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The impact of water transport facilities on the economies of English river ports, c.1660-c.1760[1]

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The notion that moving goods by water had considerable cost advantages over land carriage prior to the building of the railways has been commented on extensively by contemporary observers and historians alike, and a recent attempt to suggest that this advantage was confined largely to heavy items of low value has been questioned by Wakelin.[2] Given the weight of evidence attesting to the importance of water transport, it seems logical to conclude that towns located on navigable waterways would have enjoyed advantages over others which were not, particularly in periods such as 1660-1760 when internal trade was growing rapidly.[3] However, it seems equally appropriate to conclude that not all towns thus situated would necessarily have benefited. The length, direction, capacity, and reliability of the navigation, the wealth or potential wealth of the town's hinterland, and the presence or absence of competitors, were important factors, as York came to realize in the 1660s.[4]

Historians differ on the general significance to towns of direct access to river transport. Clark and Slack note that the largest towns of early modern England were located 'at nodal points of transport networks, especially those formed by navigable rivers', and Patten maintains that 'location on a river was as important to urban fortunes and urban market areas as could be location on the "great river around England" ' to ports.[5] Corfield, on the other hand, while asserting that commerce and manufacturing were the principal reasons why inland towns grew in the seventeenth century, has noted that many did not have 'river access to the sea'. Her discussion, moreover, shows that of the seven inland towns which achieved a population of 5,000 during that century only one, Nottingham, was located on a navigable river. Elsewhere, however, she claims that 'any transshipment stage in a transportation network tends to generate a certain concentration of population', and that river transport had for long been an influential

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[2] Aldcroft and Freeman, eds., *Transport*, p. 12; Wilson, *England's apprenticeship*, pp. 42-3; Mathias, *First industrial nation*, pp. 108-9; Summers, *Great Ouse*, pp. 45-7; Chartres, *Internal trade*, pp. 41-2; Wakelin, 'Pre-industrial trade', pp. 123-8, 258-9.

[3] Pawson, *Early industrial revolution*, pp. 131-4; Corfield, *Impact*, p. 21; Chartres, *Internal trade*, p. 11; Wakelin, 'Pre-industrial trade', pp. 16-23.

[4] Thirsk and Cooper, *Documents*, p. 330.

[5] Clark and Slack, *English towns*, p. 47; Patten, *English towns*, p. 216.

factor in the growth of the larger inland towns, although it was no longer so by 1800.[6] The purpose of this article is to investigate whether urban growth was a particular characteristic of those towns which were on what are recognized as important river navigations in the period 1660-1760.

I

In the case of many coastal ports it has long been established that industrial activity followed trade in the century after the Restoration.[7] At London and Bristol, the principal ports involved in transoceanic trade, this mainly took the form of refining and processing imported goods, such as sugar and tobacco.[8] Commodities moved along the coast played a significant role in the industrial profiles of lesser ports. Fullers' earth was transported to Colchester from Rochester and Faversham for cleansing and thickening woollen cloth; salt for curing herrings was dispatched to Yarmouth and the Somerset ports from Newcastle and Liverpool respectively.[9] Ports could also benefit, like provincial marketing centres, from being on the boundary between areas of production and areas of consumption. After the end of the War of the Spanish Succession, for example, corn from Surrey and Hampshire, instead of being collected at Farnham for overland carriage to London, was being sent to Chichester, and milled there before being carried to the capital by sea. Finally, traffic through a seaport could stimulate directly such industrial activities as shipbuilding and repairing, sail- and rope-making, and the preparation of victuals, as in the case of Plymouth, Yarmouth, and Shoreham.[10]

There has been no systematic attempt, however, to investigate whether river ports benefited in the same manner, largely because of the paucity of quantitative evidence concerning goods passing through river navigations, and its scattered and elusive nature.[11] It is also a matter of regret that the impact of water transport on urban industry was something rarely thought worth mentioning by contemporary observers (though this in itself may be highly significant). Defoe, for example, frequently alluded to the significance of rivers in moving coal, wine, and groceries around the country. Occasionally, as in the case of Reading and Leeds, he emphasized the importance of a river in the dispersal of locally produced goods. However, even though the Aire had been made navigable only five years before his visit, the impact of the navigation on production, as opposed to pre-existing trading patterns, is not discussed. Moreover, he does not state whether 'the very great quantities of malt and meal' sent from Reading to London by barge had been processed at Reading itself or been transported there from other towns, as in the case of its Thamesside neighbour Great Marlow. Fiennes remarked

[6] Corfield, 'Economic change', pp. 40-4; *idem*, 'Urban development', p. 228; *idem*, *Impact*, p. 11.

[7] See, for example, Wilson, *England's apprenticeship*, p. 200.

[8] Beier and Finlay, *London*, pp. 137-9; Minchinton, 'Bristol', p. 84; Defoe, *Tour*, pp. 90-1.

[9] Willan, *Coasting trade*, pp. 128-30, 136, 170.

[10] Defoe, *Tour*, pp. 90-1, 145, 227, 317, 536; Morris, ed., *Fiennes*, pp. 156, 243; Hist. MSS. Comm., Duke of Portland MSS, II, p. 267.

[11] For example, the records of the Weaver navigation appear to contain little detail about cargo items other than industrial goods: Willan, 'Weaver', p. 39.

on the failure of Ipswich to exploit the economic potential of its river, and compared the town unfavourably with Colchester and Norwich in this respect, though she had nothing to say about the impact of waterborne trade on industry and commerce when describing her visits to the other two towns.[12]

Although literary evidence is muted, common sense would seem to suggest that, all other things being equal, towns located on rivers carrying a large quantity of trade might have experienced some stimulus to industrial development. In the first place, the relative cheapness of waterborne coal at river ports, particularly in parts of the country without an easy overland route to coalfields, might be expected to have had a beneficial effect on costs of production. Moreover, the prices of most industrial raw materials and producer goods which needed to be brought in from outside would have been lower, particularly if they were not only heavy and required in large quantities, but also had to be brought in from a distance. On the other hand, the basic function of river ports may have been to serve as channels of trade between manufacturers and consumers, or between the producers of raw materials and their industrial users, a role analogous in coastal and seaborne trade to that of Exeter which principally shipped out cloth produced in other Devonshire towns.[13] Nevertheless, river ports of this nature might, like Exeter, have gained an enhanced commercial role and as a result prospered through the expansion of the service sector of their economy. However, ascertaining the significance of the movement of goods by water to the economy of such towns is bedevilled by the difficulties of quantifying the movements of goods. Also, without a thorough knowledge of a port's hinterland it can be difficult to ascertain to what extent goods being shipped outwards had been produced in the port or outside, and also to what extent goods being shipped inwards were to be consumed in the port or in its hinterland. Given the complexity of the task, the most profitable approach must be to concentrate on a single, important river navigation, rather than attempt to cover the entire country and, in the process, make questionable generalizations based on a survey of the more easily accessible sources.

The Severn and its tributaries have been described as the most important river navigation system in England in the early modern period, and in Europe second only to the Meuse in the volume of goods carried.[14] In 1660 the principal ports on its banks were: Shrewsbury, whose marketing area included mid-Wales, north Staffordshire, and much of the Cheshire plain; Bewdley, which served Birmingham and the Black Country but also took goods from all parts of central Staffordshire and north Worcestershire; and Worcester through which some of the trade of the Birmingham area was channelled, but which also shared the fielden south midlands with Tewkesbury. The latter port, at the apex of the tidal reach of the Severn, benefited from being able to run larger vessels, but also from its position at the

[12] Defoe, *Tour*, pp. 269, 503; Morris, ed., *Fiennes*, pp. 143-4.
[13] Defoe, *Tour*, p. 219.
[14] Nef, *Coal industry*, I, p. 97.

junction of the Avon navigation and the Severn; whereas Gloucester was primarily a transshipment place for goods carried downriver on boats which could not navigate in the Severn estuary. The most important of the lesser ports early in the period was Upton-on-Severn, which had road links with Herefordshire, but its long distance trade seems to have been undermined by the new Wye navigation completed in the 1690s. All the places mentioned so far were long-established urban centres. In a completely different category were Broseley and Madeley, industrial settlements in what was later to be described as the Ironbridge Gorge, whose boats were used primarily for shipping out coal mined locally. Finally, Bridgnorth, an ancient corporate town, took a share of the east Shropshire coal trade, but was soon to develop trading links with north Staffordshire.[15]

In order to assess the impact of river trade on the economies of the Severnside ports, it is necessary to investigate the components of trade. Compiling a list of cargo items is easy enough, but estimating the quantities being carried and the contributions of the boats of a specific port is highly problematic. As the Severn was unimproved, there was no individual or group interested in keeping a record of traffic passing along the navigation until the establishment of the tow path commission at the very end of the eighteenth century. However, boats were required to stop at Gloucester and Worcester, and to pay for the privilege of passing under the bridges and using the quays. Although records were kept of these tolls, they do not appear to have survived, though some information concerning the volume of trade can be found in the records of Exchequer Court cases in which the legality of such tolls was investigated. Yet, given the large sums involved, the evidence needs to be treated with some caution.[16]

Other sources provide invaluable insights into the nature and conduct of trade on the Severn, but they do not lend themselves to quantitative analysis. The records of the various petty debt courts of the corporate towns on the river and of the Franchise of Wenlock (which included Broseley and Madeley within its jurisdiction), and also the wills and probate inventories of boat operators and their customers, provide snippets of information.[17] More systematic data are to be found in the account books of firms, corporations, and landed families which used the river for the transport of goods, but these can shed light on only a limited range of cargo items such as iron and building stone. As a result it is impossible to arrive at an estimate of the totality of trade on the river at any single point. Nevertheless, the diverse sources of evidence described above suggest very strongly that the short-distance trade (i.e. that between the ports on the river itself) though it commanded the services of a larger number of boats and boatmen than the long-distance trade (i.e. that which involved voyages to and from sea ports such as Bristol and Cardiff) was dominated in terms of the tonnage of goods

[15] Wanklyn, 'Severn navigation', pp. 34-8; Wakelin, 'Pre-industrial trade', pp. 104-5.

[16] The most informative are the pleas and depositions in P.R.O., E134, 4 William and Mary, East. 29 and Mich. 50, and ibid., 1 George II, Hil. 52.

[17] Wanklyn, 'Industrial development', pp. 6-7.

carried by a severely limited range of commodities.[18] Of these, coal was the most important, with timber, pig iron, malt, building stone, and lime making up much of the remainder. Of these commodities only malt was an important product of towns situated on the banks of the Severn, though all of the coal and some of the iron, lime, and building stone originated in the urbanizing riverside communities of Broseley and Madeley.[19]

However, the long-distance trade of the ports of the river Severn can be quantified using the Gloucester coastal port books. A comprehensive database of the Gloucester series has been constructed, and much of the argument which follows derives from various specific analyses carried out using the Gloucester database.[20] General trends, which are discussed more thoroughly elsewhere, show an overall increase in the volume and diversity of trade on the Severn. For example, the number of boats passing through Gloucester per year increased from 443 to 736 between the 1670s and the early 1720s.[21] In the same period the number of commodities being carried increased from an average of just over 150 per year to over 400. Moreover the size of the boats increased over time. Before the Civil Wars vessels in excess of 30 tons burthen using the Severn above Gloucester were exceedingly rare. By 1760 cargoes in excess of 50 tons were not at all uncommon. Such findings dovetail neatly with an independent source of evidence concerning coastal shipping which shows that the tonnage operating out of Gloucester was the largest of any port on the west or the south coast of England throughout the period 1709 to 1751 and increased by over 20 per cent during that period.[22] Almost all the tonnage ascribed to Gloucester was involved in the trade between the Severn towns and the ports of the Bristol Channel. Very few boats operated out of Berkeley, Gloucester's only member port not situated on the river itself.

However, the Gloucester evidence is not as full as one would have wished. Although port books survive for a substantial part of almost three-quarters of the years between 1660 and 1760, there are gaps in the 1660s and 1670s, and again in the 1740s. Moreover, a change in customs regulations means that port books compiled after 1729 list only the cargoes of boats carrying a very narrow range of items such as coal and pot clay. Additionally, books in the Gloucester series tend to record details only of boats proceeding under coquets, the commonest type of official document allowing a boat to proceed coastwise. But even if information concerning let passes was also

[18] For example, Shrewsbury Library MSS. 328-37 (Coalbrookdale Company Accounts); Hereford and Worcester County Record Office, Hereford, Foley MSS.; Shropshire County Record Office (hereafter S.R.O.), Apley House MSS., income and expenditure books, 1734-1815.

[19] Wanklyn, 'Urban revival', pp. 53-5; Wakelin, 'Pre-industrial trade', pp. 91-112. It is not possible to quantify the trade in any of these commodities, but it has been argued elsewhere that Andrew Yarranton's estimate of 100,000 tons of east Shropshire coal being carried on the Severn in the early 1660s was probably quite accurate: Wanklyn, 'Industrial development', p. 3.

[20] The initial database was set up in 1984 by A. P. Wakelin and M. Griffiths. A copy of the revised micro version is held by the E.S.R.C. Data Archive.

[21] Hussey et al., *Summary*, Willan's claim that trade through Gloucester declined between 1691 and 1736 is incorrect because he failed to appreciate that customs regulations there had changed in the 1720s: Willan, *Coasting trade*, p. 175.

[22] Ibid., pp. 220-2. The figures for Preston show it as having a larger tonnage of coastal shipping than Gloucester in 1751, but this appears to be the result of a transcription error.

available, it would only serve to enhance the importance of the Severn navigation in England's internal trade.[23]

A most important feature of the Gloucester port book data for the purposes of this article is that for the years 1660 to 1725 it is possible to distinguish between the starting points of boats passing downriver through Gloucester by means of the phrase appended to the name of the boat in the port-book entry (e.g. the *John* of Shrewsbury).[24] As a result, for most of the period being examined the long-distance trade of the individual river ports can be compared,[25] and this is shown in table 1. However, the significance of the term 'of Tewkesbury' or 'of Shrewsbury' for the upriver

Table 1. *Number of voyages per annum through Gloucester made by boats of selected Severnside ports*

Date	*Shropshire ports*	*Bewdley*	*Worcester*	*Tewkesbury*	*Gloucester*
1637	27	61	8	62	39
1673-9	35	137	66	88	12
1697-1701	69	127	150	76	58
1718-24	28	206	157	98	90

Source: port book records

leg of a voyage is more problematic, as some goods appear to have been off-loaded before boats reached their home ports.[26] Nevertheless, if the demand for a particular commodity was focused exclusively on a single port or its trading region, it was almost invariably carried by boats associated with that port. White clay from north Devon, for example, shipped upriver in increasing quantities from 1715 for use in pottery manufacture at Burslem, was very largely transported in boats of Bridgnorth.[27]

II

Even a cursory examination of the cargoes of boats passing through Gloucester suggests very strongly that the principal role of the Severnside ports was to serve as channels of trade between their marketing regions and the sea ports of the Bristol Channel. Many of the items being carried downriver were foodstuffs which had either been processed at source, such as cider and perry, or which would be processed at their destination, such as bread corn. The same pattern applies to sugar, the principal foodstuff being transported upriver. This was manufactured at Bristol, the port through which it had been imported, the attempt to set up a sugar works at Gloucester having failed largely, it seems, because of opposition from

[23] Wakelin, 'Pre-industrial trade', pp. 44-58.

[24] Wanklyn, 'Severn navigation', p. 38; Wakelin, 'Pre-industrial trade', pp. 46-8.

[25] The almost total absence of quantifiable data for inter-port trade is disappointing, but as the number of boats involved far exceeded those sailing beyond Gloucester, their significance for the regional economy must have been very considerable.

[26] Off-loading of groceries from Worcester boats certainly took place at Gloucester (P.R.O., E134, 4 William and Mary, Mich. 50).

[27] Wanklyn, 'Urban revival', p. 56.

Bristol.[28] In addition few of the raw materials and finished goods passing along the navigation were destined for, or had been produced by, industrial undertakings in the Severnside ports. The raw cotton carried by Shrewsbury and Worcester boats in increasing quantities in the second half of the seventeenth century, for example, was not consumed locally, whereas salt, whose trade increased 50-fold between the early 1690s and 1760, had been produced at Droitwich or at one of the saltworks scattered across the flat lands of Cheshire and north Shropshire.[29] Similarly, most of the commoner manufactured items carried on the river were not the products of the ports situated on its banks. Iron goods from the Black Country and glass wares from Stourbridge were shipped via Bewdley; paper, mainly from the mills of south Shropshire and north Worcestershire, passed through the ports of the middle Severn; and earthenware from north Staffordshire travelled south, initially via Shrewsbury, but later via Bridgnorth and Bewdley. Moreover, those towns on the banks of the river which still retained their traditional woollen cloth industries, such as Shrewsbury, Worcester, and Bridgnorth, rarely despatched their products by water after 1660. This was probably because their principal trading link was with London, in a different direction from that taken by the Severn navigation, rather than because overland carriage was seen as more suitable for the movement of textiles.[30] Cloth and Manchester wares from the north-west of England and also Kidderminster cloth, both bound for Bristol, were carried on the Severn in increasing quantities from 1666 onwards. Table 2 gives some indication of the increase in trade in some important commodities carried on the Severn.

Table 2. *Annual quantity of commodities passing through Gloucester by river, 1673-1725 (tons)*

	1637	*1673-1680*	*1720-1725*
Cheese (downriver)	> 2	5	289
Salt (downriver)	0	> 1	4,274
Iron (downriver)	4	596	1,456
Pot clay (downriver)	0	129	1,926
Earthenware (downriver)	0	475[a]	2,519[a]
Grocery (upriver)	79	259	1,539
White clay (upriver)	0	29	156

Note: [a] crates
Source: port book records

There are, however, exceptions to this paradigm. Quite clearly the best example of industrial growth stimulated by, and thereafter highly dependent on, a cheap and efficient system of river transport, is provided by Broseley and Madeley. With easily worked coal deposits close to the river banks, they were able to respond to the demands of the Severnside towns which appear to have outgrown their local supplies of fuel by the middle of Queen Elizabeth I's reign. By soon after 1600 large quantities of coal were being

[28] *V.C.H. Gloucs.*, IV, p. 127.
[29] Wanklyn, 'Severn navigation', pp. 35, 54-5.
[30] Ibid., pp. 47-8; Defoe, *Complete tradesman*, p. 228.

carried by boat to places as far away as Gloucester. The construction of the Avon navigation opened up the south midlands in the second half of the seventeenth century, and in the last quarter Shropshire coal was being sold at Tewkesbury at a lower price than coal from the Bristol coalfield was selling at Bristol. Moreover, Shropshire coal was able to compete successfully beyond the river navigation. It supplied the textile towns and villages of south Gloucestershire from wharves at Framilode in the Severn estuary, and was even used at Bath after the opening of the Bristol Avon navigation in 1728.[31]

The demand for coal created employment. In 1660 the combined population of Broseley and Madeley was just over 2,000; by 1750 it had risen to about 5,000. As a result, the area within a two-mile radius of where the first iron bridge was to be constructed had the largest population in Shropshire apart from the county town. Of the 600 adult males living in the three parishes between 1570 and 1700 whose occupations are known, 44 per cent were miners, 23 per cent workers on the river, and another 8 per cent involved in ancillary trades.[32] Diversification, however, was slow to develop and limited in nature in spite of the navigable river, cheap coal, and other locally available raw materials such as ironstone, lime, salt, and potters' clay. The exception was the Darby enterprise at Coalbrookdale which shipped hundreds of tons of cast iron wares downriver from soon after 1710. Nevertheless, although there were as many charcoal blast furnaces in the vicinity throughout the period as there were in the Black Country, the Shropshire coalfield ports failed to develop an iron-using industry in any way comparable with those of the central midlands or the Sheffield area, and lead smelting was the only new industry to become firmly established there which brought in its raw material by river.[33] Moreover, because of their location, Broseley and Madeley failed to develop a commercial role serving a wider region.[34] Not only did they have very poor overland communications because of the topography of their surroundings, they were also very close to Bridgnorth and Shrewsbury, both of which were the centres of important road networks. Thus boats of the Gorge townships carried only sufficient wine, tobacco, and sugar to cater for the demand of their own inhabitants and those of a tiny circle of villages which could not be better served by local market towns such as Shifnal, Wellington, and Much Wenlock, whose road links were with Shrewsbury and Bridgnorth.

The availability of cheap fuel and raw materials in all areas served by the Severn navigation did, however, have a beneficial effect on other industrial undertakings. It is, for example, difficult to see how malt production at

[31] Shropshire C.R.O., 1224/3/226; P.R.O., STAC8 310/16; Dyer, *Worcester*, p. 56; Handford, *Stroudwater canal*, pp. 28, 53; Willan, 'Severn valley', p. 78; Hist. MSS. Comm., Duke of Portland MSS., II, p. 300; Clew, *Kennet and Avon canal*, p. 20.

[32] The percentages are an updated version of those given in Wanklyn, 'Industrial development', p. 4.

[33] Ibid., p. 4; Shropshire C.R.O., 1224, box 149; Trinder, *Industrial revolution*, pp. 8-12, 54; Cox, 'Innovation', p. 34; Sogner, 'Demographic situation', pp. 138-44; P.R.O., E179/168/219 (Madeley poll tax 1660, occupations); Wanklyn, 'Landownership and allegiance', pp. 356-9.

[34] In some years such as 1689 no groceries or tobacco were carried (P.R.O., E190 1149/2), but an east Shropshire coalfield boat transported 12 tons of sugar and groceries upriver from Bristol in 1693 (P.R.O., E190 1150/4).

Gloucester and Tewkesbury could have remained as buoyant as it did without a navigable river after it had been discovered, circa 1650, that heating germinating barley with smokeless mineral fuel rather than wood resulted in a cheaper, but not inferior, end product. The Gloucester port books show hundreds of tons of coking coal and anthracite passing into the Severn navigation from the early part of Charles II's reign, and a strong downriver trade in malt which, in times of peace, frequently attained a total of over 2,000 tons a year.[35] There was, however, no overall increase in the downriver trade through Gloucester. Although a peak of over 3,000 tons was attained in 1724, the average for the first three years of the 1720s was slightly lower than for the first three years of the 1680s, and only slightly higher than for the first three years of the 1580s.[36]

Unlike malting, pin making at Gloucester was a new industry established during the period covered by the port books. Although it cannot be proved that entrepreneurs chose Gloucester in preference to other towns because it was located on the river Severn, all the materials needed to produce pins could be transported there by water from various directions. Iron wire was made in the Forest of Dean and shipped to Gloucester via Chepstow. Brass wire, on the other hand, was carried on boats from Bristol even though there is no certain evidence that it was manufactured there until the 1740s. Prior to that date it appears to have been imported from overseas or carried overland from London, whereas tin, the metal used in plating better quality pins, was carried by ship from Cornwall.[37] Heat was required at various stages in the highly complex production process, and this was almost certainly provided by smiths' coal which would have been brought downriver from the east Shropshire field. Finally, the pins needed to be packed in paper, which would have arrived in Gloucester from Bridgnorth or one of the Worcestershire ports.[38] However, the quantity of pins moving back into the estuary was a small and highly intermittent element in the cargoes carried by Gloucester boats in the period in which 'of the town' is noted in the Gloucester coastal port books. This is perhaps not surprising as pins were one of the products of the Severnside towns and their marketing region most likely to have been affected by damp, particularly the cheaper kind made of iron wire. Yet, in spite of all these advantages, it is possible that more pins were manufactured at Birmingham, which lacked Gloucester's direct access to navigable water, than at Gloucester.[39]

Other industries located in the Severnside towns also moved goods in and

[35] Wanklyn, 'Urban revival', p. 54. The continuing importance of malting to the two towns is confirmed by occupational data provided in Day, *Tewkesbury* and Ripley, 'City of Gloucester'.

[36] The average annual figures are 2,099 weys (1580s); 2,355 weys (1680s); 2,158 weys (1720s).

[37] Hart, *Dean*, pp. 200-1; Day, *Bristol brass*, pp. 22-6, 40-1, 65; Hamilton, *Brass and copper*, pp. 108-9; *V.C.H. Gloucs.*, p. 108; Thirsk, *Economic policy*, pp. 78-83. Some brass wire may have been carried downriver to Gloucester from Tern mills, near Shrewsbury. I am grateful to Nancy Cox for this information.

[38] Hussey et al., *Summary*, p. 78. Paper was needed to prevent the pins rubbing against one another in transit, but it also helped to reduce corrosion if they were stored for any length of time.

[39] The annual averages for the four years for which there are data are: 1713-20: 87 boxes; 1722-7: 149 boxes. In 1762-5, 206 boxes were carried mostly, it seems, on Bewdley boats, but it is possible that more Bewdley boats than Gloucester ones appear in the Gloucester port books as they transported pot clay, one of the commodities which customs officials were required to record at that date.

out by water. The early stages of glove making at Worcester can be traced via the upriver traffic in deer skins beginning soon after 1700. At Bewdley horn lanterns were manufactured using ox and cow horns, and horn plates already made up, imported through Gloucester. The glass works at Gloucester established in 1682 might not have been viable without cheap coal and other materials such as wood ashes, some of which were shipped from Bridgwater. Finally, the pewterers of Worcester, Gloucester, and Bewdley would have received their tin by water, and also most, if not all, of their lead, though in the case of Worcester and Bewdley some might have come overland from Derbyshire.[40] Sometimes, the port books can give very sensitive evidence about these movements in trade. Celia Fiennes's comment on the manufacture of cotton goods at Gloucester in the late 1690s does not accord with our knowledge of the city's economy, but her assertion is supported by the fact that it was at this time and no other that boats of Gloucester are to be found carrying quantities of raw cotton upriver from Bristol.[41] Also wool cards and teasels, regular upriver cargoes on boats of Worcester for much of the period, disappeared almost completely after the 1720s at precisely the time the city's woollen industry went into terminal decline.[42]

III

The argument so far suggests that increasing trade on the Severn had a recognizable, but nevertheless rather limited effect on industrial activity taking place in the towns situated on its banks. However, the river's potential to influence the economies of those towns was both more immediate, and more elusive and diffuse.

In the first place the navigation might be expected to have had a direct influence on urban industrial activities because of the demands which it itself generated. Research into this aspect of the Severn's influence has been very patchy, but evidence currently available suggests that by 1700 Bridgnorth had become the most important location on the river for boat building. Sail-making and rope-making, however, had not become firmly established there or in any of the other Severnside towns whose early modern economies have been researched.[43] There must have been a considerable demand for barrels, which served as containers for many cargo items according to the evidence of port books and contemporary illustrations, and it would have been surprising if the Severnside towns had not responded. There is some evidence of concentrations of coopers at Bridgnorth and Tewkesbury,[44] and coopery wares were of some significance in downriver trade. But it is quite impossible to estimate either the proportion of barrels produced in the river ports which were used in the river trade, or the percentage of coopery

[40] *V.C.H. Gloucs.*, IV, p. 109; Hatcher and Barker, *British pewter*, pp. 120-5.

[41] Morris, ed., *Fiennes*, p. 234; *V.C.H. Gloucs.*, IV, p. 108.

[42] P.R.O., E190 1252/7, 8, 9, 14, 17; 1253/3, 5, 6, 9; Mann, *Cloth industry*, pp. 42-3; Lemire, *Fashion's favourite*, p. 33.

[43] The author's database of the occupations of people living in Bridgnorth contains no rope makers and only a single sail maker in the period covered by this article.

[44] Wanklyn, 'Urban revival', pp. 43-7; Anon., 'Bewdley', pp. 56-7, 202-23; Day, *Tewkesbury*, pp. 145-250.

goods being carried which had been made in the ports themselves rather than in their hinterlands.

The growth in the number of boats using the system also created a whole range of employment possibilities in the service sector. Labour was required not simply for manning and moving, and loading and unloading, but also for transporting goods by road to and from the Severn. In the case of Bridgnorth, for example, it is possible that as many as 20 per cent of adult males worked on the river and in ancillary trades by 1740. The percentage employed at Gloucester and Bewdley appears to have been much smaller, though it is probably underestimated in published and unpublished research which has relied too heavily on probate records. Wills and inventories have little to tell about young males belonging to the lowest levels of urban society who would have provided the bulk of the labour.[45]

The indirect impact of the river trade on urban economies is even more difficult to assess. The ways in which boatmen, waggoners, and those employed in moving packhorse trains around the country spent their wages must have had a beneficial effect on the towns in which they and their families lived and, to a lesser extent, on those which they visited in the course of their employment. Innkeepers, victuallers, and lodging house keepers would certainly have gained custom by feeding and accommodating such people, and in catering for the needs of merchants who visited the port towns to draw up agreements with boat owners concerning the movement of goods. The prosperity of innkeeping, which is a characteristic of both Bridgnorth and Gloucester in the 1660-1760 period, would also have had a beneficial impact on many other trades, because of purchases made not only by the innkeepers themselves and the proprietors of boats and their employees, but also by visiting traders, waggoners, and packhorse men when they walked the town.[46] The impact of the growth of trade on urban employment ought to be indicated by future research on population figures.

It is, of course, recognized that population is a crude instrument for assessing comparative urban growth. The quality of the data is variable, and increasing population does not necessarily go hand in hand with increasing wealth, but as it is the only measure which is currently available, it is widely used by urban historians to construct hierarchies.[47] In other studies population trends have been shown to mirror changes in economic circumstances, but in the case of the Severnside towns, there are considerable disparities between the demographic fortunes of the individual ports and what is known about their river trade. Only Bridgnorth and the proto-towns of the 'Ironbridge Gorge' display unequivocal signs of significant urban growth. Their populations doubled in size between 1660 and 1760, and the river navigation was largely responsible for that growth. In the

[45] Wanklyn, 'Urban revival', pp. 40, 43-7, 52-3; Ripley, 'City of Gloucester', pp. 132-5; Anon., *Bewdley*, pp. 54-7.

[46] Wanklyn, 'Urban revival', p. 39; Ripley, 'Poverty in Gloucester'. pp. 185-8; *V.C.H. Gloucs.*, IV, pp. 106-7.

[47] For instance, Corfield, *Impact*, pp. 5-12, but others are more cautious, e.g. Clark, *Transformation*, pp. 14-5.

former this took the form of an expansion in the tertiary sector and in boat building; in the latter industrial growth promoted by the river was the decisive factor. Neither was important as a transshipment point compared with downriver ports.[48]

Worcester seems to have experienced modest population growth of well under 20 per cent, which is below the national average for towns of its size. It had admittedly lost its woollen cloth industry by 1760, but glove making was of growing importance. Moreover, its long-distance trade was much greater in 1725 than it had been in the 1670s and there is no evidence of a decline thereafter. Shrewsbury's population grew at roughly the same rate, but the history of its urban functions between 1660 and 1760 is so complex and its long-distance river trade so much less than that of Worcester that it would be unwise to draw any conclusions about the effect its loss might have had on the urban economy. Indeed there is some doubt as to whether it had been truly lost. Bishop Pococke commended Shrewsbury for its river trade and marketing functions in the early 1740s, which may mean that its boat operators had given up sailing below Gloucester, being content to pick up transshipped goods at that city rather than risk the voyage to Bristol. In the case of Tewkesbury also it would be unwise to speculate. The population data currently available, though pointing to a level of growth similar to that of Worcester and Shrewsbury, are of a somewhat impressionistic nature. Moreover, much more needs to be known about Tewkesbury's industrial history in the 1660-1760 period before its river trade can be put into context. It is, for example, possible that malt making was in decline in the second quarter of the eighteenth century, and that this preceded rather than coincided with the rapid expansion of stocking manufacture.[49]

However, in the case of the other two major river ports, the demographic evidence is more firmly grounded and understanding of the urban economy much more advanced. Gloucester's population, stagnant from 1660 to the mid 1740s, had gained only a few hundreds by 1760, whereas that of Bewdley may have been slightly smaller in 1761 than it had been in 1661. Yet Gloucester's long-distance river trade had grown between 1660 and 1724, cloth manufacture had been eclipsed before, rather than after, the Civil War (as had overseas trade), whereas pin making, which was quite labour intensive, was developing fast. Moreover, Gloucester was a most important stopping place for road traffic passing along the main road between London and south Wales, whereas Bewdley was the principal port of Birmingham and the Black Country with hundreds of tons of iron and iron goods passing through it every year. Bewdley's boats also enjoyed a larger percentage of the long-distance trade through Gloucester than those of any other port on the Severn.[50]

[48] Wanklyn, 'Urban revival', pp. 38-9; *idem*, 'Industrial development', p. 4; Sogner, 'Aspects of demographic structure', pp. 141-2.

[49] Johnston, 'Developments', pp. 52-4; Talbut, 'Worcester', pp. 92, 96, 100; McInnes, 'Leisure town', p. 54; Jones, *Tewkesbury*, pp. 81, 104.

[50] Ripley, 'Poverty in Gloucester', p. 188; Anon., *Bewdley*, pp. 26-7, 54-9; Davies, 'Bewdley before *c.*1700'.

IV

Why, then, did a boom in internal trade not have a more pronounced effect on urban growth in Severnside ports?[51] Failure to develop as conspicuous centres of industry is not difficult to understand. They were, for example, much less well placed than sea ports for the processing of raw materials imported from overseas or shipped coastwise. Moreover, none of them had the potential to develop certain industrial processes as they lacked powerful water power sources. Admittedly, cheap fuel was readily available throughout the Severn navigation, but its direct industrial significance can be overemphasized; coal was of prime importance only in a quite narrow range of 'industrial' activities. Moreover, textile manufacture, which is acknowledged to have been the most important and widespread manufacturing industry in the 1660-1760 period, made direct use of coal only to provide heat in some of the finishing processes. Cheap supplies of coal could, however, have had an indirect effect on industrial costs (and therefore on competitiveness) in labour intensive trades, by enabling employers to pay lower wages than their competitors elsewhere. The growth of the hosiery industry at Tewkesbury may have been encouraged by this factor, but, if so, it only served to put it in the same position as many of the town's east midlands competitors which had coal pits in their immediate vicinity.

Some of the disadvantages noted above would not have prevented the ports on the Severn from becoming commercial centres orchestrating the trade of more distant agricultural and industrial regions. However, they lacked what was probably the principal advantage enjoyed by the river ports in, for example, nineteenth-century North America before the construction of the railways. They did not serve as unique conduits between areas of conspicuous agricultural or industrial development and their markets.[52] In the period covered by this article, coastal ports approach nearest to this ideal, but overseas merchants often had a choice of ports through which to ship their goods. River ports on the Severn were in a markedly inferior position. Except possibly for some of the lead mines of central Wales, no industrial activity of significance in the west midlands or the Welsh borderland not situated directly on the river was uniquely reliant on any one of the river ports. North Staffordshire potters, for example, imported Devonshire clay through both Chester and Bridgnorth, whereas the metal-working areas of the central midlands sent iron wares to Bristol via both Bewdley and Worcester.[53] In addition river ports faced some competition from the road system of the region. Comparing the two is fraught with difficulties as evidence concerning goods being moved overland is much more scattered and unsatisfactory than it is for goods being transported by river, and what does survive may be untypical, but the textile manufacturers of south Lancashire, for example, had three possible routes to Bristol—by road, by river and road, and by sea.[54] Boatmen therefore had little prospect of making their fortunes by putting up freight charges and thus, through

[51] Corfield, *Impact*, pp. 7-12.

[52] See Levy, *Urban and metropolitan economics*, pp. 16-8.

[53] Wanklyn, 'Severn navigation', pp. 52, 54; *idem*, 'Urban revival', pp. 55-6; Weatherill, *Pottery trade*, pp. 80-1.

[54] Lemire, *Fashion's favourite*, p. 116.

their enhanced incomes, indirectly conferring benefits on the economic life of the ports in which they lived.

There is, moreover, little evidence that watermen were willing or able to diversify into a wider range of economic activities. Although some boat proprietors such as Edward Whittingham of Bewdley and Richard Harnage of Broseley had interests in timber, coal mines, and lime kilns, and others such as John Andrews of Bridgnorth in innkeeping, wills and probate inventories suggest that even the wealthiest had their capital largely invested in boats. Moreover, the chances of making large profits from carrying were limited, as these proprietors rarely seem to have traded in their own right in anything other than coal (and even this was purchased on credit from mine owners), and research so far completed does not suggest that any family or partnership acquired great wealth through dominating the carrying trade on any stretch of the river in the period 1660-1760.[55] Also, there is very limited evidence of the carrying trade falling into the hands of middlemen whose activities could have had a beneficial impact on the economies of the river ports. Instead a direct relationship seems to have existed between the shippers and those whose goods they shipped.[56] With transport on the Severn organized in such a manner, commercial hegemony was out of the question. However, this should not be taken as an assertion that the benefits conferred by river navigations on the economic life of the nation were less than has previously been suggested. There is no doubt that the industries of north Staffordshire and the Birmingham area gained from the Severn because they made such conspicuous use of it. Moreover, returning to the national scene, the growing towns of the 1660-1760 period may not have been located on rivers but they were most anxious to improve their access to navigable water. Of the 15 towns which attained populations of 5,000 or more between 1650 and 1750 but were not situated on navigable waterways, eight had had navigable water brought to their vicinity via river improvement schemes by 1760.[57]

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[55] Much Wenlock Corn Exchange, bailiffs' court case papers 1641-66, unfoliated; Trinder, 'Severn navigation', pp. 32-3. Wanklyn, 'Urban revival', pp. 51-2 contains a discussion of the Bridgnorth evidence.

[56] The only probate inventory so far encountered of such a merchant is that of John Shallcrosse of Shrewsbury who at his death had textiles, earthenware, and cheese to be sent down river from Shrewsbury (Lichfield Joint Record Office, Diocesan probate records 1/4/1691). I am grateful to Dr. B. Trinder for this reference.

[57] The calculations are based on data included in Corfield, *Impact*, pp. 7-15 and *idem*, 'Economic change', p. 43.

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