

**Chester and the
Archaeology of
Industrialisation,
1650 to 1900. An
Appraisal**

Final

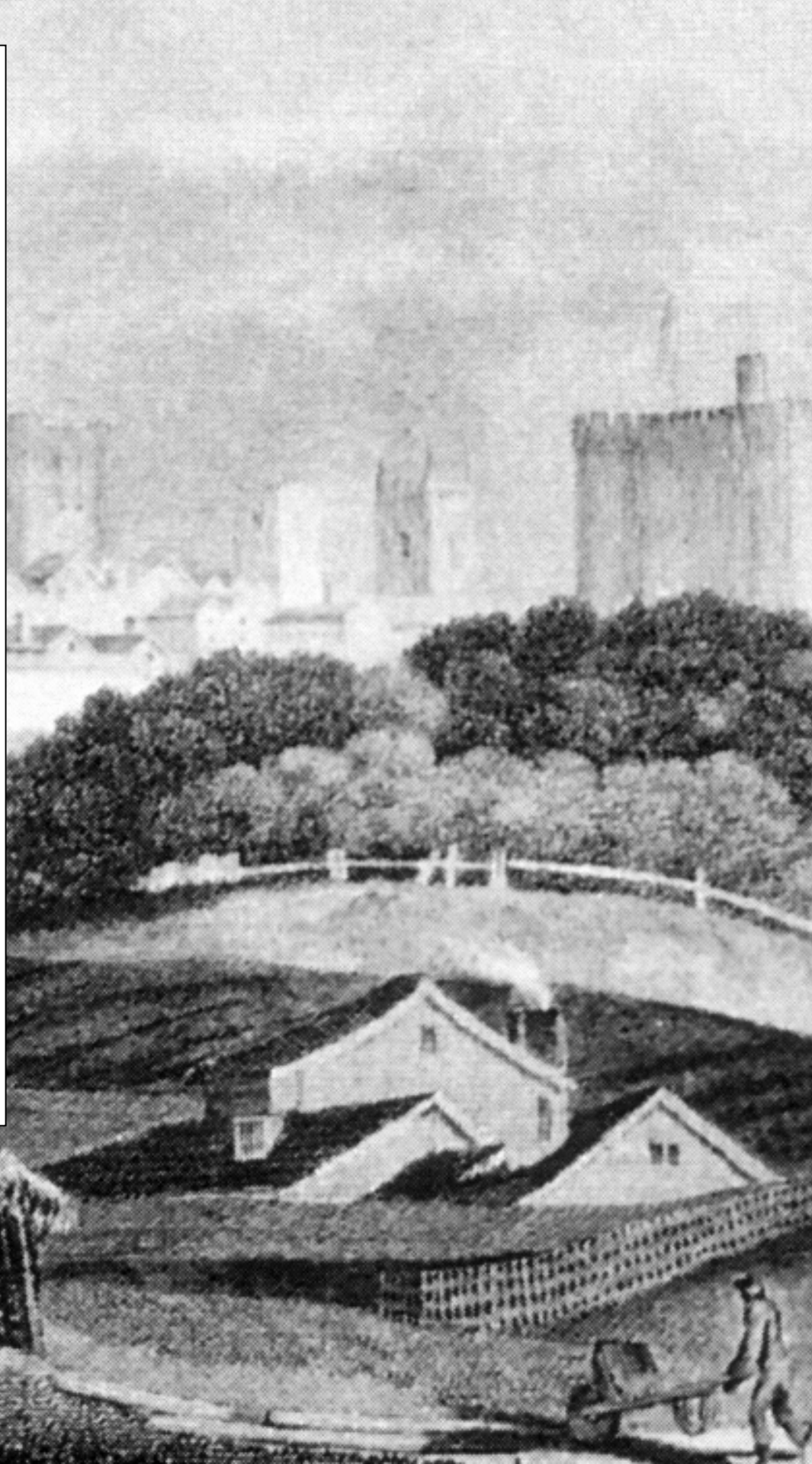
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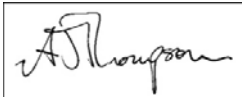
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1. Introduction: The Problem of Chester's 'Failure' to Industrialise

Industrialisation, the shift from an agrarian, largely rural-based, society to an urban-based manufacturing society, is one of the great changes in human history. Britain was the first society in the world to undergo this change, during the 18th and 19th centuries, and North West England, with its strong textile base, was one of the leading regions in that transformation. It might have been expected that Chester, as the chief port city and the largest urban centre in late medieval and post-medieval North West England, would have developed as a significant centre of industrialisation, like its contemporaries Bristol and Glasgow. Yet 19th century commentators viewed Chester as an industrial failure. Wardle and Bentham observed in their 1814 volume *The Commercial Guide* that 'in this city, although we mark the infancy of several manufacturers, few arrive at maturity' (Wardle & Bentham 1814). Two generations later White wrote in his *History of Cheshire*, published in 1860, that 'The modern history of the trade of Chester is rather the history of its decay', (White 1860, 1906). Two opinions may not count for much in a rapidly changing era but there is other evidence to support these views (Lewis & Thacker 2003, 146). Nevertheless, Chester's experience of industrialisation is not straightforward, and as Herson has observed: 'some new manufacturing industry arrived - it is wrong to say Chester had no industry - but the relative importance of manufacturing declined' (Herson 1996a, 14).

20th century economic and social studies of Chester all broadly agree that whilst some of the newly mechanised manufacturing industries were established within the city during this era, overall its 19th century economy developed around the city's role as a regional commercial, transport and social centre (Herson 1996a & 1996b). Yet in the 17th century Atlantic trade Chester was the largest port in the North West and was the most important port on the western seaboard after Bristol (Brennand with Chitty & Nevell 2006, 191). This is in contrast to its fellow Atlantic-facing ports of the 18th century: Bristol and Glasgow. Both of these centres developed as port and industrial centres in the 19th century, with sugar, tobacco and textiles initially driving industrialisation in the later 18th century and in the 19th century mass manufacturing being re-enforced by the development of the railway network.

The debate about Chester's role in the industrialisation of Britain can be divided broadly into two theories to account for the city's apparent failure to fully or even partly industrialise. Firstly, there is what might be termed the transport geography argument. This model proposes that the progressive silting of the Dee Estuary led to the decline of the port of Chester in the 18th and early 19th centuries, in consequence starving Chester of investment in Transatlantic-related industries and infrastructure at the expense of its rival port, Liverpool (Reid 2011, 6-9). Attempts to revitalise the port through the canalisation of the Dee channel, the building of the Chester Canal, and the expansion of the old port and canal basin were a failure due to a mixture of poor management, political inertia, the expansion of competitors such as Liverpool and Whitehaven, the growth of other forms of transport and changes in coastal geography (Herson 1996b, Woodward 1996).

Secondly, there is the landed-interest opposition model, where it has been argued that Chester's failure to fully industrialise in the 19th century was influenced by active opposition from major land owners in and adjacent to the city (Herson 1996a; Lewis & Thacker 2003). These land owners had significant political influence on the City Town Council, and comprised representatives of the local gentry and religious elite who held large estates immediately to the north, and south of the city. This influential group included the Cathedral Dean and Chapter, the Earl of Kilmorey, the Earl of Shrewsbury, the Grosvenor family, Rev Peploe William Hamilton and Lord Howe. Documentary evidence indicates that during the mid- to late-19th century they actively discouraged industrialisation on their lands (Herson 1996a; Lewis & Thacker 2003). Instead, these land owners supported redevelopment schemes that focussed upon Chester's traditional roles as an administration, elite social and retail centre, especially higher class housing and retail outlets

This study takes an explicitly archaeological approach to these debates and the impact of industrialisation within the city of Chester, and springs directly from the foundation research for a paper that the author wrote on the industrial archaeology of Cheshire (Nevell 2015). It draws upon more than two decades of archaeological research in order to take a landscape approach based upon the archaeological evidence available from Chester, both above and below ground, linking this back to historical and cartographic data and the contemporary social structure. In doing so the study has sought for patterns in the resultant data that describe and perhaps start to explain how the process of industrialisation within the city of Chester developed from the perspective of the discipline of archaeology.

2. Post-medieval and Industrial Archaeological Research in Chester Since 1990

Historically, until the late 20th century archaeological research in Chester was focussed upon the remains of the Roman and Medieval cities, and their international importance (Crosby 1999, 50-56, 77-83; Brennand 2006, 63-71, 127-31; Matthews 1999, 155-59). Much of this investigative activity post-dates 1945 (Crosby 1999, 83-96). Archaeological investigation and recording was encouraged by the development of the profession in the mid-20th century, not least through the Grosvenor Museum and the Chester Archaeological Society, and successive waves of redevelopment. In the later 20th century the designation of the city as an archaeological area under the 1979 Scheduled Ancient Monuments and Archaeological Areas Act, required the city to record archaeological remains, and later the introduction of developer-funded rescue archaeological work in 1990, firstly for below ground investigations and then in 1994 for above-ground standing structures, led to the emergence of archaeological work undertaken as part of the planning process (Everill & Irving 2015). Although there have been changes to Government planning guidance for heritage since 1994, culminating in 2012 with the publication of the present National Planning Policy Framework (Beckley, Campbell & Collens 2014), the principle of the developer paying for archaeological and heritage work ahead of redevelopment, with advice from planning archaeologists based within local government, established in 1990 remains imbedded in the planning process. The legacy of this research, both academic- and planning-led, is more than 900 investigations, some going back as far as the 17th century, across the city, from the discovery of individual objects to excavations and building surveys, and an increasing recognition of the importance of post-medieval and industrial remains (Fig 1; Beckley & Campbell 2013, 55, 70-81; CHER).

It was only with the development of the Post-Medieval and Industrial branches of archaeology during the 1960s and 1970s that a framework emerged for studying the archaeology of these later periods through the remains (often standing) of individual industries and transport networks (Ashmore 1981, 32-34). Study of the broader theme of the archaeology of industrialisation, rather than individual industries, had to wait until the 1990s (Carrington 1996; Matthews 1999; Nevell 2015). Consequently, only a small amount this material has been synthesised for the industrial period in Chester (Reid 2011; Thacker & Lewis 2005).

In terms of studying the impact of industrialisation within the city, a number of archaeological excavations and surveys have been important in developing this database and in furthering our understanding of the impact of industrialisation through detailed case studies.

Chester's post-medieval and industrial tanning industry was investigated at two major sites to the north and south of Eastgate Street; The Bars on the corner of Eastgate and Dee Lane in 1998 and Rylands Garage north of Eastgate in 2004-5 (Hayes 2008; *Past Uncovered*, Spring 1999, 1). The 1998 excavations on the site of the Chester Royal Infirmary, as well as revealing

the foundations of this 18th century institution also uncovered the remains of a clay pipe kiln established in 1630, one of the earliest to be built in England (*Past Uncovered*, Autumn 1998, 1). A series of investigations in the Gorse Stacks area of the city, north-east of the city walls from the early 2000s to 2016 has revealed post-medieval and industrial remains associated with the cattle market (*The Chester Antiquary* 2016 Issue 1, 1). Excavations in the centre of city at 25 Bridge Street in 2001 revealed details of the backyard activities into the early 20th century, including late 17th century cess pits and later 18th century backyard infilling with structures (Garner 2008). The first detailed below-ground investigation of 19th century living conditions in the North West was in Chester, where Matthews' 1994 excavation of a mid-19th century court at Hamilton Place remains a case study of the archaeology of lower-class urban housing (Brennand 2006, 177; Matthews 1996 & 1999). Furthermore, Matthews demonstrated how the archaeological excavation of recent urban deposits could reveal undocumented evidence for small-scale industrial activities, in the form of a late 19th/early 20th century metal forge at Herbert's Court, off Hamilton Place (Matthews 1999, 165-6). Excavations at Sellar Street & Canal Side, north of The Bars and west of the Old steam Mill in the mid-2000s revealed the extensive remains of mid-19th century terraced housing. The Old Port on the Roodee has seen a number of excavations since 1999, including investigation of the 18th century cheese warehouse (1999-2001; *The Chester Antiquary* Issue 2, 2001, 1), the 18th century Roodee Cop river defences (Poole 2011), the waterfront on New Crane Street (Hewitson & Scruby 2011), Workhouse (Poole 2011), and builders yard (Nash, Owen & Martin 2011). The early 19th century canal basin at Tower Wharf has also seen significant excavations, including the recording of five Mersey flats in 1998 and more remains in 2007 (*The Past Uncovered*, Spring 1999, 2).

Industrial manufacturing sites excavated since 1990 include the 19th century well house at the Northgate Brewery (Matthews 2003, 56), the gas works in the Old Port (Poole 2011), the Old Steam Mill, and the Lead Works (2001, 2002, 2004-5). Both the latter sites have standing buildings that have been recorded, whilst the Old Steam Mill had an early Boulton and Watt steam pumping engine from 1785 (one of the first to be installed in Cheshire; Challoner 1949) which was excavated in 2004-5 (Castlering Archaeology 2005). Other standing building surveys include a study of one of the first timber-buildings erected after the Civil War siege (Tudor House, Lower Bridge Street, in 1998); the house used by the mayor of Chester during the Civil War (The Bars on Dee Lane, 1998); the Union Hall cloth hall from 1809 (Matthews 2003, 58), and the last two surviving boatyard buildings at Tilston Yard on the Old Port (Nash, Owen & Martin 2011). Finally, the development of the Rows in the post-medieval and Industrial period has been captured at 3-15 Eastgate Street in 1990-1, with extensive evidence for rebuilding and re-arrangement in the 18th and 19th centuries (Matthews 1995).

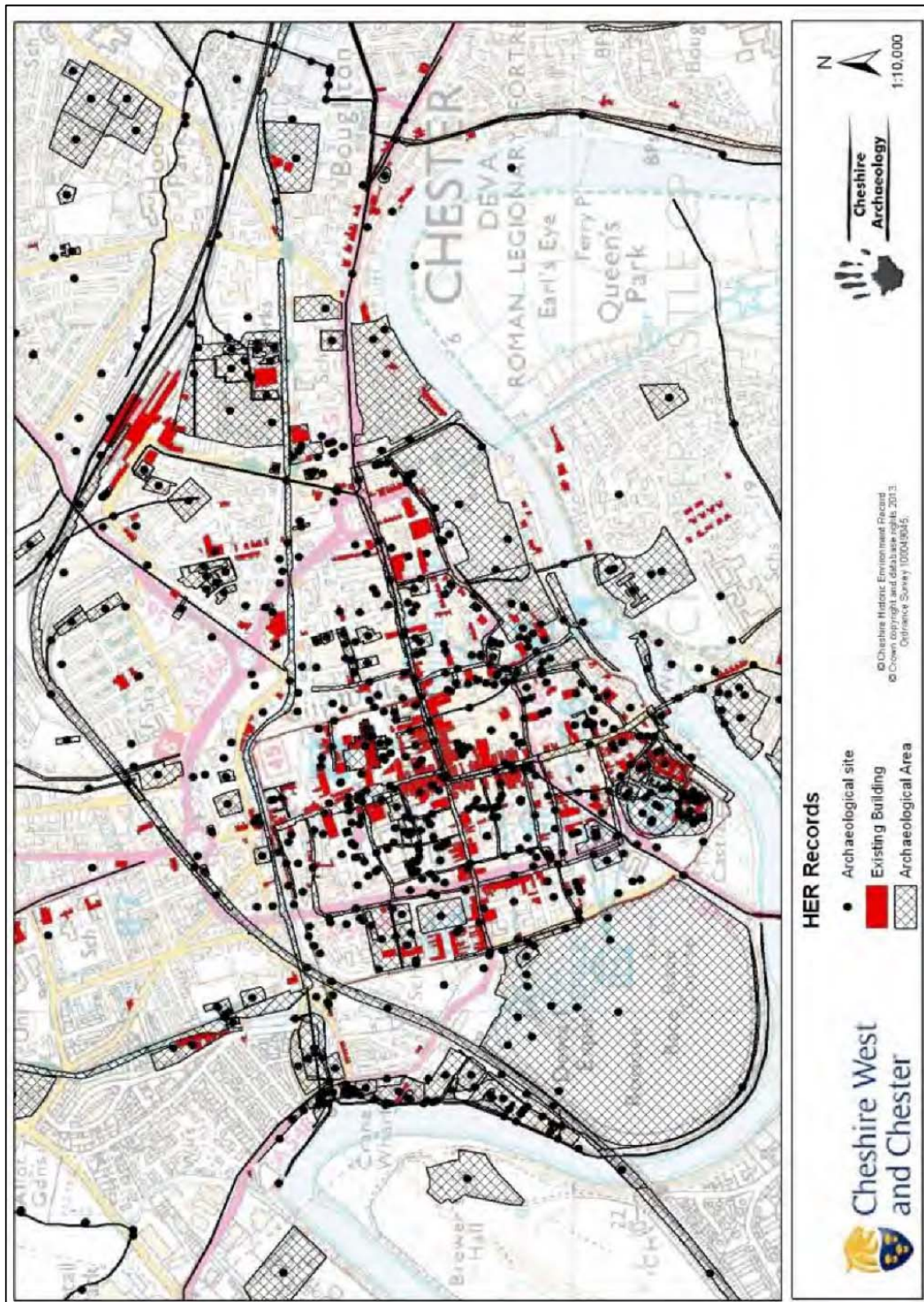


Fig 1: HER records for the Industrial period in Chester, This covers sites only from c. 1750 onwards

3. The Manchester Methodology and Archaeological Metadata

One of the characteristics of Industrial period archaeology (typically the 18th and 19th centuries; Palmer, Nevell & Sissons 2012, 7-9) is a surge in the range and depth of data available, not just archaeologically but in allied disciplines from history and cartography to photography and oral records. The evidence-base from 18th and 19th century North West England, and Chester, is no different in this respect. The brief review of published material and the more important unpublished grey literature given earlier demonstrates the quantity of detailed evidence available from Chester for this period. In addition, the recently completed Chester Urban Archaeological Database and Chester Characterization Study have added greatly to the Historic Environment Record database for the city, currently held by Cheshire West and Chester Council. This amounts to 842 individual industrial period records. This can be broken down into 404 entries covering standing structures, including both listed and non-listed structures and 438 records relating to former buildings, archaeological sites, isolated finds and landscapes from this period (Beckley & Campbell 2013, 73).

How such a mass of data can be used to aid our understanding of the process of industrialisation has been the subject of study by industrial archaeologists since the 1990s (Palmer, Nevell & Sissons 2012, 6-7). The central approach used in this study is the 'Manchester Methodology', a way of processing large amounts of data in the search for meaningful patterns. This approach, which uses meta-data, has the potential to significantly advance our understanding of the process of industrialisation within the city of Chester, without the need for fresh and costly fieldwork.

The 'Manchester Methodology' was developed in the late 1990s and early 2000s in the Manchester city region as a modelling tool to aid understanding of the rate at which the new industrial-period monument types were introduced into any given area, their relationship to the contemporary social structures, and their impact on local communities (Nevell & Walker 2004). Two adjacent Pennine parishes, Ashton-under-Lyne and Mottram-in-Longdendale (the old 'panhandle' of the historic county of Cheshire), were chosen for the pilot study area and a broad date range for the project established, from 1348 to 1870. The rate of archaeological change in these two parishes was studied through the temporal occurrence of sites as defined in the *Thesaurus of Archaeological Monument Types* (first published by RCHM (E) in 1995, developed and used by Historic England and now in use for categorising Historic Environment Records). The decade during which each monument type was first attested was noted and a cumulative graph produced of the 101 monument types identified. The shape of the resultant graph was then studied to assess how and when the new monument types were introduced.

The analysis of this data was taken a step further by putting each of the monument types in their social context through assigning their ownership or authorship to one of three contemporary social groupings: lords, freeholders, or tenants. The types of site associated with each social group were then studied. By this means the chronology, nature and causes of the phenomenon of industrialisation could be traced archaeologically in the new hamlets,

villages and towns of the industrial transition in this part of the western Pennines. The validity of the method has been tested elsewhere in north-west England, as well as in northern Wales and southern Ireland (Nevell 2005). Unsurprisingly, each study produced slightly different results, yet in each case the method of charting the growth of new monument types was shown to work, whilst the different social backgrounds in each area produced radically different results – which themselves emphasised the localised nature of the social context of industrialisation.

This methodology has been applied by the current study to the archaeology of Chester (using meta-data for both below- and above-ground evidence taken from the Chester HER and urban characterisation project). The period limits have been taken as 1650 to 1900, in order to provide long-range data for the introduction of new monument types into the city. This also allows for comparison with other areas within the region where the Manchester Methodology has been used such as Manchester, Tameside and Warburton. The physical boundaries are those broadly of the city of Chester in 1900. The research involved desk-based work, supported by some archival research, consultation of the Cheshire Historic Environment Record and investigation of the Archaeological Data Service archive (based at the University of York) for relevant past fieldwork and grey literature reports from the city. It also involved a study of a number of key published sources; the *Victoria County History for Chester*, volume 5 parts 1 and 2; Ashmore 1982; Beckley & Campbell 2013; Hartwell, Hyde, Hubbard & Pevsner 2011; Nevell & George 2014; and Stobart 2004. The results of analysing the data are given below in section 4.

The Chester Urban Archaeological Database and Characterization Study

The current project also had access to the Chester Urban Archaeological Database Project and the Characterisation of Historic Chester's Built Environment Project, undertaken by Cheshire West and Chester Council (Chester West & Chester Council 2011). The analysis of these two databases has helped in interpreting the monuments data. The twin techniques of Historic Landscape Characterisation and Extensive Urban Survey were developed by English Heritage in the 1990s primarily as conservation tools (Rippon 2004). Allied to archaeological data, as in Chester, they provide a powerful landscape research tool that can be used to study the industrial transition and in particular the nature of urbanisation during this period of transition.

The Chester Urban Archaeological Database Project, funded by English Heritage, was an enhancement of the records within the Cheshire Historic Environment Record relating to the city undertaken between 2012 and 2014 (Beckley, Campbell & Collens 2014, 9). The project had three parts:

- The Urban Archaeological Database (UAD) which synthesised all available information on the archaeological resource from investigations, research projects, building surveys, published sources and maps spanning more than 200 years of research in Chester. The UAD formed a subset of the Cheshire Historic Environment Record.
- The Archaeological Characterisation, where period-based maps were synthesised into zones defined by their predominant archaeological character, together with the Research Framework, to inform future work in the city.

- The Chester Archaeological Plan, which was drawn up to inform the management of the archaeological resource.

The Characterisation of Historic Chester's Built Environment Project was completed in 2011 (Chester West & Chester Council 2011) and formed part of the evidence-base for the then emerging Local Plan, a planning document to aide in Chester's future development. The study assessed the character of the buildings, structures and spaces within Chester's main Conservation Areas and identified 16 General Areas, with 113 Sub-Areas. The authors noted that in many cases the boundaries of the built character assessment corresponded to those of the archaeological characterisation. This was largely due to surviving urban landscape elements such as the City Walls or the Roman street grid within the fortress, which were central to both studies (Beckley, Campbell & Collens 2014, 9).

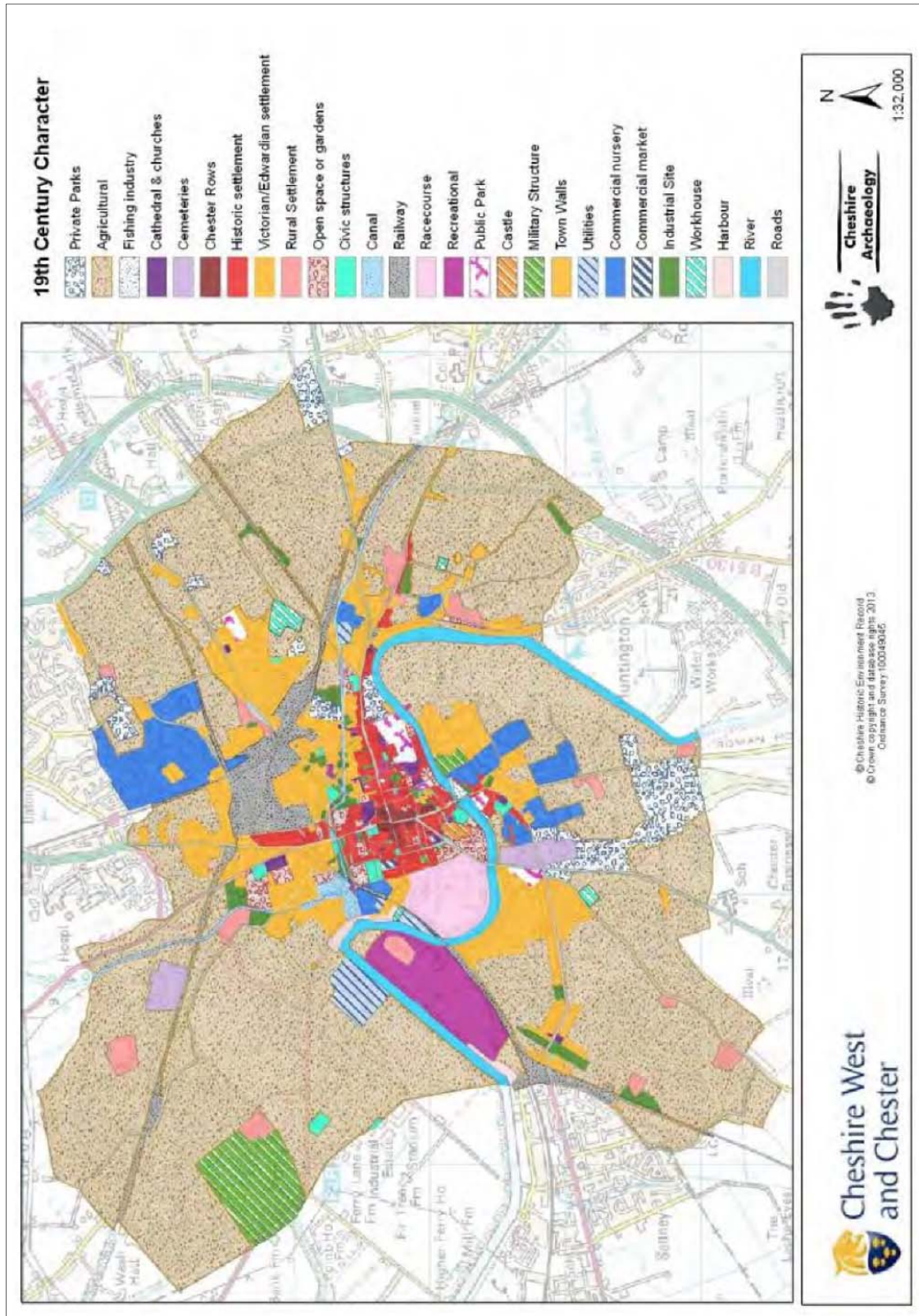


Fig 2: Characterisation of Historic Chester's Built Environment zones.

4. The Chester Monument Types List, 1650-1900

The Chester Monument Type List is detailed in Table 1. This is a catalogue of the earliest known dates for new monument types, as defined in the *Thesaurus of Monument Types* published by Historic England (formerly published by English Heritage and before that the Royal Commission on the Historical Monuments on England), introduced into the Chester area between 1650 and 1900. A total of 160 new monument types were identified as having been established in Chester during this period. These spanned 15 monument categories as follows:

Table 1: Chester Archaeological Monument Types, 1650 to 1900

Agriculture and Food Processing (6)

- 1650s tanning, The Bars, 156-8 Foregate
- 1715 sugar refinery, port
- 1784 steam mill, Chester Steam Mill
- 1789 distillery, Port
- 1789 maltings, Port
- c. 1875 greenhouses, Dee House, St John's

Civil (9)

- 1655 house of correction, north of walls
- 1696 Royal Mint, Chester Castle
- 1709 fire engine house, Bishop's Palace
- 1768 gateway, Eastgate
- 1793 county gaol, Chester Castle
- 1799 court house, Chester Castle
- 1856 fire station, potato market, Northgate Street
- 1869 town hall
- 1884 police station, County Constabulary HQ, Foregate Street

Commemorative (3)

- 1810 Graveyard, Holy Trinity
- 1848 municipal cemetery, Hough Green
- 1850 cemetery chaplain's house

Commercial (22)

- 1695 Exchange
- 1695 butchers' shambles, Northgate St
- c. 1737 Dock warehouse, New Crane Wharf
- c. 1743 sugar house
- 1744 linen hall, Northgate St
- 1749 goldsmiths' guild house, Goss St

1751 cotton hall, Manchester Hall, St Werburgh St
1760 cheese warehouse, Cheese Wharf
1792 bank, Chester Old Bank
1790 canal warehouse, Telford Warehouse
1827 Butter market house, Northgate St
1827 vegetable & fish market hall, Northgate St
1828 department clothing store, Browns, Holmes & Co, Eastgate St
1833 salt store, Victoria Wharf, Cow Lane Bridge
1840s corner retail shop, Egerton St/Milton St
1855 coal exchange, Black Diamond St
1859 railway hotel, Queens Hotel
1859 Corn Exchange, Eastgate St
1865 public house, The Town Crier, Station Road
1884 co-operative shop, Black Diamond Street
1885 tower brewery, Northgate Brewery
1900 Post Office Sorting Office, Station Road

Defence (6)

1689 gun platform, Chester Castle
1745 gun battery, Chester Castle
1810 barracks, Chester Castle
1830 armoury, Chester Castle
1859 militia barracks, Nuns Garden, Chester Castle
1869 drill hall, Volunteer Street

Domestic (16)

1655 alms houses, Nine Houses, Park Street
1656 timber-framed town house No.1 White Friars off Bridge St
1676 brick town house, Nos 16-24 Lower Bridge St
1741 house double depth, Groves, Watergate
1754 Georgian terraced houses, Abbey Square
1759 detached house, Forest House, Foregate Street
1780s court housing, between Watergate St & Commonhall St
1800 factory owner's house, Chester Lead Works
1814 villa house, Dee Hills, Boughton
1820s terraced housing, Seaville Street, Boughton
1830s semi-detached houses, Liverpool Road
1830s houses, back-to-back, south of Grosvenor Place
1830s houses, blind backs, south of Grosvenor Place
1860s terrace houses tunnel back, Albion Place
1860s terrace houses through to light, Volunteer Street
1889 tenement block, Parker's Buildings, Foregate St

Education (7)

1717 church day school, Blue Coat School, Upper Northgate St
1816 day school, National School, Upper Northgate St
1839 teacher-training college, Chester University, Parkgate Road

1845 mechanic's institute building, St John Street
1877 public library, St John St
1885 museum, Grosvenor Museums, Grosvenor St
1889 art gallery, No. 55 Bridge Street

Gardens, Parks & Urban Spaces (2)

1818 ornamental garden (Hamilton Park), Albion Hotel, east of Lower Bridge St
1865 public park, Grosvenor Park

Health & Welfare (4)

1758 Hospital, Chester Infirmary
1773 slipper baths, Chester infirmary
1849 public baths & wash house, Water Tower Baths, Northgate
1892 Isolation hospital, Sealand Rd

Industrial (27)

1650s brick clay pits, Cow Lane (Frodsham Street)
1650s brick clamp kiln, Cow Lane (Frodsham Street)
1650s fulling mill, Handbridge
1652 windmill, Hough Green
1665 smithy, Hough Green
1690s slipway, ship yard, Roodee
1698 Paper Mill, Handbridge
1700s felt hatting plank shop
1700s felt hatting dye shop
1700s quarry, The Dingle, Hough Green
1700 ropewalk, beneath western city wall (Pemberton's)
1701 Snuff Mill, Handbridge
1755 lime kiln, Hough Green
1757 pottery kiln, Paper Mill Lane, Handbridge
1781 tobacco pipe kiln, Roman gardens
1784 stationary steam engine & house, Boulton & Watt type, Chester Steam Mill
1789 cotton spinning mill, Water Tower
1800 lead shot tower, Chester Lead Works
1800 Roodee Iron Foundry
1800s Needle factory, Gorse Stacks
1812 rolling mill, Chester Lead Works
1850s railway engineering works, LNWR wagon works, City Road
1850s saw mill, Egerton Street
1860 tobacco factory, W T Davies & Sons, City Road, Canal Bridge
1864 shoe factory, William Collinson, City Road
1870s clothes factory, Browns, Eastgate
1874 engineering works, Hydraulic Engineering Co, Charles Street

Institutional (2)

1759 workhouse, Paradise Row, Roodee
1827 lunatic asylum, Chester Hospital, Liverpool Rd

Recreational (9)

- 1680s real tennis court, southern side of Foregate Street
- 1700 bowling green, Bowling Green Bank, Gorse Stacks
- 1773 theatre, New Theatre, Wool Hall, Northgate St
- 1777 assembly rooms, Talbot Inn, Eastgate St
- 1817 grandstand, Chester race course
- 1822 rackets court, Brewer's Arms, Foregate St
- 1840 boathouse, Royal Chester Rowing Club, Groves
- 1873 cricket pavilion, Boughton Hall
- 1890 tennis clubhouse, Wrexham Road

Religious, Ritual & Funerary (8)

- 1700 Presbyterian chapel, Trinity St
- 1703 Quaker meeting house, Frodsham St
- 1765 Methodist Chapel (Octagon), City Rd, Boughton
- 1777 Congregational chapel, Queen St
- 1799 Catholic chapel, Queen St
- 1871 Baptist chapel, Pepper St
- 1875 Catholic Church, St Werburgh, Grosvenor Park Road
- 1900 synagogue, Bolland Court, White Friars

Transport (24)

- c. 1700 wharf, Roodee
- 1706 flood bank, The Cop, Roodee
- 1736 River navigation cut, new channel
- 1737 quay, Crane Street
- 1737 harbour master's house, New Crane Wharf
- 1760s new street, Paradise Row & Crane Street
- 1770s coaching inn, Pied Bull, Northgate
- 1779 canal, Chester Canal
- 1779 tidal basin
- 1779 canal lock, Northgate Staircase
- c. 1789 dock basin, Crane Street
- 1798 canal dry dock, Tower Wharf
- 1800 lock-keeper's cottage, Chester Wharf
- 1833 canal roving bridge, Tower Wharf
- 1832 Single arch road bridge, stone, Grosvenor Bridge
- 1840 railway, Chester & Crewe Railway
- 1841 railway goods yard
- 1847 railway viaduct, Dee Viaduct
- 1848 railway passenger station building, Chester Station
- 1852 suspension bridge, Queen's Park
- 1875 railway goods shed/warehouse, Chester Northgate Station
- 1875 railway signal box, Chester Station
- 1879 public tramway
- 1890 railway footbridge, Chester Station

Utilities (13)

1692 Water tower, Bridgegate

1807 rainwater culvert, Watergate Street

1819 gas works, Cuppin Street

1830 gas street lighting

1847 water closet, Northgate St

1847 sewer drain, Boughton, Northgate St & Watergate St

1849 washhouse, north of Bonewaldersthorne's tower, west of bridge of Sighs

1853 water pumping station, Chester Water Works, Boughton

c. 1856 gas holder? Railway station gas works

1860s filter beds, Chester Water Works, Boughton

1875 Sewage works, Sealand Road

1882 telephone exchange,

1896 electric power station, New Crane Street

1896 electric street lamp

Years	Decade Total	Cumulative total
1650s	8	8
1660s	1	9
1670s	1	10
1680s	2	12
1690s	6	18
1700s	11	29
1710s	2	31
1720s	0	31
1730s	4	35
1740s	5	40
1750s	7	47
1760s	4	51
1770s	8	59
1780s	8	67
1790s	6	73
1800s	6	79
1810s	8	87
1820s	6	93
1830s	9	102
1840s	13	115
1850s	11	126
1860s	9	135
1870s	11	146
1880s	7	153
1890s	7	160

Table 2: Monument Types introduced in to Chester by decade and number

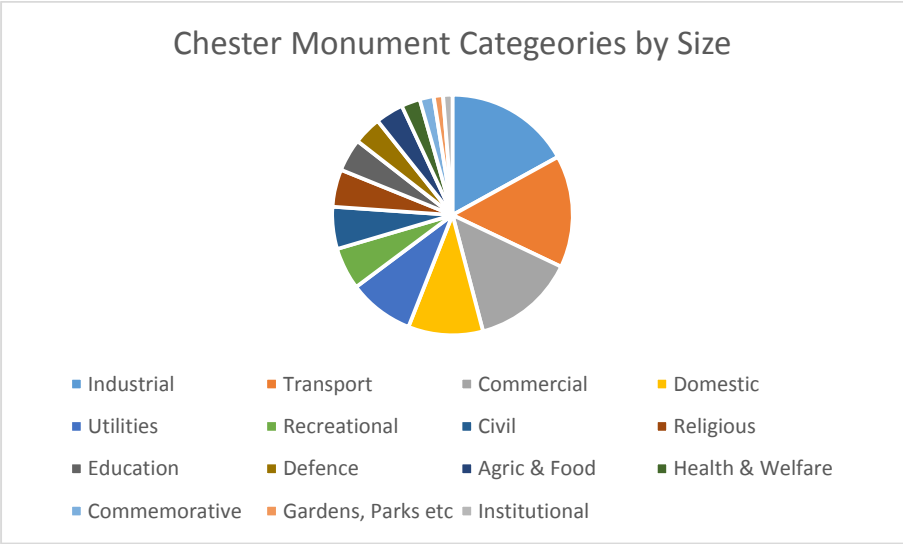


Fig 3: Chester monument categories by size with industrial sites the largest (27) and institutional the smallest (2).

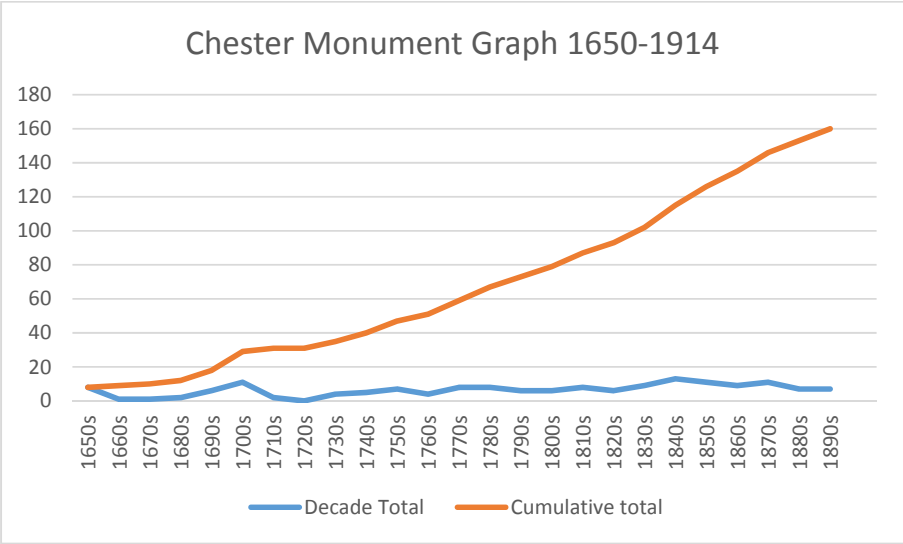


Fig 4: New monuments types introduced into Chester, 1650 to 1900.

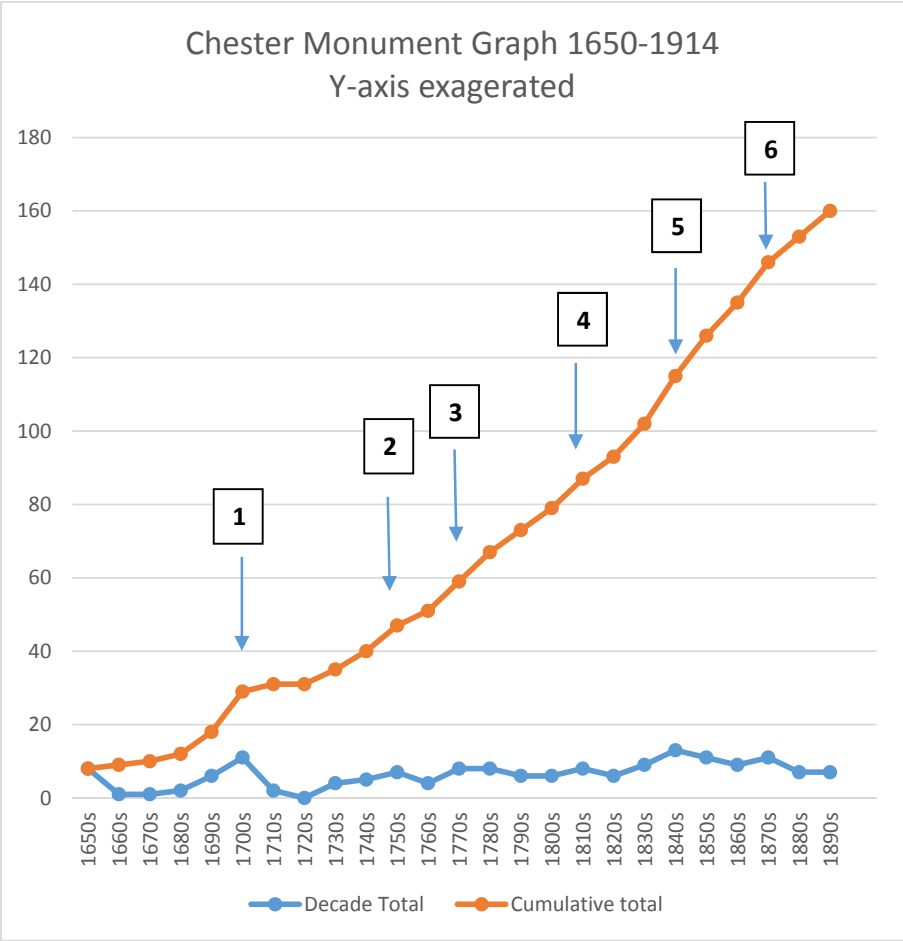


Fig 5: New monuments types introduced into Chester, 1650 to 1900 with the Y-axis exaggerated to show key peaks by decade (arrowed and numbered).

5. Chester and Industrialisation: Making Sense of the Archaeological Data

5.1 Thematic & Chronological Distribution of New Monument Types

Analysis of the archaeological database and documentary record for the city of Chester during the period 1650 to 1900 shows a distinct archaeological profile. The landscape of the expanding city was characterised by 160 new monument types spread across 15 categories (Figs 3 to 5). Five of these categories contained more than ten new monument types: industrial (27), transport (24), commercial (22), domestic (16) and utilities (13). The remaining ten categories had nine or fewer new monument types: recreational (9); civil (9); religious (8); education (7); defence (6); agriculture and food processing (6); health and welfare (4); commemorative (3); gardens and parks (2) and institutional sites (2). Since it seems unlikely that future research will substantially alter the range, number and date of these figures, a detailed analysis of this evidence is now possible.

The focus of these new monument types was in five categories: commercial, domestic, industry, transport and utilities. These groupings appear to reflect the focus of innovation in the Chester landscape during the 18th and 19th centuries. Bearing in mind contemporary comments about the lack of industry in Chester during this period (Wardle & Bentham 1814; White 1860), it might be a surprise to see the industrial category of new monument types heading this list, but it must be remembered that this study is looking at innovation, not the largest number of individual monument types. Nevertheless, this is an interesting feature of the Chester data and the implications of this observation are discussed more fully below.

The chronological spread of these new monument types is shown on a cumulative graph by decade (Figs 4 to 5). The graph advances in a series of S-shaped curves, with periods of low introduction of new monument types and peaks in establishment. This indicates that the introduction of new monument types was not a steady, even, process, but rather came in waves culminating in a peak period of innovation. Such S-shaped (sigmoidal or logistic) growth curves are found in many cases of population growth and typically can be divided into four main phases:

- The adaptive phase; in which change is slow.
- The expansionary phase; a period of rapid growth with positive feedback.
- The consolidatory phase; in which growth is less rapid and negative feedback becomes more common.
- Maturity; when growth slows considerably or stops.

The study of growth curves is dominated by ecological theory (Allaby 1996; Colinvaux 1993; Smith & Smith 1998) and if we accepted some of these insights are valid in an archaeological context then it can be concluded that the graph of new archaeological type sites from the City of Chester is typical of a population where investment in developing new sites (population

members) is high but not consistent and that ultimately the total range and chronological spread of such sites is restricted by some form of complex constraint.

Thus, analysis of the chronological spread of new monument types introduced into Chester shows six peaks in innovation (Fig 5, points 1 to 6). These correspond to the decades 1700s, 1750s, 1770s, 1810s, 1840s and 1870s. Some of this accords with the historical data on the development of the urban fabric and economy of the city, such as the economic boost given to Chester by the opening of the new navigation in the 1730s, the peak in the 1770s might be associated with the building of the Chester Canal, and the introduction of the railway network in the 1840s might account for the peak in this decade. However, some peak periods of innovation do not obviously match such well-documented periods of innovation, such as the peaks in the 1700s, 1810s and 1870s and therefore would be worth considering further. Thus, the upward trend of new monument types in the late 17th century that culminates in the peak in the 1700s may reflect the rebuilding of the city after the ravages of the civil war siege of the 1640s. The peak in the 1870s comes at the end of several decades of high levels of innovation in new monument types and may reflect further development of the economy and urban landscape of the city after the arrival of the railways. The cause of the peak in the 1810s is less obvious but may reflect the opening of the Ellesmere branch of the Chester Canal in the 1790s or the growth of industry in the Newtown area. Of equal interest are two low points: the 1720s and 1760s when innovation appears to have been very low. The archaeological and historical evidence from the period 1710 to 1730 does suggest a period of stagnation in the economy of the city, at least in terms of establishing new types of activity and this coincided with increasing problems with the silting of the Dee Estuary (Reid 20110, although other causes may also be at work in dampening new activity.

It should be noted that the current study deals with the introduction of new monument types into the archaeological record, not with the absolute numbers for the most numerous of these new monument types. Documentary evidence and the evidence from the Characterisation of Historic Chester's Built Environment Project (Cheshire West & Chester Council 2011) indicates that the most common of these new monument types in number were the several varieties of workers' housing and fixed commercial premises, all at their peak in the mid- to late-19th century. In terms of industrial premises, craft workshops and engineering works were the most common monument types, peaking in the mid-19th century. The archaeological evidence for new monument types thus confirms the evidence that the mid-19th century was the most economically and socially dynamic period in Chester's development in the years between 1650 and 1900. It also provides for the first time an archaeological perspective and the potential for new insights on changes which have been explored in detailed by historians.

5.2 The Spatial Distribution of the New Monument Types

The archaeological and historical data from the City of Chester for the period 1650 to 1900 is so detailed that it is possible to locate with some confidence within the urban landscape nearly all of the first examples of new monument types introduced during this period. This allows an analysis of the spatial distribution of the new monument types, both as a single group and by shorter periods. For the present study blocks of 50 years were chosen for the shorter periods as being the time frames most likely to show revealing distribution patterns.

The overall distribution of the new monument types within the city broadly reflects the urban limits of Chester during the period 1650 to 1900 (Figs 6 & 7). Initial urban development lay within the walled city and the historic suburbs, before spreading north-westwards along the River Dee, northwards beyond Northgate along Liverpool Road, eastwards beyond Foregate towards Boughton, and north-eastwards through the Gorse Stacks and Newtown areas. Though the canalisation of the river by the River Dee Company led to the drainage of a large area of flood plain to the west of the city, extensive exploitation of this drained area was not undertaken until the end of the 19th century and 20th century. The distribution of new monument types is not even across this urban area, with clusters of activity within the walls of the city, to the north-west of the city walls in the old port area, in the eastern suburbs along Foregate Street, in the Newtown and Boughton areas between the canal and the railway station, and on the eastern and western fringes of the Handbridge suburb, south of the River Dee. Further patterns in this distribution can be seen when the data is studied chronologically.

The distribution of 18 new monument types for the period 1650 to 1699 (Fig 8) reflects at least in part the rebuilding of the city after the Civil War siege of the 1640s. Brick making is first recorded in this period on Hough Green from the 1650s and to north-east of the walls around Frodsham Street in the same decade. The renovation of Chester castle saw a new gun platform and, briefly, at the end of the century a Royal mint. New civic buildings included the New Exchange and butchers' shambles both in Northgate. The rebuilding of housing stock is reflected in new alms houses and new timber-framed properties. Industrial sites are the most common though in this period, with seven new sites known. More traditional industries such as tanning continued in the Foregate area and a new slipway in the Old Port area. There are also signs that Handbridge, on the southern bank of the river Dee, was beginning to emerge as a proto-industrial area. A fulling mill and a paper mill are recorded at the Dee Mills and there was a smithy and windmill on Hough Green.

The period 1700 to 1749 (Fig 9) saw 22 new monument types established, across 10 monument categories, with industry (five), transport (five) and commercial (four) leading the new sites. The second two decades of the period are short of new type sites, after a peak in the 1700s. The Cop flood defences were built at the beginning of the century, perhaps reflecting the problems with the River Dee channel silting (Reid 2011). Innovation picks up from the 1730s when the new river channel is cut and in the following decade the redevelopment of the Old Port begins with the dock warehouse, a new quay and harbour master's house (Nevell 2015, 67-8). The Old Port activity also included sugar refining, whilst within the walls of the city a linen hall is established, new guild houses and a fire engine house at Bishop's Palace. The installation of a new gun battery at Chester Castle in 1745 seems to be a response to the Jacobite rebellion of that year. New styles of Georgian housing first appear in Watergate, a Blue Coat School is established in Northgate and non-conformist chapels are built for the first time. Small scale industry such as felt hatting was also thriving in the city, whilst Hough Green on the southern side of the river developed further with new quarries and to the east in Handbridge a new snuff mill was added to the Dee Mills.

The period 1750 to 1799 (Fig 10) saw a significant acceleration in expansion, with 33 new monument types focussing upon transport (seven new sites) and industry (five new site). The building of the Chester Canal led to commercial development around Tower Wharf with new canal warehouses and bridges, and the establishment of the first of several cotton spinning

mills (Pigot 1822-3, 3). Though not completed in this period the canal had a link to the River Dee and the old port. A cheese warehouse, distillery and maltings are recorded in the Old Port area as well as lime kilns, by the 1770s, though lime kilns are recorded even earlier at Hough Green in the 1750s. Indeed, lime kilns are noted as late as the 1820s at the northern end of Dee Bridge. Handbridge continued its development as a small industrial suburb with new industrial sites such as a pottery kiln established in the 1750s, as well as the lime kilns further to the west. The later 18th century saw the beginning of the industrial suburb of Newtown on the Broughton border. This is shown by the establishment of a steam-powered grain mill and a lead works along the new canal corridor, as well as a second cotton mill. There was further new building within the city walls including new commercial sites such as a bank, and civil sites around the castle in form of the rebuilt law courts and gaol. A workhouse was established at the Old Port. This was also the period when the first court housing development is recorded, off Watergate, a sign of growing overcrowding within the old city walls, in contrast to the new streets, Georgian terraces, and detached houses of the mid-18th century.

The first half of the 19th century (1800 to 1849; Fig 11) saw 42 new monument types established with transport (seven new sites), domestic (six), utilities (six) and commercial monument categories (five) leading the innovation. Transport remained the largest new area of innovation, due to further development of the canal basin and the arrival of the railway network. The upsurge in domestic and utility sites reflect the urban and population growth of the city and the problems that developed around overcrowding and sanitation. There were many new domestic house types, especially in the southern part of the city off Lower Bridge Street and along Foregate towards Newtown. The greater number of commercial sites compared to new industrial sites seems to reflect a swing back towards Chester's more traditional economic base. Other noteworthy new monument types included new civil sites and in Northgate schools and markets. The building of additional barracks at Chester Castle 1810 is linked to the Napoleonic wars period.

The last period of the current study, 1850 to 1900 (Fig 12), saw 45 new monument types established, the leading categories being commercial sites (seven) and utilities (seven sites). Industry had six new type sites and transport five new type sites. The continued focus on utility sites matches the City's attempts to provide clean drinking water and sewage disposal systems across Chester and the introduction of gas and electricity. New commercial sites continued to out-number new industrial manufacturing type sites. That said, Newtown developed further as the chief industrial manufacturing suburb after 1850 with the arrival of railway engineering. Elsewhere, there were new civil, domestic, educational and religious sites (three each), with new chapel types around Bridge Street and new forms of housing east of Lower Bridge Street. Recreational sites also saw a further expansion (two sites) to add to the three new sites in the early 19th century and the two in the late 18th century.

5.3 Land Holding and the Distribution of New Monument Types

A key feature of the Manchester Methodology is the linking of the introduction of new monument types with the contemporary social structure for a given area, the argument being that contemporary social structures influenced the growth and distribution of new monument types. Chester's contemporary social structure during 18th and 19th centuries was complex. Partnering the new monument types with that structure proved complex and

unsatisfactory, with the data unclear on who was responsible for promoting many of these new types of sites. This is a problem seen elsewhere in the application of the methodology, specifically in Ireland (Nevell 2005). Therefore, a different approach was sought to assess the impact of contemporary social structures on the introduction of new monument types (Nevell 2005, 92-93).

It was decided to compare the 19th century landowner and landholding patterns with the distribution of monument types to see if there was any obvious patterns in the data. The 1840s tithe awards were chosen as a quick way of mapping landholding in and around the city. The only drawback with this evidence is that there are four gaps; for the Roodee area, the Northgate area, the eastern Foregate and the river frontage in Broughton. The Roodee area as a piece of reclaimed land managed by the city was ineligible for tithing. The remaining gaps could be filled by documentary research in the Cheshire archives, using such evidence as the city rates and taxes (where they survive) for instance, although this large piece of work was beyond the scope and timescale of the present project. Despite these holes in the data it was possible to compare landownership and monument patterns.

Landownership across the city core (within the walls, beyond the Northgate and in the Foregate area) was spread, unsurprisingly, across hundreds of individuals and thousands of tenants (Fig 13). Beyond this core, the landowning pattern around the city, as recorded in the 1840s, was dominated by a small group of owners who held large blocks of land: most notably Chester Cathedral, the Duke of Westminster, the Earl of Kilmorey, Lord Crewe, Lord Howe and the River Dee Company. Historical research has shown that this landholding pattern was little altered from the mid-18th century (Herson 1996a; Fig 13) and therefore likely to have a bearing on the introduction of new monument types and the way in which the city's urban landscape developed during the period under study.

The areas of densest new monument types lay in those zones with high areas of multiple ownership and multiple tenancies. This is not surprising as such areas offered a large amount of opportunity for innovation through weak local governance. Of particular note are the areas around the Old Port, the southern third of the walled city, the Foregate and the Newtown area (Fig 13). The distribution of industry and commerce in Chester as recorded in the 1780s trade directory also reflects this pattern (Figs 14 & 15), with the greatest concentration of small-scale manufacturing along Bridge Street and Eastgate and to the east of the walls along the Foregate. Larger-scale manufacturing began around the Old Port and along the Chester Canal in the Foregate/Broughton area during the late 18th century before expanding into the Newtown area during the 19th century (Figs 11-12 & 16). By the mid-19th century most new industrial monument types were occurring in the Newtown area and this is reflected in the distribution of larger-scale manufacturing in this area during the late 19th century (Fig 16). It is noticeable that the land purchased by the canal and railway companies on the northern side of the Newtown area became the focus for engineering manufacture in the mid-19th century as well as innovations in transport and distribution.

The present study supports the observation by historians (Herson 1996a, Lewis & Thacker 2003), and the results of the urban characterisation study, that those large areas held by a few landowners around the walled city core and the Foregate area saw limited development, in terms of monument categories. Such development was focussed primarily upon domestic

monument types. New areas of housing in these areas can be seen to the north of the city along Liverpool Road and Parkgate Road (mainly late Georgian), to the east in Boughton (late Georgian and Victorian), and south of the river in Handbridge (primarily late Georgian), Curzon Park (late Georgian and Victorian) and Queens Park (late Victorian). The majority of these new domestic buildings date from the 19th century and cover a limited range of monument types, usually though not exclusively variants of middleclass housing. In contrast, large areas of workers' housing, along with the associated new monument types, were found in areas of multiple landownership, such as Newtown (the Station Gateway area of the characterisation study), Hoole, and the area along Garden Lane, to the north of the Old Port and west of Liverpool Road. Some surviving infill development can also still be seen in the Bridgegate area of the city centre and in Handbridge.

5.4 Comparative Material

Chester's new monument and category profiles (Figs 3 to 5) compare favourably in number and spread to Manchester, which has 138 new monument types spread across 15 categories for the period 1650 to 1900 (these are slightly adjusted figures to those I published in 2003 in order to match the chronological spread of the two cities; Nevell 2003, 28-9). Chester has more monument types but spread across one fewer category. The top four monument categories are the same for each city, though the size order is slightly different; industry, transport, domestic and commercial categories in descending order for Manchester (Fig 17) as opposed to industry, transport, commercial and domestic categories for Chester (Fig 3). The real difference came in the volume of individual monument types, particularly those associated with industry. Manchester has around 172 textile mill sites, for instance (Nevell 2008, 102), more than 50 surviving large-scale commercial and transport warehouses (Taylor, Cooper & Barnwell 2002, 54-55), and around 21 glass making factory sites (Champness & Nevell 2003; Miller 2007, 14-15). In contrast Chester has just two textile mills, a handful of purpose-built transport and commercial warehouses and no glass making sites that we know of.

Chester's strength in terms of numbers of particular monument types lay in its commercial premises, domestic dwellings and agricultural processing sites such as tanyards and tan pits. These types of sites have tended to mask the wider role of industry within the city during the 18th and 19th centuries. Thus, the largest single industrial monument type in terms of numbers was the engineering works or iron foundry, with nine sites known in Chester. Most of these were concentrated in the industrial suburb of Newtown around the railway station, but there were examples along the canal westwards towards the Gorse Stacks area. Even then, this number was just a small fraction of the 63 engineering sites known from central Manchester during the 19th century.

Comparison with the Tameside evidence (Fig 18), a mixed rural and urban area dominated by nine industrial towns strung along two rivers (the Etherow and Tame), is more marked. This area has 15 monument categories with 101 new monument types (Nevell 2003, 19). Here the largest new monument categories were domestic, industrial, transport and commercial sites in descending order (Nevell & Walker 1999). The single largest industrial type site was the textile mill, with 274 examples known, followed by 273 farmstead sites, figures which demonstrate the mixed rural and urban landscape of the area.

Finally, a clearer contrast can be made with the rural landscape of Warburton, a small township in northern Cheshire owned by a single family in the medieval and post-medieval periods. This landscape demonstrates the limited impact of industrialisation on a traditional rural community with just 12 monument categories covering 44 new monument types (Nevell 2003, 23; Fig 19). The top four new monument types were agricultural, domestic, transport and religious sites.

Thus, Chester's broad development during this period has more in common with industrial Manchester, than the mixed rural and urbanising landscape of Tameside and the traditional rural community of Warburton. Yet its character was that of a commercial regional centre rather than a manufacturing town. Indeed, it fits into a model of regional market town industrial development described by Trinder (Trinder 2002) and supported by the detailed historical work of Stobart (Stobart 2004). Trinder argued that 'in approaching the history of a market town it is necessary to appreciate those elements that were common to most towns, and those that gave a distinctive character to its economy, whether they were 'manufactures' of the 18th century, or consumer goods factories of the late Victorian period' (Trinder 2002, 76). He then set out a three-stage model of regional market town development beginning with a pre-1750 local or regional centre with a complex central urban zone in terms of building types and social uses, a core of occupations servicing local needs, a prevalence of agricultural processing industries, some specialist manufactures for national markets, and a local building materials sector. In the second stage (1750 to 1850) the market centre developed through transport innovations, the development of food processing, the emergence of mechanical engineering, the importation of building materials, and an increased regulation of market activities. The developed third stage, covering the period 1850 to 1900, saw the establishment of consumer-goods industries serving regional and national markets, the persistence of more traditional small-scale manufacturing, and the proliferation of public utilities. Chester, with its abundance of below-ground archaeological evidence and above-ground historic building fabric is ideally placed to test such an interpretation, whilst the application of the Manchester Methodology allows the patterning in the urban landscape to become apparent and quantifiable over time. Thus, Trinder's study of the spatial and social archaeology of 18th and 19th century market towns (Trinder 2002) allows us to explore what was common place and what was new in the context of social archaeology and industrialisation amongst the lesser market towns of this period such as Chester. Chartering and describing the progress of Chester's distinctive industrialisation character archaeologically is now possible. Explaining the underlying causes, however, remains harder.

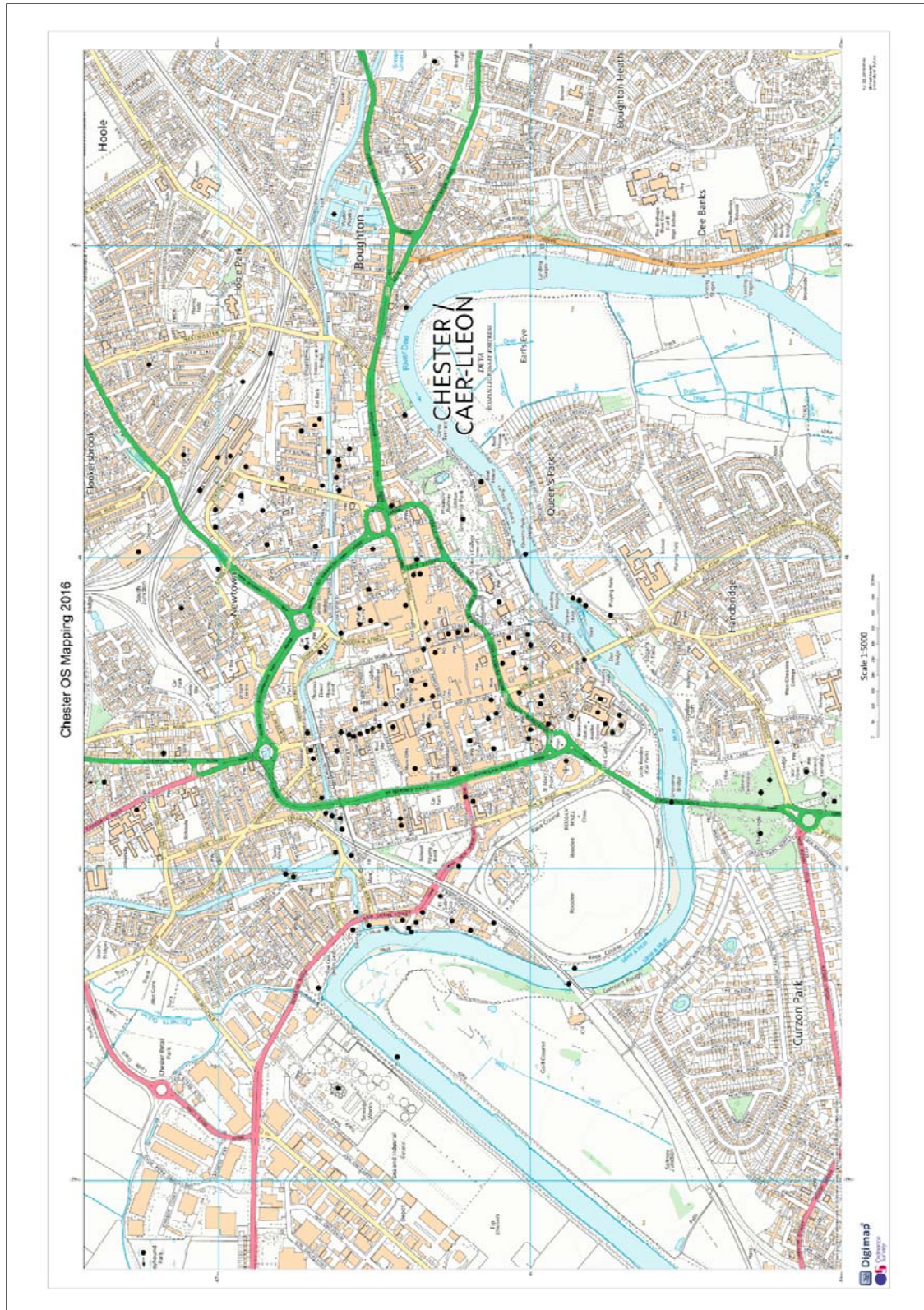


Fig 6 The distribution of new monument types in the city of Chester, 1650 to 1900.

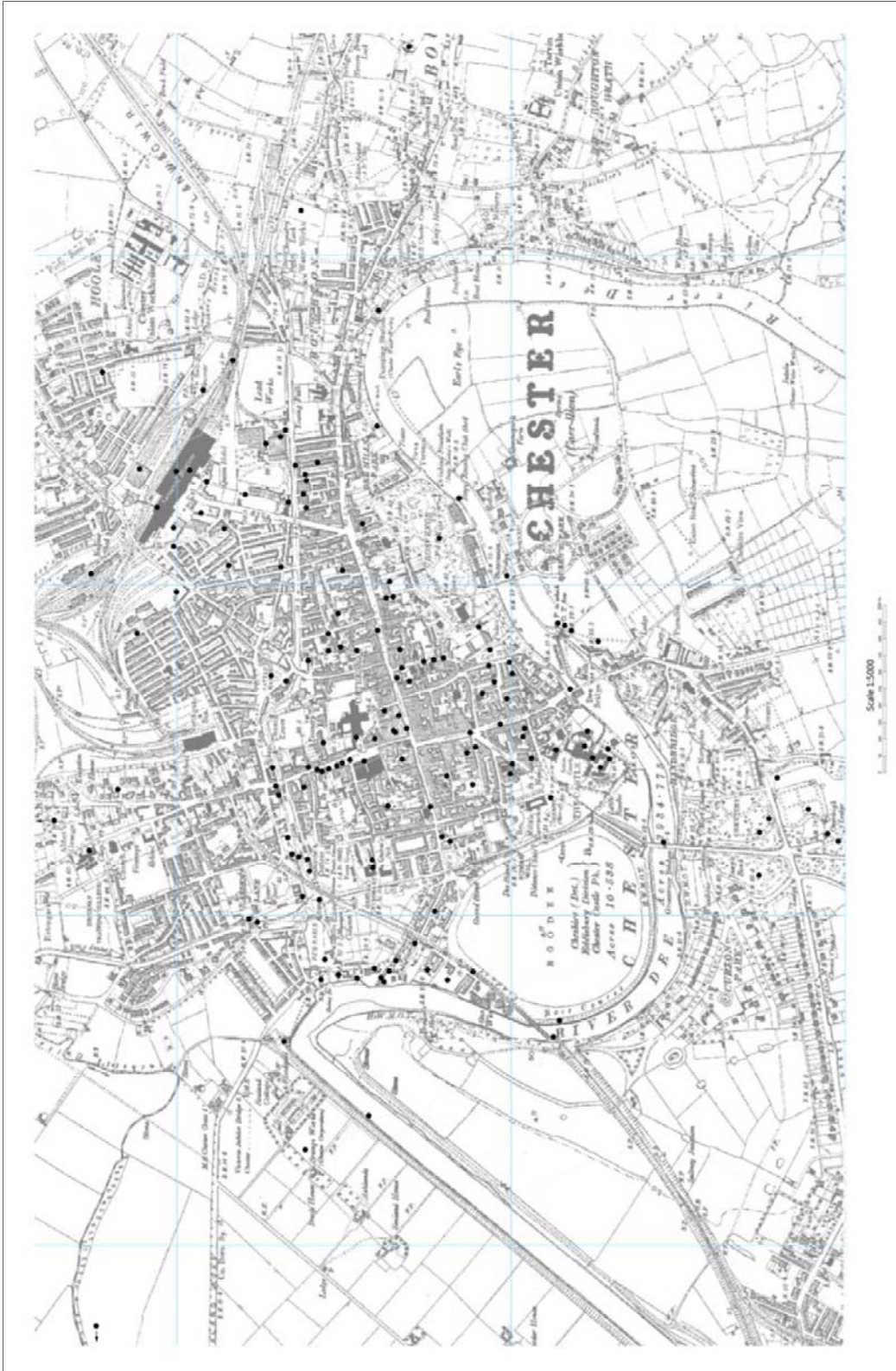


Fig 7 The distribution of new monument types in the city of Chester, 1650 to 1900 compared to the OS mapping from the 1890s.

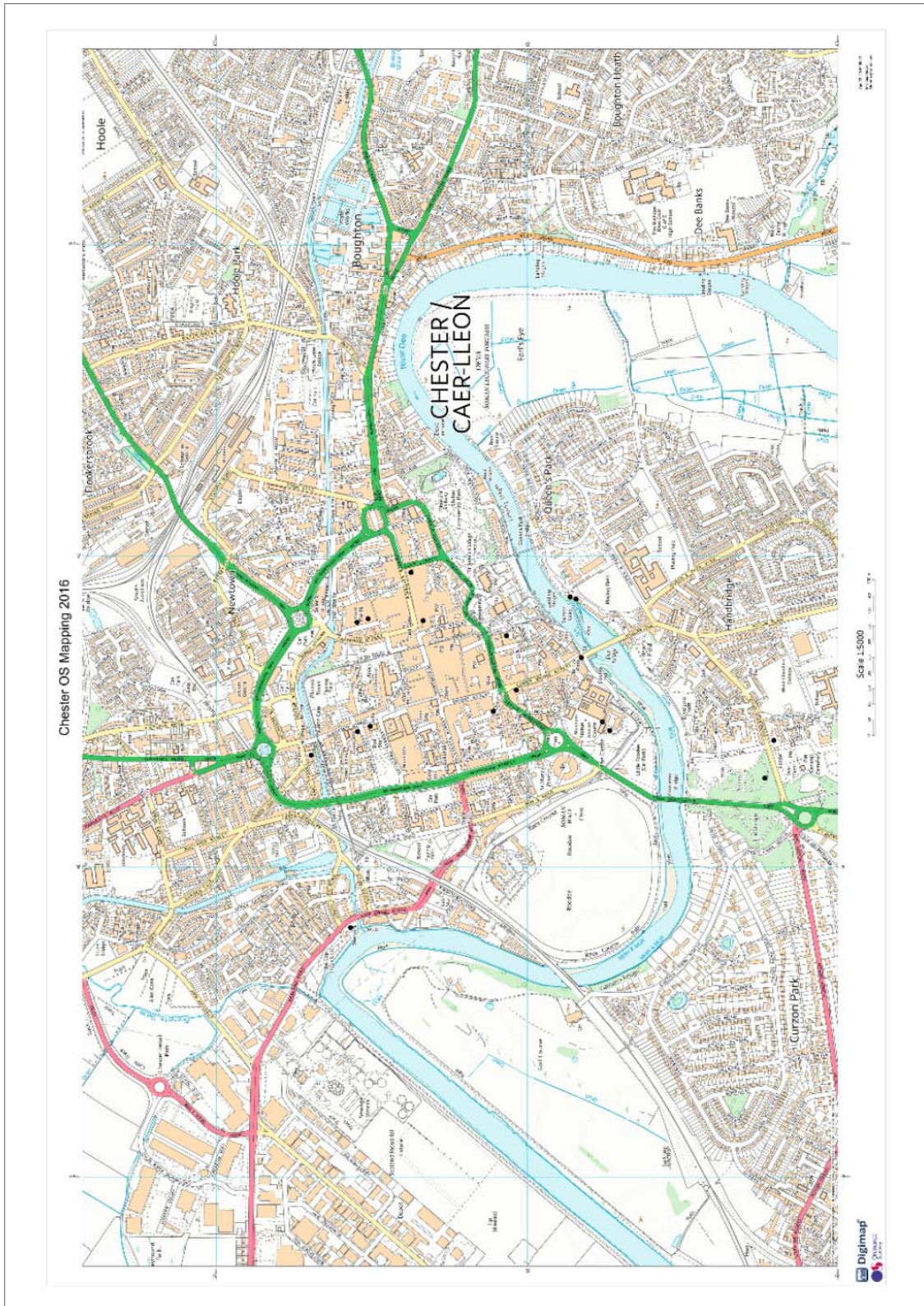


Fig 8: The geographical distribution of new monument types in Chester, 1650 to 1699.

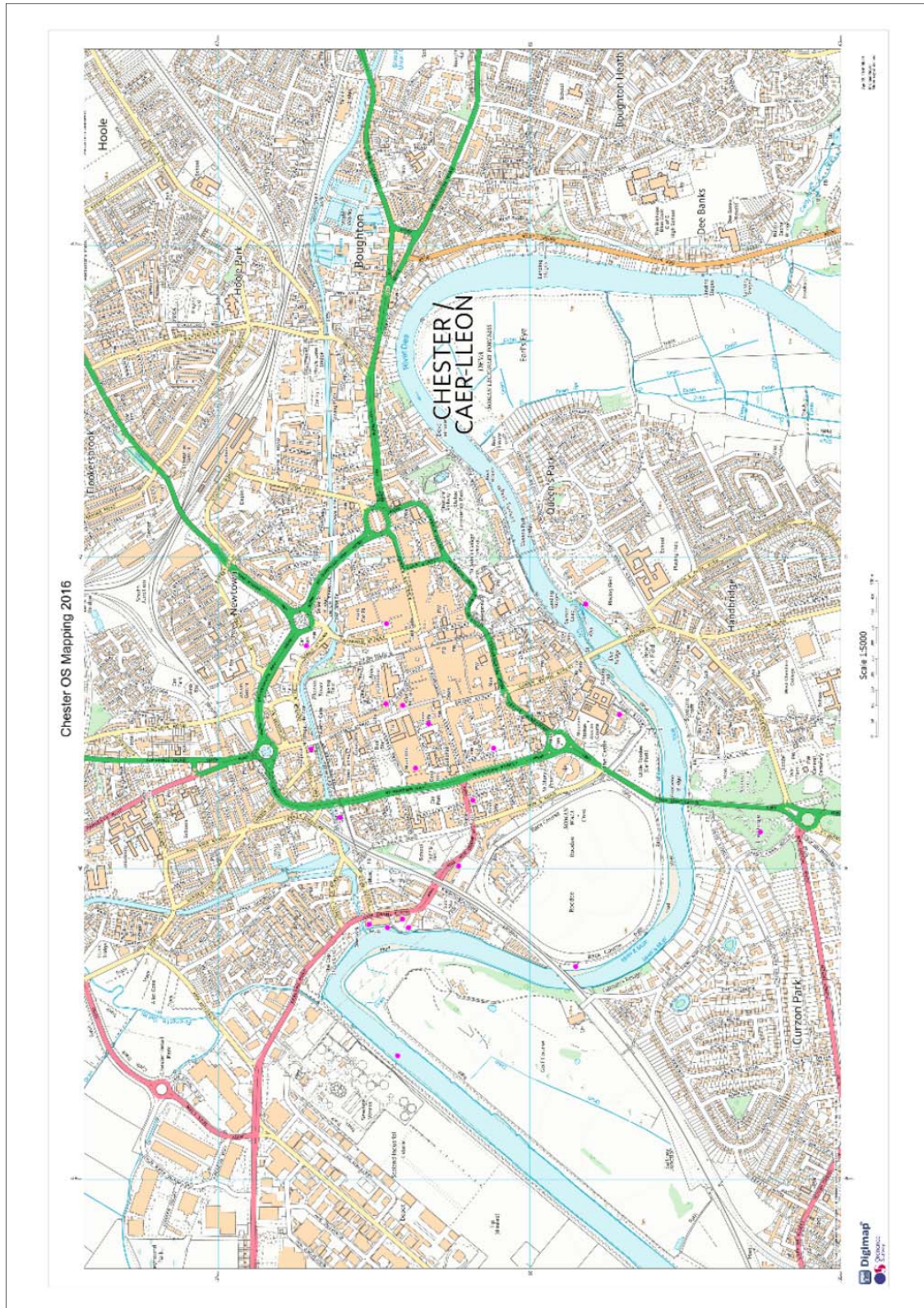


Fig 9: The geographical distribution of new monument types in Chester, 1700-1749

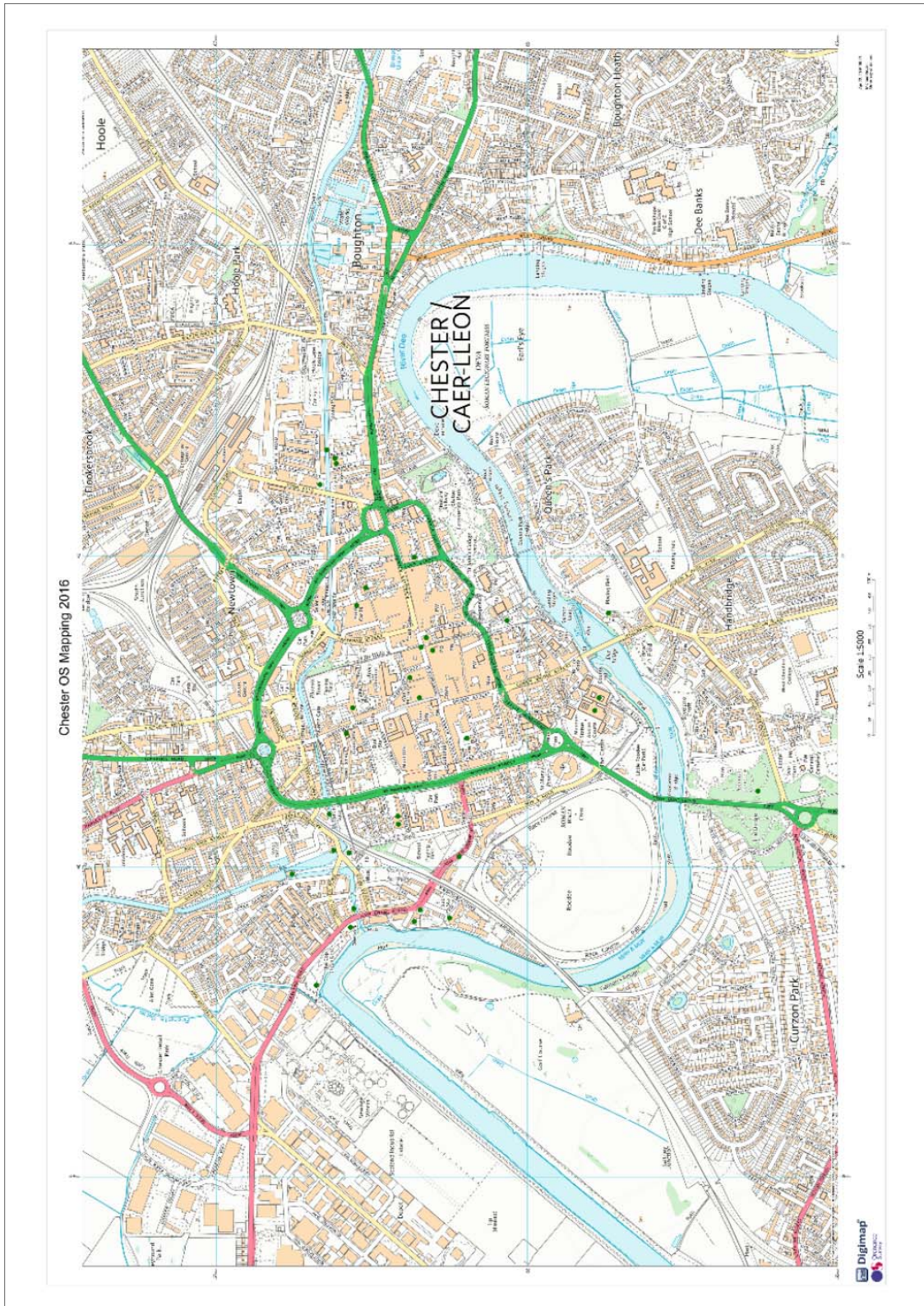


Fig 10: The geographical distribution of new monument types in Chester, 1750-1799.

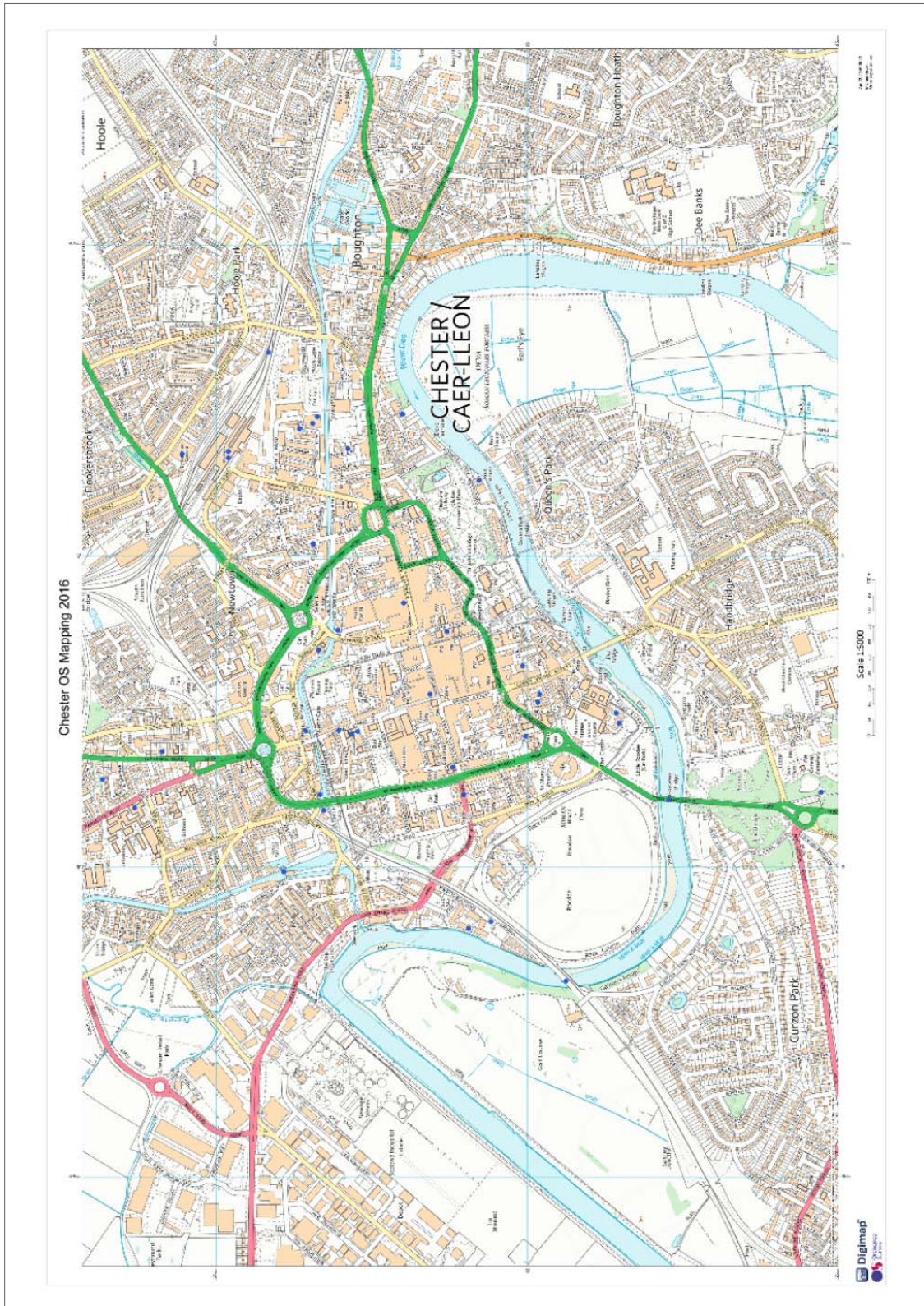


Fig 11: The geographical distribution of new monument types in Chester, 1800-1849.

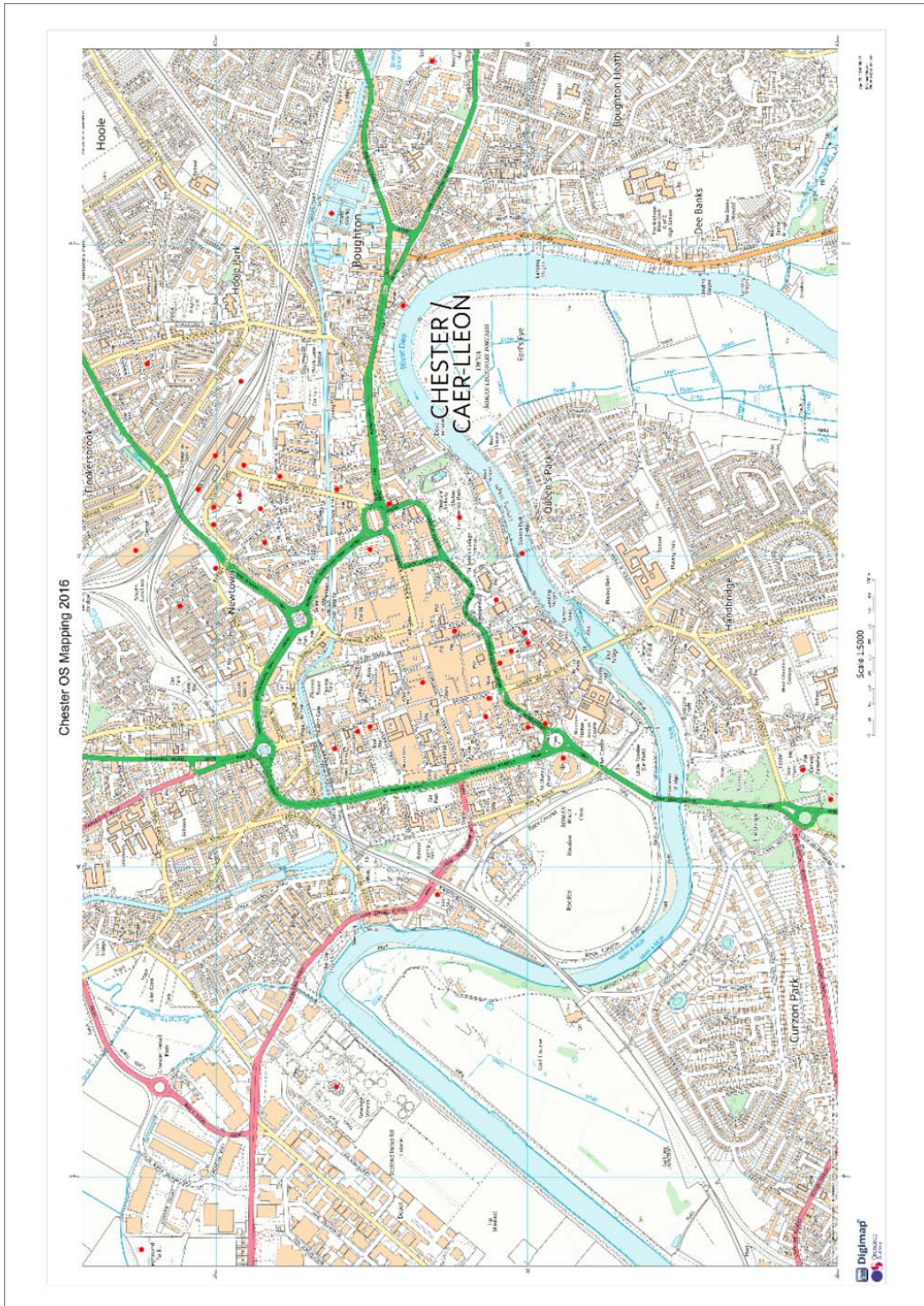


Fig 12: The geographical distribution of new monument types in Chester, 1850-1900.

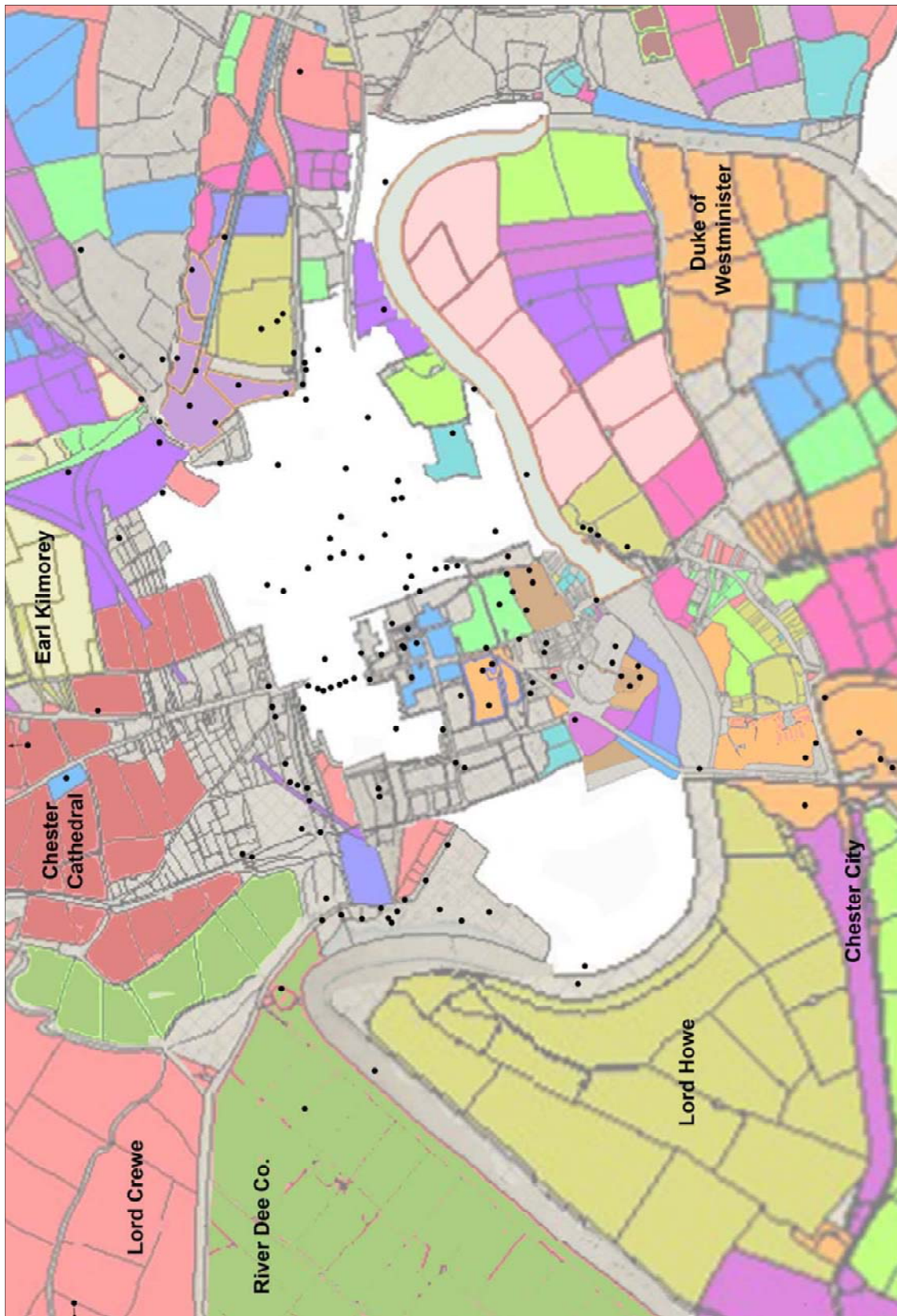


Fig 13: Landownership in Chester in the 1840s, plotted against new monument type distribution: Source 1840s tithe data.

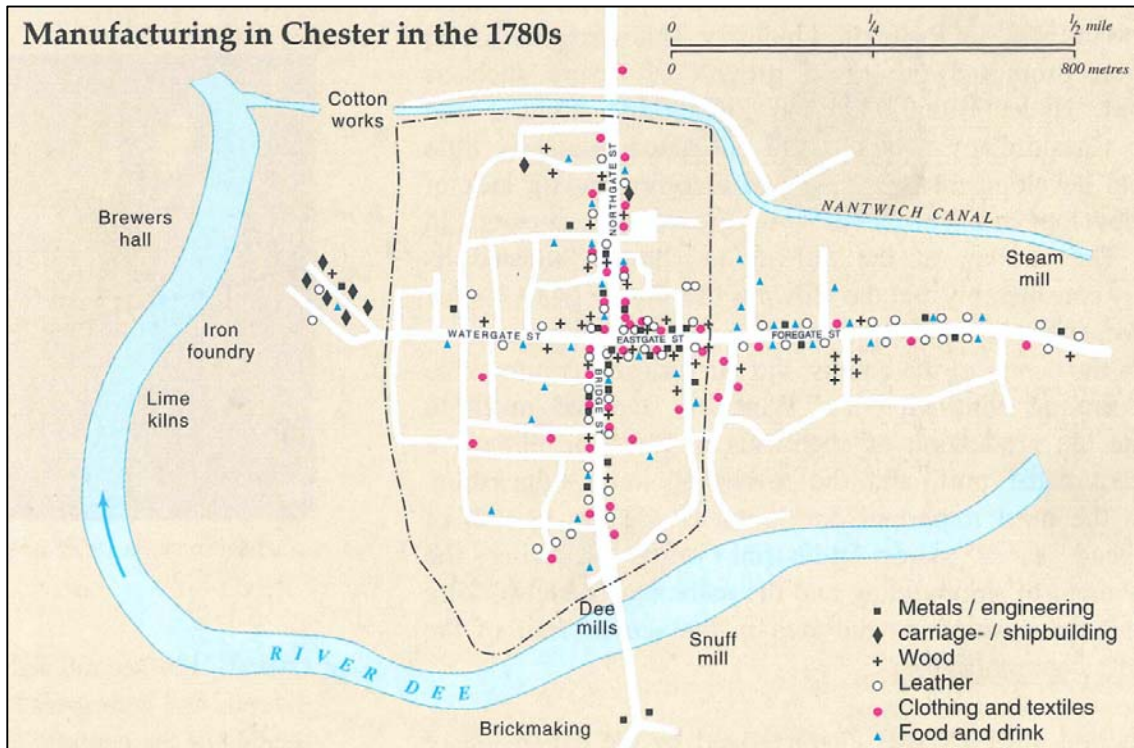


Fig 14: Manufacturing in Chester during the 1780s. Source: Phillips & Phillips 2002. Based upon directory evidence.

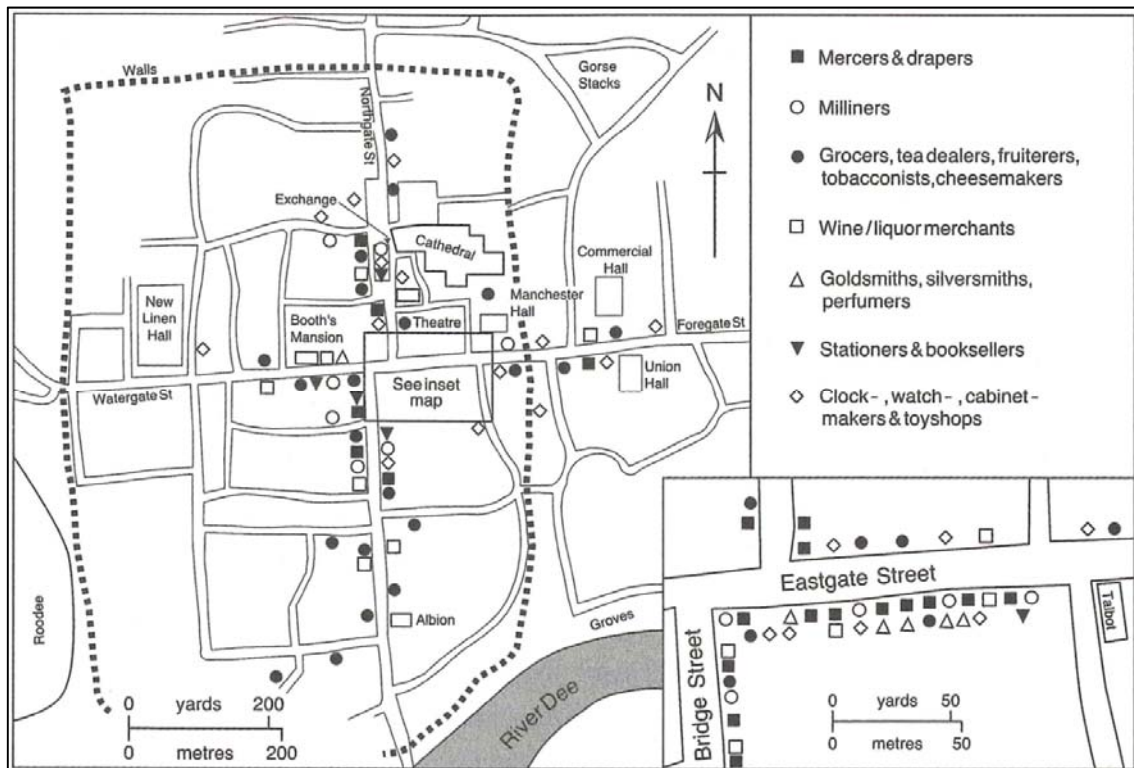


Fig 15: Retail outlets in Chester during the 1780s. Source: Stobart 2004. Based upon directory evidence.

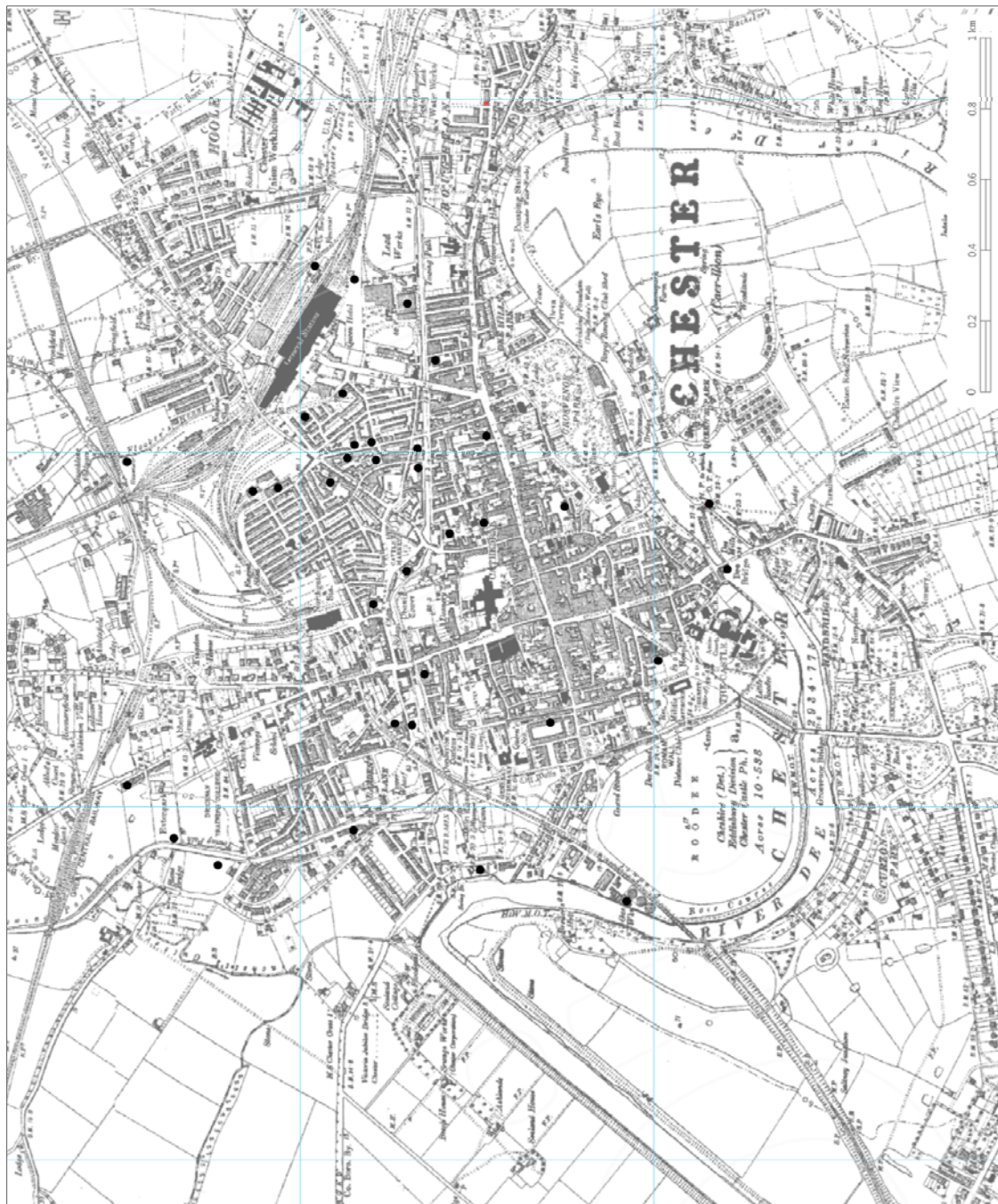


Fig 16: The distribution of larger-scale industry in Chester, 1870-1900. Sources: OS 1890s mapping, CHER and local directories.

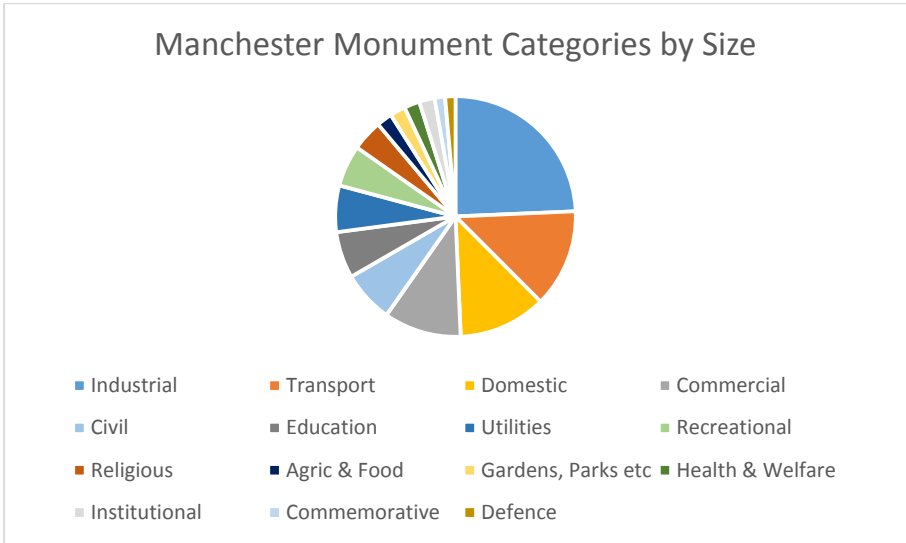


Fig 17: Manchester monument categories by size with industrial sites the largest (35) and defence the smallest (2).

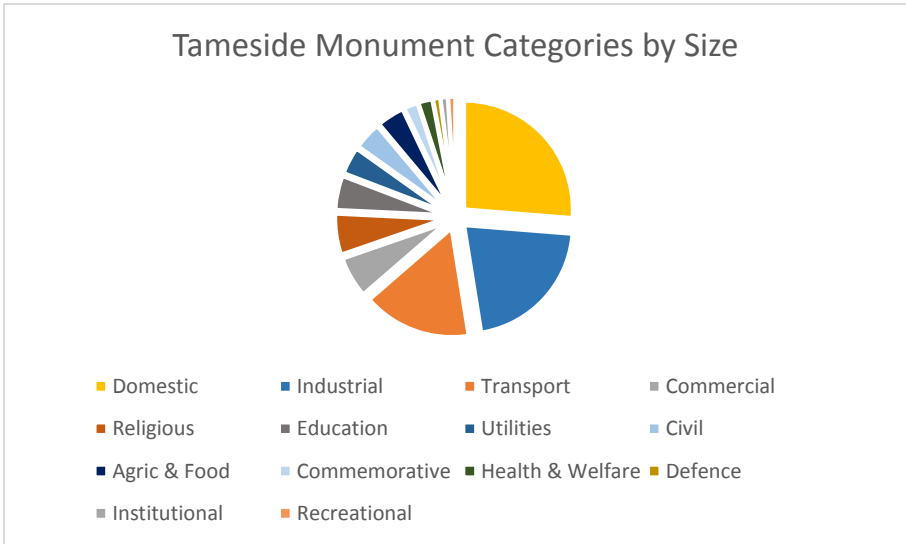


Fig 18: Tameside monument categories by size with domestic sites the largest (26) and recreation the smallest (1).

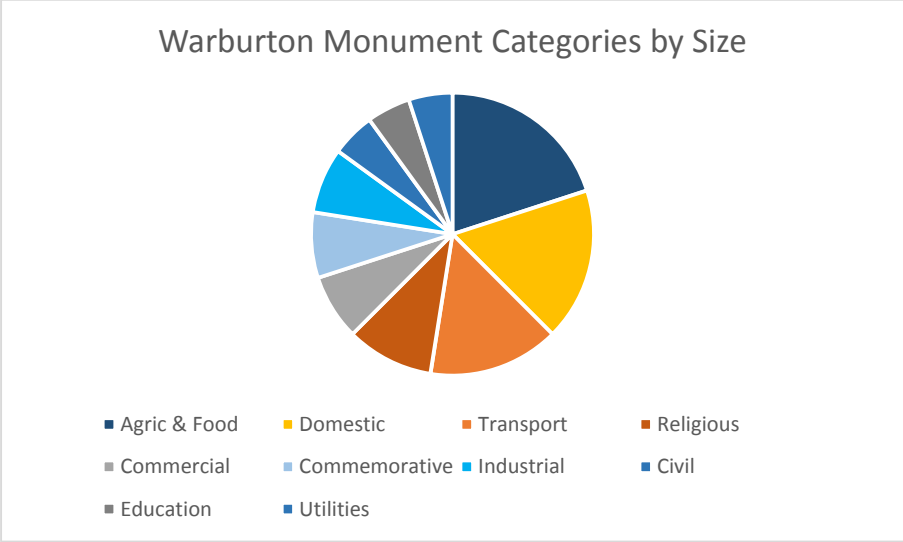


Fig 19: Tameside monument categories by size with domestic sites the largest (26) and recreation the smallest (1).

6. Discussion: Chester and the Archaeology of Industrialisation

Researchers have noted the distinctive character of industrialisation within the city of Chester during the 18th and 19th centuries, with its emphasis on the city as a centre for the regional elite, retail activities, and agricultural processing (Lewis & Thacker 2003; Stobart 2004). This character was also bound up with the decline of the port and canal, a scarcity of large-scale manufacturing industry and the rapid population growth of the 19th century (Herson 1996b; Lewis & Thacker 2003; Woodward 1996). The conclusion has been that the city was an industrial failure (Herson 1996a; White 1860). It would be easy, therefore, to dismiss the impact of the industrialisation process within Chester as being confined merely to the mechanisation of agricultural processing, the arrival of railway transport and the consequences of rapid population growth. Yet, archaeological study of the remains of this period since the 1960s has suggested that Chester's development in the period 1650 to 1900 was much more complex, not least because of the volume of material available. How to order and interrogate this data and thus provide a distinctive archaeological view on the process of industrialisation within Chester has, though, been harder

The current study has sought to address this problem by employing the Manchester Methodology to analyse the archaeological data through charting the spatial and geographical introduction of new archaeological monument types and linking this back to the social structure of the city. This has highlighted a number of trends in the spatial and chronological distribution, which enables the industrialisation process to be characterised. The study has demonstrated that early manufacturing was focussed within the city walls and Handbridge during the late 17th and early 18th centuries. In the mid-18th century industry emerged around the Old Port area, whilst continuing in Handbridge. The main focus of the late 18th and 19th century manufacturing activity lay in the Foregate and Newtown areas (Nevell 2015, 67). Here a large concentration of engineering, food processing, gas manufacturing and smithying sites could be found, especially north of the canal and south-west of the railway station. Most larger-scale manufacturing lay within this industrial suburb by the last three decades of the 19th century (1870-1900). By this date a few industries survived in older areas of manufacturing, such as the Old Port zone and the Handbridge mills, whilst a cluster of three brick fields lay along the Chester Canal north of the city. Within the city walls and Foregate area commerce thrived throughout the 18th and 19th centuries, whilst in the 19th century new suburban areas developed to the north along Liverpool Road, and east in Boughton. South of the river, Handbridge was transformed during the 19th century into a suburban area. Together, with the built environment data from the Chester characterisation study, the archaeological and historical evidence shows that Chester was a highly successful regional market and manufacturing centre during the 18th and 19th centuries (Stobart 2004; Trinder 2002).

How to reconcile, then, this archaeological and built environment evidence with the 19th century views and more recent historical studies that criticise the city for a 'failure' to industrialise; critiques that can be summarised as the transport geography argument and the landed-interest opposition model. The evidence from the Manchester Methodology and

urban characterisation studies can supply one immediate answer. Namely, that the impression that Chester was an industrial failure may, in part, lie in a lack of visible, large-scale, manufacturing sites. The city did not develop high numbers of engineering and textile manufacturing sites typical of urban centres in eastern Cheshire or southern and north-eastern Lancashire. Nor did it have a large commercial shipping and warehousing zone as can be found at Lancaster, Liverpool and Manchester. At least to some contemporaries this was one measure of success which Chester failed (Wardle & Bentham 1814; White 1860).

Yet the Manchester Methodology also provides evidence to support the landed-interest opposition model. The monument distribution maps show an absence of new industrial monument types on the large estates surrounding Chester to the north and south, in favour of predominately residential, suburban, monument types that characterised much of the city's urban growth in these zones during the 19th century. This may be explained by the opposition to certain types of development by the larger landholders. Such opposition may also explain why the proto-industrial suburb of Hough Green and Handbridge developed into a suburban area during the 19th century, rather than a full-blown industrial suburb such as Denton Holme in Carlisle. The role of industrial suburb was then taken over by the Newtown area, where a fragmented landholding pattern allowed for innovation and development in a fairly unrestrained manner. Here, from the late 18th century to the late 19th century manufacturing industry and working class housing developed around the canal corridor and later the railway station, just as an industrial zone developed in Lancaster along the canal route to the east and south-east of the city.

Furthermore, we can also track through the Cheshire HER and the Manchester Methodology the limited development of the Old Port area via the small number of new monument types. These chart the concerted efforts from the 1730s to revitalise the port, after a period neglect, through the canalisation of the wide and meandering estuary and the construction of New Crane Wharf to the west of the urban centre. The monuments graph also records the upsurge in activity around the port after the initial opening of the Chester Canal in the 1770s. A further increase in industrial activity after the opening of the Ellesmere extension during the 1790s, however, moved the focus of industrial activity to the canal corridor and the east of the city walls, with no new innovations in monuments in the Old Port after this decade.

We thus have two contrasting interpretations of the industrialising path that the city took during the period 1650-1900; one which emphasises stunted industrial growth, rival trading centres and missed opportunities; the other which demonstrates a diverse economic base, and its regional administrative, market and transport roles. Ultimately, this is one of perspective and context, with evidence to support both lines of debate. Yet, an anomaly in the monument types' graph may provide support for one aspect of the transport- geography argument; the problems with the River Dee channel. The graph shows that just two new monument types were introduced during the period 1710 to 1730, amounting to a pause in innovation. The causes of this pause are unclear, but of relevance is a sequence of rapid and massive silting episodes during the 17th and 18th centuries which have been recovered archaeologically in the Old Port area. This period of riverine dynamism was finally stabilised by the construction of the cob wall (Reid 2011). In the 17th century Chester was the second most import port for the north Atlantic trade into western Britain. By the 1730s the Atlantic trade networks had switched to Bristol, Liverpool and Glasgow, leaving Chester behind. This was

probably because of the problems with the silting and shifting course of the channel of the River Dee and the delayed attempts to solve this crisis. Chester's opportunity to develop a large industrial sector based upon the raw materials from the Atlantic trade had gone by the time that the Old Port area was being redevelopment. Therefore, Chester's industrialisation path towards regional market centre rather than international port and manufacturing town may have been decided in the late 17th and early 18th centuries, not the late 18th and early 19th centuries.

Yet that still leaves an industrialisation process covering most of the 18th and 19th centuries to study. So, rather than looking for unfavourable archaeological and historical comparisons with the new manufacturing urban centres of North West England, perhaps we should be considering the detailed character of Chester's industrialisation experience. To fully understand this experience we should be comparing Chester, archaeologically, with the experience of similar established, pre-industrial, regional market and elite centres, such as Carlisle, Lancaster, Lincoln and York.

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