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The archaeology of industrialization: towards a research agenda

MARILYN PALMER

This paper is a contribution towards the process of constructing an archaeological research framework for south-east England and is intended to encourage the production of an archaeology of industrialization, rather than an industrial archaeology, of the county of Surrey. It is argued that, if we are to understand the effects of industrialization in the last two centuries on both the landscape and the lives of those who made up the workforce, then we need to study not just the evidence for past technological activity but also that of the society in which they lived. The material evidence for this encompasses the changes in agriculture, rural and urban settlement patterns, social and religious institutions etc which went hand in hand with the actual processes of industrialization. Like all archaeologists, the student of this period cannot be an expert in all fields and needs to call upon the services of others where necessary. However, two broad areas of research are suggested. The first of these is landscapes of industry, including those of transport, extractive industry, woodlands, towns and parks and gardens. The second is landscapes of social memory, utilizing the physical remains of the industrial period to understand more of the motivation and activities of those responsible for its creation, including settlements, leisure and entertainment, institutions, religious buildings and the ritual of death and burial. The paper is not confined to Surrey but attempts to create a broad context for further research into the archaeology of the industrial period.

Introduction

The purpose of archaeology is to ascertain changes in the human condition through the analysis of the material record. The industrial period, from *c*1750 onwards, offers unparalleled opportunities to do just that, because of the wealth of artefacts, standing structures and alterations to the landscape which survive. But, if we accept that what we are referring to is a period archaeology with as much coherence as 'Roman' or 'post-medieval' archaeology, we also have to accept that we must include the material evidence for the whole range of human experience which occurred in this period, not just that which has technological relevance. This material evidence encompasses the changes in agriculture, rural and urban settlement patterns, social and religious institutions etc which went hand in hand with the actual processes of industrialization.

It has often been argued that there is adequate documentary evidence for the industrial period without resorting to the material evidence. The process of industrialization has been seen as the province of the economic historian, who was protected from the realities of its human outcomes by the nature of the archive material. The social historian did become immersed in the conflicts generated by the changing relationships between employers and employees, but since most of the latter were illiterate, the written sources are not first-hand accounts in most instances and can only indicate what it was assumed they felt. Documentary sources certainly inform us about the innovators and inventors that characterize the period: what they do not illuminate are the nameless and the faceless who made up the workforce, nor the effect of the process of industrialization on patterns of agriculture, settlements and the landscape. This is why archaeology, in its now accepted broad sense as a discipline that embraces the study of standing structures and landscapes and not just the excavation of sites, is so important to the understanding of the process of industrialization.

However, in order to do this, industrial archaeologists have to modify their preoccupation with identifying, classifying and describing industrial monuments and to consider these in their temporal, spatial and cultural contexts. It is, of course, undoubtedly true that industrial archaeology arose out of a need to record and preserve the relics of the industrial past at a time when they were fast disappearing without record (Rix 1955; Hudson 1963; Buchanan 1972). To this end, many volunteer industrial archaeologists have produced numerous gazetteers of industrial sites: the Association for Industrial Archaeology (AIA), for example, has certainly done this since 1980 by producing gazetteers of industrial sites for the region in which its annual conference is held (Alderton 1980). In Surrey, the Surrey Industrial History Group (SIHG) produced such a gazetteer in 1990 when the annual conference was held in Guildford (Crocker 1990) but has also, to its great credit, probably produced more published regional gazetteers of sites than any other county, with Derbyshire following close behind. This process has been necessary: industrial sites have not been regularly included on most Sites and Monuments Records (SMRs), and so have not until recently been considered in the development control

Aspects of archaeology and history in Surrey: towards a research framework for the county, Surrey Archaeological Society, 2004

process, resulting in drastic loss of structures and landscapes. The AIA's *Index Record of Industrial Sites* (Trueman 1995) project and other local initiatives have moved some way towards remedying this situation and ensuring that the material evidence of the recent past is taken into account in local structure plans. Inevitably, this has been more effective in some counties than others, depending on the interests of the individuals involved in the planning process. Essex, for example, has made extensive use of Planning Policy Guidance notes PPG15 and 16 in identifying and recording the recent archaeological and architectural heritage (Gould 2001) and Manchester is well on its way to achieving similar objectives (McNeil & George 1997; Nevell & Walker 1999; McNeil & Nevell 2000; McNeil & George 2002). So, although it certainly cannot be categorically stated that the need to identify industrial sites is past, we do need to move on and consider these sites in a wider context. The industrial aspect of English Heritage's Monuments Protection Programme (MPP) has encouraged this process although it is not yet complete. In 2000, the initial Step 1 reports, which provide an overview of an industry with the emphasis firmly on the material remains, had been produced for 33 industries or groups of industries. These reports have been circulated to SMRs and specialist bodies, and are hugely important in giving a national context to particular landscapes or structures in a way that has not been possible before (Cranstone 1995; Stocker 1995; English Heritage 2000a). The Step 3 reports, providing a systematic site-by-site national evaluation, have had more limited circulation and need much wider dissemination if they are to achieve their full value, a point currently being discussed by English Heritage's Industrial Archaeology Advisory Panel. These are likely to be supplemented with *State of the Historic Environment Reports* (SHIERs), position papers on various industries, building on the methodology developed for MPP but incorporating the results of list review programmes where these have taken place.

The industrial MPP has therefore initiated the process of the contextual understanding of a wide range of industries. However, English Heritage's encouragement of the formulation of regional research frameworks in archaeology should eventually have an even more far-reaching effect on the future development of the archaeology of industrialization than the industrial MPP. The fragmentation of archaeological understanding resulting from developer-funded work under the auspices of PPG15 and 16 led English Heritage to try to take steps to ensure that appropriate research values underpin all archaeological activity. This is the main purpose of the regional research frameworks, although their formulation varies from region to region. Generally, a series of seminars has been held on each period of archaeology to consider the nature of the archaeological resource and decide on a research agenda: Cadw, the Institute of Field Archaeologists (IFA) and the Council for British Archaeology (CBA) are encouraging a similar pattern for Wales (Geary 2002). Although for the industrial period, common themes emerge such as transport, extractive industries etc, each region is able to identify its own key industries: in the East Midlands, the textile industries and outworking are important themes, while military installations, the development of the farmstead and planned industrial settlements have been selected as important themes in East Anglia (Brown & Glazebrook 2000). This paper is a contribution towards the process of constructing an archaeological research framework for south-east England and is intended to encourage others to work towards the production of an archaeology of industrialization, rather than an industrial archaeology, of the county of Surrey.

It is, of course, difficult to define either the beginning or the end of the period of industrialization. English Heritage has argued that 'it is the classic constituents of the Industrial Revolution – capital investment, organized labour, technological development and the factory scale of production which characterize the field of industrial archaeology' (English Heritage 1995, 1). This would postulate a beginning in the middle of the 18th century, but it is often difficult to explain the development of an industry without going back further than this, as is shown very clearly in both Jeremy Hodgkinson's article on 'Iron production in Surrey' and in Glenys Crocker's 'Surrey's industrial past: a review', both in this volume. Equally, some industries such as framework knitting, which was largely based in the East Midlands but also important in Godalming in Surrey (Crocker 1991), remained outside factory production until late in the 19th century and are characterized not so much by technological development as by the lack of capital investment and the determination of the workforce to remain outside the factory environment, although it cannot be argued that the independent artisan survived in many places. Generally, however, *c* 1750 is a convenient date to begin the industrial period. Its end is even more difficult to define. Some would argue that it extends to the present day but others, this author included, would draw the period to a close sometime in the mid-to-late 20th century, accepting that we are perhaps now in a post-industrial period with a completely different range of attitudes and expectations.

But we cannot leave it at that. Because industrial archaeologists are more concerned with standing

buildings and structures than archaeologists of other periods, we cannot remain outside the current debates on the nature of the historic environment and its place in society, a debate fostered by the two recent documents, *Power of Place* (English Heritage 2000b) and *The historic environment: a force for our future* (DCMS 2001). Many of us may prefer to research past industries, but their material remains form part of the contemporary historic environment and we are inevitably drawn into discussions on the significance and economic value of our cherished sites. We therefore have to make judgements on the adaptive re-use of former industrial buildings, for example, the splendid Coxes Lock mill on the Wey Navigation (fig 15.1). Another pressing problem is that of the regeneration of derelict industrial sites: how far can, or should, their past significance be taken into account in the modern environment? To quote DCMS, the Government 'wants to see more regeneration projects, large and small, going forward on the basis of a clear understanding of the existing historic environment, how this has developed over time and how it can be used creatively to meet contemporary needs' (DCMS 2001, 45). The key word in this statement is 'understanding': there is a clear need for the results of the research we carry out on the archaeology of industrialization. Our understanding of the industrial past is not an ivory tower exercise: it has contemporary relevance and so it is even more important that we establish a clear research framework for the industrial period.

This paper is not intended to be an archaeology of industrialization in Surrey, which is much more fully covered by Crocker and Hodgkinson in this volume. The author hopes that the comparison of aspects of Surrey's industrial past with areas of the country more familiar to her may raise various questions which prompt those who carry out research in Surrey to think perhaps more broadly about their research areas. Superficially, Surrey appears to be one of the least industrialized of the counties of England, at least in terms of the definition of industrial archaeology cited above (English Heritage 1995, 1). It does not, for example, have vast areas of mining activity or large numbers of redundant textile mills as elsewhere in the country. The nature of its industrial past is far more subtle, but perhaps can be teased out by adopting broad headings for areas of research. The author would like to suggest two of these here, landscapes of industry and landscapes of social memory, which might help to give a topographical and social dimension to the physical remains of past industrial activity.

Landscapes of industry

Landscape is often taken to mean natural scenery to which the onlooker reacts aesthetically and is therefore devoid of human interference. But to the historian and the archaeologist, landscape is the physical manifestation of changes wrought by man in both space and time. In some areas, it is possible to talk about 'industrial landscapes' ie those in which the practice of industry appears to be the dominant factor

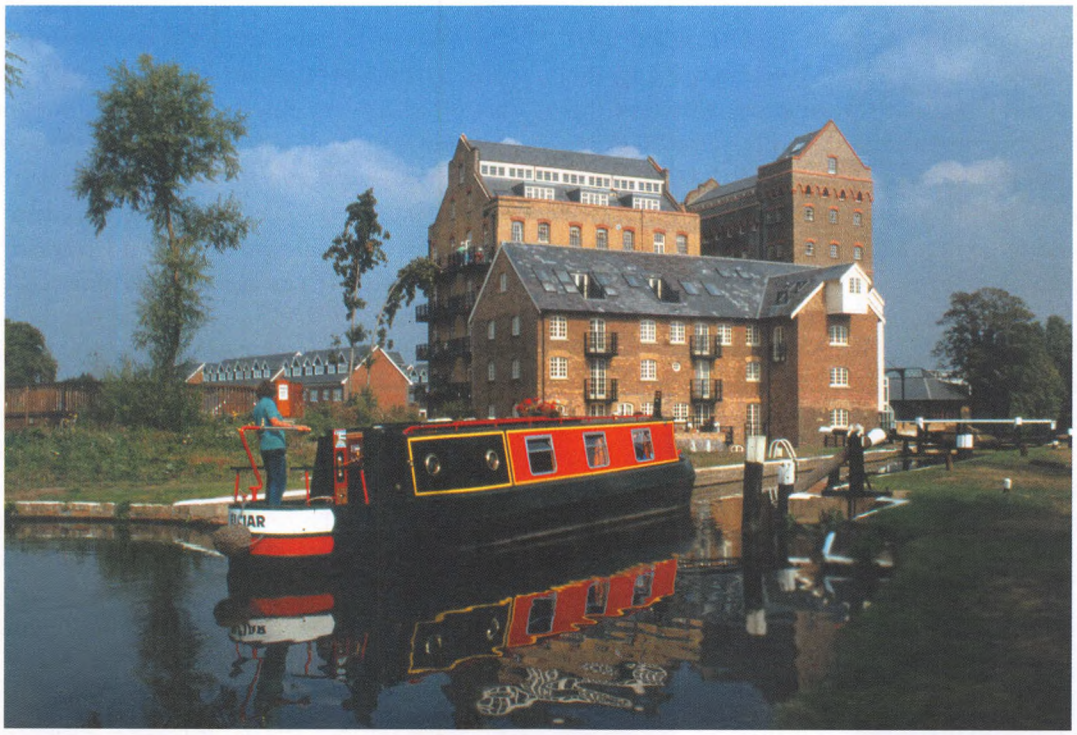

Fig 15.1 Coxes Lock Mill on the Wey Navigation. A mill was first built on the site by the ironmaster Alexander Raby *c* 1776. It became a corn mill and silk mill in the 1830s and a new corn mill was built in 1901. This operated until 1983, milling grain brought by barge on the Navigation. The complex has been converted to residential apartments. Photograph Marilyn Palmer

in their creation and in their 'human' role. One can thus talk about the mining landscapes of south-west England, the Black Country or south Wales; the textile landscapes of the Pennine districts of Lancashire and Yorkshire and the colliery landscapes of north-east England. In Surrey – as in many other southern and eastern counties of England – industry is perhaps more of an element in the development of the landscape than the chief factor responsible for its present form. Yet individual sites in a landscape do become industrial landscapes when we move beyond them to consider the human manipulation of space for economic ends. Indeed, the harnessing of power sources, particularly water power, has a regional impact which goes beyond an individual site: transport networks link individual centres of production to national or international markets; industrial settlements often exhibit evidence of the means of control and surveillance practised by employers to exploit their workforce. Industrial landscapes are a physical record of the way in which people carried out various kinds of industrial activity in the past. They therefore include buildings, not as discrete entities in themselves but in their relationship to one another and to their topographical setting. Different industrial processes are represented by often distinctive buildings which the industrial archaeologist must learn to recognize. These may survive intact or as ruins: the landscapes may also include earthwork remains or buried structures, particularly those associated with extractive industries. One of the major reasons for studying industrial landscapes is to transform such a collection of individual sites and structures into a coherent whole with meaning in both technological and cultural terms (Everson 1995). Technologically, the important elements are the linkages between the various field monuments: these may be physical in the form of watercourses supplying power or transport networks, or functional in the way in which structures were placed to facilitate the processing or manufacturing process. Culturally, these inter-relationships can reveal systems of industrial organization and social relationships, particularly those between the employer and his workforce. The task of the industrial archaeologist is to analyse the industrial landscape in terms of both the spatial and sequential relationships of structures and features to illuminate the process of industrialization.

LINEAR LANDSCAPES

One of the most important features of Surrey is the use made of water power for various purposes – milling, paper making, the manufacture of gunpowder, for example. Even small rivers were tortured into submission by the construction of ponds and leats to maximise their potential. The study of the industry created by the use of a particular river demonstrates the spatial and sequential relationships referred to above. The type of wheel may differ depending on its position on the river profile: quite often, mills in the upper reaches of a river have overshot or breast wheels, to be replaced by undershot wheels in the more sluggish lower reaches (Palmer & Neaverson 1998, 26). Alan Crocker (2001) has shown how in the course of the 19th century many wheels were replaced by turbines, enabling the use of water power to continue as an economic form of power. The use of good water-power sites changed over time: the Wandle began with corn mills at the time of Domesday; many were converted to fulling mills, grinding logwood for dyeing, gunpowder manufacture and textile printing and dyeing until in 1805 it was said to be the hardest worked river in the world (Twilley & Wilks 1974). The Tillingbourne, a more rural stream, nevertheless supported a number of paper mills and the nationally important gunpowder works at Chilworth (Crocker, G & A 2000). It is important to look at the rivers themselves and their contribution to industrialization rather than just looking at individual mills, attractive though they might be.

A similar approach can be taken in the case of artificial waterways. Although the more profitable canals were built in the north of England, Surrey can boast one of the most fascinating of all, London's 'lost route to the sea', the barge route which connected the Thames with Portsmouth via the Wey Navigation, the Wey and Arun Junction Canal, the Arun Navigations and the Portsmouth and Arundel Canal (Vine 1986). As a through route it had a very short life but, since part of it is in the care of the National Trust and the Wey and Arun Canal Trust is pursuing its ambitious Wey-South project, considerable survey and restoration work has been carried out on various sections in recent years. What is perhaps needed is further research into the effect the whole navigation system had on the landscape through which it passed – is there material evidence of any trade or industry it stimulated, such as stone or clay quarries, corn mills or warehouses? Is there evidence for the growth of settlements, perhaps where the waterway was crossed by a turnpike road? The surviving treadwheel crane in Guildford (fig 15.2) is important evidence for trading activities: do documents or engravings provide evidence of similar monuments which once existed? A good model for the study of a waterway as a linear landscape is Stephen Hughes' far-ranging *The archaeology of the Montgomeryshire Canal*, with its studies of bridges, limekilns, warehouses and vernacular housing (Hughes 1981).

Similar questions can be asked about the railway network, particularly as the earliest public railway not owned by a canal company was built in Surrey. The Surrey Iron Railway opened from Wandsworth to Croydon in 1803, to be followed by the Croydon,

Fig 15.2 Treadwheel crane on the Wey Navigation at Guildford. One of the few treadwheel-operated cranes surviving in Britain, now located on the redeveloped riverside, close to its original site on Guildford Wharf. Probably dating from the late 17th century, it was restored by Guildford Borough Council for the National Trust in 1971. Similar cranes used to exist at Stonebridge Wharf, Shalford, and Godalming. Guildford Museum (G9431A)

Merstham and Godstone Railway in 1805, although it never actually reached Godstone. Seen as the first stage in a possible route to Portsmouth, its main use was in fact industrial, the transport of stone and lime to London. The relationship of settlements in relation to transport routes can also be asked about 19th and 20th century locomotive railways, which converged on London and led to the growth of commuter towns and villages.

WOODLAND LANDSCAPES

David Crossley has emphasized the important economic role of woodland in the post-medieval period (Crossley 1994). The woodlands of Surrey, although not so extensive as the neighbouring Wealden county of Sussex, have nevertheless been an important industrial resource for centuries, but the industries carried on in them, such as iron (fig 15.3), glass production and gunpowder manufacture, have been studied individually rather than related to each other and to their woodland environment.

The woodlands were the source of charcoal, the most important fuel for industry until the 17th century. Gunpowder, which made use of charcoal as a raw material rather than a source of fuel, has been extensively studied by Glenys and Alan Crocker (1990 and this volume). The siting of mills such as Chilworth was, of course, related more to water power than to charcoal production since special kinds of charcoal were needed for good quality gunpowder. Jeremy Hodgkinson's paper in this volume on the iron industry in Surrey indicates the importance of woodland areas for the exploitation of iron from the Roman period onwards, but says little about the ways in which the woodlands must have been managed for the production of charcoal for both bloomeries and water-powered blast furnaces. Glass production was established in the woodlands of the Surrey-Sussex border in the 13th century and extended once French immigrants improved the design of furnaces in the mid-16th century (Crossley 1990, 226–42). Several furnaces have been excavated and David Crossley re-examined the evidence for the MPP reports (Crossley 1993; 1996), re-emphasizing the need to study the relationship between furnace sites and coppice woodland. A survey relevant to this theme was carried out in the north of England by the Royal Commission on the Historical Monuments of England (RCHME) just before its amalgamation with English Heritage and published as *Furness Iron* (Bowden 2000). Southern Cumbria boasts some spectacular remains of blast furnaces, such as Duddon Furnace, but these too had been considered as isolated monuments rather than as part of a complex of woodland industries. RCHME surveyed the trackways leading from charcoal platforms in the woodlands and identified bloomery sites, potash kilns, charcoal burners' huts and bark peelers' huts, demonstrating the inter-relationships between these different industries. Although Surrey woodland remains nowhere near as intact as that of Cumbria, a similar study of a discrete area of Surrey woodland – even vanished woodland – making use of documentary and place-name evidence as well as archaeological remains, might equally reveal this relationship and indicate the long-standing industrial importance of these woodlands. Such a study should be high on the research agenda for archaeology in Surrey.

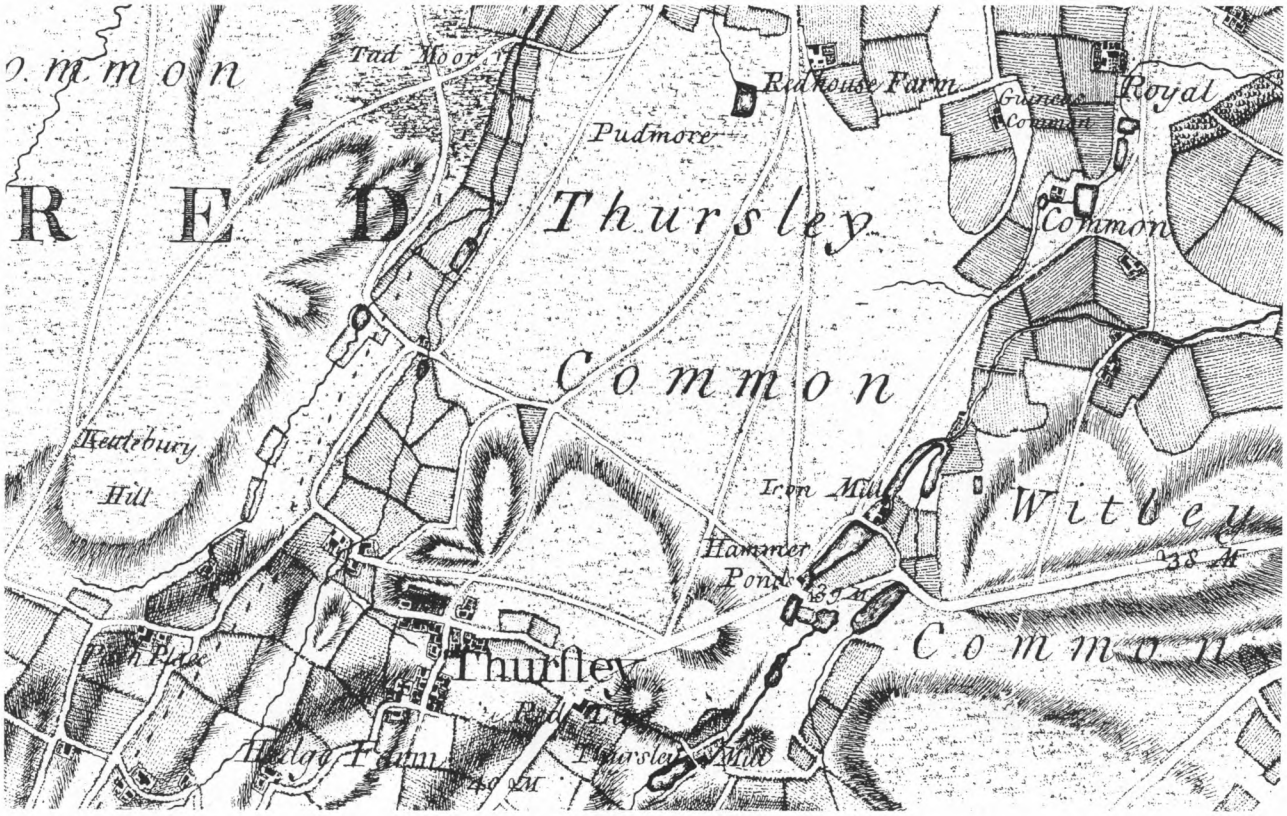

Fig 15.3 Thursley iron mills shown on Rocque's map of Surrey, 1768, scale of 1 inch to 1 mile. 'Hammer Pond' probably corresponds to Upper Hammer, 'Iron Mill' to Lower Hammer and the pond south of the road on a stream to the east to Coldharbour Hammer (Cleere & Crossley 1995, 359–60). The forges were associated with Witley Park furnace *c* 3km south-south-east. Courtesy of Surrey Archaeological Society

DESIGNED LANDSCAPES

Designed landscapes have become increasingly important as indicators of social and cultural evolution and have consumed considerable quantities of land in a region. Surrey is no exception to this, as city gentlemen and industrialists built themselves country retreats within reasonable commuter distance of London. It would be interesting to know how much these took up common land, as happened so frequently in East Anglia. How often were villages moved to improve the views of the country house owner, as in the case of Weston Street, to which the villagers of Albury were moved in the mid-19th century and which then took the name of Albury from the now-demolished village in Albury Park (Crocker, G & A 2000, 124). How far are boundaries, gates and gate houses indications of the social control exercised by the landowner in keeping the public at a distance? All these are legitimate archaeological questions which can be asked of landscapes formed within the industrial period. Equally, country estates are frequently repositories of monuments to technology, especially in the means used to create the landscapes: the 30ft (9m) water-wheel made by Bramah and Sons in Painshill Park, to operate a pump delivering water to an ornamental lake, is a spectacular example of this (fig 15.4). The National Trust is in the process of cataloguing industrial artefacts on its own properties, both inside and outside the house, but the study of country house technology in Surrey would advance our understanding of this little-known area of industrialization.

LANDSCAPES OF EXTRACTIVE INDUSTRY

Fortunately for those who live there, the landscape of Surrey has never been blighted by the huge excavations created by open-cast mining elsewhere in Britain or Europe. The evidence for extractive industries in Surrey is largely underground and hidden from public view – except where sudden subsidence occurs. The Upper Greensand between Reigate and Merstham provided useful resources of building stone, while there are several underground caverns in the Guildford area where chalk was mined, as it was also between Reigate and Dorking. Much of the hard, calcareous stone derived from the Upper Greensand was used for prestigious buildings in London from the 14th century but a useful research area would be the relationship between local building materials and social status: for example, even where good local stone was available in the late 18th or early 19th centuries, was brick considered a more fashionable building material? Hearthstone, used for whitening steps, was extensively mined throughout much of the region in the 19th century, but how much research has been carried out on the nature of underground workings and their relationship to surface remains? The extensive chalk deposits in Surrey have led to the

Fig 15.4 Water-wheel in Painshill Park. This 9m-diameter wheel was made by Bramah and Son in the 1830s to pump water to an ornamental lake and was restored in 1988. Technology played an essential role in many designed landscapes of the 18th and 19th centuries. Photograph by Jack Chinn, courtesy of Painshill Park Trust

erection of numerous banks of limekilns, such as those at Brockham (Sowan 2000a) and Betchworth (fig 15.5; Sowan 2000b). Another item on any research agenda for the industrial period ought to be a consideration of the typology of these structures and an investigation into whether the nature of chalk demanded different types of kilns from those more commonly associated with limestone and how far this is reflected in their construction. The close connection between these commercial kilns and transport has already been noted (Tarplee 1995, 6–7). The Wealden clays yielded good quality brickearth, and numbers of kilns from different periods have been recorded and, in some cases, excavated and consolidated. Again, however, it would be worth analysing the spatial distribution of these kilns in relation to available transport as well as constructing a typology of these structures with reference to the local geology. The variations in the latter also means that there can be few places better than Surrey (and the other Wealden counties) where the relationship between vernacular architecture and resources of building materials can be studied.

URBAN LANDSCAPES

Although most of us resent new building work taking place in historic towns, urban centres have always been dynamic environments which have continually been refurbished, re-shaped and renewed. The urban fabric is probably more rapidly responsive to social change than the countryside, as those in charge of the administration of towns have usually been able to finance and organize change to a far greater extent than is possible on the wider canvas of the countryside. So, understanding the historic environment of towns is vital to understanding the development of human society. Urban regeneration must be based on knowledge and understanding of the past, a theme emphasized in both *Power of Place* and *A Force for our Future.* Such understanding will bring with it a sense of identity and a sense of place, both of which have been shown in recent surveys to be important in people's consciousness. Urban landscapes must therefore have an important role in a future archaeological research agenda.

What themes will contribute to a greater understanding of the role played by towns in the industrial period? First the relationship between towns and their hinterland, between towns and the countryside. Now that towns seem to concentrate more and more on retail and leisure activities rather than industrial pursuits, it is easy to forget that towns were also seen as places where the products of the countryside were processed for sale. We need to know more about industries such as urban grain-milling, tanning and textile production. Guildford and Godalming, for example, had all these – Gomshall tannery, the remains of the medieval woollen industry and several grain mills. Secondly, towns were also centres of retail trade. Many of the towns of Surrey were founded as market towns, and sites of markets often survive as open spaces – we tend to forget the importance of spaces as well as buildings when studying the topography of towns. It would be useful to ask how far the original sites of markets changed as towns expanded and whether separate markets came to exist for different types of goods, as in Guildford. How far were market sites given permanence by the provision of a market building, often one combining other civic functions as in Kingston. Archaeologists of industrialization perhaps pay too much attention to production of goods at the expense of consumption, and further studies of the physical evidence for retail trade would enhance our understanding of the distribution of goods.

Thirdly, as population grew in the post-medieval period, what evidence is there that thought was given to the positioning of public buildings as a means of expressing social control? In the USA, Paul Shackel, Mark Leone and others have looked at the deliberate planning of Annapolis in Maryland to reflect the

Fig 15.5 Betchworth limekilns. These kilns form part of the industrial landscape of the chalkpits and limeworks on the North Downs. The Betchworth site was worked from 1865 to 1934 by the Dorking Greystone Lime Company and these rare Dietzsch kilns were added in the 1890s to convert chalk into quicklime.The 1924 hydrator for converting the quicklime to slaked lime, seen to the right of the kilns, went out of use in 1956 and has since been demolished. Photograph by Paul Sowan

relationship between church and state – the systematic uses of streets, for example, with important buildings closing off the vistas within the built environment (Shackel *et al* 1998). The more organic growth of towns in Britain makes the study of the symbolism of public buildings more difficult, but there are examples of such deliberate planning, as in London and Edinburgh. Is it possible to determine the motivation for the placing of town halls or new churches within the confines of Surrey towns? Were the towns zoned in any way to separate classes of people, or different trades, such as separate tanners' quarters, for example? Can archaeological evidence help us to understand how order was imposed on very large numbers of people living in close proximity? How, too, did the urban population cope with everyday living? What evidence survives for water supply and sewerage systems? Attention is carefully drawn to individual examples of public utilities in all the SIHG *Guides*, but they do need to be seen in the context of the burgeoning 19th century town.

Finally, of course, we need to look at the built fabric of towns. There are many studies of vernacular buildings or public buildings within towns, but what about the housing of the workforce? Is there evidence for housing on previously empty plots such as urban gardens which could imply considerable population growth? The distribution of assemblages of excavated artefacts, too, would provide clues to both the zoning of the inhabitants in towns as well as to changes in consumption. Surrey has no industrial towns on the scale of, say, Sheffield or Manchester, but it did not entirely escape 19th century slum housing – all towns housed workers as well as artisans in all periods. Interesting results are beginning to appear from the urban work carried out by contract archaeologists in response to PPG15 and 16, such as a recent study of a slum area of Sheffield (Belford 2001). There are, then, many themes that we ought to consider in studying urban landscapes which would enhance our understanding of the role played by towns in the industrial period.

LANDSCAPES OF WAR

Man's attempt to defend himself against his fellow man has always been of concern to archaeologists, and this is as true for the 19th and 20th centuries as it was for the Roman or medieval periods. The study of how defence structures have changed in response both to developments in technology, such as the long-range rifled guns which could fire horizontally over longer distance, and the direction of threat, with defence against aerial attack taking precedence over defences against land invasion, is a very necessary one. Since, however, a paper by Chris Shepheard and Alan Crocker is included elsewhere in this volume, the question will not be further pursued here.

Landscapes of social memory

Archaeologists of any period need to 'read' the society behind the physical remains of the past and to accept that material culture is not a passive reflection

of society but an active element in its creation. This applies to the material culture of the working past as much as it does to that of the prehistoric past, and industrial archaeologists should be even more successful at deducing the actions and purposes of the individuals responsible for that material culture since they have a much wider range of data with which to work. The second broad heading of this paper is consequently entitled 'landscapes of social memory' and indicates how we might try to utilize the physical remains of the industrial period to understand more of the motivation of those responsible for its creation.

MANUFACTURING INDUSTRIES, EMPLOYERS AND THE WORKFORCE

As suggested earlier, documentary sources provide some evidence for the lives of those who built and those who worked in mills and factories, but a study of the buildings and related settlements can add much to our understanding. For example, the early textile colonies of the late 18th century in Derbyshire, Cheshire and Scotland or colliery settlements such as Elsecar in South Yorkshire reveal the paternalism of the entrepreneurs who provided the housing for their mill- or mine-based workforce, but they also reveal a pattern of social control which the occupiers had to accept if they wished to retain their homes. Owners' houses adjacent to their works, perhaps best seen in the textile industries of the west of England, are also an example of implicit social control. The continuation of outwork beyond the introduction of the factory can also indicate resistance by the workforce to factory discipline and was common in the textile industries of the north and west of England (Timmins 1977; 2000), south-west England (Palmer & Neaverson 2003), the boot and shoe industry of Northamptonshire (Menuge 2001) and the small metal industries of the West Midlands (Cattell *et al* 2002). There is perhaps some evidence of worker resistance in Surrey, for example in the Godalming hosiery industry, although the factory system was introduced there quite early (Crocker, G 1991). Employer-provided housing often accompanied the development of 20th century industry, for example, in the production by Crittalls of metal windows in Essex (Crosby 1998). Dennis Bros of Guildford certainly built housing for their workforce in the early 20th century, but it would be interesting to know how far their example was followed by other employers in the car and aircraft industries. How far, too, were manufacturers responsible for commissioning the design of their own premises, perhaps trying to establish their social status by architectural pretension (Jones 1985)? The form taken by the many trading estates which developed is also a potential subject for study (see Stratton & Trinder 2000). Study of 20th century industrial archaeology in Surrey should be an important element of a research agenda, since its closeness to London resulted in considerable development in this period.

SETTLEMENTS

The process of industrialization undoubtedly changed the nature and spatial composition of settlements, although this perhaps had less of an impact in Surrey than in the more industrialized Midlands and North. The attitudes of landowners considerably influenced this: in the East Midlands, for example, the pattern of 'closed' and 'open' villages (ie those either dominated or free from the influence of a particular landowner) has had an important effect on the development of industry, particularly outworking in the textile, boot and shoe and small metal industries. The methodology developed by Mike Nevell and John Walker for examining the relationship between the development of industry and the patterns of landholding exercised by lords, tenants and freeholders may well be applicable to areas of Surrey, especially water-powered industry of different types (Nevell & Walker 1999). Equally important in Surrey is the influence of London and of transport networks on the changing pattern of settlement.

BUILDINGS OF SOCIAL CONTROL: WORKHOUSES, HOSPITALS, PRISONS

The burgeoning population of the late 18th and early 19th centuries created a need for more centralized systems of dealing with health, poverty and crime. The building of hospitals, workhouses and prisons is equally an aspect of the archaeology of the industrial period and continues the themes of paternalism and social control discussed earlier. RCHME (shortly before its amalgamation with English Heritage) produced excellent surveys of hospitals, prisons and workhouses, and these provide good starting points for an investigation of the location and role of these social institutions (Richardson 1998; Brodie *et al* 1999; Morrison 1999). Six workhouses in Surrey were built in the period immediately after the 1834 Poor Law Amendment Act, with others following before 1880. The comparatively small number probably reflects the fact that Surrey was not so subject to cyclical unemployment as the more industrialized regions further north. Some of the first of the new workhouses were built in Kent, following the courtyard plans of Sir Francis Head, as did the now demolished ones in Surrey in Reigate, Hambledon and Farnham, while that at Chertsey was built to the hexagonal plan devised by Samuel Kempthorne (Morrison 1999, 60). The layout of these buildings, where males, females and children

were segregated not only into different dormitories but also different exercise areas, exemplify social control at its most extreme, and need to be related to the changes in both agricultural and industrial employment (or unemployment) which brought them into being. Prisons are obviously buildings designed with social control in mind but, even more than the workhouses, as buildings of surveillance. Hospitals, particularly those designed as asylums like the Surrey County Asylum (later Springfield Hospital) in Wandsworth, the Epsom cluster (fig 15.6) and Brookwood Hospital, were equally concerned with surveillance, but also included provision for therapy, such as the farm at Brookwood. All three classes of building demonstrate how aspects of the built environment were structured to promote desired patterns of human behaviour and to achieve social control of certain classes of people during the industrial period.

RELIGIOUS BUILDINGS AND THEIR COMMUNITIES, INCLUDING CEMETERIES

Death and burial is a major theme in the archaeology of all periods, but has rarely played a role in the archaeology of industrialization. Yet it is integral to the study of social memory as shown through the material culture of the period. In the East Midlands, both nonconformity as shown through its chapels and the foundation of Roman Catholic churches following toleration in 1829 made a substantial impact on industrialized villages: how far did this happen in the far less industrialized county of Surrey? Study of the decoration of headstones can reveal changing attitudes to death, a subject of increasing importance to historical archaeologists since the pioneering work of James Deetz in the USA (Deetz 1977; see also Tarlow 1999). There are many references in the Surrey gazetteers to the use of cast-iron grave-markers (fig 15.7); is this use related to social class in any way? As population grew, how were the dead accommodated? What effect did this have on the shape of villages as churchyards became full and cemeteries were located around the perimeters of settlements?

Of particular importance to Surrey, of course, is the construction of Brookwood cemetery to bury the dead who could not be accommodated in London. In 1852 the London Necropolis and National Mausoleum Company purchased the whole of Woking Common for this purpose, eventually creating what is certainly the largest cemetery in Britain, if not in Western Europe. Archaeologists are traditionally interested in past ritual significance, and they could not have a clearer example of this than Brookwood's specially constructed railway line from the so-called Necropolis Junction on the London and South-Western Railway, with its branches into the two sections reserved respectively for Anglicans and all other denominations, each with its own station (Wakeford 1987). This massive cemetery was followed by the construction in 1879 of Britain's first crematorium (fig 15.8), but as the Home Office would not legalize cremation, it was not used until 1885 and then only sporadically until the 20th century. Surrey therefore played a seminal role in the development of 20th century burial practices.

Fig 15.6 The Manor Hospital, Epsom. Opened in 1899, this was the first of the cluster of five hospitals for the mentally ill built by London County Council on the Horton Estate. It was used as a war hospital in the First World War. Bourne Hall Museum (OP 846)

Fig 15.7 One of the many cast-iron grave markers made by the Guildford firm of Filmer and Mason. This example is at Pyrford and contrasts with the marble gravestones behind it. Tony Yoward Collection

LEISURE AND ENTERTAINMENT

Mass entertainment in the Roman period created great monuments in the forms of theatres and hippodromes. It was not until the 19th or even early 20th centuries that anything on a similar scale was constructed for the purposes of entertainment. Racecourses and football grounds therefore merit some attention and study of their structures can also reveal substantial changes in their form as, for example, public health and safety considerations became important. Most football grounds have been reconstructed since the Taylor Report, replacing the terraces with covered stands (Smith 2001). Epsom racecourse, in fact, dates back to the 17th century, with covered stands built in the 19th century which have undergone considerable refurbishment and renewal (fig 15.9); it would be interesting to know what changes of form have taken place to cope with 20th century crowds and to accommodate modern media equipment. Cinemas became popular in the early 20th century and the Odeon chain, for example, developed its own style of architecture (Richardson & Upson 2001) but many have been adapted for other purposes as television enabled people to see films without having to leave home. Finally, Brooklands was the world's first purpose-built banked race track, dating from 1907 and involving vast earthworks, as well as diverting the river Wey in three places. The track was also used for early aeroplane trials, and eventually Vickers Armstrong began aircraft production near the site, purchasing it in 1946, after which racing ceased. A question that could be asked when looking at provision for mass entertainment in Surrey is the effect of proximity to London: does this appear to have helped or hindered local provision? And does the type of entertainment provided in Surrey differ from that, say, in the industrial towns of the north? What does this suggest about the social composition of the population of Surrey?

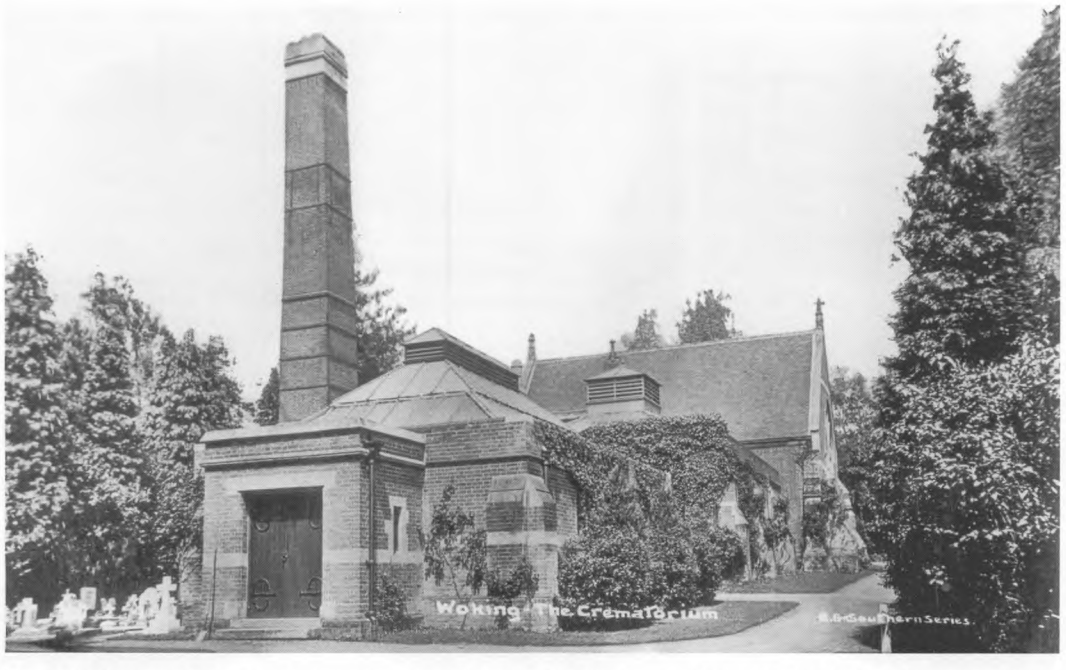

Fig 15.8 Britain's first crematorium, constructed in 1879 at Brookwood cemetery in Woking. Since the Home Office refused to legalize cremation, it was not used until 1885 and then only sporadically until the 20th century. Surrey Industrial History Group Collection

Asking questions about the social meaning of sites and structures surviving from the recent past is an important but often neglected aspect of industrial archaeology.

Conclusion

There are many more areas of the archaeology of the industrial period that could be included in a research agenda. Of particular concern is the lack of actual excavation of sites of the industrial period in England compared with Australia and the USA, which means that we have never been able to study changes in consumption from the material evidence, another major theme in all other periods of archaeology. It also means that we lack basic reference collections of artefacts from the period such as ceramics, glass bottles and metal objects: the only class of objects for which we have an adequate reference collection is the clay tobacco pipe. This may well change in the future as more multi-period excavations are carried out by contract unit staff ahead of development. The task of these archaeologists is to evaluate the archaeological potential of a site prior to re-development and as these are not officially research excavations, there is no longer the tendency to strip off the top layers in quest of the medieval or Roman layers beneath, as was the case until the last decade or so. Industrial archaeology has already benefited substantially from contract archaeology but the results tend to be published as part of the 'grey literature', not often reaching the public domain, although the past editors of *Industrial Archaeology Review* were active in soliciting the results of such contract work for publication. Some of the results of such excavations are listed annually in the CBA's *British and Irish Archaeological Bibliography* and are available on websites such as that maintained by the Archaeology Data Service (ADS), but much more could be done to prevent this considerable archaeological archive remaining largely in oblivion.

The archaeology of the industrial period, then, must be a broad-ranging study encompassing the material evidence of all aspects of human activity in the last two centuries or so. No single person can be equally familiar with all aspects so, like the archaeologists of any other period, we have to resort to specialists when dealing with buildings or artefacts beyond our range of experience. The term 'industrial monument' should perhaps be abandoned, except perhaps for statutory purposes, and sites and structures of the industrial period seen in their temporal, spatial and cultural contexts. Finally, the landscapes, artefacts and buildings of this period should, like those of any other archaeological period, be thought of as material evidence for the past human condition and not only as indicators of technological processes. As David Smith said right back in 1965:

> Industrial archaeology is ultimately concerned with people rather than things: factories, workshops, houses and machines are of interest only as products of human ingenuity, enterprise, compassion or greed – as physical expressions of human behaviour. From whatever standpoint the subject is approached, man is the basic object of our curiosity (Smith 1965, 191).

It is hoped that this brief paper will help point the way to a broad-ranging research framework for the archaeology of the industrial period in Surrey.

Fig 15.9 Epsom racecourse, Derby Day, *c* 1910, showing the 1830 grandstand. The variety of headgear indicates the differing social status of those who enjoyed a day at the races. Bourne Hall Museum (OP 1117)

ACKNOWLEDGEMENTS

The author is grateful to the Surrey Industrial History Group for the production of a series of useful gazetteers on Surrey's industrial past, and particularly to Glenys Crocker for her comments on a draft of this paper and for the further information she supplied. Chris Shepheard, Paul Sowan, Tony Yoward, the Painshill Park Trust and Bourne Hall and Guildford Museums are thanked for providing illustrations.

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Marilyn Palmer, Professor of Industrial Archaeology, School of Archaeology and Ancient History, University of Leicester LE1 7RH