Proceedings of the Cambridge Antiquarian Society

(incorporating the Cambs and Hunts Archaeological Society)

Volume XCIX
for 2010

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Proceedings XCVI, 2007: Price £12.50 for members, £14.50 for non-members

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John Pickles, Peter Gathercole, and Alison Taylor: *Mary Desborough Cra'ster, 1928–2008*
Leo Webley and Jonathan Hiller: *A fen island in the Neolithic and Bronze Age: excavations at North Fen, Sutton, Cambridgeshire*
Aileen Connor: *A fen island burial: excavation of an Early Bronze Age round barrow at North Fen, Sutton*
Hella Eckardt with Amanda Clarke, Sophie Hay, Stephen Macaulay, Pat Ryan, David Thornley and Jane Timby: *The Bartlow Hills in context*
Stephen Yeates: *Senuna, goddess of the river Rhee or Henney*
Scott Kenney: *A reappraisal of the evidence for the 'northern arm' of the Fleam Dyke at Fen Ditton*
Laura Piper and Andrew Norton: *An excavation at Station Quarry, Steeple Morden, Cambridgeshire*
Duncan Mackay: *Excavations at Scotland Road/Union Lane, Chesterton*
Aileen Connor: *A curious object from Firs Farm, Caxton*
Christopher Taylor: *A morphological analysis of Ickleton, Cambridgeshire: an admission of defeat*
Ken Sneath: *Funerals, the final consumer choice?*
N James: *The 'Age of the Windmill' in the Haddenham Level*
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John Pickles: *The CAS Collection of Cambridgeshire 'Sketches'*
Tom Lyons, Elizabeth Shepherd Popescu and Sarah Poppy: *Fieldwork in Cambridgeshire 2008*
Christopher Taylor, Christopher Brookes, Evelyn Lord and Sam Lucy: *Reviews*
Chris Jakes: *Recent Accessions to the Cambridgeshire Collection*

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Volume XCIX for 2010

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Cambridge Antiquarian Society
Report for the Year 2009

Membership: there are now 382 members, 49 Affiliated Societies and 67 subscribing institutions.
Meetings: There were 4 Council meetings and 9 Ordinary meetings, at which the following lectures were given:

Gabriel Moshenska	*The School Air Raid Shelter: History, Archaeology and Memory*
Prof. Stephen Oakley	*How Latin Texts Survived from Antiquity to the Age of Printing* (In association with the Society for the Promotion of Roman Studies)
Richard Buckley	*A Tale of Two Towns: recent discoveries from Roman and Medieval Leicester*
Prof. Ronald Hutton	*The History of Prehistory: Megaliths and the Modern Imagination*
Dr Catherine Hills	*Skeletons in the Garden – Romans and Anglo Saxons at Newnham College*
Ben Robinson	*Revealing Peterborough – New Explorations in an Ancient Cathedral City*
Dr Stephen Alford	*Finding Nicholas Berden: the career of an Elizabethan spy*
Prof. Simon Keynes	*John Mitchell Kemble (1807–57): Apostle, Revolutionary, and Anglo-Saxonist*
Richard Mortimer & Alex Pickstone	*Further Excavations at the War Ditches, Cherry Hinton, Cambridge* (In association with the Prehistoric Society)

In addition the following two conferences were held:

21st November 2009	*Recent archaeological work in Cambridgeshire*
17th April 2010	*Past Relations: different approaches to the dead over time*

Excursions: The Programme for 2010 consisted of the following visits:
Chatham Historic Dockyard, Saturday 15 May:
One of the country's foremost naval dockyards for 300 years, Chatham has been in the care of the Historic Dockyard Trust since 1985. As well as three historic vessels — HMS Gannet (1878), HMS Cavalier (1944) and HM Submarine Ocelot (1962) – it has a spectacular Victorian Ropery and a galaxy of other permanent and temporary exhibitions and displays, including 'The Wooden Walls' (a recreation of the dockyard in 1758) and the RNLI Lifeboat Collection. It also has the largest single concentration of listed buildings (military, civil and religious) in the UK.
Cherry Hinton, Saturday 26 June.
A morning was spent exploring the historical and archaeological landscape of Cherry Hinton Hall and its surroundings, under the guidance of Ms Michelle Bullivant. Outwardly Victorian, the park nonetheless has many features that bear witness to former land uses and industrial activity. Also investigated was the Lime Kiln Hill area and the newly-open to the public East Pit.
Spalding, Lincolnshire, Wednesday 14 July.
The highlight of this excursion was a visit to the Spalding Gentlemen's Society, founded in 1710 and one of the oldest learned societies in the country. The Society has the UK's second oldest museum collection, containing many rare items of both local and national interest, and a fine library.
The medieval riverside at Ely, Wednesday 15 September.
The riverside was a centre of activity in the Middle Ages attracting trades dependent on the river, and those requiring water such as brewing. The area was developed after the diversion of the river to its present course, probably in the twelfth century, thereby incorporating Ely into the fenland river network.

This walk, led by Mrs Anne Holton-Krayenbuhl, explored the area between the river and Broad Street, bounded by Waterside to the north, looking at sites of former watercourses, hithes, and buildings. The tour also included two medieval houses in Broad Street.
Moggerhanger Park, Bedfordshire, Wednesday 6 October.
Relatively little-known, perhaps due to its long period of use as a local authority TB sanatorium and then orthopaedic hospital (from 1919 to 1987), Moggerhanger was designed by Sir John Soane for Sir Godfrey Thornton, a director of the Bank of England, and built between 1790 and 1816. Listed Grade 1, it is regarded as perhaps the best complete surviving example of Soane's work, and epitomises many of his architectural ideas. The grounds were laid out by Humphry Repton. Now in the care of a Trust, which stepped in to avert the threatened demolition of the house and construction of a housing estate on the site, this excursion enabled members to see the current state of an ongoing and ambitious programme of restoration.

Cambridge Antiquarian Society Accounts for the Year Ended 31/12/2009

Registered Charity 299211 • Founded 1840

PAYMENTS

2008		2009
332.53	Lectures: Publishing Programme	310.00
255.44	Expenses	401.07
1418.33	Vol XCVI Delivery	
6399.28	Proceedings Vol XCVII Publication	
911.14	Proceedings Vol XCVII Delivery	(*b*)
	Proceedings Vol XCVIII Publication	7692.41
	Proceedings Vol XCVIII Delivery	1083.29
1050.36 (*a*)	Conduit	1005.00 (*a*)
944.69 (*a*)	Conference: March	898.35 (*b, c*)
437.67 (*a*)	: November	300.00
2147.09 (*a*)	Excursions	285.03 (*b*)
504.65	Mailings: Delivery Charges	156.56 (*b, c*)
102.00	Subscriptions (CBA, Rescue, CRSoc)	104.00
100.00	Haddon Library: Conservation	100.00
376.17	Office Expenses, Web Site, Misc	347.75
250.00	Emolument: Registrar	250.00
	Publicity	532.65
221.60	Insurance	241.05
894.83 (*b*)	From capital: new web site	1121.25 (*h*)
500.00	Small Grants Scheme	100.00
16895.78	Sub-Total	14928.41
6000.00	Purchase of Investments	
22895.78	**Total Payments**	**14928.41**

RECEIPTS

2008		2009
7110.00	Subscriptions: Members & Societies	6908.50
720.71	Tax Reclaimed	779.65
800.00	C.U. Archaeology Dept.	800.00
2369.00	Proceedings Vol XCVI: Grants	
3370.00	VolXCVII: Grants	
	VolXCVIII: Grants	2090.00
486.96	Conduit	162.60
1197.10	Conference: March	1813.00
386.00	: November	505.00
1924.25	Excursions	312.00
173.48	Sales of Publications	135.90
416.00	Royalties, Misc	208.05
997.59	Investment Income (gross)	1174.05
812.02	Interest: NSB (gross)	67.41
20763.11	**Total Receipts**	**14956.16**
22895.78	less Payments (excluding Investment of capital adjusted below)	14928.41
-2132.67	**Cash Surplus/Deficit (-)**	**27.75** (*d*)
	Fixed Interest Treasury Stock:	
6000.00	Capital investment	
-997.06	less excess cost on purchase/re-investment over maturity values	-571.32
2870.27	**Surplus/Deficit (-) Income over Expenditure**	**-543.57**

STATEMENT OF ASSETS

2611.26	Cash Funds: Current A/C	2571.60
23265.03	: Deposit A/C	23332.44 (e)
18363.84	Treasury Stock at maturity values	17792.52
44240.13		43696.56 (*g*)
	Accumulated Fund	
41369.86	At beginning of year	44240.13
2870.27	**Surplus/Deficit (-) Income over Expenditure for the Year**	**-543.57**
44240.13	At end of year	43696.56
	Planned Future Expenditure	9840.00 (*f*)

C. B. Pritchett, Hon Treasurer *B. Cloke, Independent Examiner*

Notes

The presentation of the accounts conforms to guidance provided by the Charity Commission. Comment on some of the entries is given in the following notes:

a. *The cost of mailing details to members has been attributed to the event.*

b. *A credit of £894.83 with Mailing Distributor arose in 2008 and was used in 2009.*

c. *Adding the attributable postage credit makes the 2009 figures comparable to earlier years.*

d. *This figure is influenced by a credit with the mailing distributor (b) and the exceptional expenditure on redesigning the Web site (h); excluding these amounts the surplus from the normal activities of the Society in the year 2009 is £254.17.*

e. *In 2005 the Council reviewed the policy for the reserves held by the Society and concluded that the cash funds less liabilities (f) should be maintained in the range £10,000 to £20,000: on 31 December 2009 the reserves were £16,064*

f. *Planned expenditure; PCAS Vol XCIX £8000, Ladd's Bequest (g) £840, Small Grants £500 and a grant of £500 to Cambridgeshire Archives towards the cost of purchasing the Fen Drainage Papers; total £9,840.*

g. *Includes Ladd's bequest earmarked for events associated with Huntingdon; with interest the sum is now £840.*

h. *Exceptional expenditure on the design of a new Web site.*

Contents

The medieval network of navigable Fenland waterways I: Crowland

Michael Chisholm

That rivers were the medieval 'highways' of the Fens is not in doubt (Darby 1940, pp. 100–01). However, although several diagrams have been published portraying the network of navigable rivers, there appears to have been no systematic attempt to map the 'highway' network and how it evolved during the long period from Saxon-Norman times to the early seventeenth century, immediately prior to the major land drainage schemes that transformed the Fens.

Few land routes existed in the medieval Fens and wheeled traffic over any distance was also limited by the soft terrain and dearth of bridges. Small boats were ubiquitous, but larger craft for heavy and bulky freight, probably carrying some ten tonnes or thereabouts, measuring some nine metres in length and three in the beam (see Part II), would have been restricted to the larger watercourses. It is upon these channels that this paper concentrates.

The notable early work on Fenland rivers by Fowler (1933, 1934a and b) and Astbury (1957) does not provide a coherent picture for the medieval period. They considered a longer time period and believed that any channel identified as artificial should be regarded as Roman unless there is positive evidence to the contrary. With the accumulation of new information, it has become apparent that this assumption must be revised (e.g. Blair 2007).

Published diagrams reveal agreement among scholars about some of the important elements of the medieval Fenland river network, and also disagreement about other significant parts of the system (see Tables 1 and 2 and Figure 1). I consider that the easiest way to try to work out the main 'highway' map is the following. William Hayward compiled a map of the entire Fens at a scale of one inch to the mile in 1604, but the original version has disappeared and we are reliant upon copies. Of these, the one by Payler Smyth in 1727 appears to be that of a map drawn for the purpose of planning a comprehensive drainage scheme and has a clearer provenance, from the Fen Office in Ely, than the other copies, which include detail not shown on Smyth's version (Cambridgeshire Archives R59/31/40/1; see Chisholm and Stickler in preparation). A facsimile copy of the Smyth map, supplied by Cambridgeshire Archives, has been used, simplified to show the main relevant watercourses (Figure 1).

Table 1. *Authors whose diagrams exclude specified waterways in the Fenland network.*
The authors whose diagrams have been examined are: Astbury 1957; Barley 1938; Bond 2007; Darby 1936, 1940 and 1983; Edwards and Hindle 1991; Gardiner 2007; Jones 2000; Sayer 2009; Spoerry 2005. All of these authors include the waterways listed below in their diagrams, except the authors listed below.
**Jones shows Crowland Cut and South Eau to Guyhirn but does not show the remainder of Astbury's 'original' Nene from Clough's Cross to Tydd St Mary.*

Waterway	Not mentioned in
Car Dyke	Barley; Darby (1936, 1940, 1983); Gardiner; Jones; Spoerry
Crowland Cut (Crowland to Cat's Water)	Astbury; Bond; Darby (1940, 1983); Gardiner
Astbury's 'original' Nene (Cat's Water and South Eau to Tydd St Mary)	Jones*
Plant Water/Hobs river	Astbury; Bond; Darby (1936, 1940, 1983); Gardiner; Jones; Sayer; Spoerry
South Eau (Cloughs Cross to Guyhirn)	Astbury; Bond; Darby (1940, 1983); Gardiner; Sayer; Spoerry
Welland	Astbury; Darby (1940); Gardiner.

The names applied to watercourses have changed over time in a manner that can be very confusing. We will use modern terminology and Table 2 has been constructed to identify the channels of interest, with these terms and those used by Hayward, supplemented as appropriate by other usages found in the literature. The modern river system bears little relationship to that which existed some thousand years ago and a fundamental leap of imagination is required. The

Great Ouse and the Nene entered a large swampy area that had some characteristics in common with a delta, most particularly the steady accretion of sediment and seaward progression of the coastline. In such an environment, there is continual change whereby rivers alter their courses, channels divide and re-join; in addition, it seems likely that human intervention has played a part. For a considerable period relevant for the present enquiry, two rivers – the Ouse and the Nene – at the point where they left the uplands and entered the Fens, divided into two channels that were simultaneously navigable, but with one channel in long term decline. 'Originally', the Ouse at Earith flowed northwards to Benwick, entering The Wash at Wisbech, the channel from Earith to Benwick being known as West Water. At some unknown date before the Norman Conquest, a second channel of the Ouse opened up, Old West, leading to the Cam, with their united waters flowing past Ely and Littleport and thence to Upwell, re-joining the 'original' alignment and passing to Wisbech. Subsequently, the Ouse found its outfall at King's Lynn (hereafter, Lynn).

Early in the medieval period, the main flow of the Nene took the southerly course to Whittlesea Mere and Benwick, uniting with West Water, forming what is now known as the Old Nene. However, there was a contemporary channel further north, Cat's Water/South Eau/Shire Drain, which Astbury (1957) thought was the 'original' course. The apparent lack of geological evidence as a main river (Evans 1979) suggests this cannot have been the case, and Hall (1987, p. 36 and 1992, p. 15) believes that Cat's Water was artificially created in Saxon or early medieval times. Archaeological investigation of Flag Fen and Fengate either side of Cat's Water show that Fengate stood on river terrace gravels and that Cat's Water existed in the Bronze Age (Evans 2009; Pryor 1978, 1991; Pryor *et al.* 1986). We may be confident that Cat's Water was a significant distributary of the Nene when the Saxons established county boundaries because it and South Eau formed boundaries of Lincolnshire, Cambridgeshire and Northamptonshire and, as Hall notes, pre-seventeenth century records clearly show the Nene uniting with the Welland at Crowland.[1]

Several elements of the medieval waterway network are generally accepted by scholars, namely:

Great Ouse outfall at Lynn
Old Croft (Littleport to Upwell)
Well Creek (Outwell to Salter's Lode)
West Water (Earith to Benwick)
Old Nene (to Wisbech)
Cat's Water/South Eau (to Tydd St Mary)

But there are other segments of the network that some authors omit from their illustrations, and only one writer's diagram explicitly shows change over time (Jones 2000). The Welland is excluded from some of the networks portrayed, and there is no general acceptance of the water link from that river at Crowland to Cat's Water/South Eau shown by Hayward. South Eau from Cloughs Cross to Guyhirn and the links therefrom to Upwell and Outwell are also not universally accepted as navigable channels.

Hayward's map has been chosen as the starting point, with the intention of comparing it with documentary and other evidence relating to the existence and suitability of the main network for river traffic, and how circumstances may have changed over time. For this purpose, it is convenient to begin with Crowland and its connection to the Nene river system, and then to work around the Fens in as logical a sequence as possible. Crowland has been selected because its importance has hitherto been overlooked and, once that is understood, other parts of the waterway jigsaw fall into place much more readily than if discussion of Crowland were postponed.

Table 2. *Comparison of names given to some segments of the waterway network.*
[1]Author's usage. [2]Known as Old South Eau since the seventeenth century

Modern usage		Hayward	Other names
Cat's Water		Ould Ea (to Thorney Cross), Cattes Water	Muscat
Crowland Cut[1]		Neane Flu	Green Bank, Great Porsand
Great Ouse (Earith to Cam)		Ouse Flu	Old West River
King's Dyke		Srvords Delphe or Kenouts Delfe	Cnuts Dyke
Morton's Leame		New Leame	
Old Croft		Welnye River	Welney River, West Stream, Olde Wellenhe, Old Welnha, Wellstream
Old Nene		Neane flu	
Plantwater Drain		Plantwater	Idenhe
South Eau	to Cloughs Cross[2]	Not named	Southea
	Cloughs Cross to Tydd)	Shiere Draine	Lady Nunn's Eau
Well Creek		New Podike	Pokediche Dyke, New Poldyke
West Water		West Water	

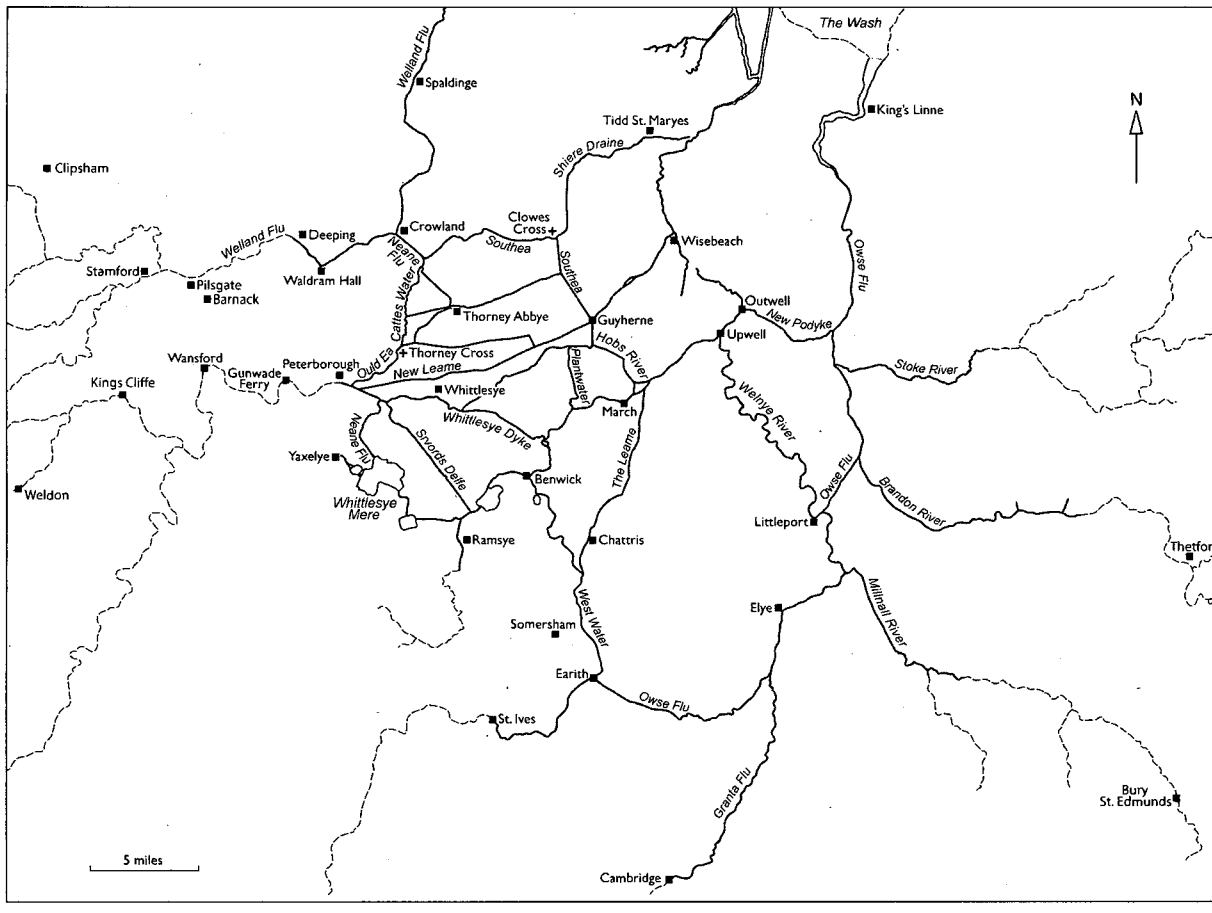

Figure 1. The main elements of the river system in 1604 as portrayed by William Hayward. The pecked lines show rivers extended beyond the compass of Hayward's map. Hayward's spelling is used for the names shown on his map. The partial outline of The Wash shows the modern coastline. The channel between Cat's Water and Clowes Cross does not carry a name on Hayward's map but there is no doubt that it was Southea, as shown in the Figure. Sources: Facsimile copy of Cambridgeshire Archives R59/31/40/1 and Ordnance Survey.

Crowland, its abbey and Crowland Cut

The abbey was originally founded in 716 and refounded in the tenth century, and Trinity Bridge, standing in the middle of the town, is key to our understanding of Crowland's importance on the navigation network. Built in 1360–90 (Moore 1884, p. 24), the Bridge is constructed of stone as three arches of equal span set at about 120 degrees to each other and rising to a central point. All three ascents/descents are steep and narrow, unsuitable for wagons but readily negotiated by porters, pack animals and livestock (Fig. 2).

There have been fanciful speculations about the purpose of Trinity Bridge (e.g., Holdich 1816) but, as will become clear, the more prosaic view of Moore (1884, p. 25) has to be correct, that it was built to permit the rivers to be navigated. The four roads within Crowland converging upon the Bridge are former waterways, as are other roads in the centre of town (Hayes and Lane 1992, Fig. 121; see also Boyes and Russell 1977, p. 242). Crowland was a miniature Venice in the Fens, a comparison made by John Ogilby in 1676, on the basis of piles used to support the buildings (Bowen 1731, p. 88; see also Jervoise 1932, p. 68). Walk away from the Bridge down North Street and consider the width of the road, its sinuous alignment and the large number of yards along the left (west) side, possessing narrow frontages to the road but running far back. It is obvious that here was a harbour basin, now filled in, with commerce-related businesses fronting thereon; West Street has similar characteristics, but less visibly so today. The existence of 'the yards of diverse tenements' is noted by Hayward (1636 p. 208), and the antecedents are recorded by the grant of an elongated messuage on the north side of the Bridge sometime between 1190 and 1236 (*Crowland Cartulary* vol. 1, fo. 46d),

The Welland flowed down West Street and then away along North Street. The channel along East Street led from the wharves to the abbey, and, as will be seen, South Street's channel connected to Cat's Water/South Eau. Viewed in this light, Trinity Bridge stood at the hub of Crowland, its role offering some parallels with The Rialto across the Grand Canal, confirming that there was a water link in the fourteenth century to what we now know as Nene

Figure 2. *Trinity Bridge, Crowland 1724, by William Stukeley. the bridge is accurately protrayed but the amount of water at that time is almost certainly exaggerated (Collection of the Spalding Gentlemen's Society).*

Terrace. This channel ran straight across the low eminence on which the abbey stood, running transverse to the general direction of drainage indicated by the rivers Welland and Cat's Water/South Eau; today, the alignment is marked by the B1040 road. As a watercourse, this channel could not have been natural and must be accepted as artificial; we will call it the Crowland Cut.

A plaque on the Bridge states that there was a wooden bridge on the same site, recorded in 943, but this cannot be taken at face value because Crowland's early charters are notorious for being 'forgeries'. The date of 943 has probably been taken from sources such as Holdich (1816, p. 134) and Moore (1884, p. 24), both of whom state that there was a *triangular* bridge on the site in that year. However:

> *The first mention of the Triangular Bridge 'pons triangulus' at Croyland is ... in Eadred's charter of 948; it is again noticed in Eadgar's charter of 966. 'Pons de Croyland' is mentioned before this in the charters of Æthelbald of 716, of Wiglaff of 833, and of Bertulph of 851.* (Searle 1894, p. 127.)

Sawyer (1998, Appendix 5) lists all of these charters as being 'certainly spurious or of doubtful authenticity, although some may be based on early records'. According to his earlier work (1968), there is general agreement that the two earliest charters noted above are spurious, and divided views about the reliability of the other three, with reason to think that the charter of 948 may be based on earlier documentation.

Crowland Abbey was devastated by fire in 1091, with the loss of most, if not all, books and manuscripts, a disaster that left the monks with a problem – how to prove ownership of their manors and other possessions? As happened elsewhere, the device adopted was to re-construct early charters and pass them off as originals. Self-evidently, these reconstructions – forgeries or spurious documents – had to be plausible, which means that they could not stray too far from the truth. Whether or not any attempt was made to cheat we do not know, but clearly it was desirable to include uncontentious detail as a means of giving credence to each document as a whole.

Assuming that all five charters were re-constructed after the 1091 fire, they must have been drafted to represent circumstances at the time of, or prior to, the conflagration. If there had been no triangular bridge, it is exceedingly unlikely that the monks would have included an obviously false detail. Therefore, without worrying too much whether there was a triangular bridge in the specific year 948, it is virtually certain that such a structure existed in 1091, and probably in the tenth century. It would be comforting had the Bridge been included in the Domesday survey of 1086 but, even it had met the criteria, no such record exists because Crowland itself, in common with some other abbeys, was exempt from the inquisition.

Other than the charters, the earliest direct reference to the Bridge that has been identified arose from a dispute between Crowland and Peterborough ab-

beys about the ownership of Alderland, a marshy area immediately southwest of Crowland, which had begun before 1206. The Abbot of Crowland objected to interference by the Abbot of Peterborough regarding market tolls (stallage) and control of the Bridge (*Fenland Notes and Queries* 5 1901–03, p. 84). Agreement was finally reached in 1247, allowing the Abbot of Crowland and his men free access over the Bridge with their cattle (*Crowland Cartulary* vol. 1, fo. 42).

That Crowland Cut existed in the first half of the twelfth century is directly demonstrated:

> *Stephen [1135–54] had confirmed to that monastery [*Crowland*] among other possessions the marsh 'from the water of Crowland, which is called Nene, to the place which is called Fynset, and from that place to Greynes, and from Greynes to Feldwardstaking, and thence to Southlake, where it falls into the Welland'.* (VCH 1970, p. 422)

This is a clockwise progression from Crowland, identifying a parcel of land south of the Abbey, Fynset being St Vincents's Cross at its original location (TF 258 076), hard by the village now known as Nene Terrace. Reference to the 'water of Crowland called Nene' describes the Cut, along which water flowed from Cat's Water/South Eau.

Peterborough refused to accept this ruling and in 1206 agreement was reached between the two monasteries, the land being recognised as belonging to Peterborough but to be leased to Crowland. A later charter confirmed this arrangement:

> *The land 'between the waters of the Nene and the waters of the Welland as they meet at Crowland', and on the west to 'the great road from Wansford, to Stamford', was what Peterborough always claimed, and those boundaries appear in a charter of John, dated 1215* (VCH 1970, p. 421).

The territorial dispute was not finally settled until 1583, after the Dissolution, the parties then being Elizabeth I, as the lady of Crowland manor, and tenants of the Soke of Peterborough.

There is a charter dated 972, by which it was agreed between the abbeys at Ramsey and Peterborough to exchange some land and also granting Peterborough the right of toll over a substantial area. This charter is almost certainly spurious but is thought to contain authentic information. The area over which Peterborough was to have toll rights was defined in part as follows:

> *... from Wansford to Stamford, and from Stamford along the water course to Crowland, and from Crowland to the Muscat ...* (Hart 1966, p. 26).

Muscat is an alternative name for Cat's Water. This definition implies obvious landscape features between Wansford and Stamford, and likewise from Crowland to Cat's Water, respectively Ermine Street and, it may be supposed, Crowland Cut.

Direct evidence for the existence of Crowland Cut confirms inference from the Bridge; the Cut clearly existed in 1091 and almost certainly in the tenth century. A court case in 1362 establishes that it was navigable, and had been so 'from time immemorial' (see Appendix). The key passage in the translation has been checked by Diana Honeybone against the original Latin and she is confident that the scribe intended to convey that there was a continuous channel, navigable in both directions, from South Eau through Crowland to Waldram Hall on the Welland. Presumably, the owner of the Hall held land along South Eau, but this is not stated in the record.

The significance of Crowland Cut for the Abbey is demonstrated by a map, held by the Public Record Office (MPCC 1/7 Pinchbeck Map), probably mid-fifteenth century in date but possibly earlier (Mitchell and Crook 1999 pp. 46–7; Silvester 2002, p. 10); a facsimile copy is possessed by the Spalding Gentlemen's Society. With Crowland towards the southeast corner, this map has three main components: the settlements east and west of the Welland, identified by name and realistically depicted by their respective churches; a large area, mostly west of the Welland, shown as uninhabited, being the river's washland; and the Welland joined by a channel from the east, the confluence straddled by the stone triangular bridge. All three waterways are shown equally large and bold, signifying the importance of Crowland Cut relative to the Welland at the time the map was made.

Why did the monks dig the channel linking the Welland and Cat's Water/South Eau? In common with monasteries elsewhere in England, Crowland held manors and other resources that were widely scattered geographically. In 1086, its possessions included the manor of Holbeach and Whaplode to the northeast, three fisheries at Wisbech, and properties in Leicestershire, Northamptonshire and Cambridgeshire (Page 1934, p. 10 and facing table; Raban 1977, Appendix 1; VCH 1906, p. 106). In the last of these counties, the possessions included Cottenham, Dry Drayton and Oakington, for which the Ouse was the nearest waterway. Although we do not know in detail when the manorial specialisations developed, note that the Cambridgeshire manors despatched malt to the abbey by water, while other manors specialised in cattle, for meat and for dairy products, and flocks of sheep grazed the fens around Crowland and elsewhere (Holmes 1962, p. 118; Page 1929, 1934; Platts 1985, p. 102; Ravensdale 1974, p. 32). There was a high degree of central control of these properties, as Page makes clear with the management of the sheep flocks, including transport to the Abbey of wool and lambs, and the dispatch of stock from the demesne properties, a system perfected from 1276 but obviously with a significant prior history. Although it was usual until the late twelfth century for estates to be farmed for their revenues rather than managed in hand, manorial specialisation was common in the tenth century and religious houses needed access to their properties for provisions and elsewhere for other necessities, such as building materials.

There was a high degree of inter-dependence across the Fens from the tenth century onwards. Bishop Aethelwold re-founded abbeys at Ely, Peterborough and Thorney in the tenth century and:

> *As late as 1000–25, Ely was supplying Thorney*

with various commodities including manpower and equipment ... Only gradually did each house emerge as an independent entity. (Raban 1977, p. 8.)

These and other links depended upon water communications, as between Peterborough and Thorney along Cat's Water from the time that the first religious settlement was established at Thorney in the seventh century, not long after the original Peterborough foundation (Mellows 1927, pp. 3–4). Likewise, Cat's Water provided the means for passengers to travel between Thorney Abbey and its Stanground property (Halliday 1986, p. 2). Early in the thirteenth century, three records from Peterborough Abbey accounts show the upper part of Cat's Water to Thorney Cross was used to transport stone to Eye for a new grange.[2] The channel was still used in 1414, when a cord of timber was purchased for Singlesole grange (TF 254 069) to construct a substantial barge (Greatrex 1984, p. 142), about the time of a record showing the collection of ferry tolls on Cat's Water for cattle being driven from Whittlesey to Peterborough (Halliday 1986, p. 2).

Crowland's need for good communications into the Fens was reinforced by the general geography of religious houses after the devastation wrought by Danish invaders in the ninth century. At the time of the Norman Conquest, Crowland was the only abbey 'in the shires of Lincoln, Leicester, Nottingham, Derby and York' (Stenton 1984, p. 456). Crowland was on the northern edge of a remarkable cluster of powerful religious houses, a fact underlined by the following observations about Peterborough, re-founded in 966 by Bishop Aethelwold:

In Ethelwold's lifetime, and for a period thereafter, Peterborough's fortunes were closely bound up with those of the other monasteries in his 'connexion' – Abingdon, Ely, Thorney, Crowland, the two Winchester houses and (probably) St Albans ... These houses had a common origin, a common interest, and perhaps a common record. (King 1973, pp. 6–7.)

The evidence mentioned above indicates that the early Crowland charters are correct: a triangular bridge existed by 1091, and probably earlier. Likewise, we know that Crowland Cut existed early in the twelfth century and, independently of evidence about the Bridge, it probably existed in the tenth century. This conclusion is consistent with the date given by Hayes and Lane (1992, Fig. 121) for Crowland's waterways, the Cut included, namely 'Late Saxon-Medieval'. Water communication from Crowland to Peterborough, the Old Nene, Whittlesea Mere and thus to Wisbech was possible. We know that South Eau was navigable in 1362 and had been for some considerable time previously, offering a shorter route to Wisbech.

South Eau

Place-name records trace South Eau back to the thirteenth century. The original suffix was 'ea', later 'ee', Anglo-Saxon for a river or stream, consistent with the early existence of Cat's Water as a distributary of the Nene, and the use of the channel as the southern boundary of Lincolnshire. The 'eau' version of the suffix was rarely used in England until the nineteenth century (Owen 1986, p. 93 fn. 1).

The name Cloughs Cross, first recorded in 1438, signifies the cross that marked the county boundary near a 'clow', a Middle English word that includes the meaning of a dam. Hayward's map shows a channel from Cloughs Cross to Guyhirn with the name South Eau, a usage recorded in 1313. This channel is straight and transverse to the general drainage direction and must be artificial; and its name was clearly derived from the original South Eau that drained to the sea near Tydd St Mary. If Woodgate (1934, p. 5) is correct, this artificial channel 'anciently was 40 feet in breadth and six feet deep'. We may infer that the dam at Cloughs Cross was built to divert South Eau. So when was the diversion engineered, and why?

Moore (*c.*1658) records this channel as 'new opened', from which we may infer that any archaeological evidence for its existence prior to the seventeenth century had been destroyed (compare the problem at March, where the diverted Old Nene was drained and scoured to the chalk bed about 1900, as recorded by Astbury 1957, p. 166). In the absence of identified documentary evidence for the South Eau diversion antedating 1313, it is necessary to turn to other sources of information for its earlier history. Tydd St Mary is recorded in the 1086 Domesday Survey, and nearby Tydd Gote in 1361, marking the point at which South Eau entered the Wisbech outfall. 'Tydd' is to be interpreted as a slight hill, while 'gote' comes from the Old English word for a sluice (see Wheeler 1990, Appendix IV). Tydd Gote lies on the landward side of the Great Bank (the so-called Roman Bank) that formerly kept the seas at bay, and the existence of a sluice at this point means that provision had been made for the discharge of land water through the bank while preventing incursions of salt water. Such an arrangement would not have been possible at that time if South Eau had been a flowing river. Therefore, when the sluice was built, South Eau at this point was already little more than a land drain.

In this area of Lincolnshire, there are several other place-name elements 'gote' and 'gowt', testifying to the widespread practice of managing the outfalls of small channels through sea embankments. One such sluice through Great Bank, a little south of Tydd Gote, was excavated in the 1970s. It consisted of three massive hollowed-out tree trunks, fitted into each other to form a culvert. The radio carbon date for this structure is 1250+40, consistent with serious sea flooding in 1251 (Taylor 1977). There would have been no point in constructing this sluice if the sea could spread onto the land from South Eau, which implies either that the river was embanked or that Great Bank continued across the outfall, with a sluice.

Great Bank runs along both sides of the Wisbech outfall. On the basis of carefully argued evidence, Hallam (1965, p. 4ff.) considers that the Lincolnshire side had probably been completed as 'one unit of de-

fence' before the Norman Conquest. He notes that earlier embankments protected the Elloe wapentake, 'sealing off' the minor estuaries along the former coastline, but there is no evidence shown for any such embayment for South Eau and Great Bank runs straight across the outfall at Tydd Gote. The inference is clear, that South Eau was already a drain rather than a flowing river before 1066, because the volume of water to be discharged was sufficiently small that the then existing sluice technology was able to cope.

Therefore, we may be sure that South Eau had been diverted no later than 1066. We know that there was substantial reclamation of valuable silt lands from the sea before the Conquest, which would have necessitated the management of land water. We also know that Crowland had possessions at Holbeach and Whaplode in 1086, and that other properties were acquired in the vicinity by both Crowland and Thorney (Hallam 1965, pp. 7 and 9; Raban 1977, Appendices 1 and 3). There would have been a collective interest of landowners, private and ecclesiastical, to assist land reclamation by ensuring that as little 'upland' water as possible entered areas being improved. Diversion of South Eau, with an embankment along the east side, would have achieved that aim and Old Southeau Bank is first recorded as a place-name in 1313. The alternative name of Fen Dyke is used by Woodgate (1934, pp. 4–5), who emphasises its importance as the landward flood defence for the silt fens. Note that Hall (1987, p. 52) considers a Saxon embankment was built along the north side of South Eau and Shire Drain to prevent flood waters in Thorney fens penetrating into Lincolnshire.

There is, therefore, one reason for engineering the diversion at an early date, consistent with the co-operative nature of drainage works noted by Raftis (1957, p. 155). The other reason is that South Eau did not 'originally' flow to a seaport of any importance, whereas the Ouse-Nene river system led to Wisbech, which 'was sufficiently important to possess the only coastal Norman royal castle in the region' (Spoerry 2005, p. 102). Although Crowland Cut allowed access to Wisbech by Cat's Water to Peterborough and then down the Old Nene, this would have been a circuitous route to achieve a seaward outlet alternative to Spalding. Diversion of South Eau to Guyhirn would have given Crowland direct access to Wisbech. Therefore, the full benefit of the Cut could only be obtained if South Eau were diverted. The combined effect of Crowland Cut and the diversion of South Eau was to create a continuous and reasonably direct waterway from Crowland to Wisbech, presumably navigable all the way, open in the eleventh century and probably in the tenth.

From Guyhirn to the Old Nene

Guyhirn as a place-name is recorded in 1275, the two components meaning 'guide' and 'angle, corner', the latter plausibly describing the right angle union of South Eau and Plant Water. As Reaney (1943, p. 293) observes:

> *Guyhirn must always have been a critical point on the drainage of this part of the fens ... and long before the construction of Moreton's Leam* [1478–86], *the meeting here of the fresh waters and the tides* [salt water] *probably led to the construction of works for the safe guidance of their flow at this corner.*

Plant Water is recorded as early as 1251 (as Idenhe), and as late as 1618 it was described as a 'principal river' and as 'the body of Neane and Ouze united' (Atkins 1618, p. 83). Plant Water is portrayed by Hayward as dividing, to make a second channel, Hobs River; both are likely to have been natural channels that may have been modified to some degree by engineering works. By means of Plant Water there was access from Guyhirn to the Old Nene above March, and to a point below that town by using Hobs River, in both cases giving water access to Upwell and Outwell. It is reasonable to suppose that these two channels existed long before 1251.

Upwell and Outwell, built upon rodhams or river levees, offered access to the Ouse and Lynn along Old Croft to Littleport and then, as we shall see below, via Well Creek to Salter's Lode (Fig. 3). The early importance of the two places is evident in several ways (VCH 1967, pp. 208–10). Upwell, first recorded as a place-name in 963, was a very important fishery because, eleven years later, the grant of 60,000 eels annually for the newly founded Abbey at Ramsey was confirmed, and river traffic was evidently important because 'as late as 1490 many of the [Ely] bishop's tenants' in Upwell and Outwell made their living that way. The Abbott of Ramsey was granted a market in 1202, and in 1291 no fewer that sixteen religious houses had interests in the villages, whose thirteenth century churches attest to their wealth – both churches are included in Jenkins' book *England's Thousand Best Churches* (1999). Remarkably, nearby March has a thirteenth century church that is also included in this volume (March occupies a small eminence or 'island' rising above the surrounding fens). It is a reasonable inference that river trade on the Old Nene and Old Croft must have been important in the twelfth century, and probably from considerably earlier, a conclusion consistent with the idea that the South Eau diversion to Guyhirn existed by 1066.

Old Nene-Ouse

The Ouse has been as changeable as the Nene in its choice of channel to the sea. The first known course, equivalent to the Cat's Water/South Eau channel of the Nene, flowed northward from Earith and so to Wisbech; this channel is generally known as West Water. It existed before the Old Nene came into existence, the Old Nene joining West Water at Benwick, giving its name to the pre-existing channel it occupied from that point downstream.

At some unknown time before the Norman Conquest, the Ouse divided at Earith, a new chan-

Figure 3. The Old Nene, Upwell, c. 1900. Although still passable by a string of lighters, note encroachments into the channel (Cambs Collection Y. Upwe. KO 35093).

nel opening up to join the Cam between Cambridge and Ely. The Ouse-Cam flowed near Ely but a little to the east and on to Littleport. At Littleport, instead of flowing to Lynn the river turned somewhat west to Wisbech, joining its other channel (West Water), now occupied by the Old Nene, at Upwell before reaching Wisbech via Outwell.

Subsequently, Well Creek formed between Outwell and Salter's Lode, on what is now the channel of the Ouse to Lynn, something that some believe was deliberately done, with adverse consequences for Wisbech as a port (e.g., Walker and Craddock 1849, pp. 97–103). The more probable explanation is that accumulation of silt in the Wisbech outfall was progressively impeding the discharge of river water, which backed up, reversing the flow of a small tributary river, so that the waters ran to Lynn (Astbury 1957, pp. 144–6). There may have been intervention to assist the natural process.

At much the same time and for the same basic reason, the Ouse-Cam divided at Littleport, with the new branch flowing to Lynn, establishing today's reach known as Brandon Creek, the straightness of which signifies an artificial channel. It seems possible that the men of Littleport opened up a Roman canal to alleviate local flooding and then found that the river took over. The former course of the Ouse-Cam from Littleport to Upwell has been known as Welney River, West Stream and now as Old Croft.

There appears to be no direct documentary evidence for when these changes occurred, though the belief is widely held that they happened quite rapidly in the mid-thirteenth century (e.g., Clarke and Carter 1977, pp. 413–5; Darby 1940, p. 96). There are, however, persuasive reasons for thinking that the changes occurred considerably earlier. Old Croft is first recorded in 1251, as Old Wellenhe, clearly implying that a new channel for the Ouse had already opened from Littleport. In her study of Lynn's history, Owen (1984, pp. 42 and 49) notes a record of royal arrangements for the hire of boats from Cambridge to Lynn in 1169, and another for the shipment of corn from that town to Lynn in 1170 and thereafter. Clearly, there were well-established water links from Cambridge to Lynn by the third quarter of the twelfth century, though we do not know whether this meant using Old Croft and Well Stream, or the Brandon Creek course of the Ouse directly to the Wash. Either way, the Ouse had been connected to Lynn before 1169, and therefore Lynn had access to the Nene river system, directly by Well Creek and/or the roundabout route to Littleport and then Old Croft to Upwell.

Before 1086, Lynn was a significant centre for salt making, attracting traders but only modest settlement. By Domesday, there were large flocks of sheep on the coastal marshes, suggesting that wool was being exported. About 1100, Bishop Herbert de Losinga endowed a small Benedictine priory, followed by the construction of the adjacent church of St Margaret's: the town expanded rapidly thereafter

(Owen 1984, p. 9; Richards 2006, p. 1).

The first charter of Bishop Losinga, dated 1101, refers to an inhabitant of Yaxley market resident in Lynn. Although Owen suggests that this person was dealing with coastal shipping to Wisbech, the more probable explanation is that one of the Ouse/Nene connections already existed at the turn of the century. Perhaps more telling is the 1184 record of a coastwise shipment from Lynn of lead originating from Derbyshire (Owen 1984, p. 42), implying continuous water links from the port to the Welland – presumably to Stamford, the head of navigation from before the Norman Conquest (Jones 2000, p. 70). Towards the end of the twelfth century, the King's purveyors were buying spices, wines, hawks and falcons at Lynn, and by 1204 'Lynn was for all practical purposes fully grown' (Owen 1984, pp. 41–2).

The early history of Lynn throws further light upon the medieval waterway network:

> *Well Stream was ... easily obstructed, to the damage of Yaxley, Holme and Peterborough. Complaints about it began about 1251, and were frequent in the fourteenth century, especially after the Lord Treasurer, Walter Langton, Bishop of Lichfield, had drawn off some of the water by his drainage works at Coldham so that in 1331 the merchants from these towns, and even from South Lincolnshire, were driven to take a long detour via Old Welnha [Old Croft] and Littleport, to reach the Ouse and Lynn. (Owen 1984, pp. 49–50.)*

There was widespread agreement across the Fens that damming Well Stream was having seriously adverse effects, causing flooding and impeding river trade, leading jurors in Lincolnshire to complain that:

> *There used to be a common way of passage for ships and boats carrying grain and other merchandise from Crowland through Outwell to Lynn, and because of the dam it was now necessary to go around through Old Welney and Littleport, a route fifty leagues longer than the old route* (Sutherland 1983, pp. 228–9).

Dugdale (1772, pp. 304–05) translates 'league' as 'mile', consistent with the Seebohm's view (1914, Part II) that it was the old Gallic 'leuga' of 2,220 metres, and the 2,000 paces referred to in the *Crowland Cartulary* (vol. 1, fo. 24) as constituting a league. Measured from Hayward's map, the detour added about eighteen statute miles (1,760 yards), so it is clear that the jurors exaggerated the inconvenience.

The obstruction was removed and the existence of the through waterway is confirmed in 1373 (Darby 1940, p. 98 fn; Salzman 1964, p. 209). Stamford provides earlier confirmation of a through waterway to Lynn, presumably via Well Creek. It was a prosperous and important town, one of whose functions in post-Norman England was acting as the collecting point for wool that was then shipped to both Boston and Lynn (Roffe 1994, p. 54; Rogers 1965, p. 44).

West Water, from Benwick to Earith, offered an alternative route from the Old Nene to Lynn and we know the channel was navigable in the early post-Conquest years. The bishopric of Ely was established in 1109 and the incumbents frequently travelled by water to the summer palace at Somersham, a journey up the Ouse to Earith and then along West Water to Somersham Lode (VCH 1974, p. 225). This practice continued at least until 1341/42 (Chapman 1907, p. 120). Further north, Chatteris was connected by lode to West Water in the thirteenth century (Hall 1992, p. 94 and Fig. 56), showing that it was passable by boats. However, by comparison with Well Creek, there appears to be no direct evidence that West Water was much used for long distance traffic, and the indirect evidence suggests that it cannot have been regularly employed on any scale.

Earith occupied a potentially strategic position on that part of the river system but West Water does not seem to have been important for the inhabitants' livelihoods. The first place-name record for Earith's existence is comparatively late, 1244, preceded by Earith Bridge in 1219. The very name Earith implies the relative unimportance of river traffic, denoting a muddy landing place. The bridge formed a crucial link across West Water in the land route from Haddenham to the east and St Ives to the west and is the main medieval economic feature of the settlement noted by the VCH (1974, pp. 153–8). The first and only mention of early river traffic in that volume is for 1425, a sixty-ton consignment of corn to Lynn. Benwick is the other settlement that one would expect to have been important in Anglo-Norman times if West Water were a major thoroughfare, but again the place-name evidence (1221) suggests the relatively late establishment of the village. Neither village possesses churches to compare with the architectural gems at March, Upwell and Outwell, noted above. The other indirect evidence has already been mentioned, namely, that when there were problems over the use of Well Stream in the early fourteenth century, the merchants of Yaxley, Holme and Peterborough did not use West Water to reach Lynn, but instead used Old Croft to Littleport. Although West Water was navigable in the early years after the Conquest, it appears that its role was for local use, presumably by relatively small boats, and not for long distance trade. This conclusion is consistent with the development of large-scale sheep pasturing on the Fens around West Water following a 'decisive drop in water level' in the thirteenth century; sheep are less able to cope with sodden pasture than are cattle (Raftis 1957, p. 155).

Deterioration of watercourses

It is generally accepted that many rivers became less navigable towards the end of the medieval period, and that one reason was the construction of water mills, but the Fenland rivers have very gentle gradients and, prior to the seventeenth century draining, were subject to seasonal inundation and were tidal far inland, circumstances that precluded mill construction (Jones 2000; Langdon 2004, Map 1.1). Therefore, reasons for any decline must lie with other causes.

Probably the single most important event that

has not so far been discussed was the construction of Morton's Leam (1478–1486), a channel that would have been suitable for vessels but would have had adverse effects upon the two former Nene channels. By substantially shortening the distance to the sea, the velocity of the water would have been increased and the water level at the point where it took off from the Old Nene would have been lowered, drawing water away from Cat's Water and the Old Nene downstream of the Leam's divergence.

We know that Cat's Water had ceased to be navigable by the seventeenth century. Commissioners of Sewers toured the Fens in 1605 and found that the 'ancient sewer' was:

> *So grown up with earth and weeds, as that it serveth neither for passage with boats, nor draining, and so hath been of long time; which ought and had been wont to be for the ordinary passage to and from Spalding, and other places in Holland* [Lincolnshire], *to Peterburrow* (Dugdale 1772, p. 380).

This assessment was confirmed in 1618 by Edmond and Atkins (both 1618, respectively pp. 63–4 and p. 73), the latter noting that the Welland flowed into South Eau.

When, after 1414, did Cat's Water cease to be navigable? According to Gaches (1901–03, p. 97), the opening of Morton's Leam so diminished the channel that 'it afforded no passage by boat' (see also Godwin 1615, p. 277), but this probably exaggerates the immediate impact. Four 'foders' of lime (four loads, probably each of one ton), were purchased in 1502–03 for Singlesole (Greatrex 1984, p. 93), and it seems unlikely that overland transport would have been used from the probable source near Peterborough. There are reasons for thinking that Crowland Cut and South Eau remained open until about 1536. In 1508, work was resumed on King's College chapel and in the two years 1509/10 and 1510/11 some 3,000 tons of Weldon stone were purchased and a similar quantity of Clipsham stone (Woodman 1986, p. 233). Clipsham stone was also used for Great St Mary's in Cambridge, built between 1478 and 1536 (Purcell 1967, p. 41). In both cases, it is probable that Clipsham stone was brought down the Welland from Stamford (see Part II).

However, it is clear that navigation had ceased by 1579. Corpus Christi began the construction of its chapel, buying second hand stone from Thorney (following the Dissolution), stone that had to be transported overland to Guyhirn for onward shipment by barge to Cambridge (Purcell 1967, pp. 32–3). If Thorney's local waterways had been passable, it is reasonable to suppose they would have been used in preference to the land haul.

This conclusion is consistent with the fact that the upper Welland had ceased to be navigable by 1570 (Harrod 1785, pages following p. 534; Jones 2000, p. 70; Thirsk 1965, p. 70). Between Stamford and Market Deeping, outside the Fens, six or seven mills had been constructed, not all of which would necessarily have impeded vessels, but the sources noted do not specify when the mills were built. However, the fact of a petition resulting in legislation in 1570 implies that the loss of navigation had been relatively recent. The navigation was not in fact restored until about 1670, as the Stamford Canal (Boyes and Russell 1977, p. 240).

Shortly after Vermuyden had completed the drainage works that he undertook following the 1649 drainage Act, Dodson published his design for a more perfect scheme, in which he stated that Crowland Cut had always been a navigation 'which is now obstructed', arguing that it should be re-opened (Dodson 1665, p. 8; see also Wheeler 1990, p. 292). The absence of navigable water in Crowland Cut is clearly shown cartographically by Jonas Moore (*c.* 1658). Instead of flowing through Crowland, the Welland is shown further west, with an embankment across two drains diverging from Trinity Bridge, drains that represent the former inflowing and outflowing river channels. One of these drains is shown as passing through the embankment, whereas the other stops at the bank but presumably also passed through it. A drain is also shown from Crowland to Cat's Water/South Eau, diverging south of Crowland Cut to the head of the then recently dug New South Eau. Two maps confirm the change: one shows Crowland as a little Venice at some date after 1588; the other shows the Fens as drained (Dugdale 1772, facing pp. 218 and 416 respectively). Further confirmation, albeit qualified, is provided by Featherstone's 1763 map of Deeping Fen, which claims to represent the situation as surveyed by Vincent Grant about 1670. By the mid-seventeenth century, the Welland did not flow through Crowland and Crowland Cut had been reduced to a land drain.

The 1618 report by Atkins (pp. 76–9) contains an interesting discussion of Cloughs Cross, the point at issue being the following. From a drainage perspective, there was a case for allowing water from South Eau to resume its original course to the sea, along Shire Drain, supposedly because this was shorter than by Guyhirn. On the other hand, Wisbech was anxious to have as much fresh water as possible entering its outfall, in the belief that this would help scour the channel and so improve access to the port. This provides independent confirmation that the clow at Cloughs Cross was indeed built to divert South Eau, for a purpose or purposes other than land drainage in the peat fens.

According to Atkins, Bishop Morton had a grand scheme in mind when digging his Leam (1478–86), namely to concentrate as much water as possible upon the Wisbech outfall, to help keep it clear of silt. The Leam would necessarily divert water from the Old Nene that hitherto found its way to the Ouse from Outwell along Well Creek. At the same time, it may be that he wanted to collect Welland water to augment the flow of South Eau to Guyhirn; that he blocked up the sluice at Cloughs Cross formerly permitting controlled amounts of water to enter Shire Drain is suggestive (Gaches 1901–03, p. 99). So it may be that the flow along Crowland Cut had already been reversed by the late fifteenth century, consistent with the statement on the plaque attached to Crowland's Trinity Bridge that it marks the spot where the Welland di-

vided.

Other parts of the waterway network also declined as navigations. As early as 1342, Monks Lode to Sawtry Abbey had ceased to be navigable, principally because seven paths had been established across it. The Abbot undertook to restore the navigation, primarily, it appears, for the benefit of local townspeople (Inskip Ladds 1914, pp. 367–8). Whether the works were carried out, and with what success, is not clear. There were similar problems with other lodes on the edge of the Fens at Walton and Conington (Darby 1940, p. 150 fn). Atkins (1618, p. 86) records that West Water 'is utterly decayed from Erith to Benwick', while Edmond (1618, p.62) notes that it had reversed its flow, draining into the Ouse at Earith instead of the other way, 'for want of cleanseing and dikeing.'[3] This reversal of flow would be consistent with the progressive shift of the Ouse from its outlet at Wisbech via West Water and the associated reduction of the distance to the sea, accentuated by the channel being shortened when the Ouse was re-aligned at Ely early in the twelfth century.

Decline is also visible on Hayward's 1604 map, between Outwell and Wisbech; the Old Nene channel is shown as petering out at Elm and as having a dam across the section that remained. Hayward's map also provides a strong hint that Old Croft between Littleport and Welney had ceased to be a major waterway. Although he identifies the channel as Welnye River, it is shown with a weir across it and with most of the land on either side taken into private ownership as 'severals', unlike channels elsewhere.

Moore's map (*c.* 1658) shows Old Croft as existing all the way from Littleport to Upwell, identified as Welnye River, but not as a channel fit for navigation, except a short section immediately north of Littleport, where it formed the lower reaches of Grunty Fen Drain. At the confluence of this drain with the Ouse is the double chevron symbol for a lock, implying that part of the drain was still navigable. The rest of Old Croft is shown as a snaking ribbon of land properties either side of a small stream, interrupted by the Old Bedford and New Bedford rivers; at these points, Moore does not show the sasses or locks that would be needed to allow traffic along Old Croft. This cartographic evidence indicates that Old Croft had ceased to be a commercial artery by the 1650s. In conjunction with Hayward's evidence, it seems clear that virtually all of Old Croft had ceased to be navigable before the seventeenth century, except for access to Littleport from the Ouse.

Other parts of the river system remained navigable, as at March, where eight boats were recorded in 1566 (Elye *et al.* 1909, p. 95). An account of building expenses for Gonville and Caius, 1564–73, records the purchase of freestone and rubble from Ramsey, among other sources (RCHM 1959, p. 73). In the absence of any hint to the contrary, we may infer that Ramsey's lode or lodes were still in use, or could be readily cleared, and that transit from that point to Cambridge was not a problem. Second hand Ramsey materials were used by Corpus Christi in 1673, and also for church towers at Godmanchester and Holywell in the same century (Pevsner 1974, p. 330: Purcell 1967, p. 33), showing that waterways from the abbey site to the Ouse via Well Creek were still in use. Another example is that of new stone from the Weldon quarries (west of Oundle) brought to Trinity College in 1560–1, having been taken overland to the Nene at Gunwade Ferry above Peterborough and then by barge to Cambridge (Purcell 1967, p. 41).

Yaxley was a significant inland port until the seventeenth century, coal being transported thence to Northamptonshire as late as 1628 (Hall 1992, p. 22). This traffic depended on a lode from Whittlesea Mere, to which goods may have been brought up the Old Nene, or along Morton's Leam to near Peterborough and then past Stanground down the upper reaches of the Old Nene.

Moore's cartography provides an interesting contrast between Well Creek and West Water, showing the former to be a continuing thoroughfare; the New Poldyke, is shown with the chevron symbol for a sasse or lock at the point where it joins the Ouse at Salter's Lode. This channel had survived as a navigation, sufficiently important to be protected by providing a lock to prevent tides penetrating the interior drainage network. By comparison, the only part of West Water given prominence is the link from Earith to Somersham Lode, but the Lode itself is portrayed as being somewhat degraded. From there to Benwick, West Water is shown as a minor watercourse, interrupted by what is now known as the Forty Foot Drain (Vermuyden's Drain), with no provision for boats to pass.

Conclusion

On the basis of the preceding discussion, limited to main watercourses, it is clear that Hayward's map is accurate in showing channels that were navigable in the early medieval period but that they were not necessarily still usable early in the seventeenth century. This is not altogether surprising when attention is paid to the embankments he identifies. Those shown in red are sea banks, banks between which rivers passed to the sea, and fen banks, i.e., the major flood defences. Lesser banks 'serving for more particular uses' are in light green. Evidently, the map was compiled with the interests of land drainage foremost, and is to be thought of as a map of relevant landscape features, including visible watercourses that had less water in them than hitherto. Therefore, although Hayward does not provide a snapshot of the functioning rivers and drains, he does record the visible ones. Consequently, he gives us a precious starting point from which to investigate the medieval river system, but it is essential to seek out independent evidence to ascertain whether specific watercourses were in use, for navigation or otherwise, at identifiable dates, and also watercourses that had ceased to be significant features of the landscape.

While the picture that has been described for main

watercourses is likely to bear scrutiny, it is clear that much further work remains to be done, on the channels discussed in this paper and on the innumerable others that have not been mentioned. Meantime, there can be no doubt that Crowland Cut existed from very early times, probably the tenth century, and that connections along the diverted South Eau and then Well Creek existed earlier than has hitherto been thought, thereby linking the Welland to the Nene and Ouse river systems. The more southerly link between the Nene and Ouse along West Water manifestly did exist, but appears not to have been much used for long-distance heavy freight, and evidently had ceased to be used before the seventeenth century – consistent with the decline noted by Jones (2000, Fig. 2). Cat's Water/South Eau and Crowland Cut had also become impassable for vessels before 1600.

It is a matter for speculation what the main causes were for the decline of the watercourses. How far were the changes due to natural causes, such as silt accumulation and changes in climate, and deliberate human intervention? To what extent did the Black Death reduce the need for water transport and the ability to main the channels? Was the Dissolution the primary factor? Or was it the spread of road access within the Fens, associated with medieval embankments and land drainage?

Meantime, credit must be given to Gras (1915, p. 62) for recognising the existence of Crowland Cut and its significance for trade in corn, whereas later writers have overlooked this short waterway. Its existence enables us to understand historical circumstances that otherwise seem opaque, such as: the dispatch of 7,284 fleeces from Crowland to Lynn in 1298–9 (Wretts-Smith 1932, p. 185); scholars from King's Hall travelled by boat from Cambridge to Spalding in 1319, taking two days (Stenton 1936, p. 20); and in 1467, Edward IV 'took boat' from Crowland on his way to Fotheringhay (Perry 1887, p. 126), almost certainly along Crowland Cut to the Nene. Finally, as will be seen in Part II, the existence of the Cut has major implications for the manner in which Barnack stone was moved across the Fens, and it may be that this traffic provided one of the reasons for creating the channel.

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Footnotes

1 Although pre-seventeenth century documents refer to the Nene joining the Welland at Crowland, the plaque on Trinity Bridge states that this was where the Welland divided, meaning that Welland waters joined the Nene. As shown in the text, there is evidence that the flow along Crowland Cut had reversed by the early seventeenth century but when this happened and why has not been ascertained. This problem does not affect the discussion in this paper.

2 Northamptonshire Record Office F(M) 2388.m.lr, the *Abbot of Peterborough's Receiver's Account* 1300–01, 1303–04 and 1307–08, translated by Sandra Raban.

3 There is a discrepancy of testimony to note. Fowler (1933, p. 120) cites Badeslade (1766, pp. 77 and 78) for a report by Atkins in 1604, to the effect that most of the Ouse waters reaching Earith passed along West Water. Badeslade is not specific about the 1604 report by Atkins, which has not been located (see Little 1891, p. 289). Badeslade is not a very reliable source of information (Chisholm 2007); therefore, the 1618 testimony of Atkins and Edmond should be accepted.

Appendices

Crowland Abbey Cartulary

The Spalding Gentlemen's Society holds the original *Crowland Cartulary*, known as the *Wrest Park Cartulary*, and a manuscript translation thereof entitled *Crowland Abbey Cartulary*, from which the following account of a 1362 court case is taken (vol. 1, fo. 1d.3).

> *At the court at Depyng. Monday after St. Hilary 36 Edw. III. All the boatmen of Croyland, to wit Henry del Mershe (Merks), Roger Moreby, John Crane, John Wyttelsey, John Presteman, John Kelby, Thomas Marche, John Gryme, John Freend, William Bate, Peter Haske, John Fower, John Mylner, Geoffrey Wyttleseye, Robert Gobende, Roger Goode, William Gryme, the wife of Thomas Carter, Hugh Slade, Henry Grymesman and William Fyssher, came into the court before John Depynghale, steward of Dame Blanche Wake, and before Sir Walter Carleton, Sir John Colne, John Thame and others of the counsel of Dame Wake, because they had been amerced at 16s. 5d. unlawfully for breaking the dyke (fossat) on le Southee with their boats, and demand remedy therein because they say that the river is common by the watercourse of le Southee from Croyland to Walleramhalle, and vice versa, and has been so from time immemorial; and that they have never until now been molested or disturbed. An inquisition was taken thereupon ex officio by the oath of John Harel, William de Burgh, William Freman,*

William Baret, Roger Cotell, Simon Rose, Geoffrey Illeford, John Cunleys, Simon Spenser, Andrew Lytcester, John Henry, Robert Bate, Robert Gylberd and John Bydell, who say that neither in the time of Sir Thomas Wake, nor in other time of which they have recollection, were the boatmen amerced or molested for fishing with their boats on the said dyke, and that it is their right to fish and fowl with their boats wherever they chose on the said dyke. Therefore it is considered by the said steward and counsel that the said boatmen shall go, and be quit thereof.

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