different methods had to be adopted.

The concerted and organised opposition which, despite several rebuffs, was to be ultimately successful emanated from the local road carriers, who were known by the term badgers.⁶

These badgers, centred at Enfield, Cheshunt, Waltham and Hoddesdon, had long dominated the grain, meal and malt trade down the valley to London. The market at Hoddesdon was an important centre of their activities, for it was here that they dealt with the provincial dealers and carriers, and then served the London markets.

The local communities benefitted greatly from this trade. The middlemen made good profits; the local farmers and labourers could supplement their income by small scale dealing on their own account, by hiring out horses and carts to the middlemen, and indeed hiring themselves out to accompany the pack horses and carts as they wended their way to the capital.⁷

This trade was now threatened by the development of a substantial barge traffic along the Lea. Not only could the barges carry at cheaper rates, but the emergence of Ware as an important transshipment centre and market threatened the position of Hoddesdon. The badgers responded vigorously, and in doing so enjoyed much support in their local communities.

In particular they enjoyed the support of the Wroths, owners of the manor of Durants in Enfield, Enfield Mills, and much other property in the vicinity. In 1573 Sir Thomas Wroth died, leaving a life interest in this estate to his widow, after which it was to pass to his eldest son, Robert.⁸

Robert had been a member of the Commons' committee which emasculated the 1571 bill, and a member of the commission which introduced the improvements. It would be surprising if he had not opposed the City's bill, and it is difficult to imagine him as an advocate of the improvement scheme, but no evidence of his activities as a commissioner survives, except that he was one of the sub-committee which had made concessions to Hickeys in 1576(see 5.2).

When riots broke out at Enfield in 1581 he refused to join investigations into them. Not surprisingly, for much of the damage had been on stretches of river adjacent to his property, and he personally felt the improved navigation was a greater wrong. In 1587 Lady Wroth made complaints about the adverse effects of the improvements to Enfield Mills, and Lord Hunsdon noted Wroth's efforts to close the navigation 'for his private gayne'. Then in 1592 Wroth as a local J.P. arrested bargemen involved in the riots, but not the badgers, and was then named as a defendant when the bargemen brought a case before the Star Chamber. At all times Robert Wroth was a staunch defender of the badgers' cause.⁹

Another prominent supporter to emerge in the 1590s was Sir Edward Denny, lord of the manor of Waltham. He had inherited several properties when a minor in 1576, including three fisheries along the upper river and two mills at Waltham. Many of his tenants must also have been badgers. In his case bribery seems to have been a further reason for his

support for the badgers' cause. Whatever his motives, it was his authorisation which allowed the badgers to first destroy Waltham pound lock, and then try and prevent the bargemen using the traditional route once more.¹⁰

7.2 The first bout of riots

During the period when the improvements were being introduced, Fanshawe complained several times that many of the commissioners' orders were not being speedily obeyed. Such laxity might reflect lethargy rather than opposition, but Fanshawe also noted that newly erected towing bridges were being immediately pulled down 'by some evill Disposed persons'.¹¹

Once the improvements had been completed, evidence of the badgers' opposition emerges. In 1580 they complained to Burghley about their hardship as a result of the growing barge traffic. Burghley informed them that he could not help as the river had been improved as a result of an Act of Parliament, so the badgers presented their case there. However the House rose in March 1581 before they obtained a hearing.¹²

Frustrated in these efforts, the badgers took to illicit action. By March 1581 several breaches had been made to the river banks at Enfield, and this destruction was to continue during the ensuing months. If bargemen mended a breach, it was immediately re-opened. In addition earth and stones were thrown into the navigable channel to cause further problems. One badger expressed

a desire to bore holes in the bottom of the barges.¹³

Further up river at Waltham efforts to destroy the pound lock began. In May someone tried to borrow a saw from Cheshunt Mill to do the job, but more desperate schemes evolved. William Shambrooke, a Cheshunt mealman, went to London to buy 'Rosseyne and brymston' and about Lammas time (August 1) the pound lock was set on fire.¹⁴

By late summer the bargemen petitioned Burghley for help, and three commissioners, Sir Henry Cocke, Thomas Fanshawe and Edward Baeshe, were instructed to investigate the complaints. These three held court on 21 August and 3 September, and succeeded in unearthing much evidence.

The activities of Shambrooke were easily detected, as was the help he received from William Cocke, a carter, and John Shellye, a mealman. Furthermore many Waltham inhabitants had known of their plans and had done nothing to discourage them. Indeed an employee at Waltham Corn Mills, Christopher Pennyfather, was upset that the pound lock had not been totally destroyed by the fire and wished that there had been a barrell of gunpowder in the lock and another in a passing barge.

Investigations into events at Enfield uncovered the same widespread support for the illegal methods. Gangs of young men had gathered on the green late at night, and had made no attempt to hide the fact that they were about to breach the banks once more. Indeed when they had finished, they retired to the houses of some of the better off inhabitants to receive suitable

refreshment.¹⁵

The three commissioners had sufficient powers to punish, but chose to await further instructions from Burghley. On 8 September Fanshawe reminded Burghley that they were still waiting, and complained of further breaches. He stressed that further investigations were necessary, and suggested that these should be conducted by Burghley himself, or Lord Hunsdon. The bargemen submitted a petition to the same effect.¹⁶

No response had been received from Burghley by the end of September, so a dinner was arranged at Baeshe's house at Stanstead where the commissioners had a long conversation with Hunsdon. He immediately wrote to Burghley informing him of the gravity of the situation, and stressed that the badgers had used

lewd speach...that yf the Ryver should not
be overthrowne that then they would ryse
agaynste the maynteyners of the same and that
yt would also coste many mens lives, the
next Waye(in my opinion) to shure rebellion

Hunsdon wanted speedy action, and offered to serve on any investigation.¹⁷

This time notice was taken. On 5 October a special commission was appointed. It was chaired by William Fleetwood, Recorder of the City of London, and all its members were already Commissioners of Sewers. It could be expected to favour the navigation interest.¹⁸

When the commission began their investigations they met with problems which were described by Fleetwood:-¹⁹

in the forenoone wee could Learne nothing whereby we weare halfe discouraged. But in thafter none one poore man, that was a doer and being examyned upon his othe...did for feare he shoulde have gon to Newgate confesse moste of all mysdemeanors and whoe weare the Doers, and then wee examyned those whome he had accused whereof some weare Mr Wrothes men and the residue weare of Enfeilde; Of theis one of Mr Wrothes men being his horsekeper did after muche a doe take his othe and confessed all the truthe And that he hym selfe was a principall doer, the other of Mr Wrothes men being his porveyor of wheate and malt did comytt wilfull perjurye and would confesse nothing though he were charged by them that weare att the acte doing Certen other being sworne having used certen rebellious and sedicious wordes did utterly denye the same, althoughe they weare confronted with sevrall wytnesses upon their othes Some others being cheife offenders did bothe utterly refuse to take any othe and also denied to be examyned

Fleetwood's opinion of these proceedings was severe:-

I have served in many Comyssions bothe in the northe and Sowthe a long tyme and I assure yor Lordeshipp I have never mett wth suche stobberne verlettes as those be that appered before us this daie

He was particularly concerned about the involvement of Wroth;-

In thende of all our travell being towarde nighte there came in substannciall profe of a matter that wee were all sory for, & that was Mr Wrothe had mysdemeaned hym selfe wthoute wthoute the Compas of all reason, in speaking publiqlye, certen Wordes againste the Quenes highnes and the Councell, The Wordes tended in myne opynyon verye muche towards a rebellion and were suche as in good reason maye not lightlie be passed over

Wroth's inflammatory comments were that

the Lordes of the Counsell had don theym greate wronge...and rather then my Lordes ...shall force us to make up the breaches againe we will be hanged at our owne gates

Fleetwood was saddened to report all this for he had been a close friend of Robert's father, but he felt

the son was 'over much puffed in pride wth over much Lyving and wealth'. Robert was involved in several disputes at this date,²⁰ and must have attracted much adverse comment from others besides Fleetwood.

Despite all these problems the commissioners succeeded in obtaining a comprehensive account of the riots. Their report listed the damage to the navigation and the culprits responsible, but also noted the comments and support of other local inhabitants. In particular there was criticism of the local constable, John Goddard. He had refused to carry out any investigations when the breaches had first been reported, had hidden what he knew from the commissioners, and had defended the badgers' behaviour. He was removed from his post and committed to Newgate by the commissioners. Several others were also committed to Newgate or the Gatehouse in Westminster, but those who had confessed were allowed home until further notice.

The report was sent to Burghley, along with a letter from Fleetwood which stressed that repairs should be carried out quickly before winter weather brought further damage.²¹

What happened next is not documented. There is no evidence that any prolonged imprisonments²² or other punishments were handed out, and no evidence about the repairs to the navigation, though presumably these were quickly implemented. What is known is that the navigation continued, and that for the rest of the decade the badgers refrained from physical damage, resorting instead to persistent petitioning in their

attempts to defend their interests in the face of the threat from the bargemen.

7.3 A decade of argument

The investigations into these riots had been accompanied by a fierce debate about the validity of the badgers' complaints and the advantages and disadvantages of the barge traffic. The badgers submitted a petition to Burghley summarising their objections, and this elicited at least five replies from supporters of the navigation.²³

The main thrust of the badgers' complaints was that the cost advantages enjoyed by the barges threatened their livelihood. They contrasted the large number of road carriers who they claimed were thrown into dire poverty with the few bargemen and brewers who obtained any profit from the barge carriage. That cheaper transport costs might be a benefit was not considered by them to be an argument. The other arguments they forwarded, the alleged adverse effects upon agriculture, the decline in the Queen's subsidies and the damage caused by the passing bargemen, were all subordinate to this main complaint.

It cannot be said that the badgers had the best of this exchange of opinion. Their complaints of poverty seem exaggerated, and their inclusion of road carriers from Hertfordshire, Cambridgeshire and Bedford must have struck many as ridiculous. Some of their other points were also weak, and the bargemen and their supporters had little difficulty in countering them.

The badgers' arguments suggest a long established vested interest desperately defending that interest before a climate of opinion which was unsympathetic. In a time of shortages and inflation middlemen were a popular target of abuse, and supporters of the navigation were able to recount many stories about the abuses which, it was alleged, the badgers had indulged in before the advent of competition from the bargemen.²⁴

Whatever the precise rights and wrongs of the arguments the badgers did not attain their objective. The barge traffic continued, but so too did the road carriage. Despite the complaints of utter ruin, the badgers sustained their trade, never, however, ceasing their efforts to restrain the barge traffic.

Although the 1581 petition had not met with success the badgers submitted an almost identical one in 1583. Two additional complaints were raised. Besides blaming the improvements for the paucity of game and swans, the badgers for the first time noted the reduced fertility of the hay fields as a result of the absence of the customary annual flooding. This was the most telling criticism made by the badgers.²⁵

There is no reason to suspect that this petition met with any better response than that in 1581. In December 1584 the badgers tried a different approach. They submitted a petition to the London aldermen which argued that the bargemen were trading in a manner which was not beneficial to the capital's markets. It was

stated that the bargemen were unloading at the mouth of the Lea onto ships which took the grain either abroad or to other coastal ports. Furthermore malt was often discharged at the private wharves of the London brewers rather than at the City's legal quays. Thus the London markets were not supplied as they should be and the City's income from meteage dues was reduced.²⁶

This particular petition may have been designed to solicit the aldermen's support for an approach the badgers were about to make to Parliament. For in February 1585 the badgers submitted a bill to the Commons entitled 'A Bill prohibiting of carrieng of Malt to London by the River of Lee'. The main proposal of this bill was

That yt shall not be Lawfull from heareforth for any pson...in any Barge Bote Lighter or other Vessell to transporte...by the said Ryver from Ware...or from any other place...within the said Counties of Hartf Midd or Essex to London or elsewhere any manner of Mault... but shall suffer the same to be onely caryed by horse and Cartes as before was accustomed

The bill did specifically exempt the carriage of malt for the bargemen's own use, but any attempt to carry commercially was to result in the forfeiture of both the malt and the vessel. The bill was not an attempt to close the navigation, for other goods were not mentioned, it was merely an attempt to restrict the malt trade to the road carriers. The Commons Journals for 1585 are missing so the exact fate of the bill is not known, but it never reached the Lords.²⁷

This total prohibition of the carriage of malt by barge was not the only idea under discussion in

1585. The badgers were also proposing a prohibitive tax of 16d on every quarter of malt carried by barge down the Lea, and some were actually suggesting that the river be made navigable a further five or six miles upstream towards Luton. To this last the bargemen made the sarcastic rejoinder that 'seinge the bringinge of the Ryver fyve myles nerer to Bedfordshire will restore all theis decayes there is no soch great cause of Complaynt'.²⁸

None of the badgers' proposals met with success. Yet it is obvious that they had not lost any of their determination to oppose the bargemen. In view of this it is surprising that the bargemen made no attempt to renew the Commission of Sewers when it expired in September 1585(see 5.3). The badgers returned to the offensive.

In June and August 1587 Lady Wroth submitted detailed complaints of the frequent interruptions to the workings of Enfield Mill which the passage of the barges occasioned.²⁹ Local badgers supported her with a petition detailing the problems they faced in getting their corn ground at Enfield Mill, and how they often had to travel to other mills many miles.³⁰ away to satisfy their needs.

The Wroth family were engaged in more determined efforts than mere petitioning however. In September 1587 Lord Hunsdon wrote to Burghley specifically to complain of Robert Wroth's attempts to close down the navigation, mentioning that stakes were being placed in the navigable channel to prevent the

passage of barges. Hunsdon was so angry about Wroth's actions that he suggested that 'yt were better Mr Wrothes mylles were pulled downe, and he drowned in one of them', further hinting that it would be easy to arrange the pulling down of the mills by 'some willfull felowes'.³¹

Burghley was concerned about this strife between the millers and the bargemen, and informed Fanshawe that he had asked Sir Henry Cock and Robert Wroth to meet him. Later in September he told Fanshawe that he thought a Commission of Sewers was necessary.³²

Subsequent events cannot be related for lack of evidence. However no Commission of Sewers was issued, but some agreement must have been reached, for there is no reason to suspect that the navigation was brought to a halt permanently by these events. It was not until 1592 that the badgers achieved this end. However this exchange of letters in 1587 does indicate that the opponents of the navigation were once more considering illegal or direct action to achieve their ends.

7.4 The second bout of rioting

Much discussion and careful planning preceded the direct action undertaken by the badgers in 1592. They then approached Edward Denny, lord of the manor of Waltham, and asked him whether he would dismantle the pound lock near his mills at Waltham, and lower Waltham High Bridge to that height it had stood before being raised by the improvement commissioners during the 1570s.

The badgers described Denny's response:-³³

Sir Edwarde Denny in care and love of the comon wealth...and havinge a charitable and pyttiful respecte more to the releivinge of his poore distressed neighbours then to his pryvate gaine...gave commandement to his servautes and officers and to...William Cheyney...his Bayliffe...that the sayde Locke shold be pulled upp and the sayde Bridge shold be layed lower

His tenants were to carry out these tasks on the bailiff's instructions, taking particular care to cause as little interruption to users of the bridge as possible.

Ensuing events on 31 May were described by the bargemen:-³⁴

desperate riotous and evell disposed psonns to the number of threescore, not having the feare of God before theire eyes, nor any wise regardinge the paynes and punishments by your highnes gracious lawes and Statutes ...in most riotous and warlike manner beeing armed with divers and sundrie weapons aswell invasive as defensive...with Swordes, Billes, Staves, Pitchforkes, Mattockes Spades Shovells ...abowt tenne of the clocke in the night... did come together to the sayde high Bridge at Waltham and...did pull + take downe the sayde Bridge...And to thintent and purpose that noe vessel or Bardge might passe...did...verie spightfullie and malitiouslie laye the same Bridge soe lowe and neere the water that noe Bardge or other Vessell coulde passe

The pound lock was dismantled the same evening, but significantly the bargemen made no complaint about this.

The badgers had achieved a notable success. They had effectively closed the route opened by the improvement commissioners and had severely hampered the passage of barges along the river. Moreover they had achieved this with the blessing and authorisation of a prominent landowner and J.P.

As a token of appreciation these 'poore distressed'

badgers organised a collection and presented Denny with the enormous sum of £240. A sum which the bargemen alleged was a bribe, but which the badgers defended as merely an expression of thanks.³⁵

The bargemen's first response was to complain to the Privy Council, who on June 18 issued a warrant for the arrest of 11 men. Soon afterwards however the Council wrote to Denny acknowledging his complaints that the improvement commissioners had made alterations to his property whilst he was still a minor, and promised to dispatch a Mr Adams to investigate.³⁶

After Adams had investigated the Privy Council wrote to Denny once more. They agreed that the alterations had been made during his minority, but nevertheless asked him to allow that 'the same maie now presentlie be opened at the chardges of the bardgmen' and that he also allow them access to his land to hale their barges. In return they promised to take action against those millers who owned barges, contrary to law and custom, and also issued a general pardon to those who had been involved in the events of 31 May.³⁷

It is not clear from the wording of the Council letter whether it was envisaged that the bargemen were to be allowed to restore the pound lock or not. There is no other evidence that they contemplated such action. Instead they seem to have accepted the closure of the route down the millstream and concentrated their efforts on ensuring their rights to use the river.

When they tried to use the traditional river route once more however, they met with problems. First, when it was realised that it would cost £20 to raise Waltham High Bridge again, the bargemen decided that they could live with the problems and did not carry out the work.³⁸

More seriously when the bargemen tried to remove the lowshare so that they could pass down the river rather than the millstream(see Figure 3) they met with violent opposition. On July 19, and on several other occasions during the ensuing weeks, whenever the bargemen came down river they met with large gangs of local inhabitants at Waltham who

did in most violent riotous and horrible manner stopp the passage of the sayde river with stoones, Timbar, earth and other things cast and fixed in the River...And also did...resist the passage of such persons as attempted to passe...did keepe and detayne the said Boats...soe longe tyme that many of there sakes weare rotten ...and some of there corne issued out, and was spoyled and they disabled to performe such bargaynes and contractes for delyverie of the sayd Corne at London

The badgers told a different tale, arguing that they were merely trying to prevent the bargemen from illegally, as they alleged, pulling up the lowshare. Furthermore they claimed, it was the bargemen who initiated the violence, for they

assembled themselves together...verie riotouslie and unlawfullie with weapons and other Engines, and of sett purpose... furnished theire Boates with a greate quantitye of stoones, and...combyned and associated with dyvers reputed Soldiers and other evell disposed psonns about London and there indevored to pull upp the sayde olde Locke

Indeed on one occasion one of Denny's servants had been wounded and thrown into the river by the bargemen.³⁹

The badgers enjoyed the best of these exchanges. They successfully delayed the bargemen's passage, and in August sympathetic justices such as Robert Wroth and Robert Leigh fined nearly 30 bargemen for their part in the fights and warned the bargemen that they would be bound over if they continued to try and pass down the river.⁴⁰ Since no incidents were reported in September and October the bargemen seem to have taken heed of this advice.

In November the bargemen submitted a case to Chancery outlining the above events, but all else that is known of this approach is that the badgers argued that the case should not be heard in Chancery, but before the 'Queens Court Leet'.⁴¹

The bargemen did make a concerted effort to use the navigation once more in November and December, but again they met with opposition, this time even more vehement. One bargemen was wounded in the shoulder when a piked staff was thrust at him, sacks of corn and meal were thrown into the river, and on December 22 a barge was even sunk. This last seems to have closed the navigation, for no more incidents are reported. Once more it was the bargemen not the badgers who were indicted before the Essex justices.⁴²

On the few occasions the bargemen proceeded beyond Waltham they met further problems down river at Stratford. Robert Smith, owner of the Four Mills, threw a chain across the river and forced the bargemen to pay a toll of 12d if they wished to pass. If bargemen had the temerity to protest, another gang of local inhabitants

was on hand to persuade them.⁴³

Faced with these set-backs the bargemen returned to the courts, this time to the Star Chamber. By July 1593 the London aldermen, Thomas Fanshawe and several bargeowners had presented a case there, and, after replies and counter replies, the Star Chamber instructed Lord Justices Popham and Anderson to investigate both the riots and the rights of the bargemen to navigate along the river. In May 1594 the judges made their report, and on 20 June the Court issued its findings.⁴⁴

Of the evidence and arguments presented to the Star Chamber two points can be particularly noted. The bargemen were making no attempt to insist that the pound lock be rebuilt and the new route through Waltham be re-opened. They merely insisted on their long standing rights to navigate along the river. For their part the badgers acknowledged that the bargemen had a right to use the river, but questioned their right to hale the barges from the bankside, and raised queries about which was actually the traditional river channel.

In defence of their refusal to allow the bargemen to pull down the lowshare and pass down to Waltham High Bridge the badgers argued that the traditional river channel was in fact 'the little stream running to Cheshunt mill down to Smalley Bridge'. To substantiate this claim they argued that the Lea marked the boundary between Essex and Hertfordshire, and that since the county boundary was the millstream belonging to Cheshunt Mill, this proved it to be the traditional river channel.⁴⁵

The bargemen had little difficulty in dismissing this last argument as nonsense, for many ancient deeds could be produced to show that the traditional river channel had always been that from the lowshare to Waltham High Bridge and that the other had never been more than a millstream. These ancient deeds also showed the long standing rights to hale from the bankside.

The Star Chamber found in favour of the bargemen, although they did make a proviso that if any landowner felt aggrieved over the right of access to the bankside to hale then they could bring a case before the Kings Bench or the Common Pleas.

The bargemen had thus won their right to navigate the river, but what was never confirmed, because it was never discussed, was the validity of the orders issued by the commissioners in the 1570s. The bargemen had a legal right to navigate the traditional river, they had not sought or obtained a right to maintain the experimental policy which had been introduced by the improvement commissioners. To this extent the badgers' persistent opposition had been successful.

CHAPTER EIGHTTHE END OF THE EXPERIMENT8.1 A loss of will

The Star Chamber had confirmed the rights of the bargemen to navigate along the river, but they had not specifically confirmed the policy introduced by the improvement commissioners during the 1570s. Furthermore the badgers had not been punished, either for closing down the new route at Waltham or for their later closure of the traditional route. Even if they had failed to close the navigation permanently, they had once more demonstrated their nuisance value.

The bargemen could have tried to restore the experimental navigation. They did not, and there is no evidence to suggest that they seriously considered this option. Indeed, the very wording of their complaints to the Star Chamber confirms this.

The precise reasons for this loss of will cannot be established, but it does seem that the necessary initiative and commitment which had existed during the 1570s was no longer there.

The early 1590s were a period of economic depression, there had been a series of poor harvests, and a serious outbreak of the plague in London in 1593. Furthermore the country had been involved in expensive wars for several years. Under such circumstances the central authorities must have had little time for river improvement schemes, especially one which had

aroused so much persistent opposition.¹

Without such commitment from the centre, it seems unlikely that local supporters could have restored the experimental navigation. Instead they had to reach some sort of accommodation with Denny and Wroth, and, most probably, with other land-owners who took their lead from this pair. A more conciliatory approach was in order.

The first evidence of this new policy is that in June 1594, soon after the Star Chamber verdict had been reached, Fanshawe wrote to Burghley informing him of events and asking for his assistance in re-opening the river for the barges. He specifically asked Burghley²

to move Sir Edward Denny that he will willingly agree to our right and permytt us with his good likeinge to enioye it and for any curtesye or good neygbored that he shall shewe to us about the same he shall fynde our neyghborhed as neyghborly, and us as ready to acquyt to our powers as he will desyre in all reasonable matters

The desire to negotiate is obvious, but thereafter the record is blank, except that special meetings were held between Fanshawe and the London aldermen to discuss the Lea in December 1594 and January 1595.³

Examination of the available evidence below shows that the result of these and other negotiations was that the traditional flash lock navigation was either restored or allowed to re-appear, and that by 1607 this system had already been operative for several years.⁴ Furthermore this change was the result of private initiative and agreement, it was not authorised by a Commission of Sewers, for between 1585 and 1607 no such body existed along the Lea.

Exactly how this came about cannot be established, but a major element must have been an agreement with Denny whereby a turnpike* was erected at Waltham to provide a flash of water to assist the barges, for which assistance the enormous toll of 5/- was paid by every barge whenever they passed through the turnpike (see 8.2). In addition fishing weirs once more re-appeared in the navigable channel, and the traditional rights of their owners to tolls recognised(see 8.3).

Details of how the new policy affected the mills is difficult to establish. It is probable that their traditional rights to tolls were once more recognised, and that the new routes at Stanstead Mills and Broxbourne Mills which had been opened in the 1570s were closed down.⁵ Other than that, nothing can be said about whether the arrangements controlling their supplies of water were altered or not.

Another aspect of these new arrangements were that Fanshawe seems to have obtained some personal benefit. There is no other way to interpret a statement made in 1607, not as an accusation, that he did enjoy 'the benefite of the boates y^t goe upp the river'.⁶

8.2 The erection of Waltham Turnpike

It has to be stated at the outset that the evidence about the erection of this turnpike is unsatisfactory, and much of that collected in the seventeenth century must be wrong. What can be said with a fair degree of certainty is that the turnpike was first set up in the last half of the 1590s, that

its owner was from the first entitled to a toll of 5/-, and that major rows erupted during the ensuing century as the bargemen attempted, unsuccessfully, to secure the abolition of this toll.

On one such occasion, a Court of Sewers in 1682, after having received oral and written evidence, now no longer available, provided an inaccurate explanation of how the turnpike was first erected.

The commissioners stated that in 1590 or 1600 (different copies cite different dates) Sir Edward Denny had built at his own expence a new cut over a mile long and thirty feet wide from the head stream of Waltham Abbey Corn Mills to Waltham High Bridge, and that at the head of this new cut he had set up the turnpike. In their opinion this new route replaced the traditional route down the head stream and along the Long Pool.

The commissioners thus justified the high toll of 5/- on two accounts. First as compensation to Denny for the costs of this work and as payment for the land used in the new cut, and secondly as an economic toll in view of the fact that barges using this new route could carry 100 quarters more than barges using the old route.⁷

Exception must be taken to this explanation on several grounds. Most importantly the commissioners had obviously obtained a confused picture of the various channels in the area, and no knowledge of the work of the Tudor improvement commissioners.

The channel which the 1682 commissioners were

calling a new cut was in fact the traditional river channel. This can be determined from a reading of John Leland's description in the mid-sixteenth century,⁸ from an inspection of a map produced about 50 years later(used as the basis for Figure 3), and from evidence presented to a Court of Sewers in 1576.⁹

Furthermore a comparison between the county maps produced by Saxton and Norden at the end of the sixteenth century with later maps confirms that no new channels were ever dug by Denny at this date, even allowing for the lack of precision and the discrepancies which appear in the various maps.¹⁰

Exception can also be taken to the statement that the construction of the turnpike allowed an immediate increase of 100 quarters in the carrying capacity of the barges. The size of barges did increase during the seventeenth century(see 13.2), but this was a gradual process, not the result of any sudden improvement in the navigation. It is also unlikely that barges could carry as much as 100 quarters until the second half of the century.

The reasons why this mistaken explanation arose must be a mixture of genuine confusion in the oral tradition, the events had taken place 80 and 100 years previously, and a distinct need on the part of the owners of Waltham Turnpike to encourage such arguments to justify such a high toll. Without a proper written record it was easy, and convenient, to confuse the new cut dug in 1576-77 with the re-opening of the traditional river route in the aftermath of the Star Chamber case.

To replace this mistaken explanation with firm evidence is difficult, but circumstantial evidence suggests that the turnpike must have been erected by 1597, and the probability is that the high 5/- toll was agreed in order to obtain Denny's co-operation.

The tentative dating of the construction emerges from arguments between Denny and his tenant at Waltham Abbey Corn Mills, William Parnell. Some time between August 1604 and May 1605 the latter complained to Viscount Cranborne that for 7 years he had held a lease to the mills, paying a rent of over £100 a year, and that the lease still had 7 or 8 years to run. Recently, however, Denny had begun to withhold 'one Commodity of ye said Lease' which was worth £80, so he had refused to pay any rent unless he was allowed to enjoy all the profits of his original lease. In response Denny had besieged the mills for over 20 days and had finally blocked up the mouth of the head stream.¹¹

The wording of the complaint makes it obvious that it is not the mill itself which was the cause of the argument, so it is difficult to imagine what else the commodity worth £80 could be, except a lease to the tolls collected at the turnpike. It seems too high a valuation for any lands let with the mills. It would have been sensible to let the turnpike to the miller for it did control the supply of water to the mills, and a rent of about £80 would suggest at least 360 barges passing through each year, a not improbable figure.

If the above establishes that the turnpike had been built by 1596 or 1597, whenever Parnell first obtained his lease, and that the toll had been fixed at 5/-, then comment is necessary about the high rate of this toll. It seems probable that the bargemen needed to compete for Denny's support, and had to make an offer comparable to the £240 that the badgers had given him in 1592. It must be stressed that this toll was by far the highest along the river, and was to remain so until 1767 even though it remained at 5/- whilst other tolls slowly increased.

8.3 The re-appearance of other weirs

The comments in 1607 show that other fishing weirs had been in situ for several years by that date, but provides no information as to how many. Other evidence is scanty, but some does suggest that they began to re-appear before the Star Chamber case and the subsequent compromise.

In 1587 a Mr Whorliden complained that bargemen had removed planks from his footbridge and weir. This weir did not stand in the navigable channel, but on a ditch parting Marshe Holme and Brode Meadowe, as shown in Figure 6 opposite.¹² Nevertheless it is interesting that the bargemen were seeking flashes at this date. Furthermore Figure 5, which cannot be definitely dated, but could pre-date the Star Chamber case, shows what seems to be a fishing weir in the navigable channel near to Enfield Lock. Were fishermen taking advantage of the failure to renew the Commission of Sewers to

rebuild their weirs once more?

Of other weirs along the river at this date, only brief details are available. In 1616 a weir, part of the manor of Netherhall, was described as 'the newe Ware', and the fishery was let for £5 a year compared to 30/- in 1581 when the weir was not standing.¹³ In 1650 it was stated that the fishing and the weirs in the manor of Sewardstone had been let for 50 years past at £10 a year;¹⁴ whilst a note, made most probably about 1602, ordered a search of the records for any mention of a weir called 'Dobb Ware'.¹⁵

Such evidence establishes that several weirs were rebuilt after the decay or end of the experimental navigation, but what cannot be established is how many or what tolls were imposed. Neither can it be established just how the weirs came to be rebuilt. Was there a deliberate policy to see that sufficient weirs were rebuilt to ensure sufficiently frequent flashes of water for the barges, or did it depend on the haphazard response of certain landowners towards re-establishing their ancient rights?

All that can be said is that these developments were not supervised by any Commission of Sewers, for no such body existed, and not all weirs were erected at this date. Several were not built until later in the seventeenth century, and some maybe not until the first half of the eighteenth.

8.4 The effect on the navigation

It would be a mistake to assume that the

re-appearance of the flash-lock navigation with all the associated delays, and the imposition of tolls, meant that severe a set-back to the bargemen. The badgers must have hoped that the toll at Waltham and at other weirs and mills would substantially reduce the cost advantage enjoyed by the bargemen, equivalent to the taxes they had earlier proposed for this purpose. If so, they were to be disappointed. The barge traffic continued, and though there is no quantitative evidence, there is nothing to suggest any great decline in the size of the traffic.

The evidence of this resilient barge traffic emerges from several sources. In 1599 Sir Arthur Gorges wrote to Robert Cecil about the need to restock Theobalds with deer, promising to 'find means by the river of Ware to land the deer hard by your park'.¹⁶ Early in the seventeenth century the millers at Cheshunt Mill complained that barges were frequently laid across the mouth of their head stream, thus cutting off their supply of water, and that if they remonstrated, fights broke out.¹⁷ There were other conflicts between millers and bargemen at this date,¹⁸ and in 1608 22 barges were held up for several days by the miller at Enfield.¹⁹

In addition, before Edmund Colthurst obtained his patent to bring water to London in 1604, the precursor of the New River scheme, he had to prove that his scheme would not adversely effect the navigation on the Lea.²⁰ It was at this date also that schemes to build a canal from the Lea to London

were once more resurrected.²¹ Finally, and conclusively, a bill was submitted to Parliament in May 1604 'For suppressing the Inconvenience growing by Barges in the River of Lee'.²² Unfortunately nothing more is known of this attempt, except that it did not pass.

8.5 The success of the experimental navigation?

The replacement of the experimental navigation by the traditional flash-lock navigation might well suggest that the former had not been a success, particularly as the bargemen seem to have made no attempt to maintain it, and instead sought the restoration of the latter. On the other hand they could have merely been facing reality and were concentrating on a possible solution to their continued conflict with the road carriers.

A proper assessment of the experimental scheme cannot be made, for far too little is known of how it worked in practice. Did it reduce the delays compared to waiting for frequent flashes? Had the millers always been co-operative? Did the current sufficiently scour the bed to prevent the formation of shoals? No answer can be given unless further evidence is found.

In one important aspect, the experiment was a success. Before 1575 the Lea had not been a major transport artery supplying the needs of the capital, but it became so as a result of the improvements.

In addition an important pressure group emerged which were prepared to struggle to maintain the navigation during the ensuing centuries. It is not too

far fetched to imagine that if such a pressure group had not emerged during Elizabeth's reign, then the Lea could have deteriorated, and its subsequent history could have been much different.

SECTION TWO

THE RIVER LEA:
AN ADEQUATE
SEVENTEENTH CENTURY
FLASH-LOCK NAVIGATION?

INTRODUCTION

The evidence for the late Tudor and mid-eighteenth century periods in Sections One and Three is presented in a sequential narrative form. But for the period now under consideration in Section Two, the seventeenth and early eighteenth centuries, the very nature and complexity of the evidence available means that a different approach has been adopted.

Initially consideration is given to the Commissions of Sewers operating along the river, for it was one of these bodies which had the ultimate responsibility for preserving the rights of navigation, even though other groups might take the initiative and other bodies might be involved.

The narrative is then split into three chapters, detailing events along three separate stretches of the river. Such a separation is not that artificial, for the three stretches do have different and unique features which allow of this treatment.

The short stretch between Hertford and Ware was always less important than the rest of the navigable river, was often outside the jurisdiction of the Lea commissioners, and was the object of special attention from the Borough of Hertford.

The lower Lea below Hackney was tidal, the navigation did not depend upon flashes from weirs and mills, and it came within the purview of a different Commission of

Sewers from the rest of the river, and was eventually to become the object of special interest from the City of London.

In between lay that stretch of the river, from Ware to Hackney, which was the flash-lock navigation par excellence, which was always ultimately the responsibility of the Lea commissioners, and for which no other body ever acquired a closer involvement.

It remains to stress that it for this stretch of the river, and for this period in particular, that the evidence available is at its worst. The almost complete absence of records of the Lea Commissioners of Sewers for the seventeenth century is a serious problem. As a result both the narrative and the conclusions drawn must be hedged with more reservations than is desirable.

Finally an attempt is made to describe the workings of the whole navigation, and to argue that despite the numerous problems described in the previous chapters, and despite the admitted deficiencies of the system of flashing, that the Lea navigation during this period was adequate to the demands placed upon it, and that it might well be compared with the concept of Appropriate Technology which is discussed in contemporary debates about development policy in under-developed countries.

CHAPTER NINECOMMISSIONS OF SEWERS9.1 Marshland commissions

The pattern, which had first emerged during the mediaeval period, whereby separate commissions supervised the estuarine marshlands and the navigable river, continued throughout the seventeenth century and the first half of the eighteenth. Commissions of Sewers for the marshlands were primarily concerned with the problems of flooding and drainage, the commissions for the navigable river with the task of maintaining the navigation.

The varying boundaries of these separate commissions did sometimes overlap, so there was the possibility that they could issue conflicting decrees. Such fears were expressed, and measures to prevent such conflict were taken, but there is no evidence that these commissions did ever disagree or even interfere with each others separate responsibilities.

There were three drainage commissions with a responsibility for specific marshes along the lower Lea, and some of these marshes also came within the purview of the commission for the navigable river. With regard to the Lea, the most important drainage commission was that which became known as the Commission of Sewers for the Levels of Havering and Dagenham.¹

This commission had responsibility for the Lea from the mouth of the Fleet, the head stream of Walthamstow Mills, to the Thames, and supervised the levels of

Walthamstow, Leyton and West Ham in Essex and the level of Bromley in Middlesex. Such boundaries meant that the commission supervised the tidal stretches of the Lea and all tidal mills fed by the river.

Extant records for the commission, minutes for the years 1691 to 1724,² show almost no concern with the problems of navigation. Notes extracted from earlier records which are now lost confirm this, although if the actual records turn up, a different conclusion might emerge.³

During the 1620s a major rebuilding of Temple Mills and changes to the head stream forced the commissioners to consider the effect on the navigation and issue orders to protect the bargemen's interest.⁴ Between 1690 and 1715 there were discussions over whether to build a tumbling bay next to the Three Mills to ease the problems of flooding above Stratford Causey, and the navigation was considered during these debates (see 12.3), but only after the bargemen forced such consideration. Otherwise nothing.

The prime concern of this commission was with maintaining banks and walls, with scouring ditches and with ensuring that the numerous tidal mills did not pen back water to the extent that floods occurred or other mills were adversely effected. To cope with such problems the commissioners and juries met at intervals of six months and kept proper records. This efficient organisation did not regularly review the state of the navigation along the lower Lea, and were not regularly approached by the bargemen. The tidal navigation was obviously

adequate without such supervision. Temporary problems could be avoided by the bargemen unloading at Hackney, which many bargemen preferred anyway.

Some estuarine marshes in Middlesex were supervised by other commissions. A commission variously described as the commission for Limehouse and Blackwall or the commission for Stebenheath or Poplar Marsh supervised the Isle of Dogs.⁵ The commission for Tower Hamlets also included marshes at Hackney within their jurisdiction.⁶ Their records show no concern whatsoever with the navigation along the lower Lea, one rare exception being that in 1708 the bargemen complained to the Tower Hamlets commission about a new waterworks at Hackney.⁷

9.2 Commissions for the navigable Lea

It was these commissions for which the preservation of the navigation was a prime objective. Traditionally they had enjoyed jurisdiction over the river between Ware and the Thames, but from the beginning of the seventeenth century, this pattern changed. Thereafter the limits of jurisdiction changed frequently, and at times there was confusion over their very existence. Indeed their authority was severely affected by the political squabbles of the seventeenth century.

Under such circumstances it is important to catalogue the various commissions which were issued after 1600, with some attempt to explain any variation or confusion.

It should be noted that Commissions of Sewers were issued under the Great Seal, and that they automatically expired after ten years or on the death of the reigning

monarch. Renewal was not automatic, but depended upon local initiative to ensure that a new commission was issued.

An additional factor was that the seal of the Duchy of Lancaster was required for any commission which had jurisdiction over any property of the Duchy.⁸ Since the Duchy had property at Hertford and Enfield, some of the commissions which were issued after 1600 had to be granted their seal as well.⁹

The authority of the Tudor improvement commission had expired in 1585(see 5.3), and it was not until August 1607 that a new commission was issued. This had 44 members, and enjoyed the traditional limits of jurisdiction, Ware to the Thames.¹⁰ Thus no Duchy seal was necessary.

This long interlude without a commission, the existence of the act of 1571, and the subsequent introduction and setting aside of the experimental improvement scheme all combined to introduce some element of confusion and concern about the exact legal position of this new commission. There may also have been conflicting opinions over the policy to be pursued. The available evidence hints at this confusion, but there is insufficient to provide a clear picture.

One writer expressed fears that the commissioners either by choice or force of precedent might choose to remove all weirs and locks as the Tudor commissioners had done. He was of the opinion that the 'kings pleasure must be signified to y^e Lo Chancelo^r absolutely in yt behalfe, otherwise he cannot make a comission directly to cross a former albeit the kings Consell be of

opinion (contrary to the Lo Chancel^{ors} dowbt) yt the Statutes for Sewers will beare this Commision'.¹¹ The exact nature of these doubts and conflict of opinion cannot be determined.

The 1607 commission did not follow the precedent of the Tudor improvement commissioners, but there may have been a body of opinion pressing them to do so. A document, which can be dated no more precisely than that it was compiled after August 1604, lists 18 names and is endorsed 'Comission^{rs} for ye River'. The names are displayed in a manner suggesting 4 commissioners each for Hertfordshire, Essex, Middlesex and the City of London, with one alternative name for both Hertfordshire and Essex.¹²

Such a deliberate reference to the commission specified in the act of 1571 suggests either confusion over the legal requirements of any new commission or a concerted attempt to revive the powers enjoyed by the improvement commissioners. It should be noted that of the 18 names cited in this undated list, only 9 were appointed as commissioners in August 1607, and the City only had two representatives on the commission, not four.

Further doubts about the new commission were raised by Thomas Fanshawe of Barking, the second eldest son of Thomas Fanshawe of Ware Park. He was concerned that the commissioners would overrule the decrees of the commission which had surveyed the estuarial marshlands four years previously. He thought the new commissioners would have scant regard for the differing problems of the lower river. He wanted a separate commission to reconsider these matters.

His request was not granted, but he was assured that 'Though it be true this Commission repeals the former yet it alters none of the laws or orders made by them, unless the new Commissioners find just cause'. It is unlikely that Fanshawe's fears were allayed. The option of appointing him to the new commission was not taken ¹³

It would be expected that the authority of the 1607 commission would not expire before August 1617, yet in July 1609 a new commission was issued. This commission was identical to that of 1607 except that five new members replaced four who had died since 1607 and one who was otherwise occupied at the time, that Sir Thomas Foster was promoted in the order of precedence to reflect his promotion to a justice in the Court of Common Pleas, and three members were promoted to the quorum for the first time.¹⁴ The only explanation for the new commission was that it was renewed because prominent members had died, which was the normal pattern for Commissions of the Peace. This was not to be the normal practice with Commissions of Sewers subsequently, and is further evidence of confusion over their exact legal status.

Unless further deaths were considered as affecting its authority, this commission's authority should have lasted until July 1619. However the position was radically altered in July 1618 when a Special Commission, not a Commission of Sewers, was issued to authorise the New River Company to take water out of the Lea (see 10.2). The decisions of this Special Commission were to have important

consequences for the subsequent Commissions of Sewers.¹⁵

In June 1623 it was reported that King James wanted a commission to level the low grounds round Waltham, and the following month a new Commission of Sewers was issued 'for certen lymittes of the Marshes and lowe groundes of the River of Lee'. This commission enjoyed a jurisdiction over the river between Hertingfordbury and Walthamstow.¹⁶ Thus the upper limits had been extended to include the intake of the New River Company at Chalk Island, and the lower limits altered so that the new commission had no jurisdiction over the tidal Lea, which was left to the Commission of Sewers for the Levels of Havering and Dagenham.

Then in May 1624 a new commission was issued, identical to that of the previous year except that the whole of the New River was for the first time included. Eight new members were added, three to represent the City, which had had no representation in 1623.¹⁷ Since the Duchy had property within these new limits, a Duchy seal should have been affixed, but none has been found for either of these commissions.¹⁸

The 1624 commission expired automatically on the death of James I in March 1625. A new commission was issued immediately, receiving the Great Seal in July 1625. A Duchy seal has been found for this commission, but it was not granted until February 1626. Membership was identical to that of 1624 except that three new members were appointed, and there were some minor changes to the quorum. One new member was Lord Brooke, a valued political adviser and poet, but the Lea was not to reawaken

his muse.¹⁹

A new commission was issued in July 1635, once more with changed limits of jurisdiction. The upper limits were extended once more, to Welwyn near its source, whilst the lower limits were extended down to Bow Bridge, specifically including estuarine marshes such as East Marsh, Bromley Marsh and Stebenheath(Stepney) Marsh. This meant possible conflict with the Havering commissioners, but this was precluded by instructions to the Lea commissioners that they had no powers to supersede the decisions of the Havering commissioners.²⁰

Problems may have occurred over the unnavigable upper river, for in February 1636 a writ of supercedeas was granted to members of the 1635 commission who represented the parishes of Welwyn, Digswell and Tewing.²¹ This was the only time such an exception was ever made, and this stretch of the river never had a separate commission when the Lea commissions did not extend above Hertford.

The exact legal position of these commissions on the outbreak of the Civil War is not clear, but their renewal did cause constitutional problems, for the King had taken the Great Seal with him when he withdrew from London. The parliamentary authorities wished to retain the ancient symbolism of the seal, and sought agreement with the Lords whereby commissions could be issued under a newly made seal. Such agreement had been reached by the end of 1643.²²

With this seal a new commission was issued for the Lea in May 1645, with exactly the same limits as that issued in 1635. However no instructions about the

Havering commission were given. Neither was any Duchy seal granted. This was because the much of the Duchy administration fell into abeyance during the Interregnum, but also more specifically because the manor of Enfield had been confiscated by the new regime (much of the Duchy property at Hertford had been disposed of during the 1620s and 1630s).²³

There were further rows over the constitutional position of Commissions of Sewers following Charles' execution, but in June 1649 it was left in the powers of the Lord Commissioners for the Great Seal to grant commissions to such persons as they should think fit without vetting by the committee of the army. Later it was decided that members had to subscribe to the oath of engagement of fidelity that the Rump tried to impose on the population.²⁴

Whether the Lea commissioners were effected by these developments has not been ascertained. There is no evidence of new commissions being issued subsequent to these decisions. Yet there is evidence of a commission at work in September 1655, several months after the legal ten year limit had expired. Either such constitutional niceties were ignored, or a new commission had been issued during the intervening period, of which no record now remains. Then in December 1656 the Hertford burgesses instructed their Steward to obtain a new commission, and this was granted in March 1657, with the same limits

of jurisdiction as in 1645.²⁵

The authority of this commission was thrown in doubt on the death of Oliver Cromwell, but in May 1659 an act specified that all commissioners either acting on or appointed since 19 April 1653 should continue to act until new commissions could be appointed. No new commission was thereafter issued during the Interregnum and the authority of the 1657 commission ceased on the Restoration.²⁶

A new commission was issued under the Great Seal in December 1663, but the Duchy Seal was not awarded until September 1664 (the manor of Enfield had been re-possessioned). In the intervening months membership increased by 10, and minor changes to membership, to the precedence and to the quorum were made, the most important being that the Chancellor of the Duchy of Lancaster and a second alderman to represent the City were appointed to the commission. The limits of jurisdiction were the same as those awarded in 1636, obviously a deliberate reversion to immediate pre-Civil War practice. One important change however, was that the size of the membership was greatly increased (see Table 3) by the appointment of numerous courtesy members drawn from the ranks of the most prominent politicians, judges and state officials.²⁷

The next commission was issued in April 1675, with no changes from the pattern that had been introduced in 1663-64.²⁸ Thereafter a period of confusion arises, which can be only explained by the political conflicts which emerged during the last decade of Charles II's reign. Commissions of Sewers along the Lea experienced exactly

the same pressures that Glassey has described for Commissions of the Peace during these years.²⁹

These problems first came to light in July 1681 when bargemen complained to the Privy Council that they had approached the commissioners as the King had advised, but had found that the commissioners were unable to consider their complaints 'by reason their Commission was expired'.³⁰

No explanation is minuted, but it must be that several members appointed in 1675 were in political disgrace. Thomas, Earl of Danby had been impeached and resided in the Tower, the Earl of Arlington had retired to his estate in 1678, the Earl of Lindsey and Lord Newport had been dropped from the Privy Council in 1679. In addition Robert Read was removed from the bench in 1676 for refusing the oath of allegiance, and four more members, Sir Thomas Byde, Sir Harbottle Grimston, Sir Robert Clayton and Sir Thomas Clarges were noted as 'worthy men' by Shaftesbury in 1679 and may have been considered unsuitable when the Court began to move against the Whigs. Furthermore purges of the bench in July-August 1681 removed another commissioner, the Earl of Essex.³¹

A new commission was issued in December 1681, further members being added in March 1682. The membership of this commission is not known, so the expected changes as a result of the purges cannot be confirmed. However it should be noted that Nicholas Rainton and Sir Eliab Harvey who were added in March were considered to be opponents of the King.³²

Further purges of the bench took place in May 1682.

Nine Hertfordshire justices were removed, including three who had been appointed commissioners in 1675, John Ellis, Sir Humphrey and Sir John Gore, and one who may have been appointed in 1681, Sir Robert Jocelyn. Despite this, Jocelyn and Sir Humphrey Gore attended Courts of Sewers in June 1682.³³

This confusion continued. In July 1683 bargemen's complaints to the Privy Council were referred not to the 1681 commission, but to Lord Chief Justice Pemberton. Then in September 1683 a new commission was issued under the Great Seal, with the Duchy seal being added in November. This commission had the same limits of jurisdiction as those in 1663-4 and 1675(those of 1681 are not known). Comparison between 1675 and 1683 shows considerable changes amongst the courtesy members, and confirms that those purged from the bench were no longer appointed as commissioners.³⁴

Yet whilst this 1683 commission was in the process of being issued, the bargemen complained to the Privy Council once more, and these complaints were referred not to the new commissioners, but to Lord Chief Justice Jeffreys and Justice Wythens. These two then held a Court of Sewers to consider the rows about Waltham Turnpike(see 11.2). Wythens was a member of the commission appointed in 1683, Jeffreys was not.³⁵ Just why this sequence of events took place is not clear.

The death of Charles II in February 1685 meant this 1683 commission expired. A new commission received the Great Seal in November 1685 and the Duchy Seal in December. The local membership was identical to that of 1683 except that one new member was added, and there

were a few changes amongst the courtesy membership, reflecting political changes since November 1683.³⁶

Events during the previous decade would suggest further changes to the 1685 commission, similar to the policy pursued by James towards the local justices, first admitting Catholics, then purging opponents and supporters as his policy vacillated. No relevant evidence about the commission has been found. Perhaps it had become moribund before James' flight and 'demise' meant its authority ceased.³⁷

It should be noted that no new commission was immediately sought, and when one was, in June 1695, it was different from those which had been issued since the Restoration. One important change was that large numbers of courtesy members, a distinct feature since the Restoration, were not chosen in 1695. The size of the commission was thus smaller.

Another change was that the limits of jurisdiction were once more altered. This commission no longer supervised the New River, and along the Lea supervised only that part of the navigable river between Ware and the 'beginning of the new Cutt neare Hackney' with the specific injunction that they had no authority over any part of the river over which the City of London was claiming jurisdiction 'by any Custome or Speciall Priviledge'.

These changes were the result of manoeuvres in the bargemen's struggle to revoke the rights to collect tolls at Waltham Turnpike. After failures during the 1670s and 1680s, the bargemen tried a new approach, persuading the City that they had built a new cut along the lower Lea as

a result of the act of 1571(see 11.2 and 12.1).

This act had specified one 16 man commission to improve the Lea between Ware and the mouth of the canal or 'new cut' that had been authorised. Since official recognition was to be given to the mistaken claim that the City had built a new cut, the limits of jurisdiction were changed so that they were within the terms of reference of the act of 1571. Indeed the City had originally proposed that only 16 members be appointed, but this was ignored, and 45 members were appointed in June 1695. It should be noted that the new limits of jurisdiction meant that the Duchy seal was no longer needed.³⁸

Then in November 1695 another new commission was issued, to replace that appointed in June. The only changes were that five named in June were dropped, and seven new members were chosen instead. There is evidence of lobbying at this date(see 11.2), and this seems to provide the only explanation as to why a new commission was issued in November.³⁹

Official recognition that the City had built a new cut as a result of the act of 1571 was an important victory for the bargemen. It provided them with a precedent, they could then concentrate on removing the tolls. The fact that they once more failed must be one reason why no new commission was sought on the death of William in 1702. Another reason must be that since(as argued in 9.4) it was the bargemen and not the riparian landowners who were now responsible for the costs of any Commission of Sewers, that there were incentives to seek other means of preserving the navigation (see 11.4).

Whatever the reason, it was not until September 1719 that a new commission was issued, with the same limits of jurisdiction and membership pattern as that introduced in 1695, although the number of members was increased to 62.⁴⁰

This commission was at work for only two years (see 11.5) but it did not officially expire until 1727 when George I died. However once again, no efforts were made to immediately obtain a new commission. Once more alternative methods were sought. It was not until 1740 that a new commission was eventually granted, and by this date their role and authority had been altered by the act of 1739 (see 15.1).

One result of the changes introduced in 1695 was that the navigable river between Hertford and Ware no longer came under the jurisdiction of the commissioners. This did not arouse immediate concern, the bargemen and the Borough of Hertford supervised this stretch of the river instead. However in December 1734 a Commission of Sewers was issued for the river between Hertford Bridge and Ware Bridge, and for some reason a Duchy Seal was needed as well.⁴¹ It was issued at the request of the Hertford aldermen, as part of the improvement scheme they were debating at this date (see 14.1).

9.3 The administration of the commissions

One innovation of the commissioners who were appointed in September 1719 was that their clerk purchased a book

in which to record the minutes. This book was only recently saved from destruction.⁴² Records of the seventeenth century commissions are rare. All that remain are an incomplete list of questions prepared by the commissioners at some date between 1626 and 1637, two manuscript copies of three Courts of Sewers in 1682, a couple of the commissioners' decrees about the rights of the New River Company which have been specifically enrolled in Chancery, some legal cases prepared by interested parties for submission to the commissioners, and some private records of decisions made about specific problems.⁴³

This paucity of records, together with reliance on oral evidence of elderly local inhabitants and ignorance of decisions taken a couple of decades earlier which emerges from the few remaining records, does suggest that no proper record keeping was ever instituted before 1719. Certainly no attempt to preserve the decisions of earlier commissions was ever made before the eighteenth century.

Even then there were problems. In 1741 the clerk to the commissioners reported his difficulties in obtaining the minute book of the 1719 commission. The clerk to that commission was demanding 10 guineas before handing them over rather than the 5 guineas the commissioners had authorised. He got the 10 guineas.⁴⁴

This lack of records inhibits any proper discussion of the role and administration of the Lea commissioners between 1600 and 1730. However sufficient emerges to show differences when compared to the improvement

commissioners at work along the Lea after 1575, to the Havering and Dagenham commissioners at work along the lower Lea, or to the various commissions described by the Webbs.⁴⁵

Commissions of Sewers were not uniform bodies. They were issued for a wide variety of purposes. Fuller investigation must show widespread variations in practice, depending much on differing local custom and differing intentions of the commissions.

Whenever a Commission of Sewers was issued, the names of those chosen as commissioners were affixed, and note was also made of those commissioners who were considered to be of the quorum. The attendance of at least six of the latter was necessary at any meeting for that meeting to be quorate. To be eligible for membership a commissioner had to have freehold property worth at least £40 a year, be a freeman of any corporation with property to the value of at least £100 a year, or be learned in the law. Commissioners did not have to be resident in the locality, but they were expected to take an oath, first stipulated in the act of 1532, with only minor changes subsequently to take note of the Reformation.⁴⁶

The size of membership varied considerably throughout the period under consideration, as can be seen from Table Three overleaf:-⁴⁷

TABLE THREE: NUMBERS APPOINTED TO COMMISSIONS OF SEWERS

<u>Year appointed</u>	<u>Membership</u>	<u>Quorum</u>
1607	44	29
1609	46	32
1623	29	22
1624	37	29
1625 and 1626	40	33
1635	25	21
1645	29	28
1657	46	39
1663	106	80
1675	105	79
1682	n/a	n/a
1683	75	65
1685	80	73
1695(June)	45	40
1695(November)	47	40
1719	62	44

The varying size of these commissions bore no relationship to the expansion or contraction of their limits of jurisdiction. The 1635 commission enjoyed the largest extent to date, but the smallest membership. When these same limits were chosen once more between 1663 and 1685 the increased size of membership reflects not the large area of jurisdiction, but a distinct increase in the appointment of courtesy members after the Restoration. The reduction in size after 1695 not only reflects the reduced area supervised by the commission, but also the fact that courtesy members were no longer appointed. Indeed the varying policy adopted over the appointment of courtesy members means that the above variations mask a more constant number of local members.

There is some evidence to suggest that there were

ways of replacing members. Of 10 members attending a Court of Sewers in 1669, two were not named in 1663 but were in 1675. In August 1672, of the 28 members in attendance, 8 are not named in 1663, and of these, 6 were appointed in 1675.⁴⁸ How any replacements were chosen is not known, and it must be emphasised that neither of the commissions appointed in 1719 and 1740 ever instituted a system of replacement.

The choice of members designated as being of the quorum became a mere formality as the century progressed. In 1607, 1609, 1632 and 1663 attention was paid to the problem. Members are listed in order of precedence, but not all those near the top were of the quorum, whilst some further down were. The normal practice was that in 1624 the first 29 in the list were chosen, in 1625 the first 33 and so on. This formality was tempered in 1675 when all members of the rank of esquire and higher were of the quorum, and it was only the last named 26 gentlemen who were not, but that is all.

Some members of the commissions were Justices of the Peace as well, but many were not. To some extent this must reflect the fact that local landowners were appointed to Commissions of Sewers even though they were not considered eligible for the bench. Is it possible that sewer commissions were ever regarded as a training ground for those rising into the ranks considered as eligible for the local bench?

An initial inspection of those appointed as commissioners suggests little formal consistency, that the criteria for appointment varied, and that it

differed from that used for Commissions of the Peace. A greater degree of consistency in appointment was to emerge the following century.

Until 1685 leading members of the establishment were appointed as courtesy members, thereafter the practice ceased, but the criteria governing their appointment varied, both with regard to the numbers chosen (variations which largely explain the differing size of membership recorded in Table 3) and the persons and posts considered.

The Lord Chancellor and the Lord Treasurer were appointed at the head of the Commissions of Peace, but this was not the regular pattern for Commissions of Sewers. Along the Lea this practice was followed only in 1607, 1609 and 1685. On no other occasion was the Lord Chancellor appointed, and the Lord Treasurer was to be found only in 1663 and 1675. Many commissions had neither.

The only consistent pattern which emerges from the appointment of courtesy members is that the Exchequer and the Royal Household were always represented, and that legal expertise was always included. In 1623, 1624 and 1625 the Under-Treasurer of the Exchequer was chosen, otherwise it was one of the Barons of the Exchequer. In 1607 and 1609 the Cofferer of the Royal Household was chosen, thereafter it was their Treasurer who represented the department's interests. Judges of the Assize were not appointed, but legal expertise was available, either from serjeants-at-law who were appointed in the first half of the century or from the numerous leading judges who were appointed in 1663, 1675, 1683 and 1685.

The position of the Duchy of Lancaster was somewhat different. In 1607 and 1609 the Chancellor of the Duchy was appointed as a courtesy member, but thereafter whenever the Duchy Seal was affixed, automatic representation may have been thought desirable. It is difficult to establish whether this was actually the case. Between 1663 and 1685 the Chancellor represented his department, his name being added to the list in 1663 before the Duchy Seal was granted, after some delay. In 1623, 1624, 1625 and 1635 the Duchy was represented by minor officials, but both had other local or official reasons which could explain their appointment, they were not necessarily representing the Duchy. William, Earl of Salisbury, was Steward of the Manor of Enfield, but he was also one of the most important local representatives in Hertfordshire. Sir Heneage Finch was Steward to the Duchy for Essex, Middlesex and Hertfordshire, but he was also Recorder of the City of London. During the Interregnum when the Duchy Seal was not considered necessary, the Duchy was not represented.⁴⁹

There were other official bodies with reason to be represented on the Lea commissions. The City of London was the most important, and they had a variety of reasons for their interest in the river (see Chapter 12). In 1607 and 1609 the Lord Mayor and the Recorder were appointed, but in 1623 they were not represented, and it was not until a new commission was appointed in 1624, that their Recorder and three aldermen were added. The City's right to be represented may have been a factor that led to a new commission being issued to replace that issued only the year before.

The Recorder and the three aldermen were automatically re-appointed in 1625, but in 1635 only one of their number was, Nicholas Rainton, and no other City representative was chosen. By 1635 Rainton had acquired a local interest, the manor of Worcesters in Enfield, which might explain his appointment. Such a supposition is strengthened by the fact that Rainton was the only aldermen chosen in 1645, and that after his death it was his son, not an alderman, who was appointed in 1657. No other City representative was chosen in that year.

It is thus possible that the City were not officially represented for over 30 years. In 1663 however their Chamberlain and one alderman were chosen, and another alderman was added when the Duchy Seal was affixed the following year. Thereafter two aldermen were appointed to the commissions issued in 1675, 1683 and 1685.

The remarkable changes inherent in the issuing of the commission in 1695 meant that the City's representation was increased to the Lord Mayor and four aldermen, possibly some acknowledgement of the four representatives mentioned in the act of 1571. In 1719 the Lord Mayor and six aldermen were chosen, and from 1739 the Lord Mayor and all aldermen were automatically acknowledged as ex-officio members.⁵⁰

The Borough of Hertford also had an interest in the navigation, but this interest was never properly recognised in the appointment policy. The Mayor of Hertford was considered in 1663, but his name was crossed out, and he was not appointed. In 1719 the Mayor was appointed, even though by this date Hertford

fell outside the limits of jurisdiction of the commission. He was most probably chosen as a representative of local trading interests, a role the borough was to play in securing the act of 1739.

The representation of the New River Company, whose New River lay within the limits of jurisdiction from 1624 to 1695, is difficult to determine. Much more detailed knowledge of the managerial and shareholding structure of the Company is necessary before it can be properly determined. All that can be said is that in 1635 Sir William Myddleton, eldest son and heir of Sir Hugh Myddleton, was appointed and remained a commissioner until his death in 1652. In 1663 three members of the Myddleton family were appointed, as was John Buckworth who had been granted the King's remaining interest in the venture shortly before. In 1675 only one of the Myddleton family was re-appointed, the others were dead, but one of the courtesy members, Henry, Earl of Clarendon, was a prominent member of the venture and became Governor of the Company between 1682 and 1687. After 1695 the New River was no longer within the jurisdiction of the Commission, and the Company may not have been represented, although they obviously retained a close involvement in events along the river.⁵¹

Courtesy members and representatives of interested parties were particularly important numerically between 1663 and 1685, but less so both before and after these years. But by far the most important body of the membership, and those who it must be assumed were actively involved, were the local landowners from the three riparian counties. Many of these would have been

specifically interested in the river, owning mills, fishing weirs and lands in and along the river, but many held property elsewhere in the counties, away from the Lea valley. The trading interests who used the navigation were never directly represented.

Such a bias may explain why the bargemen were never able to secure the annulment of the tolls and why riparian landowners were able to rid themselves of the costs of the commission. These same commissioners did preserve the navigation, and their frequent appointment at the request of the bargemen does suggest they rose above narrow self interest to some extent.

A comparison between the Victoria County Histories and the membership lists of the commissions shows that the owners of manors along the river such as Ware, Stanstead, Broxbourne, Hoddesdon, Cheshunt, Wormley, Chingford St Pauls, and Durants and Worcesters in Enfield were usually chosen. Yet there were manors such as Chingford Earls, Tottenham, and those in Walthamstow and Leyton which were rarely represented. The evidence does not suggest that owners of manors along the river were automatically chosen, but obviously they were given greater consideration.

What emerges from the above is that there seems to have been no hard and fast rules which governed appointment, and that little is known of the actual process itself. A list of suggested members was compiled in the first decade of the seventeenth century, but of the suggested sixteen names, only seven were appointed in 1607, and only eight in 1609.⁵² In August 1694 the City of London at the request of the bargemen petitioned for a commission, themselves submitting the sixteen members to be chosen. Of these

sixteen, three were omitted from the commission issued in June 1695, and four from that issued in November 1695.⁵³

There is additional evidence to suggest lobbying over membership. The addition of London aldermen in 1624 and an additional alderman in 1664 suggests representations from the City. The addition of two members in March 1682 to the commission issued in December 1681 suggests efforts from some interested party. In 1696 a letter states that the bargemen had lobbied successfully to obtain a commission favourable to their interests, in the process preventing the appointment of one weir-owner, Robert Boothby, as a commissioner, and rejecting others with interests in weirs from acting either as surveyors or jurors to the commission.⁵⁴

Whether such lobbying was frequent, whether lists of suggested members were normally submitted, cannot be established, for lack of evidence. Indeed it cannot even be established who normally petitioned or paid the relevant fees for a renewal of the commissions. It can only be assumed it must have been the trading interest who were concerned to maintain the navigation who took the initiative.

Similarly little can be established about the officials responsible to the commission. It is known that Andrew Cole was clerk in 1682, and that Samuel Troughton was appointed to this post in 1719.⁵⁵ Their precise duties can only be assumed, though it seems sensible to assume that a clerk was always appointed.

The precise position and role of an official known as a surveyor is more difficult to establish. In 1695 or 1696 Thomas North, steward of the manor of Sewardstone,

was nominated as a surveyor, but the bargemen successfully opposed him.⁵⁶ The commission appointed in 1719 chose a clerk at their first meeting, but not a surveyor. It was not until a few months later after several meetings that they chose two surveyors. Thomas North was appointed a surveyor to check that the orders issued by the commissioners had been obeyed. Thomas Pettit of Ware, maltster, was appointed a surveyor with one specific task, to remove shoals from the river bed.⁵⁷

It is obvious that these surveyors were not the important officials that the sole surveyor appointed after 1739 was to be (see 15.3). Whether surveyors were regularly appointed during the seventeenth century is not known. If they were, it seems likely they played only a limited and localised role, perhaps fulfilling the functions that the dikegraves had on behalf of the Tudor improvement commissioners. Whether dikegraves were ever appointed during the century is not known, it seems possible that the differing role of commissioners after 1600 meant that they were not.

The very paucity of commission records during the seventeenth century means that any conclusions from those that remain must be tentative, but some attempt must be made. What is beyond doubt is that the process of administration and decision making was conducted by Courts of Sewers, meetings of the commissioners, to which juries could be summoned, and at which interested parties could attend to make their feelings known.

It was at these courts that the commissioners debated the major arguments over the rights of the New River Company and the owners of Waltham Turnpike, and at which the more mundane matters such as scouring and cleansing

the river, the rights of millers and riparian landowners to water, and the rights of millers and weir-keepers to tolls were considered. Unfortunately it is just these mundane matters about which no record now exists, it is only from the major disputes that some sparse evidence about the conduct of Courts of Sewers emerges.

On 6 April 1682 the newly appointed commissioners held a Court of Sewers at the 'Signe of the Foure Swanns' in Waltham Holy Cross, specifically to consider the arguments over Waltham Turnpike. At this Court a sixteen man jury, all of Essex, presented that the turnpike had been pulled down a few years previously and should be rebuilt at the expense of its owner. After this verdict the commissioners postponed consideration until a further meeting the following month, to which all interested parties were invited. At this subsequent Court of Sewers, on 1 May at the same venue, the orders and decrees of earlier commissions were read out (evidence now no longer remaining), witnesses were called, and counsel was heard on behalf of the bargemen and the owners of the turnpike. After all this the commissioners decided that the turnpike should be rebuilt at the expense of its owner, but reserved their official decree until after they had taken a survey. This survey was taken on 1 June at a Court of Sewers convened at the Cock in Waltham Abbey, and their decision was confirmed and properly decreed.⁵⁸

Little else can be said of the conduct of Courts of Sewers in the seventeenth century. Several Courts were held between 1666 and 1669 to consider the rights of the New River Company to take water from the Lea, a jury was empanelled at at least one of these Courts,

and the Crown Inn at Ware was the venue for another. In 1696 three Courts of Sewers were held at the Boars Head in Waltham Abbey, once more to debate the rights of the owners of Waltham Turnpike.⁵⁹

Further insight into the conduct of Courts of Sewers can be gleaned from advice given to newly appointed commissioners in 1719. They were told they were to receive written complaints, take views of the river and of any particular obstruction about which complaint was made, and then inform all interested parties so that further discussion could take place. At these further discussions all complaints were to be read out openly, all parties were to be allowed a hearing, using counsel if they wished, and witnesses could be called. Only after these procedures had been followed could decrees be issued.

The commissioners were further advised that if any particular issue was contentious then a jury was 'a very proper and safe way' to determine the case, but they were reminded that they did have sufficient authority to proceed without a jury if they so chose.

Finally the commissioners were informed that they must be governed by the rules of law and justice, that much weight should be given to the decisions of earlier commissions, and that they were not to arbitrarily remove anyone's rights. If any party felt that the commissioners had so acted or had failed to take all the relevant evidence into consideration, then that party could move a writ of certiorari so that the matter could be tried at law before the Kings Bench.⁶⁰

Armed with this advice the commissioners began work within days of their appointment. They met fortnightly during September and November 1719, adjourned for winter, met twice in April 1720, and monthly thereafter until the following September. After that they never met again. The problems they dealt with are summarised later(see 11.5), but some consideration is here given to their method of work.

The first three Courts of Sewers were held either at the Rose and Crown in Enfield or the Four Swans at Waltham Holy Cross, when consideration was given to complaints and evidence about problems with mills in Enfield and Sewardstone. Then on 19 November the commissioners met at the Old Kings Head Tavern in Holborn, and made their first orders about these problems, as well as issuing general orders that millers and weir-keepers should not cut weeds in the river without first informing the commissioners. A surveyor was also appointed to check that the commissioners' orders were carried out, and another was appointed to scour and cleanse the river. The commissioners then adjourned for winter.

Their first task the following spring was to hire a boat and take a survey of the upper river from Ware towards Waltham, specifically to inspect problems about which written complaint had been made that very morning by local maltsters and barge-owners. At the end of this survey, notice was given of a Court of Sewers at the Crown Inn at Ware, where further consideration was to be given to the problems found during the survey.

Much business was expedited at this Court of Sewers

despite potentially contentious problems at Stanstead Mill and Pages Weir. Several orders were issued, for the settling of these two problems, for the removal of shoals, and for the closure of ditches which took water out of the river. The commissioners also heard legal representation on behalf of the millers that the orders forbidding the cutting of weeds were illegal 'because it was tollerating a Nuisance' which only increased the problems of silting and flooding. The commissioners promised that they would appoint a surveyor to cut the weeds.

These problems seem to have been dealt with satisfactorily in the short term, for they were not raised again at subsequent meetings, and do not seem to have been contested. However it must be noted that soon after the commission ceased their work, that the miller at Stanstead Mills and the weir-keeper at Pages Weir began to make the same encroachments once more (see 16.2 and 16.4).

During the ensuing four months, the last of these commissioners' working existence, the loose ends at Sewardstone were tidied up, damage at Pages Weir was repaired, but the main task was that of trying to deal with Flanders at Enfield Mill, who was continuing to be singularly unco-operative.

On 6 June 1720 a Court of Sewers was convened at the Blue Bell at Edmonton, to which a jury empanelled from Middlesex was summoned. Several maltsters gave evidence about the problems at Enfield, but Flanders did not attend. The jurors made several presentments, and the commissioners gave Flanders three months to carry out the work.

On 11 June these presentments were served on Flanders, along with notice of a Court of Sewers at the Blue Bell on 24 August where he could lodge any objections if he so chose. He chose not to attend. Then on 21 September another jury found that he had not obeyed the previous orders, which were once more repeated, with the proviso that the work should be completed by the end of October or else fines would be imposed. On 2 November, after it was reported that Flanders had still done nothing, the commissioners instructed their clerk to estreat the fines in the Court of Exchequer.⁶¹

Thereafter the record is blank. No more Courts of Sewers were held, and no record of any case against Flanders has been found in the Exchequer records.⁶² The commission did not expire until 1727, but its working life lasted only a year, from September 1719 to September 1720.

It is of interest to note those problems which these commissioners did not give consideration to. No survey of the lower river was ever taken, nor was any consideration given to problems below Enfield. Nothing is recorded about the growth in the number of weirs, yet the bargemen complained of this to Parliament in 1721. Similarly no interest is recorded in the New River Company, yet the bargemen were to complain of this as well in 1721 (see 11.6). Why there were such limitations to the commissioners' work is not clear.

A question to be raised but not answered is whether the pattern of work adopted by the commission appointed in 1719 was the normal pattern for commissions the preceding century? A period of intense effort when first appointed,

to deal with problems that had slowly accumulated, then a period of no activity, during which time the problems accumulated once more, to be dealt with by a fresh initiative or a new commission? All that can be said is that such a pattern would be adequate to the task of maintaining a river navigation, when the administration was unpaid, part-time, and faced with many other calls upon their services.

If so, it was a complete contrast to the pattern of administration which evolved for the drainage commissions working along the lower Lea. These bodies met regularly. The Havering commissioners met every six months, juries were always summoned, much decision making became mere routine, and particular problems could be dealt with by sub-committees. Differing tasks required differing administrative solutions.

But it must be emphasised once more that the almost complete absence of records of the Commissions of Sewers appointed for the Lea during the seventeenth century means that the above suppositions must remain tentative.

9.4 The role of the Commissions of Sewers

This same lack of evidence makes it even more difficult to properly evaluate the role of the commissions between 1600 and 1730. What is clear however, is that they were not the innovative bodies that the Tudor improvement commission had been. Indeed, by the early years of the seventeenth century, the powers of such commissions to innovate were no longer recognised(see 5.3).

The alternative role that evolved was that the commissions provided a forum whereby a balance could be

maintained between the conflicting interests of the bargemen, the millers, the fishermen and the riparian landowners. The millers and riparian landowners always wanted more water from the river for themselves, the fishermen always wanted to force the bargemen to demand flashes of water from their weirs. The self interest of these groups led them to encroach upon the navigation at the expense of the bargemen. It was the commissioners who provided the forum whereby excessive encroachment could be curtailed, where disagreements between these conflicting groups could be discussed and settled, and who had the authority to order the traditional tasks needed to keep the navigation open.

The prime function of the commissioners must have been to respond to complaints from bargemen, maltsters and other traders interested in using the navigation. It was this group who must have taken the initiative in obtaining the renewal of the commissions, who must have brought defects to the notice of the commissioners, and who must have been most aware of the necessary policies and the possible compromises with the millers, fishermen and riparian andowners.

The commission itself had no staff or brief to take such initiatives themselves, they only responded to problems brought before them. Under such circumstances it seems probable that there was much self organisation amongst the bargemen to make use of the commissions, long before the evidence of such self organisation first emerges in the first decades of the eighteenth century(see 11.4).

One point which does emerge is just how often the bargemen appealed to bodies other than the Commissions

of Sewers. In the ensuing chapters evidence will be shown of the bargemen appealing to the Privy Council or the City of London on several occasions, in their disputes with the New River Company, in their disputes with the millers, and in their disputes over the 5/- toll at Waltham Turnpike.

Such appeals were listened to, but the authority and role of the commissioners was usually acknowledged, and was not, as far as the record appears, denigrated. The bargemen or their opponents might seek to sympathy and support of other bodies, but only to effect changes through the means of the commissioners. There is no evidence that they ever wished to supersede their authority. Even during the years between 1702 and 1719 when the bargemen tried to maintain the navigation themselves without a Commission of Sewers(see 11.4), the decrees of earlier commissions seem to have played an important part in their attempt.

Another factor to emphasise is the involvement of persons or organisations other than the commissions in carrying out tasks along the river, tasks which must have helped preserve the navigation. Such work was not ordered or supervised by the commissioners, but they did have sufficient authority to restrict or prevent such work if it threatened the navigation.

Thus it was that the jury of the manor of Tottenham in 1560 ordered the local miller to cut the weeds on and along the bank of the river 'as the miller there twice yearly anciently used to do'. Thus it was that the court leet of the manor of Edmonton noted in 1699 that tenants occupying lands along the river customarily maintained the banks and mended any breaches, and that any tenant

who made a ditch or cut out of the river faced a fine of £5. Thus it was that Samuel Jones of Waltham Abbey could state in 1703 that he had spent several hundred pounds, 'without any Consideration given', in maintaining the banks, the wharfing and the causeway along the river.⁶³

Proper maintenance of the banks was surely an important task for most riparian landowners. It was in their own interests to prevent flooding or erosion, but such work obviously benefitted the navigation as well. Self interest and customary practice must have ensured that much of this maintenance work was normally done. The commissioners had no need to interfere unless the work was neglected or disagreement arose. A particular point of conflict must have been over how much water riparian landowners could take out of the river to water their grounds, to act as fences between fields, and how surrounding lands were to be drained.

Self interest and communal pride amongst the inhabitants of Hertford meant that the burgesses often scoured and cleansed the river down to the end of Hartham Common (see Chapter 10). Likewise in 1651 eight inhabitants of Ware were ordered to fix a rate 'towards repairing the watercourse through the town...and also the highway leading through the said town'.⁶⁴ Indeed inhabitants of Ware and Stanstead in particular may have been prepared to explore means of maintaining the navigation and its associated facilities without necessarily resorting to the commissioners.

This responsive rather than directive role meant that the commissioners authorised, or acquiesced in, several changes to the navigation. They authorised a new route between Hertford and Ware, allowed the New River Company to ignore restraints placed on their intake of water by the Privy

Council decision of 1669, allowed millers to take increasing amounts of water out of the river to fuel their expansion, allowed an increase in the numbers of fishing weirs, and authorised an increase in the tolls that the millers and fishermen could demand from the bargemen.

This form of administration was not inflexible. Change could take place. Many developments could take place which were not discussed by the commissioners, because the bargemen did not raise the problem. After all some developments, such as an increase in the number of fishing weirs, brought advantages as well as disadvantages. Other developments might not have warranted the intervention of the commissioners as long as the effects were not too detrimental. Some changes were discussed by the commissioners, but far from banning change, they often accepted it, merely decreeing certain guidelines which were to be followed. Thus the depth and width of millstreams increased, although not by as much as the millers would have liked.

If the Lea commissioners had been innovative during the seventeenth and early eighteenth centuries then their powers may have been questioned. However the navigation was adequate, other interested parties were prepared to accept some limitations on their rights, so the commissioners continued to fulfil their role without, as far as it is possible to ascertain, facing such questions.

Yet there is certain evidence to suggest that some of their powers must have been questioned, and indeed altered, during the seventeenth century. The evidence

is sparse, and hardly adequate, but some tentative conclusion may be possible.

During the 1570s the improvements ordered by the commissioners had been financed by the riparian landowners, either because they were specifically ordered to carry out some task or because they contributed towards the rates fixed by the commissioners. Yet in 1719 legal advice to the commissioners stressed that the scouring and cleansing of the river 'must(as I apprehend) be at y^e charge of the Navigators...not at y^e charge of the Land owners', and this advice was followed subsequently.⁶⁵ When this change took place is not clear.

When the new route between Hertford and Ware was opened during the late 1650s, the riparian landowners paid for scouring and cleansing the river, but new ideas such as turnpikes or the pound lock were financed either by voluntary contribution, by the Borough of Hertford, or by the owner of Ware Mills. In 1703 a landowner could state that as a riparian landowner he was responsible for wharfing 1½ miles of the river bank as well as maintaining the tow-paths.⁶⁶ Yet in 1694 the City of London, when petitioning for a Commission of Sewers, stressed that they did not wish to bear the costs of this commission,⁶⁷ which suggests that it was already a matter for dispute or query.

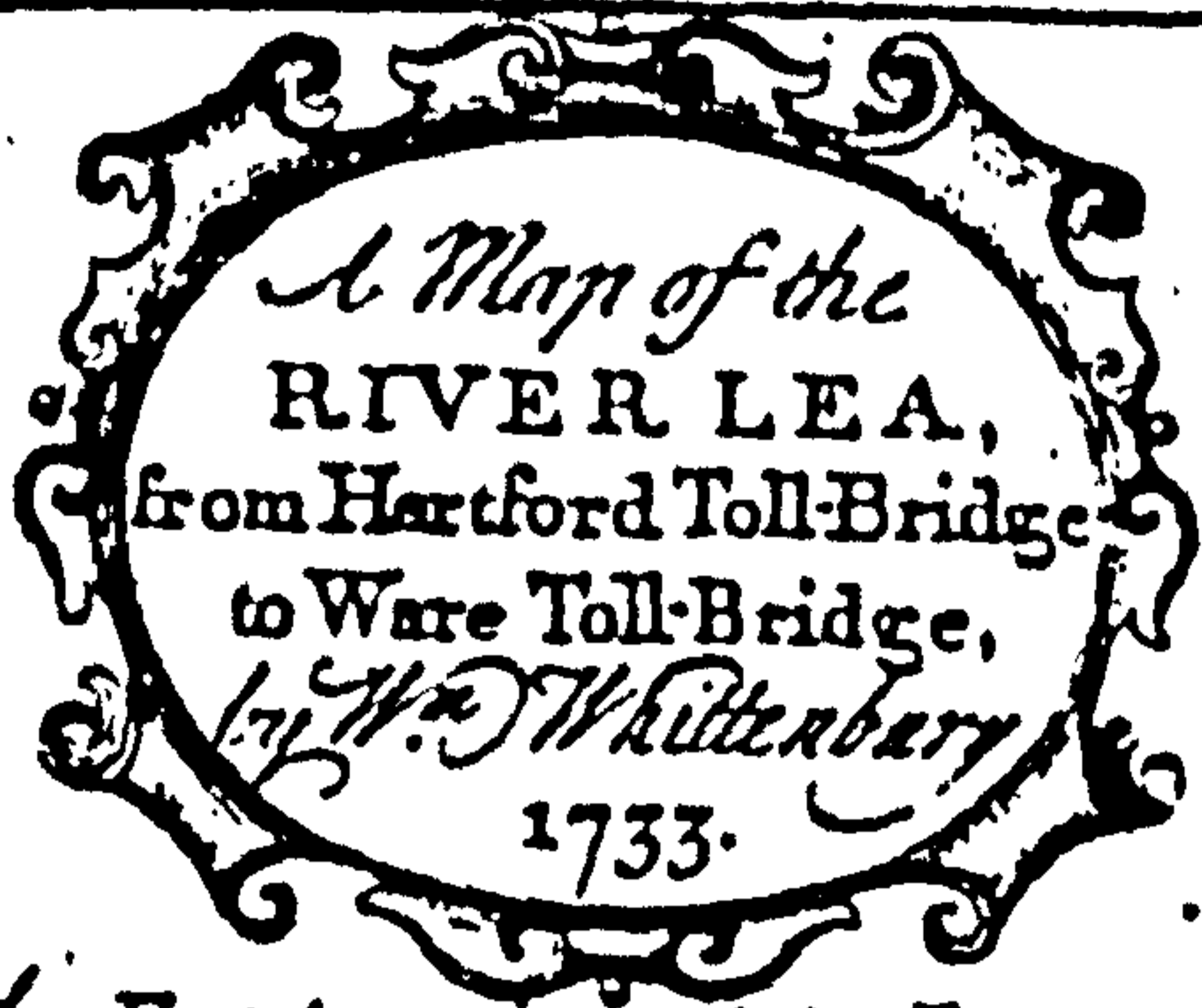
Indeed the approach of the bargemen to maintaining the navigation between 1702 and 1719 could be explained by an attempt to enforce earlier decrees at the expense of the riparian landowners rather than obtain a

Commission of Sewers which might decree that they should bear the costs themselves. If a decision to switch such costs had been taken during the late seventeenth century, then this could explain why commissions were not sought so regularly after James' reign.

The evidence does suggest such a switch at this period, but not how or why. It may have been reflecting legal decisions elsewhere, or there may have been arguments before the Lea commissioners themselves about which no evidence now remains. It would be ironic if the persistent attempts of the bargemen to annul the tolls only met, not only with refusal of this, but a successful attempt by riparian landowners to divest themselves of their traditional responsibility. Much more evidence, both about events along the Lea and about the powers of Commissions of Sewers during the seventeenth century is necessary.

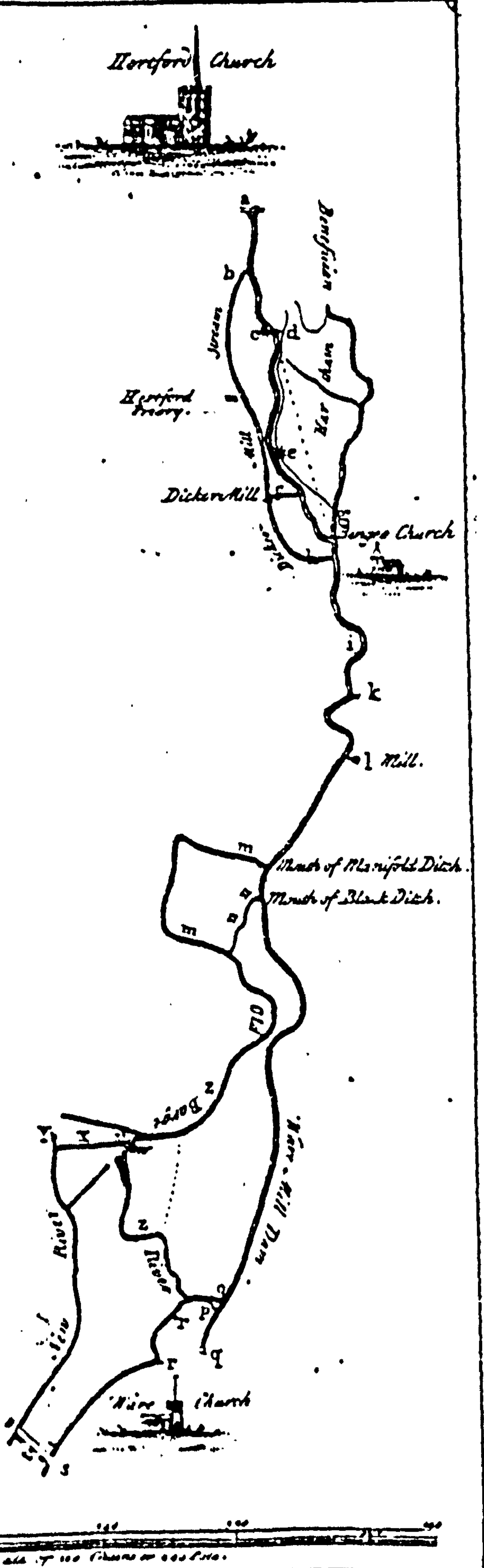
In conclusion it can be emphasised that the very lack of evidence of effort to supersede the powers of such commissions, the very limited administrative changes which were sought when an improvement act was obtained in 1739(see Chapters 14 and 15), all suggest that the Commissioners of Sewers were adequate to the task during the seventeenth and early eighteenth centuries. For all the problems associated with such bodies, limited powers, infrequent meetings, lack of enthusiasm, the Lea was maintained and improved as a navigation during their supervision. Their unpaid administration was one facet of the concept of appropriate technology it is hoped to explore further in Chapter 13.

FIGURE SEVEN: THE LEA, HERTFORD TO WARE



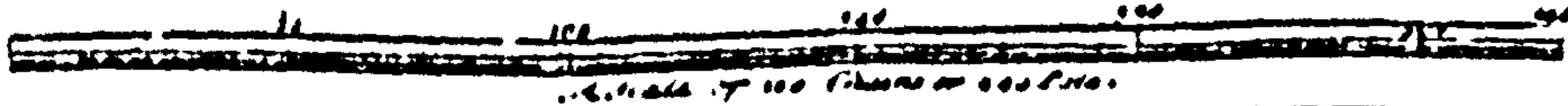
An Explanation of the Letters in this Map of the River Lea betwixt Hertford & Ware.

- a. Hertford town Mill & Toll Bridge.
 - b. Dicker Mill stream.
 - c. The upper Turnpike.
 - d. Paper Mill or Engine house.
 - e. The lower Turnpike.
 - eh. Dicker Mill back Water.
 - g. The Benefician falling into the Lea.
 - i. Constars Ware.
 - k. The Rib falling into the Lea.
 - l. The place where the new cut out of the Rib (for Fordham's Mill) falls into the Lea.
 - m. m. Manifold Ditch. n. n. Black Ditch.
 - o. A Mill.
 - p. Caisern made by Owners of Ware Mills for the Barges to pass out of y^e Mill Dam into the Old Barge River & contrarywise.
 - q. Ware Mills.
 - r. r. Back Water to Ware Mills.
 - s. Ware Toll Bridge.
 - t. Amwell End.
 - v. Mouth of the new cut n^o. carries the Water out of the Old Barge River into the New River.
 - w. The Turnpike that stops the Old Barge River & turns y^e Water down y^e New Cut x into y^e New River.
 - y. Chadwell Spring or New River Head.
 - z. z. Old Barge River, or River Lea, now not made use of by the Barges.
- Note the yellow spot by the Old Barge River is call'd Chalk Island.



To St. Thomas Clarke Esq. & George Harrison Esq. Members of Parliament for y^e Borough of HERTFORD. This Map of y^e River Lea is humbly Dedicated & Presented by their Humble Servants

J. M. 1733. W. D. Whittenbury.



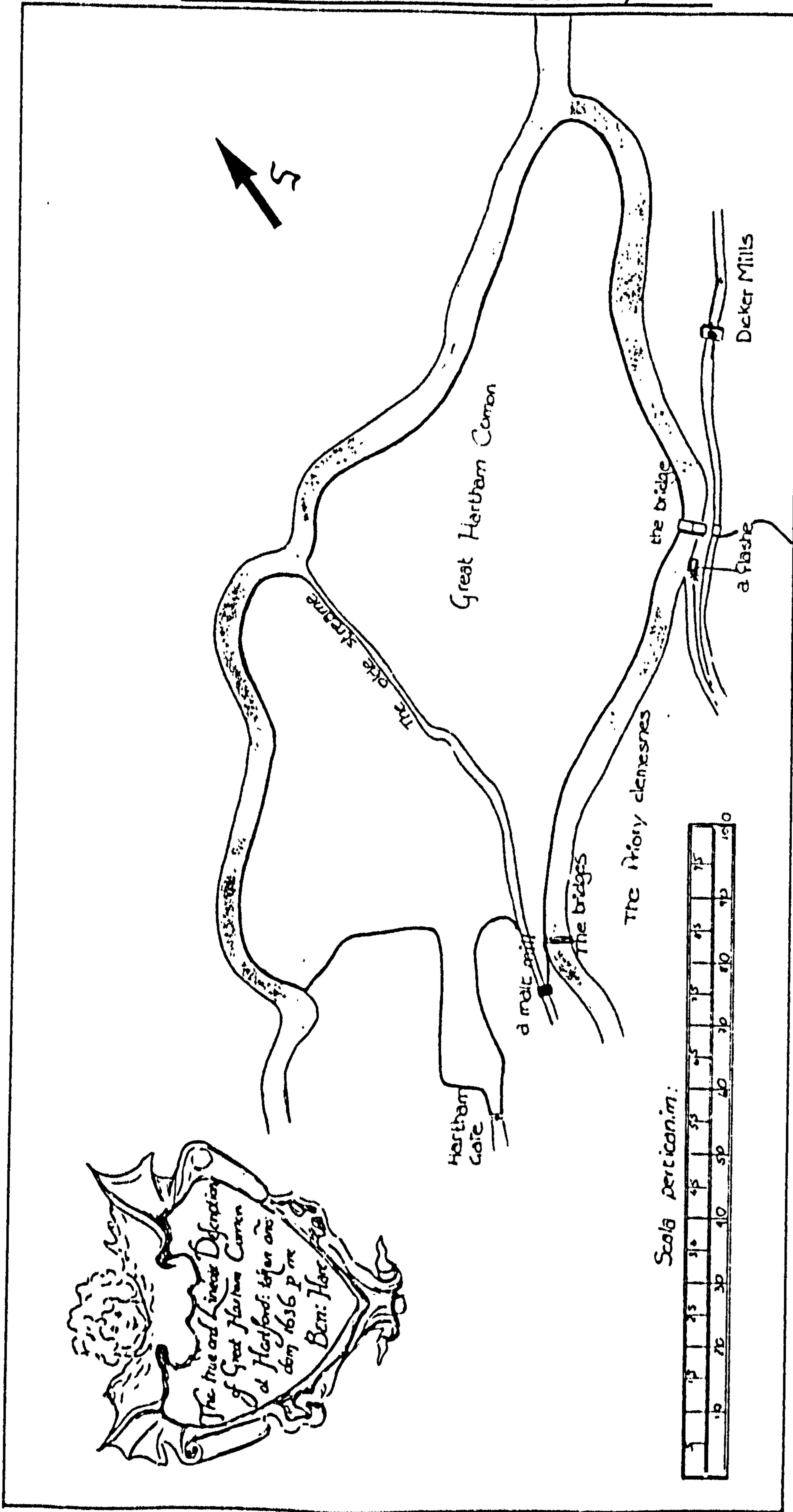
CHAPTER TENTHE RIVER BETWEEN HERTFORD & WARE10.1 The early seventeenth century

When Fanshawe blocked up the head of Black Ditch in 1595(see 4.5), he severely limited the navigation between Hertford and Ware, as he obviously intended. It was not until the middle of the seventeenth century that efforts were once more made to improve this stretch of the river.

During the intervening period some limited movement of boats was possible, although evidence of such is sparse. A survey of the manor of Hertford in 1621 noted that the Black Ditch was still stopped up, and commented that this was to 'the great annoyance and hindrance of the passage of barges', not that passage was prevented altogether. There is also a reference to bargemen bringing deal boards to Hertford in 1633. What is clear is that the large barges which could come up the Lea to Ware could not then progress upwards to Hertford. Only smaller vessels could navigate this stretch, and then maybe only on certain occasions.¹

Reference to the maps reproduced as Figures 7 and 8 show how this limited navigation was possible. Boats passing down from Hertford to the mouth of Manifold Ditch could receive assistance from 'a flashe' in a back-water of Dicker Mills, see Figure 8, and further assistance from the fishing weir 'Constants Ware',

FIGURE EIGHT : HARTHAM COMMON, 1636



shown as i on Figure 7. The barges then passed down the circuitous Manifold Ditch, marked m, Old Barge River and z on Figure 7. Emerging out of this ditch just above the back-waters of Ware Mills, the barges then proceeded down to Ware Bridge, with assistance from Ware Mills if this was necessary.²

The Commissions of Sewers issued for the river at this date had authority over this stretch of the river and must have taken steps to preserve it, but an additional factor was that the Hertford burgesses began to assume some responsibility themselves. There are several references to the borough spending small sums on scouring the river and cutting down weeds between the town and the end of Hartham Common, and on one occasion they raised a rate for this purpose from all those with commoners rights on Hartham. This despite some confusion as to whether the borough or the manor had been granted rights over this stretch of the river.³

10.2 The intrusion of the New River⁴

The tapping of the river Lea by the New River Company to augment their supplies of water for the capital was most probably the most important development along the river during the first half of the seventeenth century. Besides the localised effects on the passage of boats along Manifold Ditch, the extraction of water from the river without it being returned had implications for the navigation further downstream, especially during dry weather. The millers and the bargemen had

cause for resentment.

When the scheme to supply London with water from Hertfordshire was first proposed Edmund Colthurst, its instigator, promised that the water would come from springs and not from the river Lea. He thus felt that it would not be necessary to issue a Commission of ad quod damnum* to see whether his plans damaged the interests of others.⁵ Nevertheless such commissions were issued, but their findings were that his plans could not harm the navigation along the Lea.⁶ When Letters Patent were eventually granted to Colthurst in April 1604 it was carefully specified that his plans were not to hinder the passage of barges along the Lea, the Thames or any other navigable river.⁷

Colthurst's attempts faltered, and the City of London took over the scheme. Their initial intentions were different. In January 1606 the aldermen submitted a bill to Parliament 'for Bringing in of a fresh Stream of running Water from the River of Lee, or Uxbridge, to the North Parts of the City of London'. This bill was ammended however, and the act stated that the sole source of water was to be springs at Amwell and Chadwell near Ware.⁸

Bargemen and millers had fears even about these proposals. In a petition, most probably submitted to Parliament in 1610, they argued that since the springs normally fed the river Lea, tapping them to supply the New River meant that their interests were harmed. These fears were dismissed by supporters of the New River, who cited the findings of the Commissions of ad quod damnum,

and argued that if the bargemen or millers could make a proper case, then the Commissioners of Sewers were empowered to give judgement on these disputes.⁹

These complaints make it clear that the springs were still considered to be the sole source of supply. This was soon to change. The City of London had granted their powers to Hugh Myddleton, and it was he, together with the financial backing of King James, who completed the scheme and first supplied the London customers in 1613. Soon afterwards it became obvious that the springs were an inadequate source, and steps were taken in 1618 to authorise the Company to augment these supplies by tapping the Lea.

There are, however, two intriguing entries in the account books of the Company which could suggest a prior link. In March 1614 £10 was paid for carrying 200 loads of chalk 'too Rayse the great damme att the Mouthe of Ware Ryver';¹⁰ whilst in June 1615 25/- was paid for digging and carrying 25 loads of chalk 'toe Repayre the great Damme att Chalke Ayland'.¹¹

Chalk Island was the place where the Company built a dam to turn water into their river once they had received proper authorisation. So what purpose did the dam there in 1615 serve? If it was to prevent water flowing out of the Lea into the New River, why did such a link exist in the first place? Had the Company tried to tap the Lea illegally before 1618? More evidence is necessary.

The business of obtaining proper authorisation began in September 1618 when a Special Commission was

issued to Sir Richard Lucy and others 'ad inquirend et exequend sdm omnia et singula in scedula armex concernen Rivum de Lee'. The costs of this commission were borne by the New River Company, whose accounts referred to the 'Lorde Commissioners for the Waterworkes' and described their purpose as being 'for the takeinge in of Water oute of the Ryver of Lee & other things enquireable...for the good & benefit of ye Newe Ryver'.¹²

Contemporary evidence shows that these commissioners spent four days surveying the upper river above Waltham, spending nights at Ware, Hoddesdon and Waltham as they progressed down river.¹³ During this survey, as Chancery was informed in 1672, the commissioners considered just how much water would pass out of the Lea into the New River through a pipe of 20" diameter, whether this in effect doubled the supplies at the disposal of the Company, and whether this would harm the navigation. At the end of the survey the commissioners decreed that these developments 'would not make an abatement discernable in Lee River'.¹⁴

With this authorisation the Company laid the pipe, and built a dam in Manifold Ditch to divert more water into the drainage ditch which connected with the New River. Work which had been completed by the summer of 1620.¹⁵

The bargemen were not happy with such developments, and resorted to violence. In July 1619 they vented their displeasure with James for his part in financing the scheme by destroying several of the bridges which he had had constructed over the Lea to facilitate his enjoyment of hunting and hawking. In December 1620

they pulled down a dam in the New River at Ware End which regulated the flow of water, despite having met Myddleton a few days previously to try and settle their differences.¹⁶

The causes of such resentment are obvious, and indeed were acknowledged by the Privy Council in July 1619. They instructed Lord Denny to punish the bargemen who had damaged the bridges, but they also told him to scour and cleanse the Lea between Hoddesdon and Hackney. The work of the Special Commissioners had obviously been inadequate.

The consequences of this authorisation were that less water was available for navigation along the whole river, and the bargemen's objections to this were to resurface several times during the remainder of the century.

What effect, if any, the construction of the dam in Manifold Ditch had on the passage of boats between Hertford and Ware cannot be ascertained. However when attempts were made during the Interregnum to improve this stretch of the river once more, the favoured solution was to open a new route which by-passed the Ditch altogether.

10.3 The opening of a new route

This new initiative was undertaken by the burgesses and inhabitants of Hertford. They had been forced to accept the closure of the Black Ditch by Thomas Fanshawe in 1595 (see 4.5), but the fact that the Fanshawe family supported Charles during the Civil War before settling

with the new regime meant that their influence waned, and this must have encouraged thoughts of restoring the navigation above Ware once more.

The first evidence of this initiative was that in October 1646 the burgesses decided to hold talks with a Captain Oliver Butler to see whether a turnpike could be built. Then in February 1647 the inhabitants of Hertford made representations to the burgesses that the navigation to Ware 'be laid open for boates...as formly yt hath ben'. A full answer was promised at the next meeting.¹⁷

The immediate response was that an agreement was entered into with Thomas Ebbs to preserve the banks in Hartham Common, with later agreement to scour and cleanse the river between Hertford Bridge and the end of Hartham Common. The Mayor also collected information from two elderly inhabitants about the state of the navigation before 1595.¹⁸ Nothing further is recorded about the turnpike, and it was certainly never built.

At this date the aldermen seem to have been in favour of re-opening the Black Ditch and erecting a turnpike at its head once more. The Oliver Butler (Boteler) approached was a parliamentary supporter who had taken possession of the manor of Ware after Sir Thomas Fanshawe, a staunch royalist, had fled abroad in February 1646. The fact that Sir Thomas returned to England in April 1647 and began negotiations to compound for the return of his estates may be sufficient reason why plans for the turnpike were dropped.¹⁹

Several years were to elapse before these attempts were revived, but on this occasion the navigation was

to be successfully improved. This second attempt was much more ambitious, and involved the construction of two turnpikes at Hertford, the opening of a new route down the head stream of Ware Mills, and the construction of a pound lock besides these mills. This pound lock was to remain the only such lock along the river until the 1760s.

The first evidence of this new initiative was that in May 1655 the burgesses once more questioned elderly inhabitants about the navigation before 1595.²⁰ Then in September 1655 a jury presented to a Court of Sewers that the river between Hertford and Ware should be cleansed and scoured, and the commissioners promptly ordered that this be done by the riparian landowners at their own expense. At Hertford a town meeting was called, at which it was agreed that a rate be levied in the town to meet the costs of scouring the river down to the end of Hartham Common. This rate was then confirmed by the commissioners a couple of weeks later.²¹

It seems likely that more ambitious proposals were either discussed at or stimulated by this town meeting, for in January 1656 the burgesses appointed a committee consisting of the Mayor and ten burgesses or assistants. This committee were instructed to 'take care to set Men on Work, to make the River Navigable...out of the Money, that is collected for that Purpose'. Then in February it was decided to solicit funds from anyone outside the town who would be willing to support 'soe good a worke'.²²

In March the committee met to decide which of several alternative channels past midstream islands

were to be fixed as the navigable channel, and they also reached agreement with William Green, the miller at Dicker Mill, and several local landowners as to the level of their contributions to this work.²³

Then in June 1656 another town meeting considered and supported a proposal to build a turnpike 'for the better bringinge upp of Barges', resolving that the burgesses borrow £20 to finance this work. Problems may have arisen in obtaining this loan, for in October another town meeting agreed that 'the Navigation cannot bee compleated without a Turnepike', and several persons present promised to lend small sums totalling £17 1/-.²⁴

The above evidence suggests that the improvement scheme emerged, evolved, and became more ambitious as a result of frequent discussion in the town. This was to continue. The proposals in June and October mentioned only one turnpike, but two were actually built.

These were the upper turnpike across the Lea just below its parting with the head stream of Dicker Mill (point c on Figure 7) and the lower turnpike a short distance below (point e on Figure 7).

The decision to build two rather than one turnpike seems to have arisen out of complaints from bargemen in December 1656 that they were experiencing problems in bringing up their barges to Hertford. They felt that the existing agreement with Green was unsatisfactory, and that the stakes he had placed in the river to turn water to his mills were an obstruction.

The agreement existing at this date gave Green leave 'to turne the water out of the River of Lee to

his Mill duringe pleasure or untill the Navigation was required to bee open and cleare', but the exact arrangements are not known.

After investigation, the burgesses ordered that the stakes be pulled up, and negotiations were begun which led to an agreement in November 1657 with the owner of Dicker Mill, Mr Andrews. By this agreement the turnpikes, a plural usage for the first time, were adapted so as 'to make them fit for Conveying Water to Dicker Mill'. In return Andrews contributed £20 towards the improvements and agreed to pay thereafter an annual rent of 10/- towards the navigation.²⁵

Problems were soon to be experienced with these turnpikes. The Mayor's accounts for 1658-59 provide details of 'An accompt of the materialls of the two boxes at the Turnpikes that were made to put the flash gates into & findinge them not usefull were ordered to bee taken upp 1657 & disposed of'. Such problems meant that a new rate was levied in March 1657, that a further £30 was borrowed in August(although £20 was repaid within a few months), and major rebuilding of the turnpikes had to be undertaken.²⁶

Then in April 1659 it was reported that serious flooding the previous winter had severely damaged the lower turnpike and the banks of the millstream. Another £10 had to be borrowed to repair this damage, and to lower the sill of the lower turnpike.²⁷

Besides these measures along the stretch of the river the borough always regarded as their own, Hertford Bridge to the end of Hartham Common, the burgesses were also involved in substantially improving the navigation

from the end of Hartham Common to Ware. To attain these ends the burgesses reached agreement with Fanshawe and the New River Company, and in December 1656 applied for a new Commission of Sewers.

The agreements reached were that Manifold Ditch was blocked up and barges allowed to pass down the head stream of Ware Mills instead. From a point just above these mills a short cut was dug between the head stream and the Lea, and in this cut a pound lock, or 'cistern' as it was termed, was built, at point p in Figure 7.

Of the genesis of this initiative little is known. All that is, is that at some date before June 1658 the burgesses and Fanshawe had signed their agreement, for in that month the burgesses hired carts to carry timber from Fanshawe's estate at Brickendon to build the pound lock and also met some small bills for bricklaying at Ware.²⁸

The agreement itself outlined the new route to be used by the barges, and fixed a toll of 6d that was to be paid every time a barge passed through the pound lock. Arrangements were also included whereby the mills could be shut down or be used to provide additional flashes of water, if such assistance was needed to carry barges down to Ware Bridge.²⁹

Other aspects of the new route were to be more controversial, especially the closure of Manifold Ditch, for it was from this stream that the New River Company took their supplies of water from the Lea. In 1658 the Commissioners of Sewers sought a compromise between the

conflicting parties.

They ordered that a dam be placed across the mouth of Manifold Ditch to turn more water down the head stream, but restricted the height of this dam so that some water could pass over it into the Ditch. To compensate the Company for the reduced flow of water in the Ditch, the commissioners authorised them to erect a dam across the Ditch just below their intake at Chalk Island so that most of the water entering the Ditch could be diverted into the New River. The commissioners also decreed that the Company could lay down two pipes, one of 16" bore, the other of 9" bore, through which water was to pass from the Ditch into the New River. These pipes presumably replaced the 20" pipe authorised in 1618.³⁰ The potential for argument is obvious, and was soon to erupt (see 10.5).

Nevertheless the burgesses between 1656 and 1659 had succeeded in substantially upgrading the navigation so that the largest barges using the river could come up to Hertford. Their pride is suggested by the expenses claimed by the Mayor in November 1658:-

Laid out for 3 daies extraordinary at London with the Steward about the water, & addresses to the Protector, for goinge too & fro by water, my expences & passage down

Passenger traffic on the river was rare. For the Mayor to travel in ceremony was unique.³¹

The effect of these efforts is illustrated by the fact that in January 1657 John Hide was admitted as a freeman in the 'art & misterie of Malting or to goe by water wth a barge', whilst in June 1658 Henry Stout, of the famous Quaker family, was given his liberty 'to trade in malts & coles'.³² Such admissions had not been

recorded before.

The burgesses also built a wharf in Hartham Common, and made a turning point for the barges near the head of the navigation.³³ Further research might show other changes in land use along the river at this date, and development in the town to take advantage of the new opportunities.

The burgesses' success was achieved at some cost however. Voluntary contributions, rates and loans had been used to finance these improvements, and these latter may well have been the major reason why the borough finances were in such a parlous state by the end of the 1650s.

A loan of £50 had been raised from John Flower in 1658 to ease the financial problems. This loan was soon repaid, but another, for £63 12/-, was immediately raised from John Clarke in 1659. This sum was reduced to £55 in January 1662, but a bond for the remainder at 6% was renewed annually until 1670. In that year Clarke became Mayor, and the debt seems to have disappeared as part of the settlement of his mayoralty accounts. In addition the small loans raised from local inhabitants in June 1656 and April 1659 were not repaid until 1677-79.³⁴

Such problems were caused because there was little return from the improved navigation. Problems of maintenance soon arose, and were to be a major problem. In addition the evidence suggests that little use was made of the river between Hertford and Ware, an average of one or two barges a week (see 10.8). Expectations must surely have been higher, and the result hardly justifies

the effort expended by the burgesses and townsmen. The former in particular were not prepared to continue the borough's financial commitment, and sought other means to preserve the improved navigation for the future, at no expense to the borough.

The nature of the available evidence does illustrate the important role of the burgesses and the town meetings, but provides little indication of the essential co-operation of Fanshawe and the New River Company, or of the necessary authorisation by a Commission of Sewers. One interesting feature is that subsequent events suggest that Fanshawe's co-operation may have been somewhat less than enthusiastic, and that he may have felt that the prevailing political climate left him little option but to agree to the burgesses' proposals. The Restoration gave him his chance of revenge.

10.4 Initial problems of maintenance, 1660-66

Major rebuilding of the two turnpikes at Hertford had been necessary in April 1659, yet in April 1660 a petition was submitted to the burgesses, complaining that the navigation would soon decay if proper care was not taken. To meet the costs of such maintenance the burgesses resolved to impose tolls for the use of the turnpikes.

Inhabitants of Hertford were to pay 6d, other barge owners 1/-, whilst Fanshawe's tenant at Ware Mills was permitted to pass toll free, in recognition of Fanshawe's assistance in opening the new route.³⁵ At first Thomas Pryor, possibly the miller at Dicker Mill, was appointed to collect the tolls, under the supervision of John King and Abraham Rutt, local traders and Quakers,³⁶ but then

in May 1663 Edmund Harvey, a local woolcomber, was instructed to take over these responsibilities.³⁷

Soon afterwards major problems arose. Complaints were made to a meeting of Hertford common councillors, a rare reference to such a body, that the turnpikes were 'to be cutt upp' on July 15. An express messenger was dispatched to seek the advice of the Borough Steward. On July 18 an agreement was signed with Harvey whereby he agreed to take out a lease on the turnpikes, to commence from September 1663. Then on July 27 the common councillors instructed the Mayor that he ensure that the lower turnpike 'be sett upp againe', and the Mayor's accounts show that 25/- was spent on repairs on July 29.³⁸

More evidence would be desirable, but that available does suggest conflict within the town over the future of the navigation, with the distinct possibility that the burgesses themselves were at first prepared to close it down. It should be emphasised that many of the burgesses responsible for improving the navigation the previous decade had been removed in September 1662. They were protestant dissenters unwilling to take communion in the established church or to subscribe to the oaths of allegiance and supremacy.³⁹

The lease to Harvey meant that the navigation was preserved, but at no expense to the borough, for the lease meant that Harvey took on all costs of maintenance in return for the tolls. To obtain his three year lease Harvey paid a fine of £3 and promised an annual rent of 1/-. In March 1666 Harvey surrendered the lease, paying

20/- for the privilege.⁴¹

By this date the lease was valueless, for the new route had become unusable. Fanshawe's revenge was that neither he nor his tenant had made any effort to repair or maintain the pound lock since it had been built. By late 1665 or early 1666 it was no longer of any use to the navigation, and a meeting between the burgesses and Fanshawe's son and heir brought no change.⁴²

The only alternative for the bargemen was to try and use Manifold Ditch once more, but this meant that the dams at the mouth of Manifold Ditch and at Chalk Island would have to be removed. Conflict with the New River Company was imminent, for although they might welcome the removal of the dam at the mouth of the Ditch they would oppose the removal of the dam at Chalk Island. The bargemen seem to have hesitated, for it was nearly a year after the decay of the pound lock before they tried to re-open Manifold Ditch.

10.5 The row with the New River Company

On 11 September 1667 the Company complained to the Privy Council that two bargemen, Edward Hopkins of Waltham Abbey and Edward Chapman of Ware, 'haveing gotten to their assistance some Boyes of Ware' had pulled down the dam at Chalk Island, to the disadvantage, they claimed, of both the New River and the navigation.⁴³

Hopkins and Chapman were brought before the Privy Council the following week, but a proper discussion of the conflict was postponed until all parties to the

dispute were in attendance. This was not achieved until 16 October.⁴⁴

In the intervening period the bargemen continued their offensive. On 25 September 'a Jury Impannelled by the Commissioners of Sewers, for the County of Hertford' presented that the dam at Chalk Island was a 'Common Nuisance', and that it had only stood two years, not since 1658 as the Company claimed. The commissioners accepted these findings, and so the destruction of the dam by the bargemen was thus justified after the event.⁴⁵

When the dispute finally came before the Privy Council, the commissioners' decision was confirmed, and the Company's complaints were dismissed. However the Council took the precaution of appointing a committee, all of whose members were already Commissioners of Sewers, to investigate the problems further.⁴⁶

The bargemen had thus successfully re-opened Manifold Ditch, navigation between Hertford and Ware could resume. The Company cannot have been satisfied with the decision of the Privy Council, but they were able to present their case to the committee, and this case was strengthened by the shortage of water for rebuilding London after the Great Fire. Over the ensuing years the committee searched for a solution which would allow the bargemen to continue to use Manifold Ditch, but which would also maintain and increase the supply of water to the Company.

In their first year the committee held several meetings, with some other Commissioners of Sewers in attendance, and tried several experiments to check the

effect of the Company's intake of water on the navigation. They were unable to produce a final report, for the necessary quorum of five had not been obtained. Therefore five new members were added in July 1668.⁴⁷

One of the solutions the committee tried was that in March 1668 they ordered that near Chalk Island two 'jetties' be built from the bankside into the stream, one on each side of the ditch. A gap of 14' was left between the two jetties, through which the barges were to pass. These jetties thus acted as partial dams which increased the depth of the water near the Company's intake and thus increased that intake, but which did not impede the navigation.

The Company were at first satisfied with these arrangements, but then they argued that the ditch below the jetties had been scoured and cleansed to such an extent that the water flowed down the ditch so rapidly that the level of water fell once more, and thus invalidated the committee's experiment.

The Company then, without permission, built a sill along the bed of the ditch between the two jetties. Such a sill* could have been built solely to strengthen the structures, as the Company claimed, but the fact that 'mortis holes' were drilled in the sill suggests otherwise. Their proper purpose must have been to insert boards in the gap and thus complete the dam.

If the Company and the bargemen had been prepared to co-operate, even these new developments may have been acceptable. The Company's dam could have operated as a normal flash lock to assist the navigation along

Manifold Ditch. However, the dispute was still about the actual loss of water from the river Lea and its effect on the whole navigation, neither party was amenable to compromise.

In July 1669 a Commission of Sewers ordered that the sill be removed, only to relent the following month and decree that the sill could be put back in place as long as no mortice holes were drilled in it. Such decisions suggest conflict between the committee and the commission, and thus between the commissioners themselves, but no accurate portrayal of this friction can be obtained.⁴⁸

A further element intruded into this dispute. In April 1669 Henry Dunstar and several other local inhabitants made a breach in the banks of the New River. The Company complained that so much water escaped that 'it will Draw the whole River Drye'. Subsequent litigation before the Court of Chancery shows that Dunstar was arguing that the Company had encroached on his property by widening the ditch which conveyed water from Manifold Ditch to the New River, and there was even an accusation that he was demanding £5000 for 2 acres of land lost to the Company.

However it is clear that Dunstar was also motivated by his support for and support from the bargemen. He himself argued that the navigation had 'beene obstructed soe that Boates cannot passe in Somer tyme as formerly they had done for want of water'. Surely an irrelevancy in a property dispute, and at least one of his accomplices, William Bustard, described as either a

fishermen or a sack carrier, was to be involved in the riots at Ware later that year.

The immediate outcome of Dunstar's action was that the Commissioners of Sewers ordered that the breach be repaired and that Dunstar be fined. Soon afterwards the Privy Council issued a proclamation making it an offence to breach the banks of the New River, the first such proclamation to be made.⁴⁹

This particular dispute shows that after three years work the committee and the Commissioners of Sewers had still not resolved the conflict between the New River Company and the bargemen. Indeed the Company obviously felt that some of the commissioners were not attempting to resolve the problem. They took the dispute back to the Privy Council.

In August 1669 they complained to the Council that the ditch below their jetties had been cleansed so thoroughly that the level of water in the ditch had sunk so low that little water was flowing out of the Lea through their pipes. Since they obviously felt that the Hertfordshire commissioners and juries were biased towards the interests of the bargemen they asked that those commissioners residing in Middlesex be summoned to take a view of the existing arrangements. This request was granted and all parties to the dispute prepared for a full debate before the Privy Council.⁵⁰

This debate took place on 22 September. Two reports were read, one submitted by the committee, the other from 15 Middlesex commissioners. Witnesses were called, and counsel submitted cases on behalf of

the Company, the bargemen, and the City of London who were supporting the bargemen rather than the Company. At the end the Privy Council decreed:-

That the Governor and Company of the New River do take away their Great Pipes now lying in the River Lee, And in stead thereof do lay two lesser Pipes the One of Eight, and the other of Six Inches Bore, at or neare the Place where the Great Pipes lye, and so to place and Contrive them that they may be Constantly served with Watter to supply the New River, And if upon Tryall, it shall be found that the Water in the River Lee will not alwayes rise high enough to fill the said Pipes, that then the said Governor and Company may and they are hereby Authorised to sett up, and use a Turen Pike Jettye or some other devise to rayse + force the Water to the Pipes whereby they may be rendred most usefull to the New River Yet so as may not cause Inundation of the Meadow Grounds adjoyning nor retard, or, indanger the Vessells that shall Passe that way

These decisions were confirmed on 9 November by the Commissioners of Sewers, who at the same time authorised the Company to erect the turnpike that the Council had said could be built if after trial it was found that insufficient water entered the pipes. Finally on 1 December the Royal Assent was granted to further strengthen the legal authority of this solution.⁵¹

The bargemen were furious, and resorted to violence. On 17 November the Privy Council received reports that the Company's turnpike had been pulled down and burnt, and that the orders of the Commissioners of Sewers which had been displayed in the market place at Ware had been pulled down and torn in pieces. A messenger was sent to arrest the culprits, all of whom were known to the Council.

The messenger, Samuel Botteley, arrested three of them, but was then set upon and beaten up by 'at least

Sixty Men armed with ye Guns, Clubs and Poles with a multitude of Women with Spits & such other Weapons'. Botteley retired from the fray without his prisoners.

This time the Privy Council was furious. They issued a warrant to the High Sheriff of Hertford, Sir Thomas Byde, to arrest twelve men named in their warrant before 1 December, and asked the Attorney General to prepare a case to see whether the townsmen of Ware could be charged for permitting riots and for failing to assist the King's messenger.

This action quieted the opposition. One of the culprits, Isaac Allis, a bargemaster of Ware, had attended the Privy Council the day the reports of the riot had been heard, the remainder were produced the following week. All were remanded in custody, but were released during the ensuing three weeks, having first begged pardon and given assurances for good behaviour thereafter.⁵² No further action was taken.

This depth of feeling in Ware was an expression of the importance of the navigation to the town and of the resentment felt about the New River Company tapping the Lea. Bargemen were involved in disputes at this date with millers and weir-keepers further downstream (see 11.2) and obviously felt that this loss of water from the river harmed their interests. They must have been hoping that the Company's rights to tap the Lea were either rescinded or curtailed, the Privy Council decision dashed those hopes.

Meanwhile other developments took place with

regard to the navigation between Hertford and Ware. The Privy Council decision of September had been based on the assumption that Manifold Ditch would be the navigable channel, yet by 11 October an agreement had been signed to re-open the new route that had been opened in 1658.⁵³ Thus the decision of the Commissioners of Sewers on 9 November that the Company could erect a turnpike across Manifold Ditch had no effect on the navigation between the two towns.

This development was possible because Sir Thomas Fanshawe, 1st Lord Viscount Fanshawe, who had allowed this route to decay, had died in March 1665, and his heir, Sir Thomas Fanshawe, 2nd Lord Viscount, sold the manor of Ware in 1668 to a London brewer, Sir Thomas Byde. Soon after the purchase the burgesses met Byde and obviously found him co-operative. Byde was to forge close links with the borough, becoming a freeman in 1669, and representing them in Parliament from 1673 to 1690.⁵⁴

The agreement between the burgesses and Byde to re-open the new route was identical to the agreement which had been made in 1658, except that the toll for the use of the pound lock next to Ware Mills was increased from 6d to 1/-. It was also agreed to get the agreement confirmed by a Commission of Sewers, and it would seem reasonable to assume that this confirmation was obtained on 9 November, although there is no evidence of this.

Thereafter the new route remained the sole navigable channel between the two towns. Even canalisation after 1767 made only minor alterations to the channel which by-passed Ware Mills, and none

to the other parts of the new route. Problems after 1669 were with maintaining the route, not with the route itself.

The bargemen still made efforts to rescind the right of the Company to tap the Lea. In February 1670 inhabitants of Hertford and Ware petitioned the London aldermen, who then petitioned the Privy Council on their behalf. This petition complained that the Company took so much water out of the Lea that the river was 'Shallow and insufficient for Navigation and the Cariage of Provisions to the City of London'. The Council instructed Sir Robert Murray, Sir Bernard de Gomme and Christopher Wren to take a survey of the Lea and the New River, taking with them three persons chosen by the Company and three by the City of London.⁵⁵

This survey dismissed the contention that the Company took too much water out of the Lea. After 'several sure and well grounded experiments by measuring the velocities and comparing the quantities of both streams' it was concluded that 'the pipes drew off from the navigable River about one part of thirty ...a thing very little prejudicial to Navigation and which could not abate the River half an inch'. It was felt it was the millers further downstream who were causing the real problems, not the New River Company.⁵⁶

Such a report must have dampened any hopes the bargemen had of redress, but not quite. In both March and October 1670 presentments were made at assizes and county sessions that the dam erected by the New River Company in Manifold Ditch was a nuisance which diverted water out of the navigable river, but no

further action was taken.⁵⁷

Then in August 1672, as part of the settlement of the case between Dunstar and the Company, the Court of Chancery issued a decree which forever preserved the link between Manifold Ditch and the New River, and once more confirmed the Privy Council decisions of September 1669.⁵⁸ The bargemen's assault on the New River Company had failed.

One unanswered query about these disputes must be just why the City of London chose to wholeheartedly support the bargemen rather than the New River Company. The aldermen presented the bargemen's case to the Privy Council in 1669 and in 1670, arguing always that the Lea was an important artery supplying the capital's markets.⁵⁹ In the aftermath of the Fire, supplies of water from the New River were very important.⁶⁰ Yet the City consistently opposed the Company in these disputes.

10.6 Maintaining the improved navigation, 1670-1730

For the next sixty years this improved navigation between Hertford and Ware sufficed. There were problems of maintenance, there were disagreements between the various parties, but these were always overcome and settled. There was no major interruption of the navigation, and no evidence of any initiative to make further improvements.

There was no overall policy of maintenance, it was just that separate short sections of this stretch of the river were the responsibility of different parties, and these parties accepted their responsibilities for

maintenance . From the evidence that survives three main elements can be discerned. The need to maintain the two turnpikes at Hertford and preserve the river down to the end of Hartham Common, the particular responsibility of the borough of Hertford; the need to maintain the pound lock at Ware Mills and the navigable condition of the head stream, the responsibility of the miller; and the need to maintain some sort of truce with the New River Company.

There were other elements about which no evidence now remains. For instance it is not known what part was played by Commissioners of Sewers. There is almost no reference to their involvement above Ware after 1670, and after 1695 such bodies had no jurisdiction over this stretch of the river anyway. Similarly nothing can be said about the private fishing weir, Constants Weir, except that it existed and must at times have provided an additional flash to help barges pass down into the head stream of Ware Mills.

The borough of Hertford retained a particular interest in the navigation between Hertford Bridge and the end of Hartham Common, but they continued the policy that had first emerged in the 1660s. They were prepared to ensure that it was maintained, but they were not prepared to accept any financial responsibility or commitment themselves. Whenever major repairs were needed they acted as a forum where initiatives could be debated. At other periods they preferred to lease the turnpikes and oblige the lessees to maintain the navigation.

Soon after the new route had been re-opened the turnpikes were let for 11/- a year to the miller at Dicker Mill, Thomas Harlow.⁶¹ Such arrangements might be adequate for ensuring normal maintenance, but if a major rebuilding of the turnpikes was envisaged, other initiatives were necessary. Such an initiative emerged in 1672.

In that year the inhabitants of Hertford submitted a series of proposals to the Mayor. They suggested that a voluntary collection be made in the town, and that the receipts of this collection and the income from the tolls collected at the turnpikes should be used to rebuild the two turnpikes, to scour and cleanse the river, and to extend the navigation part way down the head stream of Dicker Mill so that goods could be landed at Butchery Green. They wanted responsible persons appointed to supervise the collection of money, and a committee, responsible to the borough, to supervise the repairs and future maintenance.⁶²

The burgesses welcomed the initiative, but were careful not to saddle themselves with any extra responsibility. They gave permission for a voluntary collection, and set up a committee to survey the navigation and report what repairs and improvements were necessary. However they did not accept that the repairs should be supervised by a committee responsible to them, suggesting instead that it should be independent, although they would appoint three members themselves, the other three being appointed by the bargemen.⁶³

Despite this encouraging exchange, no major

rebuilding was undertaken until the end of the decade. Meanwhile the navigation continued to decay, but never to the extent that it became unpassable.

In May 1674 a survey was ordered after reports were received that the banks were decaying, and in June 1675 council minutes noted that a debate on the turnpikes should be postponed for a further month. All that happened at this date however was that Richard Martin, a Quaker, and John Mathews, the miller at Dicker Mill were appointed to take care of the navigation for a year with a brief to carry out minor repairs to the banks and the turnpikes. To help them the toll for using the turnpikes was fixed at 1/- for everyone, thus suspending the privilege previously enjoyed by barge-owning inhabitants. These arrangements lasted until the end of the decade.⁶⁴

Then in 1679 the initiative to rebuild the turnpikes re-emerged, following closely the methods of administration first suggested in 1672. In April 1679 Thomas Webb, most probably a Quaker,⁶⁵ was appointed to collect the tolls, and a committee of six, four of whom were Quakers and two were burgesses, to survey the river and supervise the repairs.⁶⁶ In September 1680 these arrangements were altered. Benjamin Jones, Richard Martin, Nicholas Lucas and William Guise were appointed as 'Surveyors of the Navigation of this Burrough, and Receivers of the Money subscribed to & to be subscribed towards ye Same'.⁶⁷

It was this group which carried out the necessary major repairs. By the end of 1680 the turnpikes had been

rebuilt and the banks repaired. Altogether £39 1s had been obtained from the voluntary collection and the tolls, whilst £37 17s 3d had been spent. The surplus was expended on minor repairs in 1681 and 1682.⁶⁸

The task completed, the aldermen⁶⁹ appointed Jones and Martin as 'Overseers of the River and Navigation', responsible for future maintenance, and Mathews resumed his collection of the tolls, presenting his accounts until September 1684 when he vacated Dicker Mill.⁷⁰

In view of the leading role played by Hertford Quakers in these events, it can be little coincidence that the proposals were first submitted to the Mayor on 20 March 1672, only five days after Charles' Declaration of Indulgence promised them some respite from persecution, and indeed freed several of them from imprisonment.

Furthermore postponement of the measures until the end of the decade may be explained by the uncertainty created by the fact that Parliament opposed Charles' policy, and cancelled the Declaration of Indulgence in 1673. By the end of the decade Parliament had become more favourably inclined towards Dissenters, and the Quakers were able to take advantage of this to resume their efforts to repair the navigation above Ware.⁷¹

A gap in the evidence means that after 1684 the position is not clear for several years. In November 1693 and March 1695 the aldermen made surveys after complaints of decay, but only minor repairs were made.⁷²

Then in 1697 Thomas Webb, a Quaker maltster, probably the son of the erstwhile collector, offered to lease the navigation and the borough's fishing rights. Initially

the aldermen offered Webb £6 towards repairs if he would raise the rest by voluntary contribution, but eventually they paid him £11. After these repairs had been completed, about which there are no details, Webb and Jonathan Smith, the miller at Dicker Mill, took out a 21 year lease on the navigation down to the end of Hartham Common at 10/- a year.⁷³

When this lease expired in 1720 a new lease was granted on the same terms to John Ward of Hackney, proprietor of Hertford waterworks. These arrangements sufficed until the 1730s, when Ward's financial problems forced the aldermen to first repossess the turnpikes and then the waterworks.⁷⁴

These two leases meant that the aldermen maintained their policy of avoiding financial responsibility for maintaining the navigation at Hertford. This policy was successful because traders in the town were determined to ensure that the navigation was preserved, at their own expense if necessary.

Another factor in the success of this policy was that for most of the period the miller at Dicker Mill controlled the operation of the turnpikes. This was sensible for all parties. The upper turnpike controlled both the flow of water down the navigable river and down the head stream of Dicker Mill, whilst the lower turnpike could be used in conjunction with a flash from the back waters of the mill if necessary. There was a possibility of conflict of interest, but if there was ever, it was never serious enough to be minuted in the borough records.

This equilibrium could have been upset in 1708 when George Osmond and a Mr Hudson set up a waterworks and a

paper mill in Hartham Common, next to the upper turnpike. In his lease Osmond promised to shut his flood gates whenever the turnpike was to provide a flash for the barges. In 1720 when the owner of the waterworks took over the leases to the turnpikes, special provisions were made to prevent any conflict. The aldermen appointed a committee specifically to ensure that the turnpikes were used properly by all parties.

No evidence of any such conflict remains, except that in 1711 rows over commoners' rights in Hartham Common, and in 1725 rows over the suitability of Marmaduke Arlington as Borough Recorder, both included comments that the waterworks and the paper mill had harmed the navigation.⁷⁵ No response was forthcoming.

Of the navigation below the end of Hartham Common. The agreement with Byde in 1669 specified that he was responsible for maintaining the pound lock next to Ware Mills. Thereafter lessees of the mill accepted this responsibility as a condition of their lease.⁷⁶ There is no evidence that the lock ever fell into serious disrepair ever again.

There was conflict over another clause of the 1669 agreement, namely the responsibility of the burgesses to maintain the dam at the mouth of Manifold Ditch. The height of this dam had been specified by the Commissioners of Sewers to allow water into the Ditch to serve the New River, but both the miller and the bargemen wanted it higher to reduce any loss of water from the head stream.

In 1672 the bargemen suggested that the miller should take over responsibility for maintaining this dam, so that he could heighten it and allow only enough

water into the Ditch to supply it with water for cattle. The burgesses could not agree to such a flagrant disregard of the rights of the Company, and would only agree to such a transfer of responsibility if the decrees of the commissioners were included in any agreement.⁷⁷

It may be resentment on this score which led the miller, Thomas Harte, to demand a toll of 2/6 rather than the agreed 1/- in July 1674. Whatever the reason, the burgesses were angry, and sent two of their number to remonstrate with Byde. The outcome was a new agreement whereby all barges of freemen and inhabitants of Hertford could pass through the pound lock toll free. It can be noted that Byde had just been elected as Borough M.P., and this toll had been specifically criticised as too high by Wren and Murray in 1670.⁷⁸

Then in June 1676 several employees of the New River Company pulled down the dam at the mouth of Manifold Ditch. The burgesses resolved to bring legal action, but this did not satisfy Byde. He instructed the miller at Ware, Francis Pryor a Quaker, to demand a toll of 1/6 until the dam was rebuilt.

The burgesses responded angrily, and threatened to open negotiations with the Company to re-open the old routes down Black or Manifold Ditch if Byde or Pryor did not reply within 14 days. Negotiations did begin, and the agreements of 1669 and 1674 were once more confirmed, and this time submitted to a Commission of Sewers for their approval.⁷⁹ The dam was presumably rebuilt.

These matters rested until after the death of Byde in January 1704. Then in 1707 Thomas Byde, the grandson

and heir, instructed the miller, still Pryor, to demand a toll of 1/- once more. The aldermen responded by threatening to re-open the old routes once more.⁸⁰

Byde replied by letter. He noted the 6d toll due to Fanshawe, but not the 1/- due to his grandfather before 1674. He argued that the new route benefitted the bargemen as much as the miller, and that it would be difficult to re-open the old routes. He concluded by offering to allow barges to pass toll free except on one day a year when he would demand 6d merely to protect his property rights. In return he wanted the aldermen to ensure that the mouths of Manifold Ditch and Black Ditch remained blocked up, and agree to pay him or his miller 10/- every day they were not.⁸¹

Subsequent discussion and agreement are not recorded, and there is a distinct possibility that the two sides did not settle, for in September 1725 it is recorded that a barge, as a matter of course, paid a toll of 1/6 at the pound lock.⁸²

The reason for Byde's demands in 1707 are nowhere noted, but it may be that they were a response to alterations being implemented by the New River Company at this date, alterations which threatened to reduce the supply of water to his mills.

10.7 Encroachment by the New River Company

It is difficult to establish any precise sequence of events, but it can be shown that by the 1730s the New River Company had substantially increased the amount

of water they took from the Lea far beyond that authorised by the Privy Council in September 1669, and that they had done this without authorisation.

In August 1735 Dr Desaguliers⁸³ estimated that the Company were taking between 2100 and 2400 Tuns* of water an hour from the Lea. He contrasted this with 200 or 250 Tuns an hour which he thought the 1669 rulings allowed. Later he reduced this last estimate to 90 Tuns an hour.⁸⁴

No proper explanation was ever provided as to how this increase had arisen, but it is obvious that by 1730 the pipes were no longer there, and had not been for some time. Neither the bargemen nor the New River Company ever mentioned that the increase had been discussed and authorised, indeed the Company evaded the whole question.⁸⁵

The bargemen had made unspecified complaints about the abuses committed by the Company in 1681,⁸⁶ but there is evidence to suggest that they most probably removed the pipes some time during the first decade of the eighteenth century.

There was a major expansion of the Company's activities about 1708.⁸⁷ Such expansion and change would explain Byde's fears in 1707. In addition, it was about this date, bargemen recalled, that the Company had purchased land on either side of Manifold Ditch, and had erected a new turnpike, and a brick arch over their intake. An ideal opportunity to remove the pipes. Also, no Commission of Sewers was in existence at this date, so the bargemen would have less opportunity for immediate redress.⁸⁸

TABLE 4: BARGES PASSING THROUGH HERTFORD TURNPIKE

<u>Period</u>	<u>Toll collected</u>	<u>No. of barges</u>	<u>Comments</u>
1673	£1 10s 6d	42	A
1674	£1 8s 3d	42	A
29/9/1693-28/9/1694	£4 1s -d	81(est)	B
29/9/1694-28/9/1695	£4 3s -d	83(est)	B
1737	£5 7s -d	85 barges & 84 boats	C,D
1738	£4 2s 6d	53 barges & 59 boats	C,D
1739	£3 13s 6d	50 barges & 47 boats	C,D
29/9/1757-29/9/1758	£5 7s -d	107	E
29/9/1758-28/9/1759	£5 6s -d	106	E
29/9/1759-28/9/1760	£5 19s -d	119	E
29/9/1760-28/9/1761	£5 1s -d	101	E
29/9/1761-28/9/1762	£4 15s -d	95	E
29/9/1762-28/9/1763	£3 15s -d	75	E
29/9/1763-28/9/1764	£3 5s -d	65	E
29/9/1764-28/9/1765	£2 18s -d	58	E
29/9/1765-28/9/1766	£3 11s -d	71	E

A: Three tolls applicable:- 6d,9d,1/-

B: Assume one toll applicable:- 1/-

C: Two tolls applicable:- barges 1/-, boats 6d.
(sizes not specified)

D: Between 1737-1739 miller at Ware Park Mills carried wheat
from Hertford market to his mills 20 times toll-free

E: Based on toll of 1/- collected at Constants Weir

Sources: HRO, BHR, Vol 20 fos.622-23, Vol 39 fos.65,86-7, Vol 48 fo.42

Surprisingly there is no evidence of opposition to this illegal encroachment by the Company. No complaints were made to the Commission of Sewers appointed in 1719, although other encroachments made the previous decades were complained of. The only complaint on record is that in 1721 bargemen submitted a petition to Parliament complaining that the Company had arbitrarily erected a turnpike to divert water out of the Lea. This particular complaint is neither specific nor accurate, and indeed was part of a concerted campaign to oppose a bill to supply London with water from streams north of the capital rather than a proper attempt to solve any dispute with the Company.⁸⁹

Indeed throughout the 1730s when the bargemen were seriously considering how to improve the navigation, they made no complaint about the Company's increased intake of water. Rather than try to rescind or limit the Company's rights to the water, as they had done during the 1660s, they chose instead to formalise the encroachment, and obtain a rent from the Company for the water with which to improve the state of the navigation(see Chapter 14).

10.8 Use made of the river

Any hopes that were entertained during the Interregnum that Hertford could rival Ware if the navigation was improved were not to be realized. Table 4 opposite shows just how few barges used this stretch of the river, especially in the years just after it had first been improved. In 1728 Nathaniel Salmon emphasised

TABLE 5 : MONTHLY MOVEMENT OF BARGES AT HERTFORD

	1672	1673	1674	1675
January		4	3	4
February		2	1	5
March		3	2	5
April		2	9	5
May		8	3	4
June		2	4	6
July		6	1**	7
August	7*	2	2	
September	3	5	2	
October	5	-	7	
November	7	2	6	
December	2	6	2	

* 7 recorded on 29th & 30th, possibly up to 6 more earlier in month, although the six could have been spread over a longer period

** Written as 7/6 but in sequence for 7/7

Source:- HRO, BHR Vol 48 fo.42

	1737		1738		1739	
	Boats	Barges	Boats	Barges	Boats	Barges
January	7	8	6	11	3	3
February	5	6	8	3	4	3
March	6	3	5	2	3	6
April	5	4	3	3	4	4
May	7	5	1	3	4	3
June	5	2	4	4	5	2
July	6	3	5	2	2	5
August	9	3	4	3	2	4
September	11	14	5	3	4	4
October	6	24	7	5	5	8
November	11	8	6	5	5	3
December	6	5	5	9	6	5

* The difference between boats and barges is not recorded, presumably the former had a smaller capacity.

Source:- HRO, BHR Vol 39 fo.65

this point, commenting that the 'Lea is Navigable as high as Hertford; but Ware is the Place from whence and to which the Water-Carriage is most used'.⁹⁰ No data is available about the numbers of barges travelling to and from Ware, so no accurate comparison is possible.

For some of the years cited in Table 4 a monthly breakdown of toll income is obtainable. These are reproduced opposite in Table 5. They do show a tendency for the river to be busier in the months after the harvest, but this is not pronounced, and more impressive is the fact that the river was used throughout the year. Shortages of water in summer and bad weather in winter were not severe enough to close the navigation.

For the period between the summer of 1672 and the summer of 1675 the names of the barge owners are also recorded. These show that it was Hertford residents who made most use of the river above Ware, but barge owners from Ware, Stanstead and elsewhere were not uncommon visitors to the town.

The most regular users were Henry Stout, a Quaker maltster who made 64 trips during the period, Richard Thomas, a Quaker brewer, who made 15 trips and William Coxe, a dissenting maltster. All were residents and freemen of Hertford. On one occasion each, both Stout and Coxe took two barges downstream, with their wives possibly in charge of the second barge. There were other regular visitors who were not inhabitants of Hertford. A Mr Wilson made 10 trips, as did Thomas Burr, the Quaker maltster of Ware, and a John Perrot made 9.⁹¹

ADDENDA

In the closing paragraph of section 10.5 an unanswered query was raised as to why the City of London chose to support the Lea bargemen in their arguments with the New River Company, even though the supply of water from the latter was so important to the capital. In fact W.G. Bell's 'The Great Fire of London in 1666' recounts a story told by Bishop Burnet which might provide some hint about the City's attitude, even though the inconsistencies in Burnet's story, which have been emphasised by historians, means that the query is still unanswered.

In his memoirs Burnet made the following comments on the behaviour of the New River Company during the Great Fire, relying on information given to him by Doctor Lloyd and the Countess of Clarendon:-

The constant order of that matter was to set all the pipes a running on Saturday night, that so the cisterns might be all full by Sunday morning, there being a more than ordinary consumption of water on that day. There was one Grant, a papist, under whose name Sir William Petty published his observations on the bills of mortality: he had some time before applied himself to Lloyd, who had great credit with the countess of Clarendon, and said, he could raise that estate considerably, if she would make him a trustee for her. His schemes were probable: and he was made one of the board that governed that matter: and by that he had a right to come, as oft as he pleased, to view their works at Islington. He went thither the Saturday before the fire broke out, and called for the key of the place where the heads of the pipes were, and turned all the cocks that were then open, and stopped the water, and went away, and carried the keys with him. So when the fire broke out next morning, they opened the pipes in the streets to find water, but there was none. And some hours were lost in sending to Islington, where the door was to be broke open, and the cocks turned. And it was long before the water got to

London. Grant indeed denied that he had turned the cocks. But the officer of the works affirmed that he had, according to order, set them all a running, and that no person had got the keys from him, besides Grant; who confessed he had carried away the keys, but pretended he did it without design

William Maitland, who had access to records of the New River Company destroyed in a fire in 1769, pointed out that Grant was not admitted to the Company until 23 days after the Great Fire, and that the Clarendon family were not associated with the New River until 1670.

Besides these two comments, there must be further suspicion about the accuracy of this story. If it was true, it is incredible that such a story never emerged in the investigations and discussions that followed such a disaster. That it did not does suggest that the story was one of several papist rumours associated with the Great Fire.

Yet the fact that the supplies of water from the New River had not prevented the spread of the fire, whether justified or not, might provide some explanation as to why the City aldermen were so unsympathetic to the demands of the Company when they tried to secure their supplies of water from the Lea in the years immediately following the fire.

Bishop Burnet, History of His Own Time (6 vols, Oxford, 2nd ed, 1833), i.423-25; W. Maitland, History of London (2 vols, London, 1756), i.435-36; W.G. Bell, The Great Fire of London in 1666 (London, 1923 edition), 34-35, 73, 345-46.

CHAPTER ELEVENTHE RIVER BETWEEN WARE AND HACKNEY

This stretch of the river is treated separately for two particular reasons. It is this stretch which was always under the supervision of the Commissioners of Sewers for the river Lea, whatever the varying limits of jurisdiction of that body, and, unlike either the river above Ware or the lower tidal Lea, no other official body had any interest in the navigation.

Furthermore it is this stretch which was the most important part of the flash lock navigation throughout the period under consideration. Above Ware the navigation was not improved until the second half of the seventeenth century, and was never to be used as intensively as the river below Ware. Below Hackney the river was tidal, the problems of navigation were different and did not depend primarily upon the availability of flashes.

It must be admitted at the outset that it is for this stretch of the river during this period of time that the documentation is at its worst. Some problems are discussed below, but there must have been other problems and developments about which no hint even now remains.

11.1 Developments before 1660

As argued in Chapter 8 the flash-lock navigation had already been restored by the first years of the

century. However the location and number of weirs erected by this date cannot be established. Nor is there evidence of other weirs being erected at a later date during the first half of the seventeenth century. All that can be said is that probably there were fewer weirs and locks providing flashes than there were later on. A fuller description of the workings of this flash-lock navigation is provided in Chapter 13.

The restoration of this navigation did not pass without problem. There seems to be more evidence of conflict between bargemen and millers during the first decade of the century than is normally recorded along the Lea.

The millers at Cheshunt Mills, Henry Stapleford and Richard Shakerley, complained that bargemen were temporarily cutting off supplies of water to their mills by laying barges across the mouth of their head stream whilst other barges progressed along the river. This not only shut down their mills for the duration but led to shoals forming at the mouth of their head stream. This reduced their supplies of water permanently. When they remonstrated with the bargemen they were met with 'blowes and great threatninge speaches'.¹ A recognizance for the miller at Broxbourne, George Kympton, to give evidence against two bargemen suggests similar conflict.²

Then on Monday 26 May 1608 London's Lord Mayor complained to the Privy Council that 22 barges were laid aground along the river, many since the previous Tuesday, because the miller at Enfield Mills, amongst

others, was drawing too much water out of the river. The Lord Mayor wanted the Council to take action to restrain the millers.³ Ensuing developments are not recorded, but it should be noted that the bargemen complained to the City rather than to the newly appointed Commissioners of Sewers. Why?

The commissioners had been at work immediately before this exchange, for in April 1608 one of their number, Sir Henry Cock, wrote⁴

For the Brackes [breaches] and other disorders aboute the water of Ley, the Lor Denny and I with the reste, have taken order for the present and sufficient ammendment of them, soe that I hope the Marshes and Meddowes shalbe made dry enough to his Maties good likinge

James' personal interest in these problems of flooding arose because he had just acquired Theobalds House at Cheshunt. He was to express similar concern about local meadows in 1623.⁵

The forests which lined the valley along the middle sections of the Lea provided James with ideal facilities to pursue his love of hunting and hawking. Soon after his accession he insisted that a series of bridges were built along the valley solely for his private use, so that he could cross over the river whenever the pursuit required it.⁶

These bridges can only have hampered the bargemen's progress, but there is no evidence of any opposition until after the New River Company, with which James was closely involved, were given permission to tap the Lea (see 10.2). Then in July 1619 it was reported that the bargemen had destroyed most of these bridges, to the great inconvenience of the King. Lord Denny was ordered to rebuild them, and ensure that the bargemen responsible were both punished

and made to bear the costs of repair, but as a gesture to the bargemen he was also ordered to scour and cleanse the river.⁷ In 1631 the Privy Council had to write to Denny once more about the bargemen destroying these bridges,⁸ and it seems likely that many were finally removed by the bargemen during the Civil War.

The first skirmishes in the struggle over Waltham Turnpike were recorded during this period. At some date between 1626 and 1637 a series of questions were drawn up for the consideration of the Commissioners of Sewers. These questions, unfortunately incomplete and without answers, show concern to discover what decisions had been taken during the 1570s with regard to the navigation at Waltham, and whether the building of the turnpike by Denny had contravened these decisions. Furthermore the commissioners were instructed to consider whether the Lea 'ought to be a free passage...without payinge anye thinge for the same passage'.⁹

Thus the bargemen were already arguing that clauses in the act of 1571 entitled them to use the river without paying tolls, and were already concentrating on Waltham Turnpike as a test case, presumably because its 5/- toll was the highest along the river.

They had no success at this date, for in 1643 the turnpike was let to the miller at Waltham Abbey Corn Mills, Abraham Hudson, for £123 a year.¹⁰ However in May 1643 the bargemen took advantage of the Civil War to destroy the turnpike and other weirs along the river which belonged to James, Earl of Carlisle, Denny's heir.¹¹

Carlisle made his peace with the parliamentarians

in 1644 and was appointed to the Commissions of Sewers issued in 1645 and 1657.¹² Under such circumstances it might be expected that Waltham Turnpike was soon rebuilt. However there is some evidence to suggest that this might not have been the case.

Such speculation arises because bargemen complained to the Privy Council in 1666 that Edward Clayton at Waltham Turnpike was demanding a toll of 5/- instead of the 4d(sic) 'he had formerly had'.¹³ Soon afterwards the commissioners confirmed Clayton's right to collect 5/-.¹⁴ Various hypotheses can be forwarded to explain this sequence of events.

It is possible that the turnpike was rebuilt soon after its destruction in 1643, but that only a toll of 4d was allowed, as the bargemen pressed home their advantage during the changed circumstances of the Civil War. However, it could also be that the turnpike was not rebuilt until after the Restoration, and that the 4d that Clayton had formerly enjoyed was a toll he claimed as either a tenant of a fishing weir in Waltham or as a sub-tenant at one of the Waltham Mills. More evidence is necessary before such guesses can be properly evaluated.

Some of the damage to Carlisle's property in 1643 does not seem to have been repaired by the following decade. In June 1653 the Council of State, faced by a shortage of gunpowder during the 1st Dutch War, wrote to both the Commissioners of Sewers and to Carlisle asking them to allow John Freeman to erect a weir at Sewardstone to increase the water power available to drive newly erected powder mills there.¹⁵

Except to suggest that it seems unlikely there was ever any long term interruption to the navigation or any major decline in its use during these years, it is difficult to have any opinion about the traffic carried on the river.

One trend which did emerge was that larger barges were using the river. A list of barges in 1588 notes capacities between 26 and 42 quarters, yet in 1648 an elderly Hertford resident talked of barges carrying 60 to 80 quarters to Hertford during Elizabeth's reign.¹⁶ Since the nature of his reminiscing is about the large barges which once came up river above Ware, but could no longer do so (see 4.5 & 10.1), it seems probable that the capacities he quoted were those of the larger barges using the river in the 1640s. Whether this increase in size was gradual or whether it reflected a quick response to the realities of a newly restored flash-lock navigation at the beginning of the century cannot be posited.

11.2 The last half of the century: a row over tolls

The second half of the seventeenth century was dominated by rows about whether the millers and fishermen had rights to collect tolls in return for the assistance they provided the bargemen. The latter made persistent, but unsuccessful, attempts to revoke the customary rights to tolls. The main argument was over the 5/- toll at Waltham Turnpike, but the other lower tolls were also queried.

The toll at Waltham Turnpike was important not only because it was so high, but also because it was collected every time a barge passed through, hence the name turnpike.

Other tolls could only be collected if the miller or the fisherman had to provide a pen or flash of water at the request of the bargemen.

If the bargemen could revoke the right to collect 5/- at Waltham Turnpike, it would be a substantial reduction to their costs in itself, but it would also be an important precedent when they chose to query the validity of the numerous other tolls, which in 1667 the bargemen claimed totalled 30/- a trip.^{16A}

The basis of the bargemen's case was a clause in the act of 1571 which had been added by Parliament. This stated that boats 'shall have free Passage through the said Ryver, aswell the newe Cut as the older Ryver, without interruption molestacon, by reason of or for his or theyre Passage, as in other comone Ryvers and Waters they lawfully may do'. The bargemen argued that this meant that tolls were illegal because passage should be free, but the wording is obviously open to differing interpretations, and it is possible that it was only inserted to ensure that the City of London would forever maintain their canal once it had been built(see 2.2).

Such arguments had been first raised before the Civil War(see 11.1), but were further stimulated by developments after the Restoration. In May 1666 bargemen complained to the Privy Council that owners of weirs and locks had begun to demand higher tolls than had hitherto been customary.

Specific complaints were made against Thomas Worrill, a gunpowder manufacturer at Tottenham Mills,¹⁷ and Edward

Clayton at Waltham Turnpike. Worrill was accused of having drawn off so much water that 20 barges had lain aground for nearly a fortnight. Worrill was demanding tolls of 5/- or 10/- if they wanted to pass downstream, thereby hoping to encourage the bargemen to unload at his wharf and cart from there to London. Clayton was accused of demanding 5/- when previously he had been entitled to 4d(sic). It is difficult to explain this sharp increase, but some suggestions have been forwarded already(see 11.1).¹⁸

Of another seven, the bargemen complained that 'they severally exact fower times What they heretofore demanded'. From the order these names are listed and those who can be identified, it can be determined that the bargemen were complaining only about millers and weir-keepers along the upper river, above Waltham. Except for Worrill, they made no complaints about the lower river.¹⁹

This could be that there were fewer problems along this stretch of the river, there were certainly fewer weirs at this date, but it is also probable that the bargemen sensibly refrained from complaining to the Privy Council about mills along the lower river, most of which were producing gunpowder for the Ordnance.²⁰ There was a war on.

The Privy Council held a special session to hear these complaints, after which they referred them to the Commissioners of Sewers, instructing the bargemen meanwhile to pay only those tolls they anciently had paid. The Commissioners fixed the level of tolls in June 1666,²¹ but

no record of their decisions remain. All that can be said with certainty is that they confirmed the toll of 5/- at Waltham Turnpike,²² but a suspicion remains that they allowed some increase in the rates even if they did peg back those rates that the bargemen had originally complained about.

In October 1667 the bargemen returned to the Privy Council. They complained that the millers and weir-keepers had at first accepted the rates fixed by the commissioners but that they were now once more demanding higher tolls. To reinforce their demands they were deliberately manipulating the provision of flashes to force barges to lie aground if they refused. The bargemen stated it was now costing them 30/- in tolls to make the trip from Ware to London.

The Privy Council referred the dispute to a special committee which had been appointed earlier that day to arbitrate in disputes between the bargemen and the New River Company(see 10.5). In the meantime they issued instructions to the millers and weir-keepers to provide flashes at the rates fixed by the commissioners the previous year.²³ The deliberations of the special committee on this particular problem are not known, but since a petition in 1681 refers to the rates fixed in June 1666 as the norm,²⁴ it can be assumed that no changes were made.

The bargemen obviously resented this state of affairs, they were not alone. In 1670 Sir Robert Murray and Christopher Wren noted the high rate of tolls and the practices of millers and weir-keepers which forced

bargemen to rely on flashes more frequently than should have been necessary.²⁵ In 1673 the Kings Purveyor told Parliament he'd been informed of 'great impositions' on boats using the Lea.²⁶ Out of this resentment grew a new initiative, an attack on the rights of the owner of Waltham Turnpike.

In August 1678 Edward Hopkins, who described himself as a 'Carrier of Timber in his Barge for his Maty from Hadham Hall Parke to his Matyes stores at Deptford & Woolwich', complained to the Privy Council that on a journey to Stanstead to load timber his barge was stopped and chained up by William Moulton, lessee of Waltham Turnpike, because he refused to pay Moulton 35/-, the toll due for having passed through the turnpike seven times. Hopkins stated that the toll was contrary to the act of 1571 which stated that barges 'should at all times goe free up the sayd River'. Hopkins' complaints were referred to the Attorney General, Sir William Jones.²⁷

The bargemen later claimed that Jones had determined that they should have a free passage.²⁸ This seems improbable. If Jones had made such a decision it would surely have been discussed at the Court of Sewers held in 1682 to debate the whole question of the rights of Waltham Turnpike. It was not. What the commissioners did determine in 1682 was that at some date in 1678 or 1679 Waltham Turnpike had been pulled down illegally 'in an obscure manner by Persons unknowne'.²⁹ Rather a polite description for the bargemen's actions.

The bargemen had taken advantage of the fact that owing to long standing complex disputes about the estate

of the Earl of Carlisle, there was no undisputed owner of Waltham Turnpike for some years. During this hiatus the bargemen pulled the turnpike down, and although William, Earl of Kinnoull gained possession in 1679 it was not until 1682 that he took steps to rebuild it.³⁰

Not only did the bargemen enjoy a respite from the 5/- toll during these years, but in 1680 Hopkins, on their behalf, petitioned the Privy Council requesting an order for 'Freedom of Passage' along the Lea as accorded in the act of 1571. The attack had turned to the other weirs and mills along the river. The request was referred to the Attorney General, now Sir Creswell Levinz.³¹

Nothing suggests the bargemen achieved any success with this request, even temporarily. Indeed they met with problems at Waltham. In June 1681 the bargemen complained that the miller at Waltham Abbey Corn Mills was ignoring all customary practices regulating flashes, with the result that 19 barges had been stranded at Waltham for 12 days and more. The miller, William Everit, was refusing to accept the 1/- toll determined by the commissioners in June 1666, and was saying that he would not help them even for £40.³² Obviously the advantages of not having to pay the 5/- toll were offset to some extent by the fact that the bargemen no longer enjoyed any assistance from the turnpike.

By 1682 the Earl of Kinnoull was ready to reclaim his rights. A major debate was held before Commissioners of Sewers over whether he had the right to erect a turnpike and collect a 5/- toll. The commissioners' reasoning was faulty

(see 8.2), their decision was correct. They decreed that the turnpike should be rebuilt at the costs of its owner, and that he should be entitled to collect a toll of 5/-.³³

Within a year the turnpike had been rebuilt at a cost of £261 12s 1d, and let to Edward Clayton and John Bell for £120 a year. This rent was increased to £130 in 1685.³⁴

The bargemen did not accept this setback. In July 1683 they complained to the Privy Council 'of being oprest against all Law & Justice in their Navigation' by people cutting weeds or cutting open the banks, which meant that the flashes were less effective and their barges were often laid aground 'contrary to the Statute made in the 13th yeare of Queen Eliz for free passage thereon'. Were the bargemen themselves now putting a different gloss on the wording of the act of 1571 or is it just the way the minutes are recorded? Whatever, the complaints were referred to Lord Chief Justice Pemberton and Justice Wythens.³⁵

In October the bargemen returned to the Council, saying that nothing had been done since July because Pemberton had been removed. On this occasion they specifically complained about Waltham Turnpike once more. The matter was referred to the new Lord Chief Justice, Jeffreys, and Wythens, even though a new Commission of Sewers was in the process of being issued (see 9.2).³⁶

Jeffreys and Wythens held an investigation, to which the bargemen submitted a case. They argued that the turnpike was of no benefit to the navigation, but was an obstruction contrary to the act of 1571. They

quietly ignored the findings of the commissioners in 1682. Making no mention of the fact that there had been no turnpike for several years, they argued that in 1679 Sir William Jones had decreed that the navigation should be free, but that since then a new turnpike had been erected without any authority that they knew of, and a toll of 9/-(sic) had been demanded.³⁷ Since Wythens had presented their case to the commissioners in 1682 the bargemen may have hoped for a sympathetic hearing. They were to be disappointed. Perhaps Wythens had a good memory.

It was another ten years before the bargemen returned to the fray. In the meantime they had persuaded the City of London to pursue a claim to jurisdiction over the lower Lea, based on arguments that a new cut had been built by the city as a result of the act of 1571(see 12.1).

This mistaken claim was accepted officially in 1695 when newly appointed Commissioners of Sewers for the Lea were told that they had no jurisdiction over any part of the river to which the City entertained a claim(see 9.2). This was an important victory for the bargemen, it set a precedent that the act of 1571 had been implemented in part, they could thus concentrate once more upon arguing that clauses promising 'free Passage' should be implemented.

Their optimism on this occasion was noted by an opponent who commented that the bargemen 'have taken out this Commission in Order to have their Passage free, they have formerly been att it, but could never prevaile; but now many of ye Commissioners seeme to me to be their frends and what

will come of it i cannot tell'.³⁸

The bargemen fought hard to obtain a favourable commission. They successfully opposed the appointment of some weir-owners as commissioners, they successfully opposed the appointment of Thomas North as a surveyor on the basis that he had interests in weirs in the manor of Sewardstone, and later objected to North when summoned as a juror.³⁹ The changes in membership between the commissions issued in June and November 1695 are further evidence of lobbying, but it must be emphasised that the bargemen did not have it all their own way, several owners of weirs and mills still remained on the commission.⁴⁰

Further factors may have increased the bargemen's confidence. The Earl of Kinnoull who had inherited the turnpike in 1687 was a Catholic who had attended James in exile. Even though he had made his peace with the new regime, he may have been less able to defend his own interests as a consequence.⁴¹ Furthermore these years witnessed intense interest in river improvement and some concern with transport costs, both on land and river.⁴² The bargemen may have expected a sympathetic hearing for their attempts to reduce such costs.

They were to be severely disappointed, yet again. Of the ensuing debate, all that remains is a confused and incorrect defence submitted by the lessees of the turnpike.⁴³ But it can be stated with certainty that once more the commissioners rejected the bargemen's arguments that the toll at Waltham Turnpike was illegal, a legal case in 1703 shows that the toll was collected throughout this period

without interruption.⁴⁴

This was the bargemen's last attempt. After twenty years of repeated failure they had to accept that the owners of Waltham Turnpike, and other millers and weir-owners along the valley, had rights to collect tolls. The bargemen were later to complain about the increased costs caused by these tolls, but they never again questioned whether they had to be paid.

11.3 The last half of the century: some gleanings

A recent myth is that during the Great Plague of 1664-65 Ware bargemen played such an important role in feeding those who remained in the capital that they were later granted special privileges to navigate the Thames without the assistance of a Thames lighterman.⁴⁵ No contemporary evidence has been found to support either contention.

The sterling role of the Ware bargemen is not recorded by diarists such as Pepys or Evelyn, or recalled by a journalist of the calibre of Defoe. The bargemen themselves never mentioned these services in their numerous submissions to Parliament or the Privy Council during the ensuing century, even though such could only have helped.

It was not until 1700 that the lightermen had their privileges granted them, and the enabling act specifically exempted 'Trinity men, fishermen, ballast men, western barges, and mill boats, chalk hoys, faggot and wood lighters, and other craft carrying the same' from requiring the services of lightermen. Ware barges would seem to be included in this list. If they were

not, then why is there no record of any disputes about their exemption in the earliest minute books of the Company of Watermen and Lightermen, for Ware barges were travelling in and out of London during these years? The Company itself does not recognise any link between the privileges of Ware barges and the Great Plague.⁴⁶

The river did have a role in historical events at this date however. During the 2nd Dutch War (1665-67) colliers carrying coal from Newcastle to London were harried by the Dutch navy, and on occasions were unable to reach London. In July 1667 60 colliers had to put in at Kings Lynn, from whence the coal was carried by barge to Cambridge, by land to Ware, and then to London by barge. The total cost of carriage was 30/- a chaldron, of which two-thirds was expended on the short land haul between Cambridge and Ware.⁴⁷

Such problems had led the Privy Council in November 1665 to investigate the possibility of a canal between the River Cam or other rivers in East Anglia and the Lea or any other river which entered the Thames. The project was entrusted to Lord Arlington and Viscount Fanshawe, with technical advice from Sir Bernard de Gomme, the King's chief engineer, and Jonas Moore, an ordnance officer and son of Sir Jonas Moore, the famous mathematician.⁴⁸ The more pressing urgencies of defence and fortification must explain why the project was not pursued.

The Lea was to play another brief and unfulfilled role in the affairs of state. One of the Rye House plotters was Richard Rumbold, a local maltster, whose barges are recorded as using Hertford turnpike the previous decade.

When he put his mind to acquiring the arms with which to kill King Charles he first 'thought to make use of trusty Watermen of his acquaintance, who should lay them in the Boat and carry Oysters over them...up Ware River, and land them at, or near his own house'. Incidentally the only evidence that remains of such an up-river traffic. In the event this plan was not pursued, nor with the failure of the plot itself was his planned escape route, to ride down the unenclosed empty meadows which bordered the Lea all the way to London.⁴⁹

A final point to note about events along the river during this period is that despite the major attack on the rights to collect tolls, the bargemen themselves were well aware of the benefit of the flashes that weirs provided.

In 1666 a bargemaster, Thomas Hopkins of Waltham Abbey took out a lease on a fishery above Waltham. In 1672 he made proposals to build a new weir within the confines of this fishery, in order to provide an additional flash of water between Kings Weir and Waltons Weir. However the weir was not built. Similarly, in 1681 another bargemaster, James Flanders, leased a fishery in Chingford, and at some date before 1701 built a new weir along a part of the river where no weirs had previously existed.⁵⁰

11.4 In lieu of a Commission of Sewers(1702-1719)

The failure to get a Commission of Sewers to revoke the rights to collect tolls coupled with the suspicion that by this date riparian landowners had

already succeeded in shedding their responsibility for meeting the costs of maintenance(see 9.4) meant that the commission became less desirable to the bargemen. Alternative methods of preserving the navigation must have been encouraged, and it may be this factor which explains why no new Commission of Sewers was sought after the 1695 commission expired in 1702 on William's death. It was not until 1719 that a new commission was sought.

Sparse evidence suggests that during the intervening years the bargemen sought alternative methods, but that they sought to preserve the existing navigation, not to substantially improve it. This evidence emerges from a bill of complaint submitted to Chancery by nine Ware maltsters against six other Ware maltsters and bargemasters. No reply has been traced, and no other details have been found.

The bill of complaint shows that several bargemen, concerned about a deteriorating navigation, joined together to preserve the navigation themselves rather than petition for a new Commission of Sewers.

At some unspecified date several bargemen and maltsters entered into an agreement by each signing a promisory note for £5 to John Docwra of Ware, maltster. The agreement specified that five Trustees were to be elected, each party to the agreement having one vote for every barge owned. These Trustees were to first survey the river between Ware Bridge downwards and then were to:-

do as they shall think fitt by Accon at Lawe
 Indictment at any Sessions by Scoureing the
 said River where it shall be needfull or by
 any other Lawfull wayes or means as they or
 the majority of them shall think most proper
 for the regulateing the abuses of the Free
 Navigacon

The expenses of the Trustees were to be met by John Docwra. Further clauses specified that a quorum of three Trustees was necessary, but that a majority decision was sufficient for action to be taken. New Trustees were to be elected every six months.

The bill of complaint had been brought because, it was alleged, the six defendants had refused to honour their promissary notes and were combining with Docwra 'to defeate the...Agreement and make some Sinister Advantage to themselves'. The complainants wanted the court to see that the promissary notes were honoured and the agreement put into effect.⁵¹

The precise action that the Trustees were to take is not specifically stated, the vague wording suggests two possible courses. Having surveyed the river and decided what needed to be done the Trustees could then carry out the work themselves at the expense of the parties to the agreement or they could take legal action to ensure that others, presumably millers, fishermen and riparian landowners, were made to acknowledge their responsibilities and carry out the work at their own expense.

Were the bargemen trying to enforce orders of earlier Commissions of Sewers in the Courts? Were they arguing that millers, fishermen and riparian landowners had traditional responsibilities which the courts should enforce even if Commissions of Sewers were no longer

prepared to do so? Or what? Further evidence is needed.

All that remains is a brief note made in February 1705 by the defence counsel in a case, the Queen versus William Hulls, which states that

The Informacon brought for cutting a ditch in the River Lea...and thereby drawing the streame out of the said River in prejudice of the navigation and for other Neusance committed in the River whereby the navigation was destroyed

The notes stress that a jury was needed to take a view.⁵²

The court where this case was brought has not been determined, but the note does show that some sort of legal action was considered in order to pursue complaints which would normally be within the jurisdiction of a Commission of Sewers.

The above is the earliest evidence of the bargemen organising themselves to finance and preserve the navigation, a practice which was to be the norm for most of the early decades of the eighteenth century, until the act of 1739 was obtained. The absence of evidence makes it impossible to determine whether this organisation first arose after a conscious decision had been made not to obtain a new Commission of Sewers in 1702, or whether such informal organisation had existed previously, and merely adapted itself after deciding their ends could be best pursued without a Commission of Sewers. Under prevailing circumstances such self organisation was a sensible option(see 11.6).

The same absence of evidence makes it impossible to determine how effective this self organisation was in dispensing with the services of a Commission of Sewers, or indeed whether the bargemen were ever able to settle the squabbles which were displayed before Chancery in such

a way that did not weaken their efforts to preserve the navigation.

There is some evidence to suggest that the number of weirs increased during these years when no Commission of Sewers was at work. There are references to a new weir at Hackney about 1700, a weir which was then rebuilt about 1707 to accomodate a newly erected waterworks.⁵³ A new weir was set up at Sewardstone about 1703, though probably on the site of an old weir that had been removed some years previously.⁵⁴ In 1721 there were complaints about several new weirs,⁵⁵ whilst in 1737 it was said that once barges had been able to pass between Waltham and Old Ford without the assistance of flashes, but that now this could not be done, as weirs had been erected.⁵⁶

Similarly there is evidence that during these same years alterations were made to arrangements governing the intake of water to mills at Stanstead, Enfield, Sewardstone and to the Temple Mills at Leyton. All these alterations were designed to increase the amounts of water available to the mills at the expense of the navigation.⁵⁷

It cannot be assumed that these developments would not have taken place if a Commission of Sewers had been at work. The bargemen themselves agreed to the new weir at Hackney and the changes at Temple Mills, the weir at Sewardstone was allowed to stand after it was investigated by the Commissioners of Sewers appointed in 1719. Indeed these commissioners did not even investigate some of these supposed encroachments.

The advice given to the commissioners on their appointment in 1719, and the pattern of work they adopted, does suggest that the main reason this commission was

sought was not because the bargemen's organisation had been a complete failure, but because they were unable to deal with particularly intractable millers at Enfield and Sewardstone, and the additional authority of a Commission of Sewers was considered necessary.⁵⁸

This commission did investigate other problems, but the bargemen do seem to have been prepared to put up with these for some years rather than apply for a new commission. Perhaps the unusually dry summer of 1719 brought matters to a head.⁵⁹ A new commission was eventually sought, and issued in September 1719. Their method of work has already been considered (see 9.3), the problems they faced are dealt with below.

11.5 The Commission of Sewers at work, 1719-20

The problems with John Flanders at Enfield Mills were long standing, arising from changes he made about 1709 or 1710. He had then pulled down Enfield Lock, which stood across the mouth of his head stream, and moved it 5' further down this stream, laying the sill of the lock 2' deeper so that more water could pass down to his mills. To increase this flow further he removed much of the bank between the Lea and his head stream just by the lock, scoured the mouth of his head stream so that it was deeper than the main river, and dumped stones and earth into the river just below the mouth of his head stream.

So detrimental to the navigation were these changes that empty or partially laden barges coming up river had to ask that Enfield Lock be closed to allow them to pass, a thing they had never required before, and for which they had to pay a toll of 2/-. Flanders had also begun to demand

a toll of 2/- from barges coming down river, when by custom he had previously only been entitled to 1/- on Tuesdays, Thursdays and Saturdays and 2/- on Mondays, Wednesdays and Fridays.

Details of the arguments before 1719 are not known, but the legal advice to the commissioners suggests that it was expected that Flanders would either ignore or refuse to obey any orders, and that further legal action might be necessary. An accurate assessment.

Within a month of their appointment the commissioners had heard and deliberated upon the bargemen's complaints, finding them to be true on all counts. Flanders was ordered to raise the sill of Enfield Lock, rebuild the banks he had removed, and remove the rubbish he had dumped in the Lea. It should be noted that they seem to have accepted the increase in the level of tolls, for no orders were issued about these. Flanders repeatedly ignored the commissioners' orders with consequences which have already been discussed(see 9.3).⁶⁰

It is not clear whether legal action was ever vigorously pursued or what the eventual outcome of this dispute with Flanders was. No evidence has been found. It can be noted, with some surprise, that no major problems at Enfield were recorded after 1739. Had a satisfactory solution emerged during the 1720s?

The problems with Edward Parr at Sewardstone Mills were also long standing, again arising from measures to increase the amount of water driving the mills, some of which pre-dated Parr's purchase of the property in 1709. Side ponds had been built beside the head stream to act

as reservoirs, the width of the head stream had been increased from 15' to 36', and another ditch had been dug out of the river to supplement the power available.

Such encroachments meant that the miller began to demand higher tolls, 'at first One Shilling then Eighteen pence then Two Shillings & Six pence & this Summer five Shillings a Barge'. The bargemen had resisted these last demands, but had been left stranded 14 days as a result.

The commissioners decreed that the mouth of the head stream be reduced to 12', that a jetty sticking out into the navigable channel at the mouth of the head stream be removed, but allowed the side ponds to stand. They also insisted that Parr was only entitled to collect a toll of 1/-.

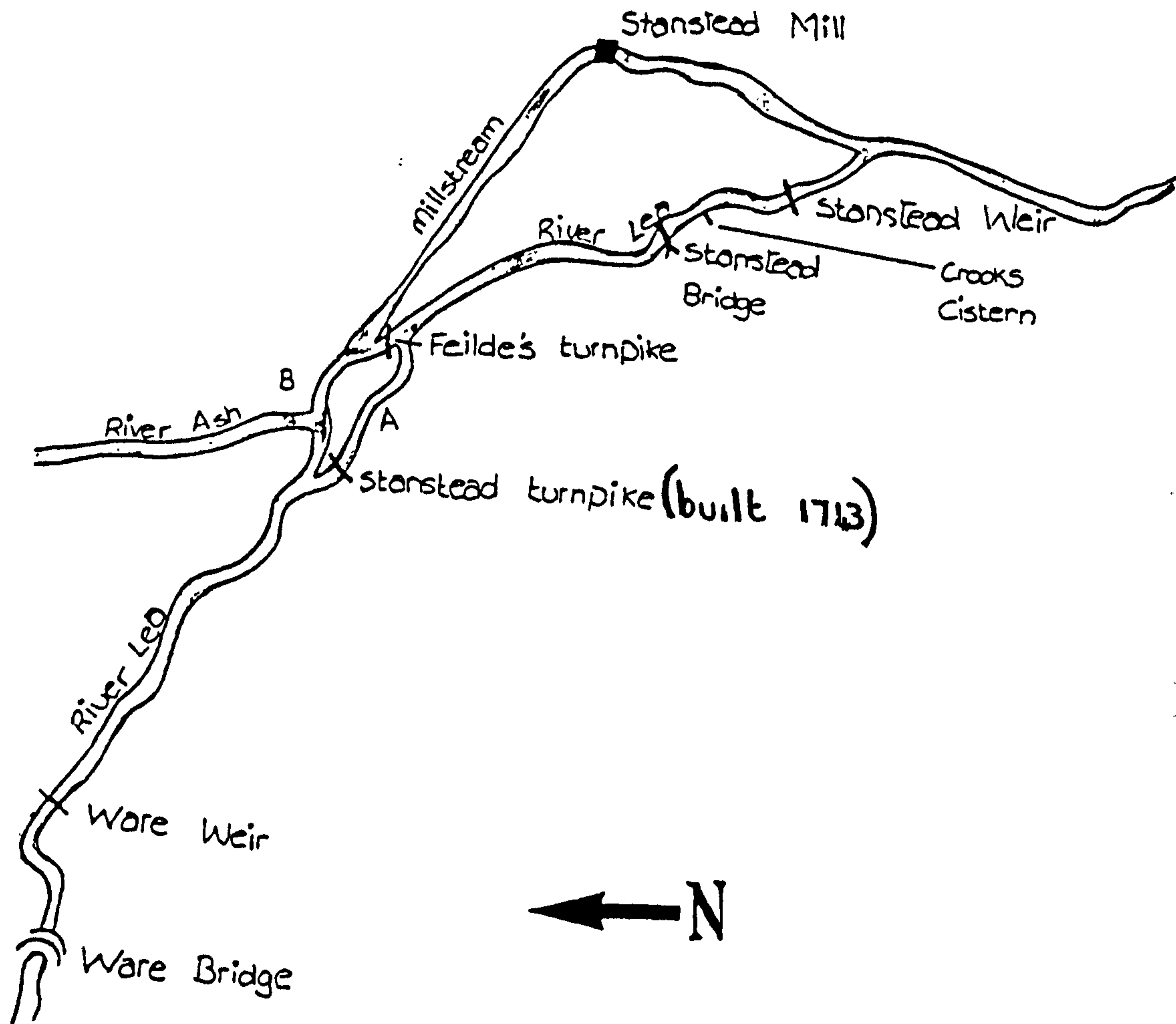
If these orders were ever obeyed in the first place, they were soon to be ignored. In 1725 Parr demanded, and was paid, a toll of 3/-, and by 1740 exactly the same encroachments at the mouth of the head stream were reported to newly appointed commissioners.⁶¹

The survey of the upper river in April 1720 noted many shoals near weirs, that many riparian landowners were taking more water out of the river, and that there were particular problems as a result of encroachments made by Michael Pepper, the miller at Stanstead Mills, and the Page family, who were tenants at Archers Weir and Dobbs Weir. All these problems meant that the bargemen had to rely on more frequent flashes of water to make their passage.⁶²

At Stanstead it was noted that the traditional navigable channel was silted to the extent it was :

FIGURE NINE: THE LEA THROUGH STANSTEAD

Scale approx. $1\frac{1}{2}'' = 1$ mile



impassable, that a point of land at the mouth of the head stream to Stanstead Mills had been extended into the navigable channel, to such an extent that most of the river was diverted into the head stream. Such had been the encroachment and natural deterioration that within the previous twelve years the barges had been forced to use the head stream rather than the traditional navigable channel.

At a subsequent Court of Sewers several bargemen gave evidence. They said that although it was only within the last 14 or 15 years that they had been forced to use the head stream regularly, they had used it before that during particularly dry seasons. They explained that shortly above the mill itself they entered a short cut which took them back to the river, and that along this cut the miller had erected a turnpike and was demanding a toll of 1/- from the bargemen for the use of this turnpike (see Figure 9).

The commissioners did not accept these developments, even though the bargemen had obviously acquiesced in them for several years. They ordered, with Pepper's consent, that the traditional channel should be used once more, and made the necessary orders. Yet by 1725 the miller was collecting a 1/- toll, the orders had been ignored.⁶³

Before considering other problems it can be noted that Pepper seems to have re-opened a route which had first been devised by the Commissioners of Sewers in the 1570s. It has to be admitted that the lack of evidence means that this can only be an educated guess.

The problems with the Page family were twofold. The bargemen had scoured the river in the autumn of 1719, but

by April 1720 shoals had built up, above and below their weirs. The bargemen suspected that the family had been throwing earth and rubbish into the river to assist the natural development of such shoals.

In addition Joseph Page had widened ditches next to Dobbs Weir so that great quantities of water flowed out of the river. Along one ditch he had erected a small weir, and was demanding a toll of 6d from the bargemen for shutting this weir so that water would not run to waste, this in addition to the 1/- toll he collected for a flash from Dobbs Weir.

The commissioners ordered that the ditches be dammed up with planks and earth to a height of 5', and that two pipes of 3" bore be placed in these dams to allow sufficient water into the ditches so that they could act as fences. The bargemen were to pay for the construction of these dams, but they were to be maintained thereafter by the local landowners.

These measures sufficed, but several months later the pressure of water burst these dams, and Page began to demand an additional 6d once more. The commissioners merely repeated their previous orders, but increased the height of the dams to 6' to give them added strength.⁶⁴

These and other complaints to these commissioners show a consistent pattern. Advantage had been taken of the absence of a Commission of Sewers to encroach upon the navigation. Such encroachments were to the advantage of their perpetrators, they obtained more water to drive their mills, to water their lands, and they were also able

to force the bargemen to request flashes more frequently and pay higher, or even new, tolls. It was the duty of the commissioners to redress this balance, but as has been seen, this did not mean that all encroachments were automatically removed. A spirit of compromise prevailed.

By November 1720 the local gentry serving on the commission had fulfilled their purpose. Many problems had been resolved, only Flander's persistent obstinacy remained. The commissioners never met again, although technically their authority did not expire until the death of the monarch in 1727. Once more the bargemen assumed a responsibility for the navigation.

11.6 The bargemen's responsibility, post 1720

Despite the efforts of the commissioners, there is evidence that the bargemen were still dissatisfied, for in March 1721 several maltsters and barge-owners from Ware submitted a petition to Parliament complaining

That the Navigation of the ancient River Lee... for several Years last past, hath been much obstructed and hindered, and is in Danger of being lost, by the Increase of the Shallows therein, the Neglect of scouring and cleansing the same, by the Millers and Weir-keepers cutting the Weeds growing on the said Shallows, by additional Tolls which the Navigators are forced to pay, by Incroachments of the Millers and Weir-keepers, and by the Erection of several new Weirs

A catalogue of woe which they wished to remedy by submitting a bill to secure and amend the navigation.⁶⁵

No such bill was ever submitted, and no other evidence of their intentions has been discovered. It can be noted that at this same date the City of London were considering a scheme to improve the river, but they too never presented the bill they had sought permission to submit(see 13.3).

The bargemen did return to Parliament, but not with an improvement bill, but with a petition against a scheme to supply London with water from rivers such as the Colne, Gade, Bulhorne, Chesham and other streams, amongst which was the 'River Lea, about Whethamstead'. Curiously this petition made no comment about these schemes, but complained about the amounts of water the New River Company were taking from the Lea.⁶⁶

Although nothing was accomplished in 1721, these two themes, that the existing navigation needed better preservation and that the New River Company bore some responsibility, were to emerge once more the following decade, when the bargemen sought an alternative method of maintaining the navigation. Their solution was the act of 1739, whereby the existing navigation was preserved and improved at the expense of the New River Company (see Chapter 14).

During the intervening years the bargemen continued to expend money on scouring and cleansing the navigation themselves, but few details are available. In 1737 the bargemen told Parliament that 'The Owners of Boats and Barges, and the Navigators, had raised amongst themselves, the Sum of £3000 which had been expended in removing the Shoals'.⁶⁷

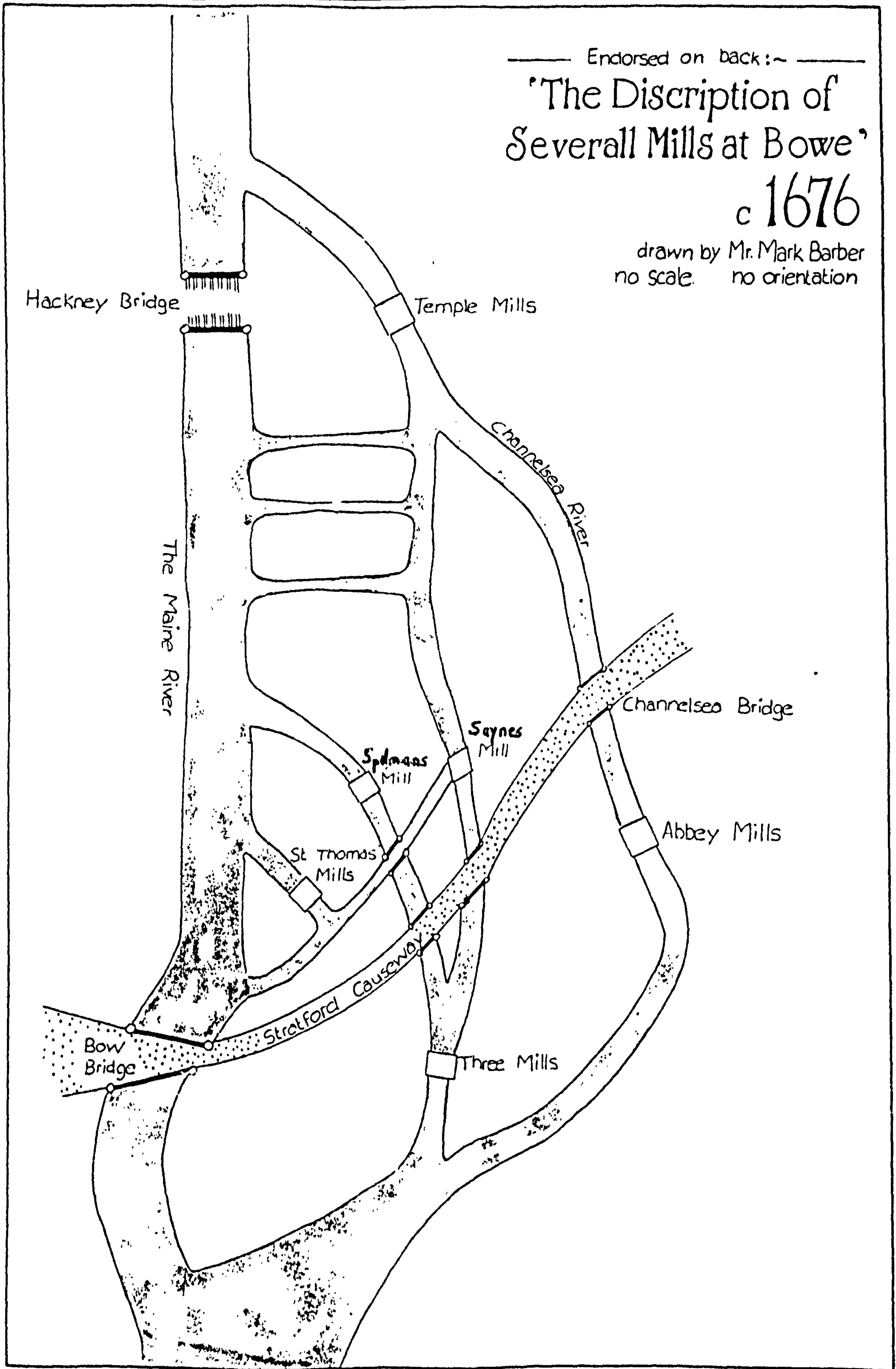
It is possible that this sum referred to all expenses since the beginning of the century, including those incurred in carrying out the orders of the commissioners between 1719 and 1720. Whatever, the Act of 1739 authorised a payment of £1000 to several persons⁶⁸ as recompense for expenses incurred in 'carrying on and executing a late Commission of Sewers' in 1719, on scouring and cleansing

the river since then, and on obtaining the act itself.

Such evidence shows that the bargemen had organised themselves to provide sufficient finance to maintain the navigation for some years. If, as has been argued earlier (see 9.4), the riparian landowners were able to divest themselves of any financial responsibility for the work ordered by a Commission of Sewers, then it was a sensible option for the traders who used the navigation to take on this responsibility themselves. Indeed it might have been their only option.

It has to be noted that it was many years before they too sought to divest themselves of the financial costs. It is unfortunate that the lack of record means that their method of organisation and work cannot now be properly determined.

FIGURE TEN: MILLS AT STRATFORD, 1676



CHAPTER TWELVETHE LOWER LEA12.1 The City of London's jurisdiction

The City had reason for a close interest in events along the Lea. Amongst the properties whose income was applied to the maintenance of London Bridge were two tidal mills north of Stratford Causey, Saynes Mill and Spilmans Mill(see Figure 10).¹ In addition the grain and malt brought downstream not only increased supplies in the London markets, but if landed at the City's legal quays, increased the City's revenue from the meteage dues paid on all water borne goods landed at London.²

In 1414 the City had claimed jurisdiction over the Lea as well as over the Thames and Medway, and their rights were recognised at this date.³ The City did pursue their claims with regard to the Thames and the Medway,⁴ but never again over the Lea, despite a close interest in improving the river in the reigns of both Henry VI and Elizabeth I.

Then in 1695 newly appointed Commissioners of Sewers for the river were told that they had no jurisdiction over those parts of the Lea 'inquirable into by any Custome or Speciall priviledge of the Citty of London', and this part of the Lea was vaguely recognised as the 'new Cutt near Hackney'.⁵

These instructions were an official recognition of the mistaken claim that the City had built a canal or new cut as a result of the act of 1571 when in fact they

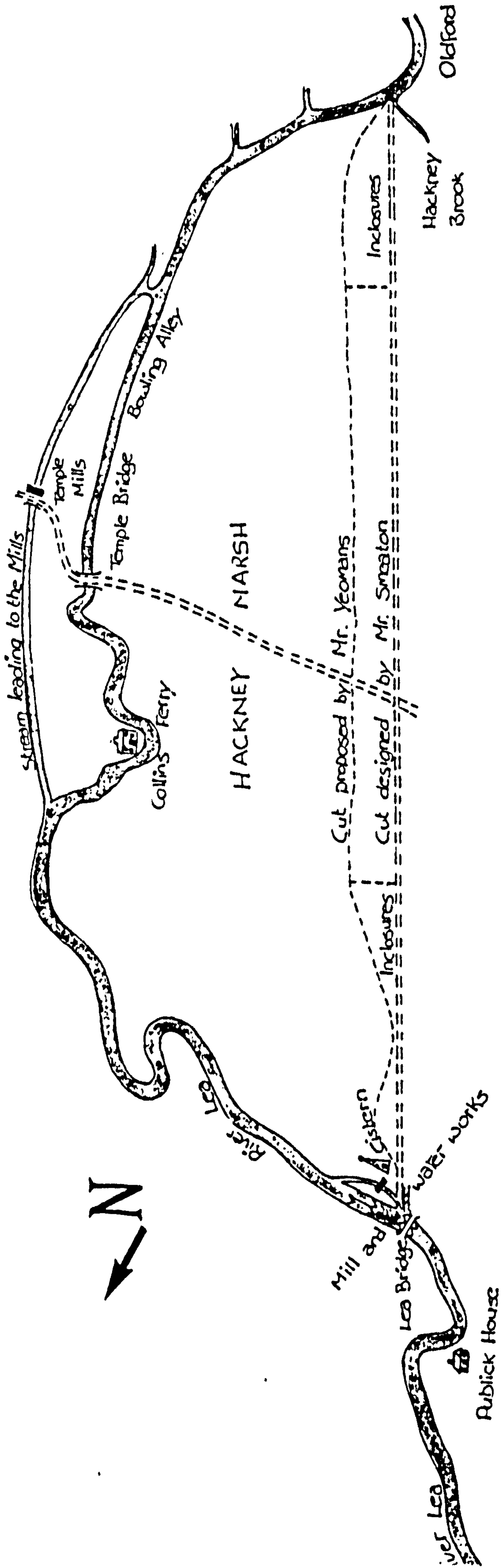


FIGURE ELEVEN: THE LEA AT HACKNEY, 1767

had not(see 3.1). Since it was recognised that they had built such a canal, the City were awarded jurisdiction over it, as specified in the Act of 1571. The City were to defend these claims until relinquishing them voluntarily in 1767.⁶

At no time were the limits of the City's jurisdiction precisely delineated. The City authorities themselves were somewhat vague about the exact extent of the new cut they claimed they had built, but in practice it came to be recognised that the new cut was the lower four miles of the river below the mouth of the head stream of Temple Mills, and more particularly that channel known as the Bowling Alley(see Figure 11).⁷

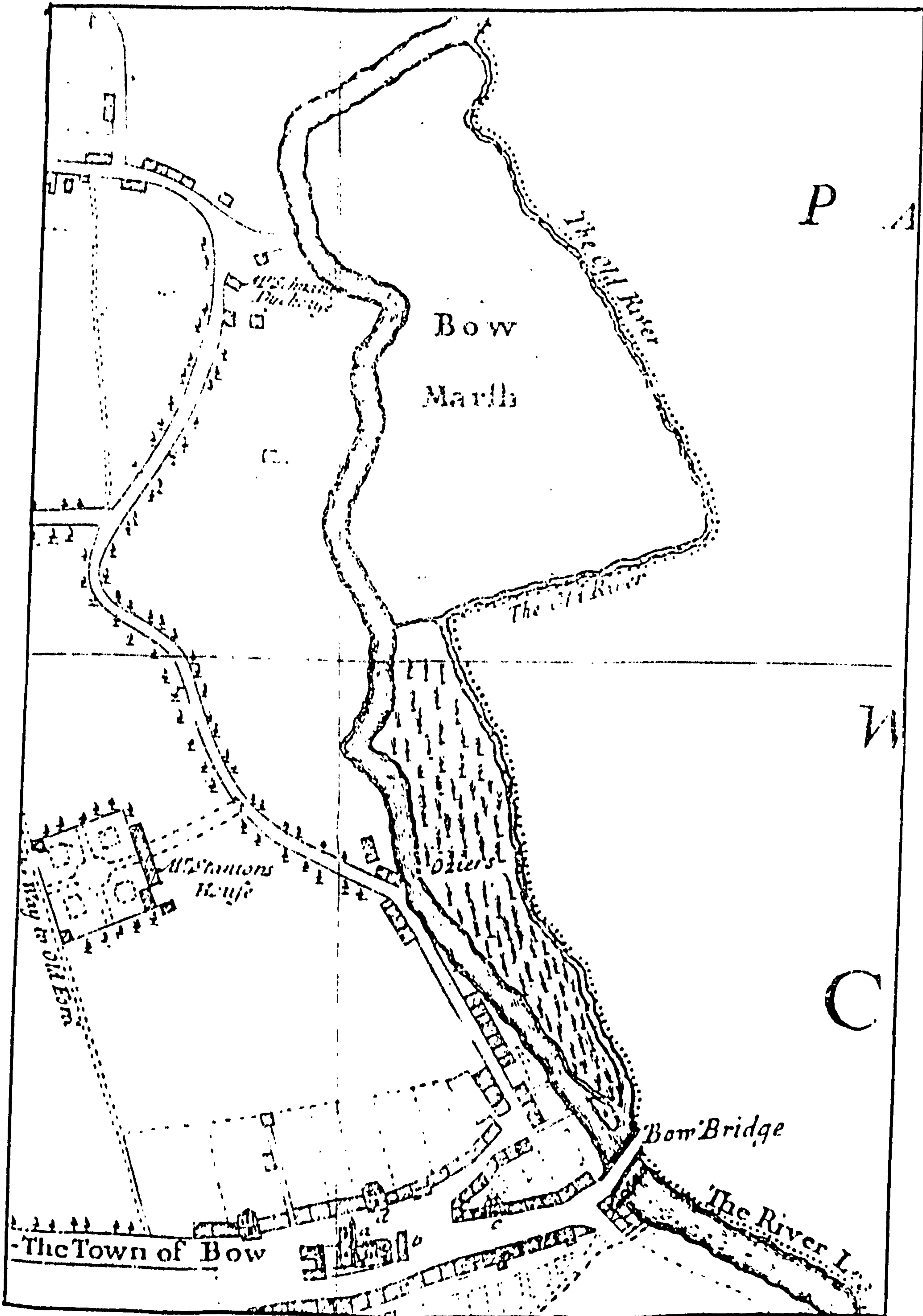
It must be that genuine confusion explains why this claim was pursued and accepted, but there must also be a strong suspicion that several circumstances combined so that the interested parties had varying but sufficient reason to press the claim and to ignore any evidence to the contrary. It is now the purpose to try and outline how these circumstances arose.

Much of the genuine confusion must have arisen because of the numerous channels into which the lower Lea split. It is difficult to provide precise evidence, but there must have been many changes to these channels, even if the basic pattern remained the same. Such changes arose both from natural causes and from alterations made by riparian land-owners and local millers.

Confusion over the navigable channel was long standing. In 1551 a Commission of Sewers set out to determine the traditional navigable channel, and one of the alternatives noted was different from those noted later.⁸ Then in 1575

FIGURE TWELVE: PARISH BOUNDARIES ALONG LOWER LEA

Extract from Joel Gascoyne's map of Stepney, 1703



commissioners were asked to consider 'w^{ch} is the water of Lee at the partinges benethe temple milles of ij Streames there is no special choyce to be made but by Deliberate vewe'.⁹

Some details of the confusion which was to arise in the seventeenth century can be discerned from a survey of the parish of Stepney made in 1703 by Joel Gascoyne (see Figures 11 & 12).¹⁰ Sufficient additional evidence has been found to make further comment, but insufficient to explain the confusion, and why certain channels were known locally as the old or new river Lea.

One source of confusion must have been that the county and parish boundaries in the area did not follow the traditional navigable channel as might be expected, but diverged at two points.

One such point was that the boundaries followed the millstream leading to and from Temple Mills rather than the main river (or Bowling Alley). Caxton and Norden do not show this on their county maps, but references in 1551 and 1614 noted as an established fact that the mills stood on the shire stream, and descriptions of the mills always noted that they stood in the parishes of Hackney in Middlesex and Leyton in Essex.¹¹ Further downstream Gascoyne noted that the boundary stood along 'The Old River' to the east of the main river at Old Ford. It is not clear what purpose this particular channel had, there is a possibility it had some connection with a tidal mill known as 'Landmylnes' which had once been part of the manor of Stepney, but had most probably fallen out of use by the early sixteenth century.¹²

Further evidence of this confusion emerges from Parliamentary Surveys of property confiscated during the Interregnum. The land between the main river and the tail stream of Temple Mills was known as Bullivants, Bully Fence, or other variants. In 1652 this land was described as abutting on channels known as 'New River of Lee' and the 'Old River'. Further downstream St Thomas Meade, land between the main river and the head stream of St Thomas Mills, was described as being 'surrounded on both sides with the river of Lee'.¹³

Just why such terms should be in local usage at this date has not been determined. It is difficult to imagine any authority which could have been altering the navigable channels during the first half of the sixteenth century, so it seems that such terms bore some reference to a confused memory of events during the 1570s. The weakness of such supposition is obvious, more evidence is necessary, but it can be noted that oral memory of events at Waltham in the 1570s can be shown to be wrong (see 8.2).

These local usages probably explain the instructions given by the London aldermen in 1654 that an investigation be held into 'the Citties power in any sort in and upon that pte of the River of Lee called the Newcutt'. Such concern arose out of fears that alterations at Temple Mills would prejudice the City's tidal mills further downstream, there is no reason to suspect that the City intended to establish jurisdiction over the lower Lea at this date.¹⁴

Nothing more is known of these investigations during the 1550s, and no interest in the 'new cut' is ever recorded

again until 1676. In the intervening years however the City co-operated with the Lea bargemen in their efforts to oppose the New River Company(see 10.5), and must have become aware of the use made by the bargemen of the Act of 1571 in their efforts to annul the rights to collect tolls, if for no other reason than that in 1671 Edward Hopkins presented his papers to the City.¹⁵

Then in January 1676 the aldermen expressed concern that a bargemen, Joseph Anger,¹⁶ was unloading malt at Hackney and carrying it by land to the capital, thus avoiding the meteage dues payable if it was landed at wharves along the Thames. City officials were asked to investigate whether such dues could be claimed from Anger, but also to discover 'what advantage may bee made to this City from the said River the Soil and profits whereof are vested in this City by an Act of Parliament made 13 Elize cap:18'.¹⁷

The City were thus investigating whether they had built a canal or not. The following month they set up a committee 'for the better Asserting the Cities Jurisdiction and Right to the River Lee and Regulating and Improving the same for the public Uses and benefit of this City'. Hopkins was instructed to attend this committee.¹⁸

This committee produced two distinct initiatives. A decision was taken to prosecute a Mr Graves who, it was argued, had 'taken to himself the whole benefit of Fishing in the River Lee Pretending to be Solely Intituled thereunto'. Graves probably held a lease to the fishing along the lower Lea from one of the riparian manors.

By threatening such action the City were claiming

that they had built a canal along the lower Lea and were thus entitled to the profits from the fishing. It seems unlikely such action was ever prosecuted, for debates in the ensuing decades show that the City were still trying to establish these rights, and it can be noted that in 1707 a John Graves enjoyed rights to moor his fishing boat at a wharf at Stratford.¹⁹

The other initiative arose from Anger's defence. He argued that he did not unload at Hackney to avoid the meteage dues, but was forced to because of the poor navigable condition of the lower Lea. This defence may have been disingenuous, there were several good reasons to unload at Hackney rather than sail all the way to London, but the aldermen chose to respond. They instructed their Water Bailiff to scour and cleanse the lower Lea, and over the next three years he spent nearly £300 on this work, and on completion was told to preserve the lower river in the future.²⁰ There is no evidence to suggest that the Water Bailiff did indeed follow this last instruction.

Whilst the Water Bailiff had been carrying out this work during the 1670s however, rows broke out with local millers who felt that the scouring, and particularly the deepening, of the navigable river threatened their supplies of water. These rows came before the Privy Council, who decided that a Special Commission should be issued to settle the dispute. They instructed the Attorney General that the preamble to this commission should include 'A salvo...as to the Rights of the said City to the said River by Act of Parliament'.²¹

This suggests official recognition of the City's

claims, but this was not to be. In fact no commission was ever issued to settle this dispute,²² and in 1681 rows over Bow Lock meant that the City once more appointed a committee to examine the act of 1571 and report what rights the City enjoyed. No report was ever minuted. Instead the dispute was referred to the Commissioners of Sewers for the Levels of Havering and Dagenham.²³

The City had failed to establish their claims, and for some reason were not prepared to pursue the matter further. These matters remained throughout the decade.

Then in 1690 a Dr William Savage informed the aldermen that the soil and ground on each side of the 'New Cutt from the River Lee to the River of Thames' was occupied by several landowners, and the fishing in the cut let by several local lords of manors, without any profit to the City. This, he felt, contravened the Act of 1571. Once more the City set up a committee to investigate.²⁴

This committee perused ancient records, surveyed the Lea, and also investigated what rights the City enjoyed along the Thames. By 1693 they were sufficiently confident to recommend that negotiations be opened with anyone willing to lease the 'Citties ground on each side' of the new cut. Negotiations with Savage began.²⁵

Then in July 1694 the Lea bargemen approached the City complaining about the tolls demanded at weirs and locks along the river which, they argued, contravened the Act of 1571. The bargemen wanted the aldermen to petition for a commission to scour and cleanse the river. This the City did, in August 1694, at the same time nominating the sixteen members they wished to see appointed, four

to represent the City, whilst the counties of Essex, Hertfordshire and Middlesex were to have four members each. The City added a rider that they were not to bear the costs of this commission.²⁶

The specific choice of sixteen members was a deliberate reference to the size of a commission specified in the Act of 1571. The bargemen and the aldermen had joined forces to use this act to pursue two separate claims. The bargemen wished to revoke the right to collect tolls, the City wished to establish a right of conservancy over their new cut.

In June 1695 a Commission of Sewers was issued, but with 45 members, not the 16 requested. However the commissioners were specifically told that they had no rights over any part of the river over which the City were laying claim.²⁷ This was a significant victory for the bargemen and the City.

Negotiations with Savage recommenced, and on 24 March 1697 agreement was finally reached. Savage leased from the City all rights to the fishing in their new cut and all rights to any profits which could be obtained from the land on either side of the cut. The City were to retain responsibility for the navigation. The lease was for 21 years, and Savage agreed to pay a peppercorn rent and a moiety of the profits for the first two years, and 1/- and a moiety thereafter. He accepted responsibility for maintaining the banks and the bed of the cut, as well as for a bridge in Hackney Marsh, most probably Temple Mills Bridge. He also promised to establish in law, at his own expense, the City's proper title to the new cut.²⁸

It was this last promise which was controversial. If the case was successfully established, then by the terms of the Act of 1571 the City would enjoy all rights to the fishing in the new cut and would also own all land on either side of the cut, up to a distance of 50 or 60 feet from the bankside. Existing landowners would resent such interference with their rights. Costly legal action could be expected.

The lease was extremely vague about what constituted the new cut, merely specifying

All that theire new cutt River comonly called the River of Lee alias Ware River extending and to be accompted from the old River called Ware River above the Town of Ware...downwards in and through the Countyes of Hertford Essex and Middlesex unto the River of Thames

Despite years of investigation, the City were still reticent. Not only were they leaving it to Savage to take the necessary legal action, which could be explained solely by their own financial difficulties, there is no reason to suspect that they were able to present him with the evidence he needed to prosecute his case. Perhaps the City were well aware of the weakness of their claims?

There were good reasons for all parties to pursue such vague claims, and to explain why they might be prepared to either ignore the lack of evidence that a canal was built or any evidence to the contrary. There is reason to suspect that the parties did not intend to pursue the claims resolutely when the lease was signed.

The bargemen were intent on revoking the right to collect tolls at Waltham Turnpike, based largely on an interpretation of a clause in the Act of 1571(see 11.2). If the City's claims, based on other clauses of the

same act, could be established, this would be a welcome precedent. In addition, such success would mean that the City was responsible for maintaining the navigation along part of the river, another important bonus.

The City authorities had reasons too. Their agreement with Savage did not commit them to any expenditure unless Savage was successful, but it did raise the possibility, however remote, that income would accrue to them in the future. At this date the City's financial position was so bad that legislation had been needed to protect them from imminent bankruptcy. Immediately following this rescue operation, private interests forwarded several schemes, all of which either offered to relieve the City of existing responsibilities in return for any profits, or offered them a share in some profit making venture in return for their support. Savage's proposals for the Lea must be seen as one of the more nebulous of these schemes.²⁹

Savage's motives were that he held the title to Temple Mills in Leyton and wished to improve this property. In 1700 he granted a lease to tenants to grind brazil-wood, redwood and logwood, raw materials for the local dyeing industry. In the lease he stipulated that if ever more water power was necessary, he would erect a weir across the navigable river. He assured the tenants that his agreement with the City gave him the necessary authority.³⁰

This tortuous conjunction of interests was to have no success. The bargemen did not secure the annulment of any tolls, the City never established any rights to the fishery or to the adjoining lands, and Savage was unable to accomplish his limited aims to improve

the mills.

Soon after the tenants occupied the mills, they asked Savage to build the weir. He hired workmen, and it was built for £150. However he met with fierce opposition from the bargemen. They complained to the aldermen, who instructed Savage to remove the weir. This angered his tenants, and the ensuing rows over their lease to the mills had still not been settled by 1707.³¹

By this date Savage was dead. His will, proved in August 1704, left a life interest in Temple Mills and most of his other property to his widow, Margaret, after which Temple Mills were to pass to his grandson, Savage Elderton. However the lease to the new cut was left not to his widow, but to his son-in-law, John Elderton.³²

Enquiries by the City discovered that William Savage had made no attempts to establish the City's claims in the courts, and that no profits had been obtained from the lease.³³ It is unlikely that Elderton pursued the matter. The lease must have been disregarded long before it expired in 1718, as were the claims that lay behind it.

The City later unsuccessfully argued that their rights along their new cut, in which they specifically included Bow Creek, entitled them to collect meteage dues on all malt and grain landed along the lower Lea,³⁴ but they were never to pursue attempts to claim either the fishing or any rights on the bankside. All that remained from all this activity is that the City acknowledged an undefined responsibility for the navigation along the lower Lea.

From all this evidence it is difficult to picture just what the City claimed or pretended they had done. Savage suggested, the Act of 1739 implied, and Griffiths, the Water Bailiff, confirmed, that the whole lower Lea below the mouth of the head stream of Temple Mills was the new cut. However comments by John Strype, and the policy pursued by the bargemen after 1739(see 16.5) suggest a more limited concept, namely that the new cut was that channel down to Old Ford known as the Bowling Alley. Of this channel Strype rightly noted 'it is more likely an antient branch of the Lee, and never cut by Art'.³⁵

Another clue to contemporary thinking is provided by a local historian, Sir Henry Chauncey, who had access to the interested parties. He wrote that he had been 'credibly informed' that the City had spent £80000 on building the new cut and improving the river.³⁶ Such tales suggest he had been talking with local fishermen.

Having acquired some responsibility for the lower Lea, the City was involved in subsequent events. Thus it was that the bargemen complained to them about Savage's weir, that the bargemen complained to them about a weir at Hackney waterworks in 1707, that the City played an important role in discussions over a tumbling bay next to the Three Mills between 1700 and 1715(see 12.3), that they inspected the rebuilding of Bow Lock in 1721, and also removed millstones which impeded barges in Bow Creek.³⁷

Such interest was always in response to requests from the bargemen, the City never took the initiative themselves. They did not treat the lower Lea the same

as they treated their responsibilities for the conservancy of the Thames and Medway. They never undertook annual surveys. Indeed in 1739 Parliament could be told that the 'City has never held any Court of Conservancy or laid out any thing to preserve the Navigation since their new cut was made'.³⁸ Unfair, and indeed inaccurate comment, but indicative of the City's attitude to the lower Lea. It should be noted that the bargemen themselves never insisted that the City regularly scour and cleanse the lower Lea until the 1730s and 1740s.

Even this limited involvement meant expense to the City, without any of the returns that had first stimulated their claims. Under such circumstances it might be expected that the City would easily relinquish their responsibilities. The bargemen assumed this when they submitted bills to Parliament in 1737, 1738 and 1739, but they were mistaken. The City fought hard to defend their vague rights along the lower river, and the bargemen were forced to compromise and amend their bill accordingly (see 14.2).

12.2 The navigation

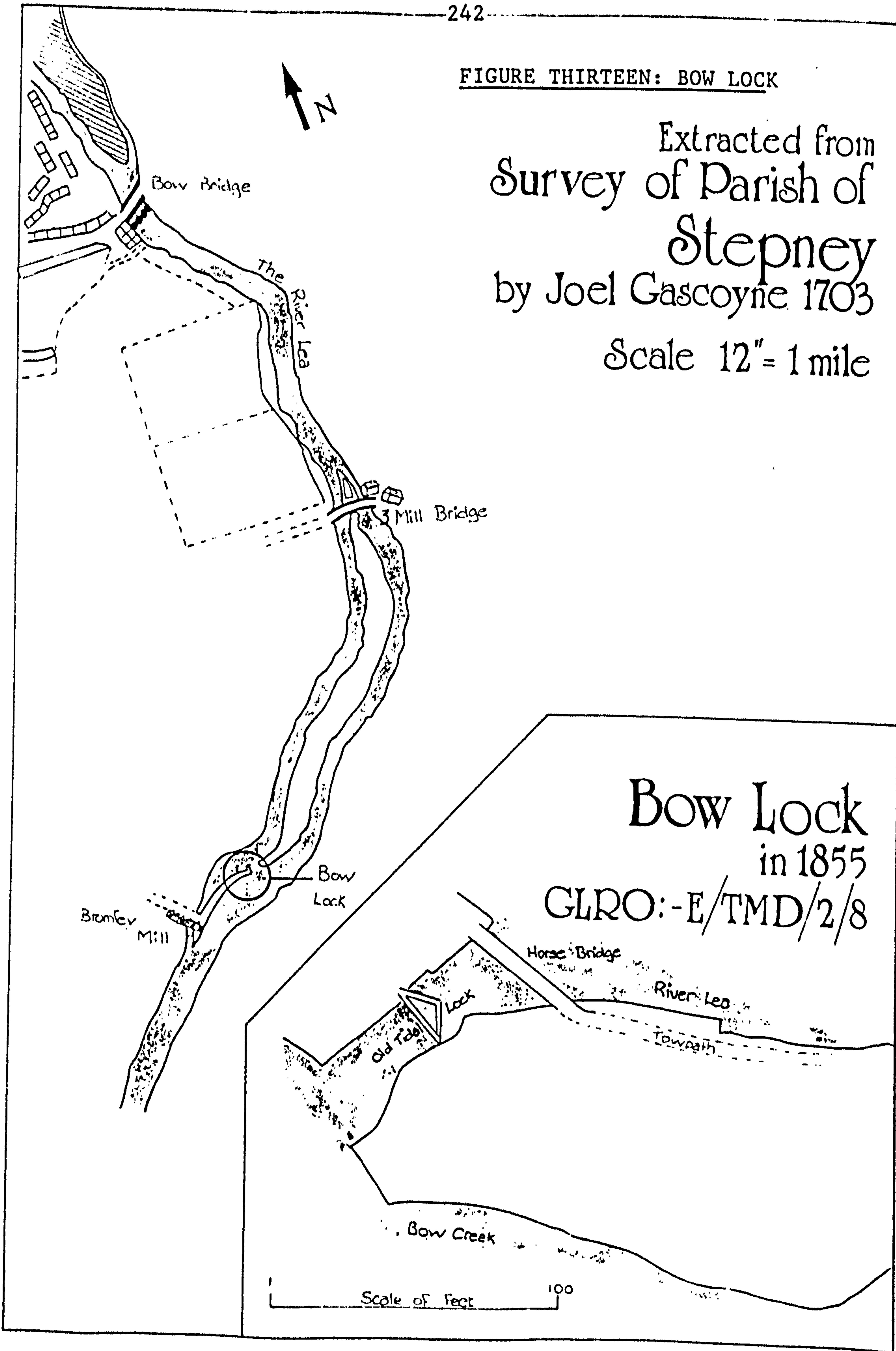
The feature dominating the navigation along the lower river was the ebb and flow of the tide as it was controlled by the operation of Bow Lock. Bow Lock was a tidal lock maintained and operated by the owners and tenants of the Four Mills at Bromley, but its operation also benefitted both the bargemen and the other tidal mills in Stratford.

Evidence suggests that though the construction of

FIGURE THIRTEEN: BOW LOCK

Extracted from
Survey of Parish of
Stepney
by Joel Gascoyne 1703

Scale 12" = 1 mile



the lock may have differed over time, the principle of its operation did not until it was replaced by pound locks in 1855. In that year the lock had a pair of gates as shown in Figure 13 opposite, as it did for much of the period under consideration, but there were times when it was merely a simple dam with removable flashboards in its centre.

The principle was that the incoming tide either pushed open the gates and flowed up the Lea or it was allowed in by the removal of the flashboards. When the tide had reached its peak and begun to turn then Bow Lock was shut, either by the turning tide forcing the gates shut or by the re-insertion of the flash boards. Thus the ebbing tide could not escape by the same route that it had entered.

Part of it escaped down the head stream feeding the Four Mills, hence its ownership, but the amount of water penned back by Bow Lock was such that much escaped down the head streams of the numerous other tidal mills in Stratford. Bow Lock thus controlled the operation of these mills, but to a lesser extent than the Four Mills.

It was during the period between the closing of Bow Lock and the time when the ebbing tide had escaped down the alternative channels that the barges came down the lower Lea from Hackney to Bow Lock. The increased depth of water behind the closed Bow Locks being essential to allow the barges to overcome the sharp fall in the river bed along the lower river and the remains of an old causeway at Old Ford.

Near the end of the ebb tide Bow Lock could be opened to allow the bargemen to pass down into Bow

Creek and on to the Thames on the last of the ebbing tide. It was over the opening of the gates at this point or the failure of a neap tide to force open the gates that most disagreement between the millers and the bargemen was to occur. The operation of the lock brought benefit to all parties, but the millers could hamper the speedy passage of the bargemen if they chose. An additional problem was that at times too much water was held back by the mills and Bow Lock, with the result that adjoining lands and sometimes even Stratford Causey were flooded.³⁹

There was a lock on the site from at least the reign of Edward 1, when it was said that Henry de Bedyk, the prior of Halliwell, whose priory owned the Four Mills first erected it. There were early arguments over whether the lock should be allowed to stand, and in 1345 and 1362 juries presented that it should be pulled down. Whatever the short term effect of such disputes were, the lock actually remained. A description in 1416 shows that it was a simple dam with an 18' gap for barges to pass through which could be closed by the insertion of flashboards, and there were no disputes over its rights to exist at meetings of the commissioners appointed in 1551.⁴⁰

The owners of the Four Mills rebuilt Bow Lock in 1573. Since the City of London had a close interest in the Lea at this date, it became involved in the work. The Dutch surveyor who was preparing a scheme for a Limehouse canal at the City's request was ordered to inspect the rebuilding plans, and a committee was

appointed to supervise the actual construction.⁴¹

In 1588 Lord Burghley noted that 'The lock at ye Boe do open at the first begyning to flow They shut it at the highest of the flood'.⁴² This does suggest a lock with gates opened automatically by the tide. Such an interpretation could be confirmed by complaints in 1581 that at neap tides the height of the incoming tide below the lock was so low compared to the river above that barges could not pass without Bow Lock being opened, yet the lock-keeper, on the instructions of the millers at the Four Mills, refused to do this.⁴³

Yet by the end of the century there are references to Bow Lock having 'eight rooms' in it, which suggests a dam with removable boards.⁴⁴ However the Four Mills estate had been allowed to decay during the 1590s during disputes over their ownership, and rebuilding of the estate was necessary when the new owner gained possession.⁴⁵

It is thus possible that a new type of lock had been built in 1573, but that it had decayed and been replaced with the more traditional type of lock by the end of the century. More evidence is necessary, and differing interpretations could be placed on the evidence available.

Evidence collected in 1713 shows that in the early 1660s Bow Lock was still a dam with removable flashboards, and that John Burton 'had 40s a year + the house to look after the flashboards'.⁴⁶

Soon afterwards major changes were made to these arrangements by the miller at the Four Mills, Robert Cowden. The sill of Bow Lock was raised two or three

feet, a pair of gates were erected, the river above the lock was narrowed from 40' to 18', and a lock above Bow Bridge may have been removed. Bow Lock was no longer a dam with flashboards, the principle whereby the gates were open and shut by the force of current of the water had been introduced, and thereafter retained.⁴⁷

Such measures increased the depth of water behind the lock, to the obvious benefit of the Four Mills, but had conflicting effects on the navigation. The increased depth was beneficial, but the heightening of the sill and the absence of a lock above Bow Bridge must have been disadvantageous.

Particular complaints emerge from evidence collected in 1712. One bargemen stated⁴⁸

he hath seen boats lay at the said lock for want of water 3 times in the space of 6 months the tides not being able to open Bow Lock it lay soe high and the back water lyeing soe heavy on the Gates that they keep out the Tyde

Other bargemen confirmed that this happened frequently at neap tides. Another bargeman stressed the problems of passing through the lock

Bow Lock is soe kept that if a barge be ever soe little above it at Ebb soe that he be not there Just as the Tyde Turns, the Tyde shutts the Gates and they are forced to lay there another Tyde although there is sometimes an hours Tide to good

In response to such complaints George Sorocold suggested that the sill should be laid lower so that the gates could open even at the lowest neap tide, but it was not until Bow Lock was rebuilt in 1721 that the sill was lowered, and then most probably not by as much as Sorocold had suggested. The City hired a surveyor to supervise this work, which was done by the owners of the

Four Mills, and marks were made so that the same sill height could be maintained for the future.⁴⁹

In 1766 John Smeaton once more recommended that the sill should be laid even lower, and the lock itself be rebuilt with two pair of gates. However no such powers were sought in 1767, and the principle of the lock's operation remained unchanged until replaced by a pair of pound locks during the 1850s.⁵⁰

Of the lock above Bow Bridge little is known. In 1551 a 'landmylles lock' stood along the river between Old Ford and Bow Bridge. In 1601 there were complaints about the 'continual lying open of the old lock above Bow Bridge' which suggests decay. During the 1660s it was owned by a Mr Beast(or Best) who died in 'the sickness year', after which the lock either fell into ruin or was pulled down by Robert Cowden when he rebuilt Bow Lock. It was never rebuilt.⁵¹

The precise ownership of the lock has not been discovered. Historically it seems to have been the property of a tide mill known as 'landmylles' which had disappeared by the sixteenth or seventeenth century. Whatever, its effect by this date was to pen back water so that barges could pass down through Old Ford with less difficulty and more water could escape down the head streams of the tidal mills above Stratford Causey. Its removal after the 1660s may have caused some problems, and during the debates over the tumbling bay in the first decades of the eighteenth century(see 12.3) proposals were made to rebuild this lock.

Shortly below the limit of the tidal flow at

Hackney the river split into two main channels, the traditional navigable channel down to Old Ford (known locally as the Bowling Alley) and the Channelsea which fed Temple Mills and Abbey Mills before merging with the navigable channel once more at Bow Lock.

The bargemen's passage down the Bowling Alley depended both on the tide and on the flash of water coming down from Hackney. On occasion they also needed the help of the miller(s) at the Temple Mills. After major rows about the expansion of milling capacity on this site, the Havering and Dagenham commissioners issued orders in 1627 that the miller(s) should shut down millgates and floodgates for a whole hour whenever the bargemen requested. They stipulated that no toll could be demanded in return for this assistance.⁵²

Millers further upstream were entitled to a toll on such occasions, so the explanation for this exception at Temple Mills may be that it lay within the confines of tidal waters. It is known that the bargemen voluntarily offered the miller a toll in 1743,⁵³ so perhaps there were other occasions when a toll was paid or demanded, just because it was so close to the limit of the tidal influence. None of the other tidal mills lower down at Stratford ever enjoyed such rights.

A further factor about the navigation along the lower Lea was that Stratford emerged as a port in the coastal trading network, although it was never officially recognised as such. Coastal craft came up Bow Creek to unload at Stratford for a variety of reasons. They could avoid the crowded Thames, they could deliver direct to the expanding industries in West Ham and Stratford, they

could tranship to smaller Lea barges for up-river carriage, and there were many areas east and north of London which were better or as easily served from wharves in Stratford as they were from the wharves along the Thames.

Little can be precisely determined about this development. In the absence of any official status as a port, data is not available. A study of the industrial development of Stratford, West Ham, Bromley and Old Ford in the seventeenth and early eighteenth centuries would provide many leads, but this has not yet been attempted.⁵⁴

Some idea of this growth can be obtained from the evidence available about wharves in the area. It can be assumed that all tidal mills in the area had their own wharves,⁵⁵ that many local industries acquired their own landing rights,⁵⁶ that there may have been a public wharf, but there were also many private wharves, both along the navigable Lea and the numerous millstreams in the area.⁵⁷

In particular the lower reaches of the Channelsea river developed important wharfing facilities. In 1648 William Cheyney complained that the Havering commissioners had granted him a liberty for passage of boats and lighters from the Thames up the Channelsea to a wharf at Charles Bridge, but that the miller at the Abbey Mills had built a bridge over the river so low that this passage was now severely hampered. The miller argued that the Channelsea was not an ancient right of way but a 'hired passage' for one year, but his arguments were rejected by the commissioners. Thereafter the miller had to allow such passage, and the locks at his mills had to permit the

passage of barges.⁵⁸

As early as 1633 a wharf at Charles Bridge was let, which was not necessarily the wharf that Cheyney was interested in. Richard Boswell who made proposals to improve the Lea in 1721(see 13.3) leased two wharves along the Channelsea, one at Charles Bridge, the other next to Abbey Mill. Whilst a map made in 1767 shows that there were wharves all along the Channelsea below Charles Bridge.⁵⁹

Further evidence of the expansion of wharfing facilities emerges from rows between the millers at St Thomas Mills and Spilmans Mills. Tenants of the latter could bring goods up to a wharf along their tail race, but access was hampered by a bridge leading to St Thomas Mill. During the 1640s this bridge had been supported by a 'Trussell in the middle'* which allowed only small craft to pass underneath. Thus all goods brought to the mill had to be transhipped at the bridge before they could be carried to the wharf.

About 1650 this bridge was pulled down and a new one erected by the tenant at St Thomas Mills. This bridge was 2' higher and had no 'trussell' which meant that larger craft could come up to the wharf without having to tranship their goods at the bridge. This was a distinct advantage to the tenant at Spilmans Mill who agreed to pay an annual rent of £4. There were later disputes over this bridge and the rental payment but the improvement remained.⁶⁰

Just as the City were concerned that barges coming down river from Ware were avoiding meteage dues by unloading at Hackney and Stratford, they were concerned

that coastal craft could avoid the same dues by entering the Lea and unloading there.

During the 1730s the City took action to close this loophole. Cases were brought against Harward Martin of Bromley, cornfactor and maltster, Peter Lefebure of the Three Mills, distiller, and William Moakes of Ware,⁶¹ maltster, and action against others was considered. All were charged with avoiding meteage and other dues on 5000 quarters (a purely nominal quantity) they had shipped from ports in East Anglia, Essex, and along the south coast.

The City's claims were based on arguments that the lower Lea was a 'new cut' over which they had the jurisdiction, and that they were thus entitled to the same dues that they enjoyed at the legal quays in London. The outcome of these cases is not known, but there is no later evidence to suggest that the City were successful in establishing such claims.⁶²

Some coastal craft did unload along the Lea, but how many cannot be determined. It can be noted that craft with a capacity of 300 quarters were said to use the lower Lea in 1676, considerably larger than the Ware barges which were said to be about 200 quarters capacity at most at this date.⁶³ Also it must be stressed many Ware barges did make the journey to London and returned with cargoes of coal and malt.⁶⁴ Loading and unloading along the lower Lea was only an option. It cannot be said which was the more normal.

12.3 The row over the tumbling bay *

This particular dispute is the best documented event

along the river before records improve after 1730. The dispute arose from the conflicting interests of various millers and landowners in Bromley and Stratford. It was only when proposed settlements to these disputes threatened the navigation that bargemen became involved, but thereafter they had sufficient influence through the City of London to ensure that the navigation became a major concern in the ensuing debate.

The original complaints were that the millers at the Three Mills and the Four Mills penned back so much water, above their proper allowance of $4\frac{1}{2}'$, that the lands further upstream were often overflowed and the three tidal mills north of Stratford Causey were unable to work efficiently by reason there was too much water in their tail streams. Such complaints were longstanding.

Normally the Havering commissioners responded to such complaints by insisting that the millers should not pen back more than the customary $4\frac{1}{2}'$, that they should open their locks and gates whenever floodwaters came downstream, and by imposing fines for persistent refusal to co-operate. However the millers at the Three Mills and the Four Mills frequently refused to co-operate, and often penned back more than $4\frac{1}{2}'$ of water in order to lengthen the time they could work their mills.

Such complaints were made to the Commissioners of Sewers in 1695, who repeated their normal orders and imposed a fine of £100 on Robert Cowden, the miller at the Four Mills. On this occasion however, the complainants, landowners and millers in High Meads and Mill Meads north of Stratford Causey, proposed that a tumbling bay be built as well.⁶⁵

This tumbling bay, or overshot as it was alternatively called, was a weir set in the bankside over which water could pour whenever the depth of water in the navigable channel rose above $4\frac{1}{2}$ ' , thus negating any efforts by the millers to pen back more than the customary allowance.

Interested in this proposal, the commissioners ordered a special survey to be taken three days later, a survey which was conducted by five commissioners and five jurors, with some millers and landowners in attendance. This survey recommended that a tumbling bay be built just below Bow Lock so that surplus water in the head stream of the Four Mills flowed into Bow Creek. This tumbling bay was to be 40' wide and was to cost £200, but no decision was taken as to who was to pay or who was to maintain it for the future.⁶⁶

When this survey was discussed at the next Court of Sewers Cowden and John Chinnal, the miller at the Three Mills, complained that they had not been present to put their case. Another survey was ordered. Nine commissioners attended on this occasion, including Sir Benjamin Bathurst who held an interest in the Three Mills,⁶⁷ and they reversed the findings of the previous survey. They held that the existing arrangements were satisfactory and that no tumbling bay was necessary. Their recommendations prevailed.⁶⁸

In 1701 however, the millers and landowners above Stratford Causey made similar complaints and proposals to the commissioners. After investigation they ordered that a tumbling bay be built, identical to that proposed in 1695, at the expense of the millers and landowners of

High Meads and Mill Meads.

The bargemen had been alarmed at these developments, feeling that the reduction in the depth of water above Bow Lock could hamper their navigation. They complained to the aldermen in July, and it was most probably as a result of ensuing representations that the final orders in August made provision for flashboards to be ready to insert in the tumbling bay, if ever it was necessary to pen back more than $4\frac{1}{2}$ ' for the benefit of the navigation. ⁶⁹

The tumbling bay was not immediately erected, for proponents of the scheme were unable to purchase the necessary land from the Bathurst family. It was not until August 1709 that John Key, the miller at St Thomas Mill, obtained possession of the land, and not until December that construction of the tumbling bay began after Thomas Hall had been hired to carry out the work. ⁷⁰

Immediately the bargemen complained to the aldermen who instructed their Water Bailiff to tell Key and Hall to stop their work. Since they ignored this approach, the City brought a writ of certiorari before the Queen's Bench and the court granted an injunction prohibiting work until after a proper hearing of the case.

This hearing took place on 19 June 1710, with the City presenting the bargemen's arguments that the tumbling bay reduced the amount of water in the navigable channel, making it difficult for barges to pass over the flats at Old Ford. However it was not these arguments that won the day. The court quashed the orders of the Commissioners of Sewers on a technicality, namely that it had not been specified whether the height of the tumbling bay was to be measured from its sill, from the bed of the river,

or from any other point.⁷¹

The commissioners immediately reconvened, and on 9 September 1710 they ordered that a tumbling bay be built 4½' high from its sill, reiterating that flashboards could be used to pen back more water if it was ever needed for the navigation. As a further response to the bargemen's complaints about the flats at Old Ford the commissioners also ordered that a lock be erected above Bow Bridge where one had stood until the 1660s.⁷²

These developments did not satisfy the bargemen. Once more they appealed to the aldermen, once more the aldermen responded, instructing their officials to prevent the tumbling bay being erected or to pull it down if a start had been made.⁷³

Work had already started. In anticipation of the commissioners' orders a lock had been built in a local carpenters yard ready to set up above Bow Bridge and the tumbling bay had been built behind the river bank, waiting only for the order to breach the bank. Proponents of the scheme were thus fully prepared to immediately implement the orders issued on 9 September.⁷⁴

Within a few days the tumbling bay was open and operating and the City had obtained and served another writ of certiorari prohibiting the implementation of the commissioners' orders. Disputes were later to break out over the exact sequence of events. Key and Hall argued that the bank at the tumbling bay had been breached because George Godfrey, the miller at the Four Mills,⁷⁵ had penned back so much water that the pressure had broken down the bank at some date before the City had obtained their writ of certiorari on 11 September or had served

it a day or two later. Godfrey maintained that the bank had stood firm until 14 September when Hall had breached it on Key's instructions despite having been served with the injunction.

Whatever the true sequence, the tumbling bay remained in operation. Godfrey was furious. On 4 October he tried to close the breach in the banks but was thwarted by Hall's workmen. He returned the following day, mob-handed. He was accompanied by thirty men he had recruited from the Mint, a place of sanctuary in the City where debtors took refuge, all of whom were in disguise, some 'having their perriwigs with their backsides before their faces others with masques on their faces and some with their faces besmeared with soot or other blacking'. Armed with swords guns and pistols, this gang broke into Key's property, cut the mooring ropes of his barges, and built a dam across the mouth of the tumbling bay.

The Commission of Sewers immediately ordered that this dam be pulled down, and Godfrey was unable to prevent the tumbling bay from coming into operation again. In February 1711 however, he once more took illicit action, sinking Key's barge and rebuilding the dam across the mouth of the tumbling bay. This time the commissioners did not immediately issued orders that it be pulled down. The tumbling bay remained closed.

Meanwhile litigation progressed. Key brought action against Godfrey in the county courts, Godfrey, with the City's help, brought action against Key in the Queens Bench. Godfrey was found guilty of trespass and was also charged with erecting the dam and removing Key's barge. Key was found guilty of contempt for continuing to work

after being served with the injunction.⁷⁶

This impending litigation may be one reason why the commissioners did not immediately remove the dam after Godfrey had built it for the second time, but there were other factors. Proponents of the scheme were in such financial difficulty that they were unable to take any initiative. Key had absented himself from his business to avoid the heavy fines and costs imposed by the Queens Bench.⁷⁷ Mrs Joyce, a tenant of the Bridge House at the adjoining Saynes Mill, had been ejected for non-payment of rent and had ended up in the Fleet prison.⁷⁸

Up until this date the City had always supported those who opposed the construction of the tumbling bay, but their problems with Mrs Joyce caused them to reconsider their position. She had always maintained that her problems would not have arisen if the tumbling bay had been built, for then her mills would have worked efficiently and she would not have fallen behind with her rent.

Eventually the Bridge House set up a committee to investigate. On 11 July 1711, about three hours after high water of a neap tide, this committee found that there was so much water in the tail streams of the two tidal mills belonging to the Bridge House that their wheels could hardly turn when the flash gates were opened. The millers stated that this was normal, and it was often much worse at spring tides. A visit to the Three Mills and the Four Mills established that their millers were penning back too much water, even though they had been forewarned of the visit and had drawn off some of the excess.

The committee then considered the commissioners'

decrees of September 1710, heard evidence from several bargemen about the state of the navigation during the short period the tumbling bay had been open, and took advice from George Sorocold. The committee concluded that both the tumbling bay and the lock above Bow Bridge were desirable.

The aldermen accepted these recommendations, and thus reversed their previous policy. Actions against Hall and Key in the Queens Bench were dropped immediately. However the aldermen insisted that the Bridge House were not just to support the commissioners' decrees of September 1710, but were to take fresh advice about possible solutions.⁷⁹

From these investigations a new initiative did emerge. Earlier proposals for the lock above Bow Bridge were retained intact, but substantial changes to those for the tumbling bay were favoured. No longer was it to act solely as an outlet for excess water above the height of $4\frac{1}{2}'$, it was also to permit the passage of barges instead of Bow Lock.

The tumbling bay was still to be 40' wide, but the 20' on the western side were to be laid as low as the bed of the river above Bow Lock. Barges could thus pass through the tumbling bay on all occasions, even at the lowest tides, which they could not do with the existing arrangements at Bow Lock. Gates were to be built in this half of the tumbling bay which would be of the same height as the other half of the tumbling bay. These gates would only be opened when barges wished to pass, thus Bow Lock would retain its function of controlling the flow of the tide for the benefit of the tidal mills.⁸⁰

During these investigations opinion amongst the bargemen was divided. Most felt that the lock above Bow Bridge would help them over the flats at Old Ford, but there were reservations about the need for a tumbling bay. Some argued that it would not improve the navigation and that it would make it more difficult to load and unload at the harbour next to Bow Lock, but as many favoured the tumbling bay.⁸¹

These new proposals were endorsed by the City in May 1712, and the Bridge House were instructed to meet the Commissioners of Sewers in order to proceed. In August the commissioners issued new decrees, but they merely re-affirmed their proposals of September 1710, they did not endorse the new proposals.⁸² It seems probable that the new proposals for the tumbling bay were dropped after legal advice that they interfered with the legal rights of the owners of the Four Mills to a level of water penned back by Bow Lock and that they constituted a new river or passage for barges which was outside the powers of a Commission of Sewers to implement.⁸³

The new orders issued in August 1712 were that a lock be built above Bow Bridge on the site where one had formerly stood, and that when this lock had been completed, and not before, a tumbling bay be built according to the specifications made in September 1710. The lock above Bow Bridge was to be a simple dam across the river, with four flood gates 4'10" wide, and one gate for the passage of barges which was to be 18' wide and have folding gates.⁸⁴

Once more the proposals were thwarted, this time by the landowners in Mill Meads and High Meads, the very same who had originally proposed the tumbling bay many years before. They objected to paying for the work, but most probably also objected to the prominence given to the problems of navigation rather than to their own complaints of flooding.

The landowners obtained a writ of certiorari, and at the ensuing hearing the Queens Bench quashed the commissioners' decrees on the grounds that they had no powers to charge local inhabitants for work which was designed to perpetuate and alleviate rather than abate a private benefit which was a nuisance. The work itself was not questioned, merely the method proposed for financing it.⁸⁵

Such an impasse left room for private initiative, and in October 1713 George Fry, a citizen and clothworker of Broad Street, offered to erect the lock above Bow Bridge at his own expense provided the City promised to defend and finance him if there was subsequent legal action. The City welcomed this offer. Fry made no offer whatsoever about the tumbling bay.⁸⁶

Fry's offer seems to have arisen as a result of his interests in local tidal mills. After a couple of years of legal problems Fry completed the purchase of the Three Mills in 1714. He made unsuccessful offers for leases to Saynes Mill and Spilmans Mill in 1712 and 1714, and obtained the lease to Saynes Mill in 1720, although his financial problems meant he was unable to enter the property. He was also the father-in-law of John Key at St Thomas Mills.

A lock above Bow Bridge would benefit all these mills, his private interest is obvious. His failure to obtain a lease to Saynes Mill or Spilmans Mill in 1712 or 1714 most probably explains why he never erected the lock at this date. However when he obtained a lease to Saynes Mill in 1720 he resurrected the scheme, for when he gave up this lease in 1722 he agreed that the 'Framed Timber intended for a Lock' should be left on the premises.⁸⁷ It was never erected.

The fact that no lock was erected by Fry or the succeeding tenants meant that the proposals for the tumbling bay fell into abeyance. The matter was never raised before the Commissioners of Sewers after August 1712, and there is no evidence to suggest that it was ever again seriously considered. After twenty years of argument, investigation, discussion and decision nothing had been achieved. The conflicting interests could not be resolved in this way, and the traditional orders about the height of penned water and the opening and shutting of gates had to suffice.

CHAPTER THIRTEENAN ADEQUATE FLASH-LOCK NAVIGATION13.1 The operation of the navigation

Once the experimental Tudor improvement scheme had been jettisoned, the navigation once more reverted to the traditional reliance upon pens and flashes of water provided by weirs and mills along the river. This system remained in operation until 1767. It was only then that the Lea was canalized by the introduction of pound locks and navigation cuts, a late date for such developments compared to other navigable rivers in England.

The map of the river made in 1741 by William Whittenbury (Map 1 folder at back) shows just how numerous were the turnpikes, weirs and mills which could provide assistance to the bargemen if necessary. However by this date the number of fishing weirs had grown substantially compared to the first half of the seventeenth century, particularly along the lower river below Waltham (see 11.3 and 11.5). The provision of pens and flashes thus became more frequent, and with the growth in the size of the barges, became more necessary as well, but the lack of evidence means that this trend cannot be properly evaluated.

The most important component of this system of navigation was the assistance provided by the turnpikes and fishing weirs which stood across the navigable channel. Precise details of their construction during this period

are not known, but they were built in such a way that they could act as temporary dams if necessary. A gap of between 14' and 18' was always left somewhere in the weir or turnpike so that barges could pass through, and this gap could always be closed by the insertion of boards known as flash boards or by the operation of a guillotine gate. All turnpikes built from 1730 onwards had guillotine gates, before that there is no evidence.

When barges were coming downstream the bargemen could request that the flash boards be inserted or the gate closed. This meant that water was penned back behind the turnpike or weir, and the increased depth of water that resulted enabled barges to pass down to the weir or turnpike. The gap could then be opened once more to allow the pen of water to pass downstream. The barges would wait for the initial surge of water to abate, and they would then ride through the gap on the 'flash' of water, taking advantage of the increased depth of water immediately below the turnpike or weir and the current of the flash to carry them downstream towards the influence of the next weir or turnpike.

Coming upstream, either empty or much more lightly laden, the barges might need a flash to bring them up to a turnpike or weir even though they had to pull against the current. Then having pulled through the gap in the weir or turnpike, they might need it to be shut so that a pen could build up and provide a sufficient depth of water for them to continue upstream.

Thus the pen of water provided by the turnpike or weir was as important as the flash. Both increased the

depth of water in the river, and so allowed the barges to pass over shoals which had built up along the river bed or through particularly shallow stretches. Indeed when water was particularly short, in hot dry summers, no movement at all was possible without the assistance provided by the weirs or turnpikes.

Yet there were other times when there was sufficient water in the river, enabling the barges to move without the assistance of the weirs or turnpikes. The bargemen would then not have to request that the gap in the weir or turnpike be closed. Indeed customary practice was that the weirs and turnpikes had to be left open so that flood waters could pass downstream without interruption. Otherwise adjacent lands would be flooded.

Although turnpikes and weirs both provided the same assistance, there was a distinguishing feature. Turnpikes, of which there were two at Hertford and one at Waltham, were built specifically to assist the navigation, and by custom a toll was payable by every barge that passed through them. Fishing weirs on the other hand were built to increase the catch of fish within a private fishery, and had been adapted so that they could allow the passage of barges and provide assistance as well if necessary. The custom was that tolls were only payable to the owners of fishing weirs if they had been closed to provide a pen and flash. If barges could pass through without such assistance then no toll was payable.¹

It was thus a temptation to weir-keepers to take steps to ensure that such assistance was required, a temptation which was not resisted. Shoals which built up naturally

above and below weirs were not scoured, even though it was customarily the responsibility of the weir-keepers to do so. Indeed they often assisted the process of shoal formation by throwing in earth and stones from the banks. They also cut weeds in the river below the weirs so that the flashes of water passed downstream more quickly and thus exhausted their effect quicker than they otherwise would have done. Adjacent weirs were brought within the control of one tenant, who could then refuse to provide a flash at one weir unless the bargemen would pay a toll for the other weirs, even though they did not need assistance from these. Every Commission of Sewers must have heard complaints of such practices.²

Another component of this system of navigation was the assistance that could be provided by the mills along the river. An unusual feature of the Lea was that mills did not possess locks in the navigable channel, as was customary along many other rivers. The only exception was the pound lock next to Ware Mills, and this had been erected as part of a special agreement made when a new route was opened(see 10.3). It can also be noted that Waltham Turnpike was most probably first erected as a lock to benefit Waltham Abbey Corn Mills, and indeed continued to function in this manner, but it was usually let separately from the mills, and was rarely under the control of the miller.

Despite this, mills did provide valuable assistance, particularly during dry weather. Mills at Broxbourne, Cheshunt and Enfield had locks across the mouth of their

head stream which could be shut when barges approached so that all the available water could be concentrated in the navigable channel whilst barges passed. Once they had passed the locks would be opened, to supply power to the mills once more.

Other mills, which did not possess locks near the mouths of their head streams, could still close down their mill gates when requested, in order that water could be penned back to such an extent that the depth of water in the navigable channel increased. In addition all mills could be asked to manipulate their gates in such a manner that a flash of water could be made available from their tail stream.

Such assistance had only a marginal effect compared to the pens and flashes provided by weirs and turnpikes, and was most probably requested less often. Nevertheless such assistance was at times essential, and when it was, the millers were entitled to a toll, as compensation for the loss of power or other inconvenience that such arrangements involved. It is almost certain that these arrangements differed at the various mills, depending upon the structure of the mill and the lay out of the head stream, but the only evidence of the exact arrangements which survives is that applicable to Broxborne Mills shortly before 1740:-³

the Navigation is difficult to Barges heavy laden, especially in a dry season, the Water being then very shallow, and therefore time out of mind they have had Flashes from three several Locks upon the Mill Stream; the first of these called the little Lock is built at the upper end of the mill stream, the other lower...the great Lock, the third is near the mill & is called the back Gates(.) When

the Barges require water of the miller they have constantly paid him three shillings for drawing these three gates, the uppermost of which seems to have been built for the sole service of the navigation and when lately decayed was rebuilt at the desire of the Navigators by the Tenant of the said Mills...these locks or Gates are built & kept in repair by the owner or occupier of ye Mills & ye Flashes are never refused ye barges paying the accustomed price

Tolls were some recompence to the miller for the interruption to his working, but too persistent interruption would have been too damaging. There is some evidence that suggests that arrangements were in force to restrict such a possibility.

It has been noted that before 1713 the miller at Enfield Mills had been entitled to a toll of 1/- for closing Enfield Lock(at the mouth of his head stream) on Tuesdays, Thursdays and Saturdays, but 2/- on Mondays, Wednesdays and Fridays.⁴ In 1767 Parliament were told that the arrangements at Waltham Abbey Powder Mills were 'the Stated Days for this Supply of Water are Wednesdays and Sundays, but in short Water Times, Sundays only'.⁵

If such restrictions were general, they would the better ensure the co-operation of the miller, for they would restrict interruptions to his power supply to certain pre-determined days of the week. Such restrictions would not be too disadvantageous to the navigation, for the assistance from the mills was not that important, except in dry weather, and the bargemen could adjust their schedules to take such restrictions into account.

It should be noted that the millers were as adept as the weir-keepers at improving their own situation at the expense of the bargemen. They widened and deepened their head streams, they threw earth and stones into the

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TABLE 6

'Account of Locks & Wears on Lee River taken Friday Saturday
& Sunday 4,5,6 September 1725'

Numerical progression	to whom they belong	Names of each	Sum paid
1	Mr Byde	Priors Lock above Ware	1 6
2	Mr Byde	Ware, below the town	1 -
3	Mrs Field	Mrs Fields Lock belongs to Stansted Mill	1 -
4	Mrs Field	Stanstead Ware	1 -
5	Mrs Field	Fields Lower Ware	1 -
6	Mr Archer	Pages Middle Ware	1 -
7	Mrs Plumer	Ford's Ware	1 6
8		The King's Ware	now no pay
-*			
9		Holyfield Bridge	
10		Woolastons bridge	
		Sometimes a Ware	
-**			
11		Waltham Turnpike	5 -
12		Flander's Frame	1 -
13		Pigborn's Ware with Sluices	1 -
14		Enfield Lock	2 -
15	Mr Parr	Suistons Mill	3 -
16		pigborn's Lower Ware	1 -
17		Flanders Ware	1 -
18		Bleakhall Ware	1 -
19		Higham Hill Ware	1 -
20		France Ware	1 -
21		Lowen's als Abraham's Ware	1 -
22		Tisons Ware	
23		Jeremy's Ferry	1 -
24		Bow Lock	

* Cheston Locks, 4 feet wide 3 feet deep 18 inch head

** Coopers Lock, 2 feet wide

Source:- Thames Water Authority Stronghold, Box 81 no.354

navigable channel so that more water flowed down to their mills, or built piers into the navigable channel to the same effect. The example of Stanstead Mills (see 11.5) shows the lengths they were prepared to go to.

The importance of flashes to the navigation, and their cost, is emphasised by the document reproduced opposite, an account of a three day journey down the river detailing the mills and weirs which provided assistance on that journey in September 1725.⁶ That this was the expected time for such a journey, if the conditions were favourable, is confirmed from other sources. In July 1733 a newspaper report stated that the extremely dry weather meant that 'Barges that generally come from Ware in less than two days, were then about a Fortnight in coming down, being obliged to wait for Flashes'.⁷ In 1698 John Houghton made calculations about traffic on the river which assumed that a round trip between Ware and London took about a week.⁸

To achieve such a regular timetable at times when insufficient water, flooding or frost did not otherwise prevent it, the co-operation of the miller, weir-keepers and riparian landowners was essential. Compromise on the level of tolls, on the regulation of flashes, on the bargemen's access to the bankside was necessary, as was compromise on the conditions affecting the operation of the mills, the catching of fish, and the drainage and watering of the surrounding lands. Various conflicting rights had to be respected, if the flash-lock navigation was to operate successfully.

Just how such co-operation was achieved, maintained and allowed to evolve is absent from the record. It has

to be assumed that custom played a major part, that individual initiative could bring permanent change, and that the Commission of Sewers had some role in determining the arrangements, in initiating and confirming change, and in settling disputes.

However the exact methods of achieving the many necessary compromises cannot be established. They most probably varied greatly, depending upon the importance of any particular problem, the personalities of the interested parties, and indeed the prevailing attitudes towards the bargemen and the importance of the navigation. Another case of muddling through, but successfully?

Besides this necessary co-operation amongst the riverside community, there is evidence to suggest that there was an element of controlled co-operation amongst the bargemen themselves in order that all could use the navigation to the best advantage. Indeed such co-operation would seem essential if the timetable of a round trip in a week was to be maintained.

Since the evidence is extremely sparse, it seems best to state it baldly at the outset. In March 1699 Sarah Stout's body was found floating in the river by James Berry, the miller at Dicker Mill at Hertford, when he 'went out in the morning to shoot a flush of water by six o'clock'.⁹ In 1743 bargemen at Stanstead applied for a flash from the newly erected Stanstead Turnpike at 6 or 7 in the morning, but were refused 'upon pretence that Notice had been given for a Flash from Ware', a flash which did not materialise until the following afternoon.¹⁰

Such evidence suggests some control over the provision

and use of flashes, so that barges could start out early in the morning from the head of the navigation, and proceed downstream from weir to weir, taking additional help from the mills whenever necessary, stopping overnight wherever they reached, picking up the same system the following morning, and so on. Barges from communities further downstream could join the procession when it arrived, so that more and more barges joined the convoy as it passed down river.

Such a convoy pattern would make the best use of any one flash from any one weir, and the element of control could ensure that the convoy would not be held up because a weir further downstream had provided a flash before the main convoy arrived. Such a pattern could also ensure the best possible co-operation from the weir-keepers and the millers, for they would know when their assistance was likely to be needed and they could adapt their working pattern accordingly.

It must be emphasised that the above pattern is only a possibility that would fit the known facts. It may be too simplified, it may only have been necessary when there were extreme shortages of water, and that the arrangements could have been less precise when there was a lot or a normal amount of water in the river. It may be wrong.

One thing that does emerge from the above summary is that there was great potential for dispute, both between the bargemen and the rest of the riverside community, and amongst the bargemen themselves. Even though they must have recognised the benefits of the flashes the bargemen

must have resented the level of tolls and the restrictions on the very availability of the flashes, they must have resented the very persistence with which the millers and weir-keepers encroached upon the navigation at their expense. Many such disagreements have been noted in the earlier chapters, many such must no longer be on record.

Yet for all this, it should be emphasised that the system did work, and there is no evidence to suggest any concerted effort to replace the flash-lock navigation before 1767, when the benefits of canals had gripped the public imagination.

13.2 Use made of the navigation

It has been argued(see 8.4) that the re-introduction of the flash-lock navigation at the end of the sixteenth century did not bring any drop in the level of traffic along the river from those quoted for the period when the experimental navigation introduced in 1575 had been in operation.

Thereafter the precise trend cannot be determined, but there is no reason to suspect any major interruption or any decline in traffic, and some reason to suspect that the underlying trend was one of expansion. By the end of the seventeenth century evidence shows that two trends had definitely emerged. The level of traffic had substantially increased, and so had the carrying capacity of individual barges.

It has been argued that the rent of Waltham Turnpike may have been £80 at the beginning of the seventeenth century(see 8.2). By 1643 it was £123 a year.¹¹ Since

the only return was the income from the collection of a 5/- toll, this suggests that by the 1640s at least 500 journeys a year were being made, and that if any profit was to be made, many more. Furthermore there is reason to suspect that the size of the barges doubled during this same period, so that they were carrying at least 8-10 tons downstream by the Interregnum(see 11.1).

Such evidence cannot be used to estimate the levels of traffic or its growth, but it does seem sufficient to suggest that there was continued growth during the first half of the seventeenth century. The efforts of the Hertford burgesses to improve the river above Ware emphasise the potential the navigation offered.

The earliest estimate that has been found for traffic during the seventeenth century is that in 1670 Wren and Murray reported that 200000 quarters of malt(25000 tons) were carried from Ware to London down the Lea every year.¹² Further indications of this traffic are that in 1681 19 barges coming downstream, carrying 3000 quarters of meal and malt, were held up at Waltham; whilst a few years later 190 bargemasters and maltsters were said to get 'their Livlyhood by this River'.¹³

In 1698 John Houghton reported that 300000 quarters of malt were stored at Ware at any one time, and added:-¹⁴

Below Blackwell are 26 Barges, 24 whereof come from Ware, and, as I have been inform'd, bring twelve score Quarters each about two and fifty times in a Year; for although sometimes they cannot make a Voyage in a Week, at other times they do more; and all these amount to (299520) ...Quarters besides what is brought by Cart to serve the North Side of London

Houghton's calculations may be too literal, but they

seem to have been based on an aldermanic report in 1694 that there were 'Seldome fewer than 26 barges a weeke'.¹⁵

Once more the evidence suggests an expansion in traffic during the second half of the seventeenth century. Similarly there seems to have been a continued expansion in the carrying capacity of the barges during this period. In 1670 Wren and Murray commented on the recent rapid expansion in the size of barges, in 1683 there were references to barges carrying 200 quarters, whilst Houghton's calculations in 1698 were based on a carrying capacity of 30 tons.¹⁶

Then during the 1730s the bargemen, whilst discussing improvements to the navigation, themselves emphasised the size and importance of their carrying trade. One petition stated that traffic along the river was 'now so considerable, that by a moderate Computation, about two Hundred Thousand Quarters of Malt, and large Quantities of all sorts of Grain, Flower(Flour), and other Commodities, have been annually carried by Vessels Navigating thereon'.¹⁷

Such contemporary estimates are all that is available. Quantative data about inland transport was not normally collected, and none survives for the Lea. There are other references which confirm the importance of malt, meal and grain as the dominant down river traffics,¹⁸ but there are also some references to timber as well.¹⁹

That this reliance upon scattered evidence may provide a misleading picture of the traffic on the river is raised by the probability that gunpowder may have been a major item even though it was not mentioned by the bargemen in their petitions or by the few contemporaries who made

reference to traffic along the Lea.

From about 1640 onwards the valley emerged as a major centre of the gunpowder industry, and most mills along the lower Lea below Waltham were producing gunpowder at some date between 1640 and 1690. Even after 1690 when most mills ceased to be gunpowder mills, production continued at Sewardstone Mills until about 1714 and at Waltham Abbey until 1941.²⁰

Complaints in 1672 refer to barges being loaded with gunpowder at Waltham Abbey, and in 1739 the owners of Waltham Abbey Gunpowder Mills, Philippa and John Walton, emphasised just how important the Lea was for carrying gunpowder to the Ordnance warehouses, especially since the barges did not pass through major towns on the journey.²¹ Other gunpowder producers in the valley must have also used the river, although no evidence now remains of this. Such a supposition is strengthened by an order from the Ordnance Board in 1674 that producers were not to carry powder through London streets but were to bring it to the Tower by water.²² Even if this was not obeyed to the letter, it remains obvious that water carriage was the sensible option for producers in the Lea valley.

Of the upstream traffic, it can be said that it was much less. One factor was that barges travelling upstream against the current had to have lighter loads. Evidence in 1767 compares the downstream capacity of 35 tons with the 10 or 15 tons that was all that was possible upstream.²³ Another factor was that bargemen often chose to return with empty or lightly laden barges, so that they would be able to travel without the assistance of flashes, and thus cut tolls to a minimum on what would otherwise be

an unprofitable journey upstream.²⁴

Coal was most probably the major upstream traffic. In 1721 a Chingford resident noted 'The Convenience of having Coals by water is to be Valued'. Evidence from meteage duties shows barges returning to Ware with 5 chaldrons, and on occasion with 10 or 15. In 1739 it was stated that 10000 chaldrons were carried upstream annually, whilst a petition in 1743 suggests that some bargemen concentrated exclusively on this trade.²⁵

It should be borne in mind that the Lea valley was well wooded, that Hertfordshire was not a major industrial area, and that the maltsters still used wood and charcoal in their processing rather than coal.²⁶ There were thus some important limits to the upstream coal traffic. It might be that it was not until the eighteenth century that the coal traffic really began to expand.

Other upstream traffics existed. Such was the fame and quality of the Ware malts that barley was carried upstream from London for local processing.²⁷ Other goods of which there is mention include iron, timber, oats, beans, pease, and oysters.²⁸ Millers in the valley who produced gunpowder or oil brought their raw materials up by river, as did dyers and distillers in Stratford.²⁹ One point to stress is that no evidence has been found of manure or other fertilizers being carried upstream,³⁰ although this does not mean that such materials were not carried.

Specific details of the barges which carried these goods have not been uncovered. Along the river, men, not ~~horses~~ horses, haled the barges from the bankside. Along the lower tidal Lea and the Thames, sails and oars provided

the motive power. It is not clear whether the complex rigging later to be associated with sailing barges had evolved by this period, or whether single sails were still the norm. It is known that in 1683 it was reported that the bottoms of the barges had recently become flatter, and that in 1720 it was stated that the barges did not draw more water even though they were carrying larger loads 'because they are larger & flatter built than formerly'. It can also be noted that as early as 1696 John Houghton distinguished a Ware barge as a distinct craft.³¹

13.3 An adequate navigation

During the seventeenth and early eighteenth centuries the dominant trend in river improvement was the introduction of pound locks and artificial navigation cuts, a process later known as canalisation. Such improvements were undertaken either as part of a determined policy for a whole river or as a limited response to a particular local problem along its course.³² This last motive induced the opening of the new route between Hertford and Ware in 1658, but otherwise the Lea was not affected by such developments, until 1767.

There were suggestions that such improvements be introduced along the Lea before that (see 13.4), but no determined effort to actually implement them. The bargemen were satisfied with the existing arrangements, and only attempted minor improvement, retaining the principles of the flash-lock navigation rather than replace them with the more efficient technology that canalisation undoubtedly was.

Technically, pound locks and navigation cuts which were built specifically to improve the navigation were a much more efficient method of transportation compared to reliance upon pens and flashes from a series of privately owned flash locks, the construction and siting of which was not necessarily determined by what was best for the navigation. The benefits of such technology were known in England, both from English and continental experience, long before Canal Age of the 1750s onwards.

That such technology was not introduced along the Lea until 1767, even though it was an important river navigation close to the capital, should not automatically be interpreted as an example of lethargy or ignorance. It will be argued that there are positive reasons to explain why this was the case, that the existing flash-lock navigation was adequate to the demands placed upon it.

In present day discussions about the best policies to be pursued in the developing nations, there is a concept termed Intermediate or Appropriate Technology, which emphasises the technical, economic and social advantages which might accrue from deliberately introducing technology which might not be the most advanced available in the industrialised nations.³³

There must be great reservations about using such concepts in seventeenth and eighteenth century England, but it can be argued that the flash-lock navigation along the Lea is a good example of an appropriate technology. It successfully met the transport demands placed upon it, and it did not severely restrict the rights and demands of

other interested parties. For instance during this same period there was a substantial expansion in milling capacity along the Lea, and the river began to be tapped as a source of water for both London and the riverside communities. These last developments did bring problems for the bargemen, but they were always accomodated, and the navigation never suffered permanently.

The evidence already discussed suggests that the flash-lock navigation was indeed adequate to the demands placed upon it. It allowed an expansion in traffic, allowed an increase in the size of barges, and allowed a regular passage in two or three days and a round trip in a week, quite an acceptable timetable for the bulky goods carried. Interruptions to this timetable must have been frequent. Water shortages, floods, freezing, disagreements with millers and fishermen could all cause delay. Indeed the bargemen made frequent complaint of the latter, but only to reach agreement, they never implied that the flash-lock navigation be replaced.

In one important sense the navigation had to be adequate, otherwise it would not have been used. There were several competing and more important transport routes such as the Thames and coastal traffic. Even down the Lea valley the road network provided a viable alternative. If problems along the Lea had been too severe or too permanent, if the navigation had been inadequate, then the river would either have fallen out of use as a transport route or radical improvements schemes would have been essential. It did not, and they were not.

The flash-lock navigation was itself adequate. It was also appropriate in the prevailing economic and social conditions. It had not required concentrated effort or large investment costs when it had been re-introduced at the beginning of the seventeenth century. It was cheap to maintain, and did not require scarce engineering expertise, local carpenters and handymen would have been quite adequate. Furthermore, and very importantly, the investment and maintenance costs were spread amongst the riverside community.

Fishing weirs, Waltham Turnpike, the pound lock next to Ware Mills, all the paraphernalia used by millers to provide pens and flashes on request, were built and maintained at the expense of their owners, not at the expense of the bargemen. Banks were often maintained and breaches mended at the expense of riparian landowners, by custom of the local manors. Some of the costs of scouring the river were borne by the fishermen or by the millers.

Such costs were borne by those with no real interest in the navigation both because it was customary and because such work was necessary to their own private interests, to prevent flooding, to control the flow of water, to increase the catch of fish. The requirements of the navigation might mean that the costs of such work was increased, but many obtained recompence from tolls.

For a long period the bargemen only contributed towards these costs according to the use they made of the navigation, by paying tolls to the weir-keepers and millers. Towards the end of the seventeenth century the

bargemen were forced to bear some extra costs of maintenance(see 9.4), but the bargemen in turn passed these costs on to the New River Company by means of the Act of 1739(see Chapter 14). During the intervening period the total costs borne by the bargemen were not that high (see 11.7), and the profits made from dealing and carrying were such that they were well able to bear them.

To replace the flash-lock navigation with a more efficient canalised navigation would have been expensive, incurring both high initial investment costs and higher future maintenance costs. Land would have to be bought, existing rights of millers, fishermen, and riparian land-owners would have to be preserved, bought out, or otherwise compensated for. Furthermore future costs of maintaining the locks and banks, of scouring the navigable channel, would have to be borne by those responsible for the improvements, not by the millers, fishermen, or other members of the riverside community.

Whilst existing arrangements were felt to be adequate, the bargemen had little incentive to undertake such expensive developments themselves, and indeed had sufficient incentive to be extremely cautious towards or to be actively opposed to any who favoured such developments. They could not be sure that such improvements would be successful, and must have feared increasing tolls and costs. Some of the financial problems that occurred after the Lea was canalised suggests such caution to be well founded.³⁴

The existing arrangements also had administrative advantages, once more appropriate to the prevailing circumstances. The body which was responsible for effecting the compromise between conflicting interests so necessary to the success of the flash-lock navigation, and which was ultimately responsible for maintaining the legal rights of the bargemen to use the river, was the Commission of Sewers, the body whose existence and operation has already been discussed in Chapter 9.

Commissions were not permanent, met infrequently at best, and must often have not met for long periods. Members were local gentry, often without any particular interest in the navigation, and almost certainly without any requisite professional expertise. There were no full time staff to make up for these defects.

Yet this body did not only preserve the navigation, it also supervised its expansion, and accomodated an expansion in the conflicting interests of milling and water supply. As an administrative structure it was adequate to the demands placed upon it. It was also appropriate. Administrative costs were cheap, members met their own expenses, both because this was the legal requirement, but also because it was part of the accepted duties of local landowners towards ensuring that the functions of local government were carried out. It was indeed a benefit to the bargemen that prominent members of the local community did have some responsibility for the river, it may have reduced the liklihood of one particularly recalcitrant landowner bringing the navigation to a stop.

The initiative and administrative approach that canalisation required would surely have precluded this cheap form of administration, and would have necessitated permanent paid administrative and engineering expertise. These can only have added to fears about the costs of replacing the flash-lock navigation, as well as raising fears that any attempt could founder through inadequate means of preserving a committed administrative structure.

Fears about the costs of improving the navigation were important, for the local road network did provide a viable alternative, which was not necessarily the case along many rivers.

The navigable Lea was not long, about 40 miles at this date, so transshipment costs were an important component of total costs. In addition the river route to London was not direct, and additional delays were incurred because of the need to wait for favourable tides and winds to navigate first the lower Lea and then the Thames. Many barges unloaded at Hackney or Stratford to avoid these delays, and to avoid the problems of distributing from the congested wharves along the Thames. The bargemen also had to pay heavy and increasing tolls to the weir-keepers and millers.

In contrast the road route from Ware to London was shorter, and was direct. Also road carriers did not have to pay tolls or otherwise contribute to the maintenance costs of the roads they used, at least not before the spread of the turnpike system in the early eighteenth century. Houghton in 1698 emphasised these particular aspects:-

For altho' there is a great Disproportion between Land and Water Carriage, yet considering those about Old-street and Shoreditch...may have it brought by Water to the Wharf much cheaper; yet the Landing and Carrying home by Carts over the Stones of London, and Charges attending, besides the Certainty of coming at set times(for in the River sometimes they want Water, and sometimes have too much Ice). For these Reasons, I say, these North Side Folk think it worth their while to have a great deal brought by Land from so short a Cut as Ware; but I hear of none that comes by Reading Newberry, Abingdon, or Oxford, or from distant Places in Kent, but by Water

Such factors meant that the Lea bargemen concentrated on the carriage of bulky items, there was no potential for any passenger traffic or to act as common carriers of general goods, as was the case on other rivers.

No evidence has been found about the carriage rates during this period, but a major component of these must have been the tolls paid to the millers and weir-keepers along the valley. In 1667 the bargemen complained that they were paying about 30/- for each trip that a barge made. In 1670 Wren and Murray noted that the problems along the river were so severe that the cost of water carriage was nearly as much as that for land carriage. In 1711 George Sorocold made the same point, arguing that the excessive tolls meant that the rate of water carriage was 19/- per ton compared to 20/- per ton by land.³⁶

It should be expected that the cost differential was usually greater, particularly after each newly appointed Commission of Sewers had been at work. Yet these specific local conditions did mean that many maltsters and bargemasters retained an interest in transport by both land and water, even though the Lea was potentially the cheaper artery.³⁷

Several reasons have been forwarded as to why the flash-lock navigation along the Lea during this period should be regarded as adequate to the demands placed upon it and to the needs of the time. It remains to point out that contemporary experts regarded the Lea somewhat differently.

In 1670 Murray and Wren surveyed the Lea and found several faults with the existing arrangements. They noted the swiftness of the current, the steepness of the fall and the winding course of the Lea itself; noted the various malpractices of the millers and weir-keepers with regard to the flashes; and noted the expanding size of both the barges and the mills. They suggested solutions within the framework of the existing arrangements, but their true opinion was that the navigation would not be adequate until the river was canalised(see 13.4).

In a book published in 1677 Andrew Yarranton, a leading exponent of the advantages of river improvement, passed over Bow Bridge and commented 'There is no care taken for the amendment of the River Lee...in all dry times much out of order'. However he made no suggestions as how to rectify this state of affairs.

13.4 Early improvement schemes

Wren and Murray did propose improvements to the existing arrangements, but their true opinion was given at the conclusion of their report:-³⁸

But when all this is done the River Lee cannot be made complete for Navigation without some expense be laid out upon it by Act of Parliament in order to cut other Channells through the Meadows in some places, to make Locks or Sasses in other places where the River is too swift, to make convenient banks for the Draughts of Men and Horses, in floods to deepen the bottom over some shelves, to buy out some Mills that do the greatest prejudice, and such other things as are and would in such cases in foreign parts be put in practice for the public benefit, which can only be ascertained by a particular Map and full Observation of the Levels

It is unlikely that any further action was taken with regard to these ambitious proposals. Later suggestions were much less ambitious. Canalisation was favoured by a minority during the 1730s(see 14.4), but otherwise it was not seriously considered again until the 1760s.

During the winter of 1702-03 George Sorocold, a leading engineer with a particular interest in water supply schemes, surveyed the Lea at his own expense. Details no longer remain, but he was later consulted by the City of London about the proposed tumbling bay at Stratford(see 12.3), and he took the opportunity to propound his theories of river improvement once more.

He favoured a series of locks, each with a moderate rise of 4', rather than one large lock to overcome any particular difference in level. He cited his successful improvements to the Derwent and Cam as proof of the validity of his ideas.

For the Lea he made the novel suggestion that a series of temporary and seasonal flash locks be built:-

I would nott onely make a 5 foot Lock at Old Ford but severall Small ones of 2 or 3 foot in Severall other Places up ye Streame; yt should take up in Winter + bee of use onely in Sumer or very dry Seasons

Once more there is no evidence that these proposals

were ever given serious consideration.³⁹

The next proposals were. In 1721 Captain Richard Boswell suggested that the City of London obtain an Act of Parliament to improve the Lea between Hertford and Bromley

by setting up proper locks and other proper conveniences to keep the River Lee always full of water for barges and tiltboats to pass...at all times and tow with horses instead of men

Such improvements, he argued, would allow barges to double their capacity and to make the journey in half the time they now did. Not only would this substantially reduce the costs of carriage for existing traffic, it would allow the bargemen to compete as common carriers of general goods and develop a regular passenger service. His proposals envisaged that Stratford would become a major transshipment centre, and that London would be served by land from there.

Boswell, somewhat optimistically, estimated that such improvements could be implemented for only £5000, and that thereafter £300 a year would be needed to maintain the navigation and pay the wages of the lock-keepers. Such a low estimate does suggest that Boswell was proposing a series of flash locks along the river rather than pound locks, but exact technical details were never recorded.

Since such improvements would benefit the capital, Boswell proposed that the City should bear the costs of implementing his scheme, recouping their investment by collecting a toll of 1/- a ton from all goods carried on the river. He estimated that a potential income of

£1500 a year could be obtained.

As his reward for surveying the river and supervising the improvements, Boswell asked that he be allowed a quarter of all future profits, be made a freeman of the City, and be allowed to operate a tiltboat to carry passengers and small parcels along the river without paying any tolls. He expected other benefits as well, for he was a local trader in timber and coal with leases to three wharves at Stratford where he obviously envisaged goods would be transhipped.⁴⁰

The aldermen decided to support Boswell's proposals, but were told that on the previous day(13 March) several Ware maltsters and bargemasters had sought leave to introduce a bill to improve the river. The wording of their petition suggests only limited improvements to the existing arrangements, but their actual intentions are nowhere recorded(see 11.6). Neither the City nor the bargemen were ever to submit bills at this date, and so no improvements were made during the 1720s.

What does emerge from this survey of early improvement schemes is just how unambitious they were. Only Wren and Murray suggested radical change, the others were content to make minor improvements to the existing arrangements. They wanted to increase the efficiency of the flash-lock system, they did not want to replace it. Such limited aims provide further evidence to support the thesis that the navigation was adequate, and this is confirmed by the very limited nature of the improvements which were authorised by the Act of 1739, the subject of the ensuing section.

SECTION THREE

THE RIVER LEA:
1730s-1767,
A PERIOD OF
LIMITED IMPROVEMENT

CHAPTER FOURTEENTHE DESIRE FOR IMPROVEMENT:THE ACT OF 1739

The impression that the flash-lock navigation was considered to be adequate is strengthened by the evidence which emerges during the 1730s. During this decade the bargemen patiently negotiated a settlement which was then authorised by Act of Parliament in 1739(12 Geo II, c.32).

Throughout this period the prime intent of the majority was not to substantially improve the navigation, but rather to obtain a regular source of income to maintain the existing navigation, and thus relieve themselves of the financial responsibility.

As a consequence the Act of 1739 is curiously unambitious when compared to other river improvement legislation. It was only along the short stretch of the navigable river above Ware that any improvement was authorised. For the river below Ware, the Act is silent.

Some did consider that more substantial improvement was necessary(see 14.4), but they do seem to have been a minority. Unfortunately such conclusions must be tempered by the nature of the evidence available. Little is known of the initiatives that arose in Ware, but much more of those which emerged from Hertford. This is a problem for there were separate and distinct initiatives from both centres, which then seem to have been merged by the process of negotiation.

14.1 Early negotiations

On 19 January 1732 the Hertford aldermen were told that the town of Ware intended to apply to Parliament to improve the Lea between Ware and London. Immediately the aldermen advanced 5 guineas so that a clause could be inserted in the intended bill to improve the river between Hertford and Ware, and they further resolved that if the bill was proceeded with, then they would consider what sums of money were necessary to improve this stretch of the river.¹

Nothing else is known of these developments at Ware, and no approach is minuted in the Commons Journals. It may be that they held back, for within a month there is evidence that the Hertford aldermen were considering their own bill.

On 5 February 1732 Sir Thomas Clarke, one of the borough M.P.s, wrote to the aldermen informing them that the bill intended for submission 'for the ascertaining and improveing the Navigation of the River Lee between the Towns of Hertford and Ware' would be opposed by the Trustees of Ware Park estate. Unfortunately the reasons for such opposition are not minuted, nor were they when Clarke wrote a few days later, repeating his points, after news of the death of Thomas Byde, owner of Ware Park. The aldermen were not dissuaded, they instructed Clarke to continue, and did so later that same month after receipt of another letter from Clarke.²

Once more nothing is known of the exact intentions at this date, and once more the initiative to approach Parliament was not pursued, for nothing is minuted in

the Commons Journals.

The next recorded development is that in July 1732 the aldermen were informed that it had been 'confidently ascertained that an Advantagious Demand hath been made by the Owners of Ware Park Estate on the New River Company for Ware Mills'. The town clerk was immediately ordered to inform the Company that the ancient way of navigation was along Manifold Ditch, and that the aldermen expected to receive a yearly satisfaction from the Company as compensation for their property rights along the Ditch, and also expected that barges would be allowed to use this route again.³

Such an exchange suggests that the Trustees of Ware Park estates may have opposed the aldermen's plans to improve the navigation because they were considering an offer for Ware Mills, and that it was the New River Company who were the interested party.

Company records for this period were destroyed in a fire in 1769, but there are reports that they were expanding and consolidating their activities in the 1730s.⁴ The purchase of Ware Mills would be a sensible option, for it would remove one source of possible conflict over their supplies of water from the Lea.

However such developments must have aroused fears amongst bargemen that they wished to increase their intake of water from the Lea once more. Thus the threats from the Hertford aldermen about the possibility of re-opening the navigation down Manifold Ditch, but also the proposals which were submitted to the Company in September 1732.

These proposals noted the importance of navigation along the Lea to London, but stressed the problems caused by the New River Company taking too much water from the river. Comments were made that the right to take water was either 'unsupported by good Foundation, as is the Opinion of some Gentlemen of Knowledge' or should be limited to that amount allowed by the Privy Council decision of September 1669. Yet the Company was said to be taking about one-third of the river's capacity, far in excess of what the Company were properly entitled to

Nevertheless the bargemen, recognising the importance of the Company's supplies of water to the capital, were prepared to allow the Company a properly ascertained supply, at existing levels, in return for an annual payment from the Company. This money was then to be used by a body of Trustees or the Commissioners of Sewers to maintain the navigation and erect locks, weirs and turnpikes where necessary.

These proposals are important, for although it was another seven years before the necessary legislation was obtained, the principle embodied in these proposals dominated that act. The ensuing negotiations and disagreements were about details, not about the basic premise of these initial proposals.

The immediate response of the New River Company to these proposals is not known, but it was obviously prepared to negotiate. The Company was taking far more water from the Lea than that allowed by a strict interpretation of the Privy Council decision of 1669 (see 10.7), and could not meet existing commitments if

these supplies were reduced. The bargemen had taken legal advice before submitting their proposals,⁶ and certainly had a case, but it was in their interests too to negotiate.

The precise details of these negotiations are not available, but by 1735 agreement had been reached that the existing route between Hertford and Ware would be retained, that the Company should purchase Ware Mills, and that the Company should be allowed as much water out of Manifold Ditch as would pass 'thro a Cavity of Six feet wide + two feet deep to be placed even with the Sill which lyeth at their old Waterhouse at the Mouth of their new Cut in a slow and languid Current'. In return the Company promised to pay £500 immediately and an annual rent of £50 to maintain the navigation between Hertford and Ware, and a further £1000 and an annual rent of £300 to maintain the navigation below Ware.⁷

A major item in the discussions which had led to this initial settlement was the precise arrangements which were to regulate the quantity of water the Company took from the Lea. These arrangements were described in the Act of 1739, but except for some minor alterations, were those which had been agreed upon by 1735.

These new arrangements were that a 'Balance Engine' was erected at the mouth of Manifold Ditch to regulate the amount of water passing out of the navigable channel into the ditch. Further down the ditch, near Chalk Island, a turnpike was built right across the ditch, which was to

turn the water coming down the ditch through a timber trough, 6' wide x 2' deep, into a cut which led to the New River.

The novel arrangement was the 'Balance Engine' at the mouth of Manifold Ditch. It was described thus:-⁸

The Ballance Engine is so artfully contrived, as to draw as much Water out of the River, when the Water is at the lowest, as it does or can do when it is at the highest, by means of a Ballance Boat, which sinks as the Water falls, and so in Course raises the Gate of the Sluice so much the higher, which, by that means, is always capable of supplying the lower Gage erected near the old Turnpike...and as the Water rises in the River, it lowers the Gate of the Sluice to such a Degree, as to prevent more Water going down than can run through the Gage, which is so exactly calculated as to keep the New River at all Times brimful

Other changes introduced by these new arrangements were that Manifold Ditch was widened, the timber trough or gauge was set up, and the turnpike was rebuilt so as to turn water through the trough, but also to allow surplus water flow over it in order to keep the ditch below supplied with sufficient water.

It had taken time to plan and test these new arrangements, both to the satisfaction of the Company, and of the bargemen, who hired Dr Desaguliers to give themselves an independent opinion. There were some further problems about these arrangements before the Act of 1739 was obtained, mainly about height and positioning of the various components, but the principle was retained, and was to prove adequate. There is no further record of dispute over these arrangements after 1739, and no alterations were made by the Act of 1767, which was innovative in every other sphere governing the navigation.

The Hertford aldermen were involved in these discussions, making suggestions that the navigation down Manifold Ditch be re-opened, consenting in 1733 that the Company should enjoy 'a Slow and languid Current of Six feet wyde and two feet deep' though they wanted £800 and an annual rent of £50 in return, then demanding in 1735 that the Company remove their Balance Engine,⁹ but the aldermen were also particularly concerned to improve the navigation between Hertford and Ware.

In the early months of 1733 the principal inhabitants of Hertford organised a voluntary collection to finance such improvements, and the aldermen subscribed £100 to this fund.¹⁰ Not only were there intentions to improve the existing arrangements, but there were fears that the financial problems of Hertford waterworks meant that steps were necessary to prevent the existing navigation falling into disuse.

The owner of the waterworks, John Ward, had been in financial difficulty for several years, and been declared bankrupt in 1730. Amongst the economies he took were that he stopped paying the rent for the waterworks and stopped maintaining the two turnpikes at Hertford. In October 1733 the aldermen began legal procedures to recover the waterworks, and by January 1734 had obtained a verdict in their favour.¹¹

Immediately afterwards the aldermen signed an agreement with the organisers of the voluntary subscription that they take over the turnpikes and restore and maintain them and the navigation, without paying rent, and without harming the waterworks. This

agreement was to last 'untill an Act of Parliament can be obtained', but was to cease if no Act had been obtained within three years.¹²

This last referred to the fact that a bill was being considered to improve the river between Hertford and Ware. A petition, engrossed as 1733/4, was prepared but never presented to Parliament on behalf of the 'Mayor of Hertford + severall land Owners farmers + dealers'. This petition stressed the importance of the weekly market at Hertford and the navigation from there down to London. However problems were noted because

that part of the said River between the said Townes as runs on the South East side of a Comon called Hartham...(in length One Hundred and Thirty two poles) being very Crooked and having many Windings therein is Choaked up and now become almost Impassable

To offset this it was suggested that

by making a New Cutt Streight thro the Comon ...from the South West to the North East end thereof(in length Ninety Eight Poles) and turning such part of the said River...into such new Cutt, and erecting proper Lockes and Workes thereon

This proposed cut is shown on Figure 7, the dotted line leading from the paper mill to the confluence of the rivers near Bengo Church. This map was prepared by William Whittenbury for presentation to Parliament, and he was also paid 4 guineas for a model of a 'new Cistern' to be built along the cut and a visit to London. Despite such preparation no approach was made to Parliament, and this particular improvement was dropped, and not included in the Act of 1739.¹³

Instead a Commission of Sewers was obtained for the short stretch of the river between Hertford Bridge

and Ware Bridge, the only time such a commission was sought. Nothing is known of the work of this commission, but it seems likely that it restricted itself to scouring and cleansing the river, and that its costs were met out of fund raised by the voluntary subscription in Hertford.¹⁴

One further initiative to emerge from these early negotiations was that Joshua Gilman, a Quaker distiller,¹⁵ organised the collection of records relevant to the Lea between Hertford and Ware. In February 1732 he began searching the borough records, and the information he collected was published in London in 1734.¹⁶

14.2 The approach to Parliament

Thus by the middle of the decade some form of agreement between the bargemen and the New River Company had been reached, and the townsmen of Hertford and Ware were agreed upon a joint approach, rather than considering separate bills as had been the case at first.

On 10 March 1737 a petition was submitted to Parliament on behalf of the

Mayor, Recorder, Aldermen, and Inhabitants of the town of Hertford, and of the Inhabitants of the Town of Ware...and of several Farmers, Maltsters, and Barge Owners...on behalf of themselves, and several Hundreds of other Persons residing near to, and concerned in, the Navigation on the River Lea...and of the Governor and Company of the New River

It stressed the importance of the Lea to London, both as a transport artery and as a major supplier of water. It noted that there had been differences between the bargemen and the Company, but that these had 'lately

been accomodated'. Thus leave was sought, and granted, to introduce a bill.¹⁷

This bill was not submitted. A failure explained by the bargemen thus:-

It was agreed by all the Parties that application should be made to the Parliament...And thereupon the Company caused a Bill to be drawn + a Copy ...delivered to the Navigators in which all or the greatest part of that Agreement was sett forth But disputes arising about some Clauses... + the Company alledging that unless the Sill of the New Cavity was laid four inches higher than the Sill of their old Waterhouse they could not supply the Citys of London and Westminster so well

Thus the bill was held back, whilst the effect of these new demands on the navigation were tested. Since it was found that the navigation did not suffer, Parliament was approached once more.¹⁸

In 1738 two acts were sought. A private act(11 Geo II, c.14 PR) was obtained whereby the New River Company acquired Ware Mills for an annuity of £400, which authorised the construction of a flash lock between Ware Mills and Ware Bridge to assist the passage of the barges, and which confirmed an agreement which had been reached between the Borough of Hertford and the Company on 1 May 1738. This agreement fixed the new route opened in 1658 as the navigable route for the future, and fixed the terms on which water could be supplied to the mills and the bargemen could use the pound lock next to the mills.¹⁹

In addition a public bill was submitted on 24 April 1738. It received its first reading, but on 4 May it was decided that the second reading should be postponed for a month. A decision which meant that the bill was lost, for the session ended on 20 May.²⁰

Several factors may explain this development. The New River Company stated that the bill had been dropped 'upon an Opposition which however groundless would have Spent more time than the Sessions was like to Continue'.²¹ This could be a reference to a further disagreement with the bargemen who complained that the Company had at the last moment demanded an additional three inches of water from the Lea,²² or to a decision of the London aldermen to oppose the bill because it ignored their claims to jurisdiction along the lower Lea.²³

Additional opposition came from Philippa and John Walton, owners of Waltham Abbey Powder Mills. They argued that the new arrangements allowed the New River Company too much water from the Lea, making an aside that it was a remarkably cheap bargain for the Company. They felt that in dry weather the lack of water in the navigable river meant that the workings of their mills were hampered and their carriage of raw materials and finished powder along the river would be held up.²⁴

A comparison between the 1738 bill and the Act of 1739 shows no material changes to those clauses dealing with the entitlement of the Company to water from the Lea. Any disagreement over an additional 3" of water in 1738 was settled, and the bargemen and the Company once more approached Parliament, to submit a bill which must have been broadly similar to that submitted the previous year.

This meant that they were still prepared to ignore the City's claims to the lower Lea, even though they had this time met with representatives of the City before approaching Parliament.²⁵ The City responded by strenuously

opposing the bill when it came before the House.

On 19 February 1739 leave was sought to introduce the bill. The same evidence in favour, with one minor change, was presented as had been submitted in 1737 and 1738. Leave was granted, and on 23 March the bill was submitted.²⁶

Evidence in favour had been given by Bostock Toller, the town clerk of Hertford who was acting as agent for the petitioners, by Jasper Bull, clerk to the New River Company, by Dr Desaguliers, and by two bargemaster, Thomas Pettit and James Fordham, who had both known the river for nearly 50 years.

Pettit and Fordham talked of the problems caused by millers and weir-keepers who were determined to extract as much money as possible from the bargemen, but emphasised that the situation had been better when a Commission of Sewers had been in existence. They told Parliament that the bargemen had raised over £3000 to meet the costs of scouring and cleansing the river, and argued that the payments from the New River Company would adequately meet such costs in the future, and also allow the bargemen to be recompensed for the sums they had already expended.

Opposition came from several quarters. The most trenchant, and effective, was that mounted by the City. They argued that their rights along the lower river were ignored, and they were not prepared to renounce them. As a result the bill was substantially changed at the third reading. The City's mistaken claim to have built a new cut along the lower Lea was upheld(see 12.1),

and clauses were inserted acknowledging the City's rights and restricting the jurisdiction of the proposed Trustees and Commissioners of Sewers to that part of the navigable river above the new cut. The title of the bill was altered to accomodate these changes.²⁷

Nevertheless the City continued to oppose the bill.²⁸ This was because they felt that the proposed bill was inadequate, and that a more concerted improvement policy was needed. Other groups shared this opinion(see 14.4), but such arguments had no effect either on the passage or the wording of the act.

Neither did those petitions or arguments submitted by the milling community. Opposition came from millers and mill-owners at Waltham Corn Mills, Waltham Abbey Powder Mills, Enfield Mills, Chingford Mills, Tottenham Mills and Walthamstow Mills. There was much collusion, for all their petitions were almost identical, and, strangely, they were brief and formal, providing no evidence of trenchant or well argued opposition.²⁹

Opposition from all these parties was presented both in the Commons and the Lords. Yet a comparison between the bill submitted in 1738 and the published act shows few changes, with the exception of those made to accomodate the City's jurisdiction over the lower Lea. There were some minor changes to clauses dealing with the New River Company's rights to extract water from the Lea and those dealing with the appointment of Trustees. Commissioners of Sewers, with all their traditional powers, were retained, to work in tandem with the Trustees, and not be superceded by them. But that is all.

Otherwise the bill passed through all its stages without interruption, and on 14 June it received the Royal Assent.³⁰ On receipt of the news in Hertford, the church bells were rung in celebration.³¹ Similar excitement in Ware and Stanstead can be assumed.

14.3 The Act of 1739

This public act first reconfirmed those arrangements above Ware which had been authorised by private act the previous year. The navigable channel was fixed forever as that route which had been opened in 1658, the terms regulating the use of the pound lock next to Ware Mills were fixed, as was a toll of 1/-, and the turnpike between the mills and Ware Bridge was once more authorised.

Several clauses then detailed the arrangements controlling the New River Company's rights to water from the Lea, with provisions to ensure that they did not surreptitiously increase their intake, and that their rights were protected for the future. These clauses confirmed those arrangements which had been worked out in the early years of the negotiations.

The act then specified those who were appointed as Trustees, responsible for implementing those improvements mentioned in the act, responsible for obtaining a Commission of Sewers to scour and cleanse the river, and who were to pay the costs of this commission out of the payments specified in the act from the New River Company.

Sixty six Trustees were specifically named, but many ex officio members were also authorised. These included the Lord Mayor, Recorder and aldermen of the

City of London, the Mayor, Recorder and aldermen of the Borough of Hertford, the Knights of the Shire and county M.P.s of the three riparian counties of Middlesex, Essex and Hertfordshire.

All nominated Trustees, and those appointed as replacements by the Trustees themselves, were to possess property worth at least £100 a year. They were in fact the same landed gentry who had traditionally acted as Commissioners of Sewers, the trading interest who used the river were not at this date appointed . A quorum of ten Trustees was stipulated.

The Act then specified those payments to be made to the Trustees by the New River Company. For the river between Hertford and Ware the Company were to pay £750 immediately with an annual payment of £50 thereafter. For the river below Ware the initial payment was £2500 with £300 annually thereafter. The initial payments specified were those originally agreed, topped up by backdating the annual rental payments to Michaelmas 1734.³²

The Act also specified some payments which had to first be paid by the Trustees out of the sums received from the Company. Out of the account for the river below Ware £1000 was to be paid to several bargemasters and maltsters, to repay them for those expenses they had incurred in executing the Commission of Sewers which had been appointed in 1721 and for expenses since then in scouring and cleansing the river. Out of the account for the river between Hertford and Ware the Trustees were to pay £320 12/- to the Borough of Hertford, to

repay them for their expenses in repairing the turnpikes, in scouring and cleansing the river, and in soliciting the Act of 1739.

Having made these payments the Trustees were to use the remainder of the initial payments and the annual rents to implement those improvements specified in the Act and to generally maintain the navigation. Separate accounts were to be kept for the river between Hertford and Ware and for the river between Ware and the beginning of the new cut.

The Act had specified some minor improvements for the river between Hertford and Ware, the result of the discussions at Hertford, but curiously, no improvements for the river below Ware were detailed. The Trustees were merely authorised to use their income 'for purchasing, building, or hiring Locks or Weirs upon the said River, in such Manner as the said Trustees, or any of them, shall direct'.

The Act also preserved the traditional rights of the City of London along the lower Lea, mistakenly recognising that they had built a new cut as a result of the Act of 1571. Also recognised were the traditional rights of the town of Ware to take water from the Lea to cleanse the highways leading through the town.³³ Finally there was a clause added by Parliament, fixing penalties upon any barge-owner who allowed his crews to carry any 'Fishing Net, Gun, Engine, or other Instruments for taking and destroying of Fish or Game'.

This Act thus authorised those arrangements and improvements agreed in discussions between the bargemen

and the New River Company, and those which had been discussed at Hertford. Missing are any improvements for the river below Ware. The work of the Trustees in the years after their appointment (see Chapter 16) suggest that were definite ideas for the improvement of this stretch of the river. It would be interesting to know just why they were omitted from the Act. Were there fears that possible opposition would prevent the passage of the Act, so it was decided to authorise only those improvements over which agreement had been reached, and leave the others to the future?

Another point to emphasise about this Act is just how unambitious it was. No powers to build new cuts, to erect pound locks or lay out proper towing paths were sought. The traditional powers of Commissions of Sewers along the river were not superseded. This in complete contrast to most river improvement legislation in the late seventeenth and early eighteenth centuries.³⁴ Further confirmation that the flash-lock navigation was considered adequate.

14.4 An alternative scheme?

One of the reasons that the City continued to oppose the bill, even after their rights had been recognised at the third reading in the Commons, was that they felt that 'the said Money is not Intended to be laid out in providing Locks to Supply the Want of Water, which is allowed to be taken away'. They stressed that they did not wish to restrict the rights of the New River Company, they just felt that better

provision should be made for the navigation.³⁵

Similar points were made in another petition presented to the Lords. This argued that the New River Company were to be allowed to take so much water that the navigation would suffer. They felt that this 'Defect can no otherwise be remedied than by erecting Locks or Weirs, as Reservoirs for Heads of Water to be let out as Occasion requires, for the free Passage of Vessels and Barges'.³⁶

The exact improvements hinted at in these comments are not recorded, they could be either the provision of a series of specially constructed flash locks, or the construction of new cuts and the introduction of pound locks.

It is of interest that one of the witnesses before the Lords was John Hore, who had 'lately surveyed the River Lee'.³⁷ Hore was a well known engineer with a long interest in river improvement schemes. He had implemented improvements to the river Kennet and to the Bristol Avon, and had formulated schemes for the rivers Chelmer and Frome. In every case he had favoured pound locks and either a series of cuts to by-pass mills and other obstructions or a lateral canal along the river valley.³⁸ It is possible that he proposed similar improvements for the Lea, but if so, no details now remain, and there is no later reference to his ideas during the 1750s and 1760s when such ideas re-emerged.

CHAPTER FIFTEEN.IMPLEMENTATION OF THE ACT OF 1739:ADMINISTRATION15.1 The role of the Trustees and the Commissioners

On 6 August 1739, at the first meeting of the newly appointed Trustees, the act itself was read, the clerk and treasurer were appointed, and a decision was taken that a motion to apply for a Commission of Sewers be postponed until the following month.¹

At the subsequent meeting it was decided that a petition be drawn up requesting a commission to scour and cleanse the river from Hertford to Ware, and from thence to the 'new cut'. A list of proposed members was prepared. This petition and list were then submitted to the Lord High Chancellor, the Lord Chief Justices, and the Chancellor of the Duchy of Lancaster, who on 10 November agreed that such a commission be issued.²

Yet it was not until 9 February 1740 that the Great Seal was affixed to 'A Commission of Sewers for the River Lee in the County of Hertford',³ and it was not until 11 June 1740 that the commissioners first met.⁴ Part of this delay may have been caused by the need to obtain the seal of the Duchy of Lancaster, for although no such seal has been found, one was issued when the commission was renewed in 1750,⁵ and it has to be assumed that one was issued in 1740.

A further reason for this delay may have been doubts about the exact legal position, for this commission was awarded jurisdiction over the navigable

river between Hertford and Ware, an extension of their authority compared to those commissions issued in 1695 and 1721. The limits of these last commissions had been based on those specified in the Act of 1571, and reflected the official acceptance that the City of London had built a 'new cut' during the 1570s. The City had upheld their claims in the Act of 1739, but now new limits of jurisdiction were being proposed that bore no relation to the Act of 1571.

These new limits were sensible, for why should the commissioners not enjoy jurisdiction over the whole stretch of the flash-lock navigation, but there may have been doubts that required legal opinion to be given. Whatever, the commission was appointed, with the new limits, and began work in June 1740.

Whilst waiting for the commission to be issued the Trustees had started implementing those improvements above Ware authorised in the Act of 1739, but it was not until after June 1740 that the Trustees and commissioners could turn their attention to the river below Ware. Then their first task was to restore the traditional flash lock navigation to its desirable state.

For this task the traditional powers of the commissioners sufficed, without recourse to the Trustees except for finance. The commissioners issued general or specific orders for the clearing of shoals, scouring of the river, and strengthening the banks. They instructed millers, fishermen and riparian landowners to cease those practices and encroachments which had impinged upon the navigation. These orders were then implemented or

supervised by their surveyor, William Whittenbury, who had been appointed at the first Court of Sewers.

During this phase of the work, the role of the Trustees was strictly limited. They merely paid the bills incurred by the surveyor in carrying out the commissioners' instructions. At no time did they question these instructions. The only initiative they took was to seek legal opinion whether they could pay for legal counsel to assist the bargemen present their complaints at the Courts of Sewers. They could.⁶

As this work of restoration progressed, the bargemen began to consider more ambitious improvements, the erection of turnpikes in Broxbourne Gull and at Stanstead. Such problems and solutions were first raised, discussed and agreed upon at Courts of Sewers, but the commissioners did not have sufficient powers to authorise such improvements.

Such improvements could only be authorised by the Trustees, using the vague powers along the river below Ware granted by the Act of 1739. Thus reports of the commissioners' discussions and proposals on these matters had to be made to meetings of the Trustees, who then further considered them, made some minor changes, and issued the necessary orders.

Such developments can only have highlighted a certain artificiality in the separation of function. All Trustees had been nominated as commissioners in 1740. Since the Trust had a system of replacing its membership whilst the commission did not, some difference in membership did arise, but this did not change the

situation. No conflict arose between the two bodies.

Indeed it was only a small group who did attend. For their convenience meetings of both bodies were held on the same day. In the morning a Court of Sewers would be held. After lunch the same people would convene a meeting of the Trustees. Under such circumstances it is not surprising that there was no conflict between the two bodies, and that the need for two separate bodies came in time to be questioned.

By the mid-1740s the role of the Commissioners of Sewers had become less important than in the first few years of their existence. They had dealt efficiently with many of the problems presented to them, and the outstanding problems were those best dealt with by the Trustees, for they necessitated powers not enjoyed by the commissioners. Furthermore the routine work of maintenance could be left to their surveyor, whose initiative was never questioned by the commissioners.

Under such circumstances Courts of Sewers became mere formalities. Fewer and fewer complaints were presented by the bargemen, the last being in 1749, and minutes merely noted matters which were being discussed and decided upon by the Trustees. The need for separate meetings must have been questioned. Indeed in January 1749 a joint meeting of the Trustees and commissioners was held to discuss the problem of Stanstead Turnpike, but this was unique.

The Trustees did obtain a new commission in June 1750, and all Trustees once more were appointed.⁷ This did not revive the commission. Thereafter all that was minuted were formal entries about the dispute over

Stanstead Turnpike. This was for administrative convenience only, as the Trustees failed to attract the necessary quorum of ten whilst only six of them could convene a Court of Sewers. No other business was transacted at these Courts.⁸

Then in August 1751 the bargemen submitted complaints about the miller at Enfield Mills, but to the Trustees not the commissioners, even though there had been a Court of Sewers that very morning, and even though the nature of the complaints were such as would have been submitted to the commissioners the previous decade.⁹

Finally on 11 February 1752 the Court of Sewers was adjourned until the following month.¹⁰ This was the last Court of Sewers ever to be minuted, and the numerous blank pages in the minute book, and the absence of any later reference to a Commission of Sewers, suggest that it must have been the last ever to be convened,

The authority of the commission along the Lea was not formally revoked until the Act of 1767, but it played no role after February 1752, and was not renewed in 1760. Thereafter the Trustees took on the sole responsibility for the Lea between Ware and the 'new cut', including those responsibilities which had at first been carefully reserved to the commissioners.

This new pattern of administration was that envisaged in the bill submitted in 1738, but which Parliament had rejected in favour of the dual role of Trustees and commissioners. It is open to question whether this development was strictly legal, but it was never challenged. It was in nobody's interest to

do so.

Another major administrative innovation was made at about this same date, to the arrangements applicable to the short stretch of the river between Hertford and Ware. Once the Trustees had implemented those improvements specified in the Act of 1739, the Trustees and the commissioners shared the same dual function that they enjoyed along the river below Ware. In addition the Borough of Hertford continued to maintain the two turnpikes at Hertford and the navigation down to the end of Hartham Common.

The bargemen made few complaints to the commissioners about this stretch of the river, and none after January 1743. Presumably the work of the burgesses and the surveyor sufficed.

Then in 1750 the Borough of Hertford purchased a fishing weir, Constants Weir, from the Earl of Salisbury. They proposed to replace it with a turnpike, and approached the Trustees. The latter set up a committee to supervise and finance the cost of this work, and appointed a keeper to look after the turnpike when it had been finished.

These developments stimulated the committee to rethink the approach to maintaining the river above Ware, and the Trustees accepted their recommendations. In December 1752 the Trustees and the Borough of Hertford signed an agreement whereby the burgesses took over responsibility for maintaining the navigation between Hertford and Ware Mills, and this agreement lasted

until 1767. The Trustees did retain a right to inspect and criticise the Borough's work, but there is no evidence that they ever did so.¹¹

Thus within only eleven or twelve years the pattern of administration introduced by the Act of 1739 had been quietly dropped. Maybe without proper authorisation, but without any particular complaint or challenge. The developments were a sensible concentration of responsibility, administratively more efficient and cheaper. Any continuing faults in the administration were not the result of these changes, but were inherent in the very nature of the reliance on unpaid gentry to supervise a matter which might not have been of great interest to the majority.

15.2 The Trustees: the discharge of their Trust

A problem which emerged after the first few years of activity was that of obtaining the necessary quorum of ten Trustees. The problem was first encountered in April 1741 when the first meeting of the year had to be adjourned until the following month. Then in August 1743 the annual meeting fixed by the Act of 1739 failed to attract sufficient interest and was likewise adjourned.

The problem only got worse. In 1744 seven of the eight meetings called failed to obtain a quorum, and in 1745 ten out of the eleven meetings called suffered a similar fate. For the rest of the decade the situation was somewhat better, but only just. Quorums were not obtained at six meetings out of twelve in 1746, eight out of ten in 1747, seven out of twelve in 1748, and

six out of ten in 1749.

This pattern continued throughout the 1750s. Indeed between November 1753 and November 1757 only one meeting attracted a sufficient number of Trustees, an occurrence which so surprised everyone that the meeting was adjourned for lack of business to discuss. Not the only occasion that a quorate meeting was so ended.

In 1759 Parliament were informed that of the 201 meetings scheduled since 1739, 125 had been adjourned for lack of a quorum, and that this had meant that the bargemen had been frustrated in their efforts to submit complaints.¹² The Trustees tried to improve this. In November 1759 they ordered that if any meeting was so adjourned, then notice should be given of the postponed meeting in the Daily Advertiser, in addition to the notice placed in the London Gazette.

To little effect, the next six meetings all failed to attract sufficient Trustees. Indeed it was not until the Trustees began to discuss the proposals authorised by the Act of 1767 that sufficient interest was generated to ensure not just a quorum, but well attended meetings.

Such a state of affairs might well suggest some dereliction of duty on the part of the Trustees, but there were several factors which ameliorated this situation, and which might rather suggest that the Trustees fulfilled their trust adequately if not enthusiastically.

Such factors included the use of small committees to handle specific problems or responsibilities, and the degree of initiative which was allowed the officials,

particularly the surveyor, to conduct the routine business of the Trust in between meetings.

Committees of three or four members to consider a specific problem or pass the annual accounts of the clerk and surveyor were used from the very beginning, they were not a response to the problem of failing to obtain a quorum. However such committees did mean that business was not necessarily held up just because a scheduled meeting had to be adjourned. The Trustees always accepted the recommendations of these committees, even though on occasions they suggested a complete reversal of previous policy, as was the case with Stanstead Turnpike in 1751(see 16.4) and the control of the river above Ware in 1750-52(see 15.1).

It should be noted that the Treasurer's accounts were never submitted to a committee, but always to a full meeting of the Trustees. The infrequency of such meetings in the 1750s seems to have benefitted the Treasurer(see 15.3), and the laxity of the Trustees towards the large surpluses left in the Treasurer's hands does seem to be the most important accusation of dereliction of duty that can be levelled.

Any assessment of the Trustees' performance must take account of the very limited nature of their trust. Once the initial problems of restoration and limited improvement had been accomplished, and accomplished adequately, there was little for them to do. They had insufficient money and power to implement further improvement.

The routine task of scouring and cleansing the

the navigation could be left to the surveyor, with whom the bargemen could deal directly without any need to approach the Trustees. With so few problems, the routine work of administration could be left to the clerk. The Trustees never found serious complaint with the work of either the surveyors or the clerks, with the exception of one clerk who was quickly replaced. Neither did the bargemen make serious complaint. The initiative allowed these officials sufficed.

The problems in obtaining a quorum could be expected from the nature of the persons appointed to be Trustees. Although many may have favoured the idea of an improved navigation, many must have been loathe to become actively involved, especially since they had to pay their own expenses. Nomination as a Trustee was only one of the duties foisted upon the local gentry or aldermen.

Many Trustees never attended at all, others turned up only occasionally, and some only if they had a particular property interest to protect. There was, however, a reliable core of active Trustees, who were prepared to attend, act on committees, and, presumably, dominate policy. Further research into this group is necessary, but Professor Matthias has emphasised the role of those with interests in the London brewing or Hertford malting communities.¹³

15.3 The officials of the Trust

At their first meeting the Trustees appointed Bostock Toller of Hertford, gentleman, as their clerk, and the Commissioners of Sewers followed suit at their

first meeting. Toller had long been associated with the navigation. He had sought legal advice for the bargemen in 1732, and had been employed by the Borough of Hertford as their agent to solicit the Act of 1739. In this capacity he had given evidence in favour of the bill in 1737, 1738 and 1739.¹⁴

Toller had been appointed Clerk of the Peace for Hertfordshire on his father's retirement in 1720, keeping the post until his death in September 1761. He also served as deputy sheriff on occasion. In 1728 he was made a freeman of the Borough of Hertford so that he could be appointed as Town Clerk later that month. In 1734, 1741 and 1751 he was chosen to serve as Mayor. Other duties included being clerk to the Cheshunt Turnpike and Wadesmill Turnpike Trusts, and being Court Steward for the manor of Hertford Priory.¹⁵

As clerk to the Trustees and Commissioners of Sewers for the Lea, Toller's duties included the keeping of minutes, the handling of paper work, and the publicising of all meetings and decisions. In return for these services, Toller was allowed, after some initial quibbling, the fee of £1 6s 8d for himself, his clerk, and their horses on any day that he attended a meeting of either body.¹⁶

When Toller died in 1761, he was replaced by James Windus, of Ware, gentleman, at a reduced fee of 1 guinea a day. For some undisclosed reason Windus was dismissed the following year, to be replaced by Henry Thorowgood of Hertford, gentleman, at the same reduced fee. He was to prove satisfactory, and was retained as one of the two

clerks employed by the Trustees appointed by the Act of 1767, until his death in 1768.¹⁷

Some further idea of the clerk's duties can be gleaned from the Table below:-

TABLE 7: THE CLERK'S ACCOUNTS¹⁸

Period of account	Ordinary(A) expenditure	Extra-ordinary expenditure
to June 1741	£111 13 2	£33 10 8(B)
27 Jun 1741-21 Apr 1742	£ 37 5 10	£ 2 19 -(C)
22 Apr 1742-14 Sep 1743	£137 13 11	
28 Sep 1743- 6 Aug 1744	£ 37 1 6	
7 Aug 1744-29 Sep 1745	£ 38 9 3(D)	
30 Sep 1745-25 Apr 1748	£103 11 5	£49 19 4(E)
26 Apr 1748- 2 Oct 1749	£ 57 3 10	
3 Oct 1749- 6 Aug 1750	£ 30 11 6	£34 12 8(B)
7 Aug 1750- 3 Aug 1752	£101 1 6	£18 8 4(F)
4 Aug 1752-27 Sep 1761	£1486 16 9(G)	
28 Sep 1761-11 Oct 1762	£ 45 5 11	
12 Oct 1762-	£2415 7 10(G)	

- (A) Includes the costs of the clerk and his assistant in attending meetings, copying orders, keeping minutes, writing letters etc. Excludes payments on account to surveyor, which were then re-imbursed by the Treasurer.
- (B) Cost of obtaining a new Commission of Sewers.
- (C) Cost of serving orders on several persons.
- (D) Estimated from surrounding accounts, as no accounts for this period minuted, even though presented.
- (E) Admission fine for Trustees to enter copyhold property, Dobbs Weir.
- (F) No further details available.
- (G) These particular accounts only presented after 1767, details of type of expenditure not minuted.

One of Toller's first duties as clerk was to write to Thomas Martin of Clapham to enquire whether he would be treasurer to the Trust. He would. Martin was already a Trustee, he owned Cheshunt Mills and the Rectory manor at Cheshunt, and he was also a partner in a banking practice at the sign of the Grasshopper, later to become Martin's

Bank.¹⁹

Martin's duties were to collect the rental payments from the New River Company, to make any payments ordered by the Trustees, including advances to the clerk and surveyor, and to provide separate annual accounts for the river between Hertford and Ware, and the river below Ware. This last could not be maintained, however, because of the infrequency of the Trustees' meetings.

The treasurer received no fees for his services, but he was able to use any surpluses that accrued for his own purposes, a not inconsiderable benefit, as can be seen from the Table below:-

TABLE 8 : SURPLUSES IN TREASURER'S ACCOUNTS²⁰

Date of account	Hertford-Ware	below Ware
Oct 1740	£ 15 19 -	£1350 - -
Sep 1741	£ 29 16 -	£1390 - -
Aug 1742	£ 41 4 10 $\frac{1}{2}$	£ 790 - -
Aug 1743	£ 91 4 10 $\frac{1}{2}$	£ 540 - -
Sep 1744	£ 31 4 10 $\frac{1}{2}$	£ 416 17 5
Jun 1746	£106 4 10 $\frac{1}{2}$	£ 825 7 6 $\frac{1}{2}$
Aug 1750	£207 7 5 $\frac{1}{2}$	£ 588 18 4 $\frac{1}{2}$
Aug 1751	£ 57 7 5 $\frac{1}{2}$	£ 803 13 10 $\frac{1}{2}$
Sep 1752	£107 7 5 $\frac{1}{2}$	£ 913 13 10 $\frac{1}{2}$
Oct 1753	£111 4 2	£ 671 17 5
Sep 1760	£295 8 7	£ 415 8 10 (A)
Aug 1765	£393 19 2	£1479 13 4 (A)
Oct 1767	£501 2 6(B)	

(A) An additional £600 invested in India Bonds.

(B) Total in both accounts handed over to new Trustees in 1767, but further bills were still to be presented.

So great were these surpluses that in July 1758 the Trustees ordered Martin to purchase six India Bonds in their name, so that the Trust rather than Martin could benefit. However the surpluses continued to build up, but no further action was taken.²¹

Martin died in April 1765, and in August 1765 his accounts were presented by his nephew, Joseph Martin of Lombard Street. Joseph was immediately appointed as treasurer, a position he retained to the new Trustees appointed in 1767.²²

At their first meeting the Commissioners of Sewers appointed William Whittenbury of Hertford as their surveyor. There is no formal record that he was ever so appointed by the Trustees, although they acted as though he was their surveyor as well, long before the role of the commissioners became defunct, and had hired his services themselves before he was appointed by the commissioners.²³

As with Toller, Whittenbury's appointment can be seen as some reward for previous association with the navigation. In April 1726 he had obtained his freedom of the Borough of Hertford as a carpenter and joiner, after having served his apprenticeship with his father William, also a carpenter. In this role Whittenbury was hired by the burgesses to work on the sessions house and on stalls in the market place. In 1738 he made a plan of the Corporation Rentals, and in 1742 gave advice about the new town house. He also rebuilt a bridge over the small river Lea at Waltham in 1738.²⁴

He also surveyed local rivers. In 1732 he made a map of the river Beane between Waterford Mills and Cow Bridge when investigating a dispute between rival millers. The following year he prepared a plan of the

Lea between Hertford and Ware for submission to Parliament (Figure 7), and also gave advice to the burgesses about the proposed new cut across Hartham Common(see 14.1).²⁵

Besides carrying out the instructions of the Trustees or commissioners, Whittenbury also had responsibility for ensuring that the routine work of maintenance was carried out, relying on his own initiative. He had to ensure that all the necessary equipment and labour were obtained, and that all costs were adequately accounted for to the Trustees. In March 1752 there is a reference to a Richard Allen who seems to have been his assistant.²⁶

The Trustees never minuted any criticism of Whittenbury's work except to reduce the expenses he claimed, and to express concern over his allowance of beer to the workmen he employed along the river.²⁷

Besides the routine work of maintenance, he fulfilled other specific duties. He erected Broxbourne Turnpike, provided boats to carry away the material scoured from the river, appointed and paid the turnpike keepers employed by the Trust, and made a map of the navigation in 1741(see Map 1 in folder). On the two occasions during his lifetime that the Trustees put out jobs to contract, it was his tender that was accepted.

Whittenbury died in September 1757, and although two of his sons continued the carpentry business,²⁸ the Trustees appointed John Clerk of Little Amwell, carpenter, in his place. Clerk seems to have carried out his duties adequately and retained the post until 1767.²⁹

Unlike the other two officials however, he did not

retain his post after 1767. His skills may have been sufficient to maintain the existing navigation, but they were not sufficient to plan and execute the improvements authorised by the Act of 1767.

For this task, the skills of leading engineers and surveyors, such as John Smeaton and Thomas Yeoman, were needed.³⁰ It can be noted that once these improvements had been introduced, and mere routine maintenance once more the skill required, that local carpenters could again be appointed to the post of surveyor, John Glynn of Bishop Stortford in 1784 for instance.³¹

There are some difficulties in presenting the accounts of the surveyor. Whittenbury changed his practice of recording expenditure between accounts and made minor errors in his arithmetic, whilst inadequate minuting means that his accounts for September 1744 to September 1745 were not recorded. Furthermore the lack of quorate meetings meant that no proper accounts were presented after 1752, until his death in September 1757 necessitated some settlement. Nevertheless the material available is presented overleaf in Table 9.

After Whittenbury's death the position is impossible. Clark was appointed surveyor in November 1757, but it was not until August 1765 that he was required to present an account, and the subsequent committee report is not minuted. After 1765 it is likely that either nothing or very little was spent by the surveyor, as the Trustees concentrated instead on the improvement plans enacted in 1767.

TABLE 9: WHITTENBURY'S ACCOUNTS³²

Attendance and supervision: Includes Whittenbury's charges for attending Courts of Sewers and meetings of Trustees, and his charges for supervising the work force and looking to the necessary equipment and materials. Until August 1741 he charged 16/- a day for attending meetings if he required a horse and 10/- if he did not, and 15/9 a day for supervising work along the river. Thereafter he accepted that he could charge only 12/6 a day whatever the reason. On occasion some costs of purchasing tools and materials seem to be included in this item.

Production costs: Includes expenditure on hiring workmen, horses and barges to scour the river, to repair banks, locks and weirs. Sometimes costs of tolls and materials recorded in this item rather than the above, and often these costs were presented differently by Whittenbury, as shown below.

N.B. The titles above have been adopted for clarity, they were not used by Whittenbury or Toller in the minutes.

HERTFORD-WARE ACCOUNT

Construction of Portobello Turnpike and associated surveying work, by contract	£276 3 -
11 June 1740-6 June 1741 total expenditure, no details	£ 1 15 6
8 June 1741-17 August 1742	NONE
17 April 1742-1 October 1743 scouring river, production & supervision	£ 44 9 -½
2 October 1743-6 October 1749 attendance and supervision	£ 7 17 6
production costs	£ 71 10 10½
7 October 1749-11 August 1750 attendance and supervision	£ 1 7 6
production costs	£ 9 14 10
12 August 1750-22 August 1752 attendance and supervision	£ 1 10 -
production costs	£ 11 5 1½

After this date the Borough of Hertford took over the responsibility, the surveyor presented no more accounts to the Trustees for this section.

Total expenditure Hertford-Ware:- £425 13 4½

(cont)

WARE-NEW CUT ACCOUNT

11 June 1740-6 June 1741			
scouring river, including labour	£248	1	5
tools, utensils, barges used	£ 25	17	11½
attendance and supervision	£ 85	11	1
Map of River	£ 25	-	-
	<u>£384</u>	<u>10</u>	<u>5½(A)</u>
8 June 1741-17 April 1742			
costs of Broxbourne Turnpike(B)	£633	6	10½
attendance and supervision	£ 36	12	-½
production costs	£ 88	8	8
	<u>£758</u>	<u>6</u>	<u>7(sic)</u>
17 April 1742-1 October 1743			
scouring river from Ware weir to Stanstead			
Bridge, production and supervision	£105	1	6
scouring river, cutting weeds, several			
places, production and supervision	£ 71	18	-
attendance costs(exc supervision)	£ 23	1	6
cost of Stanstead Turnpike(C)	£460	-	-
provision of two boats	£ 18	10	-
wharfing Broxbourne Turnpike, production			
and supervision	£ 66	7	2
	<u>£744</u>	<u>18</u>	<u>2(D)</u>
13 October 1743-1 September 1744			
total costs, no further details	£ 86	12	8
2 September 1744-29 September 1745			
total costs, estimated	£ 45	2	6(E)
30 September 1745-10 June 1748			
attendance and supervision	£ 65	-	-
production costs	£306	5	7½
	<u>£371</u>	<u>5</u>	<u>7½</u>
20 June 1748-6 October 1749			
attendance and supervision	£ 45	1	6
production costs	£148	16	3½
	<u>£193</u>	<u>17</u>	<u>9½</u>
9 October 1749-19 September 1750			
attendance and supervision	£ 16	8	6
production costs	£ 75	9	6
	<u>£ 91</u>	<u>18</u>	<u>-</u>
20 September 1750-21 August 1752			
attendance and supervision	£ 61	-	-
production costs(inc a new boat)	£226	6	5
	<u>£287</u>	<u>6</u>	<u>5</u>
22 August 1752-26 November 1757			
total costs, no further details	£472	19	5(F)
Total expenditure Ware-New Cut:-	£3435	2	1½

(cont)

WARE-NEW CUT ACCOUNT

11 June 1740-6 June 1741			
scouring river, including labour	£248	1	5
tools, utensils, barges used	£ 25	17	11½
attendance and supervision	£ 85	11	1
Map of River	£ 25	-	-
	<u>£384</u>	<u>10</u>	<u>5½(A)</u>
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costs of Broxbourne Turnpike(B)	£633	6	10½
attendance and supervision	£ 36	12	-½
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	<u>£758</u>	<u>6</u>	<u>7(sic)</u>
17 April 1742-1 October 1743			
scouring river from Ware weir to Stanstead			
Bridge, production and supervision	£105	1	6
scouring river, cutting weeds, several			
places, production and supervision	£ 71	18	-
attendance costs(exc supervision)	£ 23	1	6
cost of Stanstead Turnpike(C)	£460	-	-
provision of two boats	£ 18	10	-
wharfing Broxbourne Turnpike, production			
and supervision	£ 66	7	2
	<u>£744</u>	<u>18</u>	<u>2(D)</u>
13 October 1743-1 September 1744			
total costs, no further details	£ 86	12	8
2 September 1744-29 September 1745			
total costs, estimated	£ 45	2	6(E)
30 September 1745-10 June 1748			
attendance and supervision	£ 65	-	-
production costs	£306	5	7½
	<u>£371</u>	<u>5</u>	<u>7½</u>
20 June 1748-6 October 1749			
attendance and supervision	£ 45	1	6
production costs	£148	16	3½
	<u>£193</u>	<u>17</u>	<u>9½</u>
9 October 1749-19 September 1750			
attendance and supervision	£ 16	8	6
production costs	£ 75	9	6
	<u>£ 91</u>	<u>18</u>	<u>-</u>
20 September 1750-21 August 1752			
attendance and supervision	£ 61	-	-
production costs(inc a new boat)	£226	6	5
	<u>£287</u>	<u>6</u>	<u>5</u>
22 August 1752-26 November 1757			
total costs, no further details	£472	19	5(F)
Total expenditure Ware-New Cut:-	£3435	2	1½

(cont)

- (A) This sum includes £1 15 6 which is also recorded in the accounts for Hertford-Ware, but excludes £30 which Whittenbury paid to the clerk on the instructions of the Trustees.
- (B) Built by direct labour system.
- (C) Built by contract.
- (D) Error of 6d in this account.
- (E) No accounts for this period minuted, estimate based on minutes of surrounding accounts.
- (F) Presented by executors of Whittenbury's estate soon after his death.

15.4 The accounts of the Trust

A variety of reasons means that no accurate accounts can be presented, either to the satisfaction of an accountant, or for the purpose of presenting a detailed picture of the income and expenditure of the Trust. For such reasons, all that will be attempted in Table 10 below is a list of that income and expenditure that is known, with some indication of that which is not known, and some indication of the balances left in the hands of the Trustees at the end of their Trust in 1767.

Various reasons explain this inability to obtain a properly prepared account. There was some laxity in requiring the officials to present regular reports of their financial dealings, especially from the 1750s onwards. In addition inadequate minuting meant that on three occasions such reports are not recorded, and other reports were merely noted without greater detail.

A practice also developed whereby the clerk made advances to the surveyor or other persons, and was then himself recompensed by the Treasurer. When proper accounts were submitted in the 1740s, such items can be determined

and allowed for, but from 1752 onwards this cannot be done. Sometimes it is noted in the minutes that the clerk is to make such and such a payment, often it is not, and the lack of detail in the clerk's and treasurer's accounts means that there must be a large element of double counting in the balance of the clerks' accounts reported in 1767.

Another problem is that whereas the treasurer was required to submit separate accounts for the river between Hertford and Ware and between Ware and the mouth of the new cut, this practice was not followed in 1767 when a final surplus of £501 2s 6d was reported on the accounts of the 1739 Trust. This surplus was then handed over to the new body of Trustees appointed by the act of 1767.³³

TABLE 10: INCOME & EXPENDITURE OF THE TRUST³⁴

HERTFORD-WARE ACCOUNT

Income

Initial lump sum from New River Company	£ 750	-	-
Rental payments from Company, Lady Day 1740 to Lady Day 1767 (£50 a year)	£1375	-	-(A)
Toll income at Constants Weir from 3 November 1750 onwards	£ 96 12	-	
	<u>£2131 12</u>	-	

Expenditure

Paid to inhabitants of Hertford for work prior to 1739	£ 302 12	-	-
Paid to Bostock Toller, soliciting Act of 1739	£ 96 9	-	
Paid to Whittenbury for construction of Portobello Turnpike, and surveying	£ 276 3	-	
Paid to James Fordham, scouring river below Portobello Turnpike	£ 120	-	-
Paid to James Fordham, unsolicited scouring in 1741 and 1749	£ 26 19	-	1½

(cont)

Paid Borough of Hertford, rebuilding Hertford Upper Turnpike in 1743	£100	-	-	
Paid Borough of Hertford, building Constants Weir Turnpike	£195	-	-	
Paid Whittenbury, maintenance work	£149	10	4½	(B)
Expenditure Borough of Hertford on weir-keeper at Constants Weir between 3 Nov 1750 and 9 Dec 1752(8/- a week)	£	43	4	- (C)
Expenditure Borough of Hertford on maintenance 1752-1757	£106	-	7	(C)
Expenditure Borough of Hertford on maintenance 1757-1767	£505	11	7	(C)(D)
Clerk's expenses attributed to this account 1750-1752	£	14	13	10 (E)
Clerk's expenses attributed to this account 1760-1761	£	6	9	5 (E)
Clerk's expenses attributed to this account 1752-1760				NOT KNOWN (F)
Clerk's expenses attributed to this account 1761-1767				NOT KNOWN (F)
				<u>£1932 12 11 +</u>

- (A) Although the act of 1739 stated that the rental payments should be made from Michaelmas 1739 onwards, the first payment to be received was for Lady Day 1740, and from then on at Michaelmas and Lady Day every year
- (B) Based on expenditure reported in Table 9, excluding expenditure on Portobello Turnpike.
- (C) Only the balance on these items paid by Trustees, after deducting income received by Borough from tolls at Constants Weir Turnpike
- (D) In fact the accounts in the Borough Records record this expenditure as £507 9 7.
- (E) According to decision of Trustees one-seventh of clerk's expenses after 1750 were to be attributed to this account.
- (F) The final bills submitted in 1767 include much double accounting, much expenditure which definitely should not be attributed to this account, therefore no estimate can even be attempted.

A balance of £198 19 1 is shown, but this should be reduced to allow for clerk's expenses 1752-1760 and 1761-1767. Nevertheless a surplus seems to be implied on this account.

(cont)

WARE-NEW CUT ACCOUNTIncome

Initial lump sum from New River Company	£2500	-	-
Rental payments from Company, Lady Day 1740 to Lady Day 1767 (£300 a year)	£4050	-	-(A)
Received from William Plumer for arrears of quit rent after purchase of Dobbs Weir in 1746	£	12	4 8
Profit from India Bonds purchased 1758	£	172	- 6(B)
Toll income at Dobbs Weir Michaelmas 1746-Michaelmas 1747	£	48	13 5(C)
Toll income at Dobbs Weir Michaelmas 1747-10 June 1748	£	23	3 7(C)
Toll income at Dobbs Weir 10 June 1748-24 June 1749	£	6	10 -(C)(D)
Toll income at Dobbs Weir 25 June 1749-5 June 1750	£	18	12 -
Toll income at Dobbs Weir 6 June 1750-27 June 1752	£	35	10 -
Toll income at Dobbs Weir 28 June 1752-7 Sep 1757	£	39	11 6(C)
Toll income at Dobbs Weir 7 Sep 1757-end of Trust			NOT KNOWN
	<u>£6954</u>	<u>4</u>	<u>6+(E)</u>

- (A) See note (A) Hertford-Ware accounts.
- (B) Total profits after deducting costs of purchase and sale from interest received.
- (C) Reported as 'neat income', thus allowances made to the weir-keeper were deducted from toll income reported. Level of these allowances not known.
- (D) Sharp fall in 'neat income' due to reduction of toll from 1/6 downwards and 1/- upwards to 6d.
- (E) This total should be increased by income from Dobbs Weir after 1757, and that element not included when such income reported as 'neat income' not gross.

Expenditure

Paid to Ware inhabitants for work prior to 1739	£1000	-	-
Paid to Thomas Pettit, bargemaster, for bringing witnesses to a Court of Sewers in 1742	£	30	- -
Paid to William Pigbourne, damage to his land when scouring river 1742	£	3	5 -(A)
Paid for purchase of Dobbs Weir, 1746	£	600	- -
Paid, entry fines for Dobbs Weir	£	49	19 4

(cont)

Paid, building turnpike at Dobbs Weir,1758	£ 500	-	-
Paid,dwelling house at Dobbs Weir,1758	£ 110	-	-
Paid,building Broxbourne Turnpike,1741	£ 633	6	10½
Paid,wharfing Broxbourne Turnpike,1742-43	£ 66	7	2
Paid,building Stanstead Turnpike,1743	£ 460	-	-
Paid,to Feild damages and costs after legal action over Stanstead Turnpike	£ 337	-	-(A)
Trustees legal expenses in dispute with Feild			NOT KNOWN
Paid, to bargemasters in 1759, expenses of their application to Parliament	£ 51	18	-(A)
Paid, to Meredith Bishop, cost of providing a boat for Trustees use	£ 65	9	-(A)(B)
Paid, to Whittenbury, maintenance and other items	£2275	8	1(C)
Paid, to Clerk, work as surveyor after 1757			NOT KNOWN
Paid, to Toller, clerical expenses, before August 1750	£ 556	9	5(D)
Paid, to Toller, total expenses attributed this account 1750-1752	£ 104	16	-(E)
Paid, to Toller, total expenses attributed this account,1752-1761			NOT KNOWN(F)
Paid, to Windus, total expenses attributed this account,1761-1762	£ 38	16	6 (E)
Paid, to Thoroughgood,total expenses attributed this account,1761-1767	£		NOT KNOWN(G)
			<u>£6862 15 4½(H)</u>

- (A) Items known to be paid out by the clerk, and thus included in his accounts
- (B) Originally the Trustees had stipulated a maximum cost of £60.
- (C) Based on Table 9, after deducting costs associated with building the Turnpikes.
- (D) Based on Table 7, after deducting costs of obtaining the Commissions of Sewers and paying the entry fine to Dobbs Weir.
- (E) After a decision of Trustees six-sevenths of the clerk's expenses to be attributed to Ware-New Cut account.
- (F) In 1767 the executors of Toller's estate presented bills for £1486 16s 9d, most of which had already been met from advances to Toller. The total bill must include many items of double accounting, besides those noted in (A) above. Thus not put down in Table.
- (G) In 1767 Thorowgood presented bills for £2415 7 10, most of which had already been met from advances. This bill must include many items of double counting, and has not been included in the Table.
- (H) This sum should of course be higher, to include those costs shown as not known.

The fact that neither the total income nor the total expenditure can be calculated for the Ware-New Cut account does preclude any estimate of the balance being made. However it can be stated that a surplus must have been recorded in 1767. This is shown by the fact that a total surplus of £501 was recorded, whilst the surplus on the Hertford-Ware account, which can be estimated, was less than £200.

One point to note is that there was a sharp decline in the surpluses recorded between August 1765 when it was £1873 and October 1767 when it was £501(see Table 8). This is explained by the heavy expenditure necessitated by planning the ambitious improvement schemes enacted in 1767. It may be questioned whether such expenditure was justified under the terms and conditions of the Trust, but in fact such questions were never raised by contemporaries.

Otherwise the low level of expenditure shown in the accounts suggests just how possible it was to maintain the navigation during the seventeenth century, first by rating riparian landowners, then by voluntary contributions from the bargemen. Such experience enabled the bargemen to accurately calculate just how much money was needed from the New River Company if a deal was to be struck. Such income was necessary to enable the Trustees to fulfill their duty to maintain the existing navigation, and confirms just how well the bargemen understood the task at hand.

CHAPTER SIXTEENIMPLEMENTATION OF THE ACT OF 1739:WHAT WAS DONE16.1 The river above Ware

At their second meeting, the formalities completed, the Trustees turned their attention to implementing those improvements which were specifically authorised by the Act of 1739. A committee was appointed to consider how best to erect the turnpike between Ware Mills and Ware Bridge. Within a month it had been decided that the best position was next to the Priory Orchard at Ware, that there should be a 15' gap for barges to pass through, and that it should have a guillotine gate operated by overhead rollers. The job was then put out to contract.¹

Two tenders were received. One from William Whittenbury, the other from John Kirby of Hertford, bricklayer. Both estimates were thought to be 'defective in several points', so they were handed back for revision, and a committee was appointed to handle the discussions and the awarding of the contract. Whittenbury's revised tender was accepted, it was only £273 compared to Kirby's quote of £390.²

The turnpike must have been completed by the spring, and then handed over to the New River Company as specified in the act. The turnpike was later known as Porto Bello or Portobello Turnpike, it was presumably so named in honour of the capture of that town in the War of Jenkin's Ear in November 1739. The news of this victory only reached

England on 13 March 1740.³

Whittenbury had specified that the river in the vicinity of the turnpike should be scoured thoroughly, and deepened by 3'. The Trustees hired James Fordham, a bargemaster and the miller at Ware Park Mills,⁴ to do this work. Shortly after he had begun, several local inhabitants suggested that the channel he was deepening past a particular midstream island was the wrong one, that it would be better if the channel on the other side was chosen. This was agreed, and Fordham changed his plans accordingly.⁵

Fordham continued to take an interest in the navigation along this stretch of the river, presenting the Trustees with bills for scouring in 1741 and 1749. These were met, but on the last occasion the Trustees resolved not to accept such bills again unless the work had been authorised by their surveyor. Fordham, however, was the only person ever to submit such bills, and he never did so again.⁶

The Trustees had substantially improved the river above Ware Bridge, but the bargemen were soon to face problems with other turnpikes and locks along this stretch of the river, which were not the responsibility of the Trustees.

In September 1741 a report to the New River Company noted that the pound lock next to Ware Mills was in a ruinous condition, and a local bargeman, Mr Pettit,⁷ 'thought no Publick thing of such Consequence ever lay so much Nèglected'. Repairs were ordered, but these were not to run smoothly. There were obvious problems with the

extremely cold weather, but a series of sarcastic reports suggested incompetence on behalf of the Company and their surveyors, Mr Mills and Mr Edwards. Comments were made about gangs of workmen costing £50 or £60 a day(sic) 'who for some time passt have been imployed only in blowing their Fingers', about brickwork which was 'A Mistery not only to us, but to all the workmen there', and about gates and iron work which were 'in so grand a manner as if for a Cathedral'.⁸

Notwithstanding such broadsides the pound lock was obviously rebuilt, and the problems were never serious enough to warrant complaint to the commissioners or Trustees. Absence of later complaint suggests the New River Company adequately fulfilled their responsibility to maintain it. The only complaint ever recorded is that in March 1743 James Fordham complained that two of his barges had been left stranded because the miller, Susannah Pryor, had drawn away a flash and had locked up the gates of the pound lock.⁹

Other problems arose with the turnpikes at Hertford. These had been repaired by the Borough of Hertford in the 1730s, after they had recovered the waterworks from their bankrupt owner(see 14.1), but in 1739 the waterworks had been let once more, to Robert Hall, and he had taken on the responsibility for maintaining the two turnpikes.¹⁰

He was not to fulfill this responsibility. In 1742 the miller at Dicker Mill, Thomas Marlborough, complained that the upper turnpike had blown up. Hall had not been able to make a go of the enterprise, and in May 1743 he surrendered his lease to the Borough. Once more the

burgesses took on the responsibility for the waterworks and the turnpikes. They immediately rebuilt the upper turnpike, receiving £100 from the Trustees towards the estimated costs of £200.¹¹

Thus by the mid-1740s the navigation above Ware must have been in its best condition, requiring only the regular scouring and cleansing that the Trustees' surveyor was responsible for. The only problem to be recorded during the rest of the decade was that some bargemen had acquired keys to the Hertford Turnpikes and were opening them whenever they wanted too, ignoring agreements with the local millers as to when flashes should be provided. If the turnpike keeper remonstrated the bargemen threatened him, actually knocked his wife down, and continued to force open the gates. The burgesses were sufficiently concerned to investigate the penal laws with regard to breaking open turnpikes, but no further action was taken.¹²

Shortly below the Hertford turnpikes stood a private fishing weir, the property of the Earl of Salisbury. It was known as Constants Weir after a previous tenant, but in 1750 was leased to James Fordham. In 1750 it was sold to the Borough of Hertford for 10/- down and an annual payment of 5/- thereafter, although the Earl retained his fishing rights associated with the weir.

This sale was part of an agreement whereby the burgesses took over the weir so that they could erect a turnpike to benefit the navigation in its place, and a bridge nearby to preserve the common way from Hertford to Ware Park and Ware Park Mills.¹³

Having completed the purchase, the burgesses went to the Trustees. They proposed that the latter should bear the estimated costs of £200 for building the new turnpike, and then take over responsibility for its operation and maintenance, collecting a toll of 1/- from the bargemen for the flash it provided. Presumably 1/- was the level of toll that the Earl of Salisbury had been entitled to for any flash that was required from his fishing weir.¹⁴

These proposals were accepted and implemented. The Borough erected the new turnpike and hired James Shadbolt as its keeper for 8/- a week. However the Trustees then chose not to take it over. Instead they signed an agreement in December 1752 whereby the Borough of Hertford took over the responsibility for the navigation above Ware Mills(see 15.1). Shadbolt now had to look after the two turnpikes at Hertford, the turnpike at Constants Weir and the passage of the barges down to Ware Mills, but got no extra money for his increased responsibility.¹⁵ The Trustees did take on the financial responsibility however. The burgesses produced annual accounts which were then settled by the Trustees.¹⁶

Thereafter little is recorded. Annual receipts for tolls at Constants Weir are noted, but those for the two turnpikes at Hertford are not, presumably lost with the waterwork's accounts. All that is known is that in the autumn of 1763 one of the Hertford turnpikes was completely rebuilt.¹⁷

16.2 The river between Ware and the 'new cut'

Since the Act of 1739 authorised no specific improvements to the river below Ware, work along this stretch of the river commenced only after the appointment of a Commission of Sewers. The first task then assayed was that this commission, utilising only those powers they traditionally enjoyed, concentrated on restoring the existing navigation to its desirable state.

During these first years the commissioners held regular Courts of Sewers, to which the bargemen brought many complaints, and at which the commissioners took surveys, heard evidence, deliberated, and issued orders to their surveyor. There is no reason to suspect but that this had been the principle adopted by those commissions during the preceding century whose records no longer remain, but there were differences in the procedure adopted.

The commissioners issued some general orders which were to apply to the whole river, not just to any specific problem which had been raised by the bargemen. They ordered their surveyor to remove all shoals along the river except those near the mouths of millstreams, in which cases he was to approach the commissioners first. They issued instructions to all weir-keepers and millers that they were not to pull up weeds growing in the navigable channel without leave from the commission, that millers were not to hang up their gates and allow water to run to waste on pain of a 40/- fine,

or scour and cleanse the river themselves on pain of a
£5 fine.¹⁸

Such orders were issued not only to prevent further deterioration or encroachment upon the navigation, but also to give notice that the commissioners intended to take responsibility for maintenance. No longer were the millers and weir-keepers to carry out the commissioners' instructions, for the future it was to be their surveyor who would be responsible, and it would be the Trustees who would meet the bills.

The commissioners also issued specific orders to their surveyor, after investigating specific complaints about the various mills and weirs along the river. Many millers and weir-keepers had taken advantage of the absence of any commission since 1728 to encroach upon the navigation, both to enhance their own special interests and to force the bargemen to be more dependant upon flashes of water. The bargemen wished to redress the balance.

Thus specific complaints were made against the occupiers of Waltham Abbey Powder Mills and mills at Stanstead, Broxbourne, Cheshunt, Sewardstone, Enfield, Chingford, Tottenham, Walthamstow, and the Temple Mills in Leyton. All had taken measures, illicitly, to increase supplies of water to drive their mills. The mouth of the head stream to Cheshunt Corn Mills had been doubled in width, that serving Sewardstone Mills had been increase from 15' to 50'. Additional ditches had been opened to increase supplies to Waltham Abbey Powder Mills and Enfield Mills. In addition most millstreams had been

deepened, and shoals had been allowed or even assisted to develop in the navigable channel just below the mouth of the millstreams, to further increase the supplies diverted to the mills.¹⁹

Ensuing investigations are not well minuted. It is recorded that several shoals were removed, but not that the other encroachments were restrained. Complaints about the increased width of millstreams at Sewardstone, Cheshunt, Chingford and Temple Mills were either never followed up or no orders were ever issued, whilst the arrangements to increase water supplies to Waltham Abbey Powder Mills and Enfield Mills were specifically permitted.

The commissioners did have sufficient powers to reverse these particular encroachments. The fact that they did not suggests either that inaction was the lesser of two evils, or that more positively, it was recognised that a spirit of compromise was still necessary to ensure the proper development of the flash-lock navigation, and that such encroachments had not been too detrimental to the navigation.

Fewer complaints against weir-keepers are recorded. The Page family had been guilty of exactly those same practices which had been restrained by the commissioners in 1721(see 11.5), and these new commissioners merely repeated those former orders. In addition instructions were issued that the sill of Frances Weir in Walthamstow be lowered 4". Otherwise the only problems were the shoals that built up, above and below the weirs, and these were left to the discretion of the surveyor to remove whenever necessary.²⁰

A final problem dealt with in these years was that William Pigbourn of Waltham complained that the traditional navigable channel below Sothebys Upper Weir at Sewardstone was blocked up, and that the bargemen used an alternative channel through his lands, to his detriment. These allegations were checked with the bargemen, and orders issued that the traditional channel be re-opened and the channel through Pigbourn's lands be blocked up.²¹

Within a few years the commissioners had restored the traditional navigation to a desirable state, even though they had allowed the increase in supplies of water to the mills. There were, however, two problems that they did not resolve, for the millers objected to their original orders and suggested solutions that required powers beyond those enjoyed by the commissioners, and which needed the attention of the Trustees. These particular problems, at Stanstead and Broxbourne, were particularly contentious, and are dealt with separately in the ensuing sections. Here it can be noted that once more the commissioners were prepared to compromise to accommodate the millers, they did not insist on using their full legal powers.

With the exception of these two problems, there was now less business to deal with. The surveyor could maintain a watchful brief, and this must have restrained the millers and weir-keepers from once more encroaching on the navigation. From the mid-1740s onwards this approach sufficed, only occasionally were problems or fresh initiatives to arise, and these were dealt with by the Trustees, not the commissioners, as the role of

body fell into abeyance.

In June 1746 William Plumer, a Trustee and a commissioner, but also the owner of Dobbs Weir at the head of Broxbourne Gull which was tenanted by the Page family, informed the commissioners that the bargemen had asked him whether he was prepared to sell or let the weir to them. He told them that he was prepared to do either.

The commissioners decided that it would be better to purchase the weir, not only to improve the navigation but also to 'put an End to all Disputes Controversys and Suits about passing and repassing thro the same'. These particular disputes are not minuted. However the commissioners did not have powers to purchase property, they thus made their recommendations to the Trustees, who did have the necessary powers. These recommendations were accepted.²²

The following month the weir was purchased by the Trustees for £600, but no other initiative was taken except that widow Page was hired to take care of the weir, with instructions not to shut the weir for any barge unless the normal toll was paid. It was only after complaints in December 1747 that the weir was repaired, along traditional lines.²³

Then in November 1748 several bargemen petitioned the Trustees, asking them to reduce the toll collected at the weir. At this date the bargemen were still paying the traditional toll of 1/6 a barge downwards and 1/- a barge upwards, only on those occasions that a flash of water was needed. They now argued that the toll should

be reduced to 'Sixpence a Barge a Journey Ebb and Flood', maintaining that such a level would be sufficient to meet all costs of maintenance and that the cost of widow Page's wages could be met from the income from the fishery. The Trustees agreed, but insisted that the 6d should be paid 'every Time they pass through the said Weir Ebb and Flood²⁴ whether such Barges shall want the said Weir or not'.

The purchase and control of this weir by the Trustees must have been a success, for in October 1748 several bargemen suggested that the Trustees should purchase Ware Weir, which had been acquired by the New River Company along with Ware Mills in 1738. The Trustees were prepared to investigate, but the Company felt that such discussions would be pointless until after the existing lease had expired on Lady Day 1750, though they added that they were prepared to rebuild it themselves or sell or let it to the Trustees after that date.²⁵

Then in October 1749 the Company informed the Trustees that they were prepared to let or sell it after Lady Day 1750, mentioning a rent of £40 a year when pressed. The Trustees did not respond, and the weir remained the property of the Company.²⁶

Another problem with fishing weirs was reported in August 1751. The bargemen complained that Peter Donn of Enfield Mill had leases to four adjoining fisheries, 'Upper Water, Endfield Lock, Parkinsons Weir and Chinckford Weir', and was demanding that they pay a toll at all four weirs even if a flash was not required at all of them, enforcing such demands by refusing any flash that was required if

his demands were not met. The Trustees threatened him with prosecution if he did not immediately drop these demands, but nothing else is minuted.²⁷

Indeed, except for the continuing problems at Stanstead, no further complaints were recorded for many years, as meetings of the Trustees became more and more infrequent.

The only initiative to emerge from the Trustees during the 1750s was that in 1758 it was decided to rebuild Dobbs Weir. It was put out to tender, and the contract was awarded to William Hanscomb of Hertford, carpenter, at a cost of £500. However the Trustees instructed him that 'instead of making the Passage Pier a Weir it shall be made into a Turnpike'. They thus wanted to do away with the traditional removable planks and introduce the guillotine gates that had already been built in the turnpikes at Ware, Stanstead and Broxbourne. This was the last turnpike the Trustees were to build.²⁸

Problems were still experienced in this area however, for in September 1760 the Trustees ordered that a cut out of the Lea near the turnpike be opened and cleansed, and that another turnpike be erected in this cut which would pen back water as high as the turnpike at Dobbs Weir could. Presumably there had been problems of flooding in this area, and it is interesting to note that the Trustees were forced to introduce the very measures that the Page family had introduced and which the commissioners had overruled both in 1721 and 1741.²⁹ Further instructions to deal with the problems of flooding had to be issued to the

keeper at Dobbs Weir in November 1762 and August 1765.³⁰

Of other problems during the last years of the Trust's existence, the increasingly inadequate minuting of the Trustees' meetings means that they can often only be noted, and that an adequate explanation of both the problem and the Trustees' response is not possible.

For instance in June 1759 the first new complaint for many years is minuted, that Mr Warren at Walthamstow Oil Mills had scoured the river to the detriment of the navigation. Warren was ordered to attend the next meeting, but nothing more is minuted.³¹ Similarly it can be noted that in August 1759 the Trustees informed Pearce Galliard of Edmonton that his proposal for a new weir was not welcomed by the bargemen, but no other details are available.³²

Problems at Hackney were noted in November 1761, because proprietors of a new waterworks being set up there had built a pound lock just below Lea Bridge. The Trustees first response was to order the surveyor to pull it down, but after receipt of a legal submission from the proprietors, negotiations began instead. These negotiations are not minuted, but by November 1762 agreement had been reached whereby the Trustees leased the pound lock and appointed a keeper to ensure its proper use, both for the waterworks and the navigation.³³

Serious problems also arose at Waltham, but the minutes are so inadequate as to be confusing. In October 1759 a committee was instructed to investigate these problems and seek advice from John Smeaton. The only follow up is that in September 1760 the surveyor was

instructed to make a plan of the weir or turnpike that Thomas Hankin, a bargemaster and maltster who had been appointed a Trustee in 1757,³⁴ had suggested be erected in the 'Streights near Waltham'. Since this plan was to be shown to Sir William Wake owner of Waltham Corn Mills and Waltham Turnpike, it is possible that this was a suggested rebuilding of the Waltham Turnpike.³⁵

In 1762 John Walton, the owner of Waltham Abbey Powder Mills, complained that dams erected by the Trustees near his tail stream were causing his business problems. To arbitrate leading engineers were called in, Joseph Nickalls represented Walton and Thomas Yeoman the bargemen. Once more the problem is not properly minuted, so no explanation can be given as to why the Trustees had erected any such dams. All that can be noted is that Walton was rebuilding and expanding his production capacity at this date, and must have been determined to ensure his water supplies.³⁶

After this no more problems are minuted. The Trustees failed to obtain a quorum at any of the monthly meetings in 1763 and 1764, and it was not August 1765 that they were quorate. After that they did meet regularly, but not to consider the mundane task of maintaining the traditional flash-lock navigation, but rather to consider the ambitious improvements authorised by the Act of 1767.

16.3 The case of Broxbourne Turnpike

Of the two problems which the commissioners had insufficient powers to handle, and which needed the

attention of the Trustees, those at Broxbourne were the first to be raised, and the first to be resolved. In fact they were resolved quickly, in contrast to those at Stanstead, which were prolonged and contentious.

Before 1739 the barges passed through Dobbs Weir, and down Broxbourne Gull to Broxbourne Bridge(see Figure 4). When water was scarce the barges required a flash from Dobbs Weir and the assistance of the pen held back by Kings Weir. At times they also requested that the miller at Broxbourne Mill shut down his gates to provide additional assistance. It was a difficult stretch of the river, and Thomas Pettit raised the problem with the commissioners.

In response the surveyor was ordered to scour and cleanse Broxbourne Gull, but shortly after he began John French, the miller at Broxbourne Mills, complained that this prejudiced his property. French argued that the surveyor was deepening the river, the bargemen that the surveyor was merely removing those shoals which had built up. Whatever, the commissioners ordered that the work be stopped until further notice, to allow proper discussion.³⁷

At the next Court of Sewers the bargemen stressed the problems they experienced in Broxbourne Gull, and asked that it be scoured properly or a turnpike be erected at its lower end. The commissioners took a view, noting the barges that lay aground there, and ordered all parties to attend their next meeting, adding that if the miller did not attend, then scouring would be restarted.³⁸

After discussion at this next meeting the commissioners recommended that a turnpike be built along the Gull to pen

back water to a depth of $4\frac{1}{2}$ ' above a sill which was to be laid 20" below the surface of the mill backwaters. The turnpike was to have two gates, each 14' wide. Such measures were designed to raise the level of water in Broxbourne Gull so that it was 'at least as high if not higher' than that normally found in the millstream, and so preclude the need for scouring.

It was further proposed that the miller should have care of the turnpike subject 'to the Control and Direction of the Commissioners'. He was to provide flashes for all barges coming down river, he was to open the turnpike gates for barges coming up river when they reached a place known as Cheshunt Lock Crooks, and provide extra water by shutting his mill gates if necessary. In return he could collect a toll of 1/- from every barge.³⁹

The surveyor was ordered to investigate how best to implement these proposals. He made changes which were accepted by the commissioners. The turnpike was to be 34' wide and have four gates, one 14' wide for the passage of barges, three of 6' 8" to control the flow of water. Also the sill was to be only 15" below the surface. He provided an estimate of £420. It is likely that he also recommended the changes to the operation of the turnpike that the commissioners now recommended, that the gates of the turnpike be hung up for two hours after barges had passed through on their journey down river, and that the mill back gates be shut whenever a barge passed. To compensate the miller for these increased demands for water, the toll was increased to $1/3$.⁴⁰

Commissioners of Sewers had no authority to implement such measures, but it was assumed that the Trustees did.

The commissioners adjourned for lunch, and that afternoon met as Trustees, at a different inn and with two extra members present. A report was given to the Trustees of the commissioners' discussions and recommendations, and these were accepted, with only one change, the turnpike was to be 40' wide. The Trustees did not put this job out to tender, but ordered the surveyor to build it.⁴¹

By November 1741 the turnpike was almost complete, but at a cost of £633 6s 10½d, way above estimate. The Trustees only expressed concern over the provision of beer to the workmen. This turnpike too was to be named after an incident in the War of Jenkin's Ear, namely Cartagena or Carthage Turnpike.⁴²

When completed the turnpike was tested for a month by Whittenbury and then handed over to Edward Want, who had been hired by French to look after the turnpike. The only fault that Whittenbury found was that when opened the water rushed through with such force that the banks below were being damaged, to correct this he extended the wharfing a further 90' downstream.⁴³

There were to be some teething problems. In April 1742 three bargemen beat up Edward Want and forcibly opened the gates. In January 1743 there were complaints that adjacent lands were being flooded, and in February 1743 Alexander Hume, a Trustee and owner of Kings Weir, complained that the operation of the turnpike was damaging his fishery and his weir.⁴⁴

Therafter little is recorded. In 1759 it was reported as being in need of repair, but in fact no work was done until August 1765. Both French and the bargemen seem to

have been satisfied with its operation, and it can be noted that French himself transported his meal by barge to London.⁴⁵

16.4 The case of Stanstead Turnpike

The problems at Stanstead were not to be dealt with so quickly or so satisfactorily as those elsewhere along the river. Fortunately, for this prolonged dispute provides the best evidence available of the various conflicting interests which could be affected by any change to the prevailing arrangements along the river.

The Commissioners of Sewers appointed in 1719 had found that the miller at Stanstead Mills, Michael Pepper, had forced the bargemen to use an alternative route down his millstream and through a turnpike back into the traditional navigable channel (Route B on Figure 9). The commissioners had decreed that the traditional route (Route A on Figure 9) should be re-opened, and Pepper had agreed (see 11.5).

However during the remainder of the 1720s and 1730s the same tendencies had emerged, and by 1739 the new tenant at the mills, his son Michael Pepper, was once more forcing the bargemen to use the route down the millstream and was once more demanding a toll of 1/- when the barges passed through his turnpike. In August 1741 the bargemen brought their complaints before the commissioners, and asked that the orders made in 1720 be repeated. However the commissioners insisted on further discussion, and asked Pepper and the owner of Stanstead Mills, William Fielde, himself a Trustee, to attend their next meeting.⁴⁶

It was not until June 1742 that further discussion is minuted, and on this occasion the commissioners were in favour of re-issuing those orders made in 1720, but did not after hearing a proposal from Feilde. He suggested that the barges should continue to use his millstream and his turnpike, and he would drop his demands for any toll. In August he further proposed that he would obtain an Act of Parliament at his own expense to confirm these arrangements. An offer which emphasises just how beneficial these arrangements were to Stanstead Mill.⁴⁷

In August 1742 another proposal was made to the commissioners, by whom is not minuted, that a turnpike be erected near Graves Weir just below the town of Stanstead. Whittenbury was instructed to investigate the proposal, but no more is heard of this idea, except that in 1753 Feilde mentioned that certain Trustees had proposed a turnpike near the weir, but the bargemen would not consent to it.⁴⁸

Feilde's proposals were investigated instead. The commissioners sought legal advice, and were told that an act was indeed essential, but that it could be expensive because several of the properties affected were entailed. Feilde immediately withdrew his proposals, and the commissioners immediately issued instructions that the traditional river route be re-opened as soon as possible. They also recommended that a turnpike be built across the navigable channel just below the mouth of the head stream to Stanstead Mills. This turnpike would provide a flash for barges, and when closed would divert water into the head stream.⁴⁹

Whittenbury investigated these proposals. He told the commissioners that scouring the river would cost £75, and that a turnpike could be built for £460. The turnpike he proposed would pen back water to a depth of $4\frac{1}{2}$ ' , and would be 28' wide with three gates, one of 15' to allow the passage of barges, and two of $6\frac{1}{2}$ ' to control the flow of water.⁵⁰

The commissioners accepted these recommendations, and made a report to the Trustees that same afternoon. The Trustees favoured the plan, but put the job out to contract, having learnt from the experience with Broxbourne Turnpike.⁵¹

Two tenders were submitted. Whittenbury offered to build it 'in the most substantial manner' for £460, but in 'a Slighter Manner' for £340, or at any price between these two subject to discussion. Andrew Spellar of Hunsdon, carpenter, quoted £509 19s 3d. The Trustees accepted Whittenbury's tender, and ordered him to start work, but only after Feilde had had a chance to see the plans and give his comments.⁵²

Within a month Feilde had sent a letter to the commissioners of which it was minuted there were no objections, but which Feilde was later to claim had only stated that he was too busy to 'Shew Cause at this Meeting against their later Orders' and had not been meant as a letter of consent. Whatever, the commissioners instructed Whittenbury to commence work.⁵³

Within three months the turnpike had been erected and the river scoured. Barges could now once more use

the traditional route. The Trustees ordered Whittenbury to employ a turnpike keeper for not more than 10/6 a week.⁵⁴ The Trustees had handed over Broxbourne Turnpike to the local miller, but they were obviously not prepared to extend the same trust to Pepper. It should also be noted that the Trustees did not impose a toll for the use of Stanstead Turnpike, indeed they had no powers to do so.⁵⁵

Fears of a lack of co-operation from Pepper and Feilde were well grounded. In September 1743 complaints were made that Pepper was letting so much water run to waste that the level was 10" below normal when barges approached on a flash, and that consequently barges were being held up for 13 to 14 days. Meanwhile Feilde was organising his opposition.⁵⁶

It soon became clear that there were widespread misgivings at Stanstead about the Trustees' new turnpike. Feilde himself submitted a letter emphasising that the work had been carried out without his consent, and that great damage to his property had accrued. His lands had been damaged whilst the turnpike was being built, great quantities of earth scoured from the river had been dumped on his lands without proper care, and the operation of the turnpike harmed his mills and his two fishing weirs. His tenants backed him up with their complaints.

Pepper complained that the river had been scoured too deep, and that whereas by 'ancient right' his millstream should have been 1' deeper than the navigable river, the position had now been reversed. Furthermore the operation of the turnpike worsened the situation.

When the turnpike was open he was unable to grind, and it took at least three hours for a sufficient head of water to build up after it had been shut, and even then the water level never rose to within 9" of his ancient pen. Yet the turnpike was left open for three hours every time a flash came down from Ware, was often opened to allow barges below the turnpike at Stanstead to move 'from Shop to Shop', and so could be opened five or six times a day. In addition barges coming down from Ware in convoy often lay their barges across the mouth of his millstream to provide another pen to help them on their way down river.

The fishermen who leased Feilde's weirs also complained that their livelihood had suffered. John Graves, the tenant at Stanstead Weir, claimed that he had caught no eels since the turnpike had been set up when he would normally have caught about £5 worth. His son John, the tenant at Graves Weir, added that there was too little water in his fishery 'to set his Leaps for Eals'.

It was not just Feilde and his tenants who were concerned. Thomas Hankin, a leading member of the Stanstead malting and barge-owning community, submitted complaints on their behalf. The maltsters relied on water from the river for steeping, and the town took its drinking water from the millstream. Both supplies were now reduced, it was claimed.

The lack of water in the navigable river below the turnpike when it was shut brought other fears as well.

Corn of up to a value of £40000 was stored in the town. If a fire ever broke out the town had relied on water from the river, but now there was concern that there would be times when 'there will not be Water enough at the Bridges to dip a pail'. Opening the turnpike gates would take too long.

Hankin also stressed that although the turnpike was opened to provide water for barges to move 'from Shop to Shop' at Stanstead, the delays were still a nuisance to the bargemen, and caused Pepper great problems. In addition flashes of water were not always available when the bargemen wanted them. He cited the case of two barges loaded with wheat for export which had applied to the keeper at Stanstead Turnpike for a flash of water at 6 or 7 o'clock in the morning, but had been refused 'upon Pretence that Notice had been given for a Flash from Ware, which did not come till the Next day in the Afternoon unexpectedly'.⁵⁷

Feilde obviously enjoyed widespread local support, and once more suggested that the traditional river route be closed down and his millstream be used as the navigable channel instead. This time, however, he insisted that the Trustees bear the cost of the work, and that he retain the right to collect the toll of 1/- for the use of his own turnpike.⁵⁸

Such terms were unacceptable to the commissioners, but they still sought agreement with Feilde. They in turn proposed that they rent Stanstead Weir from him, but that he should retain control of it, and collect a toll of 1/- from every barge passing through. Furthermore

they suggested that he take over care of their own turnpike. Thus Feilde could operate the turnpike and weir for the benefit of his mills, provided he would agree to adequate provision of flashes for barges coming down from Ware.⁵⁹

Feilde was interested, asking several questions about the proposed lease and the best method of operating the turnpike and weir. But the bargemen were alarmed, informing the commissioners that 'they were not willing to Pay any Toll for Stanstead Weir or Stanstead Mill back Water or that the Miller of Stanstead Mills should have the care and custody of the said Turnpike'. This response effectively ended these discussions.⁶⁰

There matters rested. No more is heard of this dispute until 1748. The only event minuted is that in April 1746 complaints were made that bargemen were forcing the turnpike gates open or otherwise misusing it. To stop this it was felt that the turnpike keeper should live on the site, and Whittenbury was ordered to build a lodging room over the turnpike machinery at a cost of £12.⁶¹

In October 1748 the Trustees wrote to Feilde to inform him of discussion over whether to purchase Ware Weir(see 16.2), soliciting his opinion. He replied that he opposed such proposals, and took the opportunity to express his concern that his earlier complaints about Stanstead Turnpike had still not been dealt with. The Trustees expressed a willingness to listen, and asked him to submit his complaints once more.⁶²

Feilde readily responded. He noted that his mills

frequently suffered because the turnpike gates were 'often hung up unnecessarily and out of Carelessness, Sometimes whole Nights together'. Another serious problem had arisen when Pepper wanted to repair his mills. For this he needed to empty the millstream, yet the turnpike keeper refused to hang up the gates for two or three days to assist, and when Pepper had erected a dam across the mouth of his head stream, it was blown up by the force of water held back by the turnpike. Feilde commented that such was the damage to the mills that they would be difficult to let in the future.

He also complained of a loss of income from the toll for using his turnpike, and stressed that his fisheries were in a dire state. His tenants were often unable to put down 'their Boards' or their nets, and had fallen behind with their rent. Once more he claimed that he had not given the Trustees permission to erect their turnpike on his property.⁶³

The commissioners and Trustees held a joint meeting to consider these complaints, and made a spirited reply. They stated that the turnpike had been built for the benefit of the navigation, and that it answered this purpose. Nevertheless they did not wish it to harm his property, and were prepared to discuss the matter.

They did offer to repair the land between the navigable channel and the head stream, and asked him to put a specific value to the damages he claimed, but otherwise dismissed his arguments. In particular they stressed that he had had no rights to demand a toll at all, and that anyway they had been paid only when water

was short, not on all occasions. To clarify this last point they sought legal advice, and at the same time sought to establish their precise rights to have erected the turnpike.⁶⁴

The Attorney General's opinion strengthened the Trustees' position. He said that they did have the right to erect a turnpike to improve the navigation, and added that if this meant that a flash from a particular fishing weir was no longer required, then its owner had no right to claim any toll.⁶⁵

Feilde was sent a copy of this opinion, but it was over a year before he formally replied to the Trustees' response or this legal opinion. In the meantime Pepper had widened and deepened the millstream.⁶⁶

Feilde expressed himself disappointed with the Trustees' response, noting little action even though they expressed a willingness to compensate him, and expressing surprise that some Trustees evidently thought that the turnpike had benefitted his mills. He re-affirmed that his complaints were justified.⁶⁷

He also raised one new issue, namely that his name had been entered in the minutes at the very meeting at which the orders he opposed had been issued. He said this was an error which should be corrected. It was some months before this point was conceded by the commissioners, and a resolution passed that no advantage should be taken of the fact that his name had been inserted.⁶⁸

After a further exchange of letters in 1751, the Trustees set up a committee to treat with Feilde.⁶⁹ In December they made their report, making recommendations

that the Trustees accepted, which radically altered the Trustees' policy. They now favoured an Act of Parliament at the joint expense of Feilde and themselves to re-open the route down the head stream of Stanstead Mills and close down the traditional route. Furthermore they proposed to move their new turnpike to a position below Stanstead, and impose a toll which would pay for the upkeep of both this turnpike and the miller's turnpike.

Feilde had rejected these proposals beforehand, stating that they would 'be of no Service to his Mills nor in any manner reinstate the same as they formerly were', and noting the absence of any mention of compensation. He awaited their reply before going to law.⁷⁰

The Trustees merely expressed surprise at his attitude, and stated that they had been within their rights to erect the turnpike. They particularly refuted Feilde's allegation that they had procrastinated in order that the Statute of Limitations could come into effect, though they later admitted that the idea had been raised at one of their meetings, but merely as 'private conversation' not as a matter of policy.⁷¹

Feilde immediately issued writs against five Trustees, against Samuel Wood, the keeper of Stanstead Turnpike, and Whittenbury and his assistant, Richard Allen. Feilde then submitted a case before the Kings Bench, listing twelve specific complaints, and demanding £3000 in compensation.⁷²

Before the case was tried however, Feilde submitted further proposals to the Trustees. He suggested they rent Stanstead Weir at its old rent, and pay back rent from

1743, that the Trustees should dismantle Stanstead Turnpike and set it up near Graves Weir below the town, and that they should erect a new weir further up river, below Ware. He also asked for a payment of £25 a year as compensation for the loss of his tolls, but since he had heard that the Trustees intended to reject these proposals he offered to drop his demands for this £25 a year if they would agree to his other suggestions.⁷³

The Trustees met the following week to consider their reply, taking advice from several bargemen. They were prepared to rent Stanstead Weir, but only from Michaelmas 1752. Although they were prepared to build a new turnpike at this weir, they were not prepared to move their own turnpike, and felt that there would be no advantage from any weir further up river nearer Ware. They felt it would be 'a Breach of Trust' to accede to his demands for £25 a year, but did think that the £75 they had paid into court was sufficient recompense for any damage caused to his lands.⁷⁴

No out of court settlement was possible, the case was tried on 13 November 1753. The Trustees' optimism was justified, the jury found only that Feilde had suffered damage from the flooding and washing away of his lands. On these two counts they awarded him £80 damages and insisted that the Trustees pay a proportion of his legal expenses.⁷⁵

Feilde's disgust is illustrated by the fact that during the weekend following the case Pepper ground away flashes coming down from Ware and hung up his

mill gates so that several barges were laid aground at Brutons Wharf just below Stanstead Bridge for several days. To prevent further reprisals the Trustees ordered their surveyor to scour the river between Stanstead Bridge and Stanstead Weir, and narrow the channel by setting up stakes and rails on both sides of the river.⁷⁶

Thereafter the dispute disappears from the record. It should be emphasised that despite all the argument no actual changes were ever implemented to those arrangements first introduced in 1743. It can also be noted that in time even Feilde made his peace with the other Trustees. He had attended Trust meetings regularly until September 1743, but stopped when the disagreements arose. But shortly before his death in 1762 he took up these duties once more. Also in 1760 the miller, Pepper, was to help improve navigation along the lower Lea.⁷⁷

16.5 The lower Lea

The City had insisted on retaining jurisdiction over the 'new cut' in 1739, so the bargemen made sure that they fulfilled these responsibilities thereafter. The City never set up any permanent arrangements to carry out the task, just as before 1739, they merely responded to approaches from the bargemen, but the latter made these approaches more frequently than they once had.

One factor which was to emerge was that there was still confusion over the exact extent of the City's

jurisdiction. The Act of 1739 had not been precise, it had not defined what constituted the 'new cut', it had not defined the exact responsibilities of the various bodies that had some interest in the lower Lea. Yet once more the potential for conflict was never realised. In practice unofficial limits of jurisdiction were recognised.

For instance in April 1742 the bargemen complained to the Commissioners of Sewers for the river Lea that John Battin at Temple Mills intended to scour and deepen his millstream. Their surveyor was instructed to tell Battin that if he did, the commission would investigate.⁷⁸

Yet in September 1742 the bargemen raised these problems with the aldermen. They complained that Battin had scoured and deepened his millstream, and that he was also refusing to close his mill gates when flashes came downstream, despite requests from the bargemen for this traditional assistance. They also complained of certain encroachments which had been made about thirty years previously.⁷⁹ The aldermen made immediate response to other complaints in the September 1742 petition, but not to those about the Temple Mills, the bargemen submitted these particular complaints to the commissioners once more, in January 1743.⁸⁰

On this occasion the bargemen explained that they had consented to the encroachments made twenty seven years previously only on the understanding that the miller at Temple Mills would always close down his gates when flashes came downstream, but now Battin was refusing this co-operation, even if the bargemen offered him payment for such assistance. This last was a concession

by the bargemen for the miller at Temple Mills was not traditionally entitled to such a toll, probably because the mill lay within the tidal influence of the Thames.⁸¹

Battin denied some of the bargemen's complaints, but acknowledged that he refused to close his gates, he felt his mills needed this water to operate effectively. The commissioners summoned a jury to decide the issue, one of only two times that this Commission of Sewers ever used a jury.⁸²

In August 1743 this jury presented that twenty nine years previously the wharfing separating the head stream of Temple Mills from the navigable channel had been extended 14' further into the navigable channel to turn more water to the mills, and Battin was ordered to remove this extra wharfing. But no other presentments or orders are recorded. Unless some private arrangement was reached between Battin and the bargemen, he was still to refuse to close his gates when flashes came downstream.⁸³

The bargemen had raised other complaints with the aldermen in September 1742, some of which the aldermen dealt with, and none of which were submitted to the Lea commissioners. These particular complaints were of the problems experienced in navigating the channel known as the Bowling Alley, the traditional navigable river channel from the mouth of the head stream to Temple Mills towards Old Ford. It was this channel which was always regarded as the 'new cut'.

The complaints raised were that the wharfing along the banks near Temple Bridge had been neglected and allowed to deteriorate to the state they were washed away, that

a shoal had built up above Temple Mills Bridge making it difficult for the barges to negotiate the passage pier of the bridge, and that more shoals impeded the passage below the bridge. They also made a suggestion, which they said that they had first made in 1736, that Temple Mills Bridge be removed 100 yards further downstream.

To encourage the aldermen's interest the bargemen concluded their petition with the argument that such were the problems that barges were unloading great quantities of malt and other goods at Hackney, thus reducing the City's income from the meteage dues they could collect if these barges came to London.⁸⁴

The aldermen did respond, they instructed the Water Bailiff to remove the shoals, but made no orders about moving the bridge.⁸⁵ Within months the bargemen were to submit another petition.

Once more they complained of the derelict wharfing and the numerous shoals which made passage down the Bowling Alley so difficult, so difficult in fact that barges were often stranded for two or three weeks, and some had even broken up and sank.⁸⁶

In April 1743 the aldermen gave this petition further consideration, as well as a proposal from alderman William Calvert⁸⁷ that the Bowling Alley be narrowed and deepened at an estimated cost of £225 10s. The aldermen instructed their Clerk of Works and Water Bailiff to investigate the matter further, and later that month set up a committee to consider the navigation along the lower Lea, with instructions to hire an engineer, William Hutchins.⁸⁸

In July 1743 this committee recommended that the

Bowling Alley be thoroughly scoured and cleansed, and that wharfing be erected to narrow the channel. The aldermen gave instructions that this work be carried out.⁸⁹

It seems likely that this committee considered, but did not recommend, a more ambitious proposal that a turnpike be erected along the Bowling Alley to provide an additional pen and flash. For the City records contain two undated petitions from the bargemen which internal evidence suggests must have been submitted about this time.

One petition noted that the bargemen had complained several times about the problems experienced in the Bowling Alley, and that the aldermen had lately viewed the 'said new Cutt'. These petitioners hoped that the aldermen would decide to erect a turnpike, and offered to pay a 1/- toll if it was built. The other petition, signed by seven who had signed the aforesaid petition, made similar points, but expressed the view that a turnpike was not necessary, and that scouring and wharfing would be adequate, at a much cheaper cost.⁹⁰

It was this work which was authorised, and a contract was given to Francis Pank of Low Leyton to carry out the task. There were problems however. When Pank submitted his bill in October 1743, it was not paid after reports that the work had not been performed in accord with the contract. Instead he was paid only £50 on account and told to complete the work properly. Yet in December the bargemen complained that the work had been done badly, and the problems were as bad as before. The aldermen set up the

committee once more. This seems to have solved the problem, for there were no further complaints, and in November 1745 the engineer was paid, and in February 1747 Pank's bill was finally cleared.⁹¹

In 1751 the bargemen petitioned the aldermen once more, but no record of their complaints or further action are recorded.⁹² Then in November 1760 a petition with signatures was submitted, complaining once more that barges were finding it difficult to navigate along the Bowling Alley. The aldermen ordered an investigation, but the following month gratefully accepted a proposal from two of the petitioners, Thomas Hankin and Michael Pepper, that they would scour and cleanse the channel for not more than £100.⁹³

All the complaints submitted to the aldermen by the bargemen concerned that channel known as the Bowling Alley, they never raised complaints about the shallows at Old Ford or of any problems near Bow Lock. This suggests in practice a narrow interpretation of the 'new cut', an interpretation that did not extend to the whole of the lower tidal Lea.

Such an impression is strengthened by the fact that in 1749, when faced by problems near Bow Lock, the bargemen submitted their complaints to the Commissioners of Sewers for the Levels of Havering and Dagenham. These complaints were that the owners of the Three Mills had opened a cut from the Lea below Bow Bridge to provide additional water to drive their mills, to the obvious detriment of the navigation. Such a cut had first been opened during the previous decade, but had been stopped up after legal action between the owners of the Three

and Four Mills. With such a precedent the commissioners had no hesitation, they ordered that it be closed up once more. This was the only occasion between 1739 and 1762 that these commissioners specifically considered the navigation.⁹⁴

Thus although the City still thought of themselves as having jurisdiction over the whole of the lower Lea,⁹⁵ in practice the bargemen recognised only their rights along the Bowling Alley, and there is no evidence to suggest that the City seriously tried to alter this situation. There is also no evidence to suggest that after 1739 they ever tried to establish any claims to the fishing in the Lea or to profits from the adjacent banksides, the whole purpose of their original involvement.

16.6 What was not done

The evidence presented earlier in this chapter illustrates how the Trustees adequately fulfilled their limited brief, but also illustrates just how limited that brief was. There were certain initiatives the Trustees did not take, which indeed they were not empowered to undertake, but which would have been beneficial to the existing flash-lock navigation.

The Trustees took surveys of the river, but these were limited in intent. They were no different from those taken by Commissioners of Sewers before 1739. At no time did the Trustees survey the river with intent to see whether the existing arrangements for the provision of flashes could be added to, or altered, to better regulate the passage of the barges. Decisions which were taken about

the construction of new turnpikes were taken only in response to suggestions about how to tackle specific problems along the river, there was no overall plan.

Similarly the Trustees never officially considered the provision of proper towpaths. This at a time when horses, which required better towpaths, were being introduced in place of man haulage(see 17.2). This was one of the improvements sought by the bargemen when they approached parliament in 1759(see 17.4), but there is no mention of such a problem in the Trustees' minutes, probably because they had no powers to deal with such problems anyway.

CHAPTER SEVENTEENTHE NAVIGATION UNDER THE SUPERVISION OF THE TRUSTEES17.1 Use made thereof

Another function that the Trustees were neither empowered nor stimulated to undertake was the collection of data about the traffic carried along the river. As a result there is insufficient evidence to allow any proper evaluation about whether the traffic increased or whether there was any change in its pattern as a result of the Trustees' limited improvements. That which is, suggests little growth, and that the navigation continued to be dominated by the carriage of malt, meal and grain downstream, and coal upstream.

Contemporaries themselves had difficulties in calculating the traffic. In 1774 one witness told Parliament 'that when the Improvement of the River Lee was in Agitation, they had great Difficulty to come at the Tonnage; that, to the best of his Recollection, they computed it at 36,000 Tons a Year'.¹ Levels which seem little different from those estimated the previous century(see 13.2).

Other contemporaries were as impressionistic. In 1746 the Water Bailiff of the City of London stressed that few rivers 'can boast of greater Utility', making particular mention of the vast quantities of grain and malt carried to the capital.² In the same year Samuel Simpson noted the importance of the weekly market at Ware and added that '5000 Quarters of Malt and Corn are often sent in a week to London by the Barges, which return chiefly with Coals'.³

TABLE 11CHARLES JONES' INCOME FROM TOLLS AT WALTHAM TURNPIKE

	1740			1741			1742			1743			1744		
March 24-31	3	2	6												
April	11	19	6	7	5	0	8	2	6	8	17	6	10	15	+
May	8	-	-				10	5	-	10	5	-	7	5	-
June	9	-	-	21	-	-	6	2	6	6	10	-	6	12	6
July	6	10	-	8	2	-	8	10	-	5	10	-	8	5	-
August	7	-	-	8	-	6	8	17	6	7	15	-	6	5	-
September	7	11	6	8	15	-	7	10	-	5	2	6	5	8	-
October	8	5	-	7	14	6	8	10	-	7	12	6	9	2	6
November	8	17	6	11	-	-	9	17	6	7	10	-	5	2	6
December	9	17	6	10	10	-	8	10	-	8	-	-			
January	9	10	-	8	7	6	9	5	-	10	17	6	46	7	-
February	10	7	6	11	-	-	8	7	6	7	15	-			
March	11	-	-	9	17	6	6	7	6	10	2	6			
	<hr/>			<hr/>			<hr/>			<hr/>			<hr/>		
	111	1	-	111	12	-	100	5	-	95	17	6	105	2	6

Source:- NRO, Additional Wake Papers 1965/129, Rentals of Mr Jones' estate at Waltham, Nazeing, Courtenhall, Wootham and Quinton

Evidence does remain however, which allows some rough indication of the number of barges using the river, but which does not allow any trends to be determined. For the first time, data is available about the income from tolls at Waltham Turnpike, albeit for only a few years. Additional confirmation can be obtained from the Trustees' accounts about the income from tolls at Dobbs Weir, and reports of weir-keepers annual income from tolls when the Trustees were investigating major improvements in 1766-67.

Ever since a Chancery decision in 1703, Waltham Turnpike was jointly owned by the heirs of Samuel Jones, lord of the manor of Waltham, and the heirs of Peter Floyer, whose father had purchased the arrears of Kinnoull's annuity in 1699 and thus became entitled to any future income from the turnpike until the Chancery decision of 1703.⁴ Thus any income from tolls or from leases to the turnpike were split equally between the owners.

By 1740 Charles Jones was lord of the manor, and thus entitled to half the income from the 5/- toll which had to be paid by the barges every time they passed through the Turnpike, though this sum covered the return trip as well. Jones' income from the turnpike from 1740 to 1744 is reproduced opposite as Table 11, whilst from Lady Day 1762 to Lady 1763 a total of £90 9 6 was received, with a further £95 5 0 for the following twelve months.⁵

Unfortunately some of monthly incomes recorded in Table 11 are not multiples of 2/6, as should be expected. This problem means that the estimates of the number of

barges using the river each year(1 barge = 2/6) must be treated with caution

TABLE 12: ESTIMATED NUMBER OF BARGES AT WALTHAM TURNPIKE

April 1 1740-March 31 1741	863
April 1 1741-March 31 1742	892
April 1 1742-March 31 1743	802
April 1 1743-March 31 1744	767
April 1 1744-March 31 1745	841
Lady Day 1762-Lady Day 1763	723
Lady Day 1763-Lady Day 1764	762

Source:- as Table 11

However other sources confirm similar numbers of journeys in a year. The Trustees' accounts reproduced in Table 10 show that for two periods of account the gross receipt of tolls at Dobbs Weir were recorded. As the toll was 6d a barge for a return journey, this means that between June 25 1749 and June 5 1750 744 barges passed through the weir, and that from June 6 1750 until June 27 1752 another 1420 barges made the journey.⁶

The above tolls, at Waltham Turnpike and Dobbs Weir, were collected every time a barge passed, but tolls at other fishing weirs were only collected if the weir was closed to provide a pen and a flash. Thus the scarce evidence of toll income at these weirs cannot be used as a proper gauge of traffic, except that the income recorded does suggest that tolls were being paid at some weirs on every occasion, such was the importance of pens and flashes to the passage.

In 1767 the owners of Sotheby's Upper Weir claimed an annual toll income of £60 a year from a toll of 1/6

a journey, £100 a year at Sewardstone Mills from a toll of 2/- down and 1/- upstream, and £50 a year at Sotheby's Lower Weir from a toll of 2/- for a return journey.⁷ Such figures suggest at least 800 journeys a year, but do illustrate just how variable were the conditions at the different weirs. Similar levels of traffic are suggested by the other toll incomes at fishing weirs which are known.⁸

The above does suggest at least 800 return journeys a year from the river ports along the upper river. Since the evidence presented in Table 3 suggests that less than 100 journeys a year were made along the river between Hertford and Ware, the importance of Ware and Stanstead is emphasised.

It has to be assumed that London was the major destination for the cargoes carried, even if many barges unloaded at Hackney or Stratford rather than proceed all the way to London. However there must have been some local traffic, some cargoes were destined for export rather than the London markets,⁹ and gunpowder was taken to magazines at Barking and Greenwich, no longer to the Tower.¹⁰

The toll income quoted above suggests that many weirs were receiving a toll practically every time that barges moved along the river, and evidence presented in 1767 shows that tolls were an important cost on any journey. Flashes were required every two miles or so, and barges were paying up to 59/- a journey in tolls.¹¹

Nevertheless the river still enjoyed cost advantages compared to competing road carriers. In 1750 Samuel Whitbread was paying a carriage rate of 1s 3d a quarter for malt brought by river and road from Ware to his Chiswell Street Brewery compared to 2s 2d a quarter for

malt brought from Hitchin by land.¹² On the other hand the miller at Dicker Mill in Hertford told M.P.s in 1767 that rising costs on the river had forced him to use land carriage to supply meal to his London customers.¹³

17.2 Technological development

During the seventeenth century there had been a substantial growth in the size of barges using the river. It is not possible to establish whether this trend continued as a result of the Trustees' improvements, for no references have been found to the carrying capacity of barges during the decades immediately preceding or following the passage of the Act of 1739. All that can be noted is that in 1766 bargemen stated that barges carried 35-40 tons downstream and 10-15 tons on the return journey, whilst in 1767 mention was made of barges carrying 40-60 tons through Sewardstone. This in comparison with Houghton's assumption in 1698 that they carried 30 tons.¹⁴

Similarly, little can be said about whether the design of barges evolved at all during this period. The earliest description found dates from 1774, and is unfortunately incomplete:-¹⁵

These are Thirteen Feet wide, and in general about Seventy-one Feet long(exclusive of the rudder)...at present the Barges when full loaded draw Two Feet Six or Seven Inches of Water, at that Draught will carry from Thirty five to Forty Tons

By this date these boats were using the canalised Lea and Stort navigations, and may have been adapted for that purpose.

One development which did take place was that horses began to be used instead of men to haul the barges from the bankside. It is hard to be precise just when this practice began, or how common it had become before 1767, but an impression is gained that it was not until the late 1740s or early 1750s that the horses became that important.

A bargemaster, James Hewson, told Parliament in 1759 that he had known the Lea over 50 years 'and that Horses have been used to tow Vessells all that time'.¹⁶ However it is difficult to believe that horses were important as early as that. In 1728 Nathaniel Salmon noted that 'The Barges are generally drawn up the Stream by Men; Sailing being but of little Service here'.¹⁷ Furthermore there is no mention of any need to provide towpaths for horses during the 1730s, when the bargemen were discussing various improvement schemes, and the Act of 1739 awarded the Trustees no powers to deal with such problems, even though horses required better laid out paths than did men. If horses were being used frequently before 1739, this seems an unusual omission.

Horses were introduced because they were more efficient than men. Hewson told M.P.s that

Horses do less damage to the Lands than men, as the Horses make but one Track, and tow from the Body of the Barge, whereas the Men pull from the Mast Head, and go 8 or 10 pole further on the Lands, and do more Damage than the Horses; and that the Navigation cannot be carried on by the Men so well as by the Horses, for one Horse will draw as much as Ten Men

Yet it was not all gain for the bargemasters, as land-owners

began to demand tolls for the privilege of allowing the horses over their land, when previously they had never been entitled to a toll from the men who had hauled the barges.

Another witness told the M.P.s that 'exorbitant Demands have lately been made for the Liberty of towing with Horses'; whilst another mentioned that tolls for the passage of horses had only been a recent development. One example was quoted where no toll was demanded at the beginning of the 1750s, but that then 3d, then 6d and finally 1/- had been demanded by one landowner.¹⁸

Since the Trustees had no powers, no mention was ever made of this problem in their minutes, but the provision of towpaths for horses was one of the improvements wanted when the bargemen approached Parliament in 1759. With the failure of this attempt, it was not until the act of 1767 that the new Trustees gained the necessary powers. They purchased land along the bankside, laid out proper towpaths, thus allowing an even more efficient use of horses, without demanding any tolls for their use.

17.3 The deficiencies of the river navigation

For a long time the benefits of pound locks, artificial navigation cuts and other improvements had been known of, and introduced along many English rivers, but not along the Lea. Even as late as 1759 an approach to Parliament was concerned merely to make a better and more efficient use of the existing arrangements,

it was not until 1765 that serious consideration was given to canalisation schemes, and not until 1767 that the necessary powers were obtained.

These discussions about the improvements meant that much evidence was collected and presented which emphasised the deficiencies of the existing flash-lock navigation, and the need to replace it. Such deficiencies had always existed, but had been accepted. It seems probable that the interest in canal building which was generated by the success of the Duke of Bridgewater's canal in the late 1750s brought about a change of attitude, and meant that higher technical standards were considered as necessary, when before the flash-lock navigation had been considered adequate.¹⁹

A particular comment was the very frequency of of weirs and turnpikes along the river. Smeaton noted eighteen such, as well as pound locks at Ware Mills and Hackney waterworks, and the tidal lock at Bow.²⁰ The bargemen complained that they were obliged to demand flashes of water every two miles, such was frequency of shallows and shoals.²¹

They further stressed that these frequent flashes were not always efficient or adequate. In 1759 Thomas Hankin told Parliament that:-²²

Vessels are very often stopped for want of Water between Ware and London; that a Vessel, with a proper Quantity of Water, may perform a Voyage in Five Days; but that sometimes they are Three Weeks, and sometimes a Fortnight

In 1767 James Fordham made similar complaints, and presented specific details about problems at Waltham

Gull where²³

they get over...by Means of a great Body of Water, which in dry Seasons must come from Hertford, with the Addition of Mr Walton's Water [of Waltham Abbey Gunpowder Mills] which Assistance they can commonly have Twice a Week; but in very dry Seasons only Once; That the stated Days for this Supply of Water are Wednesdays and Sundays, but in short Water Times, Sundays only; so that if a Barge happens to be stopped on a Sunday, it must necessarily lie there till the Wednesday, if not, till the Sunday following; but that they are never refused Water on a Sunday, even for a single Barge

It was obvious that the reliance on flashes from mills was only a last resort. It can be noted that the bargemen were not complaining about the lack of co-operation from the millers, merely that the existing arrangements had certain disadvantages.

The bargemen emphasised other problems associated with the system of flashing. Boats were often forced into the bankside, the strong current of water scoured the bed of the river to such an extent that shoals moved about, banks were broken down, and new hazards developed too frequently. They also stressed that barges travelling upstream against the current were restricted to 10-15 tons carriage, and that even then there were problems in hauling. Indeed barges were sometimes 'beat in Pieces' by the current.²⁴

Leading engineers also emphasised the disadvantages that the practice of flashing brought to millers. Not only were there occasions when they had to close down their mills to provide additional assistance to the bargemen, but they also suffered when flashes from weirs and turnpikes sufficed. The penning back of water and the release of flashes meant that depth of water in the river could be

extremely variable.

Furthermore the progress of a flash downstream could cause the miller problems, and was itself an inefficient use of the power available, as Smeaton emphasised:-²⁵

for as they cannot possibly increase the Quantity of Water, which would otherwise be uniformly discharged by a River, and which must be the same upon the Whole, whether pent up or not, and by how much a Flash increases a Head while present; it must afterwards be diminished by the Loss of the same Water, which Diminution is of more Disadvantage than the Increase is of Advantage; for as more Water comes by a Flash than can possibly be used by the Mills, the greatest Part runs to waste, and is a Loss, for which there is not anything to compensate: And, notwithstanding the Head is at First encreased by the coming of a Flash, it is soon after diminished by the Water going round the Course of an open River, which obstructs the working of the Mill by the back Water(that is, by diminishing the Head and loading the Tail)

In fact, Joseph Nickalls, an engineer hired by the owners of Abbey Mills in Stratford to report on Smeaton's proposals for the Lea, reported back that 'much water will be saved that is now wasted in by Flashes, therefore the Mills in general will be much better'd the some, much more then Others'.²⁶

As well as these problems, there were specific problems to be faced when the barges entered the tidal stretches of the Lea. The Trustees themselves emphasised these, as an argument in favour of their proposed Limehouse Cut. They noted that barges could not pass through Bow Lock except on a high tide, that it often needed two tides to get from Bow Lock to the mouth of the river, and that even if it took only one, they then had to wait at the mouth for the tide to turn so that they could progress round the Isle of Dogs up to London. Furthermore sails were needed along the

Thames, and if the wind blew strongly from the south or south west then the barges could not make their way.²⁷

Such problems had always existed, but besides the fact that the bargemen now had higher expectations, they were also arguing that the navigation had declined as a result. In 1759 Thomas Hankin noted that the uncertainties of the navigation meant that goods often lay in warehouses at Stanstead and Ware, only to be sent eventually by land. In 1767 James Fordham said that the number of barges using the river had decreased, that land carriage was sometimes cheaper than barge carriage, and that in particular flour was usually now carried by land, when if the navigation was more certain, it would be better carried by barge. This last was confirmed by Thomas Marlborough, the miller at Dicker Mill, who told M.P.s that he had stopped using the Lea some years previously.²⁸

17.4 The desire for improvement

The growing awareness of the benefits of radical improvement was first displayed in somewhat impractical suggestions made by a correspondent, 'Com. Hertf.', in the Gentleman's Magazine for the months of August and September 1754. He favoured a cut across the Isle of Dogs from Limehouse to the Lea, but thought that such a cut, along with policies of clearing the river of weirs and straightening out any bends, would allow the tidal waters to flow further up the Lea, almost to Ware itself.²⁹

Another of the magazine's correspondents, 'C.D.', returned to the theme of improving the Lea in 1758. He suggested that cuts be made between the river Roding,

above Woodford Bridge, and the Lea, and another between Limehouse and the Lea. These cuts would admit more water into the Lea, and thus ease the problems of water shortage. He felt that such improvements would allow clay lands in Hertfordshire to be improved with chalk and lime from Northfleet, allow more corn to be brought upstream, as well as more corn, timber and hay be carried downstream to London.³⁰

This growing interest affected the Trustees. In 1757 the Act of 1739 was reprinted, and the Trustees ordered that 200 copies of it be bought. Then in December 1757 22 new Trustees were appointed to replace those who had died or resigned in the preceding years, and for the first time several barge-owners and maltsters who used the navigation were included. Then in 1758 it was decided to improve Dobbs Weir by inserting a turnpike gate when it was rebuilt.³¹

Another influence was that maltsters at Bishop Stortford decided to make the Stort navigable for the first time. Since mills blocked its course, canalisation was essential, and in December 1758 an engineer, Thomas Yeoman, surveyed the river from Bishops Stortford to its confluence with the Lea. His plans to make the river navigable for barges carrying 30 tons were authorised by Act of Parliament in 1759, but financial problems meant that nothing was achieved until after further legislation was obtained in 1766. It was not until 1769 that the Stort was opened to traffic.³²

At this same date several Trustees of the Lee petitioned Parliament seeking further improvements to the Lea. Little is known of this approach, which was certainly not minuted

as being under discussion at the Trustees' meetings. What does emerge is that canalisation of the Lea was not being proposed, rather it was a limited scheme, to deal with specific problems that obviously lay outside the existing powers of the Trustees.

New powers were being sought to allow punishment of bargemen who were damaging the navigation, in particular forcing open the turnpike gates against the instructions of the turnpike keeper. They also sought powers to scour the river deeper than it anciently had been, and to provide proper towpaths for horses. A contemporary newspaper report also makes reference an 'additional communication' between the Lea and the New River. A bill was presented, but it did not proceed beyond its first reading.³³

This interest in improvement was further illustrated by the fact that expert advice from leading engineers was sought over specific problems along the Lea. In October 1759 Smeaton's advice over problems at Waltham was sought, and in 1762 Thomas Yeoman represented the bargemen in disputes with the owners of Waltham Abbey Powder Mills. It was to these two that the Trustees were to turn when canalisation was decided upon.³⁴

On 5 August 1765 the Trustees resolved 'to have the said Navigation settled(if they can) on such a New Plan as will be Conducive to the good of the Publick', ordering their clerk to approach Smeaton. It was not until the following July, however, that the Trustees further resolved that Smeaton and his assistant, Thomas Yeoman, should make a survey in which they were to be 'as particular as he(sic) can in the Description of such parts of the Course of the

said intended Navigation where he shall be of Opinion that new Cuts ought to be made'.³⁵

It is thus not clear whether the Trustees had decided upon canalisation before they decided to solicit Smeaton's advice in 1765, whether they took such a decision themselves, or whether they were responding to Smeaton's advice when they instructed him to make the survey in July 1766. Whatever, the survey must have been a routine matter for Smeaton and Yeoman, for they presented their report in September 1766.³⁶

This report suggested improvements to the Lea 'To make a safe & certain navigatⁿ in the driest Seasons with 3 feet water in general, & at least 2f 6in on the shoals in the river, and fords across the cuts'. It was intended to use the existing channel wherever it was deep and straight enough, but made various suggestions about new cuts which would be advantageous.

To this end the report presented three alternatives, 'The first contains every improvem^t y^t the expence considerd I wd recommend. The 2^d the most frugal scheme: The 3^d a medium between both, which, all things considered, seems most eligible'. The costs for these alternatives were estimated to be £29152 7/-, £25634 7/- and £26652 18/- respectively.

In addition a recommendation was made that a cut be built across the Isle of Dogs from Limehouse to the Lea at an estimated cost of £2497. This last suggestion seems to have been an afterthought that was first suggested by Yeoman, for Smeaton writes in the original report:-

On a re-inspectn. of the plan it seems very desirable y^t a cut sh^d be carried from the 4 mills at Bromley to the Thames at Limehouse-hole; which from a general view of the ground I beleive very practicable. For this I must refer to Mr Yeoman's report, who had the same thought, & has view'd & levelled the ground

In the report printed later, Smeaton stated that the idea of the Limehouse Cut did not occur to him until he was preparing his plan.³⁷ Unfortunately Yeoman's report no longer remains.

The Trustees accepted Smeaton's report, and resolved to give further consideration to the first and third alternatives. To further this task 1000 copies of the report was printed, a public meeting was advertised for 31 December 1766, a committee was set up to confer with landowners whose properties were affected, and Yeoman was instructed to survey such properties and suggest any alterations which might avoid any splitting up of property or bring other benefits.³⁸

Over the ensuing months Yeoman and the committee negotiated with landowners, millers and weir-owners whose property was affected, with local residents who were interested in the proposals, and with any potential opponents. Substantial agreement with these parties, and some important changes to the original proposals were made both before and after a petition was submitted to Parliament on January 1767 seeking leave to submit a bill, leave which was granted.³⁹

There is no evidence of serious dissension to the principle of canalisation or of any prolonged argument over the details of the plan. The proprietors of lands mills and weirs along the river did hold their own meetings

at Searles Coffee House or the Devil Tavern, and they did retain the services of Joseph Nickalls to provide expert engineering advice, but they did not oppose the proposals, and Nickalls himself had experience in river canalisation schemes and thought that canalisation of the Lea would benefit the mills.⁴⁰

The Trustees also took care to inform the City of London of their proposals, for the City still had jurisdiction over the lower Lea. In November 1766 the Trustees presented a memorial to the aldermen, who, after noting that the proposed Limehouse Cut did interfere with their jurisdiction, concluded that they could not discover any real prejudice to their interests. By the time that the bill was presented to Parliament, the City had gone further, and were prepared to finally relinquish any claims to jurisdiction over the lower Lea. They petitioned Parliament to this effect.⁴¹

When the bill came before Parliament the only outright opposition came from the Trustees of the turnpike road between Stones End and Enfield who feared competition, and from 'several Brewers of the City of London, and of several Maltsters, Malt Factors, Farmers, and others, using the Navigation of the River Lee' who felt their interests would be harmed. Unfortunately the specific fears and intentions of this last group are not further recorded, but neither group seems to have provided any real threat to the passage of the bill.⁴²

There were also several petitions opposing the bill from interested parties, but these were designed more to protect their own interests rather than impede the bill.

Such petitions were submitted by the owners of Waltham Abbey Powder Mills, West Ham waterworks, a calico printing works at Waltham, and mills at Waltham, Tottenham and Sewardstone, and by inhabitants and business interests in Old Ford, Bromley and Stratford who were worried that their rights to navigate the lower Lea and the numerous millstreams in Stratford without paying tolls would be threatened.⁴³

The Trustees had prepared their submission well. The opposition was not strong, objections which were submitted were met without any delay to the progress of the bill, and there were no major technical changes to the proposals submitted to Parliament, such changes had been agreed on before submission of the bill. The only such change was that, at the request of the inhabitants of Hertford, the head of the navigation was extended a short distance above Hertford Bridge to the gates of the Town Mill, at an estimated cost of £50.⁴⁴

On 29 June 1767 the Royal Assent was given to 'An Act for improving the Navigation of the River Lee from the Town of Hertford to the River Thames, and for extending the said Navigation to the Floodgates belonging to the Town Mill in the said Town of Hertford'.⁴⁵ The flash-lock navigation was to be no more.

17.5 The Act of 1767

The act nominated a further 282 Trustees in addition to those who were serving as Trustees under the conditions of the Act of 1739. In addition the ex officio members were added to, by the appointment of the Comptroller

of the Works and Revenues of London Bridge, and the Governor, Deputy Governor and Treasurer of the New River Company. Despite this great increase in the number of available Trustees, the necessary quorum was reduced to five, or seven for some purposes, compared to the ten required by the Act of 1739. Obviously there was intent to overcome the problem of inquorate meetings that had bedevilled the Trustees between 1739 and 1767.

The act gave these Trustees comprehensive powers to canalise the navigation. They were authorised to deepen, straighten and enlarge the existing navigable channel wherever necessary, to use alternative channels such as the millstreams serving Enfield and Tottenham Mills where this was beneficial, and to dig fourteen artificial navigation cuts which were specified in the act.

Along this track the Trustees were empowered to remove all weirs and turnpikes and erect pound locks at the most convenient points. They were also to purchase land along the banks to provide proper towpaths for the horses or men who hauled the barges.

In order to implement these measures the Trustees were authorised to purchase all fishing weirs. The act specified the terms of purchase for some, but for others the terms had already been settled or were left to future negotiation, with proper provision for arbitration if dispute arose. Since the fishing rights were retained by the weir-owners, the terms for the fishing weirs were only compensation for the loss of income from tolls which arose from the fact that flashes were no longer required.

Most of these weirs were to be dismantled, but those that stood along stretches of the traditional navigable channel which were no longer to be used once the new track had been built could be left in situ. In fact Sir William Maynard, who owned France Weir in Walthamstow, had a clause inserted which forbade the Trustees to make any future changes to France Weir without his permission.

Once more Waltham Turnpike was to be treated as an exception. It stood along a stretch of the river which was no longer to be used, but the rights of its owners had to be respected. The Trustees did not purchase it, but they were obliged to keep it in repair so that it controlled the flow of water to Waltham Abbey Powder Mills, Waltham Corn Mills, and a calico printing works in the vicinity. Furthermore the owners were to be paid 5/- for every barge that passed through Kings Weir as compensation for the loss of their toll at Waltham Turnpike.

Other interests were also protected. Numerous clauses specified conditions controlling the supply of water to mills and waterworks, maintained navigation rights along parts of the traditional river so that millers at Walthamstow and Sewardstone could still bring barges to their mills, and alterations to Bow Lock were prohibited without the permission of the owner of Four Mills.

One major feature of the act was that no alteration was made to those conditions controlling the intake of water by the New River Company that had been fixed by the Act of 1739. The only change that affected the Company was that a short cut by-passed the channel in which their pound lock stood next to Ware Mills. They thus lost the

right to collect tolls, but were compensated by the award of a payment of 6d from the Trustees for every barge that used the new route past Ware Mills.

To finance these ambitious proposals the Trustees were empowered to raise loans and sell annuities, to supplement the rental payment of the New River Company which the act continued at its previous level. To repay these additional sums, the Trustees were empowered to collect tolls from the bargemen, at rates and at three separate collection points which were specified in the act.

Pound locks, artificial navigation cuts, towpaths for horses, tolls. At long last the Lea was to become a typical river navigation, and within a few years it was.

17.6 Canalisation was better, wasn't it?

It undoubtedly should have been, and indeed was. In 1767 Smeaton calculated the average discharge of water passing through Waltham Turnpike in a dry season. He found it to be 2 million cubic feet a day, a discharge which Professor Skempton has noted is equivalent to 250 lockfuls of water a day.⁴⁶

Canalisation could allow control of this flow, so that sufficient water was held back for the benefit of the navigation rather than be allowed to run to waste by passing downstream quickly. Particularly valuable in dry summers when pens built up slowly and flashes passed down too quickly.

Other users could benefit from canalisation as well. Even though much water was reserved for the navigation,

sufficient would be left for the use of the millers and riparian land-owners, and measures could be introduced to regulate their supplies so that they would not be so irregular or so liable to interruption as they had been when flashes were frequently demanded.

Such aims were recognised by Smeaton and Yeoman when they made their recommendations, and it was Yeoman himself who acted a resident engineer implementing the canalisation scheme on behalf of the Trustees, until his resignation in 1771. By this date much of the work had been completed.

There were some immediate benefits. Yeoman told Parliament in 1774 that the traffic was about 50000 tons a year compared to about 32000 before canalisation, though both his figures were admitted estimates.⁴⁷ Another benefit was trumpeted in a newspaper report in 1773:-⁴⁸

The navigation of the river Lee is brought to that perfection, that a barge went on Saturday last from London to Hertford in eight hours, though they met with some stoppages

Such a timetable relied on favourable winds and tides along the Thames and lower Lea, and favourable circumstances along the canalised river, and must be seen as a 'record attempt' with all the stops pulled out rather than the norm. Indeed Smeaton only envisaged a time of 13 hours along the canalised river when he made his plans, and in the early 1950s horses still took two days to draw a barge from Bromley to Ware (steam tugs took four days).⁴⁹ Yet a quicker and more regular pattern of movement should have been attained as a result of canalisation.

But to temper this, it must be emphasised that there were major problems with the implementation of the

canalisation scheme, both technical and financial. These problems were sufficiently serious to warrant query as to whether the canalisation scheme was that efficient when first introduced.

There were problems with the Limehouse Cut. Within a couple of years of being opened in 1770 it had to be widened to allow barges to pass each other, and the towing paths had to be extended. Furthermore, it could only be used at high tide. At low tide there was not enough water in the Cut to allow the movement of barges. This serious deficiency was not corrected until the 1850s, even though the remedy was not that technically difficult.⁵⁰

Another defect was that the initial scheme made no provision to improve the tidal river between Old Ford Locks and Bow Locks. Barges still faced problems in passing over the shallows and shoals at Old Ford, and still relied on the movement of the tides to take them down to Bow Locks and the Limehouse Cut. Rennie criticised this deficiency in 1805, suggesting another navigation cut, but no action was taken.⁵¹

There were also some serious problems along the canalised stretches of the Lea above Hackney. Such defects were emphasised by obviously interested parties, proponents of a canal from Waltham Abbey to Moorfields which would seriously threaten the viability of the Lee Navigation, but the criticisms were not answered by the Lee Trustees when the scheme came before Parliament in 1774.

The engineer of the proposed canal, Robert Whitworth, stated that 'it is impossible to navigate Vessels up the River Lee, in Times of Flood'. An opinion which was seconded

by other supporters of the canal scheme.

Thomas Thruckston, a miller and coal merchant who owned three barges using the river, was particularly critical. He said that the passage was often interrupted by floods, that the pound locks were frequently out of order, that shoals were still a major problem, and that the new cuts were often drawn dry 'by the Willfulness or Carelessness of the Bargemen'. In fact the bargemen were often manipulating the locks so that they could obtain a current of water to help them on their way downstream (old habits die hard), or were drawing several lockfuls of water to help them over shoals in the cuts below. As a result of these defects, Thruckston claimed, barges were only carrying 26 tons of goods, and there were still problems in carrying upstream.

Unexpectedly, another witness in favour of the canal scheme was Thomas Yeoman himself. He also mentioned the problems with floods, and was of the opinion that nothing could be done to prevent their ill effects. That Parliament was aware of his potentially embarrassing position is obvious from the following exchange

And being asked, Whether, if the River Lee was as defective now as it was when he gave his Plan for its Improvement, he would vary the present Navigation? He said, under all the Circumstances of the Question he could not give a direct Answer to it; that the other was carried on with a View to save Expence, and preserve the old Navigation, and Communication with the Thames

Much effort was put into the bill, but to the relief of
 52
 the Lee Trustees, it was rejected.

Other reasons to query the success of the canalisation scheme were that some expected developments did not take

place. Proper engineering should have allowed larger barges to use the navigation on a regular basis. Even if Throckton's evidence to Parliament in 1774 is discounted as being biased, the fact that legislation in 1805 limited barges to 40 tons suggests that this was not achieved.⁵³ It was not until after improvement during the 1850s that larger barges could use the river.

Furthermore the customers do not seem to have enjoyed any reduction in their transport charges as a result of the improvements. Professor Mathias has noted that the freight charges borne by London brewers remained constant at 1/- per quarter from 1746 until 1791, and recent research by Edgar Jones has confirmed this.⁵⁴

In fact the bargemen had little scope for reducing their charges. The tolls collected by the Lee Trustees between 1767 and 1778, 1/5 per ton on malt from Ware to London, were little different in their total effect to the 59/- that a 40 ton barge was said to be paying to millers and fishermen every journey before 1767. Then in 1778 financial problems forced the Lee Trustees to increase their tolls, to 2/2 per ton of malt.⁵⁵

Such an increase was necessary to deal with the severe debt problems the Trustees had incurred, problems due largely to the Trustees' own mismanagement. In 1767 the Trustees had attempted to raise £35000 at 4%. They were inundated with offers, £161500 in total. Ballots were held to determine whose offers were taken up. Yet the Trustees had miscalculated their needs, and in 1770 were forced to seek a further £15000.

They chose to raise it by selling annuities. In 1771 they called a halt to such sales after having raised £22566, but in March 1773 authorised a further £5000, only to find in 1778 that an unauthorised £17740 had been sold. With such mismanagement, it is not surprising to note that no formal accounts were ever produced before 1779. So serious was the debt, that legislation was needed to authorise a substantial increase in tolls, and it was not until the end of the century that this debt was finally cleared.⁵⁶

Even though the debt was cleared, the Trustees took no further action to upgrade the navigation, even though a report from Rennie in 1805 suggested that such work was necessary. It was not until the threat of rail competition materialised that the Trustees made further substantial improvement, a successful response. It is thus only from the 1850s that the fuller potentialities of canalisation were realised. Before that the Lee Navigation was not that much better or more efficient than the flash-lock navigation it replaced.

CHAPTER EIGHTEENSWAN-SONG

Reasons of intent and space has meant that little consideration has been given to the importance of the river in the local economy for purposes other than that of navigation. Yet these other uses were important. A proper utilisation of the river was important to most riparian land-owners, millers, fishermen, basket makers, and many industrialists. Even the proper care of swans was an important task.

However the temptation to mention one other usage cannot be resisted. On 10 April 1714 the News Letter included the following report:-¹

Yesterday a very unhappy and no less strange passage happened at Tottenham. A bargeman walking on the bank of the river saw a man standing in the water breast high or thereabouts, having his clothes on, and asking him what he did there, the man answered 'what's that to you?' So the bargemen went on and left him. About two hours after, coming back, he found him in the same place, and observing him to look very ill, and to give no answer though he spoke to him again, he called some people, and went down and pulled him out, though with some difficulty, he having tied himself by a rope about his middle to a stump of a tree in the river. As soon as they took him out of the water he died, without speaking a word, nor can it be discovered who he is, he had good clothes on, money in his pocket and a gold ring on his finger

REPRISE

The history of the river Lea between the 1570s and 1767 is an unusual one, it does not conform to the normal pattern of development for an important river navigation during this period, to that pattern illustrated by Jackman in The Development of Transportation in Modern England, and by Professor Willan in River Navigation in England 1600-1750, or in his numerous studies of individual rivers (see Bibliography).

The river Lea did experience the same expansion in traffic that was a feature of other existing river navigations, but unlike these and many newly created navigations, the Lea was not improved by canalisation. A pound lock and three new cuts were introduced during the 1570s but all fell into disuse in the 1590s; a pound lock was built next to Ware Mills in 1658 when a new route was opened between Hertford and Ware; and the owners of Hackney Waterworks built a pound lock on their own initiative in 1762. Other than that the Lea remained an 'old-fashioned' flash-lock navigation after the experimental system introduced during the 1570s was dropped during the 1590s. Definitely not the norm.

For a short period during the second half of the sixteenth century the Lea was the subject of intense interest, when the City of London and then the central authorities sponsored and encouraged efforts to improve transport facilities along the valley. The favoured method

of improvement however, was not canalisation, but rather the construction of a canal from the Lea to London and a different method of improving that part of the river between Ware and the canal.

The consideration of at least three separate canal schemes by the City of London was notable, even though none was ever built. There was a short-lived interest in canal building in Elizabeth's reign, and one was actually built, but those considered by the City were the most ambitious, and there is little evidence of such an intense interest in canals elsewhere in England at this time, or indeed, in the ensuing century and a half.

Furthermore, later developments showed that the three canal schemes considered by the City were sensible proposals, which took full advantage of a terrain suitable for canal building. Variations on these Tudor schemes were to crop up frequently in the ensuing centuries. In particular, the initial proposal for a canal from Hoddesdon to Islington must be seen as the germ of the idea which was to become the New River, even though no evidence of a direct link has been discovered.

The failure to construct a canal did not mean that the impetus for improvement was lost. A unique experiment in river improvement was introduced instead. An experiment based on the principle of removing weirs and other obstructions from the river and controlling the flow into a defined navigable channel, with the hope that there would be fewer interruptions to the passage of the barges and that the current of the water would of itself prevent the formation of shoals, thus precluding the need for frequent dredging.

This experiment was successful in that it stimulated a rapid expansion in the barge traffic. The Lea became an important transport artery serving the capital, a role which had all but disappeared before the improvements were made. Furthermore the success meant that a pressure group emerged, determined to use and maintain the navigation.

It is difficult to evaluate whether the experiment was such a success technically. No evidence remains as to whether it worked as expected, whether it needed frequent maintenance or not, or whether it allowed a regular timetable to be established.

The experiment ended as a result of persistent opposition from competing road carriers, who eventually took advantage of legal technicalities to justify their actions. The fact that the experimental navigation was not restored after 1595, when the Star Chamber confirmed the rights of the bargemen to use the Lea, might suggest that the experimental system had been less than satisfactory. Indeed the bargemen seem to have made no effort to preserve it, but concentrated on preserving their traditional rights along the river. It also can be noted that the experimental system was never introduced along other rivers.

The restoration of the traditional flash-lock navigation did not mean that the advantages gained during the previous decades were lost. The evidence shows that the barge traffic quickly adapted, that there was no immediate interruption or decline in use of the river, and that this was to remain the case for another century and a half.

The flash-lock navigation was 'old-fashioned' compared to an efficient canalised river navigation. Reliance upon flashes meant that at best it might take two or three days, and often four or five, to travel from Ware to the lower reaches of the river or to London. There was the distinct possibility of even greater delay as a result of arguments with millers or fishermen over the provision of flashes, and total interruption during particularly dry weather or during floods. There was also a severe constraint on the quantity of goods that could be carried back upstream against the current. Indeed many barges travelled back empty to avoid paying for flashes. Nevertheless there is sufficient reason to regard the flash-lock navigation as being adequate, as being an example of appropriate technology.

It was an adequate navigation because for over 150 years it sufficed, and there was a slow but considerable expansion in the quantity of bulky goods carried. It was adequate because the time taken on the journey was not that important for the brewers or bakers who were the main beneficiaries. Indeed the navigation was sufficiently reliable for the brewers to store much of their malt at Ware and Stanstead rather than on site at London. It was adequate because the demand for coal in upstream communities was not sufficiently high, so the fact that less could be carried upstream was not that important until the eighteenth century.

If it had not been adequate it is likely that there would have been much more evidence of schemes to radically improve it by canalisation. If it had not been adequate the improvement act of 1739 would have been more ambitious, in fact it was one of the least ambitious river improvement

acts to ever pass the legislature. If it had not been adequate, then traffic along the river would have declined drastically, for the short distance between Ware and London meant that road carriers could have provided effective competition even for the bulky items if carriage costs along the river rose too high.

The flash-lock navigation was also adequate in that it accomodated the demands of other parties interested in using the river. The passage of barges does not seem to have interferred too greatly with the fishing or the cultivation of osiers, both of which were declining in economic importance at this time anyway. Indeed by the eighteenth century the income from tolls may have been as important a source of income to the fishermen as the sale of fish. There is also no reason to suspect that the navigation harmed the needs of riparian landowners with regard to drainage and watering.

More importantly the flash-lock system does not seems to have stopped the expansion of milling capacity along the river. It is difficult to be precise, more expertise and research is necessary, but the gradual expansion in the width and depth of head streams, the use of additional head streams at Waltham Abbey Gunpowder Mills, the introduction of millponds at Sewardstone, the erection of additional mills at Waltham Abbey, Sewardstone and Tottenham, all suggest that expansion did take place.

Such expansion meant a conflict of interest, for extra capacity required extra water to power the mills. There is evidence of conflict between the millers and bargemen over

the provision of water, often serious, but compromise was always reached. Sensibly, the bargemen accepted the encroachments made by the millers, they did not insist on the letter of the law.

Smeaton accurately criticised the deficiencies of this system, as compared to the better arrangements which were possible from canalisation. The passage of flashes downstream did mean great variations in the head of water available to drive the mills, did mean that there could be frequent interruptions to the workings of the mills, and did mean that too much water could run to waste. After canalisation, the supply of water to the mills could be better regulated, to provide a greater and more consistent power to the mills.

The retention of the flash-lock navigation for so long may have retarded the expansion of milling capacity, but the millers had to accept that the bargemen did have traditional rights to navigate along the river, and that their own activities had to be accommodated to this fact. Any initiative for change had to come from the bargemen, the millers as a group were too disparate to replace the existing system, they merely tried to alter existing arrangements piecemeal to their own advantage, as long as this did not arouse too much opposition from the bargemen.

That the bargemen never took any sustained initiative to replace the flash-lock navigation until the 1760s is in itself an important indication of how adequate the river was. The barge-owners, maltsters and factors at Hertford, Ware and Stanstead were not impoverished. They were upwardly mobile, and within two or three generations had become

accepted as gentlemen. The community had sufficient money, enough self-interest, and enough social and political power. If they had chosen too, they could have organised the canalisation of the Lea much earlier.

That they did not, was because the navigation was adequate, because it was cheap to maintain, and because the administration of the Commissioners of Sewers, and later, after 1739, of the commissioners and the Trustees was sufficient for the task of ensuring that the navigation was kept open and that a balance was maintained between the competing interests. Under such circumstances there was little incentive to replace the flash-lock navigation. Despite the admitted inadequacies, it worked.

13 ELIZABETH c.18

An Acte for the brynging of the Ryver of Lee to the Northside of ye Citie of London

N.B. Clauses marked (A) are to be found in the original bill. Any substantive changes to these clauses are underlined.
Clauses marked (B) are those clauses added during the the passage of the bill through Parliament.

(A) Forasmuch as yt ys perceaved by many grave and wyse Men, aswell of the Cytie of London as of the Countrey, that it were very commodious and profitable both for the Citie and the Countrey that the Ryver of Lee otherwyse called Ware Ryver, might be brought within the Land to the North Part of the saide Cyty of London, the same to be cut out of the saide Ryver in the most aptest and meetest place of the said Ryver of Lee, to have from thence the leadinge and passage of the saide Water throughe such a convenyent and meete cut as may serve for the Navygation of Barges and other Vessels, for the caryag and conveying aswell of all Marchaundizes Corne and Victuals as other Necessaries from the Towne of Ware and all other Places neare the said Ryver, unto the saide Citye of London, and from the said Cytye to the saide Places and the Towne of Ware, and also for Tyltebotes and Whyrryes for conveying of the Queenes Subjectes to and fro to theyr great Ease and Comodytie: In Consyderation of the Premisses and of dyvers sundry Commodious profytable and beneficiall Causes which are lyke to ensue to the Bodey of thys Common wealth, and so incidently to many pticuler parsons; Bee yt enacted by the Queenes most excellent Majestie with thassent of the Lordes Spyrytuall and Temporall and the Comons in this present Parlyament assembled, and by thaucthority of the same, That it shalbe lawfull to the Lord Mayor Comynaltie and Citizens of the Citie of London and theyr Successors, at any time or tymes hereafter, to begynne and contynue the layeng out of such convenyent Lymites of Grounde for the making of the Trenche for the said Ryver, at suche Breadth as to them and theyr Deputyes and Wourkemen shalbe seene convenyent and meete for the same, and in that Place that they shal fynd to be most apte and meete for that purpose, to have take and use for the purpose abovesaid such and so muche Grounde during and by all the Lenght as the said newe Channel Cutt or Ryver shall passe, as shalbe requysite for the conveying of the said Water, and also fyfthe or threescore foote in Breadth on each syde of the said Ryver, by all the Length of the same, so alwaye that they do not in any one place take in Breadth, both in Channel and in Ground on both the sydes of the Water, above the Breadth of eight score foote in all; which convenyent Breadth of Grounde on both sydes is thought needefull to be had, for that Grounde and Soyle of necessitie must be occupied on both sides of the said Ryver, aswell for the laying of the yearth that shalbe cast out of the said Trench, to serve in the lower Groundes, and especially neare the sayde Ryver, to make substantial Banckes for the preservation and keping of the Countrey from Inudations when the Fluddes shall arise, as also for waye to passe with Troukes and Cartes, which must carry awaye the Gravel and other Earth in very greate Quantitie from the Hylles, where as the Cut must be very deepe to such places as shalbe convenyant, to help make up the saide Banckes and otherwyse to bestowe the same; and also for that when it shall please God that the same shalbe brought to passe and full effect, that the whole Grounde on both sydes of the said Ryver maye lye in one Levyll from the said Citie of London to that place where the said Ryver or Trench shall have his begynning out of the mayne Ryver of Lee;

and to thend also that in al place within that Lymyt and Dystaunce al People maye with great Ease and Comoditie go in and out of theyr Tyltebotes and other Vessels whatsoever without prill, and so walke by foote as long as it shall please them, and also that Bargemen maye upon the same Grounde without offending any other, draw theyr Vessels from place to place alongest the same, as of lyke they shalbe dryven to do agaynst the Streame being loden.

(A) And bee yt enacted, That the said Mayor Comynaltie and Cityzens and theyr Successors for ever, shall have the said Grounde alongest all the sayd whole Lenge, for such Composition as they shall make with ye Lorde Owners and Occupiers of the Soyle and Grounde. Provyded alwayes and be it enacted, That yf in the newe Cut there happen any Breaches Inundations or Hurtes, the Mayor and Cityzens of London shall stop the Breaches at theyr owne Charges, and so mayntayne them from tyme to tyme.

(A) And bee yt also enacted, That the said Lord Mayor Comynaltie and Cytizens, shall have the whole Jurisdiction Conseryce Rule and Government, aswell of the saide newe Cut ryver and Grounde of each side, as also the Royaltie of the Fyshe and Fyshing of the same, and Pfites of the said Grounde Soyle and Water, to them and theyr Successors for ever; and also shal have aucthoritye to punishe aswell all such Transgressors as shall offend in the breaking of such good Orders as shalbe hereafter made, for suche of the Queenes Majesties Subjectes as shall have occasion to travayle and passe by the same new cut Ryver as also every other person and persons which shall breake such good and wholesome Rules and Orders, as shalbe pyved and ordeyned for the preservation keping and maynteyninge of the said Ryver and every part thereof.

(A) And further bee yt enacted, That the Shyriffes and Justices of the Peace, and such other as it shall please the Lorde Chancellour or Lorde Keper of the Great Seale to put in Comysson for the same, aswell of Middlesex, Essex as of Harford Shyre, or the more of them, by theyr discretions shall at the Costes and Charges of the Countrey, after that the said newe Cut shalbe made and fynyshed, cause the same, from such place where as the saide newe Cut shall begynne unto the Towne of Ware alongest the said Ryver, to be suffyciently clenched of all the Shelfes and Shallowes, and to bring the same to a convenyent Deapth in al Places for the Passage of Barges Tyltebootes and other Vessels, in as good and convenyent Deapth al the Waye of the same as shalbe made and contynued in the aforesaid newe Ryver by the Mayor Comynaltie and Citizens of the said Cytye of London, and so to contynue the same from tyme to tyme, upon the Paynes therefore to be lymyted and levyed by discretions of the sayde Commissioners or the more part of them; And also that all other Buyldinges and Obstacles standing in or upon the said Ryver, which may be founde Impeachmentes or Lettes to this good Wourke, may be removed and taken away, to thend that this may be a good and pfyte Worke, and by the Grace of God to such good Effect and Comodity as is hooped and loked for. Provyded alwaye and bee yt enacted, That this Act shall not extend to take away any Buyldyng Locke or Obstacle which by the said Comissioners, or the more part of them, shalbe thought not to hynder the Passage of Boates and Vessels by and throughe the saide Ryver.

(A) And bee yt further enacted, That the Mayor Comynaltie and Citizens of London shall make and mayntayne at theyr Costes and Charges such suffycyent Hedges and Fences as shalbe requisite, betwene the Groundes so by them to be taken to thuse abovesaid and the Groundes of other Owners, and also convenyent Bridges and Wayes for the Passage of the Queenes Subjects and theyr Caryages

(A) Provyded alwayes and be it further enacted by thaucthority aforesayd, That the Lord Chauncellor or Lord Keper of the Great Seale of England for the tyme beyng shall and maye by his discretion, and at the Request of the said Lord Mayor Comynaltie and Citizens for the tyme being, appoynt and aucthorize by Comission under the Great Seale of England, Syxeteene Commissioners, whereof Foure to be of the said Cytye of London and thother Twelve to be of the Counties adjoyning to the said Ryver of Lee, (That is to saye) Foure of every of the Sheires of Essex, Myddlesex and Hartforde Sheyre, and every of the said Twelve having Landes Tenements or Heredytamente of the cleare yerely value of fourty Markes in the same Shyres or some of them, and not beyng Citizens of London using the Trade of Merchaundize; which Syxeteene Commissioners, or the more number of them, shall have full Powre and lawfull Aucthoritie to treate agre and compoude with such Numbers of the Freeholders and Inhabitantes of the said Counties, as to theyr Discretions shall seeme meete and convenyent, for the scowring clensinge repayring and keping of the said Ryver of Lee, from suche Place whereas the said newe Ryver or Cut shal have the begyning unto the said Towne of Ware, in such sorte as that the same may be navygable for Botes, Barges and other Vessels

(B) And further be it enacted, That untill or before such Order or Meanes be devysed and agreed upon by the said Comissioners, and the said Comysson returned into the High Courte of Chauncery, yt shall not be lawfull to the said Lord Mayor Citizens and Comynalty to put the said diggyng trenching or newe cutting of the said Ryver in Execution, nor to cut or take in any Ground by force of this Statute; Any Thing in this Acte to the contrary notwithstanding

(B) And bee yt further enacted, That the Mayor Citizins and Comynaltie of London shall not by vertue of this Acte take any mans Grounde untill they have compounded with the Owners of the same Grounde, and shall within tenne yeres next after thend of the Session of this Parliament cut and fynishe the same

(B) Provyded alwaye and be it enacted, That all the Queenes Subjectes theyr Boates and Vessells shall have free Passage through the said Ryver, aswell the newe Cut as the older Ryver, without interruption molestacon, by reason of or for his or theyre Passage, as in other comone Ryvers and Waters they lawfully may do

(B) Provyded alway, That this Lawe shall not extend to make the said Ryver to be cleansed, otherwyse then, any psons be or shalbe compellable by the Lawe or by the Statute of Sewers to cleanse the same

(A) Provyded also and be yt enacted, That yf any pson shall refuse to be reasonably compounded with for Ground to be taken in for the said newe Cut and Bankes, then the said Syختهene Comyssioners or the more part of them shall appoynt and determyne the Composition and Bargayne betwene both the pties, and the Satisfaction for such Grounde, and all Wayes Bridges and other thinges to the same parteyning

(B) Provyded alwaye and be it further enacted, That yf the said newe Cut shalbe the meane and occasyon that any Milles, beaneth or above the begynning of the said newe Cut, shalbe by vertue of this Acte destroyed or the pfite decayed by the want of Water, then ye said Lord Mayor Comynaltie and Citizens of London shall yeeld and paye to the Owners of such Mylles so decayed, and to such psons as shall have any Detryment or Losse by such Decaye, such reasonable Recompence in Monye or yerely Rent or otherwyse as the said Syختهene Comissioners in lyke fourme to be chosen and aucthorized, or any Twelve of them, shall determyne and appoynte; And that suche Owners theyre Heyres and Assignes shall have such reasonable Remedie, by Action of Debt or Distresse or otherwyse to recover have and obtayne the said Recompence as the Lord Chauncellor or Lorde Keeper of the Greate Seale of England for the tyme being, together with the said Syختهene Comissioners or with any Twelve of them, shall appoynt; Any thing in this Acte to the contrary notwithstanding

APPENDIX TWOGLOSSARY

Causey	'a passage made by art, of Earth, Gravel, Stones and such like...leading through surrounded grounds for the safe passage of the King's liege people' R. Callis, <u>The Reading of that Famous and Learned Gentleman, Robert Callis...upon the Statute of 23 Hen VIII cap 5 of Sewer(London,1647)</u> . Used in context of a raised road between Bow Bridge and Stratford, across the marshes at West Ham.
Commissions of ad quod damnum	Commissions, issued by Chancery, directing a Sheriff to enquire what damage a specific grant might cause to other interested parties.
Commissions de kidellis	Commissions, issued as a result of legislation in 1350(Act 25 Edw III, Stat. 3, c.iv) to enquire what obstructions hampered navigation along the river. Kidellus(kiddle) = fishing weir.
Commissions de walliis et fossatis	Commissions, issued as a result of legislation in 1427(6 Hen VI, c.5), to settle problems of drainage and flooding along coastal and riparian marshlands. Walla = wall. Fossa = dyke or embankment.
cut and fill techniques	Method of canal construction adopted to attain as straight a line as possible as opposed to following the contour lines. To overcome variations in height along the course, embankments and cuts were used to attain a level. Land dug up for the cuts was used to build up the embankments at other points.
dikegrave	'an officer who has charge of drains, sluices, and sea-banks of a district under the Court of Sewers'(OED); 'a manorial or parochial officer, whose duty is to superintend the dykes'(North West Lincolnshire Glossary). Thus the use of this term along the Lea at this date suggests a different context compared to later practice.

- ebbing weir 'a lock or weir for detaining fish at ebb tide'(OED). Sometimes spelt hebbing weir.
- hale Obscure form of haul. This form always used when describing the action of men or horses pulling a barge by means of a tow rope from the bankside.
- lowshare A weir or dam built across a channel leading out of the determined navigable channel. Built to a specified height to hold back water in the navigable channel, but which allows water above a certain depth to pass over the top of the lowshare. Various purposes:- to provide a share of water for watering adjacent lands, to prevent flooding by allowing flood waters to escape down other channels besides the navigable channel, to prevent millers penning back too much water. Sometimes referred to as a tumbling bay.
- peter-boats 'decked fishing-boat smaller than a smack or yawl'(OED). In context of use in this dispute, might refer to any small boat capable of bringing up goods to tide mills off the main channel of the lower Lea.
- sill 'A horizontal timber(or structure) at the bottom of a lock'(OED). On weirs and turnpikes along the Lea, it would be a timber on the river bed in the gap left for the passage of barges.
- station Term used in surveying. 'Each of the selected points at which observations are taken'(OED). Its use in the City records in 1571 is an early usage. Earliest usage quoted in OED is also 1571.
- tiltboat 'A large rowing boat having a tilt or awning, formerly used on the Thames, especially as a passenger boat'(OED)
- trussle Obscure form for trestle. 'A Framework consisting of upright(or more or less inclined) pieces with diagonal braces, used to support a bridge or other elevated structure'(OED)

- tumbling bay 'an outfall from a river, canal, or reservoir; a weir...' (OED). In some contexts, used as an alternative name for a lowshare.
- turnpike A lock on a navigable stream. Along the Lea at this time the term is specifically used for a flash lock built solely to benefit the navigation by providing a flash, as opposed to weirs which also provided flashes, but which were built to facilitate the catching of fish.
- tun of water Equivalent to 252 gallons of water. R.E. Zupko, A Dictionary of English Weights and Measures (London, 1968).
- wherry 'A light rowing-boat used chiefly on rivers to carry passengers and goods' (OED).
- writ of certiorari 'A writ, issuing from a superior court, upon the complaint of a party that he has not received justice in an inferior court, or cannot have an impartial trial, by which the records of the cause are called up for trial in the superior court' (OED)

NOTESAbbreviations used in notes

1. Record depositories

BL,	British Library
Bodl.	Bodleian Library, Oxford
CLRO	City of London Record Office
Enfield	London Borough of Enfield Library Services
ERO	Essex Record Office
GLRO	Greater London Record Office
HRO	Hertfordshire Record Office
NRO	Northamptonshire Record Office
PRO	Public Record Office
TWA	Thames Water Authority, New River Head

2. Other abbreviations

APC	Acts of Privy Council
BHC 1711	Bridge House Committee, Reports & Papers, 1711
BHR	Borough of Hertford Records
Cal. Pat.	Calendar of Patent Rolls
Cal. Close	Calendar of Close Rolls
CJ	Commons Journals
CSPD	Calendar of State Papers Domestic
DNB	Dictionary of National Biography
Harte	Manuscript book at City of London Record Office, 'Proceedings in the Star Chamber relating to the River Lea'. Compiled in 1593 by William Harte
L&P Hen VIII	Letters & Papers, Henry VIII
LJ	Lords Journals
Rawl.	Rawlinson MSS.
Trustees	Minutes of meetings of Trustees of the River Lea, Kept at Public Record Office
	RAIL 845/1 August 1739-October 1749
	RAIL 845/2 November 1749-August 1765
	RAIL 845/3 August 1765-June 1767
VCH	Victoria County History

CHAPTER ONE

1. 7 Geo. III, c.51; for details of the history of the river after 1767: J. Boyes, R. Russell, The Canals of Eastern England (Newton Abbot, 1977), 13-49; P.I. Champion, 'The Lee Navigation, 1767-1869' (unpublished Ph. D. thesis, London School of Economics, 1978); H.E. Jones, 'The Lea Valley, 1750-1900: a Regional Study of Transport and Industrial Development' (unpublished Ph.D. thesis, University of Oxford, 1982).
2. BL, Maps K.6(6); Royal Society, Smeaton Collection, vi. fo.87. Scale 1.33 inches to 1 mile. Made in 1741 by William Whittenbury, surveyor to the Lee Trustees. He surveyed river above Stanstead himself, but for the rest he relied on a map, no longer available, made in late 1730s by John Walton: Trustees, 3 August 1741.
3. J.G.L. Burnby, M. Parker, The Navigation of the River Lee (1190-1790), Edmonton Hundred Historical Society, Occasional Papers N.S. no.36(1978).
4. Act 25 Edw. III, Stat. 3, c.iv; 45 Edw. III, c.2; 21 Rich. II, c.19; 1 Hen. IV, c.12; 4 Hen. IV, c.11; 1 Hen. V, c.2; 2 Hen. VI, c.15; 12 Edw. IV, c.7.
5. Cal. Pat., 1354-58, 234; Cal. Close, 1364-68, 48; Cal. Pat., 1364-67, 282; ibid, 1377-81, 474; ibid, 1381-85, 144; ibid, 1413-16, 347; Cal. Close, 1413-19, 516; Cal. Pat., 1422-29, 402, 494, 551; 9 Hen. VI, c.9; Cal. Pat., 1429-36, 350, 356; ibid, 1436-41, 83, 371, 453; ibid, 1476-85, 344; Commissions were also in existence in 1345 and 1396: Year Bk. 19 Edw III (Rolls Ser.), 178-85, 485-94; Cal. Close, 1396-99, 54.
6. 6 Hen. VI, c.5; 8 Hen. VI, c.3; 18 Hen. VI, c.10; 23 Hen. VI, c.9; 12 Edw. IV, c.6; 4 Hen. VII, c.1; 6 Hen. VIII, c.10; S.J. Webb, B. Webb, English Local Government: Statutory Bodies for Special Purposes (London, 1922), 13-106; H.G. Richardson, 'The Early History of Commissions of Sewers', English Historical Review, xxxiv(1919), 385-93.
7. 1369: Cal. Pat., 1367-70, 261; 1390: ibid, 1388-92, 215; 1407: ibid, 1405-08, 308; 1448: ibid, 1446-52, 190; 1456: ibid, 1452-61, 298; 1467: ibid, 1467-77, 28; 1480: ibid, 1476-85, 215; 1497: ibid, 1494-1509, 117.
8. Lea commissions:- 1477: Cal. Pat., 1476-85, 22; 1502: ibid, 1494-1509, 285; c. 1515: L&P Hen. VIII, 2(1), 216-17; 1516: ibid, 646; late 1530s: Harte, fos.169-73; 1551, ibid; 1566: Cal. Pat., 1569-72, 218-19. Marshland commissions:- 1511: L&P Hen. VIII, 1(1), 489; 1529: ibid, 4(3), 2349; 1540: ibid, 15, 50; 1547: Cal. Pat., 1547-48, 78; 1554: ibid, 1554-55, 107-08; 1564: ibid, 1563-66, 41; 1567: ibid, 1569-72, 219; 1570: ibid, 220-21.

9. 23 Hen. VIII, c.5; modified by 25 Hen. VIII, c.10; 3 & 4 Edw. VI, c.8; 13 Eliz., c.9.
10. Harte, fos.109-62; Cal. Close, 1279-88, 132; Cal. Pat., 1281-92, 103; CSPD, 1591-94, 499-502; Cal. Inq. Misc., iii.70-73; BL, Landsdowne MS. 1 no.42; GLRO, Stowe MS. Box 21, 'The boke for the right Course of the Water of Lee'; CLRO, BHC 1711, copies of documents, temp Edw. III; Year Bk. 19 Edw III(Rolls Ser.), 178-85, 485-94.
11. VCH Herts. iii.380, 383, 499; *ibid*, iv.173-74; Cal. Pat., 1292-1301, 547.
12. Fn. 5 above; 3 Hen. VI, c.5; 9 Hen. VI, c.9; Cal. Pat., 1436-41, 371.
13. Harte, fos.169-73.
14. *Ibid*.
15. L&P Hen. VIII, 5, 347; *ibid*, 9, 36, 40, 49, 50, 103, 123, 128, 130, 162, 166, 170, 190, 285, 286, 298, 300, 306, 319, 325, 355, *ibid*, 10, 24, 36, 92, 168, 215, 401, 427; *ibid*, 12(2), 409; *ibid*, 13(1), 5, 57, 80, 101, 166, 168, 191, 193, 346; *ibid*, 14(1), 60; *ibid*, 14(2), 20.

CHAPTER TWO

1. F.J. Fisher, 'The Development of the London Food Market, 1540-1640', Economic History Review, 1st Series, v pt.2(1935), 46-64; N.S.B. Gras, The Evolution of the English Corn Market(Cambridge, Massachusetts, 1926), 73-94; R.M. Benbow, 'The Court of Aldermen and the Assizes: The Policy of Price Control in Elizabethan London', Guildhall Studies in London History, iv pt.3(1980), 93-118; R. Finlay, Population and Metropolis, The Demography of London 1580-1650(Cambridge, 1981), 51-69.
2. J. Strype, A Survey of the Cities of London and Westminster(2 vols, London, 1720), i.39-49; F.S. Thacker, The Thames Highway(2 vols, London, 1914-20), i.43-57.
3. CLRO, Repertories, 14 fos.365, 367.
4. T.K. Rabb, Enterprise and Empire: Merchants and Gentry Investment in the Expansion of England 1575-1630(Cambridge, Massachusetts, 1967), 335, 381; T.S. Willan, The Muscovy Merchants of 1555(Manchester, 1953), 94, 109-10, 123; C.J. Sissons, Thomas Lodge and other Elizabethans(Cambridge, Massachusetts, 1933), 1-53; B.R. Masters, 'City Officers, iv: The City Surveyor, the City Engineer and the City Architect and Planning Officers', Guildhall Miscellany, iv pt.4(1973), 237-55.

5. CLRO, Repertories, 14 fos.382,493; PRO, S.P. 12/16 nos.29,30; S.P. 12/125 no.50.
6. Bodl.,MS. Rawl. Essex 11 fo.92.
7. Cal. Pat.,1569-72,218-19
8. CLRO, Repertories, 16 fo.127.
9. Ibid, 17 fo.141.
10. PRO, D.L. 42/96 fo.18; D.L. 42/97 fo.126; D.L. 42/98 fos.7-8,327-28; D.L. 44/478; D.L. 1/89/A.21; R.C. Somerville, History of the Duchy of Lancaster (2 vols,London,1953-70), i.187,313; H.C. Andrews, The Chronicles of Hertford Castle(Hertford,1947),20-21.
11. CLRO, Repertories, 16 fo.186.
12. CJ, i.93; LJ, i.681,691,694,699-701.
13. PRO, S.P. 12/77 no.79. Endorsed 'A Bill for Lee Water', but calendared as the act itself: CSPD,1547-80,412
14. B.R. Masters,editor, Chamber Accounts of the Sixteenth Century, London Record Society Publications no.20 (London,1984),130; P.W. Hasler,editor, The History of Parliament: The House of Commons 1558-1603(3 vols, London,1981),passim; VCH Herts. iii.369,432,447; VCH Midd. v.156; R.C. Somerville, Duchy of Lancaster, i.395,446; D.O. Pam, Protestant Gentlemen, the Wroths of Durants Arbour, Enfield and Loughton,Essex, Edmonton Hundred Historical Society Occasional Papers N.S. no.26(1973).
15. PRO, S.P. 46/34 fo.218.

CHAPTER THREE

1. H. Chauncey, The Historical Antiquities of Hertfordshire(2 vols,Bishops Stortford,1828 ed),9-10; N. Salmon, The History of Hertfordshire(London,1728),247; W. Robinson, The History and Antiquities of Tottenham (2 vols,London,1840), i.21; W.T. Jackman, The Development of Transportation in Modern England(London,1966 ed); 166; E.M. Hunt, The History of Ware(Hertford,1946),18; G.B.G. Bull, 'Elizabethan Maps of the lower Lea valley', Geographical Magazine, Vol.124(1958),375-78; N.J. Barton, The Lost Rivers of London(Leicester,1962),83; T.S. Willan, The Inland Trade(Manchester,1976), 24; J.Boyes, R. Russell, The Canals of Eastern England(Newton Abbot, 1977),16; M. Denney, London's Waterways(London,1977),37; J.G.L. Burnby, M. Parker, The Navigation of the River Lea(1190-1790), Edmonton Hundred Historical Society,

- Occasional Papers N.S. no.36(1978),5; VCH Midd. v.130; VCH Essex, v.166. It should be emphasised that this writer needed two attempts: K.R. Fairclough, 'A Tudor Canal Scheme for the River Lea', London Journal, v pt.2(1979),218-22; K.R. Fairclough, 'A Tudor Canal Scheme for the River Lea-a note', London Journal, viii pt.1(1982),90-91(see back folder).
2. Bodl. MS. Rawl. Essex 11 fos.94-95.
 3. Harte, fos.169-70; BL. Lansdowne MS. 60 no.35; PRO, S.P. 12/248 no.97(see also Chapter 4 fn.4).
 4. B.R. Masters, editor, Chamber Accounts,130; K.R. Fairclough,1982.
 5. B.R. Masters,editor, Chamber Accounts,130; W.Page,editor, Letters of Denization and Acts of Naturalisation for Aliens in England, 1509-1603, Publications of Huguenot Society of London, Quarto Series viii(Lymington,1893),16; CSPD,Addenda 1566-79, 53; R. Hakluyt, The Principall Navigations, Voiages, Traffiques and Discoveries of the English Nation (12 vols,Glasgow,1903-05 ed), iii.119-24; G.L.E. Turner, 'Mathematical instrument-making in London in the sixteenth century' in S. Tyacke,editor, English Map-making 1500-1650(London,1983),92-104.
 6. B.R. Masters,editor, Chamber Accounts,130; R.E.G. Kirk, E.F. Kirk,editors, Return of Aliens dwelling in the City and Suburbs of London, Publications of the Huguenot Society of London, Quarto Series x(4 vols, Aberdeen,1900-08), pt.2,40; pt.3,352; A.M. Oakley, editor, Actes du Consistoire de l'Eglise Francaise de Threadneedle Street, Londres, 1571-77, Publications of the Huguenot Society of London, Quarto Series, xlviii (London,1969),94,176. Name variously spelt:- Furrey, Fure, Fraier, Frayer, Fraiere, Frayere.
 7. B.R. Masters,editor, Chamber Accounts,130; R. Hakluyt, Principal Voiages, iii.197-200, vi.136-37; E.G.R. Taylor, The Mathematical Practioners of Tudor and Stuart England(Cambridge,1954),168.
 8. In the early 1600s there were proposals to suply Theobalds House from Lynch Mill in Hoddesdon, whilst in the 1630s there were proposals to supply London from the same source. In 1773 there was a scheme to build a canal from Waltham Abbey to Moorfields, with further variations on this scheme in 1802 and 1810. In 1805 the intended East London Waterworks Company proposed to bring water from Waltham Cross to a reservoir at Mile End. None of these schemes were implemented. The suitability of the terrain was stressed by James Sharp in 1773:- 'I had the Level taken from the Quarters in Moorfields, to see where it would run into the River Lee, and to my very great Surprize, I found it extend no less than thirteen Miles and an half, viz as near Waltham Abbey...':

S.P. 14/5 no.27; Sir Walter Roberts, An answer to Mr Fords booke, entitled A designe for bringing a navigable river, from Rickmansworth in Hartfordshire to St Giles in the Fields(London,1641); Guildhall Library, Fo. pamp. 3349, J. Sharp, An address to the Right Honourable the Lord Mayor...(London,1774); R. Dodd, Report of the Intended North London Canal(London,1802); GLRO, MR/UP/29; MR/UP/18A(1).

9. Alnwick Castle, Percy Family, Letters and Papers, ix. fo.52.
10. PRO, S.P. 14/5 no.27.
11. K.R. Fairclough, 1979.
12. Gentleman's Magazine, xxiv(1754),376-77,426; ibid, xxviii(1758),326.
13. Enfield, The Report of John Smeaton, Engineer, upon the new making & completing the navigation of the River Lee, from the Thames thro Stanstead & Ware to Hertford; PRO, RAIL 845/4, 6 July 1770; ERO, D/DYc 11/2.
14. BL, Lansdowne MS. 25 no.12; PRO, MPF 282.
15. Thomas Procter, A worthy worke Profitable to the whole Kingdome(London,1607). Procter calls Lock Bridge beneath Tottenham Mill 'Stock-bridge'.

CHAPTER FOUR

1. BL, Harleian MS. 570 fo.10.
2. Bodl., MS. Rawl. Essex 11 fos.98-99.
3. W.T. Jackman, The Development of Transportation in Modern England(London,1966 ed); T.S. Willan, The Inland Trade(Manchester,1976); T.S. Willan, River Navigation in England 1600-1750(London,1964 ed).
4. Section based on two documents unless otherwise stated. 1) BL, Lansdowne MS. 38 no.36, 'A note of all the defectes matereall in the Water of Lee from Walton holy cross all a longe the iiij milles benethe Stratford of the Bowe'. Catalogued as 1583, but should be c.1575-76. Defects are those which would be noted when work commenced, and note is made about which was the navigable channel near Temple Mills, a problem which was sorted out about the 17th year of the reign (PRO, S.P. 12/248 no.97) This document is referred to as the 'early survey'. 2) PRO, S.P. 12/109 no.19. A list of orders issued on 20 October 1576. Referred to as the 'commissioners orders'.
5. BL, Lansdowne MS. 25 no.11. In 1588 it was stated that 'The greatest bardg laden draweth xvj ynches': Hatfield House, CP 166/47.

6. ERO, Calendar of Queens Bench Indictments Ancient relating to Essex 1558-1603, 99,100,113.
7. BL, Lansdowne MS. 32 no.34; PRO, S.P. 12/111 no.43.
8. BL, Lansdowne MS. 32 no.41.
9. BL, Lansdowne MS. 38 no.36; PRO, S.P. 12/109 nos. 2,33; S.P. 12/177 no.10; D.L. 1/187/A.34; T. Hearne, editor, The Itinerary of John Leland the Antiquary (9 vols, Oxford, 1768-69), v. page xvi.
10. Before the Dissolution, Bow Bridge had been maintained by Stratford Abbey, but the secular owners of the confiscated ignored this responsibility. By the end of the 1570s the bridge was in such decay that a temporary wooden frame had to be erected whilst repairs to the stone bridge were organised. In 1568 the City of London refused to accept responsibility for the bridge, and in the mid-1570s the secular owners of the confiscated lands followed suit(it was forced on them the following century). It was not until the mid-1580s that a new stone bridge was erected at an estimated cost of £600. The City voluntarily subscribed £50 towards this, the remainder was collected by rates upon local inhabitants as well as rates raised within the counties of Essex Suffolk. In addition a temporary two year toll was imposed on users: APC, 1578-80, 287-88; ibid, 1580-81, 108, 114, 129; CLRO, Repertories, 16 fo.341; ibid, 20 fos.96, 107; PRO, E123/6 fos.34, 35, 58; GLRO, Acc 79/9; W.H. Overall, H.C. Overall, editors, Analytical Index to the Series of Records known as Remembrancia preserved among the Archives of the City of London A.D. 1579-1664 (London, 1878), 34-35.
11. BL, Lansdowne MS 25 nos.11,12; PRO, S.P. 12/248 no.97.
12. CJ, i.77-80. First bill passed the Commons, but did not get to the Lords. The second was defeated in the Commons by 65 votes to 62.
13. Harte, fos.169-73. Evidence of John Younge.
14. Bodl., MS. Rawl. Essex 11 fo.99. Is 'Hobling' (?) an ebbing weir? Such weirs stood in tidal stretches of rivers. A survey, catalogued as c.1560, suggests that the tide came up to Lock Bridge beneath Tottenham Mills: PRO, S.P. 12/15 no.11.
15. BL, Lansdowne MS. 25 no.11.
16. Bodl., MS. Rawl. Essex 11 fo.96.
17. K.R. Fairclough, 'The Waltham Pound Lock', History of Technology, iv(1979), 31-44. The pound lock was built in the summer or autumn of 1576, not the spring or summer of 1577 as stated in the article(see back folder).
18. W. Vallans, 'A Tale of Two Swannes' in T. Hearne, editor, Itinerary of John Leland, v. pages viii-xiv.

19. Hatfield House, CPM supp. 20; HRO, B479; Sir Walter Roberts, An answer to Mr Ford's booke. In the 1740s Lea bargemen vaguely remembered that the mill river had once been the navigable channel: HRO, B1110.
20. BL, Harleian MS. 1579 fo.155; Landsdowne MS. 32 no. 41; PRO, D.L. 42/97 fo.48.
21. BL, Landsdowne MS. 32 nos.33,41; *ibid*, 53 nos.76,78; *ibid*, 60 no.38; Hatfield House, Maps II.53.
22. BL, Landsdowne MS. 32 no.40.
23. 'We shall begin by shewing how the Stream is to be contracted, to carry off Shoals or sand Banks, without the Assistance of human force': C. Vallancey, A Treatise on Inland Navigation, or, the Art of making Rivers navigable, of making Canals in all Sorts of Soils, and of Constructing Locks and Sluices(Dublin, 1763),29. 'The only permanent method of lowing soft shoals...is by reducing the width of the channel along the site of the shoal, thus producing its removal by increased scour, which also prevents it forming again' 'The regulation of a channel is more effectually accomplished by longitudinal embankments': L.F. Vernon-Harcourt, Rivers and Canals(2 vols, Oxford,1896), i.52.
24. Hatfield House, CP 166/47. Hertford market was on a Saturday, Ware market on a Tuesday: J. Norden, Speculi Britanniae Pars, A Description of Hartfordshire, (Ware,1903),3.
25. BL, Landsdowne MS. 53 nos.76,78; Harte, fos.2-15.
26. PRO, S.P. 12/177 no.10.
27. HRO, BHR Vol. 39 fo.1.
28. BL, Landsdowne MS. 32 no.36; Hatfield House, CP 166/47.
29. PRO, D.L. 42/98 fo.268; HRO, BHR Vol. 39 fo.1.
30. Hist MSS. Com. 13, Salisbury, p.165.
31. BL, Landsdowne MS. 38 no.36.
32. PRO, S.P. 12/111 no.13.
33. CLRO, Repertories, 18 fo.42.

CHAPTER FIVE

1. T.G. Barnes, A. Hassell-Smith, 'Justices of the Peace from 1558 to 1688- a Revised List of Sources', Bulletin of the Institute of Historical Research, xxxii(1959), 221-42; W.J. Jones, The Elizabethan Court of Chancery, (Oxford,1967),132-33.

2. Bodl., MS. Rawl. Essex 11 fos.98-99; BL, Lansdowne MS. 60 no.35.
3. Bodl., MS. Rawl. Essex 11 fos.98-99; BL, Lansdowne MS. 53 no.82; *ibid*, 60 no.35; Harte, fos.174-77; PRO, S.P. 12/109 no.19; *ibid*, 12/111 no.43.
4. BL, Lansdowne MS. 32 no.41; T. Hearne, editor, Itinerary of John Leland, v. page xxvi.
5. J. Thirsk, Economic Policy and Projects: The Development of a Consumer Society in Early Modern England(Cambridge, 1967), 11-12,24-25.
6. BL, Additional MS. 27979; VCH Herts. iii.387-88; T. Hearne, editor, Itinerary of John Leland, v. pages xv-xvi. ouP
7. BL. Lansdowne MS. 22 no.48; *ibid*, 25 nos.11,12; *ibid*, 32 nos.33,35,37,38; *ibid*, 77 no.16.
8. *Ibid*, 32 no.33.
9. W. Camden, Britannia(2 vols,London,1772 ed), i.321; Harte, fos.165-67; Bodl., MS. Rawl. Essex 11 fos.98-99; BL, Lansdowne MS. 22 no.48; *ibid*, 25 nos.11,12; Hatfield House, CP 166/47; *ibid*, Maps II.53; PRO, S.P. 12/15 no.11.
10. J. Thirsk, Economic Policy and Projects.
11. BL, Lansdowne 32 no.40.
12. A.B. Beaven, The Aldermen of the City of London(2 vols, London,1908-13),*passim*. Osborne and Marshe had property in Tottenham, and Marshe may have been steward of the manor: W.B.B. Marcham, Court Rolls of the Manor of Tottenham 1 Eliz-24 Eliz(London,1963),
13. R.C. Somerville, Duchy of Lancaster, i.443,609; VCH Midd. v.233; R.C. Barnett, Place, Profit and Power, A Study of the Servants of William Cecil, Elizabethan Statesman, The James Sprunt Studies in History and Political Science, Vol. 51(Chapel Hill, North Carolina, 1969),110-112.
14. PRO, S.P. 12/104 fos.91,92,119; S.P. 12/121 fos.13-16; Hist. MSS. Com., 2, Salisbury, p.164; *ibid*, 13, Salisbury, p.155; P.W. Hasler, editor, History of Parliament: The Commons 1558-1603(3 vols,London,1981),*passim*; J.S. Cockburn, editor, Calendar of Assize Records, Essex Indictments, Elizabeth I(London,1978),*passim*; J.S. Cockburn, editor, Calendar of Assize Records: Hertfordshire Indictments, Elizabeth I(London,1975),*passim*.
15. Harte, fos.174-77; Bodl., MS. Rawl. Essex 11 fo.101; CLRO, Repertories, 19 fo.102; Hist. MSS. Com., 13, Salisbury, p.165.
16. BL, Lansdowne MS. 22 no.48, *ibid*, 25 nos.11,12.

17. PRO, S.P. 12/109 no.19; S.P. 12/111 no.43.
18. Bodl., MS. Rawl. Essex 11 fo.99.
19. A.M. Kirkus, editor, The Records of the Commissioners of Sewers in the Parts of Holland, 1547-1603, Lincoln Record Society Publications no.54(Lincoln, 1959), pp. xxxii-xxxv; S. Webb, B. Webb, Statutory Bodies for Special Purposes, 54-56.
20. Bodl., MS. Rawl. Essex 11 fos.98-99; PRO, S.P. 12/109 no.19.
21. Bodl., MS. Rawl. Essex 11 fos.98-99, 101. Thomas Penyngton was either the citizen and currier who died in 1593-94, or his son, both of whom lived at Tottenham. Thomas Pyckeringe of Stepney died in the 1580s. All his relatives were from Yorkshire, Northumberland or Cumberland: PRO, PROB 11/84(65); PROB 11/67(35); W.B.B. Marcham, editor, Tottenham Court Rolls, 131, 137.
22. BL, Landsdowne MS. 22 no.48.
23. Bodl., MS. Rawl. Essex 11 fo.101.
24. Ibid, fo.99; PRO, PROB 11/83(17); R.C. Somerville, Duchy of Lancaster, i.609.
25. Bodl., MS. Rawl. Essex 11 fos.98-99; PRO, S.P. 12/111 no.43.
26. K.R. Fairclough, Waltham Pound Lock; PRO, S.P. 12/109 no.19; S.P. 12/111 no.43; Bodl., MS. Rawl. Essex 11 fos.98-99.
27. Bodl., MS. Rawl. Essex 11 fo.101. 49 acres were rated at 3s 4d per acre. 1s 4d to be used for improving the Lea, the rest for a 'Common Sewer'. Another 31 acres were rated at 1s 4d towards improving the river,
28. BL, Landsdowne MS. 32 no.33.
29. Ibid, no.41; PRO, S.P. 15/30 no.38.
30. This statement was first recorded by Sir Henry Chauncey in 1700, and has been repeated by later historians. Chauncey most probably heard it from parties, who in the 1690s were trying to establish the rights of the City of London along the lower Lea(see 12.1). It can be noted that the New River cost £18000 to build. Had the two schemes been confused?: Sir Henry Chauncey, Historical Antiquities of Hertfordshire, 9-10; E.M. Hunt, The History of Ware, 18; T.S. Willan, The Inland Trade, 24; B. Rudden, The New River(Oxford, 1985), 17.
31. BL, Landsdowne MS. 32 no.40; PRO, S.P. 15/30 no.38.
32. BL, Landsdowne MS. 32 no.41; Bodl., MS. Rawl. Essex 11 fos.94-95.

33. M. Dalton, The Country Iustice(London,1618),106-07; Sir Edward Coke, The Reports of Sir Edward Coke(7 vols, 13 parts,London,1738 ed), pt. 10,137-43; R. Callis, The Reading of That Famous and Learned Gentleman, Robert Callis...upon the Statute...of Sewers... delivered...at Grays-Inn in August 1622(London,1648), 204-17; T.S. Willan, River Navigation in England 1600-1750,16-23.
34. 13 Eliz., c.9. Life of any commission increased from 5 to 10 years, and decrees of commissioners to remain valid even after commission expired, until repealed by a later commission.
35. BL, Lansdowne MS. 53 no.82; *ibid*, 60 no.35.

CHAPTER SIX

1. In 1574 the City of London did not mention the Lea as a source by which grain was brought to the capital. In 1592 there is a reference to 'xiiij years after the water Cariadge began'. Norden said that carriage began about the 18th year of the reign, whilst a report to Star Chamber in the 1590s stated that traffic had developed within the last 20 years or thereabouts. R.H. Tawney, E. Power, editors, Tudor Economic Documents, (3 vols, London,1924), i.156-61; Bodl., MS. Rawl. Essex 11 fos.89-90; BL, Harleian MS. 570 fo.9; CSPD, 1591-94,499-502.
2. PRO, S.P. 12/177 no.10; PRO, D.L. 44/478.
3. BL, Lansdowne MS. 32 no.33; Bodl., MS. Rawl. Essex 11 fo.93; Hatfield House, CP 166/47.
4. PRO, S.P. 12/177 no.10; BL, Lansdowne MS. 32 nos.33, 40,41.
5. Table 1: BL, Lansdowne MS. 32 no.36; Table 2: Hatfield House, CP 166/47.
6. BL, Lansdowne MS. 32 no.40.
7. Richard Brooke alias Yokesley of Ware: Harte, fo.2; PRO, Req 2 387/40; ERO, Calendar of County Records (Essex), Sessions Records 1590-96,124,128,216; HRO, HAT/SR 10 no.4; HAT/SR 17 no.139; BL, Lansdowne MS. 32 no.41; *ibid*, 38 no.34.
8. John Whykhoo of 1581 could be the John Whiskerd listed in 1588, and the John Wisket of Ware, yeoman, named in the 1592 riots. In addition, in 1605 a John Whiscard of Ware, and in 1618 a John Whiskett, junior of Ware, were indicted for keeping unlicensed alehouses. A Thom Whiscot was listed as a barge-owner in 1588: ERO, Calendar of County Records(Essex), Sessions Records 1590-96,124; HRO, HAT/SR 1 nos.55, 92; HAT/SR 13 no.109; HAT/SR 29 no.229.

9. By 1596 Bearapacke may have moved to Essendon: HRO, HAT/SR 1 no.54; HAT/SR 4 no.121; HAT/SR 8 no.68; HAT/SR 9 no.126.
10. Richard Stringer: In his will, made 1597, he left small bequests between 2/- and 10/- to the poor of Amwell, for the repair of Amwell Church, to the vicar of Amwell, to his maid, and to John Wheeler's wife, but only 1/- each to his four grandchildren. The rest of his goods, chattels and cattle were left to his widow: ERO, 222 BW 35; HRO, HAT/SR 8 no.57.
Thomas How: In his will, made 1611, he left his clothes and all debts owed him to his sister, Joanne Browne. Amongst these debts was £11 due from Thomas Whitehead of Stratford atte Bowe, bargeman. Of this £11, £4 was for wages. It can be noted that in 1592 a John Howe of Ware was wounded in the riots at Waltham: ERO, 156 BW 20; ERO, Calendar of County Records (Essex), Sessions Records 1590-96, 124.
11. BL, Lansdowne MS. 32 no.40; Bodl., Rawl. Essex 11 fo.93; F.J. Fisher, 'The development of the London Food Market', Economic History Review, 1st Series, v pt.2(1934-35), 46-64. For details of the London brewing industry at this date: P. Mathias, The Brewing Industry in England 1700-1830 (Cambridge, 1959), 5-6, 140, 437; J. Archer, 'The Industrial History of London 1603-40' (unpublished M.A. thesis, Univ. of London, 1934), 17-18, 27-29, 199-201; P. Clark, The English Alehouse, a social history 1200-1830 (London, 1983), 106; VCH Surrey, ii.381-87.
12. Roger James, senior, came to England from Holland about 1540. He was wealthy, paying the highest rate of £300 in a 1582 subsidy, and the highest rate of £100 in a 1588 assessment of the Brewers Company. His son, James, became a freeman of the Brewers Company in 1584, and was assessed at £25 in 1588: Guildhall Library, MS. 5445 Vols 7 and 8, unfoliated; R.E.G. Kirk, E.F. Kirk, editors, Aliens dwelling in the City, Vol 10 pt. 2, 134, 160, 202, 214, 256, 325, 402; ibid, pt.3, 321, 386.
13. Guildhall Library, MS. 5445, Vol 7, unfoliated.
14. Parker (or Packer) was living at East Smithfield in 1581, and was recorded as being in charge of a barge at Enfield that year. In 1587 he gave evidence to the Brewers Company about deliveries of wheat and malt to a London brewing partnership. In 1588 he was living at Ware, and his will in 1593 describes him as a 'Beerbrewer' of Ware. His widow, Elizabeth, was sister to the Leonard brothers of Ware (see fn.18 below) and his daughter, Elizabeth, was married to another local brewer, William Armstrong: BL, Lansdowne MS. 32 no.37; Guildhall Library, MS. 5445, Vol 8, unfoliated; PRO, PROB 11/83(6); PROB 11/132(116).
15. BL, Lansdowne MS. 32 no.40; PRO, S.P. 12/177 no.9; S.P. 12/146 no.86.

16. CLRO, Journals, 20(1) fo.200; *ibid*, 21 fo.336; R. Bennett, J. Elton, A History of Corn Milling (4 vols, London, 1898-1904), iii.168-71; R.B. Westerfield, Middlemen in English Business (Newton Abbot, 1968 ed), 168.
17. PRO, D.L. 6/30; D.L. 1/150/G4; BL, Landsdowne MS. 32 no.33; *ibid*, 38 no.35; W.B.B. Marcham, editor, Tottenham Court Rolls, *passim*.
18. HRO, 70612; HAT/SR 8 no.123; ERO, 4 BW 24; PRO, PROB 11/63(6); PROB 11/83(6); PROB 11/121(40); S.P. 12/261 no.73; S.P. 14/28 no.136; BL, Add. MS. 27979.
19. In 1572 Robert Garnett of London, draper, purchased Broxbourne Mills from his brother, Henry. He still possessed them at his death in 1600. He must be the Mr Garner of Broxbourne listed as a barge-owner in 1581, and there is a reference in 1587 to 'gardyners barge of broxborne mill': HRO, B460, B622; PRO, S.P. 12/261 no.73; BL, Landsdowne MS. 53 no.76.
20. The Hugh Bottm listed in 1588 could be the Hughe Bottinge who owned a $\frac{1}{2}$ share in a lease to Hertford Town Mills in 1583-84: PRO, D.L. 1/150/G4.
21. Richard Hickman of Waltham Abbey listed in 1588 could be the same as the miller at Waltham Abbey Corn Mills in 1600: HRO, HAT/SR 13 no.1.
22. APC 1592, 11-12.
23. PRO, S.P. 12/177 no.8.
24. Hatfield House, Legal 231/22; *ibid*, CPM 213/78.

CHAPTER SEVEN

1. BL, Landsdowne MS. 32 nos.34,41; Harte, fos.2-15.
2. BL, Landsdowne MS. 32 no.40; *ibid*, 38 no.32; *ibid*, 41 no.48; *ibid*, 53 nos.76,78; *ibid*, 60 no.38; PRO, S.P. 12/177 no.10; Bodl., MS. Rawl. Essex 11 fo.96.
3. BL, Landsdowne MS. 32 no.41. Thomas came from a fishing family. His father, William, left Thomas a house in Hoddesdon, but left fishing leases to John and Henry Hewninge. On Thomas' death in 1595 he left 'all my fishings, nets and fishing tools' to his son, Toby, and £20 each to his other sons, Thomas and William. William, described as a fisherman of Wormley, died in 1599, whilst Thomas, also a fisherman, was in dispute in 1602 with his nephew Ralph Parrat of Enfield, yeoman, who in 1601 had taken out a lease on the fishery purchased by Lord Burghley in 1572: PRO, C2 Eliz/P12/35; ERO, D/DQ 53/20; HRO, D/EX 21 Z6; Hatfield House, CP 349 fo.43; F.G. Emmison, Elizabethan Wills of South-west Essex, (Waddesdon, 1983), 9, 130.

4. Bodl., MS. Rawl. Essex 11 fo.98.
5. BL, Add MS. 27979; PRO, S.P. 12/91 no.9; PRO, CP 25(2)/260 Hil 14 Eliz; VCH Herts., iii.387-88.
6. For an explanation of the various terms used for road carriers: R.W. Westerfield, Middlemen in English Business, 130-186.
7. D.O. Pam, Tudor Enfield, The Maltmen and the Lea Navigation, Edmonton Hundred Historical Society, Occasional Papers N.S. no.18(n.d.).
8. D.O. Pam, Protestant Gentlemen, the Wroths of Durants Arbour, Enfield and Loughton, Essex, Edmonton Hundred Historical Society, Occasional Papers N.S. no.25(1973).
9. BL, Lansdowne MS. 32 nos.34,41,42; *ibid*, 53 nos.76,78; PRO, S.P. 14/1 no.25; S.P. 15/30 no.38; Harte, fos.2-15; ERO, Calendar of County Records(Essex), Sessions Records 1590-96, no.123/93-94; W.P. Baildon, editor, Les Reportes del. Cases in Camera Stellata 1593-1609(London,1894),10.
10. DNB; VCH Herts., iii.416; VCH Essex, v.161-62,166; J.S. Cockburn, editor, Calendar of Assize Records, Essex Indictments, Elizabeth I, 393; see 7.4.
11. BL, Lansdowne MS. 22 no.43; *ibid*, 25 nos.11,12; PRO, S.P. 12/109 no.19.
12. BL, Lansdowne MS. 32 no.40.
13. *Ibid*, nos.34,37,41.
14. *Ibid*, nos.35,41.
15. *Ibid*, nos.35,37; *ibid*, 38 no.34.
16. *Ibid*, 32 no.33; *ibid*, 38 no.34.
17. *Ibid*, 32 no.33.
18. *Ibid*, nos.39,41.
19. *Ibid*, no.39; T. Wright, Queen Elizabeth and her Times (2 vols, London, 1833), ii.159-61.
20. Fleetwood noted Wroth's curses against the 'Swanemotes in the Forest'. Wroth was also arguing with another commissioner, Thomas Colshill. Colshill wanted to bring piped water to his house at Chingford from a nearby spring. Wroth refused to allow the pipes to cross his land, and when Colshill took a longer route, Wroth still objected, arguing that the pipes still crossed his land. In November 1581 Wroth and a couple of his servants, armed with daggers and a crossbow, attacked Colshill's servants, and dug up the pipes. After they were relaid, Wroth dug them up once more: PRO, STAC 5 C41/6, F55/10.

21. BL, Lansdowne MS. 32 nos.41,42.
22. Petitions from two badgers in Newgate, most probably presented October or November 1581, not 1587 or 1589 as catalogued: BL, Lansdowne MS. 53 no.95; *ibid*, 60 no.36.
23. BL, Lansdowne MS. 32 no.40. Includes the badgers' petition and four replies. Another reply is found: *ibid*, 38 no.35(catalogued as 1583, but should be 1581 as confirmed by Fanshawe's letter:*ibid*, 32 no.33).
24. For details of contemporary arguments about causes of inflation: R.H. Tawney, E. Power, editors, Tudor Economic Documents, i.141-68; R.B. Outhwaite, Inflation in Tudor and early Stuart England(London,1969); P. Bowden, 'Agricultural Prices, Farm Profits, and Rents' in J. Thirsk, editor, The Agrarian History of England and Wales, Volume IV, 1500-1640(Cambridge,1967),593-616.
25. BL, Lansdowne MS. 38 no.32. The badgers argued that 'the low grounds by the River side be greatly impayed for Want of Sorrounding wch hath happened for that the water is not stayed by Weares as it hath ben But runeth faster a Waie by reason of the opening of the Streame for passage soe as the grounds yield not soe much haie'. The bargemen admitted there was some validity validity in this complaint, although they added that the flooding had some harmful effects as well. There was a strong body of opinion which stressed the benefits of such flooding, and a river improvement scheme for the Wey in the following century included special measures to ensure such flooding: Bodl., MS. Rawl. Essex 11 fo.98; BL, Lansdowne MS. 32 no.40; *ibid*, 60 no.38; Harte, fos.15-26,153-62,171-73; J. Norden, The Surveiors Dialogue(London,1607); R.Vaughan, Most approved and long experienced Water-Workes(London, 1610); M. Nash, 'Early Seventeenth-Century Schemes to make the Wey navigable, 1618-51', Surrey Archaeological Collections, lxvi(1969),33-40.
26. BL, Lansdowne MS. 41 no.48.
27. PRO, S.P. 12/177 no.8. Dating of bill: Bodl., MS. Rawl. Essex 11 fo.93.
28. S.P. 12/177 no.10. Badgers justified tax on grounds that the Queen needed recompense for her costs in raising bridges along the river. She had spent money on Ware, Stanstead and Temple Mills Bridge, but such costs were nowhere near the expected revenue from the proposed tax.
29. BL, Lansdowne MS. 53 nos.76,78.
30. *Ibid*, 60 no.38. Catalogued as 1589, but 1587 seems more likely.

31. PRO, S.P. 15/30 no.38.
32. Ibid, 46/34 fos.218,235. Sir Henry Cock was lord of the manor of Broxbourne, but he did not own the local mills.
33. Harte, fos.15-28.
34. Ibid, fos.2-15.
35. Ibid, fos.29-35; PRO, STAC 5, L46/6; Bodl., MS. Rawl. Essex 11 fo.89. This last source cites £250 as the amount paid to Denny. There are several references to the debts and parlous financial state of Sir Edward Denny in the Salisbury papers, but these apply to the uncle of Sir Edward Denny of Waltham: Hist. Mss. Com., 5, Salisbury, pp31-32; ibid, 6, Salisbury, p.419; ibid, 9, Salisbury, pp.63,194; ibid, 10, Salisbury, p.90; CSPD, 1598-1601, 397.
36. APC, 1591-92, 537, 553-54.
37. Ibid, 1592, 11-12.
38. BL, Lansdowne 53 no.94.
39. Harte, fos.2-15, 15-28.
40. ERO, Calendar of County Records (Essex), Sessions Records 1590-96, no.123/47.
41. PRO, C234/20.
42. Harte, fos.2-15; ERO, Calendar of County Records (Essex), Sessions Records 1590-96, no.123/47.
43. Harte, fos.2-15.
44. Ibid, fos.2-15, 15-28, 29-35, 36-38, 50-92; PRO, S.P. 12/248 no.97; BL., Lansdowne MS. 76 no.55.
45. Disputes over the boundary and the rights of Cheshunt and Waltham had long been a bone of contention: J. Farmer, The History of the ancient Town, and once Famous Abbey of Waltham (London, 1735), 74-76; P.C. Archer, Historic Cheshunt (Cheshunt, 1923), 42-45.

CHAPTER EIGHT

1. W.G. Hoskins, 'Harvest Fluctuations and English Economic History, 1480-1619', Agricultural History Review, xii(1964), 128-46; J. Thirsk, 'Economic Policy and Projects' (Oxford, 1978), 51-77; D.M. Palliser, The Age of Elizabeth, England under the later Tudors, 1547-1603 (London, 1983), 27-28.

2. BL, Lansdowne MS..77 no.16.
3. CLRO, Repertories, 23 fos.329,334.
4. Hatfield House, CP 143/117.
5. HRO, B1110.
6. Hatfield House, CP 143/117.
7. NRO, WC 244. This copy states 1600 and is followed by one document prepared in 1760s:NRO, Y26094. But another copy states 1590, and this date was given to Parliament in 1767:PRO, C225 Bundle 2/59A; CJ, xxxi.308.
8. L.T. Smith, editor, 'The Itinerary of John Leland the Antiquary' (5 vols, London,1906-10),iv.112-13. 'The first arme that breketh owt by the west of the mayne streame ys a mile lower than Wormeley ...and rennith by Cheston nunnery...And oute of this arme breketh a litle beneth Cheston Nunnery an arme caullid the Shere Lake, because that there it devidith Estsax and Hertfordshire...at Northe Marshe Point meath againe with tharme that it came out of. Thens cummith the first arme to Smawley Bridge...The secunde principal arme westward brekith owte of kinges streame at a hammelet caullid Halifeld half a mile lower than Chestun Nunnery, and so to the fulling mylle,... On the este side of the Kinges streame brekith oute but one principal arme at Halifeld 3. quarters of a mile above Waltham, and so goith to the corne mille in Waltham...'
9. Hatfield House, Maps II.53; Harte, fos.174-77.
10. Caxton: BL , MAPS C 7 c 1; Norden: ERO, D/DMs P1; B.L., MAPS C7 b 24. For later maps:-'A New and Correct Map of Middlesex, Essex and Hartfordshire' by J. Warburton, J. Bland, and P. Smith, c.1724: BL , MAPS C 29 f 26, or a plan of Waltham made in 1767 by J. Parker:NRO, YZ 6097.
11. Hatfield House,CP Petitions 1434Undated, but Robert Cecil made Viscount Cranborne on 20 August 1604 and then elevated to Earl of Salisbury on 4 May 1605.
12. BL, Lansdowne MS.. 53 no.78; ERO, D/DC 27/317A. Map made between 1575 and 1604.
13. ERO, D/DB T74.
14. ERO, D/DAc 370.
15. Hatfield House, General 65/4. Cecil had bought the manor of Royden Hall in 1602 and may have been checking his manorial rights: VCH Essex, viii.235,322.

16. Hist. Mss. Com., 10, Salisbury, p.8
17. Hatfield House, CP Petitions 1750. Undated, but petitioners, Henry Stapleford and Richard Shakerley, took out a 21 year lease on mill in 1601: Hatfield House, Deeds 163/4; HRO, 10909.
18. J.S. Cockburn, editor, Calendar of Assize Records, Hertfordshire Indictments, James I (London, 1975), 40.
19. W.H. Overall, H.C. Overall, editors, Analytical Index to...Remembrancia,
20. Hatfield House, CP 184.50.
21. T. Procter, A Worthy worke.
22. CJ, i.208. Nothing else is known of this bill.

CHAPTER NINE

1. In the first decades of the seventeenth century there were separate Commissions of Sewers for the Levels of Westham, Eastham, Barking, Ripple and Bromley, and for the Levels of Havering and Dagenham. From 1625 these two bodies were amalgamated under the name of the latter and issued regularly thereafter: Westham ect:- 1601: C231/1 fo.198; 1604: C181/1 fo.169; Hatfield House, CP 122/26; 1609: C181/2 fos.97-98; 1613: *ibid*, fos.192-93; 1622: C181/3 fos.42-43; C231/4 fos.270. Havering and Dagenham:- 1606: C181/2 fos.28-29; 1612: *ibid*, fo.167. Amalgamated Havering and Dagenham:- 1625: C181/3 fos.158-59; 1632: C181/4 fos.76-77; 1633: *ibid*, fos.136-37; C231/5 fo.106; 1642: C181/5 fos.454-55; C231/5 fo.512; 1650: C231/6 fo.182; 1660: C181/7 fos. 47-49; 1666: *ibid*, fos.390-91; C231/7 fo.303; 1676: C231/7 fo.524; 1685: C231/8 fo.140; 1694: *ibid*, fo.322; 1702: C231/9 fo.75; 1713: *ibid*, fo.275; 1715: *ibid*, fo.359; 1723: C231/10 fos.40,48; 1727: *ibid*, fo.130; 1737: *ibid*, fo.259.
2. ERO, D/SH1. For a brief discussion of the work of these commissioners: R. Allison, 'Changing Landscape in South West Essex 1600-1850' (unpublished Ph.D thesis, Univ. of London, 1966), i.23-34.
3. ERO, T/P 48/1; London Borough of Hackney Library Services, Nicholson Papers 2/2/20-26. Notes extracted from three books now lost. Commissioners of Sewers Records 1583 to 1645. Book of Presentments and Orders 23 Sept 1645 to 24 Sept 1661. Records of the Commissioners of Sewers for the Levels of Havering, West Ham etc 1645-1712. Notes made in first decade of this century by a record agent, W.J. Hardy, on behalf of Richard Nicholson of J & W Nicholson, a distilling firm which owned the Three Mills at Stratford. At this date the books were in the custody of the clerk of the commissioners, William Comyns Clifton, who was a

partner in a Romford firm of solicitors (private communication, Law Society 22/7/1983). Enquiries have not traced these records, which now seem to be lost.

4. ERO, T/P 48/1, Court of Sewers 29 September 1627, 5 October 1627, 29 December 1627, 11 August 1628; CLRO, Bridge House Committee Order Book 1611-1741, fos.27,41,47; Repertories 40 fo.316; *ibid*, 41 fo.349.
5. 1610: C181/2 fo.128; 1620: C231/4 fo.227; C181/3 fo.18; 1629: C181/4 fo.23; 1630: *ibid*; C231/5 fo.32; 1632: C231/5 fo.83; 1639: *ibid*, fo.344; C181/5 fos.284-86; 1645: *ibid*, fos.523-25; C231/6 fo.26; 1649: *ibid*, fo.150; 1654: C231/6 fo.278; C181/6 fos.4-6; 1657: C231/6 fo.356; 1660: C181/7 fos.28-30; 1667: C231/7 fo.312; 1677: *ibid*, fo.529; 1684: C231/8 fo.95; 1686: *ibid*, fo.151; 1689: *ibid*, fo.237; 1693: *ibid*, fo.306; 1695: *ibid*, fo.339; 1702: C231/9 fo.80; 1710: *ibid*, fo.203; 1715: *ibid*, fo.367; 1725 C231/10 fo.79; 1727: *ibid*, fo.135; 1737: *ibid*, fo.260; GLRO, PCS 1-80.
6. GLRO, THCS 1-27, 60.
7. GLRO, THCS 60, Court of Sewers, 13 January 1708, 10 February 1708.
8. 23 Hen. VIII, c.5.
9. At Hertford the Duchy owned most of the property until in 1627 they granted Great Hartham, Kings Mead, Little Hartham, Butchery Green and the Sessions House to the Borough, and then in 1630 granted the rest of the manor and castle of Hertford to William, Earl of Salisbury, who thus obtained the fishing in the Lea within the town, and the toll rights at bridges over the river at Hertford, Ware and Stanstead. At Enfield the Duchy possessed the manor of Enfield, the largest of 8 local manors: Sir Henry Chauncey, Historical Antiquities of Hertfordshire, i.498; VCH Midd. v.224.
10. PRO, C181/2 fo.48.
11. Hatfield House, CP 143.117. Thomas Wilson to his employer, the Earl of Salisbury.
12. PRO, S.P. 15/37 no.104. Lists Sir Michael Hicks who was knighted August 1604. Mistakenly calendared as a commission for the New River in 1605: CSPD Addenda 1580-1625, 473.
13. Hatfield House, CP 122/26; CP 122/41.
14. PRO, C181/2 fo.94. Thomas Sackville, Earl of Dorset, and Lord Treasurer died April 1608. Sir John Fortescue Chancellor of the Duchy of Lancaster died 1609. Israel Amice died March 1608. In July 1609 Robert Booth recorded as being 'in another commssion': DNB; VCH Herts., iii.483; J.S. Cockburn, editor, Calendar of

Assize Records, Hertfordshire Indictments, James 1, 42,65.

15. PRO, C66/2180.
16. PRO, S.P. 14/148 no.21; C231/4 fo.310; C181/3 fos. 91-92.
17. PRO, C181/3 fo.128; C231/4 fo.331.
18. PRO, D.L. 17/51-53.
19. PRO, C231/4 fo.384; C181/3 fos184-85; D.L. 17/54.
20. PRO, C231/5 fo.175; C181/4 fos40-41. Duchy records for this period incomplete, no seal found.
21. PRO, C231/5 fo.191.
22. M.A. Thomson, A Constitutional History of England 1642-1801(London,1938),21; H. Hallam, The Consitutional History of England(3 vols, London,1872),ii.161-62.
23. PRO, C231/6 fo.11; C181/5 fos.503-04; D.L. 17/70-73; R. Somerville, Duchy of Lancaster, ii.37-47; VCH Midd., v.224; D.O. Pam, The Rude Multitude: Enfield and the Civil War, Edmonton Hundred Historical Society, Occasional Papers N.S. no.33(1977). See fn.9 above.
24. CJ, vi.134,247,306-07; CSPD 1649-50,338-39.
25. HRO, BHR Vol. 20 fos.369-70,381; PRO, C231/6 fo.360; C181/6 fos.221-22.
26. R.Steele,editor, Tudor and Stuart Proclamations 1485-1714(2 vols,Oxford,1910),i. no.3111; C.H. Firth, R.S. Rait,editors, Acts and Ordinances of the Interregnum (3 vols,London,1911), ii.1271-72; CJ, vii.658,687; 12 Car II, c.6; *ibid*, c.12. This last confirmed all decisions taken by Commissions of Sewers since May 1642.
27. PRO, C231/7 fo.218; C181/7 fos.223-25; D.L. 17/83; GLRO, Acc 1953, Deeds Register Book B nos.184,188.
28. Great Seal 12th April, Duchy seal 30th April: PRO, C231/7 fo.492; D.L. 17/84; GLRO, Acc 1953, Deeds Register Book B no.187.
29. L.K.J. Glassey, Politics and the Appointment of Justices of the Peace 1675-1720(Oxford,1979),32-62.
30. PRO, P.C. 2/69, 14 July 1681. The bargemen had petitioned the King in June, perhaps it was then that they were advised to approach the commissioners: PRO, S.P. 29/416 no.6.

31. In fact Clarges career prospered, but the others were dropped: Hist. Mss. Com., Finch, ii.43-46; Hist. Mss. Com., Eleventh Report, Appendix II, House of Lords MS. 1678-88,172-93; L.K.J. Glassey, Politics and the Appointment of Justices; J.R. Jones, 'Shaftesbury's "Worthy Men": A Whig View of the Parliament of 1679', Bulletin of the Institute of Historical Research, xxx(1957),232-41; S.N. A Catalogue of the Names of all his Majesties Justices of the Peace in Commission in the several counties of England and Wales according to the last alterations(London, 1680).
32. PRO, C231/8 fos.58,63; B.D. Henning, editor, History of Parliament: The Commons 1660-1690(3 vols, London, 1983),ii.506-09, iii.318. No Duchy seal found.
33. CSPD 1682,218; PRO, C225 Bundle 2 no.59A; NRO, WC244.
34. PRO, P.C. 2/70, 20 July 1683; C231/8 fo.89; D.L. 17/84.
35. PRO, P.C. 2/70, 24 October 1683; HRO, Hobday Papers, part.
36. Sir Francis North, Sir Leoline Jenkins and Sir Francis Pemberton were dropped, Jeffreys was brought in:PRO, C231/8 fo.140; GLRO, Acc 1953, Deeds Register Book B nos.A178,178; TWA, Box 86 no.84.
37. L.K.J. Glassey, Politics and the Appointment of Justices, 63-99; H. Horwitz, Parliament, Policy and Politics in the reign of William III(Manchester,1977),6-14; E.N. Williams, The Eighteenth-Century Constitution 1688-1815(Cambridge,1960),1-3.
38. PRO, C231/8 fo.336; C191/1 no.15; CLRO, Repertories, 98 fo.426.
39. PRO, C231/8 fo.345; C191/1 Nos.15,19; ERO, D/DSo M1. For a discussion of change in membership, see Chapter 11 fn.40.
40. PRO, C231/9 fo.477; C191/1 no.183; BL, Cup 600d.1(8).
41. PRO, C231/10 fo.223; C191/2 no.105; D.L. 17/90. It has not been established just why a Duchy seal was needed. What property did the Duchy own in Hertford at this date? They did hold the rights to the parish of St Andrews: .Sir Henry Chauncey, Historical Antiquities of Hertfordshire, i.512.
42. Enfield, 'River Lee, Book of Sewers in the Years 1719 & 1720'. This book had been left in an abandoned sewage works at Hertford. An officer of the Thames Water Authority found it and deposited with Enfield Library Services: private communication, 5/3/85, P.N. Turner, Borough of Enfield Librarian.

43. PRO, MPB 31; C225 Bundle 2 nos.5,59A; NRO, WC244; HRO, Hobday Papers, part; BL, Add. Mss. 33576 fo.63; TWA, Box 81 no.321; Box 86 no.20.
44. Trustees, 3 August 1741.
45. ERO, D/SH 1-2; S. Webb, B. Webb, Statutory Bodies for Special Purposes, 13-106.
46. 23 Hen. VIII, c.5; 13 Eliz., c.9; HRO, B193; BL, 883 h.16, The Law of Sewers(London,1732).
47. PRO, C181/2 fos.48,94; C181/3 fos.91-92,128; C181/5 fos.40-41,503-04; D.L. 17/54; D.L. 17/83-84; C191/1 nos.15,19; BL, Cup 600d 1(8); GLRO, Acc 1953, Deeds Register Book B no.178
48. PRO, C225 Bundle 2 no.5; TWA, Box 81 no.321.
49. R. Somerville, Office-Holders in the Duchy and County Palatine of Lancaster from 1603(London,1972).
50. A.B. Beaven , The Aldermen of the City of London (2 vols,London,1908-13).
51. B. Rudden, The New River, passim.
52. PRO, S.P. 15/37 no.104; C181/2 fos.48,94.
53. CLRO, Repertories 98 fo.426; PRO, C191/1 nos.15,19.
54. ERO, D/DSo M1.
55. PRO, C225 Bundle 2 no.59A; NRO, WC244; Enfield, Court of Sewers, 23 September 1719.
56. ERO, D/DSo M1.
57. Enfield, Court of Sewers, 6 November 1719.
58. PRO, C225 Bundle 2 no.59A; NRO, WC244.
59. PRO, P.C. 2/60, 16 October 1667, 29 July 1668; C225 Bundle 2 no.5; CLRO, Repertories 100 fo.71; Court of Aldermen, Records and Papers 1696; BL, L.R. 33 d 27, Extracts from the Books of the Mayor and Aldermen of Hertford together with Copies of Papers in their Custody relating to the Navigation on the River Lea between Hertford and Ware(London,1734),21.
60. HRO, B193.
61. Enfield, 'River Lee, Book of Sewers in the Years 1719 & 1720'.
62. PRO, E137/28/15; E137/29/1-2.
63. W.B.B. Marcham,editor, Tottenham Court Rolls,25; GLRO, Acc 695/42; PRO, C10 368/3.

64. W.J. Hardy, W. le Hardy, editors, Hertford County Records (10 vols, Hertford, 1905-57), v.420.
65. HRO, B193.
66. PRO, C10 368/3.
67. CLRO, Repertories 98 fo.405.

CHAPTER TEN

1. HRO, BHR Vol 5 fos.86-106; Vol 20 fo.323; Vol 39 fos.1-2.
2. Figure 6: Bodl. Gough, Hertford Papers, 1(12); Figure 7: HRO, BHR Vol. 39 fo.192.
3. HRO, BHR Vol 20 fos.123-24,135,138,142,144,172-74, 194-95,208,322-24,31. See also Chapter 9 fn. 9. The Hertford historian, R.T. Andrews, makes the following comments about rights along the river:-'If we consulted the Grant to the Corporation(1627)...without looking to the Survey(1621) we might suppose that that part of the River Lea...were conveyed by that Grant to the Corporation; but when we look to the Survey and to the Grant to the Earl of Salisbury(1630) it would seem that no part of the River Lea was conveyed to the Corporation but that it was granted to the Earl'. However 'It is probable that both the Corporation & the Inhabitants considered that that part of the River...became the property of the Corporation under the Grant. It is evident it was felt by all that it was to the advantage & convenience of the Borough that it should be so & that the Corporation, with the concurrence of the Inhabitants, acted as though it were so': HRO, BHR Vol 4 fos.90,341.
4. Early history of the New River has been told by the following, but none have dealt in detail with the effects of the scheme on the Lea: B. Rudden, The New River; J.W. Gough, Sir Hugh Myddelton: Entrepreneur and Engineer (Oxford, 1964); G.C. Berry, 'Sir Hugh Myddelton and the New River', Transactions of the Honourable Society of Cymmrodorion for 1956, 17-46.
5. Hatfield House, CP 184.50. Signature is E. Colthurst not J. Colthurst as calendared: Hist. Mss. Com., 12, Salisbury, p.243.
6. Bodl., Tanner MS. 98 fos.48,49,113.
7. TWA, Box 79 no.17; GLRO, Acc 1953, Deeds Register Book B no.185; CSPD 1603-10, 93.
8. CJ, i.261,262,265,309-13; 3 Jas. 1, c.18.

9. PRO, S.P. 14/78 no.106(catalogued as 1614?:CSPD 1611-18,266). Another copy: Bodl., Tanner MS. 98 fo.49. In 1610 a bill to repeal the New River legislation was before Parliament, these documents must have been submitted then: CJ, i.429,442,444, 445,450.
10. PRO, L.R. 2/28, 19 March 1614.
11. Ibid, 2/29, 17 June 1615.
12. PRO, C66/2180; C231/4 fo.141; L.R. 2/31, 5 September 1618; L.R. 2/32, 5 December 1618.
13. PRO, L.R. 2/31, 10 October 1618.
14. GLRO, Acc 1953, Deeds Register, Book C no.306.
15. PRO, L.R. 2/32, 17 June 1620.
16. Ibid, 2 December 1620, 16 December 1620; APC 1619-21, 8. See also 11.1.
17. HRO, BHR Vol 20 fos.238,246.
18. Ibid, fos.246,253,258,259-62,265,283,290-91,298-99, 305-06,313-14,335-37: ibid, Vol 39 fo.1.
19. Fanshawe had mortgaged the manor of Ware and other properties to meet a series of debts, including one of £1560 to Oliver Butler(Boteler), the son of Fanshawe's brother-in-law, Sir William Boteler. Sir William died fighting for the King, Oliver fought for parliament: CJ, ii.760; CJ, iii.149,355; Cal. Cttee for Compounding,1864; CSPD 1644,305,375,468; CSPD Addenda 1625-49,668; PRO, C7 47/42; BL, Add. Mss. 27979; HRO, 70612,82949,82951; DNB; H.C. Fanshawe, editor, The Memoirs of Lady Ann Fanshawe 1600-1672 (London,1907),293-305.
20. HRO, BHR Vol 39 fo.2.
21. Ibid, Vol 20 fos.369-70.
22. Ibid. Members of committee:- Joseph Dalton,mayor(died 1658); Isaac Puller; Thomas Hawes; Captain William Minors; Edward Lawrence,senior(died March 1658); William Gardiner; John Clarke,committee treasurer; Joseph Bunker; Adlard Bowde; John King; John Pritchard. Those underlined refused oath of allegiance after Restoration.
23. Ibid, fo.370.

24. Ibid, fos.374,376. Sums lent were:- William Gardiner, mayor £3; Capt Mynors, 'hee give 20/- rather than faile' £2; Mr Turnor £1; Mr Clarke £1; Mr Buncker £1 10s; Mr John Hyde £1 10/-; John Prichard £1; John King £1; John Heller 10/-; Geo Seelye £1; Geo Peach 6/-; Adlard Bowde £1; Edward Norris 10/-; John Field 10/-; William Carter £1; Henry Browne 5/-. In addition to those noted in fn.22, Turnor and Carter were also to refuse the oath of allegiance in 1662.
25. Ibid, fos.380,388,392,396-98.
26. Ibid, fos.383,385,386,388,392,396-98.
27. Ibid, fos.401,403-06. £10 raised by borrowing £1 from each of the following:- William Turnor, Mr. Gardiner, Mr Clarke, Mr Bunker, Mr Mason, Mr Bowde, John King, William Carter, Abraham Rutt, Coronett Thomas. These sources state that it was the middle turnpike which was damaged, but it was Hertford lower turnpike which suffered. There are several references to three turnpikes, the two turnpikes at Hertford and one other, which could be either the private fishing weir, Constants Weir, or the pound lock at Ware Mills
28. Ibid, fos.394,395,396-98.
29. Ibid, Vol 39 fo.21.
30. PRO, P.C. 2/60, 16 October 1667. A document dated c.1739 cites 15" and 9": BL, SPR L23 c6(37).
31. HRO, BHR Vol 20 fos.396-98.
32. Ibid, fos.381,393.
33. Ibid, fos.396-98.
34. Ibid, fos.395,396-98,406,412,414,419,429-30,434-35, 439-40,445-46,450-51,454-55,461-62,467-68,471-72,512, 528; ibid, Vol 48 fo.41.
35. Ibid, Vol 20 fos.401,498.
36. Rutt was a Quaker ironmonger, King a Quaker grocer. Both issued their own farthing coins: G.C. Williamson, editor, TradeTokens issued in the Seventeenth Century (2 vols, New York, 1970), i.314-15; V.A. Rowe, The First Hertford Quakers(Hertford, 1970), 53, 55; HRO, BHR Vol 20 fo.394; ERO, D/EAS 2081; PRO, PROB 4/13271; PROB 11/357(65). That Pryor was most probably the miller is based on fact that in 1663 Andrews(owner of Dicker Mill) and Pryor were paid £1 5/- for repairing the turnpikes. In addition Pryor was a common name amongst local millers:HRO, BHR Vol 20 fos.429-30.

37. HRO, Vol 20 fo.427. Harvey was a woolcomber who became a freeman in 1665. In 1657 he had been responsible for taking care of the key to Cow Bridge, and in 1689 he and his son leased the Borough's fishing rights: Ibid, fos.391,435,601; Ibid, Vol 39 fo.3.
38. HRO, BHR Vol 20 fos.427,429-30; ibid, Vol 39 fo.3.
39. HRO, BHR Vol 20 fo.418; see fn.22 and 24 above.
41. Ibid, fo.441.
42. Ibid, fos.445-46; HRO, A2575.
43. PRO, P.C. 2/59, 11 September 1667.
44. Ibid, 18 September 1667; P.C. 2/60, 16 October 1667.
45. Ibid, 16 October 1667.
46. Ibid.
47. Ibid, 29 July 1668.
48. Ibid, 28 August 1669; BL, L.R. 33 d 27, Extracts... relating to...the River Lea between Hertford and Ware, 21.
49. PRO, P.C. 2/61, 5 April 1669, 7 April 1669, 5 May 1669, 19 May 1669, 16 June 1669; C10 165/81; C10 168/95; HRO, BHR Vol 39 fos.12-20; GLRO, Acc 1953, Deeds Register Book C no.306: B. Rudden, The New River, 106-07.
50. PRO, P.C. 2/61, 28 August 1669.
51. Ibid, 22 September 1669; P.C. 2/62, 1 December 1669; PRO, C225 Bundle 2 no.5A; S.P. 29/268 no.79; GLRO, Acc 1953, Deeds Register Book C no.268; TWA, Box 86 no.20.
52. PRO, P.C. 2/62, 17 November 1669; 24 November 1669; 1 December 1669, 8 December 1669; 15 December 1669; 21 December 1669; W.J. Hardy, W. le Hardy, editors, Hertford County Records, i.215-16.
53. HRO, BHR Vol 20 fo.458; Vol 39 fo.21.
54. Ibid, Vol 20 fo.458; BL, Add Mss. 27979; B.D. Henning, editor, The Commons 1660-1690, i.758-59. G.E. Cokayne, Complete Peerage (14 vols, London, 1910-59), v.255-56.
55. CLRO, Repertories, 75 fos.16,86; PRO, P.C. 2/62, 25 February 1670.
56. TWA, Box 86, Robert Mylne's Commonplace Book. The original report has not been found, but Mylne made a copy of it the following century, and this has survived.

57. PRO, ASS 35/111/1; W.J. Hardy, W. le Hardy, editors, Hertford County Records, i.222.
58. Guildhall Library, MS. 4883; TWA, Box 81 no.321; Box 81, Red Box, part; GLRO, Acc 1953, Deeds Register Book C no.306.
59. PRO, P.C. 2/61, 22 September 1669; P.C. 2/62, 25 February 1670.
60. Several conduits were destroyed, as was London Bridge Waterworks. Some conduits were not rebuilt, and the restoration of the waterworks at London Bridge were treated as a priority: T.F. Reddaway, The Rebuilding of London after the Great Fire(London,1940), 98-99,282-8:
61. This 11/- presumably included the 10/- due from the miller at Dicker Mill that had been agreed in 1658: HRO, BHR, Vol 20 fos.461,466.
62. HRO, BHR, Vol 39 fo.31.
63. Ibid, fo.22.
64. Ibid, Vol 20 fos.488,502,504,511,528; ibid, Vol 48 fos.43,45,47.
65. In 1700 a Thomas Webb married Mary Martin, daughter of Richard Martin. It is possible that this was the son of the collector: HRO, Q83 fo.157.
66. HRO, BHR Vol 20 fo.528. Quakers:- Richard Martin, Henry Stout, Nicholas Lucas, Richard Thomas. Burgesses:- Edward Lawrence, Benjamin Jones.
67. Ibid, fo.540. Guise was a leading congregationalist: W. Urwick, Nonconformity in Hertfordshire(London, 1884),539,542-43.
68. HRO, BHR Vol 20 fo.565; Vol 48 fo.54.
69. In November 1680 Hertford obtained a new charter. This charter meant the appearance of aldermen in place of burgesses: Sir Henry Chauncey, Historical Antiquities of Hertfordshire, i.500-503.
70. HRO, BHR Vol 20 fos.545,564,577,583-84; Vol 48 fo.56.
71. V.A. Rowe, The First Hertford Quakers; D. Ogg, England in the Reign of Charles II(Oxford,1984 paperback ed), 354-55,365-68; W.C. Braithwaite, The Second Period of Quakerism(York,1979 ed),55-115; N. Penney, editor, Extracts from State Papers relating to Friends 1654 to 1672(London,1913),347.
72. HRO, BHR Vol 20 fos.621,622-23,626.

73. Ibid, Vol 21 fos.8-9,28-29; Vol 39 fos.23-39. The fishing rights were not included in the final lease.
74. Ibid, Vol 21 fo.94; Vol 39 fos.32-41.
75. Ibid, Vol 33 fos.56-58; Vol 36 fos.581-85; Vol 39 fos.23-29.
76. Ibid, Vol 39 fo.21; HRO, 38056.
77. Ibid, Vol 39 fos.22,31.
78. Ibid, Vol 20 fo.490; B.D. Henning, editor, The Commons 1660-1690, i.758-59.
79. HRO, BHR Vol 20 fos.508-10; Vol 48 fo.47.
80. Ibid, Vol 21 fo.49.
81. BL, L.R. 33 d 27, Extracts...relating to...the River Lea between Hertford and Ware,10-11.
82. TWA, Box 81 no.354.
83. John Theophilus Desaguliers was the son of a protestant refugee, who left France after the Revocation of the Edict of Nantes in 1685. He was a member of the Royal Society, and was known for giving lectures on science to a general audience. He held a living in Essex, and was a prominent freemason. In 1720 he obtained a patent for an invention for the application of steam to various manufacturing processes, such as drying malt and distilling. He also made an improved engine for raising water, and was known as a leading expert on the measurement of water flow: DNB; C. Vallancey, A Treatise on Inland Navigation(Dublin,1763),127.
84. CJ, xxiii.99,294-95. For a discussion of the methods he used to measure the flow of water: J.T. Desaguliers, A Course of Experimental Philosophy(2 vols,London, 1744-45), ii.419.
85. GLRO, 0/400/4; HRO, A2575.
86. PRO, P.C. 2/69, 14 July 1681.
87. H.W. Dickinson, Water Supply of Greater London(London, 1954),38.
88. HRO, A2575.
89. CJ, xix.587. see also Chapter 11 fn.66.
90. N. Salmon, The History of Hertfordshire(London,1728), 2.

91. Henry Stout: a leading Hertford Quaker, whose second wife, Mary Saunders, had been in attendance on Cromwell's wife. He became a freeman of Hertford in 1658 'to trade in Malt & Coles'. In 1670s was closely involved in efforts to preserve the navigation above Ware, but did not contribute towards it's initial improvement in 1650s. On his death in 1695 left his business estate, including barges, to his daughter Sarah, having already made provision for his sons. Her death in 1699 was the subject of a famous murder trial. Richard Thomas: A Quaker who had fought against Charles, and was imprisoned during Monmouth's rebellion in 1685 as he was regarded as a disaffected person. Imprisoned on several other occasions for non-payment of tythes. Was probably the coronett Thomas who lent money to improve the river above Ware in 1658. He jointly owned a barge with Thomas Burr, a Ware Quaker. William Coxe: a maltster who was based at the Castle Inn, Hertford, at least between 1668 and 1672. Mr Wilson probably William Wilson of Ware, described as a bargemaster in his will of 1684. Left all his property to his son William, who on his death left a half share in one barge to his widow, Sarah. Thomas Burr: a prominent Ware Quaker, who married the daughter of Richard Martin, a Hertford Quaker. Jointly owned a barge with Richard Thomas a Hertford Quaker. His brother William was also a maltster, became a bankrupt during the 1690s. John Perrot(Parratt): a Ware maltster who owned the Crown Inn between 1667 and 1688, and had a half share in the Talbot Inn at Great Amwell after 1682: V.A. Rowe, The First Hertford Quakers, 53-54. HRO, BHR Vol 20, fos.393,448,474; Vol 48 fos.42,47; ERO, 442 BR 11; 342 BR 14; GLRO, 0/463/3; HRO, D/E 4529; 25411.

CHAPTER 11

1. Hatfield House, CP Petitions. Undated, but Shakerley and Stapleford took out a 21 year lease on the mills in 1601. In 1607 Shakerley was described as the miller at Cheshunt: Hatfield House, Deeds 163/4; HRO, 10909; J.S. Cockburn, editor, Calendar of Assize Records, Hertfordshire Indictments, James I(London,1978),192.
2. J.S. Cockburn, editor, Calendar of Assize Records, Hertfordshire Indictments, James I,208.
3. W.H. Overall, H.C. Overall, editors, Analytical Index to...Remembrancia,382.
4. PRO, S.P. 14/35 no.60.
5. Ibid, 14/148 no.21.

6. CSPD 1603-10,150,158,412,501; CSPD 1611-18, 76;
PRO, S.P. 14/6 no.61; ibid, 14/9 nos.38,41; ibid,
14/35 no.30; ibid, 14/43 no.86; Hist. Mss. Com.,
16, Salisbury, p.446; ibid, 19, Salisbury, pp.183,
423.
7. APC, 1619-21,8.
8. PRO, P.C. 2/41, 26 October 1631.
9. PRO, MPB 31(formerly Exchequer 178/4965). Catalogued as temp Jas 1, but since reference is made to Earl of Norwich, the document must be dated as being between 1626 when he was elevated and 1637 when he died. Only the first page of questions remain, the rest seem to be lost. These questions have nothing whatsoever to do with the map to which they have been attached, a 1573 canal scheme.
10. BL, Add Mss. 5505 fos.23-24. Abraham Hudson leased the corn mills at £80 a year. In February 1657 a new lease to the mills was taken out by Samuel Hudson at the same rent. Samuel held a lease to other mills in Waltham which he converted to gunpowder production in late 1664 or early 1665: K.R. Fairclough, 'Early Gunpowder Production at Waltham', Essex Journal, xx pt.1(1985),11-16(see back folder).
11. Hist. Mss. Com., 5th Rep, House of Lords MS., 86.
Carlisle owned corn mills and fulling mills in Waltham Abbey, Sewardstone Mills, Waltham Turnpike, and most probably fishing weirs along the river at Cheshunt, Waltham and Sewardstone.
12. Cal. Cttee for Compounding, ii.853; PRO, C181/5 fos.
503-04; C181/6 fos.221-22.
13. PRO, P.C. 2/59, 4 May 1666. It has not been discovered when Clayton took over the lease to Waltham Turnpike, nor whether he had any interest in Waltham Abbey Corn Mills. When he died in 1684 he was described as a gentleman, see fn.34 below.
14. PRO, P.C. 2/60, 16 October 1667; P.C. 2/66, 2 August 1678; S.P, 29/416 no.6.
15. CSPD 1652-53,391,399;
16. Hatfield House, CP 166/47; HRO, BHR Vol 39 fo.1.
- 16A. PRO, P.C. 2/60, 16 October 1667.
17. PRO, WO 47/19A fos.286,287,301,317; WO 47/7 fo.49. Thomas and John Worrill(Worrall) signed their first contract with the Ordnance Board, but by April 1669 were in severe debt to the King, and ceased to be suppliers.
18. PRO, P.C. 2/59, 4 May 1666.

19. Ibid. The seven named are: Samuel Goodwin(unidentified); Johnathan Ward(unidentified, but in 1640 he may have been the miller at Hoddesdon); John Page(fisherman at Dobbs Weir and Archers Weir); William Harlow(possibly the miller at Broxbourne Mills); William Beacham(fisherman, possibly at Kings Weir); John Martin(miller at Cheshunt Mills); William Munt(probably William Moulton of Waltham?): W.J. Hardy, W. le Hardy, editors, Hertford County Records, v.286; vi.109; ERO, D/DB T74; D/DC 27/360; HRO, BR 8/418; PRO, C6 263/25; C8 265/2.
20. K.R. Fairclough, *Essex Journal*, 1985.
21. PRO, P.C. 2/59, 18 May 1666; P.C. 2/60, 16 October 1667.
22. see fn.14 above.
23. PRO, P.C. 2/60, 16 October 1667.
24. PRO, S.P. 29/416 no.6.
25. TWA, Box 86, Robert Mylne's *Commonplace Book*.
26. Anchitell Grey, Debates of the House of Commons, 1667-94(10 vols, London, 1769), ii.377-80.
27. PRO, P.C. 2/66, 2 August 1678. William Moulton took out a 12 year lease on Waltham Turnpike from Carlisle's widow, the Countess of Manchester, in January 1670 for £130 a year. In 1674 he relinquished it, and took out a new one on the same terms for 21 years. He was buried at Waltham in July 1681: NRO, Additional Wake Papers, 1965/129; ERO, T/R 36/2.
28. HRO, Hobday Papers, part.
29. PRO, C225 Bundle 2 no.59A; NRO, WC244.
30. James, Earl of Carlisle, left an annuity to his cousin William, Earl of Kinnoull. Financial problems meant that Carlisle's executors never paid this annuity, therefore in 1677 a Chancery settlement awarded Kinnoull certain properties in lieu of future payments of the annuity. These properties included Waltham Turnpike and Waltham Abbey Corn Mills. Before he could take possession, Kinnoull died in March 1677. These properties were bequeathed to his second son, William, who became Earl of Kinnoull in 1687 on the death of his elder brother. There were problems over his father's will, so it was not until 1679 that he entered his inherited property, and it was not until 1683 that any rent was obtained from either the mills or the turnpike: PRO, C10 368/3; PRO, PROB 11/353(33); G.E. Cokayne, editor, The Complete Peerage, vii.320-21.
31. PRO, P.C. 2/68, 23 February 1680.

32. PRO, S.P. 29/419 no.6.
33. PRO, C225 Bundle 2 no.59A; NRO, WC244.
34. PRO, C10 368/3; HRO, Hobday Papers, part. Clayton died in September 1686, leaving his share of the lease to the turnpike to his widow. He described himself as a gentleman in his will. This will mentioned local property such as a farm called Bowtels, 2 houses and unspecified parcels of land. Bequests included £20 to apprentice four parish boys and £10 to the poor of Waltham Abbey. Rows over his estate broke out between his widow and his son, Billedge:PRO, PROB 11/392(116); C10 231/13; C10 468/45.
35. PRO, P.C. 2/70, 20 July 1683.
36. Ibid, 24 October 1683.
37. HRO, Hobday Papers, part. It should be stressed that the record of this Commission of Sewers included in Hobday's papers is a copy, the original has not been traced. Perhaps 9/- is a copying error, there is no other reference to such a high toll ever being collected
38. ERO, D/DSO M1.
39. Ibid; ERO, D/DB M202; D/DU 804/6. North was the steward of the manor of Sewardstone, and a tenant at the two fishing weirs within the manor. He mentioned the weirs several times in letters he wrote to his employer. In 1684 he said that his first plans to repair the two weirs had been too optimistic, and that one weir needed to be completely rebuilt. In March 1685 he complained of damage caused by ice, and in September 1685 stated that repairs and rebuilding had cost him about £100. In 1695 and 1697 he mentioned problems in obtaining trees from the estate to repair the weirs, those trees earmarked had been stolen.
40. PRO, C191/1 nos.15,19. Those appointed in July but dropped in November were Thomas Freeman, Robert Fish, William Wright, Ralph Bucknall and William Calvert. Calvert and his son-in-law, Wright, had brewing interest: but special interests of other not presently discovered. Their replacements were Andrew Searle, William Scott, Thomas Winsford, John Greene, George Monson. The following commissioners possessed mills or fishing weirs along the river: Henry, Lord Coleraine(Tottenham); Sir William Maynard(Walthamstow); Sir Humphrey Gore (Nazeing); Sir Thomas Byde(Ware); William Savage (Temple Mills in Leyton).
41. Cal. Treas. Papers 1557-1696,219; Hist. Mss. Com., 29, Portland, p.339; G.E. Cokayne, Complete Peerage, vii.320-21.

42. T.S. Willan, River Navigation in England 1600-1750, 29-30; an act to restrain increasing tolls on the Thames: 6 & 7 Will. & Mary, c.16; an act empowering JPs to fix land carriage rates: 3 Will. & Mary, c.12. For a discussion of this act, T.S. Willan, 'The Justices of the Peace and the rate of land carriage', Journal of Transport History, v(1961-62),197-204;
43. BL, Add. Mss. 33576 fo.63.
44. PRO, C10 368/3.
45. E.M. Hunt, The History of Ware,20; W.G. Bell, The Great Plague of London in 1665(London,1951,2nd ed), 321. Bell makes no mention of such services in his first edition in 1924, but cites Hunt in the second edition. J. Boyes, R. Russell, The Canals of Eastern England,17; J.G.L. Burnby, M. Parker, The Navigation of the River Lea,12; The Times, Saturday Review, 8-14 June 1985,35.
46. 11 & 12 Will. III, c.21; Guildhall Library, Ms. 6375; *ibid*, Ms. 6287 Vols 1 & 2; private communication, R. Aspinall, Port of London Authority, 23/09/82.
47. CSPD 1667, April-October,268.
48. PRO, S.P. 29/137 nos.150,153; DNB; T.S. Willan, River Navigation in England 1600-1750,89. Latter mistakenly says it was the father who was consulted.
49. HRO, BHR Vol 48 fo.42(name given as R. Rumball); T. Sprat, A True Account and Declaration of the Horrid Conspiracy against the Late King, His Present Majesty, and the Government(London,1684),Copies of Information, p.44; T.B. Howell, T.J. Howell,editors, A Complete Collection of State Trials(34 vols,London,1816-28), xi.874-89.
50. ERO, D/DC 27/256-59,363-71; *ibid*, D/DQ 53/34; *ibid*, D/DU 99/23.
51. PRO, C7 124/25.
52. ERO, D/DU 63/5.
53. E.M. Gardner, The History of the Three Mills(London, 1957), 3 ; K.R. Fairclough, 'Hackney Waterworks', East London Record, viii(1985),7-21(see back folder).
54. Enfield, Court of Sewers, 23 September 1719, 7 October 1719, 15 October 1719. The commissioners fixed a toll of 1/- at the weir and decreed that it could be used for fishing 'only in darke nightes'.
55. CJ, xix.477-78.
56. Ibid, xxii.825-27.

57. See 11.5 and 16.5.
58. HRO, B193.
59. T.S. Ashton, Economic Fluctuations in England 1700-1800(Oxford,1959),17.
60. Enfield, Court of Sewers, 23 September 1719, 7 October 1719, 6 November 1719, 6 June 1720, 26 August 1720, 21 September 1720, 2 November 1720; TWA, Box 81 no.354.
61. Enfield, Court of Sewers, 23 September 1719, 7 October 1719, 15 October 1719, 6 November 1719, 6 June 1720, 21 September 1720; PRO, RAIL 845/53 Court of Sewers, 4 August 1740; TWA, Box 81 no.354.
62. HRO, B190; Enfield, Court of Sewers, 6 April 1720,
63. HRO, B190; Enfield, Court of Sewers, 23 September 1719, 7 October 1719, 15 October 1719, 21 September 1720; PRO, RAIL 845/53, Court of Sewers, 10 June 1741, 1 July 1741; TWA, Box 81 no.354.
64. HRO, B190; Enfield, Court of Sewers, 6 April 1720, 23 April 1720, 21 September 1720.
65. CJ, xix.477-78.
66. Ibid, 587. For details of these schemes to take water from the Colne,Gade, and Chesham rivers, and on one occasion from the Lea near Wheathampstead: F. Clifford, A History of Private Bill Legislation(2 vols,London, 1885-87), ii.85-90,94-98; CJ, xix.284,297,315,321-25.
67. CJ, xxii.825-27.
68. Those recompensed by the act were five Ware maltsters and barge-owners, John Docwra, Anthony Fage, Wayte Hampson, Humphrey Ives and Ambrose Procter, and two others who seem not to have had such trading interest, George Hathaway of Ware, gentleman, and a Thomas Fletcher,
John Docwra: Inherited much of a thriving malting and barge-owning business from his father, Thomas Docwra, in 1695. His father was a Quaker, but John seems to have left, for he was buried in the local churchyard at Ware in 1741. His younger brothers, Thomas and Joseph were still recorded as Quakers in 1719 and 1714 respectively. In 1699 John was named as one of only 13 Ware inhabitants who had freehold or copyhold property worth at least £10 a year. He was one of the bargemen involved in the Chancery dispute in 1707, acting as treasurer to the group. In 1719 he made complaints about problems near Enfield Mill, in 1721 took a close interest in rebuilding Bow Lock, writing a letter on his own initiative, and in 1736 he signed a petition about problems near Temple Mills Bridge. In 1725 he became a trustee of Cheshunt Turnpike and in 1733 a trustee of Wadesmill Turnpike: HRO, Q

82 fo.102; Q85 fos.66-67; HRO, D/P 116 1/4; HRO, T/P 1/1; TP 7/1; PRO, PROB 11/424(21); PRO, C124/25; CLRO, Repertories, 140 fo.386; CLRO, Court of Aldermen, Reports and Papers, July 1721; Enfield, Court of Sewers, 23 September 1719, 7 October 1719; W.J. Hardy, W. le Hardy, editors, Hertford County Records, ii.21. Anthony Fage: a Quaker, son of Thomas Fage of Ware, maltster, and nephew of Anthony Fage of Baldock, maltster. Remained a Quaker until his death, and was named as a trustee of Friends House at Ware in 1728 and 1750. Became a trustee and treasurer to Wadesmill Turnpike, relinquishing his duties only shortly before his death in 1758. His will, in which he described himself as a maltster, mentioned several properties in Great Amwell, Little Amwell, Hertford, Great Chishall and Little Chishall in Essex, as well as the White Horse Inn at Ware and maltshops nos. 6 & 7 on the Common Wharf at Ware. He also owned a malting at Stanstead until 1756. His will also included monetary bequests of over £2500: HRO, 54003, 54006; HRO, Q85 fos.66-67; HRO, 716/75837 fo.5; HRO, T/P 1/1; T/P 7/1; PRO, PROB 11/840(263). Wayte Hampson: a Quaker cheesemonger who moved from London to Ware in 1728. Named as a trustee of Friends House at Ware in 1728, and eventually became clerk of the Hertford meeting. He was engaged in the malting business with his father-in-law, George Haggar, and at various times was a tenant at a malting in Little Amwell, the George Inn at Ware. In 1732 he became a trustee of the Cheshunt Turnpike. Signed several petitions about the Lea in 1736, 1742 and 1743. By 1747 he had died, and some of his estate had passed to his son-in-law, Thomas Gripper, a Hertford woolstaper, who also owned barges: HRO, 54003; HRO, Q85 fos.4, 45, 66-67, 190; HRO, D/EB 898 T4; HRO, D/EX 145 T2; Guildhall Library, Ms. 11936/30 fo.605; *ibid*, 11936/31 fo.220; CLRO, MS. 18.14; CLRO, Repertories, 140 fo.386; CLRO, Court of Aldermen, Reports and Papers, 1742-43. Humphrey Ives: came from a family of bargemasters. In 1680 his grandfather, Humphrey Ives, bargemaster, was buried in Ware churchyard. His father, also Humphrey, was recorded as owning more than one barge in 1712, and one his death in 1721 left his business, including a malting at Ware, to Humphrey. Humphrey III became a trustee of Cheshunt Turnpike in 1733 and a trustee of Wadesmill turnpike the same year. Signed the same petitions about the Lea as did Wayte Hampson. On his death in 1752 left his estate to his nephew John Ives, after a bequest of £750 to his cousin Judith Fordham, of the local milling and mealman family, and 10 guineas to the local minister, Ebenezer Fletcher: HRO, D/P 116 29/8 fo.41; HRO, 71408-12; HRO, T/P 1/1; T/P 7/1; PRO, PROB 11/831(193); CLRO, BHC 1711. Ambrose Procter: a Ware maltster who died late 1746 or early 1747. His will mentioned Star Inn at Ware, several houses in Ware, farms at Standon and Thundridge, as well as monetary bequests of over £2500. In 1718 was a tenant at a Ware malting which was the property of Edward Hagger of Moorfields, distiller. He insured

several properties in Ware in 1720s, had problems in 1723 after one of his barges sank near London Bridge. In 1732 became a trustee of Cheshunt Turnpike and in 1733 a trustee of Wadesmill Turnpike. Two of his sons, George and Ambrose, continued his business, and in 1757 Ambrose became a trustee of the River Lea: HRO, T/P 1/1; T/P 7/1. Guildhall Library, MS. 11936/8 fo.317; *ibid*, 11936/13 fo.327; *ibid*, 11936/14 fo.36; PRO, PROB 11/752(49); Trustees, 23 November 1748, 26 December 1757; ERO, D/SH2, Court of Sewers, 14 October 1749; W.J. Hardy, W. le Hardy, editors, Hertford County Records, vii.192. George Hathaway; a Ware gentleman, living at a house known as Warners in Ware, who was appointed a Trustee of the river Lee in 1739 and was an active member until his death in late 1766 or early 1767. His will shows investment in real estate, government securities and bonds, but no involvement in malting. He never signed any petition about the navigation: PRO, PROB 11/926(53); PRO, RAIL 845/1-3, *passim*. Thomas Fletcher: Never signed any of the petitions about the river. Probably the local schoolmaster who provided mortgages for local residents : BL, Add Mss 27978 fos.128-29.

CHAPTER 12

1. P.E. Jones, 'Some Bridge House Properties', Journal of British Archaeological Association, Third Series, xvi(1953), 59-73; ERO, T/P 48/1, Extracts from Bridge House Records. In addition the aldermen considered purchasing St Thomas Mills in 1615: CLRO, Repertories, 32 fo.208.
2. CLRO, H.T. Riley, Charters and other Documents relating to the Rights of the City of London to Moteage Dues(private publication for use of City of London Corporation, 1865). During the Tudor period Lea bargemen had unsuccessfully argued that they should not pay such dues, which rose from $\frac{1}{2}$ d to 1d towards the end of the sixteenth century: CLRO, Repertories, 19 fos.15, 221, 236, 268, 281, 293, 298; *ibid*, 20 fos.48, 105, 320; *ibid*, 21 fos.19, 96, 129, 301, 430; *ibid*, 31(1) fo.189; W.H. Overall, H.C. Overall, editors, Analytical Index to...Remembrancia, 382.
3. Rotuli Parliamentorum(Rec. Comm.), iv.36.
4. J. Strype, A Survey of the City of London and Westminster(2 vols, London, 1720), i.32-39; R. Griffiths, An Essay to prove that the Jurisdiction and Conservancy of the River Thames is committed to the Lord Mayor and City of London(London, 1746).
5. PRO, C191/1 no.15.
6. CLRO, Repertories, 171 fos.199, 218; CJ, xxxi.201; 7 Geo. III, c.51.

7. R. Griffiths, An Essay...Conservancy of the River Thames, 55-56.
8. Harte, fos.169-73; BL, Add. Mss. 18783 fos.89-93.
9. BL, Lansdowne MS. 38 no.36.
10. BL, Maps, Crace Port. xvi(26).
11. BL. Maps, C7 cl; Maps, 2345(40); PRO, C2 James 1 538/69; GLRO, M/93/436; London Borough of Hackney Library Services, D/F/TYS 42 fos.81,338-39.
12. In 1343 Stephanie Asheday was tenant at Landemylnes. In 1431 a trench and weir at Old Ford served mills called 'Landemilles or Lunsmills'. In July 1566 Lord Wentworth sold a messuage called the Land Mills, and in October 1632 'One Capitall Messuage called ye Land Mills, barns and meadow' were sold for £600: Harte, fos.111,139; GLRO, M/93/436 fos.9-10.
13. PRO, E317 Essex no.18A.
14. CLRO, Repertories, 63 fo.89; ibid, 64 fo.130.
15. Ibid, 76 fo.101.
16. Within a few years Joseph Anger(Aunger) was dead. In his will, where he describes himself as a yeoman of Ware, he leaves Padlers Farm in Tharfield to his son, Joseph, makes monetary bequests to his daughters Mary Godfrey, Judith Dickenson and Anne Lewin, and makes their husbands(all Ware maltsters) and two Royston maltsters responsible for annuities to be paid by his son: ERO, 413 BR 10.
17. CLRO, Repertories, 81 fo.56.
18. Ibid, fos.96,196,259,297. Hopkins was awarded the right of making one person free of the City, and was himself taken on as one of the City's watermen as a reward for his work on this committee.
19. Ibid, fo.259; CLRO, BHC 1711, evidence of John Graves taken in 1713; ibid, Abstract of Mrs Key's writings.
20. CLRO, Repertories, 81 fo.336; 82 fos.7,43,197; 83 fo.196; 84 fos.106,112,115; CLRO, Misc Mss 160.14.
21. PRO, P.C. 2/65, 24 November 1676, 29 November 1676, 8 December 1676, 26 January 1677; CLRO, Repertories, 82 fos.24,26,35,55,78,197; 83 fos.196,263; Guildhall Library, MS. 13539.
22. C66(files for 1676-170); C191/1; C231/7-8.

23. CLRO, Repertories, 86 fos.154,158,163.
24. Ibid, 95 fos.175,176.
25. Ibid, 95 fos.190,197,216,338,351,355; 96 fos. 232, 233,258,269,458; 97 fos.100,163,252,307; 98 fo.337.
26. Ibid, 98 fos.405,426.
27. PRO, C191/1 no.15.
28. CLRO, Comptrollers Deeds 50 no.11; CLRO, Repertories, 100 fo.104; CLRO, City Lands Committee, Journals 8 fos.48,50,56,100-102,106,109; Guildhall Library, MS. 2194.
29. Charles Carlton, The Court of Orphans(Leicester,1974); J.R. Kellett, 'Some Late 17th century Schemes for the Improvement of the Corporation of London's Revenues', Guildhall Miscellany, i(9),27-34; J.R. Kellett, 'The Financial Crisis of the Corporation of London and the Orphans Act 1694', Guildhall Miscellany, ii(5),220-27; I.G. Doolittle, 'The City of London's Debt to the Orphans,1694-1767', Bulletin of Institute of Historical Research, lvi(1983),46-59.
30. PRO, C6 349/17.
31. Ibid; CLRO, Repertories, 105 fo.445.
32. PRO, PROB 11/477(169). In will he described himself as an esquire. Besides Temple Mills, the will mentioned houses in Golden Square and John Street in Clerkenwell, a house at Hackney, houses in Saffron Hill and Vine Street,Westminster, lands and osier grounds in Hackney, West Ham and Leyton, 'Chimicall preparacons' and drugs; Greek and Latin books, and one of Queen Elizabeth's coronation pieces.
33. CLRO, City Lands Committee, Journals 9 fos.161,163; ibid, 10 fos.178,192; ibid, 11 fo.49.
34. PRO, E112 1185/1140; E112 1183/1060.
35. J. Strype, Survey of London, i.47.
36. see Chapter 5 fn.30.
37. CLRO, Repertories, 105 fo.445; 112 fo.96; 114 fo.6; CLRO, Misc Mss. 167.9;
38. GLRO, 0/400/4.
39. Harte, fos.130-39,150; Hatfield House, CP 166/47; BL, Lansdowne MS. 32 no.34; CLRO, BHC 1711, evidence of bargemen; Enfield, The Report of John Smeaton, Engineer, upon the New-making and completing the Navigation of the River Lee...made 1766(another copy:Bodl., Gough Maps 17); TWA, East London Waterworks

Co. Minute Books, ix.fo.416.

40. CLRO, BHC 1711, pleas before King Edward III; ERO, T/P 48/1 fos.20-23; Harte, fos.130-41,150.
41. CLRO, Repertories, 17 fo.456; 18 fo.42. Committee met with Mistress Culverwell and 'Payne the mylne maker'. At this date Elizabeth Culverwell owned East Mill, one of the Four Mills:PRO, STAC 5 B88/34.
42. Hatfield House, CP 166/47.
43. BL, Lansdowne MS. 32 no.34. Exact quote:- '...at certeyn tymes the flud in the saide ryver is lower a great deale wthoute the locke, then at other tymes it is wch is at the nete Tydes whereby the boates passing betwene Ware and London cannot wthoute the openyng of Bowe locke make their passage'.
44. ERO, T/P 48/1, Court of Sewers, 21 May 1597, 12 April 1600.
45. Felix Barker, 'The Battle of the River Lea', London Evening News, May 4 1950; PRO, STAC 5 B88/34; STAC 5 B75/37; STAC 5 B41/21; STAC 5 B99/3; STAC 5 B95/15; STAC 5 B104/9; STAC 5 B108/34; STAC 5 B105/33; STAC 5 S42/29; STAC 5 S3/9; STAC 5 T1/39; PRO, E/310/13/42 fo.31.
46. CLRO, BHC 1711, evidence of John Graves.
47. Ibid, Petition from John Key and Elizabeth Joyce; ibid, The State of the Case of John Key and Thomas Hall; ERO, D/SH1, Court of Sewers, 9 September 1710.
48. CLRO, BHC 1711, evidence of bargemen.
49. Ibid, letter from George Sorocold; CLRO, Repertories, 125 fos.496,519,520,556; 126 fo.111; CLRO, Court of Aldermen Reports and Paper, September 1721.
50. Enfield, The Report of John Smeaton...upon...the River Lea; N. Beardmore, 'Description of the Navigation and Drainage Works recently executed on the tidal portion of the River Lee', Proceedings of the Institution of Civil Engineers, xiii(1855),245-51; GLRO, Acc 1016/713; 13 & 14 Vic., c.109.
51. Harte, fos.139-43; ERO, T/P 48/1, Court of Sewers, 26 September 1601; CLRO, BHC 1711, evidence of John Graves; ibid, The State of the Case of John Key and Thomas Hall; ERO, Court of Sewers, 9 September 1710.
52. ERO, T/P 48/1, Court of Sewers, 29 September 1627, 8 October 1627, 29 December 1627, 11 August 1628; CLRO, Bridge House Committee Order Book 1611-1714 fos.27,41-47; CLRO, Repertories, 40 fo.316; 41 fo.341.
53. PRO, RAIL 845/53, Court of Sewers, 21 April 1742.

54. For some brief details: R. Allison, 'The Changing Landscape of South-West Essex from 1600 to 1850' (unpublished Ph.D. thesis, Univ of London, 1958), 244-279.
55. In 1590 the 'little gryst mill', one of the Four Mills, had a wharf of its own and the miller also had the right to use a crane on a wharf at one of the other mills, 'the greate Mill'. In 1711 an inventory of the Four Mills noted 'Two Waggons and one Cart Eight old horses and a Mare hornbeams and Timber and a parcell of old Stuff on the Wharfe and some pieces of Oak one old Barge': PRO, Req 2 61/99; PRO, STAC 5 B99/3; London Borough of Tower Hamlets, Local History Collection, Deeds 3849.
56. Guildhall Library, MS. 13539,
57. ERO, D/SH1, Court of Sewers, 3 October 1691, 31 March 1692, 20 April 1693, 2 April 1694, 6 October 1699; ERO, D/DLo T59; CLRO, BHC 1711, Abstracts of Mrs Key's writings; GLRO, Acc 1449/1; PRO, E315, Vol.245 pt.2 fo.89; PRO, C8 625/54; PRO, SC 11/997 fo.21.
58. ERO, T/P 48/1, Court of Sewers, 28 March 1648, 5 April 1653, 8 October 1653.
59. Guildhall Library, MS. 13539.
60. CLRO, Repertories, 93 fos.61,117; CLRO, Bridge House Committee Order Book 1611-1741 fos.194,247-48.
61. When Moakes died in August 1738, it was of sufficient interest for Boyer to report, with the comment that this 'eminent Malt-factor' had left an estate worth £15000 to his son-in-law 'Dr Wolly of Hertford'. In fact Moakes left his estate to Trustees to provide an annuity to his widow and some immediate bequests of £500 to three grandchildren. After his widow's death his estate was to pass to his grandson, William Waller: PRO, PROB 11/691(201); A. Boyer, The Political State of Great Britain (60 vols, London, 1711-40), lvi.186.
62. CLRO, Repertories, 137 fos.384,420; 138 fo.81; 139 fo.259; PRO, E112 1185/1140; E112 1183/1060.
63. Guildhall Library, MS. 13539; BL, Add. Mss. 33576 fo.63.
64. CLRO, Cocket Duties, Cargoes passed East and West 1676-78; *ibid*, Accounts of duty on fruit, malt, salt and passage of grain and coals, 29 October 1705-28 October 1706. Hereafter both termed 'Cocket dues'
65. ERO, D/SH1, Court of Sewers, 6 April 1695.
66. *Ibid*, 9 April 1695.

67. Bathurst's son, Allen, was married to Katherine, daughter of Sir Peter Apsley. Apsley had left the Three Mills to his eldest son, Peter, and Katherine had inherited them on Peter's death: Hampshire RO, Mildmay 10M69.T191; ERO, D/DLc T36; G.E. Cokayne, The Complete Peerage, ii.28-29.
68. ERO, D/SH1, Court of Sewers, 12 October 1695, 2 November 1695.
69. Ibid, 5 April 1701, 10 May 1701, 16 August 1701; CLRO, Repertories, 105 fo.384.
70. CLRO, BHC 1711, The State of the Case of John Key and Thomas Hall.
71. Ibid; *ibid*, The Case concerning the Tumbling Bay; CLRO, Repertories, 113 fo.449; 114 fos.86,148,232, 250,271.
72. ERO, D/SH1, Court of Sewers, 9 September 1710.
73. CLRO, Repertories, 114 fo.323.
74. CLRO, BHC 1711, evidence of Charles Duncombe and others.
75. George Godfrey had taken over the lease from Abigail Cowden in February 1702 and was to purchase the Four Mills in July 1712: London Borough of Tower Hamlets, Local History Collection, Deeds 3850-51; GLRO, MDR 1714/2/109.
76. CLRO, BHC 1711, The State of the Case of John Key and Thomas Hall; *ibid*, The Case of John Key and Thomas Hall; *ibid*, affidavit of George Godfrey; ERO, Calendar of County Records and Sessions Records 1699-1714, nos.546/7-10.
77. CLRO, BHC 1711, petition of John Keys.
78. Mrs Joyce had inherited a lease to Saynes Mill on her husband's death in 1686. This lease expired in 1689, when she renewed it for 21 years at £50 a year, paying a fine of £400. In 1692 she obtained an additional 10 years to this term. By May 1710 she was £200 in arrears with her rent, and a judgement of ejection had been obtained against her. All her goods were siezed, she ended up in the Fleet, and was never to recover her lease: CLRO, BHC 1711, petition of Elizabeth Joyce; CLRO, Bridge House Committee Journals, 3 fos.90,95; 4, fos.223,237,238; ERO, T/P 48/1, copy of original deeds 285/10.
79. CLRO, Repertories, 115 fos.377-78; CLRO, Bridge House Committee Journals, 4 fo.242.
80. CLRO, BHC 1711, a Method of Improving the Navigation; CLRO, Common Council Journals, 55 fos.318-19.

81. CLRO, BHC 1711, evidence of bargemen.
82. Ibid, Bridge House report to Lord Mayor; *ibid*, order of Common Council May 1712; CLRO, Common Council Journals, 55 fos.318-19; CLRO, Bridge House Committee Journals, 4 fo.261; ERO, D/SH1, Court of Sewers, 30 August 1712.
83. CLRO, BHC 1711, legal opinion.
84. ERO, D/SH1, Court of Sewers, 30 August 1712.
85. Modern Reports.10, Case 87 Queen v. Inhabitants of West Ham.
86. CLRO, BHC 1711, legal opinion; CLRO, Bridge House Committee Journals, 4 fo.310.
87. CLRO, Bridge House Committee Journals, 4 fos.275-78, 280,331,334; 5 fos.105,112,114,117,119,120,123,125, 127,129,132,133-36,141; PRO, C7 110/112; ERO, T/P 48/3, part; Hampshire RO, Mildmay 10M69 T191.

CHAPTER THIRTEEN

1. Trustees, 14 November 1749.
2. PRO, P.C. 2/59, 4 May 1666; P.C. 2/70, 20 July 1683; PRO, C7 124/25; CJ, xix.477; CJ, xxii.826; Enfield, 'River Lee, Book of Sewers in the Years 1719 & 1720'; HRO, B190; Trustees, 5 August 1751.
3. HRO, B1110.
4. Enfield, Court of Sewers, 23 September 1719.
5. CJ, xxxi.308.
6. TWA, Box 81 no.354.
7. A. Boyer, The Political State of Great Britain, xlvi.242.
8. J. Houghton, A Collection for Improvement of Husbandry and Trade(4 vols,London,1728),22 April 1698.
9. T.B. Howell, T.J. Howell,editors, State Trials, xiii.1116.
10. PRO, RAIL 845/53, Court of Sewers, 14 September 1743.
11. BL, Add. Mss. 5505 fos.23-24.
12. TWA, Box 86, Robert Mylne's Commonplace Book.

13. PRO, S.P. 29/416 no.6; HRO, Hobday Papers, part.
14. J. Houghton, Collection for Improvement, 22 April 1698.
15. CLRO, Repertories, 98 fo.426.
16. TWA, Box 86, Robert Mylne's Commonplace Book; HRO, Hobday Papers, part; J. Houghton, Collection for Improvement, 22 April 1698
17. Lincolns Inn Library, MP 103 fo.241.
18. BL, SPR L23 c6(37); CJ, xxii.788; BL, L.R. 33 d 27, Extracts...relating to...the River Lea between Hertford and Ware, 28-29; N. Salmon, History of Hertfordshire, 2; D. Defoe, A Tour Thro the Whole Island of Great Britain(4 vols, London, 3rd ed, 1742), ii.198-99; W. Ellis, The Practical Farmer(London, 1732 ed), 27.
19. N. Salmon, History of Hertfordshire, 2; PRO, P.C. 2/66, 2 August 1678.
20. K.R. Fairclough, Essex Journal, 1985.
21. NRO, BH(K) 783; Lincolns Inn Library, MP 102 fo.174.
22. PRO, WO 47/19B, 24 September 1674.
23. CJ, xxxi.308-11.
24. Enfield, Court of Sewers, 23 September 1719, 23 April 1720, 6 June 1720.
25. ERO, D/DU 158/1; Lincolns Inn Library, MP 103 fo.241; CLRO, Repertories, 147 fo.195; CLRO, 'Cocket dues'; Enfield, Court of Sewers, 23 April 1720; N. Salmon, History of Hertfordshire, 246.
26. P. Mathias, The Brewing Industry in England 1700-1830(Cambridge, 1959), 412-13.
27. CLRO, 'Cocket dues'.
28. Ibid; CJ, xxiii.166; Lincolns Inn Library, MP 102 fo.74; MP 103 fo.241; HRO, BHR Vol 20 fos.518-19; T. Sprat, True Account of the Horrid Conspiracy, Copies of Information, p.44.
29. CLRO, 'Cocket dues'; Lincolns Inn Library, MP 102 fo.174; PRO, E112 1185/1140; E112 1183/1060; Guildhall Library, MS 13539.
30. J. Thirsk, 'The Farming Regions of England' in J. Thirsk, editor, The Agrarian History of England and Wales 1500-1640(Cambridge, 1967), 52. References cited therein do not prove that such materials were carried upstream.

31. HRO, Hobday Papers, part; Enfield, Court of Sewers, 23 April 1720; J. Houghton, Collection for Improvement, 28 February 1695/6.
32. T.S. Willan, River Navigation in England 1600-1750, 86-95; A.W. Skempton, 'Engineering on the English River Navigations to 1760' in M. Baldwin, A. Burton, editors, Canals: A New Look(Chichester,1984),23-44.
33. P.D. Dunn, Appropriate Technology, Technology with a Human Face(London,1978).
34. P. Mathias, Brewing Industry,445-56; P.I. Champion, 'The Lea Navigation 1767-1867'(unpublished Ph.D. thesis, London School of Economics,1978),83-84.
35. J. Houghton, Collection for Improvement, 22 April 1698.
36. PRO, P.C. 2/60, 16 October 1667; TWA, Box 86, Robert Mylne's Commonplace Book; CLRO, BHC 1711, letter from George Sorocold.
37. For instance the names of several Ware and Hertford maltsters with interests in the Lea are to be found in the lists of Trustees of local road turnpikes: HRO, TP 1/1; TP 7/1; TP 8/1; see also Chapter 10 fn. 68.
38. A. Yarranton, England's Improvement by Sea and Land (2 vols,London,1677-81), i.177.
39. TWA, Box 86, Robert Mylne's Commonplace Book.
40. CLRO, BHC 1711, letter from George Sorocold. For details of Sorocold's work in water supply and on the navigation of the Derwent: F. Williamson, 'George Sorocold of Derby:A Pioneer of Water Supply',Derbyshire Archaeological and Natural History Society Journal, Ivii(1936),43-93; F. Williamson, W. Crump, 'Sorocold's Waterworks at Leeds', Thoresby Miscellanea, xi pt.2 (1941),166-82; H.W. Dickinson, Water Supply of London, 38; C. Hadfield, The Canals of Yorkshire and North-East England(2 vols,Newton Abbot,1972-73), i.96-100. Of Sorocold's work along the Cam, nothing seems to be known besides what he wrote in the above letter. He said he had made 5 locks with a pen of 4' or 5' each rather than 2 of 8' as first suggested. Claimed that his work a success, 'ye Boates used to waite for Flashes ere 15 or 20 dayes whereas they now pass & repass at exact houres like those in Holland'.
41. CLRO, Repertories, 125 fos.171,173,254; CLRO, Court of Aldermen, Reports and Papers, 1721; CLRO, Committee of City Lands, Journals 16 fo.187; Guildhall Library, MS. 13533; MS. 13539; PRO, C8 625/54; ERO, D/SH1, Court of Sewers, 20 April 1693, 23 September 1693, 6 October 1705, 30 April 1709; J.A. Sharpe, editor,

"William Holcroft His Booke": Local office-holding in late Stuart Essex (Essex Record Office Publications no. 90, 1986), 30.

CHAPTER FOURTEEN

1. HRO, BHR Vol 21 fo.133.
2. Ibid, fo.134 and unfoliated page between folios 134 and 135. Byde died of the gout on Sunday 6 February 1732: London Evening Post, 10-12 February 1732.
3. HRO, BHR Vol 21 fo.136.
4. R. Seymour, A Survey of the Cities of London and Westminster, Borough of Southwark and Parts adjacent (2 vols, London, 1734), i.26.
5. BL, L.R. 33 d 27, Extracts...relating to...the River Lea between Hertford and Ware, 28-29.
6. Ibid, 25-28. Advice was asked about whether the Company could be restricted to those amounts of water allowed by September 1669 decision, whether the Company's turnpike in Manifold Ditch could be removed so that barges could use this route once more, and whether the new route opened in 1658 was legal.
7. HRO, A2575. This document is a later copy deposited at Hertford in 1946 by Major F.C. Giles-Puller. The original has not been traced.
8. Lincolns Inn Library, MP 102 fo.174.
9. HRO, BHR Vol 21 fos.137,139,147.
10. Ibid, fos.139,301.
11. Ibid, fo.141; ibid, Vol 39 fos.32-41; K.R. Fairclough, East London Record, 1985.
12. HRO, BHR Vol 21 fo.142.
13. Ibid, Vol 39 fos.61-62.
14. PRO, C231/10 fo.223; C191/2 no.105; PRO, DL 17/90.
15. Joshua Gillman came from a Quaker barge-owning family. In 1724 he was recorded as a distiller, in 1732 as a maltster and distiller, and in his will proved December 1738 a 'Dealer in Malt Hops and Strong Waters'. He was surveyor to the Cheshunt Turnpike Trust, and his son took over this post after his father's death. His widow, Mary nee Kimpton, continued in business after her husband's death until her own in 1740: HRO, Q84 fos.96,98; Guildhall Library, MS. 11936/17 fo.280; HRO, BHR Vol 21 fo.133; HRO, 51 HW 13; 52 HW 2 ; HRO, T/P 1/1.

16. HRO, BHR Vol 21 fos.133,134,137,139, and unfoliated page between folios 134 and 135; BL, L.R. 33 d 27, Extracts...relating to...the River Lee between Hertford and Ware.
17. CJ, xxii.788,825.
18. HRO, A2575.
19. 11 Geo. II, c.14 PR; BHR, Vol 21 fos.157-58; *ibid*, Vol 39 fos.43-59; GLRO, Acc 1953, Deeds Register Book A no.13.
20. CJ, xxiii.50,98,158,186; Bodl. MS. Rawl. C 192; another copy of this bill is catalogued as 1739, but since this copy is identical to 1738 bill at the Bodleian and since it continues to refer to a contract to purchase Ware Mills (authorised by Private Act of 1738), it seems probable that it too is the 1738 bill, rather than an identical bill submitted the following year:BL, SPR 357 c6(46).
21. GLRO, 0/400/4.
22. HRO, A2575.
23. CLRO, Repertories, 142 fo.299.
24. CJ, xxiii.166; Lincolns Inn Library, MP 102 fo.174.
25. CLRO, Repertories, 143 fos.159,202,214.
26. CJ, xxiii.238,293,299. The only change in evidence was that Desaguliers revised his estimate of the amount of water allowed by 1669 decision. If surmise of fn.20 above is correct, then no copy of the 1739 bill survives.
27. CLRO, Repertories, 143 fos.159,202,214; CLRO, Common Council Journals, 84 fos.127,136; CLRO, Small MS. Box 24 no.11; House of Lords RO, petition of Lord Mayor 30 May 1739; CJ, xxiii. 310,233,375.
28. CJ, xxiii.375; LJ, xxv.409. Despite alterations in bill, 2 aldermen still acted as tellers for the noes.
29. CJ, xxiii.354,367; LJ, xxv.402; House of Lords RO, II579,11581,11583,11585,11587.
30. CJ, xxiii.293,333,346,354,369,373,375,378,380; LJ, xxv.398,412-14,416-17,419.
31. HRO, BHR Vol 49 fo.286.
32. CJ, xxii.825.

33. 'The Town of Ware stands low, upon a Level with the River; the main Street is kept clear of Dirt, by turning the Water through it as often as there is Occasion': N. Salmon, History of Hertfordshire, 246.
34. See Acts of Parliament listed in T.S. Willan, River Navigation in England, 152-55.
35. House of Lords RO, petition of Lord Mayor, 30 May 1739.
36. Lincolns Inn Library, MP 103 fo.241.
37. LJ, xxv.309.
38. A.W. Skempton; 'Engineering on the English River Navigations to 1760' in M. Baldwin, A. Burton, editors, Canals: A New Look, 23-44; T.S. Willan, 'The Navigation of the Thames and Kennet 1600-1750', Berkshire Archaeological Journal, xl(1936), 146-56; R. Boyes, R. Russell, Canals of Eastern England, 63; M. Handford, The Stroudwater Canal (Gloucester, 1979) 32-41.

CHAPTER FIFTEEN

1. Trustees, 6 August 1739.
2. Ibid, 5 September 1739; PRO, C191/2 no.151.
3. PRO, C231/10 fo.294.
4. PRO, RAIL 845/53, Court of Sewers, 11 June 1740.
5. PRO, D.L. 17/90; PRO, C191/3 no.40; Trustees, 5 June 1750.
6. Trustees, 22 October 1740, 4 May 1741.
7. Ibid, 5 June 1750; PRO, C191/3 no.40; C231/11 PRO, D.L. 17/90.
8. PRO, RAIL 845/53, Court of Sewers, 28 December 1750, 11 January 1751, 25 January 1751, 13 November 1751, 11 February 1752. On all these occasions business was minuted and obviously transacted, in the expectation that the afternoon meeting of the Trustees would be adjourned as inquorate. At other meetings similar business was minuted at the morning meeting of the commissioners and the afternoon meeting of the Trustees.
9. Trustees, 5 August 1751.
10. PRO, RAIL 845/53, Court of Sewers, 11 February 1752.
11. HRO, BHR Vol 38 fos.510-11; Trustees, 26 September 1750, 18 December 1752.
12. CJ, xxviii.436.

13. P. Mathias, Brewing Industry in England, 443-44.
14. Trustees, 6 August 1739, 9 April 1740; PRO, RAIL 845/53, Court of Sewers, 11 June 1740; CJ, xxii.825; *ibid*, xxiii.98,293; BL, L.R. 33 d 27, Extracts...relating to...the River Lee between Hertford and Ware,25-28.
15. HRO, BHR Vol 21 fos.120,121; HRO, D/E 3685; HRO, T/P 1/1, 1 May 1725; HRO, T/P 7/1, 25 June 1733; W.J. Hardy, W. le Hardy, editors, Hertford County Records, vii.148,228,232,237,243,268; R. Clutterbuck, The History and Antiquities of the County of Hertford (3 vols,London,1821), ii.148,161; E. Stephens,editor, The Clerks of the Counties 1360-1960(Newport,Mon, 1961), 102
16. Trustees, 3 August 1741. When Toller first presented his accounts he charged £1 6s 8d for attending either a Trustees meeting or a Court of Sewers, but only £1 13s 4d if they both met on the same day.This was allowed, but he was restricted to £1 6s 8d a day for the future.
17. Trustees, 28 September 1761, 11 October 1762, 1 July 1767. Thorowgood had replaced Toller as town clerk of Hertford in 1759 and as Clerk of the Peace for Hertfordshire in 1761: HRO, BHR Vol 21 fos.215,217; E. Stephens,editor, Clerks of the Counties, 102
18. Trustees, 3 August 1741, 26 May 1742, 13 December 1743, 3 September 1744, 30 September 1745, 1 August 1748, 16 October 1749, 26 September 1750, 25 September 1752, 9 November 1762, 12 October 1767, 2 November 1767.
19. Trustees, 6 August 1739, 5 September 1739; HRO, 10980; J.B. Martin, The Grasshopper in Lombard Street(London, 1892),43-47,268; G. Chandler, Four Centuries of Banking (2 vols,London,1964-68), i.107-10.
20. Trustees, 22 October 1740, 22 September 1741, 2 August 1742, 29 August 1743, 3 September 1744, 6 June 1746, 6 August 1750, 5 August 1751, 25 September 1752, 10 October 1753, 1 September 1760, 5 August 1765, 12 October 1767.
21. Trustees, 3 July 1758.
22. *Ibid*, 5 August 1765, 1 July 1767; Gentleman's Magazine, xxxv(1765),199.
23. RAIL 845/53, Court of Sewers, 11 June 1740; Trustees, 3 October 1739, 2 January 1740, 21 April 1742, 6 July 1743, 30 April 1746.
24. HRO, BHR Vol 21 fos.63,108; Vol 49 fos.33,136,154, 186,207,228,354; W.J. Hardy, W. le Hardy, editors, Hertford County Records, vii.270.

25. HRO, Vol 39 fo.62; HRO, D/P 22 29/1; Bodl., Gough, Hertford Papers, 1(12); Trustees, 3 October 1739.
26. Trustees, 10 March 1752.
27. Initially Whittenbury claimed 16/- a day for attending a Court of Sewers or a meeting of the Trustees if he required a horse, but only 10/- a day if he did not. He claimed 15/9 a day when supervising work along the river. This was allowed, but he was instructed to charge only 12/6 a day in future whatever the purpose. These same accounts show that workmen earnt 2/- a day, and horses were hired at 2/6 a day. In 1742 the Trustees queried Whittenbury's provision of beer to the workmen. Carpenters and workmen building the turnpike at Ware Mills earnt 2/2 a day, but 3/- a day when working in the wet setting down the turnpike: Trustees, 3 August 1741, 26 May 1742.
28. PROB 11/833(291). He described himself as a carpenter in his will. He left much property, including houses in Hertford and Hertingfordbury, a butchers stall in Hertford market, two farms, and over £2000 invested in South Sea or Bank of England stock. His two sons, William and Henry, continued to run the carpentry business: W.J. Hardy, W. le Hardy, editors, Hertford County Records, viii.133,165,184,199.
29. Trustees, 21 November 1757.
30. For details of Smeaton and Yeoman: A.W. Skempton, E.C. Wright, 'Early Members of the Smeatonian Society of Civil Engineers', Transactions of the Newcomen Society, xliv(1971), 23-42; A.W. Skempton, editor, John Smeaton, FRS (London, 1981); E. Robinson, 'The Profession of Civil Engineer in the Eighteenth Century: A Portrait of Thomas Yeoman, FRS, 1704(?) - 1781', Annals of Science, xviii(1962), 195-215.
31. PRO, RAIL 845/6, Trustees, 10 September 1784.
32. Trustees, 4 December 1739, 2 January 1740, 9 April 1740, 28 May 1740, 22 October 1740, 3 August 1741, 22 September 1741, 11 November 1741, 2 August 1742, 22 June 1743, 29 August 1743, 3 September 1744, 6 June 1746, 16 October 1749, 14 November 1749, 3 July 1750, 26 September 1750, 5 August 1741, 25 September 1752, 18 December 1752, 10 October 1753, 11 January 1758, 1 September 1760.
33. Trustees, 12 October 1767.
34. Trustees, minutes 1739-1767, passim; HRO, BHR Vol 39 fos.80-84,86-87.

CHAPTER SIXTEEN

1. Trustees, 5 September 1739, 3 October 1739.
2. Ibid, 4 December 1739, 2 January 1740.
3. R.E. Dupuy, T.N. Dupuy, editors, The Encyclopedia of Military History (London, 1970), 661; A.J. Henderson, London and the National Government, 1721-42 (Durham, North Carolina, 1945), 195.
4. In evidence to Parliament in 1737 Fordham said that he had known the river 47 years. In 1707 he was one of the Ware maltsters and barge-owners involved in a Chancery suit about maintaining the navigation. His brother, Thomas, was on the opposing side. In April 1721 James made an agreement with Thomas Byde, lord of the manor of Ware whereby he took out a 90 year lease on lands in Ware Park. He then dug a new cut out of the river Rib through Ware Park and Shipmans Hill into the Lea, and along this cut he erected an overshot corn mill, Ware Park Mills, at a cost of about £2000. These arrangements were confirmed by private act of parliament in 1723, as there were fears over the future of the Ware estate. When Fordham insured these mills in February 1722 he was described as a bargemaster of Amwell. Thereafter there are several references to Fordham's barges and his interest in the navigation. His barge passed through Hertford Turnpike 20 times between July 1736 and December 1739. When he died in 1757 his will described him as a miller and mealman of Ware Park Mills. His three sons James, Thomas and Edward had all already been set up in business as mealmen and they were left the lease to the property on which the mills was built and all 'my Boats Barges Sacks Corn Grain Hay Waggon Carts Horses Ready Money, money at Interest Stock in Trade debts etc'. His three daughters, Susannah, Anne and Jane were left £800 each: PRO, C7 124/25; 12 Geo. 1, c.14 PR; HRO, BHR Vol 45 fos.456-60; Guildhall Library, MS. 11936/14 fo.1; PRO, PROB 11/833(298);
5. Trustees, 2 January 1740, 9 April 1740.
6. Ibid, 22 September 1741, 14 November 1749.
7. In evidence to Parliament in 1737 Pettit said that he had known the river about 45 years. In 1706 he was carrying coal up river to Ware. In 1712 he was consulted about problems at Stratford, and was thereafter referred to as a barge-owner or maltster on several occasions. In 1719 he was appointed as 'Surveyor of the said River for Removing & taking away the said Cores and Hills'. In the mid-1730s he was consulted by the London aldermen about disputes over the supply of water to the Three Mills in Stratford, and was closely involved in the navigation

in the early 1740s. He was also a Trustee of Cheshunt Turnpike Trust from 1725 onwards: CLRO, Accounts of duty on fruit, malt, salt and passage of grain and coals, 29 October 1705-28 October 1706; CLRO, BHC 1711, evidence of bargemen; Guildhall Library, MS. 11936/12 fo.47; HRO, 53999; W.J. Hardy, W. le Hardy, editors, Hertford County Records, vii.116,117; Enfield, Court of Sewers, 6 November 1719, CLRO, Court of Aldermen, Reports and Papers, January-June 1736; *ibid*, 1742-43; HRO, T/P 1/1; Trustees, 3 August 1741; PRO, RAIL 845/53, Court of Sewers, 22 October 1740.

8. TWA, Box 81, Red Box, part.
9. PRO, RAIL 845/53, 11 March 1743.
10. HRO, BHR Vol 36 fos.587-592.
11. PRO, RAIL 845/53, Court of Sewers, 28 January 1743; HRO, BHR Vol 36 fo.608; Trustees, 2 June 1743.
12. PRO, RAIL 845/53, Court of Sewers, 28 January 1743; HRO, BHR Vol 39 fos.70,78.
13. HRO, BHR Vol 39 fos.73-77; *ibid*, Vol 38 fos.510-11.
14. Trustees, 26 September 1750.
15. *Ibid*, 20 November 1752, 18 December 1752.
16. *Ibid*, 11 January 1758, 2 November 1767; HRO, BHR Vol 39 fos.80,81-84,86-87.
17. HRO, BHR Vol 50 fo.191; *ibid*, Vol 39 fos.80,81-84, 86-87.
18. PRO, RAIL 845/53, Court of Sewers, 2 July 1740, 4 August 1740, 22 October 1740.
19. *Ibid*, 2 July 1740, 4 August 1740, 22 October 1740, 24 September 1740, 28 January 1743, 25 May 1743, 19 August 1743.
20. *Ibid*, 2 July 1740, 22 October 1740, 10 June 1741, 1 July 1741.
21. *Ibid*, 4 August 1740.
22. *Ibid*, 6 June 1746; Trustees, 6 June 1746.
23. PRO, RAIL 845/53, Court of Sewers, 7 December 1747; Trustees, 7 July 1746, 4 August 1746, 3 September 1746, 10 October 1746.
24. Trustees, 23 November 1748.
25. *Ibid*, 17 October 1748.
26. *Ibid*, 2 October 1749, 14 November 1749.

27. Ibid, 5 August 1741.
28. Ibid, 30 January 1753, 27 February 1758, 17 April 1758. In May 1758 the surveyor was ordered to build a new dwelling house at Dobbs Weir for the turnpike keeper: Trustees, 29 May 1758.
29. Ibid, 8 September 1760.
30. Ibid, 8 November 1762, 19 August 1765.
31. Ibid, 25 June 1759.
32. Ibid, 6 August 1759
33. Ibid, 23 November 1761, 15 March 1762, 19 April 1762, 19 May 1762, 11 December 1762; K.R. Fairclough, East London Record, 1985.
34. Thomas Hankin, a maltster of Stanstead Abbot, was styled a gentleman on his death in 1764. In business as early as 1720, he insured a malthouse in Hunsdon, and in 1735 was admitted to a malting at Stanstead with access to a wharf along the Lea. He signed several petitions about the navigation, was appointed a Trustee in 1757, gave evidence to Parliament in 1759, and proposed that a turnpike be erected at Waltham in 1760. In 1763 two of his barges sank near London Bridge. His will, proved in February 1765, gives details of his business affairs. He had been for years in partnership with his son, George, 'as Factors in Malt and Wheat to London by water in Barge'. The capital stock of this partnership was valued at £15000. This business was left to his widow, Anne, and to George, to continue as partners. Thomas had also been in partnership with Messrs Thornton & Company, brewers of Spitalfields. His share in this business was £10000. He left this share to his sons, Ambrose and Cornelius. He had also 'for many years past carried on in a Mercantile way the Iron and Coal Trade'. His widow and another son, John, were to carry on this business until another son, Thomas, reached 25, when he was to inherit it. To his son, John, he left £4000. The will also noted real estate, worth at least over £4000, in Stanstead Abbot, Ware, Great Hadham, Furneaux Pelham, Stocking Pelham. In a codicil added in December 1764 he threatened to partially disinherit his son John if he should marry the daughter of the local baker, he thought the 'Match not being a proper one for him'. In 1772-73 his mother lent Mrs Thrale £6000 when her brewery faced financial problems: Guildhall Library, MS. 11936/11 fo.279; MS. 11935/12 fo.194; MS. 11936/ fo.67; HRO, 10885; PRO, PROB 11/906(59); CLRO, Court of Aldermen, Reports and Papers, September 1742 and February 1743; CJ, xxviii.436; W.J. Hardy, W. le. Hardy, editors, Hertford County Records, vii.95; P. Mathias, The Brewing Industry, 267.
35. Trustees, 8 October 1759; 8 September 1760.

36. Ibid, 11 October 1762, 8 November 1762; CJ, xxxi.303.
37. PRO, RAIL 845/53, Court of Sewers, 22 October 1740, 4 May 1741; HRO, B1110.
38. Ibid, Court of Sewers, 10 June 1741.
39. Ibid, Court of Sewers, 1 July 1741.
40. Ibid, Court of Sewers, 3 August 1741.
41. Trustees, 3 August 1741.
42. PRO, RAIL 845/53, Court of Sewers, 11 November 1741; Trustees, 26 May 1742, 31 December 1766; R.E. Dupuy, T.N. Dupuy, editors, Encyclopedia of Military History, 661.
43. PRO, RAIL 845/53, Court of Sewers, 11 November 1741, Trustees, 21 April 1742.
44. PRO, RAIL 845/53, Court of Sewers, 26 May 1742, 28 January 1743; Trustees, 25 February 1743.
45. CJ, xxviii.436; Trustees, 19 August 1765; CLRO, MS.18.14.
46. PRO, RAIL 845/53, Court of Sewers, 3 August 1741. The father had died in 1727. After monetary bequests to his three daughters, he left the dwelling house, corn mills and associated buildings to his only son, Michael, to take entry when he was 21. All other property was left to his widow, Mary, to pass to Michael on her death. Mary died in 1770. The father also left £5 to his 'kinswoman' Anne, wife of his landlord, William Feilde: PRO, PROB 11/616(147).
47. PRO, RAIL 845/53, Court of Sewers, 23 June 1742, 2 August 1742.
48. Ibid, 2 August 1742; Trustees, 6 March 1753.
49. PRO, RAIL 845/53, Court of Sewers, 3 November 1742.
50. Ibid, 1 December 1742.
51. Trustees, 1 December 1742.
52. Ibid, 25 February 1743.
53. PRO, RAIL 845/53, Court of Sewers, 11 March 1743; Trustees, 14 November 1749.
54. Trustees, 6 July 1743.
55. Tolls were collected by the Trustees at Constants Weir Turnpike and Dobbs Weir Turnpike by virtue of the fact that they enjoyed rights as fishing weirs, The fact that the tolls were collected on every occasion not just when a flash was essential may have been open to question, but no queries were

ever raised. The toll at Broxbourne Turnpike was collected by the miller, and was justified as the normal compensation for providing assistance to the bargemen. The fact that no such toll was allowed to the miller at Stanstead Turnpike must have caused resentment.

56. PRO, RAIL 845/53, Court of Sewers, 14 September 1743.
57. Ibid.
58. Ibid.
59. Ibid, Court of Sewers, 28 September 1743.
60. Ibid, Court of Sewers, 18 October 1743.
61. Trustees, 30 April 1746.
62. Ibid, 17 October 1748.
63. Ibid, 23 November 1748.
64. Ibid, 10 January 1749.
65. Ibid, 14 November 1749.
66. PRO, RAIL 845/53, Court of Sewers, 14 November 1749.
67. Ibid, Court of Sewers, 28 December 1750.
68. Ibid, Court of Sewers, 28 December 1750, 5 August 1751.
69. Ibid, Court of Sewers, 11 January 1751, 25 January 1751; Trustees, 5 August 1751.
70. Trustees, 11 December 1751.
71. Ibid, 11 December 1751, 10 March 1752.
72. PRO, RAIL 845/53, Court of Sewers, 11 February 1752, Trustees, 2 June 1752, 7 August 1753.
73. Trustees, 6 March 1753.
74. Ibid, 13 March 1753.
75. Ibid, 7 August 1758.
76. Ibid, 20 November 1753. Feilde was awarded £80 damages and £282 costs on one issue, but the Trustees were allowed £25 costs on another issue.
77. CLRO, Repertories, 165 fo.26.
78. PRO, RAIL 845/53, Court of Sewers, 21 April 1742.
79. CLRO, Court of Aldermen, Reports and Papers, September 1742.

80. CLRO, Repertories 146 fo.384; PRO, RAIL 845/53, Court of Sewers, 28 January 1743.
81. In 1626 the Havering Level Commissioners of Sewers decreed that the miller at Temple Mills was not entitled to a toll for closing his gates when a flash came downstream: CLRO, Bridge House Committee Order Book 1611-1741, fos.41-47.
82. PRO, RAIL 845/53, Court of Sewers, 25 May 1743, 6 July 1743. The other occasion was when a jury was summoned to investigate problems at Waltham Abbey Powder Mills: *ibid*, Court of Sewers, 24 September 1740.
83. *Ibid*, Court of Sewers, 19 August 1743.
84. CLRO, Court of Aldermen, Reports and Papers, September 1742.
85. CLRO, Repertories 146 fo.334.
86. CLRO, Court of Aldermen, Reports and Papers, February 1743.
87. William Calvert was an alderman and one of the largest brewers in London. He was Master of the Brewers Company for the period 1741-42, and attended three meetings of the Trustees as an ex-officio member in 1743: R. Sedgwick, editor, The Commons 1715-1754, ii.519-20; Trustees, 22 June 1743, 6 July 1743, 14 September 1743.
88. CLRO, Repertories 147 fos.195,216; *ibid*, 150 fo.33.
89. *Ibid*, 147 fo.350.
90. CLRO, MS. 18.14.
91. CLRO, Repertories 147 fos.350,456; *ibid*, 148 fos. 64,180,430; *ibid*, 150 fo.33; *ibid*, 151 fo.141.
92. *Ibid*, 155 fo.265.
93. *Ibid*, 165 fos.13-16,26.
94. ERO, D/SH2, Court of Sewers, 14 September 1749, 7 April 1750; ERO, D/DU 257; ERO, D/DLo T59.
95. R. Griffiths, An Essay...Conservancy of the River Thames, 55-56.

CHAPTER SEVENTEEN

1. CJ, xxxiv.642-44.

2. R. Griffiths, An Essay...Conservancy of the River Thames, 55-56.
3. S. Simpson, The Agreeable Historian (3 vols, London 1746), ii.278.
4. PRO, C10 363/3. Jones argued it was unfair that he as the major local landowner should be responsible for wharfing 1½ miles of the river bank from the turnpike to Waltham High Bridge, and for allowing bargemen access to his land to hale their barges, yet receive no income from either the turnpike or the mill.
5. NRO, Additional Wake Papers 1965/129, General Accounts of Essex Estate 1762-1782.
6. Trustees, 26 September 1750, 25 September 1752.
7. ERO, D/DQt 125.
8. Trustees, 17 March 1767, 1 April 1767.
9. PRO, RAIL 845/53, Court of Sewers, 14 September 1743.
10. The Walton family set up their own warehouses in Barking Creek as early as 1721, whilst complaints of problems in transporting powder through London streets caused the Ordnance office to issue orders in 1707 that powder be delivered to Greenwich: Lincoln Inns Library, MP 102 fo.174; Royal Armament Research and Development Establishment (Waltham Abbey), WASC 436; PRO, WO 47/24 Fo.270; PRO, C11 113/19.
11. CLRO, Repertories 71 fo.68; CJ, xxxi.308-11.
12. E. Jones, 'A transport private saving calculation for the brewers Truman Hanbury & Buxton, 1815-63', Journal of Transport History, 3rd series, vii(1986), 1-17.
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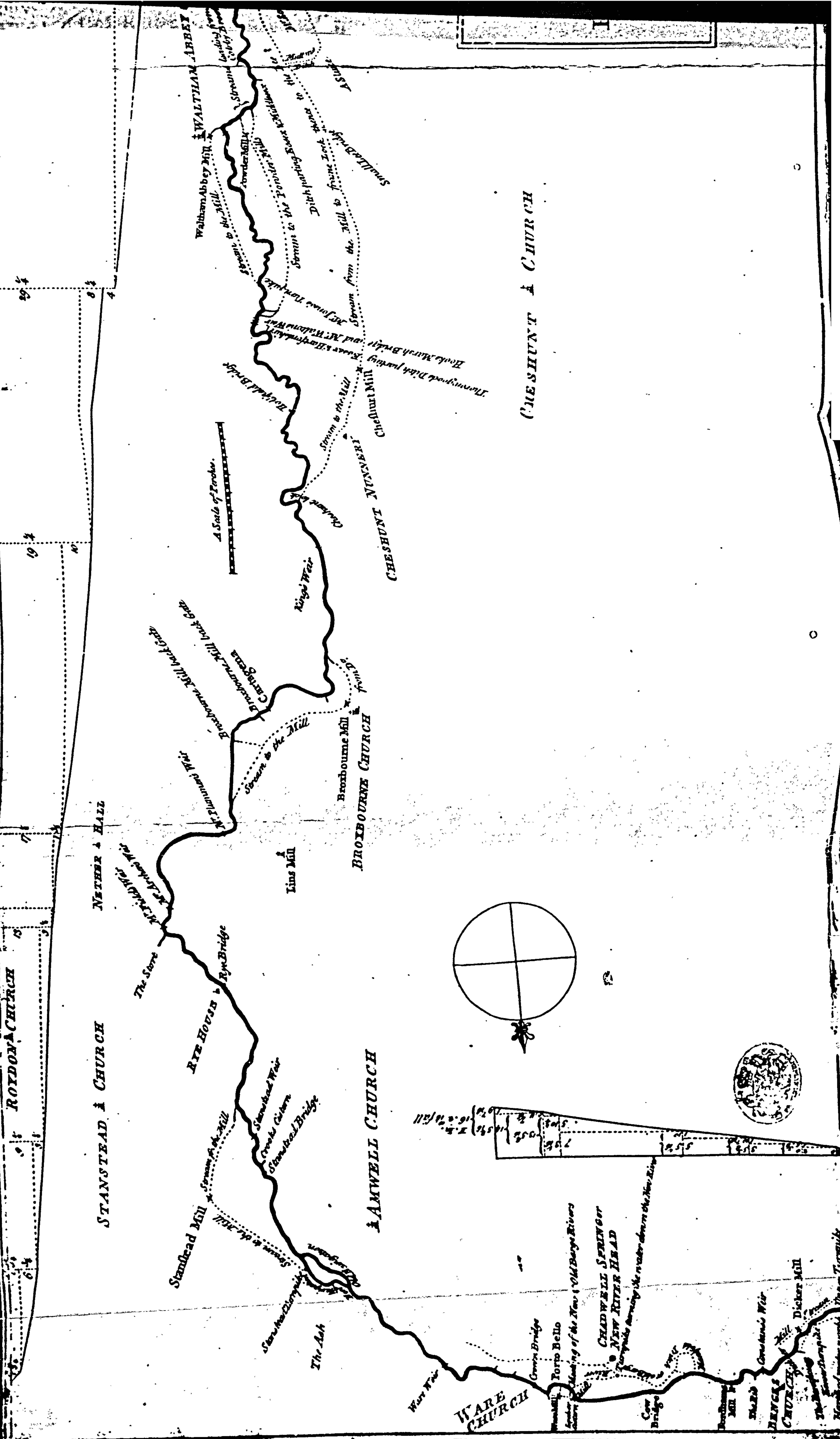
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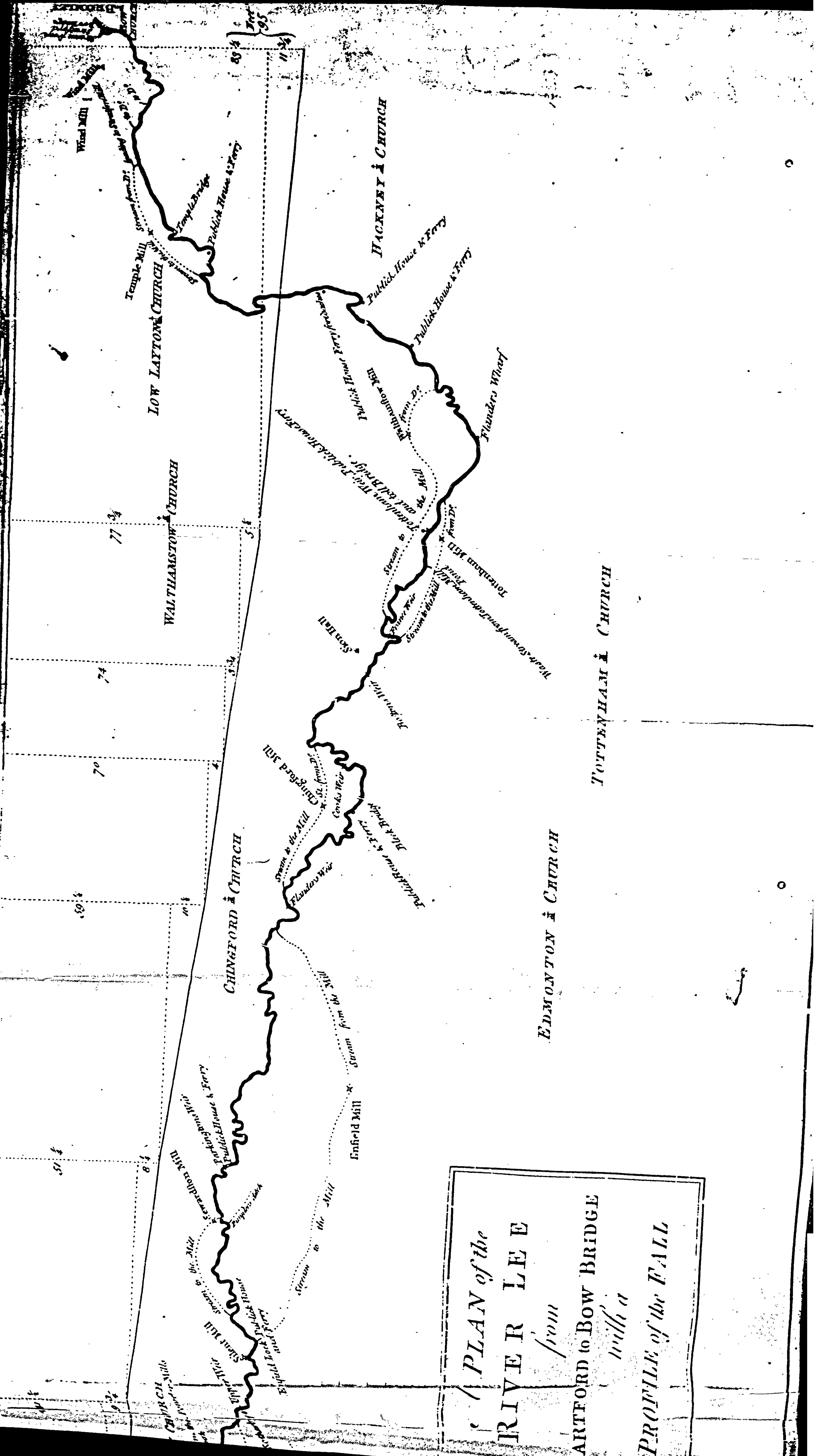
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PLAN of the
 RIVER LE E
 from
 HARTFORD to BOW BRIDGE
 with a
 PROFILE of the FALL

EDMONTON CHURCH

TOTTENHAM CHURCH

Keith Fairclough

DURING the last years of his life Francis Tyssen II became the major landowner within the parish of Hackney, acquiring three manors there between 1697 and his death in 1710. He was a prominent East India merchant, and had been involved in the formation of several joint-stock companies — the Hollow Sword Blades Company, the Company of Copper Miners in England, and the Company for Recovering Wrecks in England, amongst others. Of particular interest is that he was one of the original shareholders of a company floated in 1692 to supply London with water, the Hampstead Aqueduct Company. For a man with such interests, Hackney provided a convenient residence close to the City.¹

Among the properties he acquired in Hackney were Jeremy's Ferry across the river Lea, and a fishery along the river between Lock Bridge and Bullivants (by this date Lock Bridge was already a ferry not a bridge, about ½ mile further up the river from Jeremy's Ferry).² Owners of fisheries had rights to erect weirs across the river, ostensibly to increase the catch, but they also acted as occasional flash locks to assist the passage of barges. Such a weir stood at Jeremy's Ferry, and Francis II was to erect a waterworks at this weir to supply his tenants and neighbours.

Some doubt must remain as to the exact date that these works were set up,³ but sufficient evidence does exist to suggest that it was built between 1707 and 1709. In March 1707 the Lea bargemen complained to the London aldermen that Tyssen was setting up a weir and other works at Jeremy's Ferry, and the aldermen appointed a committee to investigate. This committee subsequently surveyed the completed works in November 1709. Meanwhile the bargemen made similar complaints to the Commission of Sewers for Tower Hamlets, only for the complaints to be dismissed after the bargemen failed to attend the hearing.

Then in December 1709 7 bargemen signed a document certifying that the weir at Jeremy's Ferry had stood for several years and was essential to the navigation, also acknowledging that Tyssen had recently 'fixed a Mill or Engine in the Dead Roome of the said weare on Hackney side of the said River' but that this in no manner prejudiced their interests.⁴

Nowhere is it stated that it was a waterworks that Tyssen had built, but in the light of evidence from the ensuing decades, it can have been little else.

In August 1715 the Hackney churchwardens excommunicated Randolph Johnson, the engineer at the waterworks, for non-payment of his rates. An effective ploy, he paid up the following week.⁵ In 1720 John Strype described the works in his Survey,⁶ and in 1724 a report to Chancery stated that the waterworks had become derelict, itself confirmation that the waterworks had stood some years.⁷ Unfortunately the wills of Francis II in 1710 and Francis III in 1717 provide no information about the works.⁸

From these various sources however, a vague impression of the works can be gleaned. There was a weir in the river at Jeremy's Ferry; an engine, probably a waterwheel, to raise water out of the river; either pipes or a

pipes to distribute it from thence to the customer.⁹

When Francis III made his will in 1717, his wife was still expecting the heir, Francis John Tyssen, so guardians were appointed to look after the estate during his minority. It may have been these guardians who allowed the waterworks to decay, for in July 1724 John Ward of Hackney, representing Francis John, complained to Chancery that the waterworks were dilapidated, and that there was a need to rebuild and expand the enterprise.

Ward wished to undertake this task himself, and presented an estimate which had been prepared by a plumber, George Osmond. The plans produced show not just repairs but a major expansion. The engine house was to be rebuilt, and a better cast-iron engine introduced. Old pipes were to be dug up and rejoined, the conduit was to be properly planked, and new pipes were to be laid. It was estimated that this work would cost £2,051 if done 'with Brick and Stone' or £1,781 'if only done with Timber'; and that the annual maintainance thereafter would be £60.

Ward had already canvassed custom. He told Chancery that the rental income already assured came to £152 7s a year, and that if the other 340 inhabitants would sign agreements this would bring in an additional £50 a year. Furthermore the income of the enterprise could be increased if he was allowed to build two mills, one on each side of the river, the rent from which could be £50 a year.¹⁰

Ward and Osmond had been involved in waterwork enterprises together before this date. In 1708 Osmond had erected a waterworks at Hertford, and Ward had taken over the property by the end of the following decade.¹¹ Osmond had also given evidence to Parliament in 1721 in favour of a scheme to supply London from the Colne and its tributaries.¹² The pair were obviously sufficiently keen and experienced, but their proposals for Hackney were never implemented. Evidence to the contrary can readily be discounted.¹³

One reason was that Ward was in no position to finance or organise the plans. Shortly after presenting his case to Chancery, he was convicted of forgery and expelled from Parliament after rows between him and the Duke of Buckingham over alum mines in Yorkshire. As early as 1726 he was taking steps to avoid his creditors, and he was formally declared bankrupt in November 1730.¹⁴

With the loss of the waterworks, the inhabitants had to rely on traditional methods once more. Parliament were told in 1762 that they were supplied either 'by Carts from the River which is very expensive' or relied on pumps and rainwater. The inhabitants had approached the New River Company in 1757, but negotiations had fallen through because they could not guarantee a minimum annual income of £250.¹⁵

Such evidence was presented because a new initiative had emerged to set up a local waterworks once more. In June 1760 Francis John Tyssen granted a 61 year lease at £30 a year to John Barrow of Stafford Row in Middlesex, gentleman, Thomas Holloway of Hackney, merchant, and Henry Holloway of Hackney, yeoman. The premises let were a tenement and lands on the west bank of the river just south of the road leading to Lea Bridge. On this property the lessees were granted rights to erect 'any Buildings Engines or

WORKS FOR THE PURPOSE OF SUPPLYING THE TOWN OF HACKNEY AND THE PARTS ADJACENT WITH WATER'.¹⁶

Then in September 1762 Tyssen issued another lease, for 59 years at £23 a-year on premises on the east side of the river in Low Layton marsh known as Chevaliers Ferry House, with all the associated fishing rights. At this date the lessees were named as William Miller of London, merchant; John Bourke of London, merchant; Abraham Ogier of Hackney, gentleman; William Gilbee of Blacksfields in Surrey, mariner; in addition to the already named John Barrow and Henry Holloway. Thomas Holloway was no longer involved.¹⁷

Abraham Ogier was a notary based in Popes Head Alley, and was certainly living in Hackney when he died in 1784.¹⁸ The others were 'several Adventurers and Undertakers' described as 'several Gentlemen . . . willing to undertaking the Furnishing a sufficient Quantity of Water, at a reasonable Expence.'¹⁹ The will of Henry Southouse of Southampton in 1791 refers to '4 shares in Hackney Mills and Water Works'²⁰ which confirms that the works were financed by share capital, but so far no other information of the financial arrangements has been discovered. Share finance was a sharp contrast with the earlier works which had been financed privately by Francis Tyssen II.

Another contrast was that the new works were cited lower down the river, below Lea Bridge, not at Jeremy's Ferry, where the earlier works had been. The new adventurers did take over the reservoir at Clapton and some of the pipes from the original venture, but it was unlikely that they took over the original engine house as the lessees were to claim in 1821.

Of the new venture, a contemporary newspaper reported that 'Some curious waterworks of a new construction will shortly be erected near the River Lea, for the better supplying with water the parish of Hackney, the hamlets of Clapton, Hammerton and parts adjacent'.²¹ Just why the works should be considered curious has to be gleaned from the evidence provided by the map reproduced as Figure 1²² and other scattered sources.

A new cut had been built alongside the navigable river over which were erected mills designed both to raise water and grind corn. On the west bank of this cut a tower was built, presumably to provide extra pressure to drive the water through underground wooden pipes to the reservoir at Clapton. In the navigable channel the locks shown on the map were built. On one side of the river there were single gates, but on the other side a pound lock was built.

Major rows erupted over the existence and design of these locks. In November 1761 the bargemen complained that the 'Works lately erected' prejudiced the navigation, and the Trustees of the Lee Navigation instructed the owners of the waterworks to attend their next meeting. If they did, they were to be disappointed, for the Trustees failed to obtain the necessary quorum of 10 at any of the next three monthly meetings. The owners approached Parliament instead, and on March 3, 1762 they were given leave to introduce a bill.²³

The bill was never submitted. Eventually agreement was reached between the adventurers and the Trustees, but not before further acrimony. The Trustees' immediate response to events in Parliament was that 20 actually attended the next meeting, and resolved to oppose the bill. The following

17. This task was postponed however, on receipt of a legal submission from the adventurers, and proper negotiations began. These negotiations are not minuted but by October an agreement had been reached. The Trustees leased the locks from the adventurers and appointed a lock-keeper to ensure their proper use, both for the navigation and the waterworks.²⁴

In 1766 John Smeaton reported to the Trustees that the pound lock was only 'occasionally used' and that its design was bad 'as neither its floor nor the river below is deep enough for navigation, without flashes there, as at present'. He proposed an artificial navigation cut from Lea Bridge to Old Ford which by-passed the mills completely (see Figure 1). However, subsequent negotiations led to an alternative cut being proposed by Thomas Yeoman, Smeaton's assistant, and to statements in the act of 1767 that the lock 'hath been found by Experience to be of very great Service and Advantage to the Navigation'.²⁵

The Hackney Cut was opened to barges on 7 August 1769, and it left the Lea immediately below the lock and the mills. By this date Tyssen had sold his interest in the pound lock for £750, part of the payment being compensation for the loss of income from a wharf and two public houses he owned on the by-passed river channel.²⁶

Of the fate of the enterprise in the ensuing decades, little has been found about the waterworks, but Simmons has found several references to the corn milling business in the insurance records. In 1772 Benjamin Ardley of Bow, miller, insured his stock and utensils in a timber and tiled corn mill near Lea Bridge for £1,000. In January 1776 however the mills are described as brick and timber built when Jonathan Rogers and Charles Hammerton insured their corn mills and waterworks for £2,000, a valuation which was raised to £4,000 in 1782.

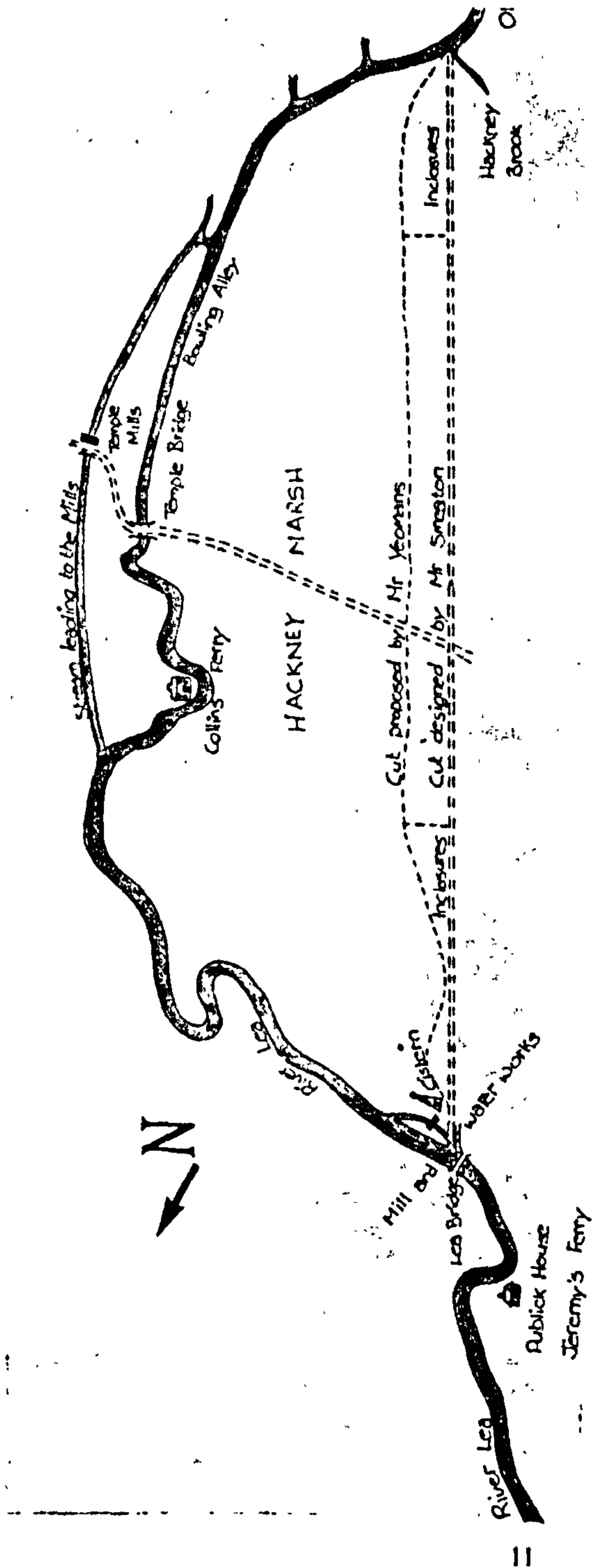
These two were in possession of the main lease, but a series of millers and mealmen insured their stock and utensils on the premises:- Thomas Palmer and Ralph Nattrass of Southwark, mealmen, in 1781; Samuel Lewin and Robert Thomas of Hackney, mealmen, in 1782; Edward Phillips and William Foster of Tottenham, millers, in 1786, and George Fawbert of Bromley, mealmen, in 1787.²⁷

The precise arrangements between these mealmen and millers, and Rogers and Hammerton have not been discovered, nor have the latter's arrangements with the original adventurers about the waterworks.

These works were an integral part of the enterprise. In January 1788 when major floods inundated Hackney marshes the mills were at a standstill, and fears were expressed that since 'they throw water into the reservoir at Clapton, a scarcity of water was apprehended, in consequence of which, it was distributed through the pipes in scanty portions'. However, supplies did last until the waters receded.²⁸

Jonathan Rogers was still a partner in 1782. However, in 1790 a commission of bankruptcy was awarded against Richard Rogers 'late of Lee Bridge Mills but now of Charing-cross, miller, dealer and chapman'; and in a 1793 directory there is a reference to 'Hamerton & Co, mealmen of Hackney'.²⁹

Sketch map drawn to show alterations to the original plans of Smeaton for canalizing the river in 1766 (Hackney Library Services)



Then on Thursday 14 January 1796 disaster struck:—

About a quarter before three o'clock this morning, a fire broke out at the extensive Mills at Lea Bridge . . . which, after burning with amazing rapidity for two hours, entirely consumed the same, with an immense quantity of wheat and flour. The works which supply Clapton with water were also destroyed; and a considerable pin or needle manufactory, with much timber on the Wharf, and about 3000 quarters of wheat and flour, the property of the Government. The fire is supposed to have been occasioned by the meal-weighter's leaving a lighted candle between 2 sacks in an upper-room. The dwelling house adjoining escaped. Mrs. Killick, who lived in it and had lately lain-in, sustained no injury, though greatly alarmed and removed in fright . . .

Of the pin manufactory nothing else is known; but the mills were presumably working on contracts for the war effort. The Mrs. Killick who escaped was Hamerton's daughter, who had married a John Shepherd Killick.³⁰

Hamerton did not suffer too much from this disaster. He became the alderman for Bread Street ward in 1797, and obituaries on his death in November 1800 noted his wealth, commenting particularly on the 'extremely lucrative concern' at Lea Bridge Mills, and his links with his brother, Thomas, at Lynn Mills in Norfolk.³¹

The mills and waterworks were rebuilt after this fire, but the exact sequence of events is difficult to discern. The 1821 legal case states that the lessees proposed to surrender the existing 61 year lease which still had 25 years to run, in order to take out a new lease for a longer period, and at a higher rent. They might have wished not just to rebuild but to expand the enterprise. The guardians of Francis Tyssen (the illegitimate son of Francis John who had died in 1781) took the advice of a leading engineer, John Rennie, and refused to grant a new lease. Another famous engineer, Robert Mylne, was also consulted, but by whom and in what capacity is not known.³² An opportunity to expand was thus lost, and the opportunity was siezed instead the following decade by the East London Waterworks Company.

The evidence suggests that the mills and waterworks were rebuilt on the same scale as before, if not to the same design, but by whom and exactly when cannot at present be determined with accuracy. Different interpretations can be construed.

The waterworks were back in operation by April 1798, for in that month artillery men from Tower Hamlets were sent to guard the works 'against the mischievous intention of disaffected persons' who were rumoured to be about to make an assault. Similar protection was given to the New River and the London Bridge waterworks. The rumoured attacks did not materialise.³³

At this date, however, Charles Hamerton & Son, mealmen, were based at 29 Bread St, Cheapside, not at Hackney.³⁴ It is possible therefore that temporary measures had been taken to put the waterworks back in operation, and that the corn mills had not been rebuilt by this date.

Hamerton's obituary in November 1800 mentioned that he had let Lea Bridge mills to the 'new chartered company for supplying London with flour

and bread'. This was the London Company for the Manufacture of Flour, Meal, and Bread' which had been authorised by Act of Parliament earlier that year. It had been set up by a 'number of benevolent gentlemen' who were worried about shortages and high prices in the markets and wished to manufacture flour and bread themselves to sell 'at reasonable prices'. Share capital of £120,000 was authorised.³⁵

Since the formation of this company was vigorously opposed by the bakers, millers and mealmen who supplied the London markets, Hamerton must have annoyed many of that business community he had been part of for so long.

In December 1801 the Times reported that the annual general meeting of the Company had resolved to purchase the site of the Albion Mills near Blackfriars Bridge which had stood empty ever since the spectacular fire of 1791. The Times commented that 'The Company are at last determined to follow up the original plan of their incorporation'.³⁶

Does this statement imply that they had achieved little at Lea Bridge Mills, and that perhaps this had been because they had not taken over a working mill, but only a site on which to erect new mills? No definite answer can be given. It is possible that they took over a lease on mills which had already been rebuilt, but that the scale of their operations were too small to materially affect the level of prices in the London market, thus their interest in the larger site at Blackfriars. It has to be noted that they never rebuilt the Albion Mills, and about 1809 houses were built on the site.³⁷ Further evidence of this philanthropic venture would be interesting, it seems to have failed to have achieved anything.

Their working interest in Lea Bridge Mills was definitely short-lived. In 1802 John Killick is listed as a miller and mealman at Hackney Mills, Lea Bridge, and in the same year George Hooper of Walworth, mealman, insured his stock and utensils in 'Mr. Killicks Water Corn Mills' there. Killick was Hamerton's son-in-law and had been at the mills when they burnt down in 1796. Presumably he had reached terms with either the trustees appointed in Hamerton's will or with the London Flour Company, it is not clear which. It is also possible that it was Killick who finally rebuilt the mills.³⁸

All that can be said with certainty is that the waterworks were definitely supplying customers once more as early as April 1798, but that of the corn mills, it can only be noted that they were definitely working by 1802. Before that it can only be surmised.

In 1808 Killick insured his stock and utensils in 'his Water Corn Millhouses adjoining and communicating brick and timber and tiled having two kilns, communicating only by two iron pipes'. No waterworks are mentioned in this description, but a further description is provided in the 1821 legal case which does mention the waterworks:-

a large Building chiefly of Wood on a Brick foundation, with a Slate Roof containing the Waterworks and a Corn Mill with Ware & Stor rooms . . . 2 waterwheels one of which is used for the purpose of the Mill and the other supplies the Waterworks as well as turns the Mill and also moves an Engine for boring pipes for the Waterworks

The buildings had already taken on that configuration depicted in the map of 1829 which is reproduced in Figure Two. One obvious difference with the works built in 1762 is that the water tower was no longer required.³⁹

Killick was declared bankrupt in 1809, but he rode out the storm, paid a final dividend in 1816, and was still working the mills and waterworks in 1821 when the 61 year lease came to an end. However, he was not in possession of the expiring lease, as it was in fact held by a John and James Surrey.⁴⁰

These two had been described as millers of Silver St., Edmonton in 1802, but from 1805 onwards they were based at mills in Rotherhithe, being described variously as millers or biscuit bakers. In December 1817 these mills were burnt down, and a report of the disaster noted that the mills were 'of great importance to the poor of Southwark, whom it supplied with bread at a much lower rate than the market price'.⁴¹

This statement might suggest some link with the philanthropic company set up in 1800, however tenuous, and might explain how they held the lease. On the other hand it could have come into their possession either during Killick's bankruptcy or directly from the trustees of Hamerton's will. No definite statement can be made without further evidence.

Whatever the case, disputes arose as the end of the lease on Lady Day (25 March) 1821 drew near. The Surreys wished to renew their lease and retain an interest in the works; William George Daniel Tyssen (who had succeeded in 1814) insisted that the 1760 lease was a building lease and that he was to take over the buildings and property on its expiration; Killick too wished to protect his investments by taking out a new lease.

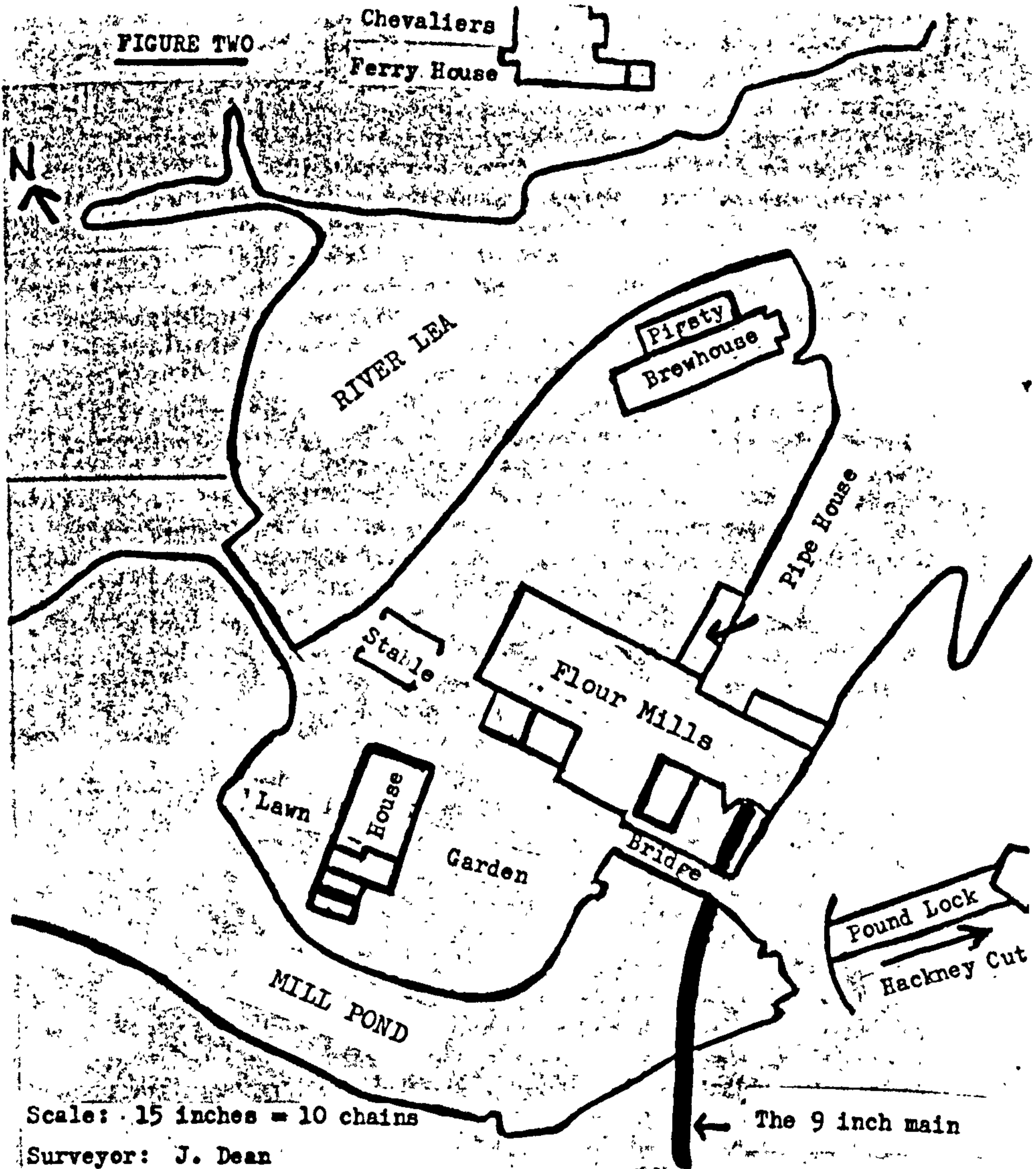
An additional factor was the growth of other competing water companies. Whereas the Hackney company had remained a localised enterprise supplying areas within the parish of Hackney, the first decades of the nineteenth century witnessed the expansion of both the New River Company and the East London Waterworks Company into the area. Both these companies had begun to supply houses within the parish, before they reached an agreement in 1815 which limited future geographical and price competition. The smaller Hackney company was not involved in this agreement, and indeed in 1816 made 'an active Canvas' to win new customers and maintain their old.⁴²

As early as June 1819 Richard Dann, a director of the East London company, had suggested to Tyssen that some agreement should be reached to allow the takeover of the Hackney works, but, to Dann's disgust, his fellow directors were not prepared to take any initiative.⁴³

Then in September 1820 the Surrey brothers approached the East London company, and offered to discontinue Hackney waterworks in return for £5,000. They stated that if this offer was not taken up, they would approach Parliament for powers to raise more capital, erect a steam engine to raise water, and expand supplies beyond the parish of Hackney. They asked for a reply within ten days.

A special meeting of the East London Waterworks Company was held a couple of days before this deadline to consider the offer. However, other matters were debated instead, and consideration of the offer was postponed,

FIGURE TWO



Scale: 15 inches = 10 chains

Surveyor: J. Dean

Lea Bridge Waterworks in 1829

as they informed the directors, because several directors had been absent from town. Notice was then placed in the London Gazette that 'the proprietors of the Hackney Water-Works, or some of them' intended to obtain an Act of Parliament.

This was a bluff. The brothers approached the East London company once more in January 1821, but once more met with a rebuff. The East London company were in a poor financial state at the time, but the real reason for these persistent refusals to get involved was that they were well advised of the weak position of the Surrey brothers.

They knew that Tyssen intended to re-possess the works, and may have been aware that as early as February 1820 Tyssen had signed a new lease with Killick, a lease which was to commence on the day that the old lease expired.

The terms of this 31 year lease involved Killick in spending £2,000 on repairing the mills and £2,000 on repairing other parts of the enterprise. In November 1821 Tyssen then had to allow Killick a further £1,050 to compensate for the dilapidated state of the works. It was this very state of disrepair which had determined Tyssen not to renew the Surreys' lease.

There may be some question concerning the probity of the Surrey brothers' approaches during this period. However, their arguments with Tyssen were settled by arbitration in April 1821. One other point to note is that at one stage they had mentioned 'Gentlemen... of the first consequence' who were prepared to act as guarantors, namely Messrs Scott, Garnett and Palmer of the Corn Exchange, a firm of corn-factors. Were these other proprietors of Hackney Waterworks?⁴⁴

In October 1821 James and John Surrey were declared bankrupt, but they had paid out a final dividend by July 1822. After this the brothers are noted in an 1825 directory as biscuit-makers of Rotherhithe, but not in other directories. Then in 1828 John Surrey is listed by himself as a flour factor at Wapping Steam Mills.⁴⁵ Further details of their activities may provide more information about the waterworks, the role of the proprietors, and of Killick's exact position before 1821.

On taking over the lease Killick seems to have come to some form of informal agreement with the East London company, for in January 1822 they wrote to him expressing surprise that he was breaking their understandings. In March 1824 it was further reported that Killick was replacing the wooden main between Lea Bridge and the reservoir at Clapton with a 9" iron main, and was replacing some of his other wooden mains with iron pipes. In addition he was known to be looking for extra capital to expand his works and introduce a 20 h.p. steam engine, and had already poached some customers away from the East London company.

The steam engine was never introduced, but the East London company were sufficiently worried by these developments to order an investigation into how much it would cost them to lay new pipes into Hackney to compete for Killick's customers. A war seemed to be in the offing.⁴⁶

In November 1824 however, Killick offered to sell his interests in Hackney waterworks to the East London company. He asked £18,000 for the mills and waterworks, or £10,000 for the waterworks alone. The company

were definitely interested, but when they arrived at Lea Bridge to inspect the works, they were informed that Killick had died that very morning. After a decent interval no doubt, negotiations continued with the son and heir, John, but in January 1825 these had broken down, the company not thinking it worth purchasing the waterworks on the terms demanded by John. It is not known whether his terms were different from those of his father.⁴⁷

However, within a few years the East London company were to finally acquire the Hackney works. These developments sprang from a Royal Commission in 1828 into the quality of the water supplied by the various companies serving the capital. This Commission made no specific recommendations with regard to the East London Waterworks Company, but the drift of their questions to the company's representatives showed concern that their supplies were taken from the Lea below the limit of the tidal influence of the polluted Thames.⁴⁸

Stimulated by this the East London company petitioned Parliament in February 1829. They referred to the doubts expressed by the Royal Commission, and admitted that their own water must be suspect because the Thames tide flowed up the Lea beyond the intake to their reservoirs and they took water in on the ascending tide. They thus sought leave to introduce a bill to allow them to take water out of the Lea above the tidal limit, 'between the Lea Bridge Mills . . . and Old Ford Lock'.⁴⁹ Their intentions at this date are shown on a map in the Rose Lipman Library. They did not wish to purchase Hackney waterworks, they just wished to take water out of the Lea just below the Lea Bridge Mills.⁵⁰

When the bill was submitted, both Tyssen and Killick submitted petitions opposing the scheme, with the sole intent, as the East London company opined, to achieve some personal benefit. Whatever the case, the company changed their plans, and in April 1829 resolved to purchase Hackney waterworks. By the following month initial agreement had been reached with Killick and Tyssen, and the bill before Parliament was redrafted to give the company powers to purchase the mills and waterworks.⁵¹

The ensuing purchase was not effected without dispute, however. After valuation of the estate the East London company offered Killick £4,000 for the remainder of his lease, but Killick was of the opinion that it was worth £20,000, generously offering to settle for £15,000. When the decision to go to arbitration was taken in August 1829, Killick immediately increased his valuation to £30,000.

He was not just awaiting developments. The East London company were concerned to hear reports that he was busily improving the property whilst waiting for the arbitrators to arrive, and they made some comment about the special efforts he had made to display a thriving business to the arbitrators. They were also annoyed that Killick had refused entry to the engineer hired by them to take a survey, Joseph Cubitt. For their part the company began to emphasise that the advent of steam was rapidly devaluing any property which still relied on water for its power.

Eventually the arbitrator gave his valuation in July 1830. He awarded Killick £10,830 for the remainder of his lease, and instructed the company to pay all costs. Even then Killick dragged his feet. He failed to turn up to sign documents, argued over the fixtures and fittings, and made a final plea to be

allowed to stay on at the dwelling house next to the mills. But by November they had gained complete possession of the property.⁵²

One reason that Killick offered for his unwillingness to quit was that he had not yet found alternative mills. Whether he did has not been discovered, but every year between 1828 and 1836 he was listed in the annual Post Office London Directory as John Killick, flour-factor, Jacks Coffee House Marks Lane. The edition for 1837 has not been consulted, but he was missing from the 1838 directory.

The East London company also had to reach agreement with Tyssen over the purchase of the property. No details of these negotiations are minuted, except that in March 1832 they had been completed, and that £271 2s 6d had been expended on the necessary stamp duty.⁵³

From these negotiations some idea of the enterprise during its last years can be gleaned, and Figure 2 provides a plan of Hackney Mills as they stood in 1829.⁵⁴ Robinson writing shortly after the purchase described the estate thus: 'The Lea Bridge Mills were employed for grinding corn, and a small portion of the power (amounting to about eight horses) was used occasionally to supply water, about 600,000 barrells being raised annually'.⁵⁵

An inventory provided by Killick, and a report made by Thomas Wickstead, the East London company's engineer, provides additional detail. The mills had two waterwheels, a breast-shot wheel equivalent to 20-24 h.p., and an undershot wheel of 8-12 h.p. There were 7 pair of french stones for the grinding of corn and a carpenters shop with a water-driven saw and lathe. The water was raised out of the river for distribution by means of 'a three throwed 8 inch forcing engine with crank' and a '9 inch three throwed lifting engine', with the necessary suction and delivery pipes. The water was carried from the mills to Clapton by the 9" iron main that Killick had laid in 1824, and was distributed from the reservoir by a mixture of wooden and iron pipes. One point to note is that Wickstead said the pumps were out of repair when the estate was taken over, but that he thought them capable of raising 7,740 barrells every 12 hours.⁵⁶

Killick had stated that his waterworks had an income of £780 from rents alone, and the East London company accepted this figure, though noting that the poundage allowed the collectors would diminish this total. Killick also provided a complete list of his clients, but no trace of this list has been found in the Thames Water Authority's stronghold.⁵⁷

Having acquired Hackney waterworks the East London company began to put their plans into effect. By May 1834 they had completed the canal from their new intake at Lea Bridge down to their reservoirs at Old Ford, and thus secured the better quality water they sought.

The customers of the Hackney enterprise continued to be supplied from Lea Bridge, but changes were made to these works during the decade. Initially the Clapton reservoir was withdrawn from use, and the customers were supplied direct from the river by means of an 18" main which replaced the 9" iron main. By October 1833 the flour mills had been pulled down, but it was not until 1837 that the waterworks itself were refurbished and expanded.

In that year a new mill was erected, with 2 water wheels and 4 pumps, with a total power of 50 h.p. capable of raising 13 million barrels a year. Part

of this water was raised to a new reservoir at Stamford Hill which was opened that year, in order to allow the water to settle before distribution.⁵⁸

It was not until after the cholera outbreak in East London in 1866, and its subsequent association with supplies of water at Old Ford from the tidal Lea, that the East London Waterworks concentrated its pumping activities and reservoir capacity on the site at Lea Bridge.

ACKNOWLEDGEMENTS

I would like to thank the Thames Water Authority for access to and permission to quote from their private archives, and to Mr. Damonsing for his courtesy in showing me these archives. Thanks also to Ms. Roberta Lewis for drawing Figure 1.

NOTES

1. W. Robinson, *History & Antiquities of Hackney* (1842-3, 2 vols), i. 304, 314, 322-3; Public Record Office, PROB 11/518(278); W. R. Scott, *The Constitution and Finance of English, Scottish and Irish Joint-Stock Companies to 1720* (1910-12, 3 vols), iii. 5, 435-42; Cal. S. P. Dom., 1690-1, 207, 422, 459, 505, 522. His father, Francis Tyssen I was a London merchant born in Flanders and naturalised in 1660.
2. London Borough of Hackney Library Services, M1280; *ibid.*, D/F/TYS 35 fos. 83-91; GLRO, M79/2H/112/1-2.
3. A legal case drawn up in 1821 states 1700, but it is obvious that little was known of these original works at this date. John Strype, in a book published in 1720, states that it was built by Mr. Tyssen, late lord of the manor. In 1720 such a description would fit Francis III who had died in 1717, but Strype could have written the comment long before publication, so it could refer to Francis II who died in 1710; GLRO, Acc. 413; J. Strype, *A Survey of the Cities of London and Westminster* (1720, 2 vols), ii. 123.
4. City of London Record Office, Repertories, 112 fo. 96; *ibid.*, 14 fo.6; GLRO, THCS 60, Court of Sewers, 13 January 1708, 10 February 1708; GLRO, M79/LH/122/1.
5. London Borough of Hackney Library Services, D/F/TYS 12/1.
6. J. Strype, *op. cit.*
7. PRO, C38/374.
8. PRO, PROB 11/518(278); *ibid.*, PROB 11/561 (222).
9. Thames Water Authority Stronghold, Box 81 no. 354; J. Strype, *op. cit.*; PRO, C38/374; GLRO, M79/LH/122/1.
10. PRO, C38/374.
11. Hertford Record Office, Borough of Hertford Records, Vol. 36 fos. 581-4; *ibid.*, Vol. 39 fos. 23-9.
12. CJ, xix. 526.
13. The 1821 legal case states that it was thought that the works fell into disuse about 1730, but admitted that it was not known whether the works were rebuilt after the Chancery case. In 1735 Robert Seymour described the waterworks in his Survey. However, his description is copied word for word from John Strype's book published in 1720. I think the polite phrase is that it must be treated with scepticism; GLRO, Acc. 413; R. Seymour, *A Survey of the Cities of London and Westminster, Borough of Southwark and Parts adjacent* (1725, 2 vols), ii. 780.
14. B.M. Add. Mss. 36153 fos. 141-8; R. Sedgwick, ed., *The History of Parliament. The House of Commons 1715-54* (1970, 2 vols), ii. 519-20.
15. CJ, xxix. 154, 205. No mention was made of any existing or past local waterworks.
16. M79/LH/127/3. This document came to this writer's notice too late to pursue the names of the other adventurers in probate records or directories.
17. *ibid.*
18. Mortimer's Universal Directory 1763; PRO, PROB 11/1125 (37).
19. CJ, xxix. 154, 205.
20. GLRO, BRA 723/44.
21. London Borough of Tower Hamlets Library Services, Local History Collection 980.

23. PRO, RAIL 843/2, Minutes 23 November 1761, 21 December 1761, 18 January 1762, 13 February 1762; CJ, xxix. 154, 205.
24. PRO, RAIL 845/2, Minutes 15 March 1762, 19 April 1762, 19 May 1762, 11 December 1762; GLRO, M79/LH/127/3.
25. London Borough of Enfield Library Services, *The Report of Smeaton, Engineer, upon the New-making and completing the Navigation of the River Lee, from the River Thames, through Stanstead and Ware to the Town of Hertford*; another copy, Bodleian Library, Gough Maps 17; revised report submitted to Parliament in 1767: *Reports of the Late John Smeaton* (1812-4, 4 vols), ii. 155-63; 7 Geo III c. 51.
26. PRO, RAIL 854/4, Minutes 18 June 1768, 29 July 1769.
27. Science Museum Library, Simmons Collection 2/85.
28. W. Robinson, op. cit, i. 71; see also: G. A. Walpoole, *The New British Traveller* (1784), 287.
29. Simmons, op. cit; London Gazette (1790), p. 262; Wilkes British Directory 1793. This last cites Richard Rogers of Lea Bridge as a member of the Baker's Company.
30. Gent. Mag. lxxvi (1796), 75; Times 15 and 16 January 1796; PRO, PROB 11/1350 (794).
31. A. B. Beavens, *The Aldermen of the City of London* (1913, 2 vols), i. 139; Gent. Mag. lxx pt. 2 (1800), 1113-4; C. Welch, *History of the Worshipful Company of Paviers* (1909), 55-6.
32. GLRO, Acc. 413; A. E. Richardson, *Robert Mylne, Architect and Engineer, 1733 to 1811* (1955); Rennie's biographer makes no mention of this consultancy, and the pocket books kept by Rennie which could provide further information are no longer at the private address cited: C. T. G. Boucher, *John Rennie, 1761-1821* (1963).
33. Annual Register, April 1798, Chronicle p. 31.
34. London Directory 1798.
35. Gent. Mag. lxx pt. 2 (1800), 1113-4; 39 & 40 Geo III, c. 97; D. MacPherson, *Annals of Commerce* (1805, 4 vols), iv. 500.
36. Times, 12 December 1801.
37. O. Manning & W. Bray, *The History and Antiquities of the County of Surrey* (1810-14, 3 vols), iii. 539-40.
38. Holden's Triennial Directory 1802-04; Simmons, op. cit; PRO, PROB 11/1350(794).
39. Simmons, op. cit; GLRO, Acc 413.
40. Ibid.
41. Holden's Triennial Directory 1802-04; Holden's Triennial Directory 1805-07; Kent's Directory 1811; Johnstone's London Commercial Guide 1818; Robson's London Directory 1820; Gent. Mag. lxxxvii pt. 2 (1817), 624; Times, 15 December 1817.
42. East London Waterworks, v. fo. 125; *ibid*, vi fo. 259; *ibid*, vii fos. 78, 81; Report of the Select Committee appointed to inquire into the past and present state of the Supply of Water to the Metropolis' (1821).
43. ELW, viii fos. 435, 458.
44. ELW, ix fos. 415, 422, 430-1, 436; *ibid*., x fos. 15, 19, 28-30, 34-5; *ibid*., xviii fos. 132-3; London Gazette, July - December 1820, pp. 1801, 1828, 1852; Report of 1821 Select Committee, op. cit, p. 62; GLRO, Acc. 413; Triennial Directory 1817-19; Pigot's Commercial Directory 1826-7.
45. ELW, x fo. 100; London Gazette, July-December 1821, p. 2085; *ibid*., January-June 1822, p. 1010; Kent's Directory 1825; Post Office Directories, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829.
46. ELW, x. fo. 377; *ibid*, xii fos. 284, 471.
47. ELW, xiii fos. 82, 83, 107, 209; PRO, PROB 11/1696 (147). Killick described himself as a miller. A witness to the will was Robert Death, miller, Lea Bridge.
48. Report of the Commissioners appointed by his Majesty to inquire into the State of Supply of Water in the Metropolis (April 1828); see also Select Committee Report. July 1828. In evidence to the Royal Commission the New River Company expressed a wish to take water from the Lea near Lea Bridge. They were later to purchase Tottenham Mills instead.
49. CJ, lxxxiv. 58.
50. London Borough of Hackney Library Services, 912.1840.
51. CJ, lxxxiv. 88, 123, 169, 210; ELW, xvii fo. 519; *ibid*., xviii fos. 2-3, 258ff; 10 Geo IV, c. 117.
52. ELW, xviii fos. 94-101, 132-3, 134-6, 143, 148, 172, 185, 205, 218, 258ff, 306, 464; *ibid*., xix fos. 151, 310, 318, 374, 400, 412, 421, 439, 457, 496; *ibid*., xx fos. 38, 40, 55, 78.
53. ELW, xxi, 1 May 1832.
54. London Borough of Hackney Library Services, 912.1829.

56. ELW, xviii fos. 94-105; *ibid.*, xx fo. 40.
57. ELW, xx fo. 134. Some clients and areas supplied by Hackney waterworks included:- Homerton, College Street, John Street, Hockley Street, London Lane, The Grove, Almhouses Grove, Silvester Row, Jerusalem Square, Clapton Square, Clapton Alley, - Laura Place, Dalston Lane, beyond the Coach & Horses Homerton, from end of Hackney plug to the Nags Head; Orphan Asylum, Clapton Turnpike: ELW, xviii fos. 94-101.
58. ELW, xxi fo. 511; *ibid.*, xxiv fo. 459; Report of Select Committee on Metropolis Water (1834); Robinson, *op cit.*, 1. 49-50; H. W. Dickenson, *'Water Supply of Greater London'* (1954), 89-92.

Article 2

History of Technology, Vol 4 (1979)

The Waltham Pound Lock

K.R. FAIRCLOUGH

In 1571 an Act of Parliament was passed 'for the brynging of the Ryver of Lee to the Northside of ye Citie of London'.¹ This act, sponsored by the city authorities, gave details of plans proposed by the aldermen for building a new cut from the River Lee, through Hackney and Shoreditch, to terminate just outside the city walls near Moorgate. Once this canal had been completed, the aldermen further proposed that improvements be carried out along the existing river between Ware and the mouth of their new cut.

These ambitious plans, however, were never carried out. During the committee stage of the bill's passage through the House of Commons, several important additions and alterations were made to the original draft, the most important of which was the insertion of a veto on the right to collect tolls for using either the improved river or the new cut. Such a veto meant that the City was unable to finance the canal and although the scheme was not shelved immediately it became obvious within a couple of years that the project could not go ahead.

Interest in improving the Lee had been awakened, however, and on 27 September 1574 a Commission of Sewers was appointed to improve the navigation on the river² in order that it might become an important artery along which grain, meal and malt could be brought to the capital. John Norden ascribes this later initiative to 'the instant suyte of the inhabitants of Hartfordshire'³ who saw that an improved navigation would allow them to capture an important share of a trade which had previously been dominated by land carriers known as 'badgers'.

There is no evidence to suggest that the Commissioners ever seriously considered building the new cut to Moorgate; instead they concentrated on improving the existing navigable channel. They scoured and cleaned this channel, ordered the removal of all fishing weirs and impediments to navigation, raised all bridges over the river to allow the barges more headroom, laid out a rough towpath which included towing bridges, and came to a series of differing compromises with the many millers in the valley whereby they were to take water out of the river without the use of any flash locks which would hold up the passage of the barges.⁴ Though these improvements were much less ambitious than those originally proposed by the City, they were nevertheless extremely successful. Within four or five years of the Commissioners' appointment the river had been substantially improved and an expanding barge traffic was already arousing the opposition of the badgers.

The most ambitious task undertaken by the Commissioners was the construction of a pound lock at Waltham and it remains their best-known

work for it was the first pound lock in England to be equipped with mitre gates at both ends. The only earlier pound locks known in England were those built between 1564 and 1567 by John Trew along the River Exe. These were constructed as large pools in which several boats could lie at once. Mitre gates were used at one end only; at the other end were single guillotine gates.⁵

The Waltham lock is described in a poem written by William Vallans some time during the 1580s.⁶ In it two swans make a journey down the River Lee and one of the many sights they marvel at is:

But newly made, a waterwourke: the locke
Through which the boates of Ware doe passe with malt.
This locke containes two double doores of wood,
Within the same a Cesterne all of Plancke,
Which onely fils when boates come there to passe
By opening of these mightie dores with sleight,
And strange devise, but now decayed sore.

Before the Commissioners began their work barges navigated the river above Waltham by means of a flash lock which stood across the main stream about three-quarters of a mile above Waltham High Bridge. When shut, this flash lock diverted water out of the river into the head stream of Waltham Mill. Since few barges navigated the river at this time the flash lock was usually shut and consequently, it was later claimed, 'the auntient Channell did decay for lacke of Continuall corse of Water and soe did become unpassable for Boates'.⁷

The Commissioners, however, chose not to scour and cleanse this traditional channel, but rather to open a new route. They ordered that 'the passage of the Boates shold be directed to passe by the sayde Mill-streame And for that purpose that a newe Cutt shold be made from the sayde Millstreame somewhat distaunte from the sayde Mill towardes the North unto the old River towardes the West', and that along this new cut 'a newe devised Lock to Cawse the water to swell upp wherby Boates may passe and repasse betwixt the sayd river of Ley and the water belonginge to the Mill' be constructed.⁸

To complete the arrangements for this new route the Commissioners further decreed that the old flash lock be pulled up and replaced by a 'loweshare of three foote and a half highe from the bottome of the river for the forcinge of the water to his (Edwards Denny's) sayde Milles and yett not be suffered to be anie higher for that all white and superfluous waters may passe that way for the drayninge of the groundes adioyninge and keepinge open of the olde channell'.⁹ As a precaution the Commissioners added that the bargemen were to have the right of pulling up this loweshare and using the traditional channel, if, for any reason, they were unable to use the newly opened route. This particular proviso was to assume great importance later when (in 1592) disputes arose and riots ensued over the rights of navigation through Waltham.

In October 1576 the Commissioners were still debating which route to take through Waltham.¹⁰ Yet by October 1577 they were meeting to discuss the completion of their work in the area. Thus the pound lock must have been built some time during the spring or early summer of 1577 and not earlier as is usually stated.

Besides discussions about the route the Commissioners seem to have considered at least two alternative plans for the construction of the lock. A surviving estimate of costs,¹¹ reproduced in full in the Appendix, provides a rather inadequate comparison between the cost of building the lock entirely of wood, and an alternative proposal whereby the walls of the pound would be built of stone. Vallans' poem suggests that the Commissioners chose to build entirely with wood but no firm evidence remains to throw light on the reasons for such a choice.

The estimate itemizes the different sections of the lock and calculates the amount of timber necessary for each section. Although the arithmetic is not quite correct a total of 44 loades of timber is estimated and it was reckoned that the cost of this timber and the associated carpentry work would be £40 5s. 0d. No allowance, however, is made for any mechanism to open the doors nor for any paddles or other devices to let water into the lock when the gates were shut. The estimate for the lock built with stone walls is even more incomplete, although it does seem likely that this would have been the more expensive piece of work.

if it be don with timber	Tymb xliiij lodes at x ^s Sawinge + Carpenters woorke	xxii ^{li} xviiij ^{li}	v ^s
		xl ^{li}	v ^s
the same with stone	Tymber xxiiij lodes Lyme viij lodes at 16.8 Sand xvj lodes at ii ^s The walling Carpenters woork Stone	xii ^{li} vi ^{li} viiij ^{li}	xiii ^s iiij ^d xxxii ^s
		xxviiij ^{li} [sic]	

In addition it was estimated that the digging of a new cut, 36 poles in length,¹² would cost a further £48, while heightening Waltham High Bridge by two feet would cost £4. These estimates, however, turned out to be much too optimistic. Though the total estimated cost of the work was given as £88 5s. 0d. beforehand, the actual cost was reported to be £271 18s. 0½.¹³

Assuming that the wooden lock was built according to the specifications laid down in the estimate, the reconstruction shown in Figures 1a and 1b indicates how the frame of the lock was constructed.¹⁴ First, timbers known as 'grounsylles' and 'gysses' (joists) were laid in the bed of the cut to provide a foundation upon which to fix the frame of the

The Waltham Pound Lock

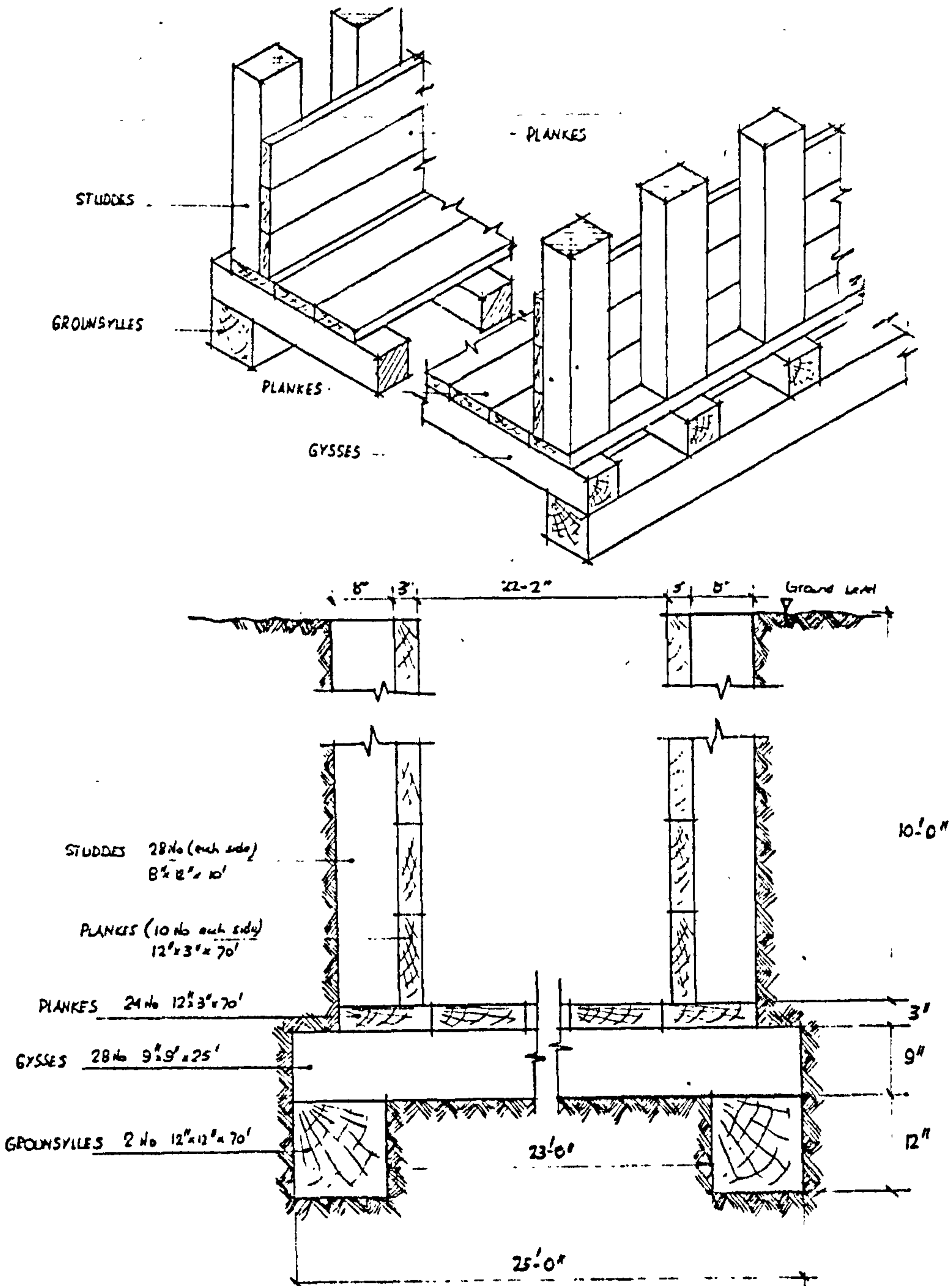


Figure 1. Pound Lock, Waltham Abbey, 1576.

(a) Isometric view (b) Central cross-section.

lock. The floor and walls of the enclosure were made up of planks, each measuring 70 feet by 1 foot by 3 inches, laid side by side. The floor planks were nailed to the 'gysses', whilst the wall planks were nailed to vertical 'studdes' which were fixed at regular intervals along the sides of the lock. In this manner a frame 70 feet long, 24 feet broad, and 10 feet high was built up, and at the ends of this frame posts were fixed from which the four gates were hung.

Vallans mentions that the gates were opened by a 'sleight and strange devise', but unfortunately the estimate gives no idea what this might have been. Conceivably chains were used because in 1581 it was alleged that 'Aron Yong of Waltham Abbey Tailor solde a chayne that belonged to the said lock to one Davie of Waltham Cross smyth for sixe pence'.¹⁵ On the other hand such a chain might have been used to lock the gates so that they could not be opened except with the cooperation of the miller.

It seems likely that the Commissioners opened this new route after representations from the owners and occupiers of Waltham Mill for it was the owners who were made to bear the cost of the new cut and lock. The mill was owned by the Denny family as part of the manor of Waltham. At the time of the alterations Henry Denny had just died and his heir, Edward Denny, was still a minor and as such a Ward of Court whose interests were looked after by Queen Elizabeth. In view of this the Commissioners at their meeting in the Star Chamber decided that the cost of the work should be split equally between the executors of Henry Denny's will and the Queen in her role as Edward's guardian. All further costs of maintenance were to be borne by the miller, Thomas Perrott, during the remaining term of his lease after which they became the responsibility of Edward Denny and his heirs.

Since it was also reported that, despite their previous orders, the old flash lock was still standing, the Commissioners further decreed that the miller was to pull it down and build a loweshare by 14 February 1578 or else face a fine of £10.

Within a couple of years, however, major problems had to be faced. In 1579 full-scale repairs had to be carried out and the fact that the cost of this work was borne by the Treasury rather than the miller does suggest faults in the original construction. From hints in an account book¹⁶ detailing these repairs it seems that one side of the wooden foundations had settled so far into the bed of the new cut that the lock had become lopsided. To rectify this the Commissioners were forced to close down the new cut so that the lock could be dismantled and masonry foundations constructed. The wooden frame was then replaced on top of these new foundations.

On the back of the account book a total cost of £96 13s. 3d. is recorded of which £40 6s. 9d. is attributed to 'redy money' and the remaining of £56 6s. 6d. to 'bills of Woork'. No further details are given about the 'redy money' but the account lays out in great detail the various charges which

constituted the 'bills of Woork'. These include the wages paid, the amounts spent on transportation and sums for many small items such as nails and planks, the need for which must have arisen during the actual course of the reconstruction.

Work commenced on 18 May 1579 and was completed by 13 June. During the first few days temporary dams were built and preparations made so that five carpenters could be employed at 'pulling upp the plankes and laiiing them agayne'. In between two masons and their assistants were employed to lay the masonry foundations. These carpenters and masons, being skilled workers, were paid 14d. per day.

Most of those employed, however, were unskilled men taken on either as general labourers or 'skavellmen'. The latter were so named because they were hired to bale out any water which seeped through the temporary dams using a tool known as a skavell. The two types of unskilled labour were interchangeable, men working at whatever job was available on any one day. Labourers worked during the day only while the skavellmen were needed right round the clock. Since the men were paid either 10d. or 12d. per shift it seems likely that they worked for either 10 or 12 hours and were paid at a rate of 1d. per hour, the variation in pay per shift not depending on the type of work done. Some men only worked the odd shift whilst others took advantage of the availability of employment to put in extremely long hours. One man, John Foster, earnt 9s. one week and 11s. the following, which means that in the second week he worked the equivalent of 7 day and 4 night shifts.

The account book also mentions that a Mr Trewe was paid £6 13s. 4d. for directing and overseeing the work. It is conceivable that this was the John Trew who was responsible for improving the River Exe. Such a high salary does suggest that he was being rewarded for professional skills over and above the mere ability to oversee a work-force. Whether he introduced any basic changes into the design or operation of the lock cannot be said.

The problems experienced with the Waltham lock arose no doubt because of the technical novelty of the work. The Commissioners, however, enjoyed far more success with their other improvements. Their success, however, only aroused opposition. Not only did the millers, the fishermen and the riparian landowners feel that their traditional rights had been interfered with but the local badgers felt that their livelihood was directly threatened. Traditionally grain and malt had been brought to markets in the lower Lee valley, particularly Hoddesdon, where local dealers and badgers bought it in order to resell in the London markets. This traditional pattern was threatened by a growing barge traffic, not only because barges could carry at cheaper rates, but also because markets further up the valley, particularly those at Ware and Hertford, could intercept much of the trade at the expense of Hoddesdon. The badgers, especially those living in Enfield, Cheshunt and Waltham, were to become the most persistent and vociferous opponents of the navigation.

In 1580 the badgers petitioned Lord Burghley requesting that the navigation be closed down. He advised them that he did not have the necessary authority and suggested that they approach Parliament instead. This they did but before their petition could be heard Parliament was prorogued.¹⁷ Having failed by legal methods the badgers turned to violence and during the summer and autumn of 1581 destroyed many of the works along the river. A full-scale enquiry was held at which the badgers were given full opportunity to express their grievances. Nevertheless the Commissioners obtained the authority to carry on with their work without any of the badgers' objections being met. It was felt that the national interest warranted the expansion of barge traffic along the Lee even though it was admitted that the badgers did suffer as a result. For the rest of the decade the badgers continued to petition the authorities but to no avail and so they turned once more to violence. The outbreak in 1592 was better organized and barges were forced to stop using the river while appeals to the authorities to restore the navigation were made. Once more the verdict was in the bargemen's favour.

During both outbreaks of rioting Waltham Lock was a prime target. In May 1581 an approach was made to an employee at Cheshunt Mill for the loan of a handsaw with which to damage the lock but come July the less energetic course of setting the lock on fire was preferred. William Shanbrooke journeyed to London to purchase 'Rosseyne and brymston' for a groat. The lock was eventually fired in August but the damage was not as severe as hoped. One local inhabitant, Christopher Pennyfather, told bargemen who were using the lock several days later that he wished there had been a barrel of gunpowder in the lock when it had been set on fire.¹⁸

In 1592, however, the lock was completely destroyed.¹⁹ In June of that year Edward Denny ordered his servants to dismantle the lock, to block up the new cut and to lower Waltham High Bridge to the height it had been prior to 1576. Denny argued that the Commissioners had made their alterations whilst he had still been a minor and therefore it could not be assumed that he had given his permission to changes affecting his freehold property and traditional rights. There were, however, veiled accusations that he had received money from the badgers to encourage him to take the steps he did. Whatever the case, however, his orders were quickly carried out.

Deprived of access to the new route the bargemen tried to take advantage of the provisions made by the Commissioners for just such a contingency. When, however, they tried to pull up the lowshare and proceed down the old river channel they met with violent opposition from large gangs of badgers and other local inhabitants who had gathered on the banks to thwart the bargemen's efforts. Throughout the summer, autumn and early winter, the violence continued. Boats were damaged, one was even sunk, and men on both sides suffered injuries. Eventually the bargemen found it impossible to continue, so once more they had to appeal to the central authorities for help.

In their case before the Star Chamber, however, the bargemen made no complaint whatsoever about the destruction of the pound lock; they concentrated solely on establishing their rights to use the original river channel. Indeed the destruction of the lock is only mentioned in passing by one of Edward Denny's servants under cross-examination. This suggests either that the bargemen felt their case to be stronger if they accepted Denny's arguments about his freehold property and concentrated on their own traditional rights, or that they were dissatisfied with the workings of the lock. Unfortunately there is no evidence to establish conclusively which was the case.

Though the bargemen succeeded in reopening the navigation the pound lock was never rebuilt. This was because the navigation reverted to the traditional route and the new cut in which the pound lock had stood was no longer used. The remaining evidence is incomplete²⁰ and on some points contradictory, but what does emerge is that soon after the end of the Star Chamber case some form of compromise was effected between Denny and the bargemen.

The evidence definitely establishes that Edward Denny built a turnpike, in fact a flash lock, at which he collected a toll of five shillings from each passing barge. This turnpike was still in existence in the eighteenth century despite many complaints from the bargemen that the lords of the manor of Waltham had no right to collect such a toll. The position of the eighteenth century turnpike on the map (Figure 2) is taken from a contemporary survey²¹ but the turnpike which Denny built must have been roughly the same position, as must also the flash lock which was replaced by a lowshare in 1576–7. In evidence before a 1682 Commission of Sewers²² certain local inhabitants claimed that Denny had built a new cut of over a mile in length in which the turnpike was sited but this seems very unlikely. It is much more probable that the old river channel was scoured and cleaned and that local memory had confused the measures taken by the Commissioners of Sewers in 1576–7 with those taken by Denny after 1595.

The confused evidence given to the 1682 Commission also mentions a 'Longe Poole very neere the said Corne Mills' through which barges had passed prior to the making of Denny's turnpike. P.J. Huggins²³ has already suggested that this 'Longe Poole' must have been the same as the cut built by the Tudor Commissioners and this is confirmed by measurements taken in the area. The new cut was said to have been 36 poles in length,²⁴ which would have made it just under 200 yards if it is assumed that 1 pole equals 16½ feet. This approximates to the distance along the 'Longe Poole' as it is shown on the map in Figure 3. Any cut between the mill stream and the river beginning at a point any further up the mill stream would have been some 40–50 yards longer. It thus seems indisputable that the pound lock was situated at the place marked on the map.

There is no trace of this 'Longe Poole' today and it seems unlikely that.

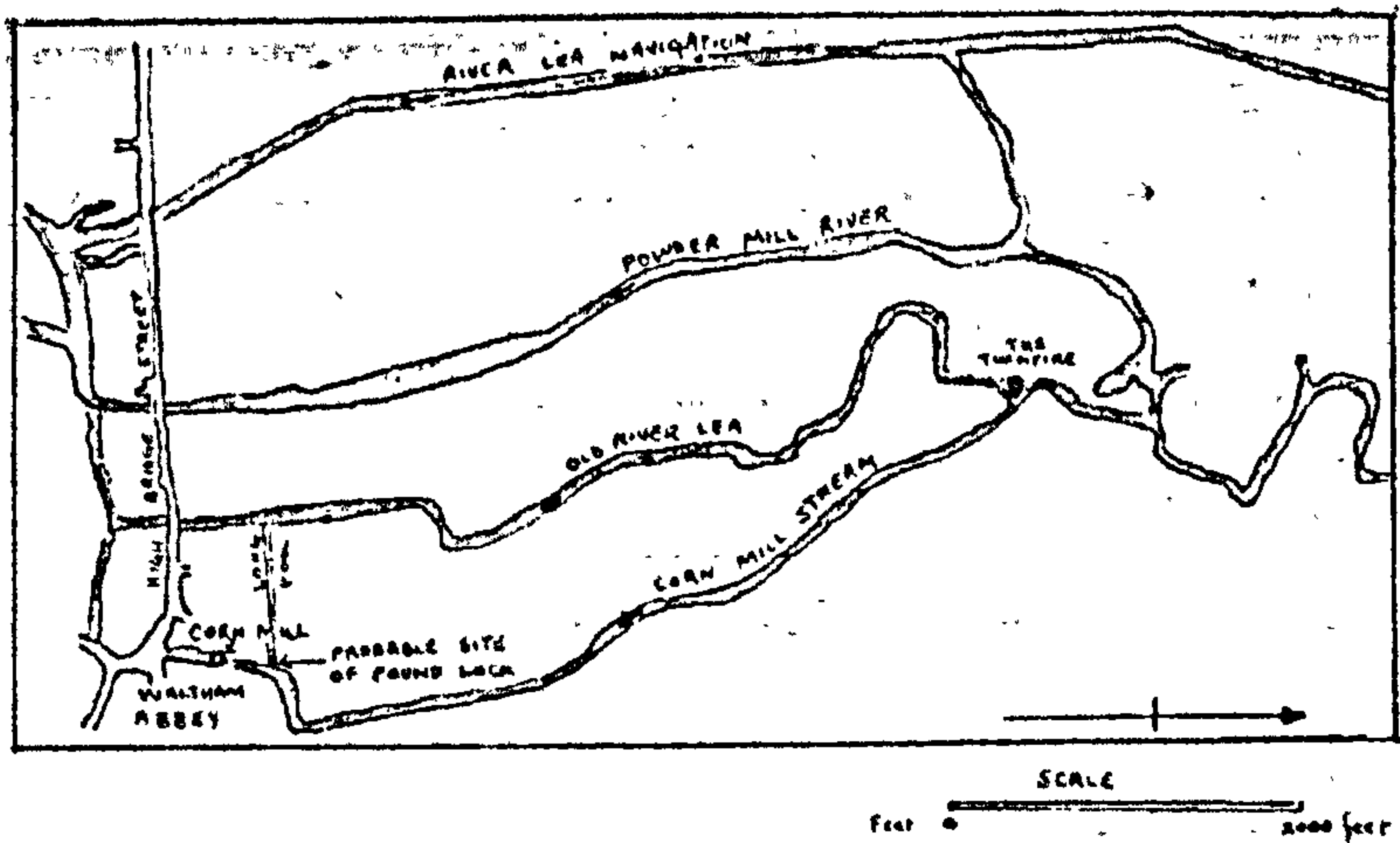


Figure 2. Branches of the River Lee near Waltham Abbey showing the site of the pound lock and of the turnpike. From a contemporary survey.

any remains of the lock would be found even if the site were excavated. However there is evidence that barges could still use the 'Longe Poole' until well into the eighteenth century. Notes in the margin of the 1682 Commission of Sewers' records mention that barges used the route within living memory though they had to carry much lighter loads than if they had used the turnpike.

Appendix

The estimate of costs to construct the pound lock at Waltham is taken from Public Record Office, State Papers Elizabeth, Domestic Series, Vol. 109 no. 133. A modern English version follows the original.

26 November 1576

An estimate of the Charges of the newe Locke that shalbe made at Waltham yf yt be all of tymber as followeth, and beinge in leyngthe lxx foote and xxiiij foote in breathe

Imprimus xxviiij gysse to lye in the bottom, under the plankes, every gysse being ix enches square and xxv foote longe so every gysse will Conteyne xvj foote, one quarter of a foote whiche will amownte to ix Lodes of square tymber.

Itm for the bottom xxiiijth plankes, every planke Conteyninge lxx foote Longe, and one foote brode + iij enches thicke, so every planke will

Conteyne xvij foote &, whiche will amownte to viij Lodes xx foote of square tymbber.

Itm ther, moste be ij grounsylles, every grounsyll of lxx foote Longe and one foote square, which will Conteyne vij^{xx} foote of square tymbber, that is ij Lode, forty foote.

Itm for every syde ther moste be xxviiij studdes, every studd beinge xij enches brode and viij enches thicke and x foote heygh, so every studd will Conteyne vii foote in square tymbber, which will amownte to viij Lodes.

Item ther moste be ij peces of tymbber to Lay upon the sayd studdes, every pece of lxx foote longe, and one foote square, which is ii Lodes xl foote.

Itm every syde will aske x plankes every planke beinge lxx foote Longe, one foote brode, and iij enches thicke, so every planke will Conteyne xvij foote &, whiche will amownte to, for bothe sydes, vij Lodes of tymbber.

Itm the iij gates wth the postes to hange them upon, and Certeyne Lande keyes for the same, will aske vi Lodes of tymbber.

Suma of the Lodes of tymbber xliiij }
 every Lode Rated at x^s the lode } xxij^{li}

Itm the sawinge worke of all the foresayd tymbber will amownte to lvi hundred at xx^d the hundred iij^{li} xvij^s iij^d

Itm the Carpenters worke for the same Locke will Coste xx markes so that the Carpenter be put to no other Charge but onlye the framynge, and settinge upe of the same.

Itm yf the sydes and endes of the sayd Locke be made of stone or brycke, then the tymbber y' shale go to the same will amownte to xxiiij Lodes or ther abowtes.

Itm the workmanshipe of the same walle, beinge x foote heyghe, and iij foote thicke will Coste xvj^s a pole, so that the mason be putt to no other Charge, but onlye the Reysinge of the same walle, and the same worke will Conteyne by estimacon x pole, every pole being xvj foote.

Itm ther will go to the same walle viij Lodes of Lyme whiche will Coste xvj^s viij^d the Lode, whiche is vi^{li} xiiij^s iij^d.

Itm ther moste be to the same worke xvj Lodes of sande at ii^s the Lode, xxxij^s

Item the heyghtinge of the hyghe brydge at Waltham to Reyse yt ii foote hygher will Cost by estimacon iiij^{li}.

Item the Charges of the Cuttyng of the newe Cutte from the myll ryver to the ryver of Lee, which Conteynes xxxvi pole, every pole rated at xxvj^s viij^d the pole, whiche will amownte to xlviij^{li}.

if it be don with timber	Tymb xliiij lodes at x ^s Sawinge + Carpenters woorke	xxii li xviij li	v ^s
		xl li	v ^s
the same with stone	Tymber xxiiij lodes Lyme viij lodes at 16.8 Sand xvj lodes at ii ^s The walling Carpenters woork Stone	xii li vi li viiij li	xiii ^s iiiij ^d xxxii ^s
		xxviiij ^{li} [sic]	
	The heightening of the bridge The chardge of the Cut	iiij li xlviij li	
		lij li	

MODERN VERSION

26 November 1576

An estimate of the cost of the new lock that shall be made at Waltham if it be all of timber as follows, and being in length 70 feet and 24 feet in breadth

First of all 28 joists to lie in the bottom, under the planks, every joint being 9 inches square and 25 feet long so every joist will contain 16 feet and one quarter of a foot which will amount to 9 loads of square timber.

Item, for the bottom 24 planks, every plank being 70 feet long, and 1 foot broad and 3 inches thick, so every plank will contain 17+ feet, which will amount to 8 loads and 20 feet of square timber.

Item, there must be 2 ground-sills, every ground-sill of 70-foot length and 1 foot square, which will contain 140 feet of square timber, that is 2 loads and 40 feet.

Item, for every side there must be 28 studs, every stud being 12 inches broad and 8 inches thick and 10 feet high, so every stud will contain 7 feet in square timber, which will amount to 8 loads.

Item, there must be 2 pieces of timber to lay upon the said studs, every piece of 70-foot length, and 1 foot square, which is 2 loads and 40 feet.

Item, every side will require 10 planks, every plank being 70 feet long, 1 foot broad and 3 inches thick, so every plank will contain 17+ feet, which will amount to, for both sides, 7 loads of timber.

Item, the 4 gates with the posts to hang them upon, and certain 'Lande Keyes'† for the same, will require 6 loads of timber.

Total loads of timber = 44
every load rated at 10s. per load } £22

Item, the sawing work of all the aforesaid timber will amount to 56 hundred at 20d. the hundred £4 18s. 4d.‡

Item, the carpenters work for the same lock will cost 20 marks§ so that the carpenter be put to no other charge but only the framing, and setting up of the same.

Item, if the sides and ends of the said lock be made of stone or brick, then the timber that shall go to the same will amount to 24 loads or thereabouts.

Item, the workmanship of the same wall, being 10 feet high, and 3 feet thick will cost 16s. a pole, so that the mason be put to no other charge, but only the raising of the same wall, and the same work will contain by estimation 10 poles, every pole being 16 feet.

Item, there will go to the same wall 8 loads of lime which will cost 16s. 8d. the load, which is £6 13s. 4d.

Item, there must be to the same work 16 loads of sand at 2s. the load, 32s.

Item, the heightening of the high bridge at Waltham to raise it 2 feet higher will cost by estimation £4.

Item, the charges of the cutting of the new cut from the mill river to the river of Lee, which contains 36 poles, every pole rated at 26s. 8d. the pole, which will amount to £48.

		£	s.	d.
if it be done	Timber, 44 loads at 10s.	22	0	0
with timber	Sawing & carpenters' work	18	5	0
		40	5	0

the same with stone	Timber 24 loads	12	0	0
	Lime 8 loads at 16s. 8d.	6	13	4
	Sand 16 loads at 2s.		32	0
	The walling	8	0	0
	Carpenters' work			
	Stone			
		<hr/>		
		28	0	0 [sic]
	The heightening of the bridge	4	0	0
	The charge of the cut	48	0	0
		<hr/>		
		52	0	0

Explanation of symbols (provided by Dr Norman Smith)

* One 'lode' of timber equalled 50 cubic feet.

† 'Lande keyes' probably means timber-work anchored into the ground to brace the posts; or, conceivably, it refers to some wooden device to open and close (hence key) the gates.

‡ The amount given is in fact incorrect, it should be £4 13s. 4d.

§ One mark was equal to two-thirds of a pound sterling, i.e. 13s. 4d.

Notes

1. 13 Eliz. 1 c. 18.

2. Bodleian Library, Rawlinson MSS, Essex 11.

3. John Norden's 'Description of Middlesex', British Library, Harleian MS 570.

4. For a full account of events along the Lee in the Elizabethan period, see my account 'The River Lee: A Tudor Experiment in River Navigation' shortly to be deposited with the Stratford Reference Library.

5. See A.W. Skempton, 'Canals and River Navigation before 1750' in Vol. 3, *A History of Technology* (ed. C. Singer *et al.*, London 1957, p. 456); Philip Chilwell De la Garde, 'Memoir of the Canal of Exeter 1563-1724' in the *Proceedings of the Institution of Civil Engineers*, Vol. IV, 1845, pp. 90-102; George Oliver, *The History of the City of Exeter*, Exeter 1861-84.

6. William Vallans, 'A Tale of Two Swannes. Wherein is comprehended the original and increase of the River Lee' [1590]; in J. Leland, *The Itinerary*, Vol. V, Oxford 1710.

7. In 1594-5 a manuscript book entitled 'Proceedings in the Star Chamber' was compiled by William Harte. It is now kept in the Guildhall Record Office. Besides giving the 1594 Star Chamber case in great detail, it also provides copies of many other ancient documents relating to the Lee. Folios 174-7 provide a record of a Commission of Sewers' meeting held in the Star Chamber on 19 November 1577. This is the only remaining evidence to the Commissioners' decisions relating to Waltham.

8. *ibid*

9. *ibid*

10. British Library, Lansdowne MS 22 no. 48. Thomas Fanshawe wrote to Lord Burghley that he had just visited Waltham 'to see whether passage might not be made from the mylne Dame thorough the towne by some of the chanelles there'.

11. Public Record Office, State Papers Elizabeth, Domestic Series, Vol. 109 no. 33.

12. *The Oxford English Dictionary* mentions a statute in 35 Eliz. 1 which defined a pole as being 16½ feet. If this measurement can be applied to this particular estimate then the length of the new cut would have been 176 yards.

13. Harte, *op. cit.*
14. I would like to thank Dr Norman Smith for his helpful discussion and Dr Denis Smith for drawing figures 1 and 2.
15. British Library, Lansdowne MS 32 no. 41.
16. Public Record Office, State Papers Domestic: Addenda 1580–1625, Vol. 27 no. 6.
17. British Library, Lansdowne MS 32 no. 40, paginated 109.
18. British Library, Lansdowne MS 32 nos. 35 and 41.
19. Harte, *op. cit.* folios 1–38 deal with the Star Chamber case.
20. British Library, Lansdowne MS 77 no. 16; British Library, Add MSS 33576 fo. 63; Public Record Office, Exchequer 178/4965; and Northamptonshire Record Office, WC 244.
21. Northamptonshire Record Office, YZ 6097.
22. Northamptonshire Record Office, WC 244.
23. P.J. Huggins, 'Excavations of a Medieval Bridge at Waltham Abbey, Essex in 1968', *Mediaeval Archaeology*, XIV 1970, pp. 126–47.
24. Public Record Office, State Papers Elizabeth, Domestic Series, Vol. 109 no. 33.

Early Gunpowder Production at Waltham

Keith Fairclough

Article 3

Essex Journal, Spring 1985 Vol 20(1)

...it is questionable whether the making of Gunpowder be more profitable or more dangerous, the mills in my Parish have been five times blown up within seven years, but, blessed be God, without the loss of any one man's life...

Thomas Fuller, curate at Waltham Abbey 1648-58¹

IT HAS BEEN ASSUMED previously that Fuller was referring to mills on the site at Waltham now occupied by the Royal Armament Research and Development Establishment². Sufficient contemporary evidence remains, however, to show that he was talking about gunpowder production at Sewardstone, a hamlet, which in the seventeenth century was still part of the parish of Waltham.

Gunpowder had first been made at Sewardstone Mills in the 1640s, whereas at Waltham production did not start until 1664 or 1665, after Fuller had died. Production was to continue at both sites for many years. Sewardstone Mills were converted to other uses shortly after 1715, but those at Waltham continued until an enemy land mine put the last powder mills out of action during the winter of 1940-41.

Gunpowder is made by combining saltpetre, sulphur and charcoal. Originally it was mixed with a pestle and mortar, but later, stamping mills, until they were banned as dangerous in 1772, or incorporating mills with edge runner stones were used. These mills were driven either by horses or water (Fig. 1).

Recipes varied according to the intended use of the gunpowder, but saltpetre was the most important ingredient. It usually made up about 75 per cent of the mixture. The best saltpetre was imported from India and Persia by the East India Company, but during the seventeenth century this supply was inadequate, and domestic production was necessary. Saltpetre men were unpopular because they had rights of access to all dovehouses, stables, cellars and similar properties to dig up earth, which was then mixed with animal excrement, lime and ashes, and watered with urine to obtain a less satisfactory and more expensive home product. The other raw materials were sulphur, imported from Italy or Sicily, and charcoal.

The industry was a dangerous one, and the various processes had to be physically separate so that accidents during one operation did not destroy the whole works, making remote and extensive sites necessary. The engraving of the Waltham works in 1735 (Fig. 2) illustrates this, as well as showing the large number of mills on one site. Further information is available in articles written by journalists who visited the works at Waltham during the last century.³

The Lea valley was a good location for the industry. It was close to London where the imported raw materials were brought and plentiful supplies of charcoal were available locally. In addition, the major customers, the Ordnance and the private merchants, were situated in London. The flood valley of the Lea provided many remote sites with an adequate supply of water to drive the mills and the river was a good and safe means of carrying both the raw materials and the finished product.

Surrey was the first centre of the industry⁴, both for political as well as economic reasons. During the reigns of

Elizabeth I, James I and Charles I government contracts and production monopolies had been granted mainly to those with interests in that county. At the turn of the century there had been some gunpowder production at the tidal mills in Stratford,⁵ but it was not until the abolition of the gunpowder monopoly in 1641 that the Lea valley emerged as an important centre of the industry.

Fuller commented on this development that "more (gunpowder is) made by Mills of late erected on the river Ley, betwixt Waltham and London, then in all England besides", and in 1673 Blome listed gunpowder as an important industry in Essex.⁶ This has not been noted by historians since.

This article concentrates on Sewardstone and Waltham Mills, but between 1640 and 1690 the following mills were also producing powder at various times: Naked Hall Mills in Enfield, Enfield Lock Mills, Enfield Mills, Tottenham Mills, Walthamstow Mills, and the Temple Mills at Leyton.

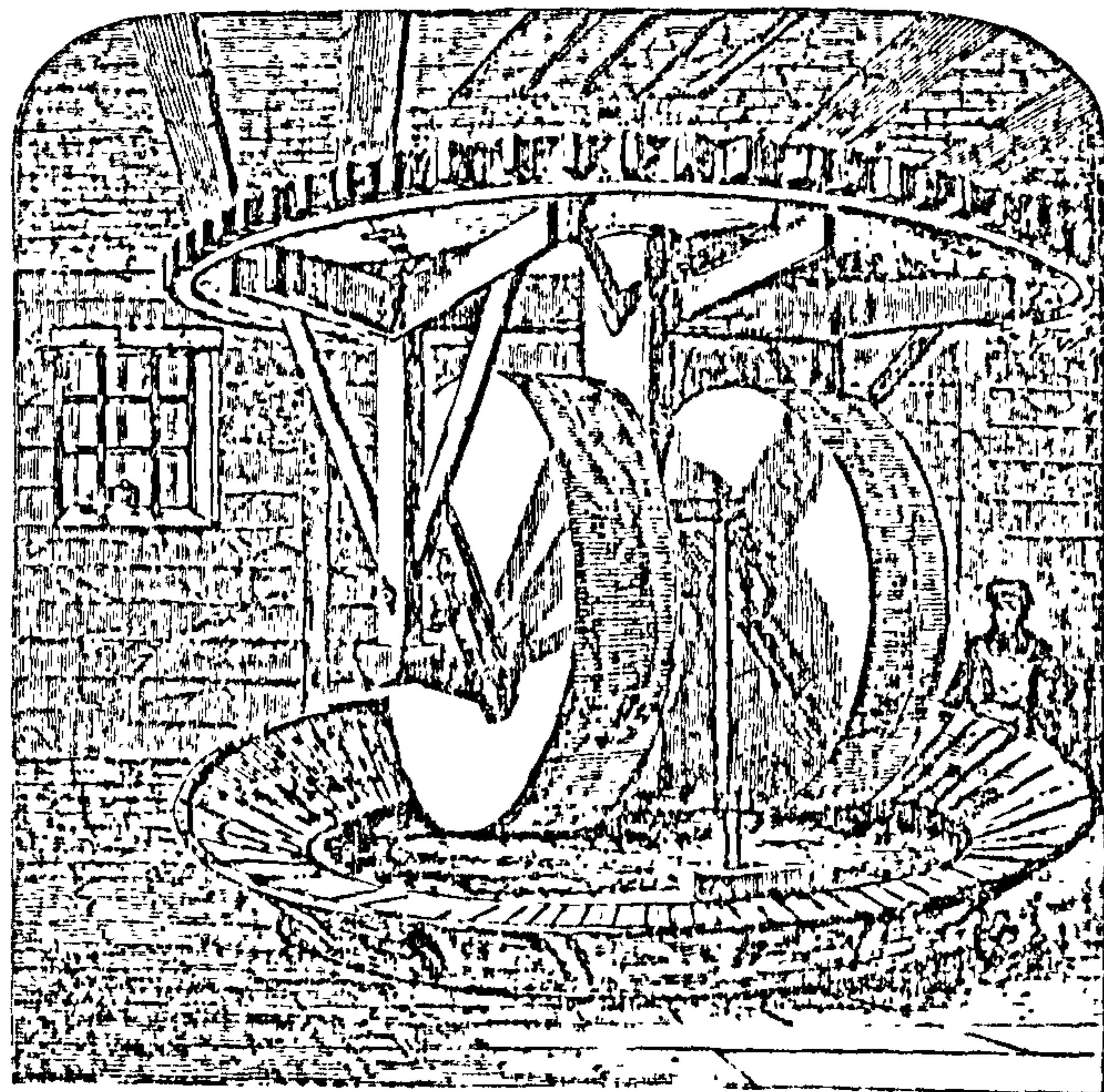


Fig. 1. The incorporating mill (Essex Record Office).

Sewardstone Mills

After the ending of the gunpowder monopoly in 1641 a new supplier to the Ordnance Board emerged, John Berrisford, a London grocer, who continued for the rest of the decade. In 1642 he took out a lease on the Temple Mills, replacing the existing blue starch and oil mills with gunpowder mills, but in March 1650 he assigned this lease to other powder makers. He had also acquired an interest in Sewardstone Mills.

As early as 1640 he was admitted to copyhold property on the death of his father-in-law, Thomas Stock. Then in May and July 1648 he was admitted to other properties in the manor, including a "Stream of Water called Sewardstone Mill Dams together with the Mills" and "Mills called the Powder Mills". K. Bascombe adds that Berrisford was already the tenant at Sewardstone Mills in

April 1646 when Richard Stock mortgaged the property to him. John Berrisford surrendered the powder mills in Sewardstone to his son, Rowland, in January 1649.⁷

This evidence suggests that John Berrisford was producing powder at both sites throughout the decade, but that at the end of the Civil War he divested himself of his interests in the industry, never to return. Whether his son continued to produce powder at Sewardstone has not been established. Shortly afterwards, however, powder was being produced at the mills by a John Freeman, definitely before October 1652, and most probably from July 1651.

John Freeman was a London merchant closely identified with the Parliamentary side in the Civil War. He had delivered 100 barrels of powder to the Ordnance in July 1644, supplied timber for the palisades erected during the fortification of London in 1646, and helped provision the armies in Ireland and Scotland.⁸

He and his son, John Freeman the Younger, were merchants involved in several trading ventures. References to their trade in match, tar, hemp, masts, hides, grain, currants and raisins and to links with Norway, Hamburg, Nantes and Amsterdam occur in the State Papers.⁹ The son was an assistant of the Eastland Company in 1654.¹⁰

Such activities suggest a close interest in the success of the First Dutch War (1652-54), the outbreak of which stimulated John Freeman the Elder to invest in the industry. In July 1651 he, together with one of his trading partners, Thomas Steventon, had delivered 100 barrels of powder to the Ordnance. They then signed contracts with the Ordnance in July 1652 and October 1653. After this date Freeman continued to supply powder, but on his own account. At no time were they major producers, but at the height of the war they were contracted to supply 75 barrels of powder a week. Each barrel contained 100lbs (45.4kgs) of powder. Such quantities suggest that Freeman or Steventon had interests in other mills besides Sewardstone, but no such interest has yet been traced.¹¹

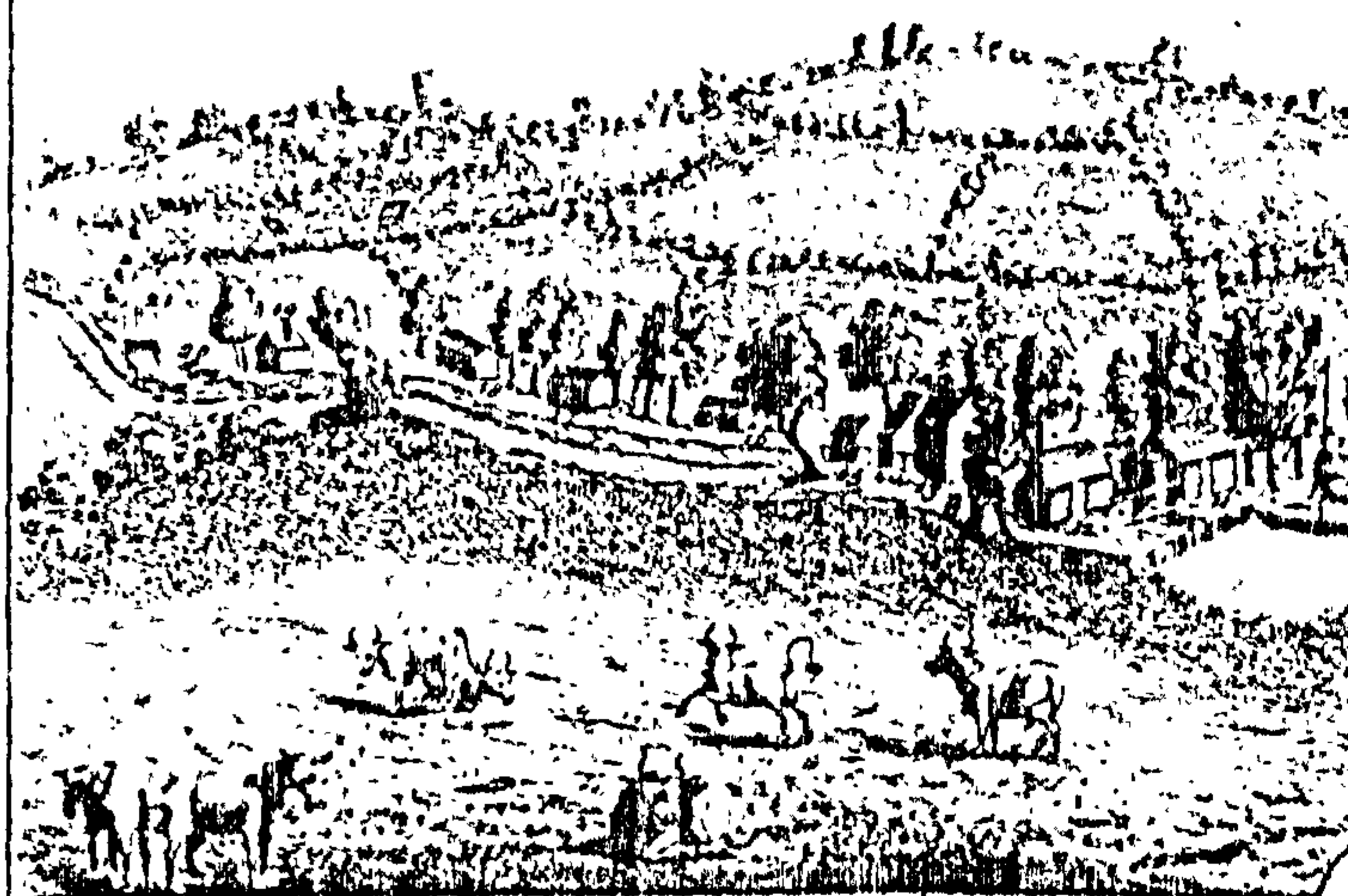
Sewardstone powder mills were sufficiently important that the Council of State wrote in 1653 to both the Commissioners of Sewers for the river Lea and the Earl of Carlisle, lord of the manor of Sewardstone, requesting them "to permit John Freeman to build a weir at Susan (Sewardstone), and to allow him to erect new powder mills".¹² The weir would increase the amount of water to drive the mills, whilst the new powder mills could have been either an expansion of existing capacity and/or a replacement of mills that had blown up.

Explosions were frequent. An undated petition from Freeman and Steventon asks for financial help to erect new mills to replace those which had "lately twice blowne up, to the loss of above five hundred pounds".¹³ A later petition from Freeman notes the failure to pay his bills and the fact that his mills had blown up six times in four years,¹⁴ not an exact correlation with Fuller's estimate of five explosions in seven years, but forceful confirmation of the hazards of the industry, both as an investment and in terms of safety.

It is difficult to establish what happened at Sewardstone Mills after the Restoration. Some powder makers who had supplied the Ordnance during the Interregnum continued to do so. John Freeman did not, even during the crisis of the Second Dutch War (1664-67). The first evidence that the family supplied the Ordnance again is a contract signed in July 1673 by John Freeman the Younger. Thereafter he and his partner, Sir Polycarpus Wharton, emerged as major suppliers. Chilworth Mills in Surrey was their main centre of production, but Freeman did work Sewardstone Mills

1 } The Water Mill
2 } The turning and Glazing Engine
3 } Three water Mills
4 } The Sables
5 } The Lead Mill and composition Mill

6 } The Carpenters and
7 } The Clerks Counting
8 } The Loading Engine
9 } Two Stamping Mills
10 } Two Counting Mills



John Walton Esq. Proprietor of these Mills this Plate is

Fig. 2. The powder mills owned by John Walton at Walt published in 1

on his own account.¹⁵

The fact that the family did not have an Ordnance contract between 1660 and 1673 does not mean that production ceased at Sewardstone. In February 1662 a Benjamin Olden, powdermaker of Sewardstone, was bound over to keep the peace. In May 1666 a John Freeman was given liberty to supply powder to the Spanish ambassador, and in November 1674 a John Freeman was working as a sub-contractor to Vincent Randyll of Chilworth Mills.¹⁶ Various options are thus open. Sewardstone Mills could have been sub-let, or the Freeman family could have worked the mills to supply the private market or as sub-contractors to other suppliers to the Ordnance. Further evidence is necessary.

John Freeman the Elder died between October 1678 and October 1679. His will, which describes him as a merchant of St. George the Martyr, Southwark, provides no details of any powder business. He merely leaves his estate, after numerous small monetary bequests, to his son. The only clue is that he bequeathed £5 to the poor at Sewardstone "where my Mills are".¹⁷

Fortunately the son's will is more informative. John Freeman of Sewardstone, gentleman, died in September 1684. He was producing powder on his own account at

work house
Naked Hall house

- 15 The Charcoal house
- 16 The old Composition house
- 17 The Store house
- 18 The Ordnance house
- 19 The Little house
- 20 Three Sun houses, or drying houses
- 21 The great Store



embly dedicated by his Obedient humble Servant J Farmer

John Farmer

(from John Farmer's 'The History of Waltham Abbey',
D.E (WA)).

Sewardstone Mills and at Naked Hall Mills in Enfield,¹⁸ which he bequeathed to Polycarpus Wharton, son of Sir Polycarpus Wharton. He was also in partnership with Sir Polycarpus at Chilworth Mills, and left him his stock there. In addition, he made several small monetary bequests to clerks in the Ordnance.

Freeman also held a third share in an unspecified glasshouse,¹⁹ but no other business interests are mentioned. To his wife, Anne, he left only a life interest in their residence at Sewardstone. Not surprisingly Anne contested the will, stating that her husband had not been sensible at the time. The will, however, was allowed to stand.²⁰

Polycarpus Wharton, a minor when he inherited Sewardstone Mills, died before he was of age. His father therefore took over and then inherited his interest. Sewardstone Mills became a small part of his large powder business. In 1687 it was estimated that Sir Polycarpus could produce 6 barrels of powder a week at Sewardstone, 45 barrels a week at Chilworth, and 12 barrels a week at a site in Clapton, so far unidentified.²¹

This large business eventually brought serious problems. The Ordnance had encouraged him to take out the lease on Chilworth Mills in 1677, and, although there were disputes during the life of this lease, he remained a major supplier

until it expired in 1698. Thereafter major rows erupted between Wharton and the Ordnance over losses incurred at Chilworth and over settlement of the accounts of his deceased father, Sir George Wharton, who had been Treasurer to the Ordnance. His claims were rejected. By 1710 Sir Polycarpus was in debtors' prison, and as late as 1723 he was still demanding settlement of both accounts.²²

Little can be determined of the fate of Sewardstone Mills, except that its production facilities remained intact. Sir Polycarpus never mentioned these mills in his petitions, although he remained their owner until 1709. Since his last deliveries to the Ordnance had been made in 1696 or 1697, it might be that production ceased temporarily or that the mills were let.

In April 1707 Sir Polycarpus mortgaged the mills with the tenant, Edward Gibbon. Gibbon had signed his first contract with the Ordnance in May 1704 and was a regular but minor supplier until 1709. He was still the tenant at this date. The quantities he supplied suggest that he was only producing powder at one site, Sewardstone Mills.

Gibbon was the grandfather of the famous historian, and true to the character portrayed by the grandson, was not content with such a small involvement. In 1706 he made a proposal to the Ordnance that he supply them with 10,000 barrels a year for 10 years at existing prices. In return he wanted cash advances to rebuild Chilworth Mills and a guarantee that he would be given priority of employment. The Ordnance felt that these proposals would have been acceptable if it could be predicted that the war would continue, but since peacetime requirements did not rise above 5,000 barrels a year, they did not wish to be tied to a fixed contract. Negotiations were not pursued.

Gibbon's last contract was signed in May 1709, but he only delivered 59 barrels. In July 1709 Edward Parre the younger of Doctors Common, London, gentleman, took over Sewardstone Mills. Gibbon's career lay elsewhere, and his interests in gunpowder production were not noted by his grandson.²³

Parre signed a contract with the Ordnance in July 1709, but after it was fulfilled he never signed another. It is difficult to establish subsequent events as there were problems in transferring Sewardstone Mills from Sir Polycarpus to Parre. However, a schedule of the property in 1715 shows an operational gunpowder business.²⁴

In 1714 and 1717 Parre obtained licences to let his copyhold property in Sewardstone; by 1719 the tenants at the mill were an Andrew and Thomas Niblet, neither of whom supplied powder to the Ordnance. In 1726 Parre bequeathed the mills to his widow, Hester, for her life, after which they were to pass to his nephew Edward Pace. The latter was still the owner on his death in 1765. None of these sources state what products were made at the mills. It has been suggested that silk production began at the site soon after 1718.²⁵

However, in 1740 the tenants were 'Frederick Tash & Partners'. Later it was stated that Frederick Teush had erected the only mills in England to make 'Powder Blue', a product used in the laundry industry to wash linen.²⁶

Such evidence suggests that Parre, or his tenants, converted the mills to other uses shortly after 1715. The long period of peace which followed the Treaty of Utrecht in 1713 would have reduced demand for powder, and it was common for some powder makers to move out of the industry at the end of a war.

The only later connection between Sewardstone Mills and the gunpowder industry is that in 1880 the Schultze Gunpowder Company formulated plans to use the site, but

negotiations between them and the owners of the mill, the New River Company, were unsuccessful.²⁷

Waltham Abbey Powder Mills

Having established that Fuller was referring to Sewardstone Mills, the question arises of when production began at the site at Waltham, later to be the nucleus of the only powder business in the valley. There are references to a John Tamworth of Waltham Abbey being involved with gunpowder in 1561 when the industry first developed in England. The evidence, however, suggests he was a person able to obtain contracts at Court, not a producer.²⁸

A map of Waltham made in the late sixteenth or early seventeenth century shows a fulling mill on the site under consideration;²⁹ this fulling mill was let to a Mr. Lyon in 1643.³⁰ In 1669 a deed describes the mill thus:³¹

“All that Mill heretofore an Oyle Mill and now lately converted into two Powder Mills... with all necessary outhouses for grindinge boylinge corninge & drying of powder... now in the tenure or occupation of Samuell Hudson or his undertenants”.

At present, the writer has discovered no evidence of when the Hudson family first acquired an interest in these mills, or anything of their conversion to oil mills. However, the family also held the tenancy to Waltham Abbey Corn Mills between 1643 and 1674, and possibly even longer.³²

Sufficient evidence exists to provide a date for the conversion of the oil mills to powder mills. In January 1665 the Ordnance, facing shortages as a result of the Second Dutch War (1664-67), instructed their officers “to impresse soe many Mills for ye making of gunpowder for his Matie Service as they shall think fitt”.³³ The following month a contract was signed with a new supplier, Ralph Hudson, the brother of Samuel Hudson and the sub-tenant at Waltham Abbey oil/powder mills.

The contract involved Hudson making powder from his own saltpetre, which he had authority to make in Bedfordshire and Hertfordshire, as well as from that delivered to him from the Ordnance. It was stipulated that he would receive an advance of £150 if he could deliver 100 barrels a month from May 1665 onwards, a deadline he achieved.³⁴ Such an advance may have been in the form of financial assistance to help with the conversion to powder mills.

Hudson is mentioned in the Ordnance accounts until December 1666, but afterwards references are few until he obtained a new contract in 1672, on the outbreak of the Third Dutch War (1672-74). This contract was for 140 barrels a month.³⁵ To obtain this increased output, Hudson expanded the works by erecting powder mills near Hook Marsh Bridge.

In 1672 complaints were made to the manor court about these new mills. It was said that they obstructed the right of way over the bridge, and fears were expressed that the mills and the barges loading at the site were a danger. The manor court ordered Hudson to remove the mills, but he ignored it, and the same complaints were made in 1673. These powder mills were still standing in 1676.³⁶

Unexpectedly, there is no record of Hudson delivering powder to the Ordnance after February 1673, even though the war was still in progress and other powder makers were making regular deliveries to the Tower. On his death in 1676 he was an active powder merchant with no other business interests. He had warehouses at Tower Hill, James Rope Walk, and Knightingall Lane in London, and at Waltham, as well as production capacity at the two sites there. Significantly he lived in Great Tower Hill. His will describes

him as a gunpowder maker, the accompanying inventory as a citizen and grocer. After monetary bequests to his family, he bequeathed the powder business to his brother, Peter.³⁷

Peter Hudson continued the business, but it was not until March 1684 that he obtained a contract to supply the Ordnance. This, and a renewed contract in December 1686, were for only 500 barrels each. Such contacts illustrate the reduced demands of the Ordnance during peacetime, and, since the capacity of the works was estimated to be 168 barrels a month in 1687, hint at the importance of the private market.³⁸

Although Hudson was supplying the Ordnance Board during James II's reign, his sympathies seemed to have been elsewhere. He supplied 400 barrels to William when he was Prince of Orange, and when William came to the throne lent him large sums of money. In July 1689 he signed a contract with the Ordnance to supply 1000 barrels over a

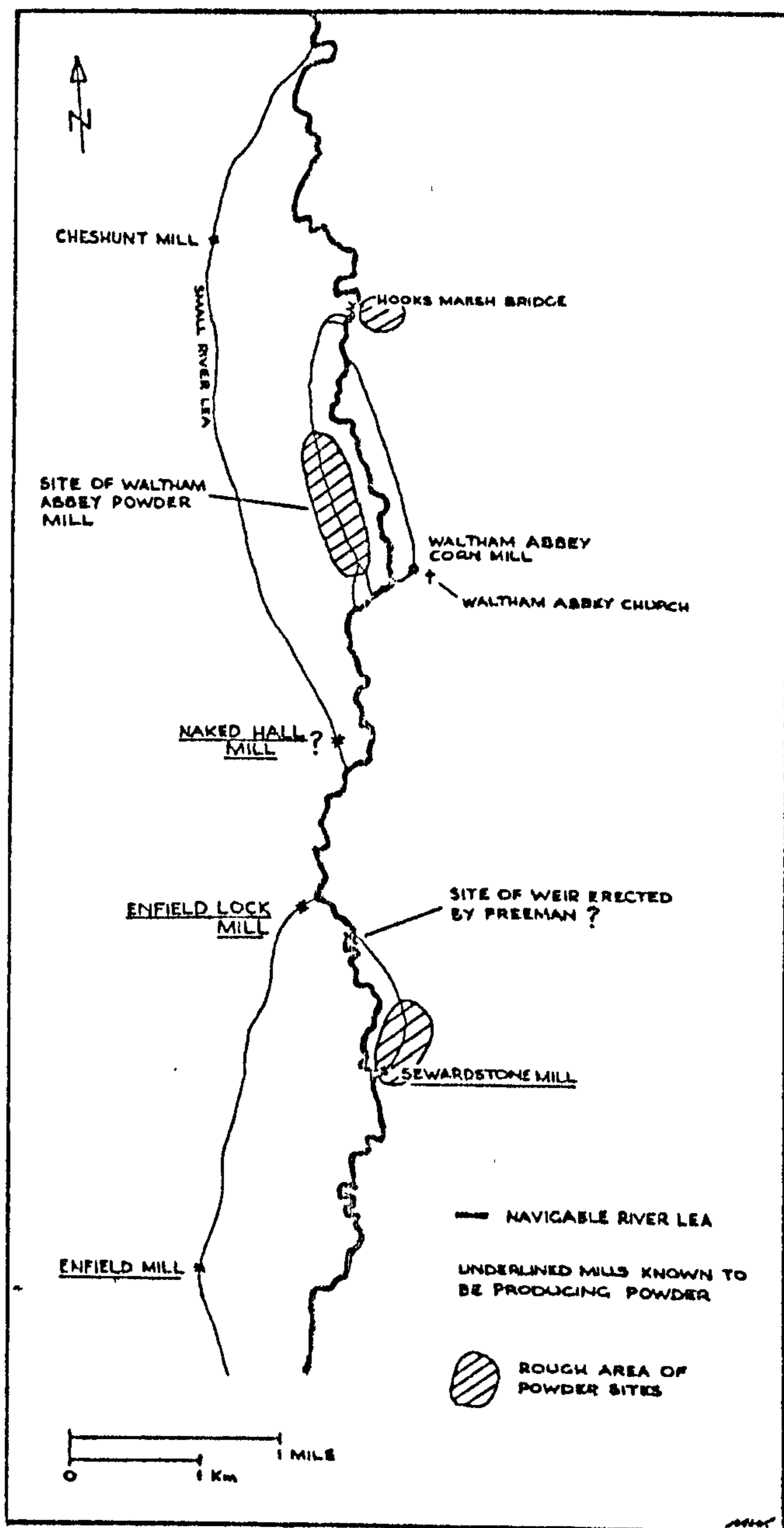


Fig. 3. Mills along the river Lea in the Waltham area. John Walton was responsible for some of the surveying for the original map on which this is based.

six month period; subsequent contracts maintained this level until July 1693.³⁹

In June 1691 Hudson complained that the Ordnance owed him £1280, but he was soon to face more serious problems. In 1693 a Treasury official recommended that he be prosecuted for fraud in mingling bad powder with good in his deliveries to the Tower.

In his defence Hudson referred to his support for William and claimed that:

"...it lately happened to be his misfortune to employ some Workmen of lewd principles, who made a Considerable Quantity of powder for your Majesty's Use; all of it Tower proofe, but hoping to gett some extraordinary Gratuity from him, They made the last part of it Stronger... they designedly putt the Strongest powder (unknowne to him) on the Topp of the Barrells & having So layd their Plott they by a letter demanded a Sume of Money or else they would accuse him as a deceiver..."

Hudson argued that it was because he had refused to meet their demands that the prosecution had arisen. Under the circumstances he asked that it be dropped. This request was met, but it can be no coincidence that he never again obtained a contract from the Ordnance.⁴⁰

The immediate fate of his powder business after this setback has not been discovered. His will in July 1703 makes no mention of a powder business, but he had not been ruined by the powder business, for he left over £4000 (more than £¼ million at today's prices) in monetary bequests alone.⁴¹

The probability is that Hudson had moved out of the industry before his death and that the site at Waltham was taken over by William Walton, the eldest son of William Walton of Mortlake in Surrey. Walton signed his first contract with the Ordnance on 3rd February 1702, becoming within a few years one of the major suppliers to the Ordnance during the War of the Spanish Succession (1701-13). Besides Waltham, he was also producing powder at mills in Balham, where he was still resident when he died intestate in May 1711. His widow, Philippa, inherited the business. She and successive members of the family first concentrated on and then expanded production at Waltham until they sold the works to the state in 1787.⁴²

Genealogical research may show family links between the powder makers so far discussed. John Berrisford, who produced powder at Sewardstone before John Freeman took over, left a will which named a Richard Freeman of Rickmansworth as a trustee of some almshouses. John Freeman the Elder bequeathed 40s to a William Walton to buy a mourning ring, and in October 1675 a John Walton married a Lydia Freeman in the parish church at Waltham.⁴³

What remains to be uncovered is the story of the Walton family's enterprise at Waltham. The locational advantages of the Lea valley continued to exist, but during the 1670's and 1680's most powder mills in the valley were converted to other uses. After this date production continued only at Waltham and Sewardstone. Then shortly after 1715 production ceased at Sewardstone, and gunpowder continued to be made in the valley only at Waltham. The Business acumen of Philippa and her son, John, must have been a major reason for their success in expanding the works during the long years of peace after 1713.

Acknowledgements

I would like to thank the following: Dr. Ken Bascombe for

providing the exact dates of Fuller's curacy at Waltham and other additional information which I had not seen previously; Mrs Kennally and the staff at the Greater London Record Office for allowing me access to the recently deposited records of the New River Company; Mr. Pryor, of the Royal Armament Research and Development Establishment (Waltham Abbey), for bringing the 1669 deed to my notice and for a more than usually helpful reply to my initial enquiry; Mr. M. McLaren also of R.A.R.D.E. (WA) for providing Fig 2., Mr. V. Gray of the E.R.O. for Fig 1., and Mr. M. Walters for drawing the map.

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16. P.R.O. WO 47/8; P.R.O. WO 47/19B; Dr. K. Bascombe, private communication 4.2.1985.
17. P.R.O., PROB 11/361 (128).
18. Mills worked by John Lucas between April 1665 and August 1673 and maybe later. Not known when Freeman acquired them. Site may be on Small River Lea near where it rejoins the navigable river, but not definitely known: P.R.O. WO 47/19B; P.R.O. WO 47/7, fos.58,90; British Library, B.M. MAPS K.1 TAB 18(10).
19. In September 1684 John Freeman of London merchant involved in an agreement with the Glass Sellers Company. James Sotheby, lord of the manor of Sewardstone, also involved in glass production: Guildhall Library, Ms.5556; E.R.O., D/DB M202.
20. P.R.O. PROB 11/380(103), PROB 11/381(161); E.R.O., D/DB M202.
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 42. P.R.O. WO 48/41; P.R.O. WO 55/344 fos.176-79; P.R.O., PROB 11/415(119); PROB 6/87.
 43. P.R.O., PROB 11/312(117); PROB 11/361(128); W. Winters, *Centenary Memorial of the Royal Gunpowder Factory, Waltham Abbey* (1887) 18.

Keith Fairclough is working on a Ph.D thesis on the early industries of the river Lea between 1671 and 1767.

Book Reviews

GEORGE PARKER BIDDER, *The Calculating Boy*, by E. F. Clark and J. Linfoot. *KSL Publications*, Bedford, 1983. 518pp. illus. £21.00.

IN THE HEROIC AGE of 19th century engineering names like the Stephensons and the Brunels immediately spring to mind, but the name of George Parker Bidder, who was a respected friend, and indeed partner, of Robert Stephenson, is frequently overlooked and is only mentioned as a child prodigy able to resolve complex mathematical calculations in his head. In his day, however, Bidder was regarded in the same light as his great contemporaries and it has been partly the absence of an adequate biography that has led to the neglected recognition of his rightful place in 19th century civil engineering development. An adequate biography is now available, excellently written and extremely readable, by his great-great-grandson E. F. Clark. Also contained is an appreciation of Bidder's calculating ability by Joyce Linfoot, a mathematical scholar and Fellow of Lucy Cavendish College, Cambridge.

This important book has its place in national biography as Bidder was a national, in fact international figure, but it is the Essex connection which must be considered here. Already as a teenager Bidder was involved in calculations at a responsible level during the extensions to the London Docks and was later consulted on the construction of the London and Blackwall Railway. His interest in dock development and in Essex led to his active participation in the promotion of the North Woolwich Railway and later the London, Tilbury

and Southend Railway, originally intended to serve Tilbury Docks but with the Southend section added on almost as an afterthought. Being involved also with railway development in Norfolk and Suffolk led ultimately to his interest in the amalgamation of eastern county railways to form the Great Eastern Railway of which he became one of the first directors. He was also critical of the wild ideas of others, including the great sanitary reformer Chadwick who at one stage advocated pumping sewage from London up to Brentwood to fertilize an estate there. He recognized the value of Bazalgette's London sewage scheme and was one of the coadjutors who recommended the construction of the Northern Outfall Sewer as an alternative to flooding the Essex countryside with sewage. Though this book is not specifically an Essex book, there is so much material relevant to Essex forming part of the historic development of the county, that it ought to be read by everyone who wishes to know more of the background to the 19th century changes in the landscape. This book is strongly recommended.

JOHN BOYES.

CLAVERING AND LANGLEY, 1783-1983, by Eileen M. Ludgate. *Published privately by the author*, 1984. 82pp. illus. £4.00, plus 50p post and packing, from Eileen Ludgate, 'Shovellers', Stickling Green, Clavering, Essex.

THE AUTHOR is the past Chairman of Essex Congress and is well-known for her interest in, and

concern for, local history. In this book on her home parishes she has wisely concentrated on the developments of the past 200 years and particularly on the life and work of the parishioners. There are three major chapters: the first deals with the pattern of land distribution and village life in 1783; the second with changes up to 1883; and the third brings the story up-to-date. In this fairly remote area in the valley of the Upper Stort, the author has been able to piece together the account of the rise and fall of local families of ordinary people as well as landowners and has demonstrated the barely subsistence level at which so many of them lived. Her book is therefore a very human document and it has been enhanced by the selection of previously unpublished and very personal photographs. With a very strong core of dissenters in the village, the problems associated with church, chapel and school were bound to be magnified and, at times, acrimonious but through the pattern is woven the thread of village unity.

It is timely that this book has been written because of the revolutionary changes which will almost inevitably ensue if sanction is given to the extension of Stansted airport on the threshold of the village. While the unusual shape of the book, 200mm x 210mm (8in x 8½in), can be explained by the desire to display the maps and photographs to better advantage — and it must be said that the printing is above the usual standard — the length of line adopted makes reading more difficult. Like the book on Warley this is a valuable addition to Essex local histories.

JOHN BOYES.

THE LONDON JOURNAL

A Review of Metropolitan Society Past and Present

ARTICLE I

A Tudor Canal Scheme for the River Lea – A Note

KEITH FAIRCLOUGH

Since my article 'A Tudor Canal Scheme for the River Lea' (LONDON JOURNAL, 4 (1978), ii) was published I have come across a fresh source of information, and also an endorsement I had previously missed on one of the maps there reproduced. This new information requires a revision of some of the arguments then advanced, and permits a more accurate appraisal of the City's proposals to build a canal from the River Lea to the north side of the City.

When the City first sponsored their bill in 1571, they intended to build a canal from Hoddesdon to the Fleet Ditch, and not, as I previously argued, the canal reproduced in Figure 1 of the original article. This evidence of their initial plans emerges from an account drawn up some time in 1571 of some of the expenses incurred by the City in obtaining the act of parliament.¹

Besides meeting the expenses of several members who must have advocated the City's scheme in Parliament, the City also met the following expenses:

'xli pd to James Basendyne scottishman for his travell three daies to Consider howe the River of Ley might best be conveyed from hogesden to the Mantells² and so into Fleet dicke & other expences bestowed upon him and others abowt the same xiiij^s viii^d more to him and Thomas → the late servant of Albert Stuges Joyning and confearring togeathers to make the instrwement pfitt [perfect] to take the Leavell of the ground from hoggesdon nere to holborne bridge and for measuring and setting owt the distannce from stacion to stacion wch occupied them Sondrie daies for theire reward in monye xxiiis iiiij^d and for supps drinkinges and other repastes for them xs vi^d and in reward to a pooreman vid pd to Jaques Farrier Frenchman for making of a new plott for the River of Ley owt of the plott wch my L[ord] Keap[er]⁴ hadd owt of the p[ar]liament howse xxxs . . .'

Unfortunately no plan, nor any other reference to this ambitious scheme remains.

The payment to Farrier might well suggest that Basendyne had revised still earlier plans, but nothing definite can be said on this point. A feature of this proposal was that it would have made use of existing wharfing facilities along the Fleet, whereas the later proposals for a canal to Moregate would have required the construction of such facilities close to the end of the canal. Though the wording of the act suggests that locks were not to be built along the canal, the fact that the earliest scheme joined two existing river channels would surely have required some sort of regulating locks about which the act is silent.

Such a scheme shows that the City's plans were even more adventurous than I first thought, and were in fact the most ambitious plans to be formulated in Elizabethan England. The accuracy in surveying and construction techniques necessary to build a canal of such length along a level pound would have tested to the limit the existing levels of technology and expertise in England. It is interesting to note both the involvement of a foreign expert, and a special payment for making an instrument which could ensure the necessary accuracy in surveying.

Interesting comparisons can also be made between this scheme, and proposals which emerged during the following centuries which also envisaged bringing water to London along a level pound. In the late 1630s there were plans to bring water from Hoddesdon to supplement London's water supply,⁵ and in 1773 proposals were put forward to build a navigable canal between Waltham and Moorgate.⁶ Both schemes involved the construction of channels which lay on a level between the Lea Valley and London. That it was the lie of the land which suggested these recurring schemes is clearly illustrated by James Sharp's comments in 1773 that his interest in a canal had been stimulated after 'I had the Level taken from the Quarters in Moorfields, to see where it would run into the River Lee, and to my very great Surprise, I found it extend no less than thirteen Miles and an half, viz. so near Waltham Abbey, as to make that Place a most beneficial Point, for the Extension of the present

running the municipal services according to the laws made elsewhere, and not to stage a shadow-play of Westminster. We should get better debates in the council chamber if we could secure the services of the many able people who do not feel able to tie themselves to a party label, and with it to a package of policies with which they do not agree. The all or nothing party ticket is a nonsense in local affairs, and is the explanation for the fact that in planning and design matters we are lucky if one councillor in a hundred has any knowledge at all, as aesthetics play no part in politics. A knowledge of architecture and the arts was in former times regarded as a basic requirement for a civilised person, but today the Tories who used to have culture have replaced it with commerce, and Labour members consider it a frivolous irrelevance. They in turn are advised by officials whose training has been in estate management or geography, and the recipe is complete for the enactment of visual disasters. At no time in London's history has the power for physical change rested with people of such profound ignorance.

We must also ask why architecture has failed us so badly, when for centuries it has delighted us. The reason must be partly the kind of client now operating, in the shape of huge impersonal finance companies or get-rich-quick developers bent on squeezing the last square inch of footage out of every available piece of land. But added to that is the entirely new situation which provided the architect with no familiar framework within which he can devise his own minor variations. The classical mould has gone, and function is the only guide. To be thrown back on one's own ingenuity with no terms of reference beyond the size of plot and the maximum permitted floorspace is to be forced into an unnatural search for an original solution. There are very few original minds at work in architecture in any one century, so what the search turns up is desperation. Many of London's new buildings are desperate, with all the discomfort which the word implies.

The reason for the enormous size of new buildings – apart from the permission for increased height so mistakenly given by the Macmillan government – is that they are built *for their own sake*, as investments, and not as ancillaries to industry which was the case in the nineteenth-century expansion. When we were building railways all over the world, and exporting manufactured goods likewise, most investment went into these new enterprises and the buildings were a by-product. We should question urgently the wisdom of putting so much of our available funds into artifacts which do not so much generate activity as drain capital from it. The rents exacted from the new and proliferating office buildings all over London must be one of the causes of inflation.

Gigantism is the disease we are suffering from, and it must be combated before we founder. The new boroughs, being too large, employ large staffs at large salaries and in some boroughs with large titles, such as 'Director of Housing, or Planning, or Finance' or whatever their department happens to be. This might seem unimportant but is not, because the inflated title gives them the wrong idea of their function. They are not directors of anything except their departments, and the pompous titles should be dropped. It may be a false conception of his own authority which encourages a planning official to recommend acceptance of schemes to which there is public objection, and to believe that he is the arbiter of events rather than their servant. And all too frequently his council lets him get away with it. Planning is a profession still in its arrogant infancy, and has been responsible for much of the damage which London has suffered. The activities of some of those in charge of the most vulnerable and precious areas have been highly destructive.

The buildings are too big. The local authorities are too big, and must be reduced to a size which can legitimately be described as local. If we are told that we cannot afford to reorganise again soon, we must answer that we cannot afford not to, if we are to remain in any real sense a democracy.

'Lord Scarman's Bran-tub':

An Episode in the Politics of Urban Disorder

N. D. DEAKIN

THE report* produced (with characteristic efficiency and despatch) by Lord Scarman on the Brixton 'disorders' of 10–12 April 1981 was greeted on its publication in November 1981 by a virtually unanimous chorus of approval. True, a token black radical sceptic was produced – by *The Times*, no less; and a few grumbles were to be heard on the far right, where the recipe for dealing with mobs remains, as it has been for the past couple of centuries, a whiff of grapeshot. But these aberrations only served to underline the extent of the range of opinion covered by approval of the report. Some of the favourable verdicts can be put down to the accessibility of the text – brief, crisply written and decorated with just enough metaphor to convey an engaging air of informality. But approval extended not merely to the manner but to the matter – the Government's immediate decision to accept the report's findings in principle won the full support of the Opposition.

Yet the suspicion lingers that perhaps the initial success of the report lay in the fact that, like a well-packed bran tub, it contained enough prizes to keep all the children happy. So, now that the initial euphoria has dispersed and the implications of the government's decision to accept the report's recommendations are beginning to work their way slowly through the system, a reappraisal of the report's findings seems in order. As a document, it can be judged at three levels: as an account of the events that took place in Brixton last April; as an analysis of the underlying causes of those events; and as a series of prescriptions for action that might avert similar 'disorders'. At all these levels, it must be said, further scrutiny removes some of the gilt from the gingerbread.

The account of events is the simplest case. Read as narrative, with the help of the map thoughtfully provided by HMSO, the report provides a clear and coherent story – but one viewed almost entirely from the perspective of the police. The verdict reached of the performance of the police themselves in the course of the 'disorders' therefore suffers from a certain one-sidedness, to put it mildly. One appreciates that difficulties existed, with cases arising from the rioting still *sub judice*; but, as an attempt at an authoritative history, Lord Scarman's is at best a provisional statement – fascinating in its description of the unfolding of police tactics, but of limited value in understanding why and how so many inhabitants of the area reacted to the presence of the police in large numbers in their neighbourhood over the course of those two days.

The question of causes is in every way more complex. Lord Scarman starts on the right foot with a clearly stated resolution to set the issues in context. 'In this Inquiry', he writes 'I have sought to identify not only the policing problem specific to the disorders but the social problem of which it is necessarily part. The one cannot be understood or resolved save in the context of the other' (para 1.5). The section which follows, on social conditions in the Brixton area, provides a useful conspectus of the quality of life in what Lord Scarman calls 'a multi-racial community in a deprived inner city area where unemployment, especially among young black people, is high and hopes are low' (para 1.6). Two important conclusions stand out: that racial discrimination 'is a reality which too often confronts the black youths of Brixton' (para 2.21); and that, in part in consequence, 'they live their lives on the street, having often nothing better to do: they make their protest there: and some of them live off street crime. The recipe for a clash with the police is therefore ready-mixed' (para 2.37).

The third section of the report provides Lord Scarman's account of how these ready-mixed ingredients detonated and produced the events of 10–12 April. The disentangling of the opening episodes is masterly. The two trigger events – the injured black youth and the misconceived attempt to give him medical attention, and the hamhanded search of the cabdriver at S&M Car Hire that precipitated the main outbreak – are both laid out with exemplary clarity. But once the disorders finally erupt, the account comes down from the judicial heights to something much closer to a *Times*

* *The Brixton Disorders 10–12 April 1981, Report of an Inquiry by the Rt. Hon. the Lord Scarman O.B.E.* Cmnd 8427, HMSO 1981. viii + 168 pages, plus 1:2500 plan of Brixton, £8.

Undertaking.’⁷ The New River built by Middleton in the early decades of the seventeenth century is a further illustration of the opportunities available.

With such an ambitious scheme in mind, it is obvious just what a setback the imposition of a veto on tolls by the Commons in 1571 must have been. Some form of tolls must have been envisaged, if the City were to finance such a scheme.

The City, however, considered other schemes whereby some of the advantages of their first proposal were retained, but at a greatly reduced cost. A scheme to build a canal across the Isle of Dogs between Bromley and Limehouse in 1573 was never carried out, but this was not, as I suggested, the end of the City’s interest: new plans were made in 1577. The map reproduced in Figure 1, which I argued must have represented the City’s original proposals, was in fact drawn as a result of new surveys taken in 1577, as an endorsement on it makes clear. Except for Fanshawe’s letter (referred to in Footnote 1 of my article), there is no other evidence about these new plans, nor any explanation why the City should undertake such an initiative at this late date, for under the terms of the 1571 act, any canal had to be built by 1581. Presumably the City were stimulated by the improvements being carried out along the River Lea itself by a Commission of Sewers appointed in 1575 to carry out this work.⁸

The damaged endorsement on this map indicates that the surveyor who made it considered at least two new routes in 1577, that he first surveyed the shorter route between Lea Bridge and Moregate, but that he came to prefer the longer route shown on the map, which is inscribed ‘This Lyne is for ye Newe Cutte’. No reason for this preference is given, but the difference in length can hardly have played an important part, for the two routes are given as 7378 yards and 7547 yards respectively.

Closer examination of the damaged parts of the map suggest that it is complete, and that the favoured route left the river at the very top of the map shortly below Tottenham Mills. My suggestion that the shorter route was considered because it fell within the tidal limits of the river, and thus within the limits of the jurisdiction claimed by the City over the Thames cannot be substantiated. Later references to the City’s jurisdiction over the lower Lea never refer to the tidal limits of the Thames, but to the mistaken notion that the City had built a canal as a result of the 1571 act.

Finally it should be noted that the City’s original bill was first presented to the House of Lords on 5 May and not 21 May as originally stated, and that this bill contained clauses requiring the City to plant hedges or build fences between their towpath and the adjacent private property, so that this was not a clause inserted by parliament as implied. In Figure 1 the shorter canal was inaccurately shown starting from somewhere east of the River Lea, thanks to a block-maker’s error.

NOTES

1 Guildhall Record Office, Chamber Accounts, Sixteenth Century, Vol. 1 f. 67.

2 The Mantells were fields, known as Commandry Mantells, lying between St John Street and Islington Town. They contained many springs which supplied the priory of St John, Clerkenwell; these might have been considered an useful additional source of water for the projected canal. I am grateful to Miss J. Coburn, Head Archivist of the Greater London Record Office for this information.

3 Blank in MS.

4 Sir Nicholas Bacon.

5 British Library, *Sir Walter Roberts his answer to Mr Fords Book entitled A Designe for bringing a Navigable River, from Rickmansworth in Hartfordshire to St Giles in the Fields* (1641), C1027 c32 or 1651/789(1) – (3).

6 Guildhall Lib., Fo Pamp 3349, James Sharp, *An address to the Right Honble the Lord Mayor, the Worshipful, the Aldermen, and Common-Council of the City of London on the Importance and great Utility of Canals in general; the Advantages which may be fairly be expected from the Canal now proposed to be made from Waltham Abbey and the necessity of promoting near the metropolis such improvements as are now carrying on in the more distant parts of the kingdom* (1773).

7 *Ibid.*

8 Bodleian Lib. MS Rawl Essex 11.

A Tudor Canal Scheme for the River Lea

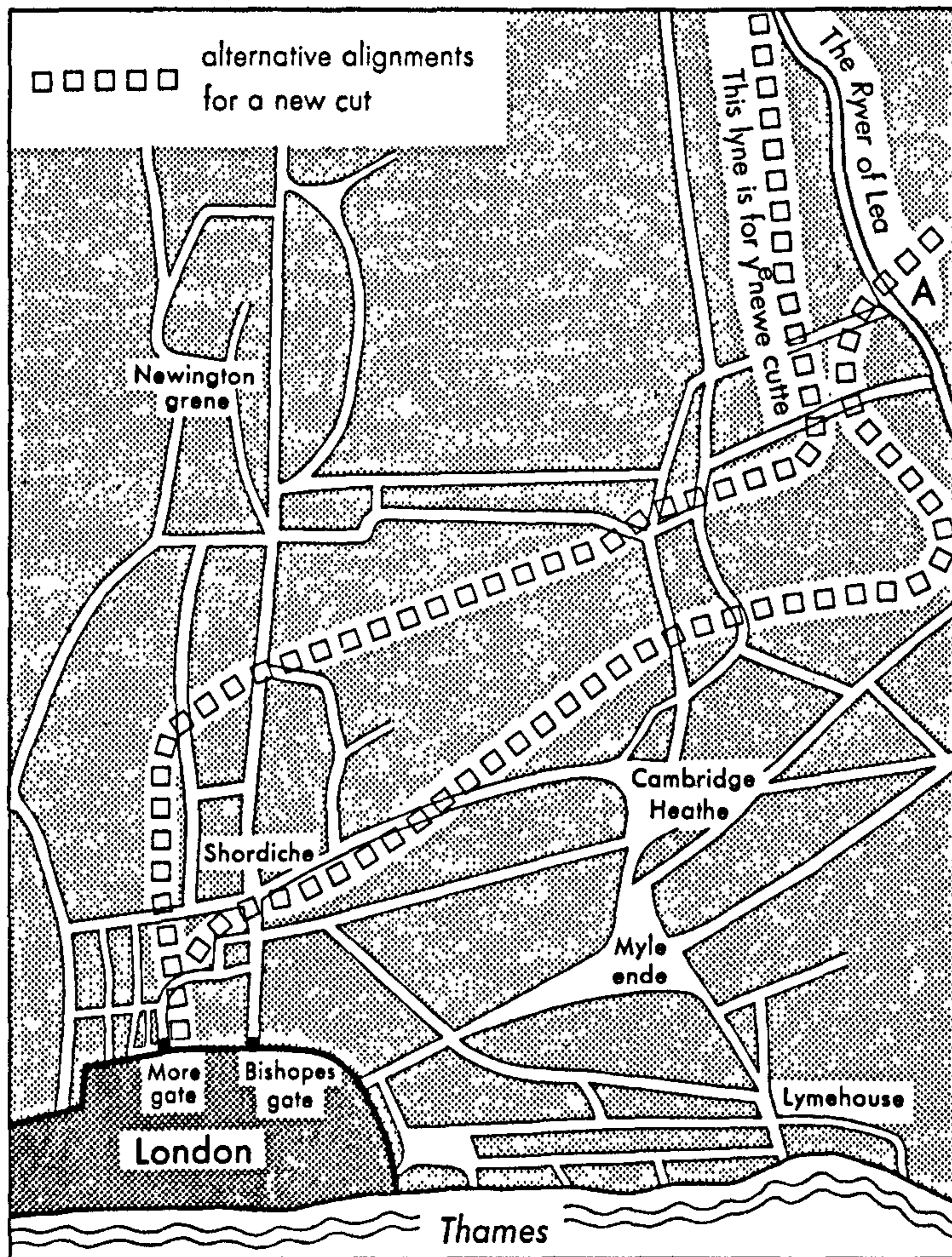
KEITH FAIRCLOUGH

IN 1571 an Act of Parliament (13 Eliz c.18) was passed 'for the brynging of the Ryver of Lee to the Northside of ye Citie of London'. The act, sponsored by the City, outlined plans to build a 'newe cut' which was to leave the Lea 'in the most aptest and meetest place . . . to have from thence the leadinge and passage of the saide Water throughe such a convenyent and meete cut . . . unto the saide Citye of London . . .'. The City proposed to construct and control this canal themselves, but they also sought additional powers whereby, once this task had been completed, further improvements could be carried out by a newly elected Commission of Sewers with representatives from the counties of Essex, Middlesex and Hertfordshire. The City's main reason for sponsoring such ambitious plans was a desire to improve the supplies of agricultural produce, but they also envisaged that the new canal could also be used for local passenger traffic. The problems of shortages and rising prices in the city markets were becoming so acute, that the city authorities were themselves forced to take active steps to promote trade, and their proposals to improve the Lea must be seen as one facet of this policy.

The Lea was in use before the City made their plans, but the boats were small, and most of the traffic involved the small communities which lay along its course. The City hoped that improvements to its navigable condition would stimulate an important trade in grain from the rich agricultural lands of Hertfordshire and Cambridgeshire.

The act itself did not specify the course which the canal was to take, this was left to the discretion of its promoters. However the map reproduced in Figure 1 must, I think, show the plans which the City had in mind when they sponsored the act.¹ Two alternative courses are shown, but the inscription 'This Lyne is for ye Newe Cutte' does suggest that the longer cut was preferred, the shorter alternative probably being presented as a precaution when parliamentary approval was sought. Traditionally, the City enjoyed rights of jurisdiction over the tidal waters of the Thames, and an investigation in 1560 had fixed the limits of such waters along the Lea at Temple Bridge in Hackney.² The City might well have expected Parliament to restrict their powers to use water from the Lea to within these traditional limits, so the shorter course might well have been surveyed in readiness for such a contingency. Since Parliament did not impose any such restriction, it does seem likely that it was the longer course which was under consideration when the act was passed. Unfortunately the top edge of the map has been torn off, so the exact place where the canal was to leave the Lea cannot be ascertained.

In order to construct the canal, the City sought and obtained powers to acquire land both for the actual trench and also for additional strips of land on either side of it, which could be up to 50 or 60 feet wide. The width of the trench was not specified, but the combined width of the trench and the adjacent strips was not to exceed 160 feet. These adjacent strips were to provide a means of access during the period of construction, and to act as a dumping ground for excavated earth. Once the trench had been dug, the strips were to be laid out as towpaths so that 'People maye with great Ease and Comoditie go in and out of theyr Tyltebotes and other Vessells whatsoever without prill, and so walke by foote as long as it shall please them, and also that Barge-men maye upon the same Grounde without offending any other, draw theyr Vessels from place to place alongest the same'.



The area through which the canal was to pass was both low and fairly level, so any slight variations were to be evened out by cut and fill technique rather than by the use of locks. At least this seems the implication from the wording of the act, and there is no suggestion on the map that locks were considered. Presumably, though there is no evidence of this, the City also intended to open a new market near Moregate, at the terminus of the canal. These proposals were extremely ambitious, and if the City had succeeded in carrying them out, then they could have claimed to have built the first canal in this country, almost 200 years before the first ones were actually built. For although the City always referred to their scheme as a new cut, it must in fact be described as a canal rather than a river cut.

There were other schemes to improve rivers during the Tudor period,³ but, with one exception, they were all unambitious schemes concentrating upon dredging and removing obstructions which impeded the traditional navigable channel. The only other Tudor scheme which was as ambitious as the City's was the improvements carried out along the lower part of the River Exe by John Trew during the period 1564-7.⁴ In an effort to allow ships to dock at Exeter once more, Trew built a new navigable channel nearly two miles in length, along which he built the first pound locks to be set up in this country. However Trew's new channel ran alongside the traditional river channel in the same flood plain, and the prime reason that it was built was because the traditional channel was obstructed by mill dams and weirs, and it was felt that it would be too difficult to remove these. The City's plan to build a canal which led out of the river valley across and into an area previously without water communication was something else again. Indeed it was not till well into the following century that such ambitious, and unsuccessful, schemes emerged for other rivers in this country.⁵

As early as 1559, the first evidence appears of the City's interest in improving the Lea. In that year the Court of Alderman appointed a committee comprising of Alderman Thomas Lodge, Richard Spryngham a mercer, and John Dymock and Thomas Wheler, both of whom were drapers.⁶ This committee was entrusted with the task of taking the pains 'some day the next weke at the Cyties charge to viewe the Ryver of Laye as far as Ware and upward to the hed of the same Ryv And to consyder whither yt maye be so clenysyd that Barges and other Vesselles may passe therupon unto this Cytie with fuell corne hay & other necessaryes out of those ptes or not'. Within a couple of months this committee made their report, in which they suggested that the navigation below Ware could be improved to the City's advantage.⁷ In reaching this decision they made use of the services of two surveyors, Garrett Honrighe and Adrian Tymberman, both of whom were referred to as 'alyens and strangers born', whilst elsewhere Honrighe is described as a Dutchman. Honrighe in fact was also giving the city advice upon water supplies, and for his work in surveying the Lea, and for 'the makeinge of a certeyne instrument whereby he dyd declare howe water might be conveyed out of the Thames unto dyvers places of the Cytie', he was awarded £10.⁸ No

further action, however, seems to have been taken at the time, but when in 1566 a new Commission of Sewers was appointed for the River Lea,⁹ they soon approached Sir Thomas Lodge to ask for details of the decisions reached by the two Dutch surveyors.¹⁰

Unfortunately, no records remain of the work of this Commission, so it cannot be ascertained whether the plans which emerged in 1571 represented the work of these Dutch surveyors, or whether fresh technical advice was sought. Neither can it be said whether this Commission backed the City's plans or not, for it was the city rather than the Commissioners who submitted plans to Parliament. All that can be said with any certainty is that the Court of Aldermen approved a draft of the bill on 26 April 1571,¹¹ before it was sent to parliament.

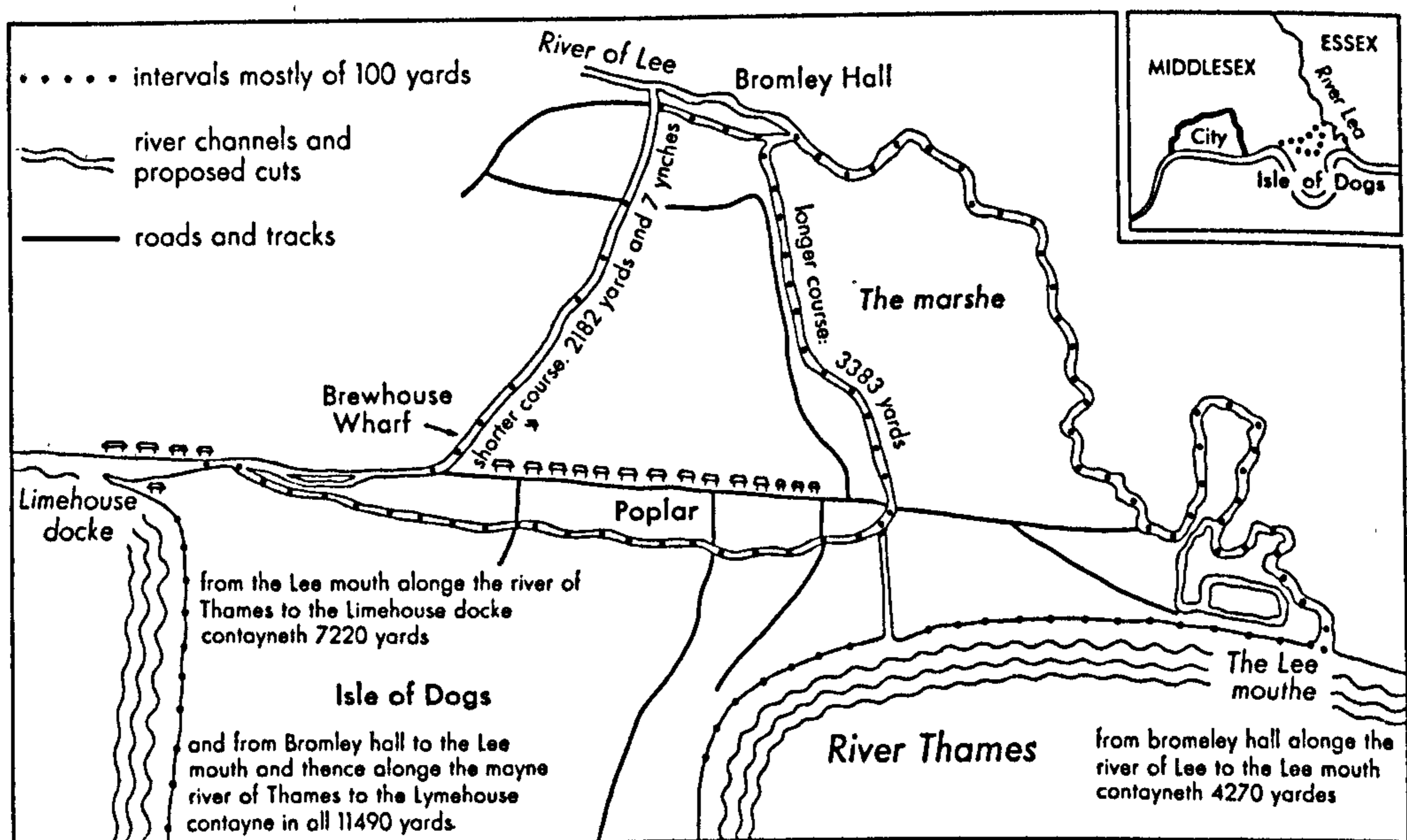
The bill first appeared before the House of Lords on 21 May, and within three days they had read and passed it, and then sent it to the Commons. There the bill was given its first reading during the morning session of 26 May, at which time a special committee was appointed to consider the bill in greater detail. However, since the parliamentary session was nearly over, the second and third readings of the bill were rushed through that same afternoon, before the special committee had had time to deliberate. However on the following day, this committee submitted various alterations and provisos which were thrice read and passed, and incorporated into the final bill which received the royal assent.¹²

What must be the original draft of the City's bill still exists,¹³ and a comparison of this draft with the act in the statute books, shows that the Commons' special committee made several important additions and alterations. Several of these changes however, can only be described as fair and just measures, designed to protect those parties whose interests might be affected by the City's proposals. Among such provisos were the requirements that the City be made responsible for any breaches which might occur in the banks of their canal, that they had to provide access bridges where necessary, and that they had to plant hedges or construct fences between their towpaths and adjacent private properties. The committee also paid heed to lobbying from the numerous millowners in Stratford, and insisted that the City be liable to pay compensation to any miller whose water supply was adversely affected by the construction of the canal. In addition they imposed a time limit of ten years, within which time the City had to complete their work.

The Commons also found themselves unable to accept the City's proposals for acquiring the land. The aldermen, in an attempt to protect themselves from the effects of inflation, had proposed that they 'for ever shall have the saide groundes . . . to be holden of the Lordes and onors of the soyle and Soyles aforesaide in fee Ferme for ever, paying suche rente for the same and everie pcell thereof . . . as the same shalbe lett for by and after the rente of an Acre, at the tyme that the saide Mayor Comonaltie and citizens shall take in the same for the saide good purpose'. A House of Commons dominated by landlords was unlikely to favour such an attempt to freeze rents, so

they redrafted the clause to give the city powers to acquire the land 'for such Composition as they shall make with ye Lorde Owners and Occupiers of the Soyle'. Changes were also made to the City's proposals for arbitration procedures in case of dispute, so that those representing the City held a less dominant position in the settlement of such disputes.

The most important change to the City's draft however, was the addition of a proviso which read:— '... all the Queenes Subjectes theyr Boates and Vessells shall have free Passage through the said Ryver, aswell the newe Cut as the older Ryver, without interruption or molestacon, by reason of or for his or theyre Passage, as in other comone Ryvers and Waters they lawfully may do'. Though no specific evidence remains to show that the City intended to charge tolls, it seems unlikely that such a project could be supported or financed without some expectation of future income. Such a toll would not in fact have been a heavy burden for the bargemen to bear, since the canal would have allowed the bargemen to avoid the Stratford area where numerous mills competed for the water, and where the bargemen often had to lay up above Bow lock for the tide to turn. In addition the bargemen would have also avoided the long winding course of the Lee below Bow Lock (see Figure 2) which was navigable only with tidal assistance, and the long haul along the Thames round the Isle of Dogs and up to Queenhithe, once more having to wait for favourable tides.



Thus, though the proviso vetoing tolls was cloaked in the language of protecting ancient rights, its insertion must be taken as evidence of strong opposition to the City's

schemes rather than any desire to protect navigation interests. Unfortunately no firm evidence remains about the complaints and activities of those who opposed these plans, but such opposition could be motivated by several factors. Millers, riparian landowners, fishermen and those who pastured their cattle in the adjacent meadows and marshes all had good reason to fear that the proposed improvements might interfere with their enjoyment of traditional rights. However in the light of later events, it seems likely that it was the 'badgers' who provided the strongest opposition.

Badgers were dealers in grain, who bought in the country markets near London in order to resell in the capital's markets. Such merchants obviously feared any new competition which might arise once the river was open to traffic, especially since it was generally recognised that river carriage was much cheaper than their own forms of transportation, by cart and packhorse. Those badgers who lived along the Lea valley, in Enfield, Cheshunt and Waltham, were particularly worried by the city's proposals, and they made common cause with their poorer neighbours, whom they employed to accompany the carts and horses on the journey into London. These poorer neighbours must have been very worried at the prospect of barge traffic, for it was well known that barges employed far fewer people to transport the same quantities of grain than did carts and horses. Such a combination of interests lay behind the riots which broke out along the river in 1581 and 1592 after more moderate improvements than those proposed by the City had been made, so it seems likely that such interests would have been vociferous in their representations against the City's bill in 1571.

At least one member of the Commons' committee responsible for changing the City's bill had strong reasons to lend his support to such opposition. This was Robert Wroth, whose family were the largest landowners in the Enfield area. Not only did the family own Enfield Mill, the largest along the river, but many of their tenants were involved in the trade of carrying grain to the capital by road. Wroth himself was named as one of the main instigators of the 1581 riots at Enfield, and he was also closely involved in the 1592 riots at Waltham, so it seems reasonable to assume that he played an important role in committee in effecting the alterations to the City's bill.

The alderman must have regarded all these alterations with distaste, but the veto on tolls, in particular, must have caused them considerable annoyance; indeed this veto must be counted as one of the major reasons why the City never carried out their intentions to construct a new cut. However there is evidence to show that the City did not give up this intention immediately, but instead brought forward new plans designed to meet this unexpected veto on tolls. In 1573 there is an entry in the City records which reads:— 'Itm yt was ordered and Agreed that Mr Chambleyn takinge with hym Mr Bates the Bridgemaster and other whom he shall thinke mete shall go with Anthony Trapper stranger to viewe & survey the River of Lee a longe to the iij^{or} mylnes at Stratford. . . . to make reporte . . . what opynyon the same Anthony is of towchinge + concernynge the conveyinge of the said Ryver of Lee to this Citye of London. . .'¹⁴ Another entry states that Anthony Trotter(sic) was to be allowed

£8 for 'his charge + paynes in vewing the Ryver of Laye . . .'¹⁵ There are no further references to a Trapper or Trotter in the City records, but a map in the Public Record Office (reproduced in Figure 2) may be taken as evidence of the plans drawn up by Trapper on the City's instructions, even though the map has been dated as being of the time of James I.¹⁶

Much remains to be interpreted but it is plain that the map was drawn up to illustrate new plans for a navigation cut or cuts across the Isle of Dogs. Two such cuts are shown, both of which leave the Lea below Bow lock, and both of which terminate in the dock at Limehouse. The longer cut is obviously a newly surveyed route, for which there can be no other purpose than to serve as a navigation cut. Its course is marked off at 100 yard intervals with dots which when added give a total length of 3,383 yards. Similar dots are also found along the course of the lower Lea, and along the Thames around the Isle of Dogs. This was the traditional route taken by the barges, and totalled 11,490 yards. Thus the construction of the longer cut would have allowed a saving of over 8,000 yards.

Another considerable advantage would accrue from its construction, for in the top left hand corner of the map there is an inscription which reads:—'Here must ye cut 13 foote deepe that the maine river maie at all ebbs yeld it 2 foote water otherwise it will at everie tide be drie'. Though this particular inscription might well refer to the shorter proposed route, it suggests that the builders intended to make the new cut navigable at all times, which was not the case with the traditional river route. The lower Lea could only be navigated with the outgoing tide, and then barges had to wait at Lea Mouth for the tide to turn before continuing along the Thames.¹⁷

It is the shorter course, however, which raises the greatest problems of interpretation. Its total distance is given as 2182 yards and 7 inches, but unlike the longer route this distance is not measured out by dots placed at even 100 yard intervals. The dots which are shown are much more unevenly spaced, and seem to accord with the boundaries of different landholdings along its course. Is this sufficient to suggest that some form of channel already existed; the upper part of which was nothing more than a drainage channel, whilst the lower part had been widened to allow barges to come up and discharge malt and hops at the brewhouse wharf? Did Trapper survey this particular course because he favoured it as the shortest and cheapest route, or was it because he felt that his favoured longer route would still have been too expensive, and the shorter route offered the only means of salvaging something from the City's once ambitious schemes? Whatever the answer, the map does show that the City made some effort to overcome the setback they had received in parliament, for Trapper's plan retains some of the advantages envisaged in the original proposals, but at a greatly reduced cost. Even his cheaper proposals, however, still left the City with the problem of how to finance them without the expectation of future income, and the fact that Trapper's plans, too, were never carried out, must be attributed once more to the veto on tolls.

There is no evidence to suggest that the City ever took serious steps to implement these schemes after 1573, but the fact that such schemes had been aired, and an Act of Parliament passed, aroused the interest of others. Once it became clear that the City had no intention of constructing the new cut, these other interested parties decided to take advantage of the other clauses in the City's act to effect more modest improvements to the traditional river channel below Ware.¹⁸ John Norden ascribes this later initiative to the 'instant suyte of the inhabitants of Hartfordshire',¹⁹ who saw that improvements to the Lea could allow them to capture an important share in the growing traffic in malt and meal down the Lea valley.

These improvers, much of whose success must be attributed to the efforts of Thomas Fanshawe, the Queen's Remembrancer, were much more modest in intention than the City had been. Though they did approach the city with a request that they present their plans for a new cut again,²⁰ there is no evidence to suggest that they ever had serious intentions of carrying out such expensive work. Through the authority of a newly appointed Commission of Sewers, these improvers concentrated on cheap but effective measures such as dredging, the removal of fishing and mill weirs from the navigable channel, the blocking off of many of the small streams which flowed into the surrounding marshes and meadows, and the construction of artificial banks where necessary. This Commission of Sewers had sixteen members, four of whom represented the City, whilst the counties of Hertfordshire, Essex and Middlesex also had four members each. The remaining records, however, do not suggest that the City dominated, or even played an important role, in the work of this Commission.

The City authorities, however, must have been very pleased with the final outcome, for the improvers were successful, and there was a rapid increase in the amount of malt and meal brought to the capital down the Lea valley. Thus the City's original intentions had been achieved, but without any nominal charge to themselves, for the cost of the improvements was borne by the riparian landowners, not by the municipality.

By an extraordinary act of municipal and official forgetfulness, the City were later to benefit from the mistaken impression that they had built a navigation cut during the Tudor period, work which in fact had never been carried out. Much confusion was to arise because the City began to claim that the course of the Lea below Temple Bridge was an artificial channel which they had built as a result of the 1571 act. This claim was recognised in 1739 when an Act of Parliament, designed to carry out further improvements to the Lea,²¹ awarded the city jurisdiction over the river below Temple Bridge, and this jurisdiction was not relinquished till a further act for improving the Lea was passed in 1767.²² The course of the Lea below Temple Bridge, however, was not an artificial cut, but was in fact the traditional river channel. A Commission of Sewers in 1551 found that "from the Locke bridge to Temple Bridge, and from Temple bridge to the Bullivannte and from thence to Clobbs Hill and from thence to Oldforde and from Oldforde to Bowe bridge and from Bowe bridge to the Laye mouth is the

Kinges high Streame called the water of Laye',²³ and this course was confirmed shortly after the Tudor improvers had completed their work,²⁴ and was to remain as the main navigable channel until the Hackney cut was made as a result of the 1767 act.

The first reference in the city records to such a claim is in 1654,²⁵ when reference is made to the 'Newcutt'. However it was not till the 1690s that the City began to take serious steps to establish such a claim in law. Then, in the aftermath of the scandal over the Orphans Fund, the city tried to establish a legal right of jurisdiction, with the hope that the profits from the groundsoil and fishing would help to increase the City's income. With this in mind the city let the river below Temple Bridge to William Savage for a peppercorn rent, on the understanding that he would take the necessary steps to establish the City's legal rights, and that they would then share the resulting profits.²⁶ Savage in fact does not seem to have made any effort towards establishing such rights, and arguments were to continue until the City's claim was finally recognised in 1739.

NOTES

- 1 Public Record Office map room, MPF 282. This plan is dated as 1578 in the catalogue, and there is evidence to show that it was, in fact, presented around this time. In October 1577 Thomas Fanshawe wrote to Lord Burghley that 'Mr Chamberlayne of London write me that there is considerance had of a newe cutt to be made to bring the passage to Moregate and prayed me to signifie so mouche to your Lord and that there is especial liking and hope it wilbe done and that he ment to bring a platt of the ground and debyt to your L. (Landsdowne MS 25 no. 12) This comment, however, is the only evidence to suggest that plans to build the city's cut were still under consideration at this late date. By 1577 the Commissioners of Sewers were already carrying out improvements to the river, but since the 1571 act implied that such work should only be done once the cut had been completed, they may well have found it expedient to pay lip service, and encourage the city authorities to present their plans once more. The city may well have been serious in their intentions in 1577, but there is no other evidence of this. Whatever the explanation, however, it seems unlikely that the City would go to the trouble of obtaining fresh plans once more, so I think it is fair to assume that the aldermen re-presented their original plans.
- 2 State Papers Elizabeth, Domestic Series, Vol 15 no. 11.
- 3 For details of Tudor river improvements, see W. T. Jackman *The Development of Transportation in Modern England* (1916).
- 4 Philip Chilwell De La Garde, 'Memoir of the Canal of Exeter 1563-1724' *Proceedings of the Institution of Civil Engineers* IV, 90-102.
- 5 T. S. Willan, *River Navigation in England 1600-1750* (1936) and Jackman *op. cit.*
- 6 City of London, Repertories 14, f. 365.
- 7 Ibid 14, f. 367b.
- 8 Ibid 14, f. 382 & f. 493.
- 9 Calendar of Patent Rolls, 1569-72 no. 1860.
- 10 City of London, Repertories 16, f. 186b.
- 11 Ibid 17, f. 141b.

- 12 Members of the Commons' committee were: Mr Chancellor of the Duchy, Mr Willson, Master of Requests, Sir Henry Gate, Sir John White, Mr Moore, Mr Holstocke, Mr Grymston, Mr Bashe, Mr Robert Wroth, Mr Henry Cock, Mr Dacre, Mr Norton, Mr Humberston and Mr Bowyer.
- 13 State Papers Elizabeth, Domestic Series, Vol 77 no. 79.
- 14 City of London, Repertories 17, f. 456.
- 15 Ibid 17, f. 464.
- 16 Public Record Office map room, MPB 31. In the catalogue this map is described as a map of Stepney and Poplar in the time of James I. However, the map's purpose is to show plans for new navigation cuts, and it is not a general map of the area. Such ambitious schemes were being considered during the 1560s and 1570s, but there is no evidence to show that they were still being considered during James I's reign. Furthermore the scope of the map falls exactly within the instructions given to Trapper in 1573, so I think that there can be little doubt but that this map was drawn up by Trapper on the instructions of the city in 1573. Much of the confusion which has arisen over the previous dating of this map must be ascribed to the document which has been attached to the map. This document is of the time of James I, but it has nothing whatsoever to do with the map. It is rather part of the instructions issued to a Commission of Sewers set up to investigate disputes over the right to collect tolls at a lock in Waltham, most probably in or around the year of 1613.
- 17 Hatfield House, CP166/47.
- 18 For a full summary of the improvements made, and of the ensuing problems, see an essay I have deposited with Stratford Reference Library entitled 'The River Lee: A Tudor Experiment in Improving a River Navigation'.
- 19 John Norden's Description of Middlesex, British Library Harleian MS 570.
- 20 See n. 1 above.
- 21 12 Geo II c. 32.
- 22 7 Geo III c. 51.
- 23 'Proceedings in the Star Chamber'. A manuscript book compiled about 1595 by William Harte, and now deposited in the Guildhall Record Office. Fos 169-70 provide evidence collected by the 1551 Commission of Sewers.
- 24 British Library, Lansdowne 60 no. 35.
- 25 City of London, Repertories 63 f. 89b.
- 26 Details of these negotiations and the lease are to be found in 'A Book of Extracts from the records relating to the River Lee and the New River', Guildhall Library MS 2194.