Chapter 7
The Industrial and 20th Century Period
Resource Assessment Update
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This chapter presents a summary of the archaeological and historic environment research undertaken in North West England since 2006 for this particular subject. The chapter is arranged using the same structure as the original resource assessment subject chapter for the first North West archaeology research framework published in 2006 (Brennand et al 2006). It is not a replacement of that work, but rather an addition and enhancement. The 2006 resource assessment text remains a key foundation document for regional research studies in North West England. Nor is this chapter merely a list of all work undertaken since 2006. Instead, it highlights key new data, emerging subject areas, and fresh synthesis in the decade or more since the original regional research framework was published. The chapter was compiled by the lead author and uses material provided by a variety of researchers who are also credited. The current consultation is designed to highlight any omissions in recent significant work. The chapter will be used as the framework for the Stage 2 Research Agenda Workshops to be held in the autumn of 2017 and spring of 2018. The revised chapter will be printed as a point-in-time document in 2019 through CBA North West. Any gaps identified in the research resource will be addressed through a new regional research frameworks website being developed by Historic England, of which this chapter will form a part.

1. Introduction

A wide variety of approaches exist for studying the post-1750 period, from a focus on the archaeology of technology and production to more theoretical approaches looking at the social context and consequences of industrialisation. Archaeological fieldwork and research on the Industrial and 20th century period (post-1750 to 2000) has been led by developer-funded archaeology, with additional material provided by HLF community projects, local voluntary societies, English Heritage/Historic England landscape surveys and university research projects. The volume of work in the period 2006 to 2017 is considerable. At least ??? grey literature reports on industrial sites and buildings have been produced for North West England, along with ??? publications as books, monograph series, journal articles and a number of student MAs and PhDs. In addition, there are a variety of regional websites containing useful resources, chief amongst these is the Industrial History of Cumbria website (www.cumbria-industries.org.uk). Such a large corpus of material reflects both the continuing interest by voluntary groups in the archaeology of the recent past, and also the way in which developer-funded archaeology can be used to recover data from this period.

The research and theoretical framework for the period continues to develop. The Association for Industrial Archaeology and the Society for Post-medieval Archaeology published a joint volume on current and future research directions in post-1550 archaeology in 2009 (Horning & Palmer 2009). This collection of 30 papers was divided into three sections covering current practice and paradigms, analytical approaches and approaches to people and things. The National Association for Mining History Organisations (NAMHO) issued a research framework document in 2016. The scope of this framework for the archaeology of extractive industries in England, whilst encompassing sites going back thousands of years, included a review of the existing evidence covering topics relevant to the
Industrial period. This includes overviews of energy minerals (coal), metals, bulk minerals (stone, aggregates, lime, sand), and other industrial minerals (clays, evaporates), as well as a research agenda (Newman 2016). The Historical Metallurgy Society has also published a research framework that is relevant to the Industrial Period. As well as very useful resource overviews, method, and technological development sections, it has a section on Post-Medieval research themes (Bayley, Crossley & Ponting 2008). The Contemporary and Historical Archaeology in Theory group (CHAT), founded in 2003 to enable dialogue between the research fields of later historical archaeology and the archaeology the contemporary world, has actively promoted research in this new area, much of which is relevant to North West England. These include individual conference proceedings and thematic publications on subjects such as graffiti (Oliver & Neal 2010).

English Heritage/Historic England have published several guides to the archaeology and heritage of the post-1750 period. A note on science for historic industries was published in 2006 (Dungworth & Paynter 2006). This guidance focussed on the investigation of post-medieval and industrial sites, with overviews on site formation processes, historical sources, sampling process residues, recording historic technology, and dealing with contaminated land. In 2010 English Heritage published a thematic research strategy on the Historic Industrial Environment in 2010 (EH 2010). This was divided into three broad themes: the origins of industrialisation; the impact of industrialisation; and the legacy of industrialisation.

Inevitably there are gaps and lacuna in this data. Two of the most obvious are the comparative lack of synthetic studies for the period and the lack of gender and identity studies.

2. Environment

A small but significant area of development since 2006 has been the gradual emergence of environmental studies for the post-1750 period. In a few cases this has been done indirectly through the study of human remains (see below) from graveyards. These studies are just starting to reveal scientific evidence for the impact of industrialisation in the region on local populations.

Environmental change has been traced in two landscape studies. Firstly, English Heritage/Historic England’s study of the Alston Moor area of north-east Cumbria has revealed a legacy of groundwater contamination associated with the lead industry (Ainsworth 2009; Huntley 2011; Jessop & Whitfied with Davison 2013). The area’s centuries-old tradition of lead mining, along with a suite of other extractive industries, has left long-recognised extensive and often highly conspicuous architectural and archaeological remains. The survey revealed local hotspots of lead contamination around mine entrances and processing sites in and close to the industrial mining communities of Alston and Nenthead. The study also discovered that the decay of those remains, especially the water-management features of the 18th, 19th and early 20th centuries, is leading to 21st century contamination of the headwaters of rivers, with problems downstream.

Secondly, an article on historic chemical contamination in the Irwell and Mersey river catchment was published in 2017 (Hurley, Rothwell & Woodward 2017). This study records the environmental impact of heavy industry upon the river system of the region’s largest industrial urban zone. This was done through recording trace elements in river sediments. This found extensive arsenic, chromium, copper and lead contamination from headwaters of the rivers to the floodplains and soils. However, lead was the most common and extensive form of contamination of sediments.

3. Agriculture
Research on and recording of the archaeological remains of the agricultural industry has been extensive since 2006 and not just confined to data gathered through the commercial sector. Such data is focused primarily on the standing structures of the agricultural industry. Of high significance is a major review of the regional character of historic farmsteads in England, undertaken by English Heritage between 2004 and 2015 and assessment framework published in 2015 (Lake 2015). The North West England regional report was published in 2006 and this provides a good overview of the major agricultural building types that survive in the region, as well as the sub-regional characteristics, from farmstead types, to crop storage and processing and animal and animal products buildings (Lake, Edwards, Wade Martins & Deadman 2006). Earlier studies concentrated on just particular estates or areas of the region. This document provides a key overview of the building types within the North West.

These documents are particularly useful in providing a framework for study since the conversion of agricultural buildings has continued since 2006. One notable hotspot of area of redevelopment has been rural Lancashire. Many of these buildings date from the 18th and 19th centuries, especially barns. Whilst individual studies may not be in themselves striking, there is a large volume of grey literature now available for synthesis. Such a study might answer whether it is worth continuing to record such structures, whether there are other agricultural building types that should be targeted; is the recording level appropriate and are the standards and recording levels adhered to; and what do these records tell us about the detailed character Lancashire building resource? A useful example of the way in which such material might be used is a study of Lancashire dairy cattle and their buildings (Grundy 2015).

Other fieldwork and research on agricultural landscapes has included the location of on the River Esk in Cumbria an 18th and 19th century fish weir at Drigg, where the timber uprights formed a lattice across estuary with evidence of wattle walkway to one side of uprights. Wider research into the lowland landscapes of Cumbria has included a study of lowland improvement through grazing and drainage (Davis & Davis 2013).

Several rural water-powered corn mills have been excavated, or earlier results published. These include, the cornmill site at Northenden (GM), which functioned until the mid-20th century (Bell 2009), whilst Norbury Mill in Stockport (GM) was further excavated as part of a road-building programme. Both project focused upon the power systems and wheelpits of the mills. Elsewhere a building survey of the Nether Alderley Mill, near Alderley Edge (Ch) for the National Trust (a building whose structure spans the 16th to 20th centuries but which was extensively rebuilt around 1746; Matrix Archaeology 2012) recorded the in situ surviving power systems and milling machinery, dating from the mid-19th century. Restoration work at the 18th century Heron Corn Mill, Beetham (C), during 2013 and 2014 involved the recording in detail, for the first time, of the power systems. The survival of contemporary water power systems and milling machinery is now very rare in the corn mills of the region and largely confined to sites run as museums, as is the case with these two mill buildings.

4. Rural Settlement

Data gathering and research on industrial period rural settlement since 2006 can be broadly split in to two types; localised surveys of small monuments done through the planning process and larger landscape surveys, often the result of landscape management projects.

The Lake District National Park has many examples of small scale studies undertaken as planning or management conditions that could be integrated into wider synthetic studies on the impact of agricultural intensification and the impact of industrialisation. These include farmstead surveys as at Peel Place, Lanthwaite (C) where features associated with the farmstead were recorded, including
building platforms, trackways, walls, lynchets and a possible corn-drier or stack stand. One building was probably used for housing animals and several different floor surfaces were revealed, some likely relating to pens or stalls accessed off an aisle. The farmstead probably dates to the first half of the 19th century (S5098). Fieldwork as part of the Black Beck Hydropower Scheme (C) revealed post-medieval and industrial-period enclosures that were shown on later mapping (S5275).

Several large-scale estate and landscape surveys reveal the impact of land management and vernacular building changes during the 18th to the early 20th centuries. At Alston Moor (C), English Heritage/Historic England have undertaken a study of the industrial village and its surrounding farming and upland lead mining landscape (Jessop, Whitefield & Davison 2013). Other upland studies include a desk based assessment by UMAU at Healey Dell, Rochdale (GM), undertaken to inform understanding of the relict industrial landscape for management and community engagement purposes. The work comprised the detailed survey of four sites, Broadley Mill, Broadley Wood Mill, Broadley Stone Rubbing Mill and Th'Owd Mill I't Thrutch (UMAU 2006). The Mellor Archaeological Trust have surveyed the industrial and rural landscape of part of the south-western Pennine upland in Stockport (GM), noting the growth of new industrial hamlets and the water management systems needed for new textile spinning mills (Hearle 2011). Recording of a series of farmsteads around Kingsway in Rochdale (GM) ahead of redevelopment noted the development of post-medieval enclosure, the shift from timber to brick building and the arrival of farmer weavers (Forthcoming 2018).

In the lowlands, two adjacent township surveys are also noteworthy. A study of the evolution and character of the lowland Dunham Massey Estate (GM) by the National Trust recorded the investment by the earls of Stamford in over 20 farmsteads and their farm buildings from the early 18th century to the early 20th century. Some of the trends this study recorded included the shift from timber to brick building and a move from mixed farming to dairying (Gregory & Miller 2013). The adjacent township of Warburton (GM) to the west was recorded as part of the Warburton Archaeological Survey (1996 to 2015). This work, led by the South Trafford Archaeological Group, encompassed detailed vernacular building recording, historic studies of manorial records and landscape exploration, producing a story of continuity and gradual change in contrast to the major horizons of estate investment seen at Dunham (Nevell with Carney et al 2015). In northern Cheshire a further landscape survey, the Alderley Sandhills Project, run in the early 2000s, was published in 2009-10 (Casella 2009; Casella & Croucher 2010). The project combined farmstead excavation with family and oral history, and artefact studies to look at the impact of the industrialisation process on a an estate community, in this case owned by the Stanleys, from the 17th to the 20th centuries.

Finally, a number of rural freehold and manor houses have been excavated around Greater Manchester with deposits running into the 18th, 19th and 20th centuries. These include Booth Hall, Etherstone Hall, Moston Hall, Royton Hall, Timperley Hall, and Wood Hall (Garratt 2009; Pierce et al 2013; Thompson et al 2007; Wooler & Newman 2016). Each is a detailed case study reflecting the development of local vernacular building traditions, the impact of new agricultural and landscape management techniques, and estate decline through their material remains. The publication of the excavations undertaken at Bewsey Old Hall near Warrington (Ch) during the 1970s and 1980s provide similar detailed case study of building development, agricultural change and decline (Lewis, Heawood & Howard-Davis 2011).

5. The Urban landscape

Urban Landscape Change
Since 2006 there has been a focus on the redevelopment of urban brownfield land. This has led to hundreds of developer-funded excavations and building surveys of sites from the Industrial period and the 20th century. As a result, a huge amount of material has been added to the archaeology and built environment grey literature database for urban industrial sites, with notable concentrations of activity in Carlisle, Chester, Lancaster, Liverpool, Manchester, Salford and Stockport. Much of this material is available to download from the Archaeological Data Service or to consult through the regional Historic Environment Records.

Most of this new material remains to be synthesised but several English Heritage/Historic England sponsored surveys have begun the work of providing a strategic framework. In particular the HLC programmes begun in the late 1990s (Ripon 2004) have now been completed for the whole region, with the datasets and reports available to download form the ADS for Cheshire, Cumbria, Greater Manchester, Lancashire and Merseyside. This data is, inevitably, dominated by post-medieval and industrial rural and urban landforms. To take the Greater Manchester Urban HLC Project, completed in 2012, as an example this study examined the evolution of whole of the county area’s landscape, using geo-rectified mapping, 54000 polygon records and time-slicing to show how it transformed in the industrial period. Ten district reports and an overview report, together with a popular publication, were produced. The individual reports describe the post medieval landscape where it survives (Mitchell & Redhead 2012).

Two further urbanscape surveys have focused on the historic built environment of particular areas of the region. The Lancashire Extensive Urban Survey has looked at the built environment history of the towns and cities of the modern county (Iles 2009), in a similar fashion to the earlier Cheshire urban survey. One of the outcomes of this work include a record of the extent of industrial workers’ housing in individual Lancashire towns, and the continuing landscape and social impact of this building type (Newman & Newman 2008).

In addition, the City of Chester has had two major pieces of planning-driven landscape study undertaken. Firstly, The Chester and approaches characterisation study (Cheshire West & Chester Council 2011) formed part of the evidence base for the then-emerging Local Plan, intended to guide Chester’s future development. The study assesses the character of the buildings, structures and spaces within Chester’s main conservation areas and identifies sixteen general areas with 113 sub-areas. It notes that in many cases the boundaries of the built character assessment corresponds to those of the archaeological characterisation. This is largely the result of the long-term survival of urban landscape elements such as the City Walls and the Roman street grid within the fortress, which are central to both studies (Beckley et al 2014, 9). Secondly, the Urban Archaeological Database Project, funded by English Heritage, undertaken between 2012 and 2014, led to an enhancement of the records within the Cheshire HER relating to the city. This fed into the archaeological research framework and plan for the city (Beckley & Campbell 2013; Beckley, Campbell & Collens 2014). These two documents provide overviews of the below ground archaeology and above ground historic built environment of the city for the post-1750 period, recording 842 individual industrial-period records. These 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, 55 & 73). Much of this data has been captured from the hundreds of archaeological interventions across the city. Many of these sites are multi-period with remains spanning the Roman period to the 20th century as at Gorse Stacks on the eastern side of the city (Cuttler et al 2012) and Bridge Street in the centre of Chester (Garner 2008).

Beyond the well-established urban centres of the region, the Industrial Period saw the establishment of many industrial centres, from villages to large-scale towns, across the North West. In Cumbria, workers’ housing in the First World War munitions settlements of Gretna, Eastriggs and Barrow-in
Furness have been studied (Caffrey 2016). In Greater Manchester, the Tameside Archaeological Survey has recorded the development and building of the late 19th century textile village of Carrbrook. This was built to house the calico print works of the adjacent textile finishing sites, from the 1880s onwards, and is contemporary with better known model industrial villages of the period such as Port Sunlight (M). Most of the original workers’ housing and community buildings established at Carrbrook before 1914 survive, although the textile print works has been demolished and the site turned over to housing (Nevell et al 2006).

Amongst the new specialist towns of the region were 19th century seaside resorts, from Southport (L) to New Brighton (M). English Heritage undertook a detailed study of the development of Blackpool (L) and its pleasure beach structures (Whitfield & Brodie 2014). English Heritage has also charted the growth of industrial suburbs around the football stadium of Anfield in Liverpool (M) as well as the wider impact of sport on the city’s townscape (Physick 2007).

The impact of industrialisation and railway construction on a historic town core can be seen through investigations carried out in Salford’s Historic Core (GM), along Greengate and Chapel Street. A variety of excavations have been undertaken on industrial remains beside the River Irwell, including workers’ housing and Exchange Station which was built in the 1880s. The station was demolished during the 1960s but the remarkable brick arched undercroft survived and was laser scan recorded by Pre-Construct Archaeology, prior to demolition. The original plan drawings were traced to the Kew Records Office (Gregory & Miller 2015; Haslam et al 2017). Other small town studies also record the impact of changing infrastructure and industrialisation on earlier urban settlements, as at Penrith (C) (Zant 2015).

**Industrial Urban Housing**

The last ten years have seen a plethora of planning-led excavations and historic building recording of workers’ housing dating from the late 18th to the early 20th century. Much of this work, has been concentrated in Greater Manchester where over 40 separate projects have been undertaken by a variety of archaeological contractors. One conclusion from this work is that there was a variety of design and construction of workers’ housing within the North West, though substantial synthesis remains to be done.

Individual building studies remain a key way of understanding the great variety of structural forms within this monument type. In Barrow-in-Furness (C), the Egerton Buildings, a rare pair of tenement blocks in the Barrow Island district of the town, have been studied (Withey 2008). Barrow was once, and to a lesser extent still is, dominated by heavy industry and had an ample stock of associated housing for workers. Egerton Buildings are situated to the south-west of Ramsden Dock Road, between Michaelson Road to the north-west and Siemens Street to the south-east. They were designed in 1879 by architects Paley & Austin of Lancaster and Barrow-in-Furness and erected between 1880 and 1886 by the contractors Smith & Caird of Dundee, working on behalf of the Furness Railway Company. They were likely built to provide accommodation for the families of employees in the Furness Railway Company’s nearby shipbuilding works. They consist of two identical four-storey blocks of nine tenements, making eighteen tenements in total, with eight flats within each tenement, giving 72 flats per block and 144 flats in all. As originally planned, 128 of the flats had one bedroom and 16 had two. Each flat had an entrance hall, a kitchen/living room, a scullery and an open drying area, enclosed by railings, off which opened a water closet, a coal store and a dust or ash store. Designed in a simplified French Renaissance style, the tenement blocks are of red brick with concrete dressings. The roofs are covered with grey slates with red ceramic ridges. Only relatively minor
alterations (such as renewed fenestration) have affected the exterior during the lifetime of the buildings, and the plan-form is substantially intact, although most internal details have been lost.

An overview study of the importance of urban workers’ housing in Lancashire has also been carried out (Newman & Newman 2008). This work builds upon the long tradition of investigating surviving workers’ housing in the county, most recently seen in Timmins’ study of the quality of back-to-back housing in several textile colonies in Lancashire (Timmins 2013). In Cheshire, samples of workers’ housing have been examined in Crewe (Henry/Forge Street) (ECH5976).

In Greater Manchester, GMAAS has used planning requirements to facilitate archaeological excavation of several industrial suburb e.g. Township in Bury, Portwood in Stockport, and Ancoats in Manchester. In Township, the remains of early to mid-19th century textile mills, workers’ housing, a graveyard, and a mid-18th century school were excavated and recorded by OAN in 2006-7 ahead of The Rock retail development, Bury (Miller & Gregory 2010).

Important remains of a variety of early house types have been recorded at Loom Street in Ancoats, Manchester. The excavations are one of the largest archaeological investigations of late 18th and 19th century worker’s housing undertaken within the City of Manchester. This work exposed the remains of various types of housing, which characterised the late 18th century and early to mid-19th century domestic environment within both Ancoats and the industrial townscapes of Industrial Britain, described by social commentators such as Frederick Engels. These houses types included large double-depth properties of a comparatively high status, which may have originally housed artisans in the late eighteenth and early nineteenth centuries, and smaller back-to-back and blind-back worker’s housing. Many of these smaller house types were arranged around insalubrious courtyards and at times may also have been associated with cellar dwellings. The archaeological evidence also included evidence for the material culture found within these houses, as well as providing clear evidence for phases of social improvement, dating to the late nineteenth century. These remains, therefore, provide significant insights into the form, construction and living conditions associated with worker’s housing within one of the world’s first industrial suburbs. The large finds assemblage is unusual for this type of excavation site (UMAU 2007) and summarised in Nevell (2008; 2011; 2014; 2017) and Redhead (2011).

In 2009 OAN undertook a targeted open area excavation of workers’ housing at Miller Street/Angel Street, Manchester which were part of Angel Meadows, once notorious for insanitary and crowded living conditions and immortalised by Engels writings. Excavation of the trial trenches demonstrated clearly that well-preserved structural remains of eighteenth- and nineteenth-century houses survived in-situ across parts of the site, which merited further archaeological investigation to mitigate their ultimate loss during development construction work. Following discussions with the County Archaeologist for Greater Manchester and the Co-operative Group, OA North was commissioned to carry out detailed excavation of three discrete parts of the site, with a total area of approximately 1000m². Approximately 75 structures were identified, almost exclusively relating to domestic dwellings, with the majority dating from the late eighteenth and early nineteenth centuries. Four broad phases of activity were recognised, with the earliest structure appearing to represent the cellar of a mid-eighteenth century town house. Other houses mainly comprised two-up-and-two down-type artisans’ dwellings, with top floor loomshops, and two-roomed cellars with independent access, which had probably used as cellar dwellings. Evidence for the decline of the area was also observed, with various buildings being partitioned to facilitate an expansion of the local population, and also perhaps to maximise rent revenue. These larger dwellings were converted subsequently into notorious lodging houses, whilst the cellars continued to provide accommodation for the poorest families, who were frequently of Irish origin.
Large-scale changes to drainage and sanitation were also identified, representing improvements that were probably implemented by the local authority in the early twentieth century. This has allowed a new insight to the physical and engineering implications of such wholesale replacement of the sanitary system, undertaken in order to make the properties fit for habitation. Whilst not all the plan-types suggested by the nineteenth-century cartographic sources survived, the excavation has added great detail to these basic, and often conflicting, plans, increasing the current understanding of domestic life in industrial Manchester. Whilst the housing of the urban poor, a class generated by the Industrial Revolution, became a political issue of great importance from the 1830s, little physical evidence has been examined to compare with the huge weight of documentary accounts available. This project has not only added significantly to the dataset of such investigations, but has also potentially added significant detail for the interpretation of the political and social history which dominates studies of this period (OAN 2011; Miller 2015). Other good example of back-to-back cellar dwellings were recorded on adjacent sites as part of the NOMA regeneration scheme and summarised in the publication above (Miller & Wild 2015; Miller, Wild & Gregory 2010; Nevell 2008). This work is adding to an important corpus of archaeological investigations on workers’ housing from the late 18th to mid-19th centuries – a critical time in Manchester’s development as one of the world’s leading manufacturing centres. A period which saw dramatic population increase leading to some of the poor and overcrowded housing conditions famously described by Engels.

An archaeological desk based assessment was undertaken for the proposed new National Graphene Institute site, Booth Street East, University of Manchester. This identified potential buried remains of archaeological interest which were then evaluated by trial trenching. The evaluation (by OAN) demonstrated that well preserved remains were present, relating to a row of c 1830 early workers’ housing with unusual plan form, a German club frequented by Engels in the 1840s, and one of Manchester’s first Turkish Baths. A final phase of site works saw a large open area excavation revealing and recording extensive archaeological remains (OAN 2013).

At Chapel Street in Salford, the Centre for Applied Archaeology (CfAA) undertook a large-scale excavation of workers’ housing in an area described by Engels in the 1840s as on a par with the worst slum areas of Manchester. Well-preserved remains of some back-to-back cellar dwellings were recorded as well as a large area of larger houses fronting onto Chapel Street with various courtyards at the rear (CfAA 2013). This was the first development plot of the Salford Central regeneration scheme (Vimto Gardens apartments).

At Bridgefield Street, Stockport, excavations by OAN in 2015 ahead of new cinema complex (Red Rock) revealed a series of back-to-back cellar dwellings. These had been built in c 1810 and demolished in the 1960s. They were associated with large cobbled yards, one of which contained a well/pump and shared toiled block. The rapid urbanisation of villages during this period has been captured in a detailed study of Cheadle (GM) (Redhead & Miller 2014) and also in Royton (GM). Here an archaeological excavation on land off Middleton Road recorded the well-preserved foundations of four back to backs dating to 1810-40. The basic amenities suggest the inhabitants were economically poor, although not in extreme poverty. This more rural example is a useful comparison with the excavations of workers’ housing in urban Manchester and Salford.

**Urban Building Types**

There have been a number of surveys of surviving urban build types from the Industrial Period. Historic England sponsored a survey of urban and suburban public houses in England, built between the First and Second World Wars. This features case studies for several establishments in North West England) including The Coach & Horses, Carlisle (C); The Blackburne Arms & The Farmers’ Arms, Liverpool (M); The Primrose Inn, Wallasey (M); The Wheatsheaf public house, Sutton Leach, St Helens (M); and The
White Swan Hotel, Swinton, Salford (GM) (Cole 2015). The project aimed to increase levels of understanding, raise awareness, and heighten levels of protection afforded to inter-war pubs. The project reflects the high level of threat now faced by England’s pubs, with high rates of closure, alteration and demolition. The study outlines the background and methodology of the project, and sets out a summary of the historical development of pubs in the inter-war period; for instance, notable architects, architectural styles employed, active breweries, and the ideals of pub improvement. Buildings considered include ‘improved’ or ‘reformed’ pubs – which usually featured rooms for entertainment, dining and non-alcoholic refreshment – as well as pubs built on more traditional lines.

Less well recorded have been the market halls of the Industrial Period. An exception is the Grade II listed 19th century Market House in Altrincham, surveyed during restoration. The building is a large rectangular structure of restrained Classical appearance, displaying the palette of building materials – notably cream, red and grey-brown brick – typical of 1870s-1880s Altrincham and its suburbs. Another example of a recently surveyed and refurbished market hall is that in Stockport, in the old market place. The cast-iron and glass covered market opened in 1861, but archaeological excavation and documentary study showed that it was the successor to market activity on this site going back to the medieval period (Arrowsmith 2010). Both buildings are significant examples of the Victorian market halls built in Greater Manchester, a considerable number of which no longer survive (Miller 2014).

In Barrow-in-Furness (C), a 19th century steam-powered corn mill was completely excavated ahead of redevelopment. This provides a rare excavated glimpse of the fully-developed urban corn mill and the complexity and size of the associated steam-power facilities (Elsworth & Whitehead 2010).

In Greater Manchester archaeology planning conditions have enabled the excavation of New Bailey Prison in Salford, work undertaken by Salford University. This was a reform prison designed in 1790 to a radial plan and intended to be self-financing through the work of the prisoners. Excellent remains of the 1815 extension have been revealed including the workshop range and prison cells with exercise yards. Three of the six development plots affecting the prison site have been excavated. The investigations have included community involvement and guided tours/open days and a monograph is in preparation. This is one of the most extensive and important prison site excavations undertaken in this country (CfAA 2014 and 2015).

Elsewhere in Greater Manchester at Leaf Street, Hulme, Salford Archaeology have revealed and recorded the well-preserved remains of a first class bathing pool, one of three that were part of the public baths established here in the mid-19th century on the site of an 1840s workhouse, very little of which survived (Salford Archaeology 2016). The context for this building type was provided by an MA study of the development of municipal baths, including examples from the city of Manchester, which was published in 2010 (Marino 2010).

In Rochdale, The Broadwater Centre (GM) was originally the Lea Hall Baths built in 1868 by Rochdale Corporation. The building has a 2-storey, almost symmetrical front elevation designed in classical style by local architect, E. N. Macdougall; this is the only part of the building with any architectural pretension. There were two pools of equal size for men, first and second class, and a smaller ladies’ pool, with a boiler house added in around 1900 to the rear. Both main pools have metal truss roofs and retain some original features, but their spatial character is obscured by inserted ceilings and floors over the pools. The ladies’ pool retains the roof and, possibly, also structure in the basement (not seen). It has not been used as a baths since the late 1930s, when new baths opened on Entwisle Road, Rochdale. A major refurbishment at an unknown date in the late 20th century re-modelled the entrance, provided new stairs, new exterior door and windows, new ancillary facilities and the inserted suspended ceilings and new wall coverings (AHP 2014). The Entwisle Street site in Rochdale
(GM) has been recorded ahead of demolition (ArcHeritage 2010), a fine example of a mid-1930s Art Deco public baths complex.

6. Religion, Ritual and Ceremony

The focus of investigation and research on religious and ceremonial sites in the region continues to be the church or chapel building. However, large-scale urban redevelopment has begun to affect 18th and 19th century graveyards associated with smaller non-conformist churches and chapels. The First World War commemoration events has led to a renewed interest in war memorials and their conservation, as well as a growth in online access to the information they hold. Historic England have a war memorials listing project funded through monies from the DCMS, with 1597 listed in England since 2014 (HE 2015). However study of non-religious ceremonial or formal landscapes from this period has been limited.

Church Buildings

Religious buildings have continued to be altered or converted in the last decade. Some Church of England parish churches have seen archaeological interventions affecting post-1540 fabric and deposits, e.g. St Bartholomew’s, Wilmslow (Ch), St Lawrence’s, Denton (GM), Manchester Cathedral, Penwortham (LA), Prestbury (Ch) and Tattenhall (Ch). A few redundant churches and chapels have been converted to other uses, primarily accommodation, as at the Wesleyan Chapel in Rhodes (GM) (2006) and the Delph Independent Chapel in Saddleworth, Oldham (GM). The Welsh Baptist Chapel, Upper Brook Street in Manchester (GM) has been converted to student accommodation, following an extensive programme of archaeological works that looked at the above and below ground remains of the site including the graveyard (see below). Elsewhere the ruins of the 16th to 19th century Dukinfield Old Hall Chapel (GM) were surveyed and excavated (2013) as part of plans to restore the site.

Cemeteries and Graveyards

The most significant development in the recording and studying of religious sites in the North West England in the last decade has been the large-scale scientific excavation of several post-median and industrial period urban graveyards. This data has the potential to provide a new source of evidence of the impact of the industrialisation process on the people of the region by analysis of their very remains. However most of these cemetery excavations have yet to be published.

Many of these sites are non-conformist denominations, which have slightly different legal protocols if disused and which usually also have different stakeholder attitudes (physical remains of dead people of little importance as souls have left the physical remains). Excavated examples include chapels at Redearth (LA) and Swinton (GM), but some large urban cemeteries associated with Church of England sites have also been excavated as at Blackburn Cathedral (LA).

In Lancashire, an archaeological watching brief at the Darwen Academy on the site of the Redearth Road Cemetery revealed six skeletons, probably from the 19th century Free Methodist Church that lay on the site. A large portion of the cemetery on Freckleton Street, Blackburn (LA), associated with St Peters, now Blackburn Cathedral, was excavated. Many of the bodies investigated on this site belonged to the working class population of the 18th and 19th century industrial town (reference).

Development pressure in Greater Manchester has impacted on several former non-conformist burial grounds, where removal of human remains has been informed by detailed programmes of
archaeological investigation and recording, including laboratory analysis to examine the skeletal remains.

A programme of excavation and recording of around 250 burials spanning the 18th and 19th centuries at Cross Street Chapel graveyard in Manchester (GM). The remains, which date from around the 1720s to the 1850s, were found to be members of the ‘non-conformist’ movement Cross Street Chapel, later part of the Unitarian Church and could be named and aged. During further Metrolink construction work, the vaulted crypt of St Peter’s Church was also uncovered, dating back to 1788. Archaeologists unearthed day-to-day discarded items along with less common finds that were put on display in Manchester Central Library. At Manchester Cathedral, redevelopment work revealed 32 burials from within 48 graves within the nave. The grave burials consisted of a mix of shroud burials, interments in wood and lead coffins and two graves containing a densely-packed chalk deposit surrounding the deceased. A further 16 burials were recovered from a watching brief, 12 of which exhibited evidence for wooden coffins. The elaborate coffin furnishings manufactured from bronze and brass recovered from within the Cathedral, alongside five lead coffins within the nave, indicated that these individuals were of a higher social standing than those encountered during similar archaeological works at the cathedrals at Wakefield and Sheffield (references?). Furthermore, the preference for iron coffin furnishings recovered during the watching brief outside the Cathedral, indicates the extra-mural burials were of individuals of a lower socio-economic status than those buried within the Cathedral walls. The mixed demographic of the burials both within and outside the Cathedral indicate these interments to be of the local lay populace served by the Cathedral. No non-adults aged less than a year old at the time of their death were recovered during this archaeological programme, suggesting those that were not baptised were excluded from the Cathedral cemetery or buried in other areas (Wessex Archaeology 2013).

At the former Welsh Baptist Chapel (originally a Unitarian Church established in 1838) on Booth Street West in Manchester (GM), 95 burials have been recorded from the well-ordered graveyard at this site. Of the 22 coffins excavated, 20 were found to be made of lead and two of iron covered in concrete. The remaining ones were preserved in various degrees and made of wood, bound by iron and studded, or leather. To date a minimum of 60 individuals have been put forward for osteological analysis. Coffin furniture, small finds, the botanical content of a wreath, pottery and animal bone found within the backfill of the vaults are also in the process of being assessed and identified in preparation for inclusion within the final report.

Excavations of the former Swinton Unitarian Free Church cemetery (GM) by OAN IN 2012/13, led to the archaeological recovery of 112 articulated skeletons for osteological analysis. The remains dated from 1863-1899 and comprised 71 adults and 41 juveniles.

Proposals for a housing development at 11-16 Chapel Street, Hazel Grove (GM), included the former site of an 18th century Wesleyan Chapel (1785/6) and Sunday School (built around 1823). The development area takes in the former burial ground where, over a 73 year period, 367 individuals are recorded as having been interred. The graves of 44 individuals were investigated and a total of 38 skeletons were removed from the site, analysed by specialist osteologists (York Osteoarchaeology) and reburied along with their coffins, personal effects and other finds. All burials were in extended and supine positions, on a west-east alignment. A small number of partially legible coffin plates were recovered during the excavation that indicate that these individuals are representative of the 18th and early 19th century members of the congregation of this chapel. In a detailed report, osteological analysis revealed evidence for childhood diseases, trauma injuries and poor dental health (CfA, 2017).

Secular Display
Very few sites of secular display from this period have been investigated, beyond the 20th century war memorials. One notable monument type that has been studied are the formal gardens of the 18th and 19th centuries. Since 2010, the Cheshire Gardens Trust have been carrying out a research and recording programme for non-designated parks and gardens in Cheshire, Warrington and Halton. 59 reports have identified survival of significant features from parks and gardens not previously known to the HER. The National Trust has undertaken a study of the 18th century gardens around Quarry Bank Mill (CH) and the eider designed, romantic, 19th century landscape. At Allan Bank, Grasmere (C) 109 archaeological features and/or garden components were recorded in a survey of the 19th century grounds (SS272). At Holbeck Ghyll, the grounds of the Low Wood Hotel were found to have Victorian leisure features such as formal gardens, cockpit, wells, and a bowling green (SS266). Also in Cumbria the recent nomination of the Lake District for UNESCO world heritage status has involved reviewing the designed and managed landscapes of the area.

In Greater Manchester, the formal terraced gardens at Worsley New Hall, Salford (GM), were investigated between 2011 and 2014 (Salford Archaeology 2014). Designed by the well-known landscape gardener William Nesfield for the Earl of Ellesmere, the formal parterres were arranged along a series of three terraces. The remains of footpaths, terrace steps and bedding edges were located along with the site of three fountain basins.

7. Technology and Production

As stated previously, developer-funded archaeology work tends to emphasise urban, brownfield sites, and in the last decade the investigation of industrial production sites has been driven by such urban redevelopment. Sites investigated in this way include metal processing and manufacturing sites, and textile sites. Sometimes this has also included industrial period extractive sites (coal, copper and limestone) although these have also been investigated through HLF community projects and through landscape management initiatives in the Lake District National Park and elsewhere. More generalised landscape surveys of surviving extractive and manufacturing sites have been undertaken by the Association for Industrial Archaeology for Lancashire (Nevell & George 2007) and for Cheshire (Nevell & George 2017). Both studies noted the high rate of destruction for the visible remains if such sites when compared to an earlier landscape survey from 1981 (Ashmore 1981).

Extractive Industries

Work on studying and recording mining has been concentrated in two areas, Cumbria and Greater Manchester. In Cumbria, a number of small-scale projects within the Lake District National Park continue to record features associated with the region’s extractive industries. A historic landscape survey at Borrowdale (C) identified quarries, a workman’s hut, and a submerged former jetty structure (SS099). At Yewbarrow Wood (C) a considerable number of woodland management features and charcoal production sites were identified (SS231). Survey work ahead of the Black Beck Hydropower Scheme recorded post-medieval and industrial-period woodland management and stone extraction features (such as paths, pitsteads, storage huts and a kiln) were identified (SS275). Evaluation showed how existing slag tips were re-used to provide standing for rail lines (SS451). At the Bangarth and Blea Tarn Ironstone Mines (C) survey work identified complex archaeological remains. Both mines are pre-dated by elements associated with zigzagging trackways giving access onto the common for stock grazing and peat cutting. Sites found adjacent to these trackways include small stone quarries, peat huts, sheepfolds and shelters. Blea Tarn mine reflects a single phase of development from 1871 which proved unsuccessful. Mining features at Bangarth mine are more complex, reflecting initial stoped working of a sizeable lode from the mid-1840s through sporadic activity to the late 1860s and renewed exploration from 1871. Evidently, the extent of viable ore was such that it was deemed profitable to
revisit the mine, by its extensive spoil heaps and the inclined plane constructed for transport to the Ravenglass and Eskdale railway (OAN 2012).

Force Crag Mine (C), which was until 1991 the last working metal mine in Cumbria, is now owned by the National Trust; the 75-hectare (185-acre) site is accessible to walkers throughout the year and the extant processing mill is open to visitors on a number of advertised days during the summer (Grindey, et al 2008). Following an archaeological survey of the surface remains of the Low Force Workings in 1999, which contributed to an award-winning series of conservation measures undertaken subsequently by the National Trust. In 2007 English Heritage undertook further analytical survey of the adits, buildings, tracks and other remains relating to the more inaccessible High Force Workings. Although mining for barytes in the High Force Workings spanned the hundred years between 1867 and 1967, it comprised five separate phases with a total duration of only 36 years and with one hiatus lasting nearly half a century, between 1881 and 1929. Underground, this part of the mine was the setting in 1949-52 of what has been called “one of the most ambitious mining operations in the Lake District”, but most of the surface remains relate to work undertaken, arguably on an equally ambitious scale, during the 1930s and 40s.

Study of the physical remains of the coal industry in the North West has been mainly through developer-funded work. One exception was Salford University’s study of Crompton Moor (GM), which was HLF funded. This is an upland moorland area in Oldham, which rises to 400m OD, and the study identified a significant relict coal mining landscape spanning the early 18th century to 1966. The mining was undertaken by tenant farmers initially and only later by small-scale mining companies. The range of sites (from adits and bell pits to tramways and the site of pithead buildings) and quality of the surviving remains (extensive earthworks including spoil heaps, bell pits, quarries and tramways) makes this group regionally important (Nash & Nevell 2011).

Groundwork Trust and Oxford Archaeology North led an HLF community project at Jubilee Colliery near Shaw, in the uplands around Oldham (GM), following on from a pilot project run by Archaeological Research Services (2013). As well as the colliery workings, this site has excellent remains of banks of late 19th century coke ovens. The project surveyed and sample excavated key features of the complex, followed by vegetation clearance and conservation to present and interpret the remains (OAN ???).

The lowland site of Gin Pit, Astley, Wigan (GM), was investigated in 2005-7 by OAN ahead of a housing development. This work included a historic building survey of the remains of the heapstead wall of the mid-19th century, c 1900 workshops for the Astley & Tyldesley Colliery Company, and a World War Two air raid shelter, followed by targeted open-area excavation. Well preserved below-ground remains were recorded, relating to the coal shaft, access tunnels, winding and pumping engine houses and associate boilers and flues, the lamp house, and coal loading areas (Miller & Plummer 2016).

In other parts of the region the above ground remains of the coalmining industry are very fragmentary. Occasionally such structures are threatened by redevelopment and therefore recorded. Thus, the Orchard House Mine Rescue Station, dating to the 1930s, at Boothstown, Salford (GM), was recorded ahead of residential conversion (Paul Butler Associates 2013).

There have been several studies of lime kilns in the region and lime was a key commodity for farming and the local building industry until the 1960s. In Cumbria, a recent study has looked at the distribution and history of these monuments in the historic county of Westmorland and along the Pennine fringe of Cumberland (Johnson 2013). The article considers the constraints which held back large-scale lime production in the county, before going on to discuss a range of variables that help to explain the distribution and details of lime kilns in the survey area.
In Greater Manchester, the Revealing Oldknow’s Legacy HLF project undertook historic research, survey and excavation at the scheduled site of Oldknow’s Lime Kilns in Marple, Stockport. These were built in three phases between 1797 and 1802, set into the Peak Forest Canal embankment and supplied with lime and coal by a dedicated canal basin; they were unique in having internal accommodation as well as being embellished with Gothic architectural styling. Associated with the lime kilns are a series of surviving buildings: a stable block, a building for loading lime onto wagons and a similar building for loading onto canal barges via a dedicated canal arm. There were a series of tram lines of the same date which connected the terminals of the canal pending the construction of the Marple locks (Arrowsmith 2015). Community excavation of the tram lines and weigh houses are being led by CfAA.

At Worsley Lime Kiln, Salford (GM), excavation (WYAS 2010) recorded and interpreted the well preserved remains of a late 18th lime kiln next to the Duke of Bridgewater’s canal. Excavation revealed a well preserved kiln pot which was full of burnt barge debris.

Evidence for industrial-scale brick making has been recovered from several locations in the North West. Surprisingly an urban brick making site was located adjacent to Oxford Road, Manchester (GM), despite extensive disturbance from the construction of the BBC North buildings in the 1970s. The remains of a brick clamp kiln were recorded, overlain by 1840s workers’ housing and is the first time such a kiln has been revealed in Manchester. These used locally sourced clay and were built adjacent to building sites in the late 18th and early 19th centuries as Manchester rapidly expanded. The kiln base displayed characteristic ‘tiger stripes’ made by oxidised orange clay and blackened linear flues (PCA 2016).

Ahead of the OASIS Academy development, Oldham (GM), OAN excavated an 1880s kiln at the former Oak Colliery in Oldham. The kiln was a 16-chamber Hoffmann type kiln, capable of producing around 200,000 brick in each cycle of the continuous kiln. The excavation revealed that the kiln had been demolished to gallery floor level, but nevertheless retained significant detail of its form and function. The firing gallery floor retained evidence for feed-holes in the barrel-vaulting that would have originally been present, and flues from the gallery, which would have fed a central flue at a higher level were also revealed. Significantly, the flues around the south-western end of the kiln were placed on the outer wall of the gallery, demonstrating that the kiln post-dated 1870, when this improvement was added to the kiln patent. The kiln had a relatively short lifespan, and was disused by 1922. The exact reason for this remains unclear, although it is likely that it was caused by either an exhaustion of appropriate shale from the colliery, or more probably economic factors, as the local demand for brick declined as the textile industry faltered following the First World War. Even within such a timescale, an incredible number of bricks were made, and it is probable that in excess of 150 million bricks were manufactured (OAN 2010). The more fragmentary remains of the Bradford Colliery Hoffman Kiln was also investigated as part of the Bradford Colliery site development in east Manchester (GM) (Miller 2011).

Manufacturing

Textiles

The Lancashire Textile Mills Rapid Assessment Survey, carried out between 2008-10, identified a total of 1661 textile-manufacturing sites that once existed in the modern county of Lancashire (OA North 2010). The majority of the identified sites were concentrated in the southern and eastern parts of the county, corresponding to Pennine Lancashire. In addition, important concentrations of urban textile-manufacturing sites have been identified in Preston, Chorley, Clitheroe and Lancaster, with notable
rural examples existing on the periphery of these centres. Of the 1661 textile-manufacturing sites identified, a total of 619 were found to survive, or were partially extant, which equates to an average survival rate of 37.27%, although this varied between the component boroughs. This total includes examples from all branches of the textile-manufacturing industry, although in some cases, such as textile-finishing works and flax mills, very few buildings survive.

In order to inform policies to help protect the remains of the county’s rich and internationally significant industrial heritage, a comprehensive Buildings at Risk (BAR) assessment was carried out as a second phase to the project. Undertaken between 2011-15, this aimed to provide an overview of the stock condition, occupancy and ownership patterns of the buildings. This was coupled with a detailed record of selected examples that were used to illustrate the historical development of the functional and architectural types that were noted for the various branches of the industry in the Rapid Assessment Survey, and allowed for any differences spatially across the county to be determined.

In Greater Manchester, GMAAS and CfAA are undertaking a Buildings at Risk survey, funded by Historic England, of Greater Manchester Textile Mills. The survey is revisiting the mills recorded by GMAU/RCHME in the second half of the 1980s. The first phase has been completed which included a desk based assessment of mill survival and a pilot study visiting the mills in Oldham borough and determining their condition and level of occupancy. It is estimated that 46% of the mills identified in the 1980s survey have been demolished. In Oldham, 70% of the mills were in reasonable condition and in use; however, three of the listed mills were in very poor condition and vulnerable (CfAA 2016). A series of recent mill fires has drawn attention to the risk from arson. The second stage of the survey is underway and due to complete in May 2017.

Through the use of planning conditions, the local government archaeological advisers (GMAU then GMAAS) have secured the implementation of a large number of historic building surveys and below-ground investigations of the area’s iconic remains relating to the textile industry. There have been 40 historic building surveys, either to record textile mills and finishing works prior to demolition or to inform conversion schemes. Alongside this work, there have been 25 excavations of textile mill sites and 12 textile finishing sites.

Murrays Mill, Manchester (GM) has seen the most detailed mill survey. This Grade II* mill was recorded by OAN during a significant fabric consolidation project. The survey and below-ground investigations resulted in a publication (Miller and Wild 2007), which also includes the results of development led excavations of other mills and workers housing in the Ancoats area, particularly for planning led investigations undertaken for the New Islington regeneration project.

Mellor Mill in Stockport (GM) has seen several years of excavation by the Mellor Archaeological Trust to reveal the mill foundations and massive internal wheel pit, which will be landscaped and interpreted as part of the Revealing Oldknow’s Legacy project. Built by Samuel Oldknow in 1792, and burnt down a hundred years later, this was possibly the largest water powered mill in the world at that time.

Ahead of regeneration, OAN fully excavated Arkwright’s Shudehill Mill, Manchester, site following on from a Time Team evaluation in 2006. The mill was built in 1783 as one of the world’s first mills to make use of steam power. The mill was destroyed by fire in the mid-19th century and re-built as a textile warehouse. Buried remains of the multi-phase power systems were exceptionally significant and included the original wheel pit, engine houses and boiler beds. The results have been published as part of GM Past Revealed (Miller 2015), however further publication, online dissemination and on-site digital interpretation is also planned.
In late 2016, Salford Archaeology excavated the remains of Salford Twist Mill No. 3, Salford (GM). Well preserved remains of the basement included intact cast iron framework for innovative fire proofing, dating to c.1800, with the use of hollow cylindrical columns for very early steam heating. The mill was the second to use gas lighting and had its own gas retorts, and provided gas to the world’s first gas lit street – Clowes Street. There was an exceptionally large for the time steam engine of 60hp provided by Boulton and Watt. Drawings survive in the latter’s archive. A report on the results is pending, but there is also a commitment to publish this site and create a heritage display.

There have been a number of textile mill building surveys undertaken in the last ten years, secured through planning conditions either to make records prior to demolition or to inform conversion schemes. Examples since 2006 include: Brownhill Bridge Mill, Slackcote Mill, Diggle Mill, Brook Mill, Greenfield Mill, Rugby Mill and Gem Mill in the Oldham borough (GM). In the last ten years there have been 40 mill surveys carried out through the planning system in Greater Manchester?

Brownhill Bridge Mill, Dobcross, (GM) is a Grade II listed water-powered mill that was recorded ahead of proposed conversion to residential use. It was first built around 1772 by three entrepreneurs, on the packhorse road from Dobcross to Uppermill, and part of its bridge still stands, now cut off by the bridge of the 1863 Dobcross New Road turnpike. The mill was built alongside the Diggle Brook and powered by an internal water wheel, initially served by a leat and then a reservoir by 1822. The wheel remained until the 1940s and its filled-in pit survives, along with water power features such as the headrace and tailrace openings and dam overflow; there are also remnants of mechanical and hand power systems. Brownhill Bridge Mill is already recognised as a significant example of an early domestic type mill by its inclusion in the Greater Manchester HER(No. 6360). As a relatively unaltered example of its kind, it is a building of importance not just locally but also in the wider context of the early Greater Manchester textile industry (Miller 2009).

As part of the Metrolink Eastern extension to Ashton under Lyne, Northern Archaeological Associates have carried out excavation and recording of remarkably well preserved industrial remains at Pollard Street in Ancoats, beside the Ashton Canal. These include the early 19th century Pollard Street Mill, with engine bed, boiler house, coal store, chimney base and flue system and the Soho Iron Works, dating to the early 1900s, which displayed excellent remains relating to a double engine bed, early tram road, a Nasmyth Forge Hammer, canal side steam crane, and former canal arm (NAA 2011).

The remains of a once famous and unusual Stockport landmark – the Edward Street Windmill (GM) were uncovered in advance of redevelopment, erected in the 1780s to power a cotton mill. Despite the site having already been redeveloped for car show rooms in the 1920s, there were impressive foundations for the windmill and fragmentary remains of the adjacent cotton mill (Wardell Armstrong, 2016).

In Cheshire, targeted programmes of mitigation have been undertaken on several mill sites, primarily in Cheshire East, where work has concentrated primarily on wheel pits and power systems, and building recording (see for example Bath Vale mill, Congleton ECH4382). The most important of these was the excavation of the wheelpit, leat system, and remains of the line shafting that powered the Old Silk Mill in Congleton. The power system was designed, and probably installed, by James Brindley (Fletcher 2008).

Textile Finishing

The extensive Grade II listed Wallsuches Bleachworks at Horwich (the only listed bleach works in Greater Manchester), underwent a detailed scheme of archaeological recording, providing important
new information on the early origins and character of textile finishing, and becoming a type site for industrial archaeology. In 2005-6 a programme of archaeological monitoring and an open area excavation of the bleaching croft revealed significant remains and allowed an extensive re-interpretation of the site (UMAU 2009). This is one of the most detailed archaeological studies ever undertaken on a textile finishing works in Britain, although it remains unpublished.

Well preserved remains of a c. 1820 dyeworks and workers’ housing were recorded at Adelphi Street, Salford, beside the river Irwell, with a regionally important assemblage of clay pipes dating to the 1810s that included a lot of kiln waste (OAN 2008 and Higgins 2016). The late 18th century logwood mill and early 19th century Crescent Road Dye Works were also excavated and significant remains of multi-phased walls and dye vats were recorded, as well as a rare survival of a late 18th century wheel house projecting into the river. This structure will be retained under a proposed riverside walkway and interpretation panels provided (ARS 2016).

A building survey by OAN recorded the buildings of Cheadle Bleachworks, Stockport (GM), a former medieval corn mill, ahead of redevelopment for apartments (OAN 2008). The Bleachers Association early 20th century plan informed the building survey and facilitated interpretation of some of the excavated features which included a set of stone lined bleaching tanks.

Tottington Print Works, Bury (GM), was the site of a community archaeology excavation in 2010, led by OAN. The industrial remains lie under a thin cover of vegetation in the Kirklees Valley which was a major centre for textile finishing. Well preserved remains of a variety of cisterns, flag floors and engine beds were exposed and the results are published in GM Past Revealed 6 (Miller 2012). Excavations at Carlyle Street, Bury Ground, Bury (GM) were undertaken during the first phase of development at the site and the evaluation has uncovered well preserved evidence for a goyt and a secondary water channel, a wheel pit, building walls and floors relating to Howarth, Peel and Yates Calico Print Works (1773) and subsequent developments.

The textile industry in the North West also encompasses several smaller branches such as fustian and felt hatting production both of which have been studied since 2006. Roger Holden has written an overview of the fustian industry in Lancashire and Cheshire England (Holden 2016). Fustians are heavily wefted cloths, which includes cotton velvets. Some fustian, principally corduroy, and all velvets were woven with weft floats which were cut after weaving to form a pile. This remained largely a manual operation, in some cases still being carried out in domestic workshops, into the 20th century. Although some cutting was carried out in the Rochdale, Todmorden, Hebden Bridge and Oldham areas, where these cloths were produced, velvet cutting in particular came to be situated in the Warrington area, in east Cheshire, where Congleton became the centre of the industry, and in adjoining parts of Staffordshire and Derbyshire. In its domestic phase the industry used top floor workshops similar to those used by weavers. The long narrow mills built for silk throwing were suitable for conversion to fustian cutting and purpose built mills took a similar form. Some of these buildings survive in alternative commercial or residential use as at Congleton.

Felt hat making saw the production of hats from rabbit fur. Early references to the domestic industry occur in the 17th century, but largescale production only began in the 18th century. Denton, Haughton, Manchester and Stockport (GM) emerged as centres of the domestic industry in the late 18th century (Nevell, Grimsditch & Hradil 2007). Mechanisation in the mid-19th century saw the emergence of concentrated, formalised production. This has two major steps. Firstly, wet side production where the felt hat body was made, a process done in single storey structures with access to water and power. Secondly, dry side production that involved finishing the hat design with a brim, liners and trimmings. This process remained largely unmechanised and took place in multi-storey structures and sometimes at home for more specialised products. Although these manufacturing processes were sometimes
found in re-used cotton spinning mills, most were housed purpose-built structures in Denton and Stockport, which emerged as the national centres of this mechanised industry in the late 19th century. The study as part of the Tameside Archaeological Survey provides an introduction to the manufacturing processes, machines and the surviving felt hatting buildings of Tameside and Stockport (Nevell, Grimsditch & Hradil 2007).

Chemicals

In the first half of 2006, a multi-disciplinary team of archaeological and architectural investigators, illustrators and photographers from English Heritage’s Research Department undertook survey and investigation of the disused Gatebeck Low Gunpowder Works and associated workers’ settlements of Endmoor and Gatebeck (C) (Archer et al 2009). Together with a more rapid survey of the adjoining Gatebeck High Works (in reality part of the same site) which took place immediately afterwards, the survey was the last in a Departmental project investigating the seven gunpowder works that operated in the historic counties of Westmorland and Lancashire North of the Sands (modern-day Cumbria) between 1768 and 1936. The study has resulted in not just a detailed understanding of the history, form and power-supply arrangements of the surviving industrial structures (four pairs of incorporating mills, a glazing house, two corning houses, a stove house plus ancillary buildings and associated features) but an in-depth appreciation of how the factory and settlements developed over time, and how these changes relate to the gunpowder industry regionally and nationally.

Well preserved remains of an early 19th century tannery were excavated by CfAA Salford University on a waterlogged site at Kitchen Street, Rochdale (GM) (CfAA 2012). This took the form of a series of timber tanks for processing the leather. In 2010-12 OAN excavated remains of Clayton’s chemical industry, east Manchester (GM), ahead of redevelopment for Manchester City’s football training ground (Miller 2013).

Metal Working Industries

The remains of the metalworking industries (processing of ores and the manufacturing of goods) have been investigated extensively in the last decade. More generalised landscape surveys of metal processing have tended to be asset management led, whilst the excavation of metal working or manufacturing sites in industrial urban towns have tended to be excavated and recorded through the developer-funded planning process.

Historic England’s study of the lead mining landscapes of Alston Moor and the industrial village of Nenthead (C) has already been mentioned under extractive industries (Jessop & Whitfield with Davison 2013). This study focused on the development of the mining landscape and the surviving domestic buildings associated with the local communities as well as mineral processing activities.

In the upper Ribble Valley a survey of the Ashnott lead mine (L) has recorded many landscape features associated with lead processing. Located in southern part of the Forest of Bowland AONB, this landscape is of particular interest for its evidence of complex, successive phases of mining originating in the medieval period (Went 2014). From the early 16th century, if not before, miners created an intricate pattern of interconnected workings by chasing erratic lead deposits present within the Ashnott limestone knoll. Exploration began with open-cuts and shafts, and culminated in levels driven into the hillside to exploit deeper deposits and to facilitate underground transport and drainage. A broad sequence of development can be determined within the earthworks visible across the surface of the knoll. The area presently designated as a scheduled monument encompasses the greater part of these remains, apart from two dams to the east and two adit entrances to the west. It also appears to include, based on records of exploration in 1961, the majority of the known underground workings,
with the exception of the greater part of a deep drainage level extending to the north. A major collapse in the price of lead, combined perhaps with the marginal nature of the mine, appears to have brought an end to the Ashnott operations in the 1830s.

Urban excavations have been concentrated in the Manchester city region. However, in Cumbria excavation of a post-medieval brewery at Irish St, Whitehaven, and excavation of a foundry and soapery at Albion Square, also in Whitehaven, demonstrates the importance of metal working in the market towns of the region (CWAAS Transactions 2015????). A recent (2016) HLF community archaeology project has also been undertaken at Cunsey Forge (C), one of many 18th and early 19th century forges found in Cumbria, Lancashire and parts of Cheshire.

Several iron works have been excavated through planning conditions. In Greater Manchester SLR excavated the remains of Ashbury’s Carriage Works and Iron Foundry, Gorton, Manchester, ahead of the construction of a Network Rail control centre. The excavation produced extensive, well-preserved archaeological remains, including include a variety of iron furnaces, large slag deposits, flues, chimneys, steam engine and eight Nasmyth hammer bases, the site of a travelling crane, and a regenerative furnace and associated flue system. Scientific analysis carried out on the slag deposits. The carriage works operated from 1841 producing carriages and wagons for railways and tramways until it was demolished and cleared in 1926.Very little documentary material survived for what was one of the largest engineering works in the region. Several carriages are still in use on heritage railway lines. The project is notable for using the knowledge of members of the Manchester Region Industrial Archaeology Society as site volunteers to supplement the archaeologists’ technical skills. Additionally, the site showed how much information archaeology can provide on an industrial site with very little documentation (SLR 2013; Hayes 2014).

In 2007, excavations by OAN ahead of a new Bus Station site on River Street, Rochdale, recorded significant remains of John Petrie’s iron works. The original works of the 1820s were sealed beneath a later floor when the site was remodelled in around 1850. John Petrie patented a wool scouring machine in 1853. A boiler house, flues chimney, engine base and casting pits were preserved. 52 box mould core fragments manufactured from a mixture of compacted silica sand with a low clay content were collected. An adjacent brass works dating back to 1831 was also partially excavated and recorded (OAN 2009).

The Sports City development, saw the excavation of remains of Bradford Iron Works, East Manchester, which was constructed adjacent to the Bradford Colliery in the 1850s by Johnson and Nephew. The excavation of Bradford Ironworks provided evidence for the remodelling of the original forge area with the installation of a range of boilers. The remains of a Siemens-type regenerative furnace was also revealed (OAN 2011).

Soho Iron Works, Pollard Street, Manchester, dating to the early 1800s, displayed excellent remains relating to a double engine bed, early tram road, a Nasmyth Forge Hammer, canal side steam crane, and former canal arm (NAA 2011).

8. Trade, Exchange and Interaction

There has been a steady stream of studies and developer-funded work on sites associated with trade, exchange and interaction since 2006. The study of workers’ housing, in particular, has provided ceramic assemblages that should go some way to identifying the various trade and social links that were emerging during the 18th, 19th and early 20th centuries. Current national research on industrial urban finds assemblages is honing in on issues such as domestic house building quality, household mobility, localised production, overcrowding, poverty, sanitation and disease (Cassella 2009; Cessford
Recording, research and publication over the last decade has been across three main areas; warehouses and commercial premises, ports and harbours, and new industrial transport systems (canal, railway and car).

**Warehouses & Commercial Premises**

Individual historic building surveys of commercial warehouses and premises in Liverpool (M) and Manchester (GM), and in smaller commercial centres such as Chester (Ch), Rochdale (GM) and Stockport (GM) have been undertaken in the last decade as part of the planning process. A wider framework for understanding these particular building types is provided by several synthetic studies. This includes an overview of the commercial and official buildings within the business and dock districts of Liverpool, tracing their development from the late 18th century to the mid-20th century (Sharples & Stonard 2008). A study of the northern quarter of Manchester encompassed the warehouse buildings of the late 18th to late 19th century in this area of the city. Many of these structures pre-dated the arrival of the railways and were associated with textile and food distribution (Taylor and Holder 2008).

The cross-over of this subject with historical evidence is indicated by several studies of the development of the Rochdale canal basin, also in Manchester, from 1792 to 1856 (Maw et al 2009: ????). These combined documentary and buildings archaeology material to chart the laying out, construction, and use of eight warehouses and 25 wharves and assessed the basin’s economic functions.

**Ports and Harbours**

Study of the traditional ports and harbours of the North West has been led by a mixture of developer-funded archaeological work and historic study. Thus, Robinson has provided an overview of trade and shipping along the Cumberland in the 50 years before 1735 (Robinson 2008). An overview of the later development of coastal trade as it effected Carlisle was given by Caron Newman (Newman 20?). At Lancaster, excavations behind the 18th century quay revealed the remains of a pottery kiln and its waste tip. Sadly, this creamware manufacture site remains unpublished and more crucially the post-excavation analysis unfinished.

The investigation of Liverpool’s river frontage in the 2000s, undertaken ahead of the building Liverpool Museum and the Liverpool One shopping centre have been partially published (Gregory et al 2014). This work revealed details of the port’s expansion in the 18th and 19th centuries. Unfortunately, the excavation work on Liverpool’s first dock, built in the 1700s, and probably Britain’s first wet dock, remains unpublished.

In Cheshire, a number of reports have appeared concerning the development of Chester’s waterfront and port (Dodd 2011; Hewitson and Scruby 2011; Nash et al 2011; Poole 2011; Reid 2011). These excavations and building surveys trace the rebuilding of the port of Chester on the Roodee from the mid-18th century to the mid-19th century, recovering evidence for cranes, quayside warehouses and the development of the quay structure itself.
One of the few studies of the turnpike system has looked at the route from Knott Head to Thornwaite (C) (Denman 2007). Another rare analysis of early roadside infrastructure is a study of Bewcastle’s (C) waterside inns (Jennings 2011). In Greater Manchester, a council-run HLF project removed the 20th century sections of Rochdale Bridge, in the centre of the town, to expose the River Roch and the original medieval to 17th century bridge fabric (May 2011).

The 250th anniversary of the opening of the Bridgewater Canal, the first arterial industrial canal, has led to an upsurge in archaeological research on the buildings, functioning and economic impact of the canal (Nevell 2013; Nevell & Wyke 2011; Nevell et al 2016). The impact of the buildings of the Manchester Ship Canal in the 1880s and the opening of the Manchester Docks in the 1890s has also been the subject of recent archaeological and historical study (Nevell & George 2017).

The continued rebuilding of much of the 19th century railway fabric has continued to threaten redundant infrastructure such as railway warehouses. This was the subject of a regional study for the North West (Nevell 2010) and more recently a national survey of the building type (Minnis 2016), the latter discussing in detail the movement of goods and the resultant variety of building plan forms. The installation nationally of electronic signalling systems has made thousands of railway signal boxes redundant. This led to a national listing programme, with several site son the North West protected, and a study of the building type by Historic England (ref????).

The 19th century railway infrastructure of the region has also been the subject of research and recording through the planning process. The electrification of the Liverpool to Manchester and Manchester to Preston routes has led to recording of historic industrial archaeology remains, including the removal and replacement of the Chorley flying arches. A rare chance to investigate two railway stations came ahead of redevelopment in Greater Manchester. An open area excavation took place at the site of Knowsley Street, Bury, railway station (opened in 1848), revealing well preserved remains and evidence for phasing of the relatively short-lived station site (OAN 2008). Pre-Construct Archaeology have carried out a detailed building survey of the remains of the late 19th century Exchange Station site in Salford, ahead of demolition to make way for new office blocks [???? 2017].

The lives of the navies and construction workers who built the railways was investigated for the first time in the region in 2010. Channel 4’s Time Team programme investigated a navy camp at Risehill, on the Great Central Line in Cumbria, revealing the workshops and domestic huts of the 1870s camp built to construction the tunnel through this part of the Pennines at over 300m AOD (Brennan 2015).

Finally, little work has been undertaken on recording the 20th century road infrastructure of the region. However, a national survey by English Heritage has identified a range of building types, from fueling stations to roadside guest houses and phone boxes that are threatened by redevelopment. A number of North West examples were include in this study (Morrison & Minnis 2012).

9. Defence

There have been a variety of initiatives undertaken by a range of professional and voluntary bodies, on the defence archaeology of the region since 2006. Unlike some research topics, local voluntary groups has been very active in recording the military archaeology of the North West. In part, this is due to the hundredth anniversary of the First World War (1914-18) and consequently dedicated funding flowing from the HLF and Historic England to encourage such projects. Whilst much of the research focus has been, therefore, on the First World War, redevelopment activity has affected...
several later 20th century military sites across the region, whilst other community engagement projects have studied defensive sites from the 19th century.

Military Archaeology before 1914

Study of the remains of the 18th and 19th century defensive structures of the region continue to be uncommon. The Rapid Coastal Zone assessment (ARS 2009) and the Citizen projects have tended to focus on 20th century coastal sites. Inland, the early 19th century shift towards stationing troops outside the growing major industrial populations of the southern part of the region, at manufacturing and port towns such as Ashton-under-Lyne, Bolton, Liverpool, Manchester and Preston, has been little studied by archaeologists and historians. A notable exception is the archaeological investigation of the Hulme Cavalry Barracks in Manchester. This was the home of 27 different regiments during its existence from 1804 to 1915, and the 15th King’s Hussars was stationed here when they took part in the Peterloo Massacre in 1819. In 2013 Salford Archaeology led a community dig of the site, now within George Park, Hulme, as part of the Dig Greater Manchester project, and discovered well preserved remains of some of the 19th century buildings and adjacent workers’ housing, some of which were rented by retired veterans from the barracks.

World War One Remains

Three national projects have helped raise awareness of surviving First World War military remains in the region. The Council for British Archaeology’s Home Front Legacy project (2014-18) was set up to help local communities identify and map the remains of the First World War across the UK. A series of training seminars and online tools were designed to support the project. The range of data included documentary, map, oral and photographic evidence, as well as physical evidence that could be uploaded to the project website and passed on to the relevant Historic Environment Records and the National Monuments records. A significant number of individual sites have been identified in the North West, whilst a number of excavations have also been recorded (see below).

The Rapid Coastal Zone Assessment Phase 1 identified a large number of nationally important WWI & WWII remains along the NW coast, particularly around the major ports/docks/shipyards of Liverpool & Barrow (Johnson 2009). Some of these have received subsequent investigations through community projects, including Fort Crosby on the Sefton coast just north of Liverpool, where there was a training fort with its own railway station and defences (Burns 2015).

A national survey of First World War national factories was published in 2015 (Kenyon 2015). This overview of their archaeological, architectural and historical importance includes at least 39 sites in the North West, out of 216 sites in England. These were mainly concentrated around Liverpool and Manchester, but there were outliers at Blackpool, Carlisle and Chester, for instance. Such sites were under the direct control of the Ministry of Munitions producing vital war material, everything from wooden boxes, respirators, shells, and explosives to optical glass and vehicle radiators. Many were adapted from existing works, as at Cloughfold, Holme and Irwell mills in Rawtenstall (L), the Hyde Road tram depot in Manchester and Woodley Mill (GM)(all surviving), while others were located in specially designed factories, such as at East Cumberland in Carlisle, Gretna, Heaton Chapel, Liverpool and Morecambe (again all surviving). Some were finished to high architectural standards and followed the latest thinking in factory design and the provision of welfare facilities. At some locations housing was included. The report discusses the historic context of the National Factories, the types of factories created, their layouts and architectural form. It also explores their social history, including evidence for the organisation of work, welfare provision and, briefly, associated housing. It documents each factory and includes short desk-based assessments of the extant factories.
Excavation on practice trench sites have been undertaken. The so-called Loos Trenches on Watson Road in Blackpool, Lancashire, were investigated in 2014 by the University of Salford. Dating from 1915 these trenches were kept open and re-used as a visitor ‘attraction’ until the end of the war. Archaeological excavation uncovered communication and front line trenches, the latter including firing steps. Excavations also at Walney Island, off Barrow, Headlands to Headspace (H2H), an HLF-funded Landscape Partnership have investigated military defences, such as First World War rifle butts and a Second World War target range and RAF Walney a gunnery school and airfield established in 1941. This work also included the excavation of First World War practice trenches on Walney Island with the University of Bristol.

Elsewhere, The Hooton Park Trust has been working on restoring First World War buildings at Hooton Park aerodrome (Ch). This site was established in 1917 and was used by the RAF until its closure in 1957. The original three Belfast-truss World War One hangars survive and The Hooton Park Trust restored the World War 1 era Central Hangar, Building 17 before 2012, whilst two further hangars, Building 17 and 18 are now also being restored.

World War Two Remains

Less attention has been paid to the remains of the Second World War since 2006. Developer-funded work, however, has led to the recording of particular sites, including a Second World War airfield remains to the north of Nantwich (Ch), and at Lucas Green, Whittle-le-Woods (L), a Bofors gun (Light AA) permanent emplacement site was excavated and presented as part of a housing development close to the site of ROF Chorley. In Hapton (L) two adjacent 'Blacker Bombard' (aka Spigot Mortar) positions and a possible ammunition store were recorded and protected by Listing in advance of housing development. A rare anti-aircraft battery from World War Two was recorded at Nook View Farm, Tameside (GM). The fragmentary remains included a concrete magazine block and the site of the command bunker (Arrowsmith 2012).

A 900 plus housing scheme at Woodford Aerodrome, Stockport (GM), involved total demolition of the airfield buildings. The site dates back to the 1920s and is famous for assembly of Lancaster Bombers, and construction of the Vulcan Bomber and Nimrod aircraft. Remains of the original 1920s hangar were found to have been extensively remodelled (CgMS ref; Wessex Archaeology ref). An historic building record was required by BAE Systems of two buildings due to be demolished at the former Orica UK, Roburite Centre near Shevington, Wigan. This report synthesises the results of a Level 3 historic building survey of two buildings on the site (known as Buildings 24 & 27) which were formerly used as magazines (AOC Archaeology 2011).

At 27 Buxton Road, Hazel Grove, Stockport, the Tameside Archaeological Society record remains of anti-invasion defences. The site was a WW2 concrete cylinder manufactory but the numerous concrete cylinders nearby were recorded. The cylinders were used as anti-tank traps, probably on a nearby ‘stop line’ (TAS 2010). A manufactory base for these tank traps was discovered in 2016 during the excavation of a development site at the bottom of Deansgate in Manchester. This was the site of the engineering works used by Bateman and Sherratt. A large number of concrete cylinders piled on the site indicated its re-use for making such tank traps during the Second World War (Salford Archaeology 2016).

World War Two air raid shelters continue to be recorded and include examples at Adelphi St in Salford (Gregory & Miller 2015), Gin Pit Colliery in Wigan (Miller & Plummer 2016), Angel Street, Manchester (Miller & Wild 2015), and First Street South, Manchester (all GM). The latter was built on a communal scale with an area of former housing being used for a planned series of sunken corrugated iron structures with blast proof entrances.
10. Legacy