I: The Early Modern Port of Chester

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Introduction

This volume contains the results of archaeological investigations carried out in the area of the former port of Chester, known locally as the 'old port', which was established in the eighteenth century (Ill. I.1). This developer-funded work was undertaken between 1999 and 2005, and overseen by Chester Archaeological Service, the curatorial body for Chester City Council (now the Historic Environment Service, Cheshire West and Chester Council). This paper provides the geographical and historical contexts for this work, and aims to present an integrated archaeological interpretation from the investigations. Before considering the evidence it is worth providing a contemporary view of the port, which indicates something of its character and economic importance:

> …the New River (cut through a large space of white sands in 1735–6) which is navigable for vessels of 350 tons burthen. Here are excellent conveniences for shipbuilding, in which our artizans particularly excel. From the quays are exported some of the richest cargoes of that excellent commodity which affords to the taste of the Londoners the most grateful flavour, and presents the Cockney with what he calls 'the fattest Velsh rabbits in the Vorld' — good old Cheshire cheese.
> Poole's *A Concise History of the County and City of Chester* (1791, 84–5)

Reviewing the context for the establishment of the port

Chester is situated at the lowest crossing point across the River Dee where a tidal pool marked the division between the navigable waters of the upper Dee and those of the estuary. Prior to, and during the early Middle Ages, part of this tidal pool (in the area now known as the Roodee, formerly the Roodeye) functioned as the town's harbour with quays constructed along the east bank of the river. Progressive silting of the Dee, extending from the tidal pool to the mouth of the estuary, combined with changes in sea level resulted in the restricted use of the port facilities close to the city walls (Laughton 1996; Ward 1996). Navigation, especially for larger vessels, became increasingly difficult. By the thirteenth century, an anchorage for sizeable ships was created at Portpool, 1km to the west of the city (Thacker 2005, 83). Thereafter, docking sites were established further downstream on both sides of the estuary far beyond the limits of the city liberties (*ibid*, 83–4). In the late sixteenth century, the Corporation of Chester built a new harbour at Little Neston some 15km from the city to act as the head of navigation for larger vessels. The position of this harbour was gradually undermined by the newly developed anchorage nearby at Parkgate

(*ibid*, 84). In 1666 it was alleged that the river had become so shallow that vessels of twenty tons could no longer reach Chester (*ibid*, 85); although, there is some evidence to suggest that in the 1690s shipbuilding on the Roodee saw a brief period of expansion (Forster 2003, 139). In the late 1680s and early 1690s several proposals were made by the corporation to make the Dee navigable and to reclaim adjacent land. Despite the passing of an Act in 1700 that authorised the corporation to collect special dues on coal, lime and limestone to finance the construction of a new channel, little was achieved (Thacker 2005, 85). However, the work that was undertaken made the wharfs and warehouses near Watergate obsolete by 1707 (*ibid*). Drainage and flood defensive works at the Roodee were also undertaken at this time and included the construction of a large protective bank, known as a Cop, between 1706 and 1710 (Thacker 2003, 225). In 1720 part of the Cop and a newly constructed wharf with its associated warehouses were destroyed by flooding (Robinson 1968, 82). According to a commemorative stone (now in the Grosvenor Museum) the Cop was rebuilt in the following year and faced with stone for a distance of 336 yards (307m) and to a height of 4 yards (3.65m) (*ibid*). By 1730, virtually no ships came up to the city. Instead, most goods were transported to and from Parkgate by lighters or carts. About this time riverine navigation to Chester ceased altogether after breaches in the dykes destroyed the channel (Thacker 2005, 85).

A new proposal to canalise the River Dee was made in 1732 by Nathaniel Kinderley, who sought funding to make the river navigable for ships of 200 tons. He proposed the creation of a channel across the Saltney marshes and estimated that about 6000 acres (*c.*14800ha) would be reclaimed to offset the cost. Although there was considerable opposition to this scheme in Parkgate and Liverpool, an Act was passed in 1733 that authorised Kinderley to cut a new channel from Chester towards Flint, some 5 miles (8km) and to a depth of 16 feet (4.9m) at a moderate spring tide. Cutting began in 1734 and the river was diverted into its new channel in 1737 (Thacker 2005, 85). The New Cut allowed ships, rather than just lighters and small boats, to reach Chester. However, restrictions in the lower estuary meant that the size of the vessels using the New Cut was less than 100 tons and the use of lighters continued (Place 1996, 73). The cost of construction was much greater than expected and the income from new dues was far less than anticipated. In order to help raise additional capital for the scheme the River Dee Company was formed in an Act of 1741. A further Act was passed in 1744, which reduced the levies in an attempt to encourage trade (Thacker 2005, 85–6). As a result of the New Cut, 18.5 square miles (48 square km) at the head of the estuary was eventually enclosed. It was this land improvement and the consequent loss of tidal scour that caused the extensive silting we see today (Place 1996, 73).

The establishment and development of the port

The area chosen for the construction of the port lies adjacent to the eastern side of the river, at the north of the Roodee, close to the point where the northern part of the river loop meets the eastern end of the New Cut. The early stages of the port's development are shown on de Lavaux's map of 1745 (Ill. I.2). A quay is depicted protruding from the river bank with a crane, which appears to lie within an enclosed yard associated with a large building and adjacent gardens, with a sizeable timber yard (presumably associated with the building and repair of vessels) to the east. The Cop is shown abutting the enclosed area. This relationship, along with its staggered course, suggests that the building and enclosure and possibly the timber yard, pre-date the construction of the Cop.

According to Burdett's map of 1777 (Ill. I.3), the initial focus of the port, immediately adjacent to the river, looks virtually unchanged since the production of de Lavaux's map. By this time an inlet had been constructed to the north of the quay shown by de Lavaux, with a large building to the east cutting through the Cop. Major changes had also occurred in the area of the timber yard where rows of houses defined by parallel streets had been built. These streets (identified as New Crane Street, Crane Street and Paradise Row on Hunter & Weston's map of 1789 (Ill. I.4)) provided direct access from the port to the city centre via Watergate. These streets also provided access to the workhouse, otherwise known as a 'house of industry', constructed in 1758–9 (Lewis 1998–9). It was a square building of three storeys with a central courtyard (Catherall & Prichard *c.*1860) and on Burdett's map its construction is clearly shown to have cut through the Cop.

In 1772, authorisation was given for the construction of the Chester Canal. It was intended to run from Chester to Nantwich and Middlewich. The line to Nantwich was completed in 1779; the Middlewich branch was never started (Herson 2005, 87). The western end of the canal connected with the River Dee a short distance from the northern extent of the port (Ill. I.3). It was obviously intended that this area would become the focus of trade between the city and much of its rural hinterland. Unfortunately, the canal attracted little traffic because at that time there were no further canal connections from Nantwich (*ibid*).

By the time of Hunter & Weston's map (1789), a period of expansion of the port had clearly occurred (Ill. I.4). Work included the construction of a series of inlets for berthing vessels, and the building of associated warehouses and walled enclosures for the probable storage of goods. The grandeur of the newly constructed port facilities at New Crane Wharf (at the end of New Crane Street), with its harbour master's house and warehouses, is provided by a vignette on a plan by the River Dee Company (Boydell, 1772) (Ill. I.8). The port was now capable of taking sizeable vessels, as indicated on this vignette and the drawings on the maps by de Lavaux and Hunter & Weston, of up to 350 tons (Thacker 2005, 87). According to Hunter & Weston's map, the length of the port was about 650m, running from a wharf approximately 160m south west of the workhouse northwards to the newly constructed Cheese Warehouse adjacent to the eastern end of the New Cut. The depiction of a new flood defence bank opposite the workhouse and abutting the original Cop indicate renewed concerns about flooding in this area at that time.

The later history of the port

Documentary evidence indicates the heyday of the port of Chester was short-lived (Herson 1996; Woodward 1996). Various factors affected its potential to grow (Herson 1996, 75; Thacker 2005, 87). These included continuing problems of river silting, the lack of a large industrial hinterland and perhaps most importantly its proximity to Liverpool, which began its rapid ascendancy as a transatlantic and international port in the late seventeenth century (Lewis 2005, 7). Improvements in navigation along the River Weaver and the building of the Grand Trunk Canal meant that trade from the Cheshire salt mines and the Staffordshire Potteries was directed towards the Mersey and away from Chester (Herson 1996, 75). All these factors meant that the port was heavily reliant on trade from within the city. Problems were made worse by the stagnation of the local economy between 1760 and 1840 (*ibid*). Trade in Irish linen reached its peak between 1761 and the early 1770s, but declined

thereafter with the last direct import of Irish linen through the port taking place in 1810. The demise in this trade was again due to competition from Liverpool (*ibid*, 75–6). Cheshire cheese appears to have been the only significant commodity to be sent directly from Chester to its final destinations, most notably London; although, its shipment faced substantial competition from Frodsham at the mouth of the Weaver and from Liverpool (*ibid*, 76–7).

A further decline in the port's fortunes came about with the development of the canal system. Close to the western end of the Chester Canal, to the north east of New Crane Wharf, a sizeable tidal basin was constructed. Its extent during construction is shown on the maps by Murray & Stuart (1791) and Stockdale (1796) (Ill. I.5), while its finished form is depicted on the second edition of Murray & Stuart's map (probably published in 1801) (Ill. I.6). In 1793 the Ellesmere Canal Act was passed and enabled Chester to serve a much wider hinterland (Herson 2005, 88). The Wirral Line of the Ellesmere Canal ran into the eastern end of the tidal basin (Ill. I.6). The Dee Lock, at the western end of the basin was opened in 1801, a short distance upstream (south) from the original Chester Canal entrance (*ibid*; Emery 2005, 56). It was not intended that the new canal system would revive the port. Its aim was to strengthen Chester through its links with Liverpool via the Mersey (Herson 1996, 77).

Despite these developments, it is apparent from the maps produced at the end of the eighteenth century and during the early nineteenth century that the port area continued to attract new industries. Limekilns and an iron foundry are depicted on the maps by Murray & Stuart (1791) and Stockdale (1796) (Ill. I.5). Graphic representations of ships under construction/repair are shown on Murray & Stuart's map of 1801 (Ill. I.6). One shipbuilding/repair yard lay immediately north of the Dee Lock and the other lay next to the iron foundry. The owner of the latter yard is noted as the 'River Dee Company' on the map by Wood (1833) (Ill. I.7). Adjacent to the iron foundry a paper mill was established (*ibid*; Malley 2006–07). Wood's map also shows that along New Crane Street additional buildings (many of them probably houses) had been constructed. Following the publication of this map and by the time the Ordnance Survey undertook their large scale mapping of the area in 1872 (maps published 1875) a significant amount of work had taken place to replace the older revetment walls with a new quayside wall built of sandstone blocks, together with a slipway replacing the berthing inlet at New Crane Wharf (Ill. I.9). Differences in construction (Harvey 1993) and analysis of cartographic sources (Fletcher 2001) indicate that the work was not undertaken in a single operation. The principal reasons for carrying out this work must surely relate to the structural stability of the older revetments and to provide a greater depth within the river for the mooring of vessels, unobstructed by river silts. However, as the Ordnance Survey maps of 1872 demonstrate, by this time silt inundation had become a major problem once again. On a larger economic scale these maps also provide further evidence of the port's decline. The foundry and paper mill depicted on Wood's map had been demolished and the inlets infilled (see also Malley 2006–07). Much of the site of these works was now occupied by the gasworks, which was constructed in 1851–2 (pictorially represented by Catherall & Prichard *c.*1860) and initially extended in 1865 (Barrow 2005a, 42). Ship building in the adjacent yard ceased in 1869 (Lewis 2005, 7).

According to Herson (1996, 85) the old port of Chester did not die at a definitive date, it just faded away. The coming of the railways to Chester in 1840 and the development of the

regional rail network throughout the rest of the nineteenth century sounded the port's protracted death knell. The city's railway stations now became the principal places where long-distance goods flowed in and out of the city (*ibid*) and in the 1890s Chester was regarded as one of the most important railway centres in England (Barrow 2005b, 94). In the 1900s small numbers of vessels continued to use the port: twenty-eight in 1902 and only three in 1907 (Herson 1996, 85). In the following decades the port remained deserted for much of the time, but in the 1940s Crane Wharf still provided a convenient anchorage for occasional, small seagoing vessels (*ibid*, Lewis 2005, 7).

Archaeological investigation of the port area

Prior to this series of investigations the only archaeological work undertaken in this area was in 1886 on the site of the municipal gasworks. Here the remains of a timber wharf or jetty was found during the excavation for a new gas holder at a depth of about 6m below ground level. They were inserted into boulder clay, overlain by a stony deposit and sealed by river silts. The nature of this construction and the associated artefacts clearly suggest it was of early Roman date (Mason 2001, 114–7; Mason 2002, 67–9).

The work undertaken during this recent campaign consists of archaeological assessments and field evaluations, larger scale excavations, watching briefs and the recording of standing structures (Ill. I.1). These investigations were carried out as a direct result of the redevelopment of the 'old port' area. They were deemed necessary by Chester Archaeological Service, in accordance with government guidance on planning matters, to preserve *in-situ*, or to record in detail prior to destruction, known or suspected remains of archaeological and historic interest and importance. The objective was to examine three key elements of the area's development. These were:

- the riverine deposits prior to the building of the flood defensive banks, collectively known as 'the Cop';
- the Cop;
- port installations and buildings, together with the workhouse.

Pre-Cop riverine deposits

The examination of riverine deposits was undertaken at three locations (Sites 1, 3 and 4; Ill. I.1) to provide information on the processes of erosion and deposition, which would allow further understanding of how the changing nature of the river contributed to and affected the city's development.

At the eastern side of the southernmost of these three sites (1), evidence was found that the River Dee in the pre-Holocene (before 10,000 BP) ran through a depression in the sandstone bedrock. Deposits examined at this location, and at Sites 3 and 4, indicate that by the early modern period the river had shifted considerably to the west, away from the city walls. At Sites 1 and 3 the depositional sequence of sands and gravels suggests that the river contained gravelly shoals and may therefore have been broad and shallow with the subsequent stabilisation and narrowing of its banks. These findings of a very rapid change in the river's course are consistent with the evidence depicted on the maps of Chester by Braun & Hogenberg (1581), Speed (*c.*1610) and de Lavaux (1745). At Site 3 it was found

that the erosion of pre-seventeenth century deposits within the path of the river as it migrated westwards was considerable. One can assume that any associated structural features would also be similarly affected.

From the archaeological investigation carried out at the eastern end of New Crane Street a short distance to the north west of Watergate (Owen 2002) (Ill. I.1 — Site 5), it is apparent that the whole process of riverine shift was not entirely the result of natural deposition. Here an organic rich silt deposit, probably formed by the river and containing sixteenth century pottery, was overlain by a large dump of material about 3m thick that produced a group of artefacts closely dated to the mid seventeenth century. A similar sequence of deposits was attested by boreholes positioned along the site. This deliberate dumping would appear to represent not only the disposal of rubbish, but was intended to raise the level of land in order to reclaim it for use.

The Cop and associated port installations

While some information exists about the Cop flood defensive banks from historic sources, the redevelopment of the area has provided an opportunity to examine in some detail the methods employed in the construction and refurbishment of these earthworks. The remains of the Cop were found at three sites: 1, 3 and 4 (Ill. I.1).

The largest area of the Cop to be examined was in Site 3. Here, the initial construction consisted of a bank, approximately 16m wide and standing originally over 2.5m high. It was formed mainly of redeposited sands with a gently sloping sandstone block facing or revetment along the base of its western face, which acted to prevent erosion and damage from berthing vessels. For the most part the sandstone facing was formed by fragmentary and irregular-shaped blocks, but in places the blocks were larger and closely-set. At Site 4 two sections of the Cop were excavated. In one trench the angled stone facing had survived, while in the other only a little stonework was evident with the exception of a linear spread of sandstone blocks to the west, which may have served as a breakwater. It is unclear whether both these sections were contemporary and whether the lack of facing stone in one section was the result of later damage. The excavated evidence from Sites 3 and 4 tends to suggest that where encountered the stone facing was an integral part of the embankment's initial construction and not an element of the historically recorded refurbishment.

At Sites 3 and 4 accumulations of silt were found overlying the western face of the Cop. At Site 3 the degree of silting was so acute and the possible effects of potential damage from flooding so severe, it necessitated the rebuilding of the Cop in the late eighteenth century. The line of this new construction followed the course of the initial embankment and consisted of layers of sand and clay and dumps of irregular blocks of sandstone along its western face and at the back of an inlet, forming a small dock. This inlet would appear to be depicted on maps of the late eighteenth and early nineteenth centuries; although, the Cop adjacent to this part of the river is not shown (eg Burdett 1777; Wood 1833) (Ills. I.3 and 7, respectively). At Site 4 the remains of a small spur, consisting of layers of sand and clay perhaps forming a jetty, was found adjoining the Cop. It is dated to the mid to late eighteenth century and was located close to a small stone-lined wharf or slipway built in the early nineteenth century.

At the southern end of Site 4 a steep-sided, clay-lined channel was discovered, which may be the remains of the original western end of the Chester Canal, pre-dating the Dee Lock to the south. However, cartographic sources seem to suggest that the line of the canal was further north. Whatever the function of this feature, the archaeological evidence indicates it was short-lived having been rapidly infilled with riverine silts in the late eighteenth century.

It has been noted previously that, according to cartographic sources, the workhouse had cut through the Cop, and in the late eighteenth century a new flood defence bank was built adjacent to the building. The southern part of this new embankment was exposed during the excavation of Site 1. Its form was similar to the sections of the Cop excavated at Sites 3 and 4 and consisted of a bank of redeposited river silt with an angled facing of irregularly shaped sandstone blocks along the base of the southern side, which was overlain by riverine silts.

Later port installations and buildings

Archaeological excavation and the analysis of standing buildings prior to their demolition has provided a detailed insight into the development of certain parts of the port. The main focus of these investigations was between Crane Wharf and Tilston's Yard (to the north of the Dee Lock) at Sites 2, 3 and 4 with some work also undertaken further south at Site 1 (Ill. I.1). Cartographic evidence and the results of archaeological investigation clearly indicate that the development of the port was by-and-large relatively small scale and piecemeal, reflecting its poor economic status.

At Site 3 evidence was found of a programme of redevelopment starting in the early nineteenth century. A land reclamation scheme in the southern part of the site extended the river front westwards by about 10m, sealing the remains of the Cop. The dumps of material were retained within a walled enclosure, the western side acting as the riverside (wharf/quayside) wall. The remains of several small structures with sandstone footings orientated along the northern wall of the enclosure were found. Associated pits containing metal slag indicate that this group of structures was used as a smithy. Later in the nineteenth century these structures were demolished and in their place an L-shaped complex of rooms or connecting structures was constructed. This building complex corresponds with a smithy depicted on the earliest large scale Ordnance Survey map published in 1875. The walls of this new building were mainly of brick, but in places were founded directly on earlier sandstone walls or incorporated blocks of sandstone from former structures. Within this later building a pit containing the impressions of barrels was found. These barrels probably functioned as storage receptacles, possibly for coal and lime.

Analysis of cartographic sources has indicated that between 1833 and 1838 the northern part of Site 3 was reclaimed resulting in the construction of a walled enclosure, the western side of which extended the line of the river-front wall existing to the south (Fletcher 2001). In the second half of the nineteenth century, four buildings were constructed around a courtyard in the north eastern part of this enclosure and together would appear to have been workshops and/or stores for shipwrights or ancillary trades serving the port (*ibid*). Two of these buildings survived as standing structures until 2000 when they were examined in some detail prior to their demolition. Both were brick-built. One was a single storey construction and the other was of two storeys and had been partially rebuilt, probably in 1880

as indicated by a cast iron panel in the apex of the north gable. Excavation of the remains of these buildings failed to provide additional information about their original use. However, the remains of a slipway uncovered immediately to the north does suggest that these buildings were used to repair and maintain boats.

At Site 4, the possible remains of a building were found represented by a possible flooring deposit of clay, dated to the mid nineteenth century. Mid to late nineteenth century drains were also discovered, one of which had probably been timber-lined and was back-filled with refuse.

During the excavation of this site, like the sequence revealed at Site 3, there was considerable dumping to level up the ground adjacent to the newly constructed section of the riverside wall, which was built about the middle of the nineteenth century. This land reclamation scheme was responsible for infilling the small stone-lined basin of late eighteenth or early nineteenth century date.

The final phase of construction at Site 4 was represented by the buildings forming Tilston's boat-building yard. Three adjoining timber-framed and weatherboard clad boat-building sheds, built in the early twentieth century, were situated next to New Crane Street. They were the subject of a programme of building recording prior to their demolition in 2004. Many of the uprights used in the timber-framing were reused from earlier structures. The yard was leased to the Tilston family in the 1920s and boat building continued until shortly before the buildings were demolished.

In the southern part of the 'old port' area a limited amount of work was undertaken to expose the remains of port installations and buildings. At Site 2 (Trench 1) work immediately adjacent to the riverside wall revealed the well-preserved remains of a late eighteenth century crane base, known from cartographic sources as one of the New Cranes. The possible remains of the other New Crane, also depicted on late eighteenth century mapping, were also found (Site 2, Trench 2). At Site 1 a short length of dock wall was exposed to the south west of the workhouse. It was built of squared sandstone blocks with an offset base and timber fender posts against its exterior face. The remains of the dock accords with an inlet first shown on Hunter & Weston's map (1789), adjacent to the iron foundry shown on Stockdale's map (1796) (Ills I.4 and 5, respectively).

The workhouse

Archaeological excavation (Site 1 — Ill. I.1) has provided important information about the construction, structural alterations and use of this building, adding to what was already known from documentary sources (Burne 1965, 44–8; Lewis 1998–9; Lewis 2003). The initial workhouse building, a sizeable structure consisting of four wings around a central courtyard, had largely been destroyed by the construction of the gasworks. Nevertheless, a significant part of its ground floor plan survived. The excavation of the surviving structure was principally directed at examining the northern and southern parts of the building, together with the courtyard. All the walls of the main building were constructed of brick with large sandstone blocks used as foundations for the main load-bearing walls. Brick was also used for internal floors. The courtyard contained a brick walled enclosure, within which

was a pit containing large quantities of clinker and coal fragments, presumably the waste from ovens/furnaces or smaller fires lit within the workhouse. A network of salt-glazed drains was found cutting through the walls and floors, which seems to relate to the subsequent use of the building for the production of confectionery and preserves from the late 1870s. Immediately to the south of the southern wing the remains of a brick-built extension were found, which probably served as a school for infant paupers.

Conclusion

This paper, while providing a summary of the history of the port with particular reference to the wealth of historic maps of the city, also presents an integrated archaeological view of the work undertaken in the area. Having set the scene and sketched out the results of the excavations, the following papers provide detailed accounts of the remains encountered.

Acknowledgements

I would like to thank Mike Morris for inviting me to write this paper and for the help and advice that he and Gillian Dunn have given during its production. I also wish to acknowledge the help given by the staff at Cheshire Archives and Local Studies, and Chester Library. I am grateful to Cheryl Quinn who was responsible for producing Illustration 1.

Bibliography

Barrow, J S 2005a — Public utilities: gas supply. *In:* Lewis, CP & Thacker, AT eds. *A history of the County of Chester. The City of Chester* **5.2.** (Institute of Historical Research). Woodbridge: Victoria History of the Counties of England, 41–2

Barrow, J S 2005b — Railways. *In:* Lewis, CP & Thacker, AT eds. *A history of the County of Chester. The City of Chester* **5.2**. (Institute of Historical Research). Woodbridge: Victoria History of the Counties of England, 91–4

Boydell, T 1772 — *A plan of so much of the lands & premises belonging to the River Dee Company.* Chester: Cheshire Record Office Ref: PM 11/7

Braun, G & Hogenberg, F 1581 — *Cestria (Vulgo)* Chester, *Angliæ Civitas*. Chester: Cheshire Record Office Ref: PM 14/1

Burdett, P P 1777 — *A survey of the county palatine of Chester.* Chester: Cheshire Record Office Ref: PM 12/16D

Burne, R V H 1965 — The treatment of the poor in the eighteenth century in Chester. *J Chester and North Wales Architectural, Archaeol and Hist Soc* **52**, 33–48

Catherall & Prichard *c.*1860 — *Pictorial plan of Chester.* Chester: Cheshire Record Office Ref: PM 15/17

Emery, G 2005 — The Ellesmere Canal. *In:* Emery, G ed. *The old Chester Canal. A history and guide.* Chester: Gordon Emery on behalf of the Chester Canal Heritage Trust, 53–63

Fletcher, M 2001 — *Buildings at Dee Lock, old port, Chester. Historic buildings assessment.* Unpublished archive report (no. 2001–01). Manchester: Matrix Archaeology

Forster, G C F 2003 — Economy and society, 1662–1762. *In:* Lewis, CP & Thacker, AT eds. *A history of the County of Chester. The City of Chester* **5.1**. (Institute of Historical Research). Woodbridge: Victoria History of the Counties of England, 137–45

Harvey, N 1993 — *Old port wall, Chester. Structural investigation.* Unpublished archive report (no. 6329/01). Chester: Gifford Consulting Engineers

Herson, J 1996 — Canals, railways and the demise of the port of Chester. *In:* Carrington, P ed. *'Where Deva spreads her wizard stream'. Trade and the port of Chester. Papers from a seminar held at Chester, November 1995.* Chester Archaeology Occasional Paper **3**. Chester: Chester City Council, 75–89

Herson, J D 2005 — Water transport: canals. *In:* Lewis, CP & Thacker, AT eds. *A history of the County of Chester. The City of Chester* **5.2**. (Institute of Historical Research). Woodbridge: Victoria History of the Counties of England, 87–90

Hunter, J & Weston, S 1789 — *Survey of the ancient and loyal city of Chester.* Chester: Cheshire Record Office Ref: PM 18/4

Laughton, J 1996 — The port of Chester in the later Middle Ages. *In:* Carrington, P ed. *'Where Deva spreads her wizard stream'. Trade and the port of Chester. Papers from a seminar held at Chester, November 1995.* Chester Archaeology Occasional Paper **3**. Chester: Chester City Council, 66–71

de Lavaux, A 1745 — *Plan of the city & castle of Chester.* Chester: Cheshire Record Office Ref: PM 18/2

Lewis, C 1998–1999 — Building Chester's first workhouse. *Cheshire History* **38**, 50–4

Lewis, C P 2003 — Late Georgian and Victorian Chester: Poor Law. *In:* Lewis, CP & Thacker, AT eds. *A history of the County of Chester. The City of Chester* **5.1**. (Institute of Historical Research). Woodbridge: Victoria History of the Counties of England, 153

Lewis, C P 2005 — Introduction. *In:* Lewis, CP & Thacker, AT eds. *A history of the County of Chester. The City of Chester* **5.2**. (Institute of Historical Research). Woodbridge: Victoria History of the Counties of England, 1–8

Malley, M 2006–07 — The Chester Roodee iron foundry and paper mill. *Cheshire History* **46**, 18–29

Mason, D J P 2001 — *Roman Chester. City of eagles.* Stroud: Tempus

Mason, D J P 2002 — The town and port of Roman Chester. *In:* Carrington, P ed. *Deva Victrix: Roman Chester re-assessed. Papers from a weekend conference held at Chester College 3–5 September 1999.* Chester: Chester Archaeological Society, 53–73

Murray & Stuart 1791 — *Plan of the city of Chester* (Grosvenor Museum Accession No. 1960.148.101).

Murray & Stuart 1801 — *Plan of the city of Chester* (2nd edition). *In:* Poole, J *A concise history of the county and city of Chester.* Re-issued 1801 with the 2nd edition map of Chester by Murray & Stuart. Chester: Cheshire Record Office Ref: Central Collection Accession No. 133

Ordnance Survey 1875 — *City and county of the city of Chester.* Edition of 1875. Sheets 38.11.11, 38.11.16, 38.11.21. Scale 1:500. Surveyed 1872

Owen, P 2002 *New Crane Street car park, Chester — CHE/NCR02_1. Report on an archaeological evaluation.* Unpublished archive report (Report no. B3811C.R04a). Chester: Gifford Consulting Engineers.

Place, G 1996 Parkgate and Ireland. *In:* Carrington, P ed. *'Where Deva spreads her wizard stream'. Trade and the port of Chester. Papers from a seminar held at Chester, November 1995.* Chester Archaeology Occasional Paper **3**. Chester: Chester City Council, 72–4

Poole, J 1791 *A concise history of the county and city of Chester.* Re-issued 1801 with the 2nd edition map of Chester by Murray & Stuart. Chester: Cheshire Record Office Ref: Central Collection Accession No. 133

Robinson, H 1968 Cheshire river navigations with special reference to the River Dee. *J Chester Archaeol Soc* new ser **55**, 63–87

Speed, J *c.*1610 *Chester. Inset in: map of Cheshire.* Chester: Cheshire Record Office Ref: PM 14/7

Stockdale, J 1796 *A plan of Chester.* Chester: Cheshire Record Office Ref: PM 14/12

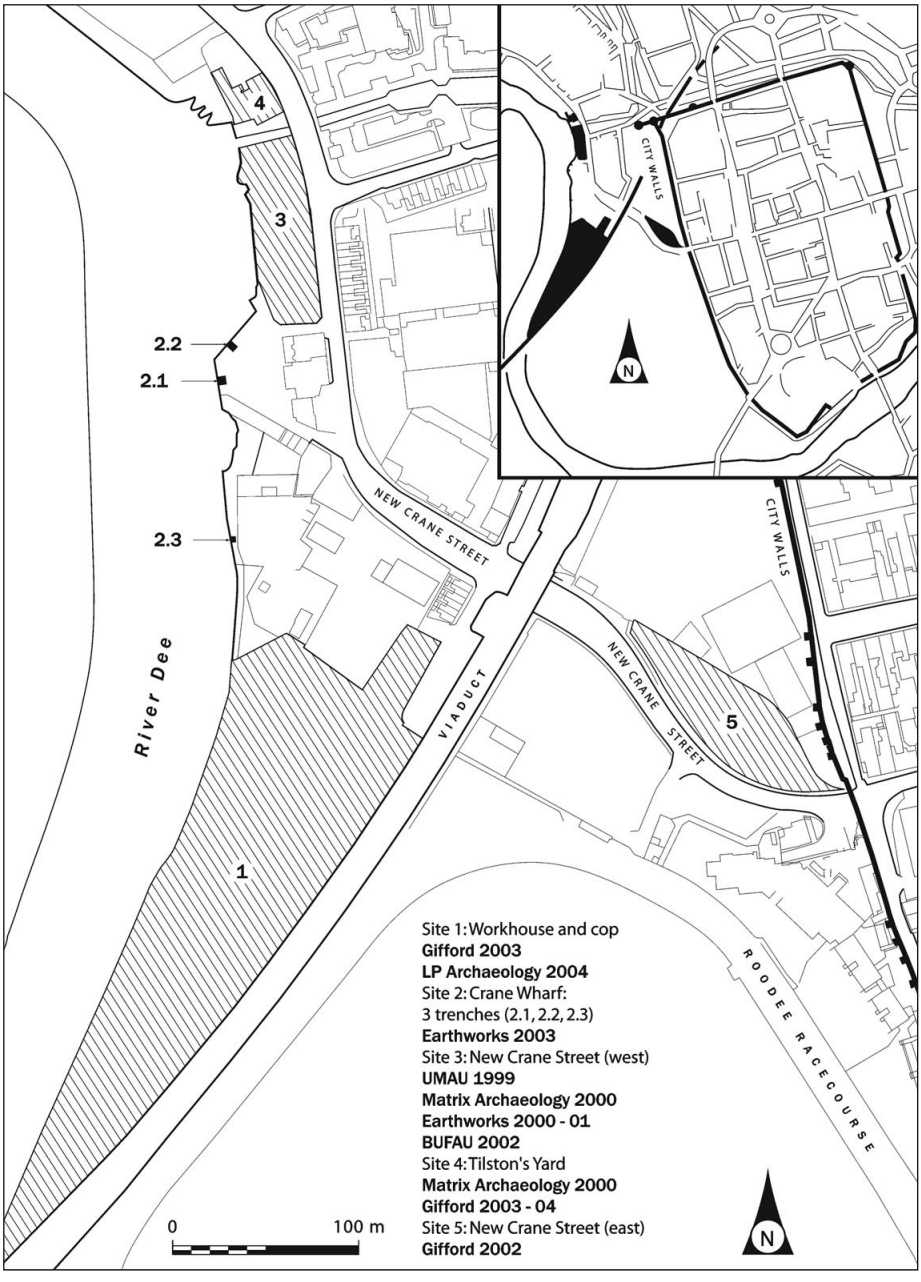
Thacker, A T 2003 Topography: early modern and Georgian. *In:* Lewis, CP & Thacker, AT eds. *A history of the County of Chester. The City of Chester* **5.1**. (Institute of Historical Research). Woodbridge: Victoria History of the Counties of England, 220–9

Thacker, A T 2005 Water transport: river navigation. *In:* Lewis, CP & Thacker, AT eds. *A history of the County of Chester. The City of Chester* **5.2**. (Institute of Historical Research). Woodbridge: Victoria History of the Counties of England, 83–7

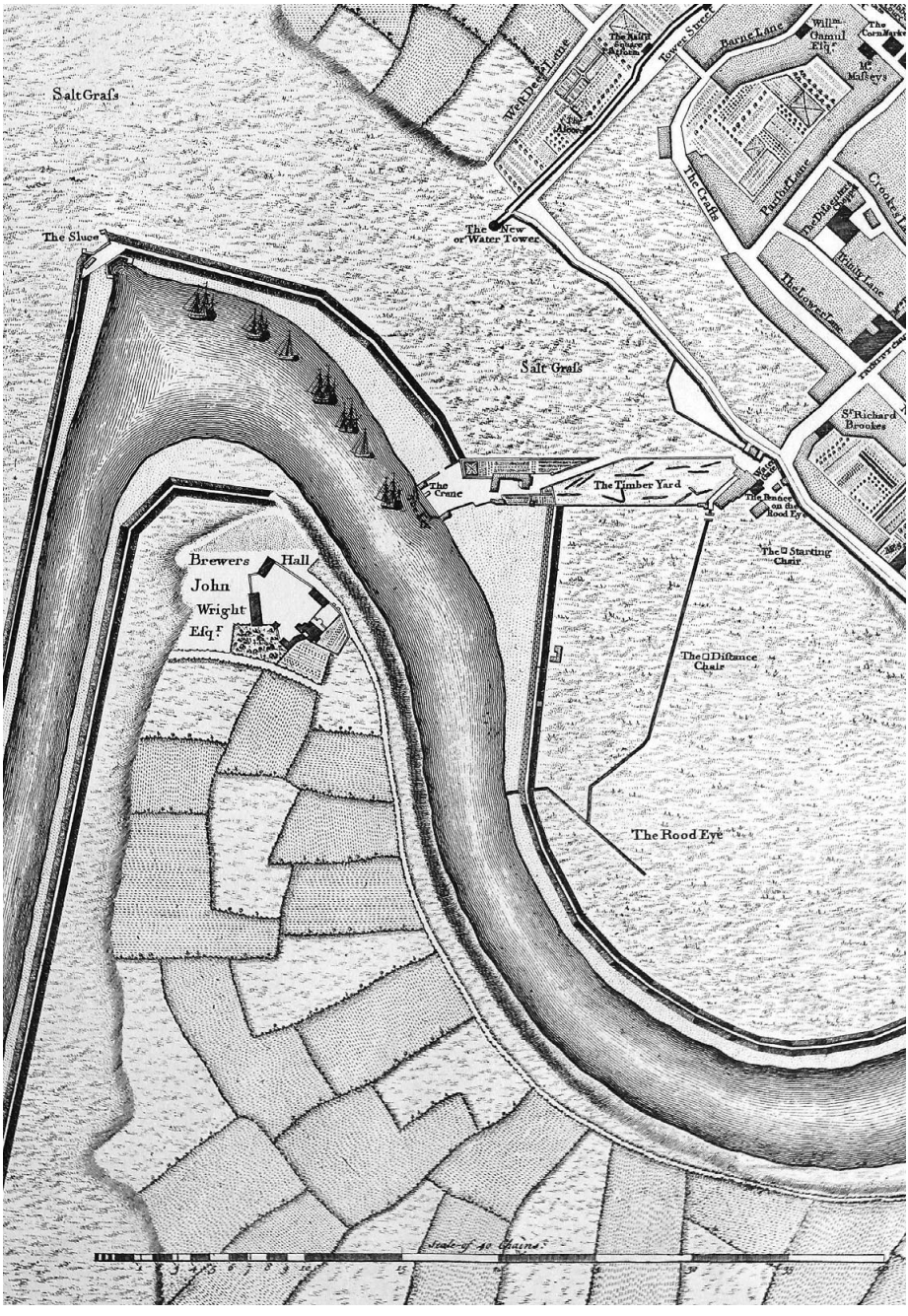
Ward, S 1996 The course of the River Dee at Chester. *In:* Carrington, P ed. *'Where Deva spreads her wizard stream'. Trade and the port of Chester. Papers from a seminar held at Chester, November 1995.* Chester Archaeology Occasional Paper **3**. Chester: Chester City Council, 4–11

Wood, J 1833 *Plan of the city of Chester.* Chester: Cheshire Record Office Ref: PM 18/5

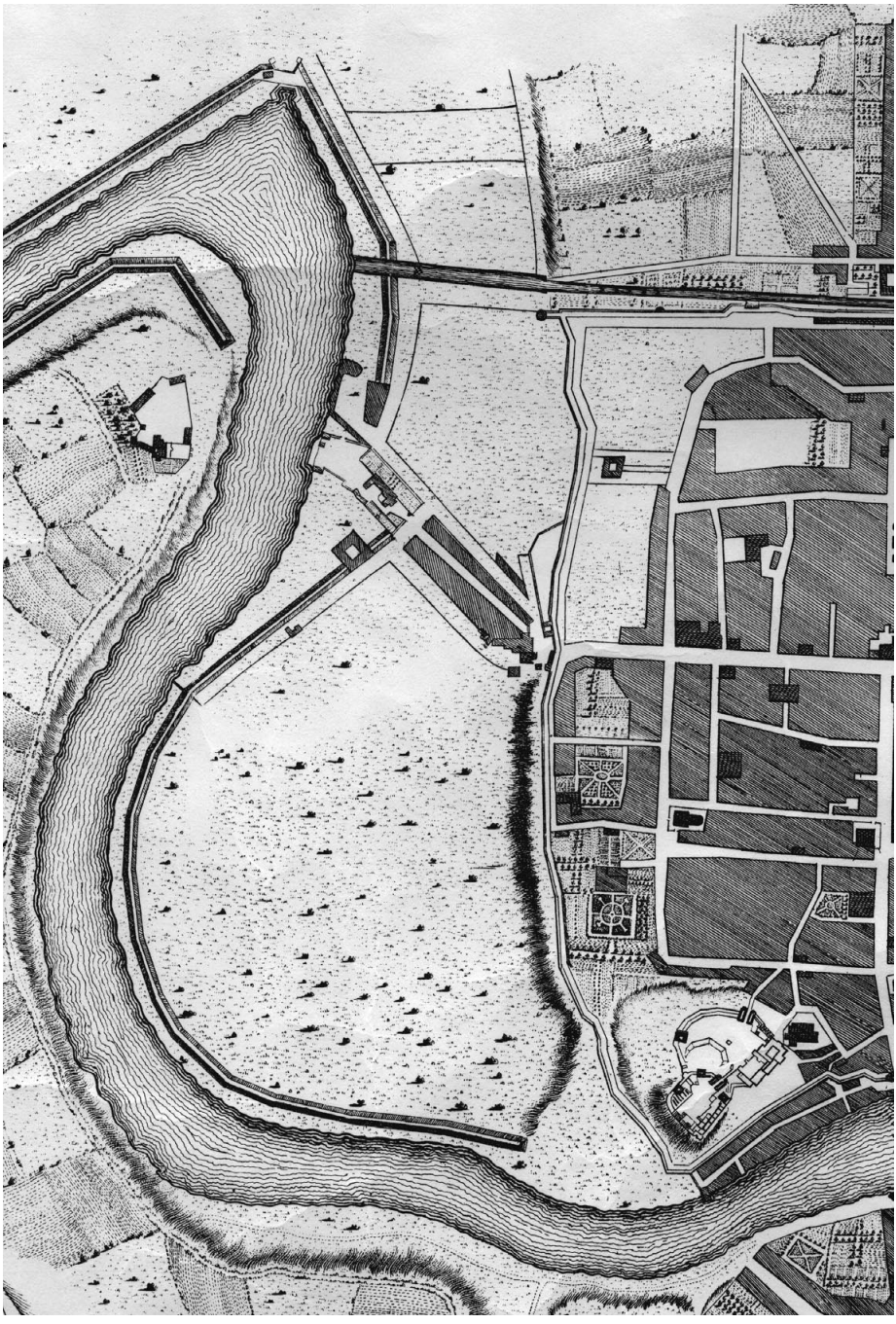
Woodward, D 1996 The port of Chester in context 1500–1800. *In:* Carrington, P ed. *'Where Deva spreads her wizard stream'. Trade and the port of Chester. Papers from a seminar held at Chester, November 1995.* Chester Archaeology Occasional Paper **3**. Chester: Chester City Council, 66–71



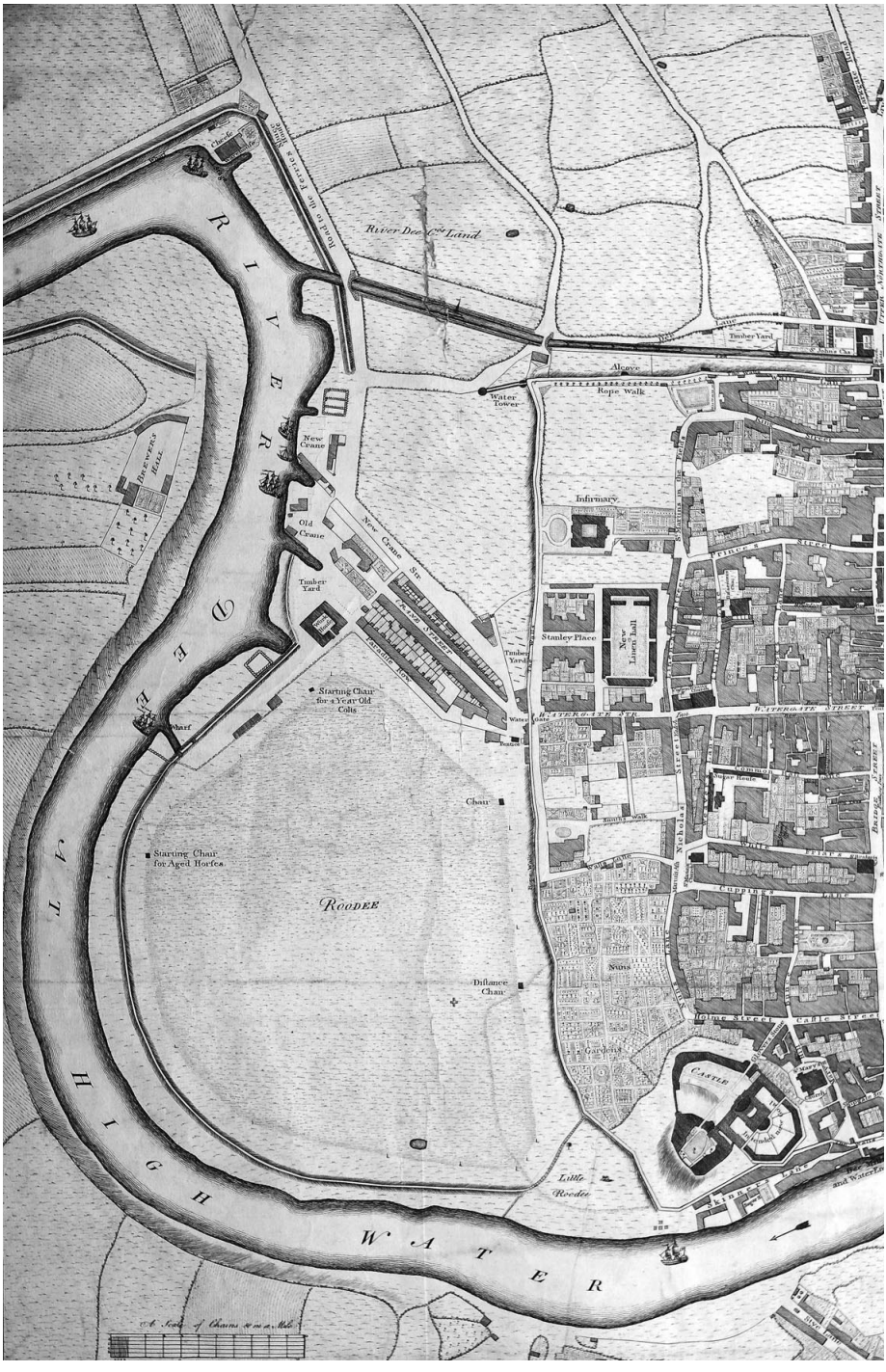
Ill. I.1: The principal field investigations undertaken in the 'old port' area (Drawn by C Quinn)



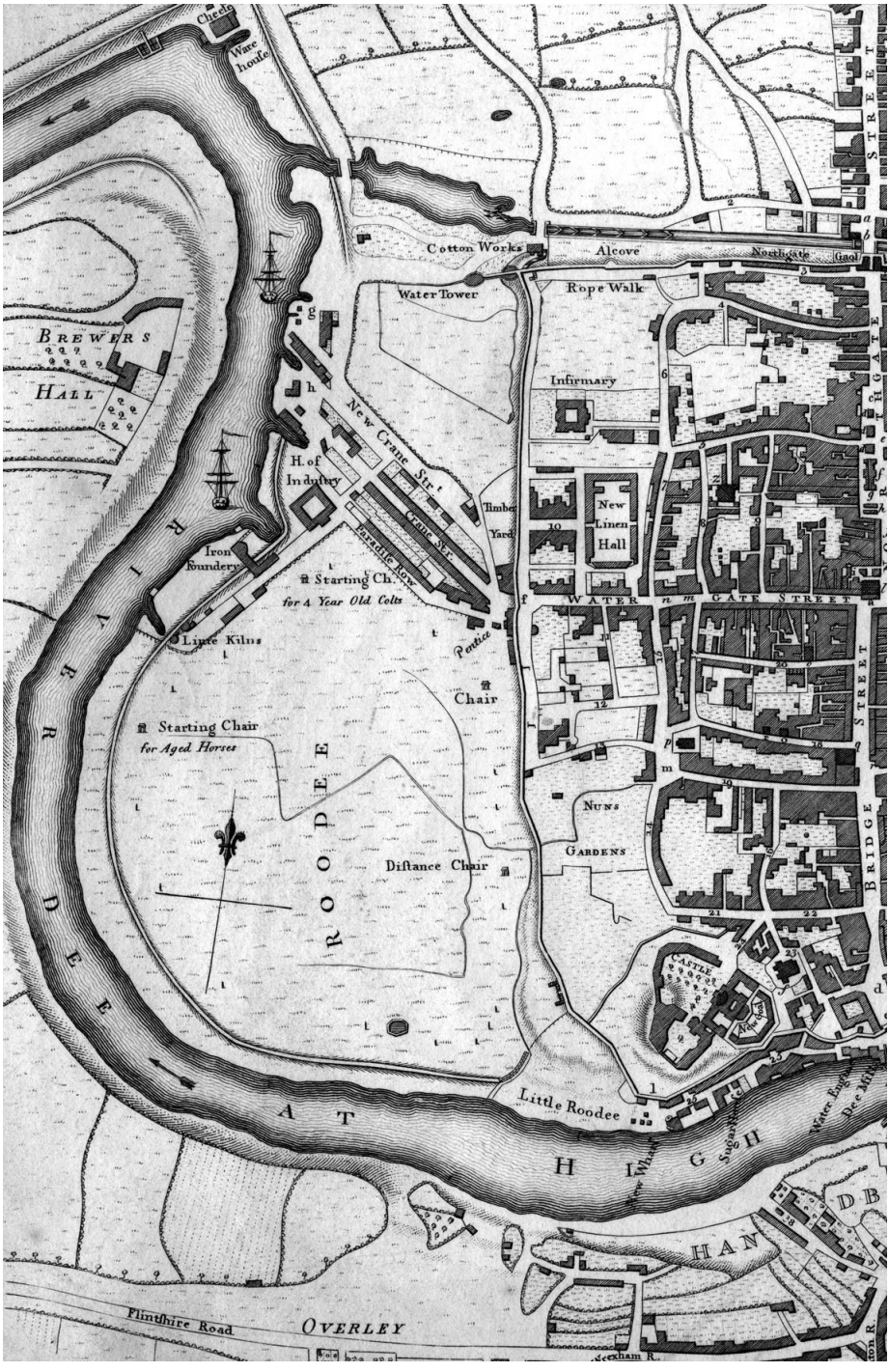
III. I.2: Extract from de Levaux's map of Chester (1745). Original scale 9⅝ inches to 40 chains; reproduction not to scale



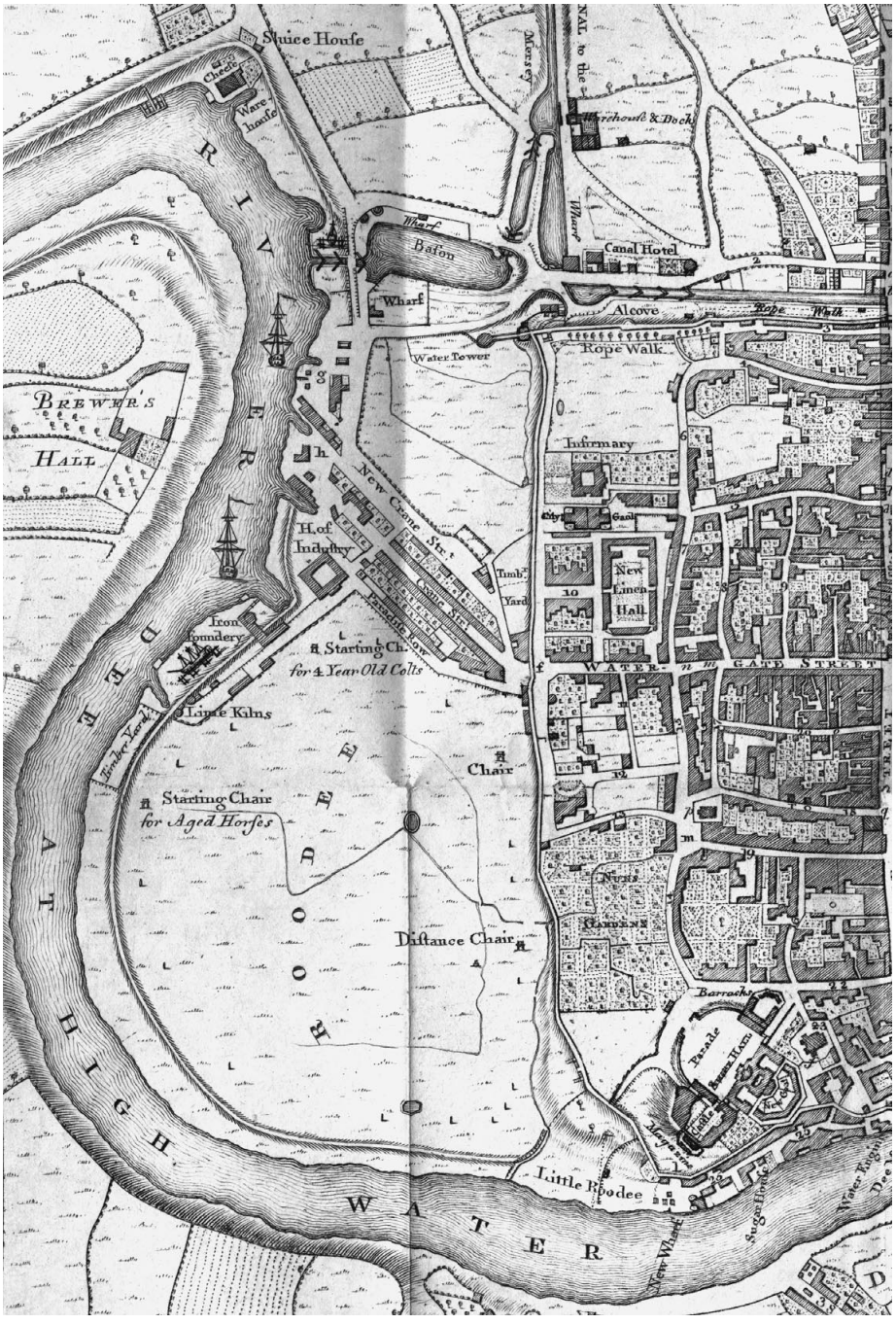
Ill. I.3: Extract from Burdett's map of Chester (1777). Original scale 3$^{5}/_{8}$ inches to 600yds; reproduction not to scale



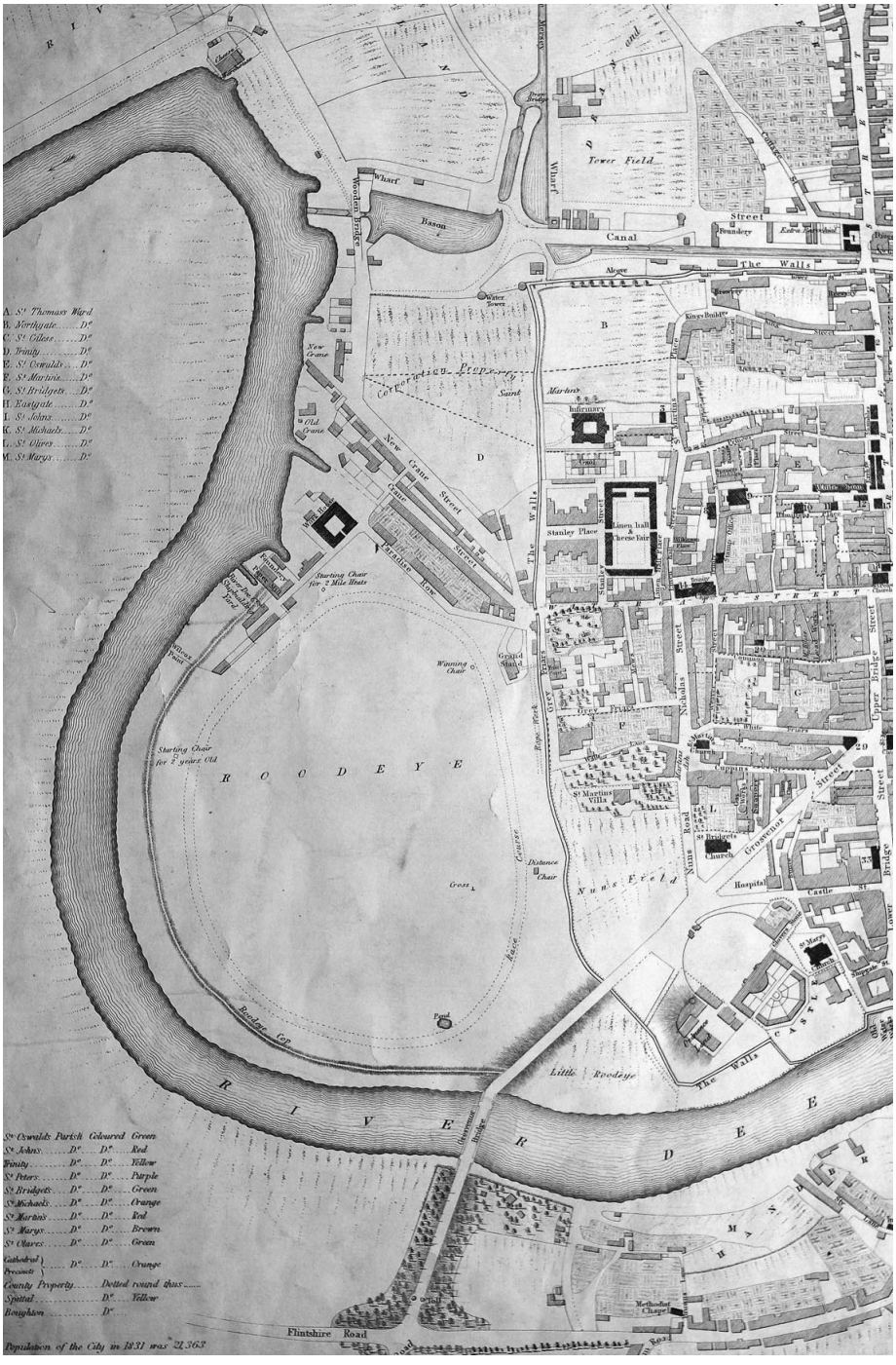
III. I.4: Extract from Hunter and Weston's map of Chester (1789) showing the River Dee at high water. Original scale 80 chains to 1 mile; reproduction not to scale



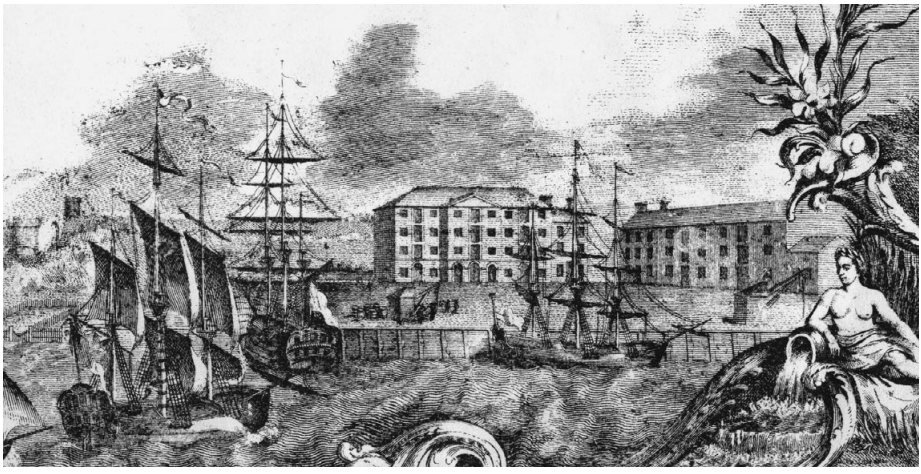
Ill. I.5: Extract from Stockdale's map of Chester (1796) showing the River Dee at high water. Original scale 1 1/16 inch to 1 mile; reproduction not to scale



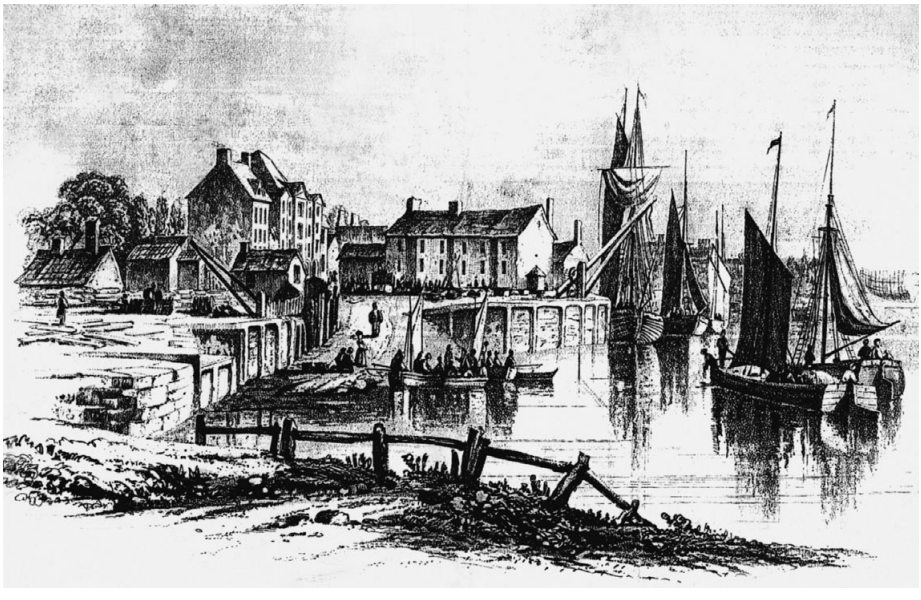
III. I.6: Extract from Murray and Stuart's map of Chester (2nd edition 1801) showing the River Dee at high water. Original scale 80 chains to 1 mile; reproduction not to scale



Ill. I.7: Extract from Wood's map of Chester (1833) showing the River Dee at high water. Original scale $11^{7}/_{16}$ inches to 40 chains; reproduction not to scale



Ill. I.8: New Crane Wharf. Vignette on a plan by the River Dee Company (Boydell 1772)



Ill. I.9: New Crane Wharf, entitled Chester Quay, from an unknown early nineteenth century publication (Chester Central Library, Local Studies Collection Ref: CL/DEE/1)