People Versus Machines or People and Machines? Current Research Directions within British Post-medieval and Industrial Archaeology

By MICHAEL NEVELL

This chapter reviews the continuing debate about the scope and role of industrial archaeology that was sparked by the publication of Understanding the Workplace, a research framework published by the Association for Industrial Archaeology in 2005. Since this volume focuses upon the landscape and social impacts of industrialisation, a number of industrial archaeologists have felt that the traditional interests of the discipline, the survey and recording of manufacturing processes and power systems, were being ignored or even marginalised. This discussion argues that such is not the case; that rather this research framework is complementary to these traditional research activities. Furthermore, it argues that there is now a range of approaches that provide a research toolkit, a set of archaeological methodologies and theoretical approaches that can be applied to the archaeology of industrialisation. Some of these approaches concentrate wholly upon the recording of technology, others upon the landscape changes and social context. None is exclusive of the other; indeed, they work best when these issues are considered together. Together, they provide a shared research agenda allowing industrial archaeologists to explore our understanding of the interconnection between machine and landscape and society and technological change during the era of industrialisation

INTRODUCTION

Since the publication of the Association for Industrial Archaeology's first overarching research agenda in 1991 and the publication of David Crossley's book on *Post-Medieval Archaeology in Britain* in 1990[1] there has been a huge upsurge in the excavation and survey of 16th-, 17th-, 18th- and 19th-century sites. Most of this new work has been done through the medium of developer-funded rescue archaeology, which in turn has led to an increasingly large body of data and a consequent need to both order and interpret this information. Understandably this new work has led to new theories and debates about the material culture of these centuries, and indeed the development of several distinctive archaeological approaches based around the physical remains recovered. A brief summary of these developments can be found in my Rolt Memorial Lecture of 2005.[2] I don't see the need, and it is not my intention, to repeat the overview of the development of industrial archaeology presented in that lecture, but I do see the need to review the continuing debate about the scope and role of post-medieval, industrial, and historical archaeology, particularly in respect to industrial archaeology.

THE CURRENT DEBATE WITHIN INDUSTRIAL ARCHAEOLOGY

Between the spring of 2006 and the winter of 2007 there was a vigorous debate on the nature of industrial archaeology in the pages of *Industrial Archaeology News*,[3] which was picked up in several articles in *Industrial Archaeology Review* and was also mentioned in the pages of the *Newsletter* of the Society for Post-Medieval Archaeology. As also discussed by Gwyn and Holden in this volume, this debate was sparked by the publication of the research agenda volume *Understanding the Workplace: A Research Framework for Industrial Archaeology in Britain* by the Association for Industrial Archaeology (AIA) in 2005.[4] The focus of this volume was the landscape and social impacts of industrial archaeology during the latter part of the post-1550 period.

The comments sparked by this 2005 research volume fall into three categories. Some correspondents argued that industrial archaeology is completely separate from so-called 'mainstream' or 'conventional' archaeology. To these writers, the absence of detailed studies of industrial manufacturing processes within the 2005 agenda volume was an attempt to marginalise traditional approaches to industrial archaeology. These writers suggest that not only is industrial archaeology just about the archaeology of technology, an ancient debate that goes back to the 1950s, but that it can only be practised by those with science and business backgrounds. This extreme elitist view found its fullest expression in the preamble to two otherwise scholarly papers in *Industrial Archaeology Review* [5] in which the writer concluded that 'the image industrial archaeology extends to the outside world remains one of a lack of definition, absence of coherent methodology and falling short of academic credibility'.[6] Such comments appear to be founded upon, firstly, a complete lack of understanding of archaeology as a discipline based upon the examination of physical evidence and secondly, on a misreading of the aims of the 2005 Research Agenda, which quite explicitly stated that the volume was designed to be a complement to, not a replacement of, the study of technological processes and their development.[7] There is also, in the above-cited criticism of the 2005 volume, a complete rejection of the intellectual framework that both industrial archaeology and post-medieval archaeology have developed since Crossley's and Palmer's works in the early 1990s, and a dismissal of the early 21st-century industrial archaeology field-recording techniques pioneered within the professional units as 'inadequate' and 'uncritical'. In the end, one has to accept that critics such as these do not wish to engage with the wider archaeological community and that the best we can do in an early 21st-century context is to respect their point of view.

Of more relevance and academic coherence are a set of opinions best exemplified by the well-informed and thoughtful comments of Roger Holden, whose initial letter in the spring edition of *Industrial Archaeology News* sparked the debate.[8] His intellectual strand puts the understanding of technology within an economic/business history point of view at the heart of industrial archaeology studies during the period of industrialisation. It accepts the need for a wider context but rejects theorisation that fails to engage with technology by hiding behind social-science jargon. From this point of view, the lack of discussion of technology within the *Understanding the Workplace* volume risks separating two sides of the same debate; technology from society. Further, it was argued by some of those who contributed to either *Industrial Archaeology Review* or *Industrial Archaeology News* that the

Workplace volume gave the impression that the industrialisation period could be studied without any understanding of the role of technology in reshaping society.

Finally, there are the well-documented views of researchers such as myself and Marilyn Palmer who have been arguing since the late 1990s for the widening of industrial archaeology to include landscape and social issues.[9] The conference upon which the *Understanding the Workplace* volume is based 'was intended to stress the role of human agency in the creation of the artefacts, buildings and landscapes that survive from our period'.[10] The role of this conference and the subsequent *Understanding the Workplace* volume was neither to advocate the supplanting of the study of technology, nor to minimise its role, but to provide a complementary line of discussion based around its social impact.

At this point, it is worth noting that the latter view has much in common with that of British historical archaeologists such as Sarah Tarlow. For instance, Tarlow has recently suggested that 'in re-assessing our approach to the archaeology of the eighteenth and nineteenth centuries we must consider the central issues of power, in equality, capitalism and class'.[11] While many industrial archaeologists would probably question whether these were the central issues during this period in Britain, rather than being the consequences of industrialisation, her assertion does open new avenues for debate between historical archaeology and industrial archaeology. We need to be aware of the historical archaeology tradition in our discussions,[12] if only to say that we have considered them and regard some or all of these issues as more suited to historical archaeology approaches than industrial archaeology methodologies.

TECHNOLOGY, INDUSTRIALISATION AND SOCIAL CHANGE

Central to all three strands of opinion that have been debated since the publication of the *Understanding the Workplace* volume is the role of technology in the transformation of British society during the 18th and 19th centuries. I have argued elsewhere[13] that the part played by technological change during this period might best be understood through looking at the wider role of industrialisation and that industrial archaeologists, with their interest in the development of technology, landscape and society, are best placed to do this within a British context.

At this point it is useful to remind ourselves what we mean by industrialisation. In the context of Britain during the 18th and 19th centuries, industrialisation refers to rapid technological change leading to extensive urbanisation, the development of large-scale factory-based industries, and social changes such as the growth of an urban working class, the development of a surplus-producing agricultural sector, and the growth of an extensive middle class. The culmination of the industrialisation process is a society that moves from being an agrarian, rural-based community to an urban, manufacturing-based, one.

As Matthew Johnson has reminded us on several occasions, these changes have deep roots that take us back in to the late medieval period and the emergence of a fully monetary, capitalist economy in Britain on the back of transformations in landholding and use in the countryside and the emergence of the idea of the individual.[14] Whether industrialisation is a consequence of the emergence of a capitalist system as outlined by Johnson, or whether

industrialisation is a separate but related process, is a discussion well worth having but not appropriate for the present purposes. This debate will, however, have implications for the way archaeologists view the development of a world economy in the later 19th and 20th centuries based around mass-production and urbanisation. Taking a long view on these processes does allow broad trends and linkages to be studied at a local, regional and national level.

The thrust of the Manchester Methodology,[15] for instance, was to attempt to bring order to the mass of new archaeological data for the period 1600–1900 by studying the link between contemporary social structures and the emergence of new types of archaeological sites, particularly industrial ones, during these centuries; in other words, to link local people with manufacturing industries. As both David Gwyn and Colin Rynne have noted, the social categories used in the original study area of Tameside, North-West England, are not directly applicable in areas such as the Vale of Ffestiniog in North Wales, and County Offaly in the Republic of Ireland, both areas where the Manchester Methodology has been applied.[16] However, the principle of linking archaeological sites to social groupings over time does appear to be transferable between the three countries, allowing comparisons to be made between these three areas during the era of industrialisation, and emphasising, if nothing else, how localised this phenomenon could be.

Individual studies using this methodology do not provide an explanation of the causes of the industrial transition, but they do provide a way of describing the changes that took place during the period. Furthermore, one might suggest that an archaeological explanation of the industrialisation phenomenon in the islands of Britain might be sought in the differences visible between these individual regional studies. However, we are a long way from having a critical mass of studies that would allow comparisons with the industrial and non-industrial areas of England, Ireland, Scotland and Wales. To achieve this critical mass would require summarising much of the regional grey literature database and targeted local and regional fieldwork, alongside a detailed knowledge of local industries and their social context. It would have to be a multi-disciplinary project requiring an understanding of both the industrial and social context at local and regional levels.

One way of beginning to bring together the local and regional social context of industries might be to look at the growing number of published regional research frameworks within England. The English regional research initiatives sponsored by English Heritage have taken a variety of approaches but follow a standard format of assessment, agenda and strategy.[17] Within the assessment volumes, each chapter deals also with a standard set of broad issues from rural settlement and land-use, urban settlement, ritual, religion and ceremony to technology and production, trade, exchange and interaction and defence, warfare and military activity. Of those assessment volumes so far published (East Midlands, East of England, London, the North West, the South West, West Midlands, and Yorkshire) various approaches to the archaeology of the post-1550 centuries have been taken. Both the South West and London volumes incorporate a single chapter covering the post-medieval, industrial and modern eras. In contrast, other regions have adopted a two-chapter approach. In the West Midlands volume, the era is divided into the earlier post-medieval period and later post-medieval period, while the East Midlands had post-medieval and modern chapters,

and the North West post-medieval and industrial chapters. Yet this diversity of approach and nomenclature hides many common themes from region to region, which would help in identifying suitable areas for the Manchester Methodology approach. The fact that we can even begin to contemplate such a research project is a testament to the way in which the recording of industries and the development of a variety of theoretical approaches to the era of industrialisation have grown in the last decade.

RECONCILING PEOPLE AND MACHINES: INTERPRETIVE ARCHAEOLOGIES

With such a range of approaches to the era of industrialisation is there really a need for the continued tensions between those more interested in technology than landscape, and those more interested in social context than in industry? After all, different data sets can be analysed in different ways. Take, for instance, the example of textile mill distribution and their potential meanings around Manchester. Between the mid-18th century and 1926, 1,617 textile mill sites (spinning, weaving and finishing), spanning the cotton, silk and wool branches of the industry, were built within the Manchester region (Greater Manchester).

In 1999 and 2002, Roger Holden published two articles that studied the distribution of later steam-powered textile mills in the Manchester area.[18] Holden noted that many post-1890, steam-powered mills were located beside water-courses, both canals and rivers, and most notably in mill towns such as Ashton-under-Lyne, Dukinfield and Stalybridge in Tameside, where the river Tame and the Ashton and Huddersfield canals ran side-by-side. His 1999 paper set out to examine why this was the case. That steam engines needed water for their boilers was well understood. Less well-known was the need for water for condensing. Most late-period mill engines condensed exhaust steam through the use of a jet of cold water; this produced a vacuum on the exhaust side of the piston, thus increasing the working pressure range and increasing the efficiency of the engine. Condensing water thus needed to be cold water and could not be recycled until it had been allowed to cool. In these late-period mills, the use of condenser water was roughly twenty-five times that required to feed the boilers. Thus, a 2,000hp engine, a size frequently found in mills built after 1900, would need roughly 1,300 gallons of condenser water per minute as opposed to around 52 gallons of boiler water per minute. Therefore, the best location for a later-period mill was by a large, fast-flowing, river where the condenser water could be taken from the river and returned without the worry of cooling it (Fig. 3.1).

Holden was able to demonstrate that late-period mills clustered along water-courses because of the need for a cold water supply for the engine condensers. If a river-side or canal-side location was not possible, then a reservoir or lodge would have to be built as some expense. At least one day's supply of water was needed, which in the later period could have amounted to a capacity of more than one million gallons, the water being left to cool overnight. One of the consequences of this requirement was that many late-period mills had more than one reservoir to allow for continuous production. It was not until the arrival of electric power that mills could be truly free of the topographical and technological constraints of the need for a water supply. In this case, a basic understanding of steam engineering and thermodynamic theory proved to be the key to understanding this late-period, water-side, mill distribution pattern in the Manchester region.

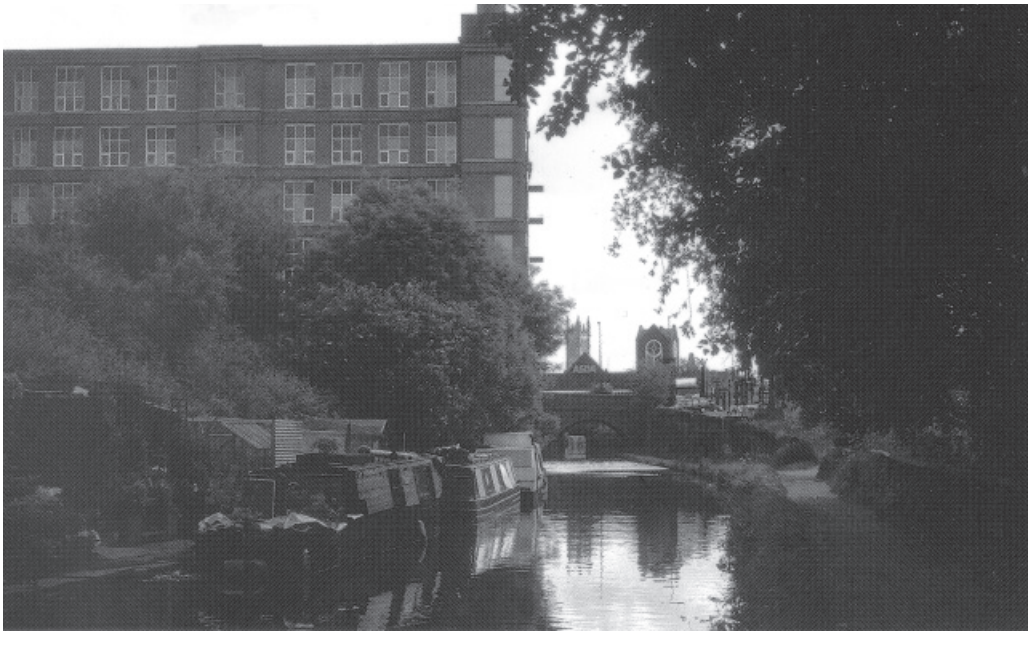

Figure 3.1 Cavendish Mill on the Ashton Canal in Ashton-under-Lyne, Tameside. A mill of 1884–5 built beside a canal in order to provide water for its condensing steam engines

Using data from the other end of the date-range for mill-building in the Manchester area, I have spent the last few years studying the distribution of 18th-century textile mills. Of the 1,617 textile mills sites known to have been established within the Manchester region between the mid-18th century and 1926, 387, or 24 per cent, were built during the 18th century. Furthermore, the majority of these mills, 228, were cotton-spinning sites, followed by 53 wool-scribbling sites, 37 fulling mills, 58 finishing sites and 11 silk mills (Fig. 3.2).

A striking feature of this textile mill distribution pattern was its upland character; most of these mills could be found above 100m AOD in minor river valleys. Out of 387 mill sites, 288 or 74 per cent were concentrated in five areas: the modern boroughs of Bury, Rochdale, Oldham, Tameside, and Stockport which lie along the Pennine fringes to the north and east of the city of Manchester.[19] This area included nine minor upland river valleys: the Carrbrook, Castleshaw Brook, Cheesden Brook, Kirklees Brook, Mellor Brook, Micklehurst Brook, Naden Brook, the River Spadden and Strine Dale at the head of the Medlock, which supported six or more water-powered textile mills from the 18th century. Why should this distribution pattern be skewed towards the uplands in this way?

It is possible that the sources studied are at fault, and there is some evidence to suggest that the two county maps of the period, Burdett's map of Cheshire published in 1777 and Yates's map of Lancashire published in 1785, under-represented the number of 18th-century water-powered textile mills because of the dates when they were surveyed, namely, the

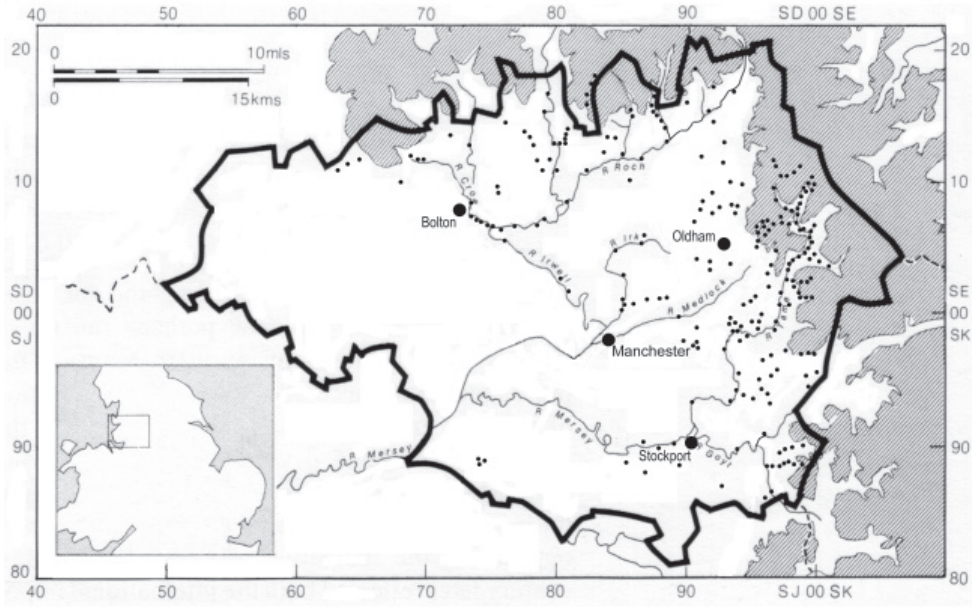

Figure 3.2 The distribution of 18th-century textile mills around Manchester

1770s and early 1780s. However, the other major sources for early textile mills, principally land-tax returns, insurance records, estate maps and newspaper advertisements, have been extensively searched across the whole region. It is unlikely that more than a handful of sites have been overlooked.

The answer to this puzzle is unlikely to be one of technology, since 18th-century water-wheel technology differed little between the cornmill, which could be found all over the North-West during this period, and the textile mill, which was not. Indeed, the gearing and line-shafting systems of the first mills drew heavily upon the technology employed in contemporary cornmills, which in North-West England were most common in the lowlands.[20] The two most likely conditioning factors are topographic and social constraints. A mill's water supply needed to be controlled before it reached the water-wheel, and this was done through a series of weirs, leats and reservoirs. Those parts of the landscape where it was easiest to build such features in the later 18th century were where there were no existing water-mills (such as cornmills) controlling the water-rights; in other words, in the more marginal upland areas around Manchester where grain growing was uncommon.

Furthermore, these areas of Bury, Rochdale, Oldham, Tameside and Stockport were where probate and estate records demonstrate that many upland farmers were acquiring surplus income from home-based textile manufacture earlier in the 18th century. This was in part reflected in the building of three-storey weaver's cottages in these areas during this period. There were thus many upland farmers both experienced in textile production and

with money to invest. The fact that 387 textile mills were built in and around Manchester during the 18th century is a testament to the willingness of many of these individuals to invest in the new textile mill technology.

Thus, we might argue that the distribution of textile mills around Manchester during this period was defined by the equation MD = C + T over SC, where MD equals mill distribution, C equals capital, T equals technology and SC equals the social context. Or, to put it another way, mill distribution was conditioned by the availability of capital and access to appropriate technology, within in a social context that encouraged or at the very least did not penalise this kind of investment (Fig. 3.3).

Using this analogy, one wonders what the technological and social constraints restricting the distribution of Irish textile mills were during the same period. As Colin Rynne has noted, by the mid-19th century the linen textile mills of Ireland were confined mostly to the Ulster region of the island, but in the late 18th century had been more widespread with significant centres of mill production in Cork and Drogheda in the south and south-east.[21] A study of the distribution and investment patterns of these early mills might provide useful comparative data with the Manchester evidence, perhaps revealing whether similar constraints were at work.

What these two Manchester case studies demonstrate is that different interpretative frameworks will provide different answers from the same or similar sets of data. Neither answer will be wholly wrong, neither will be wholly right, but by acknowledging the role of technology, landscape and society our interpretations of the archaeological data will be more rounded in their conclusions. What this brief study of Manchester mill-distribution patterns demonstrates, therefore, is the application of interpretive archaeologies that might help us recover the motivations behind the industrialisation process at a local and regional level.

CONCLUSION: A SHARED RESEARCH AGENDA

Seventeen years on from the AIA's first wide-ranging research agenda and ten years on from the publication of Palmer & Neaverson's landmark field handbook *Industrial Archaeology: Principles and Practice*,[22] industrial archaeologists have developed a wide range of approaches

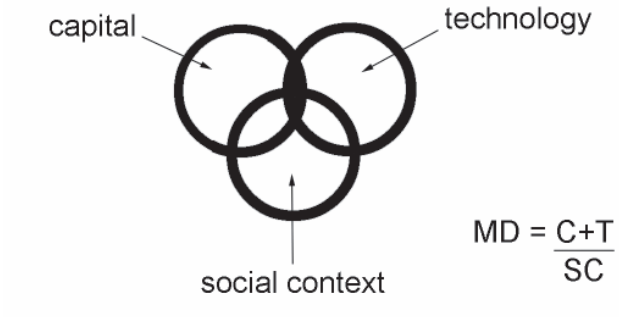

Figure 3.3 A diagram expressing the theoretical relationship between mill distribution, technology and social context

to the era of industrialisation. What these approaches provide is a research toolkit, a set of archaeological methodologies and theoretical approaches that can be applied to the archaeology of industrialisation across four broad areas of study, including (a) technological and economic; (b) social and landscape approaches; (c) industry-specific studies; and (d) site-specific surveys.

Some of these approaches concentrate wholly upon the recording of technology, others upon the landscape changes and social context. None is exclusive of the other; indeed, they work best when these issues are considered together. The *Understanding the Workplace* volume refined these areas further, suggesting nine broad topics where the archaeological study of the overlap between industry and people could be fruitfully pursued. These were: continuity and change; production and consumption; understanding the workplace; industrial settlement patterns; class, status and identity; social control, paternalism and philanthropy; the scientific analysis of artefacts and industrial residues; historic landscape characterisation; and the international context of industrialisation.

It should be clear from the above discussion and from these approaches that industrial archaeology in the early 21st century has not turned its back on the understanding and recording of technology. This practice remains central to the discipline. Rather, industrial archaeology has evolved to include a wider discussion of the impact of technological change on the landscape and on contemporary social structures. The publication of the *Understanding the Workplace* volume should not be seen as a strait-jacket within which industrial archaeologists are required to work, but rather as suggested research themes that complement the continuing study and recording of the manufacturing processes and power systems that lead the industrialisation process. Such research agendas are meant to be part of a continuing discussion within the discipline; sharing ideas, aims and interests, while acknowledging that individual researchers have always had and will continue to have their own areas of interest.

Therefore, for some industrial archaeologists to advocate concentrating wholly on the study of technology is to limit the debate and our research of the period by ignoring the individuals who built and ran the machines, those who used the technology, and the landscape and social impact of technological change that is one of the key features of the Industrial Revolution. Equally, we need to understand the technological changes of this period so that we can understand the wider context of the industrialisation process. Therefore, the current debate should not be about whether we should do these things and whether this is truly industrial archaeology, but how well we understand the interconnection between machine and landscape, society and technological change; an understanding that Tom Rolt, the founding father of Industrial Archaeology, first began.

NOTES

1. Palmer 1991; Crossley 1990. The current chapter has developed from conversations with most of the parties involved in the debate in the pages of *Industrial Archaeology News*.
2. Nevell 2006.
3. *Industrial Archaeology News* 136 (Spring 2006) to 143 (Winter 2007).
4. Gwyn & Palmer 2005.
5. Fitzgerald 2007a & b.
6. Fitzgerald 2007a, 51.
7. Palmer 2005, 11.
8. *Industrial Archaeology News* 136, 18.
9. Nevell 2005 & 2006; Palmer & Neaverson 1998; Palmer 2005.
10. Gwyn & Palmer 2005, 13.
11. Tarlow 2007.
12. Gwyn & Palmer 2005, 11–13.
13. Nevell 2005.
14. Johnson 1996 & 1999.
15. Nevell & Walker 2004.
16. Gwyn & Palmer 2005.
17. Details of these publications can be found on English Heritage's website.
18. Holden 1999 & 2003.
19. Nevell 2008.
20. Rynne 2006, 222–8.
21. Rynne 2006, 206; Rynne 2007, 250–8.
22. Palmer & Neaverson 1998.

BIBLIOGRAPHY

Crossley, D.W. 1990, *Post-Medieval Archaeology in Britain.* Leicester: University of Leicester Press.

Fitzgerald, R. 2007a, 'Historic building record and the Halifax Borough Market Doors', *Industrial Archaeology Review* **29**:1, 51–74.

Fitzgerald, R. 2007b, 'The Stone Dam Mill engine house', *Industrial Archaeology Review* **29**:2, 115–31.

Gwyn, D. & Palmer, M. 2005 (eds), *Understanding the Workplace. A Research Framework for Industrial Archaeology in Britain* (special issue), *Industrial Archaeology Review* **27**:1.

Holden, R. 1999, 'Water supplies for steam-powered textile mills', *Industrial Archaeology Review* **21**:1, 41–51.

Holden, R. 2003, 'Some cotton mills and their water supplies', *Industrial Archaeology North West* **3**, 20–2.

Johnson, M. 1996, *An Archaeology of Capitalism.* Oxford: Blackwell.

Johnson, M. 1999, 'The new post-medieval archaeology', in Egan, G. & Michael, R.L. (eds), *Old and New Worlds*. Oxford: Oxbow Books.

Nevell, M. 2005, 'Industrialisation, ownership, and the Manchester Methodology: the role of the contemporary social structure during industrialisation, 1600–1900', in Gwyn & Palmer (eds), 2005, 87–96.

Nevell, M. 2006, 'The 2005 Rolt Memorial Lecture: Industrial archaeology or the archaeology of the industrial period? Models, methodology and the future of industrial archaeology', *Industrial Archaeology Review* **28**:1, 3–16.

Nevell, M. 2008, 'The archaeology of industrialisation and the textile industry: the example of Manchester and the south-western Pennine uplands during the 18th century (Part 1)', *Industrial Archaeology Review* **30**:1, 33–48.

Nevell, M. & Walker, J. 2004, 'Industrialisation in the countryside: the roles of the lord, freeholder and tenant in the Manchester area 1600–1900', in Barker, D. & Cranstone, D. (eds), *The Archaeology of Industrialisation*. Leeds: Maney, 53–78.

Palmer, M. 1991, *Industrial Archaeology: Working for the Future.* Ironbridge: Association for Industrial Archaeology.

Palmer, M. & Neaverson P. 1998, *Industrial Archaeology: Principles and Practice*. London: Routledge.

Rynne, C. 2006, *Industrial Ireland 1750–1930: An Archaeology*. Cork: Collins Press.

Rynne, C. 2007, 'The archaeology of power and industry', in Horning, A., Ó Baoill, R., Donnelly, C. & Logue, P. (eds), *The Post-Medieval Archaeology of Ireland, 1550–1850*. Bray: Wordwell, 241–62.

Tarlow, S. 2007, *The Archaeology of Improvement in Britain, 1750–1850*. Cambridge: Cambridge University Press.

CROSSING PATHS OR SHARING TRACKS?

Future directions in the archaeological study of post-1550 Britain and Ireland

Edited by

AUDREY HORNING *and* MARILYN PALMER

Boydell & Brewer Ltd

2009

First published 2009
The Boydell Press, Woodbridge

ISBN 978 1 84383 434 2

The Boydell Press is an imprint of Boydell & Brewer Ltd
PO Box 9, Woodbridge, Suffolk IP12 3DF, UK
and of Boydell & Brewer Inc.
668 Mt Hope Avenue, Rochester, NY 14620, USA
website: www.boydellandbrewer.com

A CIP record for this book is available
from the British Library

This publication is printed on acid-free paper

Printed in Great Britain by

XXXX

CONTENTS

SECTION TWO: ANALYTICAL APPROACHES

SECTION THREE: OF PEOPLE AND THINGS