Industrial archaeology

A policy statement by English Heritage

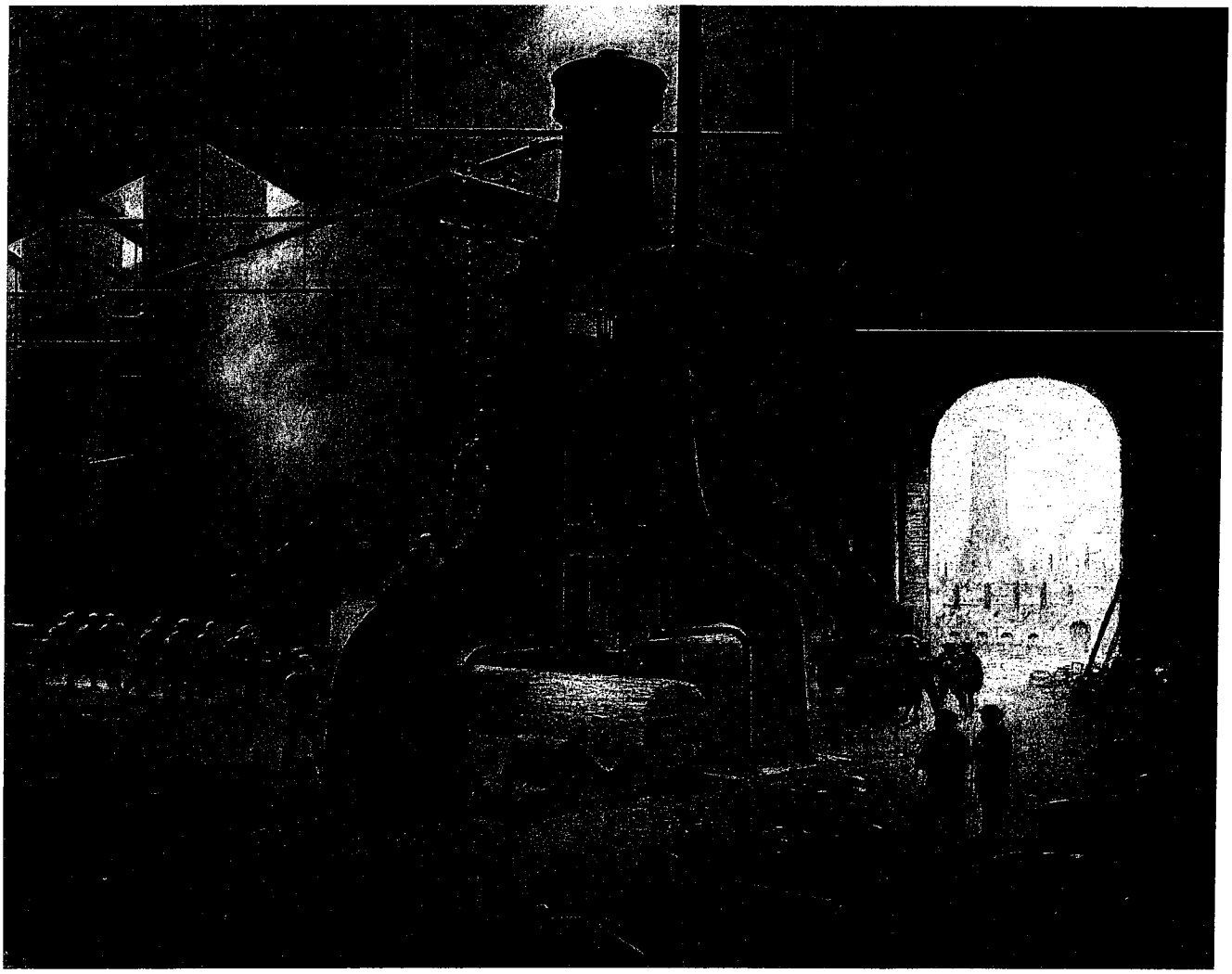


Fig 1 James Nasmyth, Steam Hammer at Work, 1871 (Reproduced by kind permission of the Science Museum, (Source)/Science and Society Picture Library: © Crown copyright)

Introduction

Britain has unique international importance as the birthplace of the Industrial Revolution. The Ironbridge Gorge, world-famous as the cradle of coke-fired ironmaking technology, is designated as a World Heritage Site. There are many other 'world firsts' in the field of industry and technology in England, such as Cromford Mill, Derbyshire, Temple Meads Station, Bristol, and Ditherington Flax Mill, Shrewsbury, Shropshire, as well as rare survivals of international importance such as the oldest Newcomen steam engine to remain *in situ* at Elsecar Colliery, Barnsley, South Yorkshire.

The crafts and industries of earlier periods paved the way for later achievements, but it is the classic constituents of the Industrial Revolution – capital investment, organised labour, technological development, and the factory scale of production – which characterise the field of industrial archaeology.

Industrial archaeology, which involves the recording, research, protection, preservation, and appreciation of the remains of former industries, is therefore an enormously important component of conservation policy in England. It covers the whole range of sites, buildings, structures in their landscapes, machines, and processes which illustrate industrial history. Much of this heritage survives today to hand on to future generations.

English Heritage, as the principal organisation responsible for the conservation of the built heritage in England, has a leading

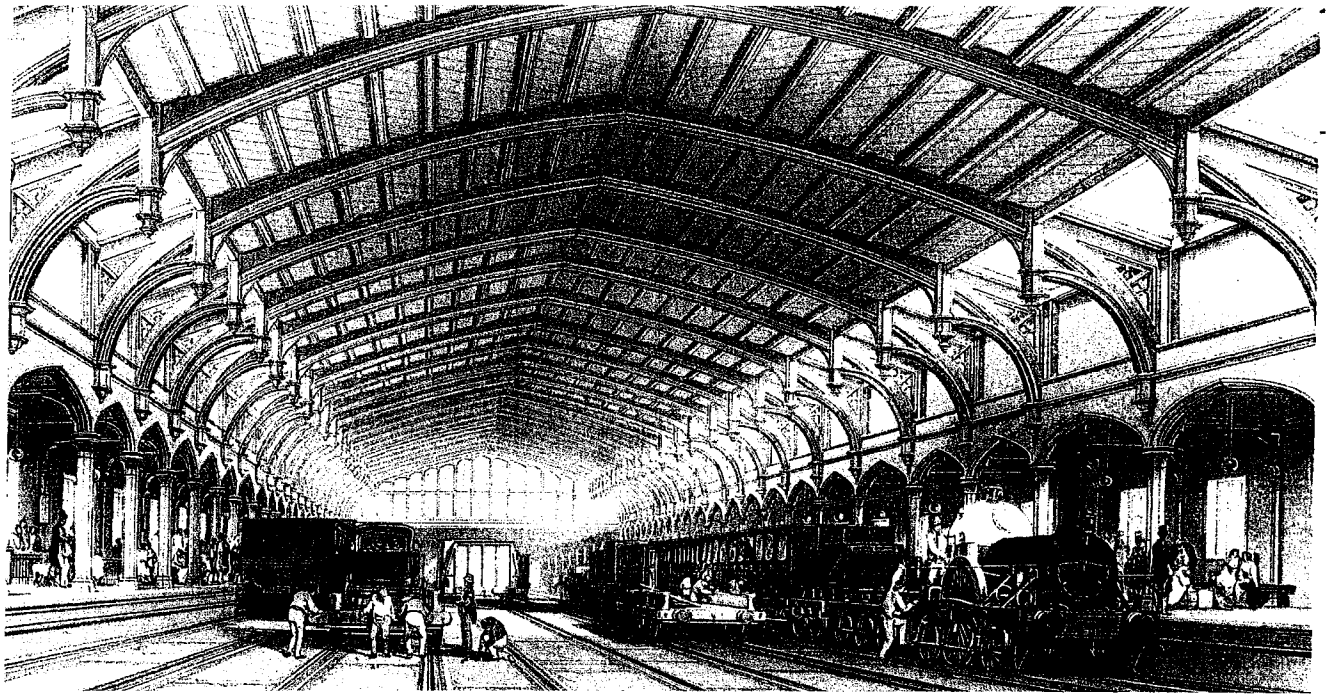


Fig 2 Temple Meads Station, Bristol, Avon (above). The terminus of 1838–40 by Isambard Kingdom Brunel for the Great Western Railway shown in this lithograph by J C Bourne (1842) is the oldest trainshed terminus in the world. Bristol Temple Meads is also of particular interest because two railway companies – both employing Brunel as their engineer – built termini at right-angles to one another. The Great Western Railway station was completed in 1842, the year after the new broad gauge line was opened to London. All that remains of Bristol and Exeter Railway station is a later office building of 1852. A new station, on a curved alignment, was built in 1865–78, accommodating through traffic. English Heritage offered grants totalling over £375,000 during the 1980s and early 1990s for repairs to this outstanding complex. Other well-known examples of Brunel's work in Bristol include his modifications to the City Docks and the SS Great Britain. His design for the Clifton Suspension Bridge, begun in 1836, was completed with renewed funding in 1864 as a tribute to this world-famous engineer. (Bourne's lithograph reproduced by kind permission of the Science Museum, (Source)/Science and Society Picture Library: © Crown copyright)

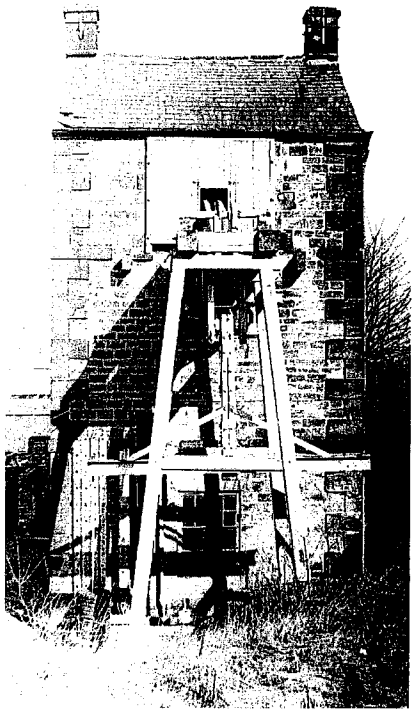


Fig 3 Newcomen Engine, Elsecar Colliery, Barnsley, South Yorkshire (right). Dating from 1787, this is the oldest Newcomen steam engine remaining in its original engine house. It was used to pump water from the coal mine until 1923 and was steamed occasionally up to 1946. It is scheduled as an ancient monument and, although it is no longer appropriate to steam the engine, presentation for visitors is a key consideration in the tourism strategy for economic regeneration of this former coal mining area. English Heritage offered a grant of £3,903 in 1987–9 for urgent repairs to the engine house and we are advising both on the conservation and on a suitable approach to displaying the engine, avoiding the risk of damage to this unique eighteenth-century installation. (Photograph by courtesy of Mr John Hislop, Barnsley Metropolitan Borough Council)

responsibility for industrial archaeology as an integral part of our conservation work. We have statutory duties to advise the Secretaries of State for the Environment and National Heritage and we work closely with other bodies such as the Royal Commission on the Historical Monuments of England and local authorities which have specific responsibilities for aspects of the subject, but we have particular skills to contribute, and a coordinating role to play. Our expertise is based on the direct experience we have of managing the industrial sites in our care, the scientific and conservation skills of English Heritage staff, the extensive research and survey work which we carry out and fund, and the initiatives we have developed in presentation and education.

In 1989, the English Heritage Industrial Archaeology Panel, which provides us with independent specialist advice, recommended a coordinated strategy focusing on the need for research programmes to reinforce and extend the scope of statutory protection for industrial buildings and monuments. This booklet, published to coincide with the Europa Nostra Forum held in Manchester in September 1995, is designed to review achievements and to identify the key issues to address in the next few years.

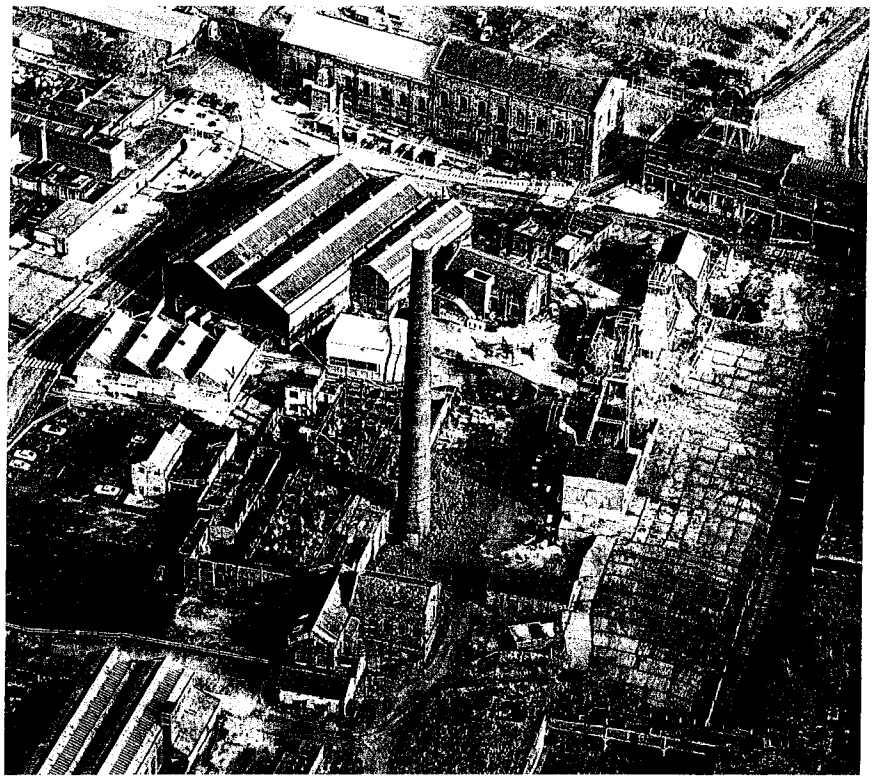


Fig 4 Chatterley Whitfield Colliery, Stoke-on-Trent, Staffordshire (above). Opened in the 1860s, Chatterley Whitfield became, in 1937, the first colliery in Britain to achieve output of over one million tons. The site was scheduled in 1993 as the best surviving colliery typical of twentieth-century deep mining technology. The surviving complex includes the remains of shafts, winding gear, ventilation equipment and other buildings, including the former locomotive works, the lamphouse and the bath and canteen complex which were listed in 1994. The colliery had closed in 1976–7 and subsequently became a museum which went into liquidation in 1993 amidst great concern regarding dispersal of the museum collection and continued preservation of the site. English Heritage has been closely involved in negotiations with the City Council and others to secure appropriate future management of the site and with the help of a grant we have encouraged work on a feasibility study. The scale and costs of conservation highlight the need for clearly defined priorities. It is an enormous challenge to preserve on this scale even the most important survivals from major industries of great significance in economic and technological history. (© Royal Commission on the Historical Monuments of England, Crown copyright.)

The first section of this booklet accordingly reports on progress, covering

- research and recording
- statutory protection and other designations
- conservation and management of the industrial heritage
- display, interpretation and public appreciation
- education

The last section on the back page of the booklet summarises the key issues in the light of progress.

Research and recording

The English Heritage commitment to research and recording for industrial archaeology complements the survey work being carried out by the Royal Commission on the Historical Monuments of England, with its responsibilities for keeping and making publicly accessible the national records of buildings and monuments. Research in industrial archaeology commissioned by English Heritage is concerned principally with the assessment and evaluation of industrial remains, for example the identification of important sites for scheduling and listing, and with the management of ancient monuments, historic buildings, and conservation areas.

Recent studies of the lead and

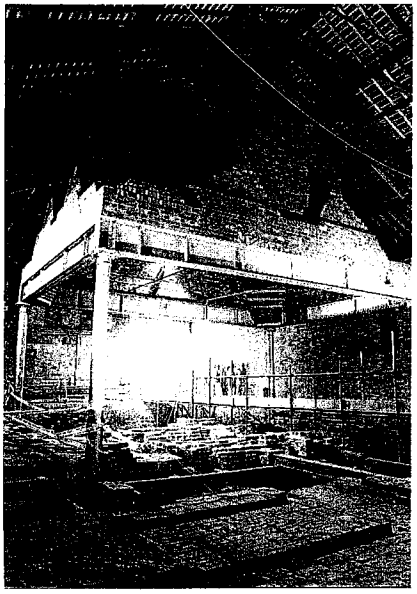


Fig 5 No 9 Tank House, Jubilee Sheet Glass Works, St Helen's, Merseyside (left). The No 9 Tank House, situated in the area of St Helen's known locally as 'The Hotties', was built by Pilkingtons in 1887. It is now the earliest remaining example of a gas-fired continuous tank furnace in Europe, and probably the oldest surviving example of a furnace using the Siemens regenerative technology for cylinder glass manufacture. Originating as an attempt to make use of the heat lost in furnace exhaust gases, this new technology also created appreciably higher temperatures within gas-fired furnaces, thereby enhancing greatly the quality, output and cost of sheet glass which was in heavy demand during the later nineteenth century. The full significance and archaeological potential of this site only became apparent when the integral network of brick-built tunnels was encountered during redevelopment of the adjoining land. English Heritage has funded archaeological excavation and recording in preparation for structural repairs and eventual display as part of The Hotties Science and Arts Centre. This initiative forms the centrepiece of a major regeneration programme known as Ravenhead Renaissance promoted through partnership between the public and private sectors. (Photograph by Neil Connolly: reproduction by kind permission of Safeguard Chemicals)

coal mining industries commissioned as part of the Monuments Protection Programme have provided us for the first time with authoritative statements regarding the history and importance of these industries and other surviving related structures and archaeological remains, whether of the Industrial Revolution or earlier. An aerial photographic survey of *Colliery Landscapes* (English Heritage 1995), carried out at a time of momentous change within the coal industry, has already been published as part of our commitment to raising public awareness of industrial archaeology. Studies of other industries, for example brass, iron, and stone, are also in preparation.

In *Exploring Our Past* (1991) we outlined suggested strategies for archaeological research in England. Pre-eminent among these was the need to collate existing data and carry out surveys of industrial archaeology. We are well on the way to achieving this through the industry-by-industry approach of the Monuments Protection Programme. As well as the need for reviews of the kind undertaken for the lead and coal industries, we identified the potential value of more detailed studies of industry and craftsmanship. These include the extraction and processing of raw materials, understanding how agriculture and industry co-existed in the landscape, and research into the manufacture of commodities – whether of perishable materials or of products which survive as part of the archaeological record.

Among the research projects commissioned to fulfil the objectives we set ourselves for the 1990s are a survey of mining and agricultural landscapes in Shropshire, the identification and recording of industrial buildings in Newark (an important centre for malting in the nineteenth century), and laboratory research into historical metallurgy. In an important new initiative to bring together specialists researching the glass industry, English Heritage convened a seminar on the Jubilee Sheet Glass Works, Merseyside (known locally as 'The Hotties'), and has been funding the investigation, recording, and conservation of this site, which is of key importance in understanding glass-making technology in the later nineteenth century.

Undertaking and advising on technical research concerned with site prospection and dating, as well as the analysis and conservation of archaeological and structural materials, are important parts of our commitment to industrial archaeology. Recent research has included work on the

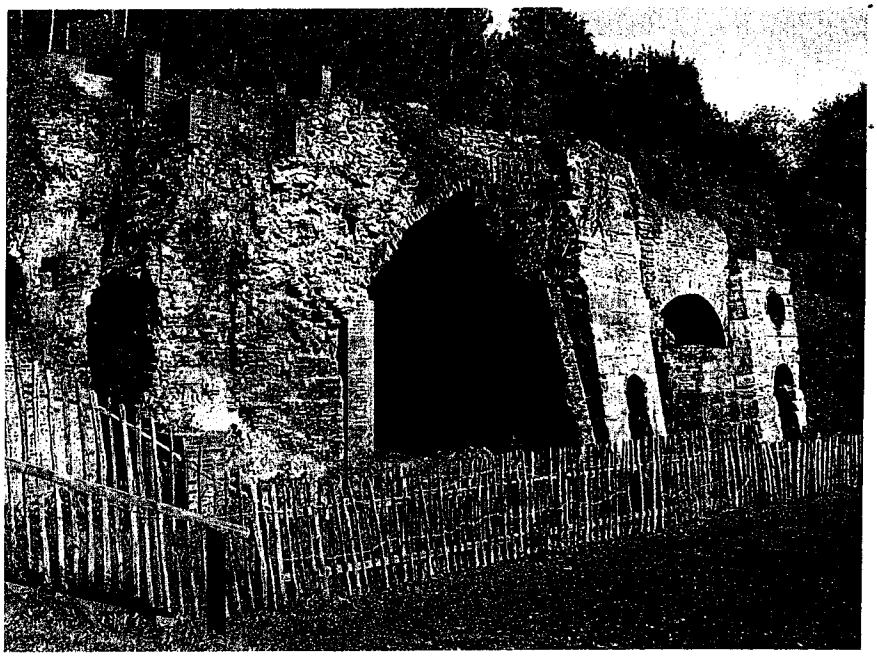


Fig 7 Bedlam Furnaces, Ironbridge, Shropshire (above). Bedlam was one of the nine new blast furnaces constructed in the Ironbridge Gorge between 1756 and 1760. Built in 1756–7, this site illustrates developments in the use of steam power to recycle water driving the wheel, thereby enhancing both the reliability of the bellows and the capacity of the blast. These innovations contributed to a dramatic increase in the output of iron using coke for fuel during the third quarter of the eighteenth century. Depicted in the famous painting of Coalbrookdale by night *by P J de Loutherburg (1801), the remains of the Bedlam Furnaces are scheduled as an ancient monument and are displayed for visitors to the Ironbridge Gorge Museum. English Heritage funded archaeological recording as part of the repair programme agreed with the Commission for New Towns. This was one of the properties in the Ironbridge Gorge, formerly owned by the Telford Development Corporation, which have been transferred with an endowment into the hands of the Ironbridge (Telford) Heritage Foundation.*

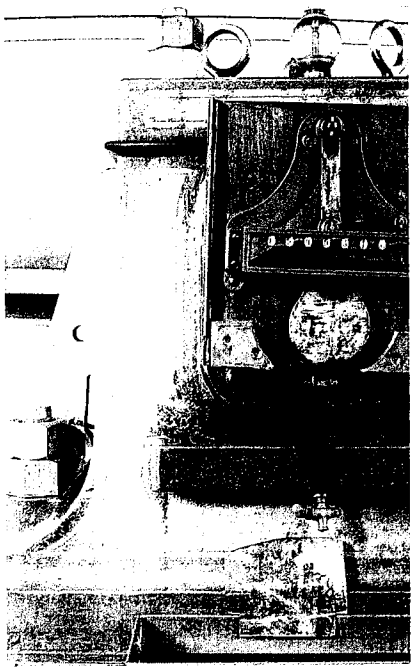


Fig 6 Tees Cottage Pumping Engine, Darlington, County Durham (right). This compound rotative beam engine, part of the Darlington Corporation Waterworks, was made in 1904 by Teesdale Brothers. In 1990, English Heritage commissioned a study of the original surviving paintwork on the engine. Conservation of historic painted surfaces is a well-established approach in other fields, but this is a relatively unexplored area of research in industrial archaeology.

ceramic and glass industries, and research on the Tees Cottage Pumping Engine, Darlington, County Durham, has shown that the paint is a uniquely surviving scheme of 1904; the conservation programme for the steam engine will ensure its preservation.

Recording and research undertaken on monuments managed by English Heritage set standards for others to follow. At Derwentcote, County Durham, repair and restoration of the eighteenth-century cementation furnace were preceded by archaeological investigation and recording. This is the kind of exercise we are promoting through advice and grants to others responsible for the upkeep of industrial buildings and monuments. Working in partnership with the Commission for the New Towns, one such major programme of archaeological recording has been funded by English Heritage in connection with repairs on sites in the Ironbridge Gorge World Heritage Site, Shropshire. At Southorn's Pipeworks, Broseley, Shropshire, painstaking recording of the abandoned contents of the former pipeworks was commissioned in advance of structural repairs.

In all research and recording we seek to make effective use of finite resources by targeting specific research objectives, concentrating

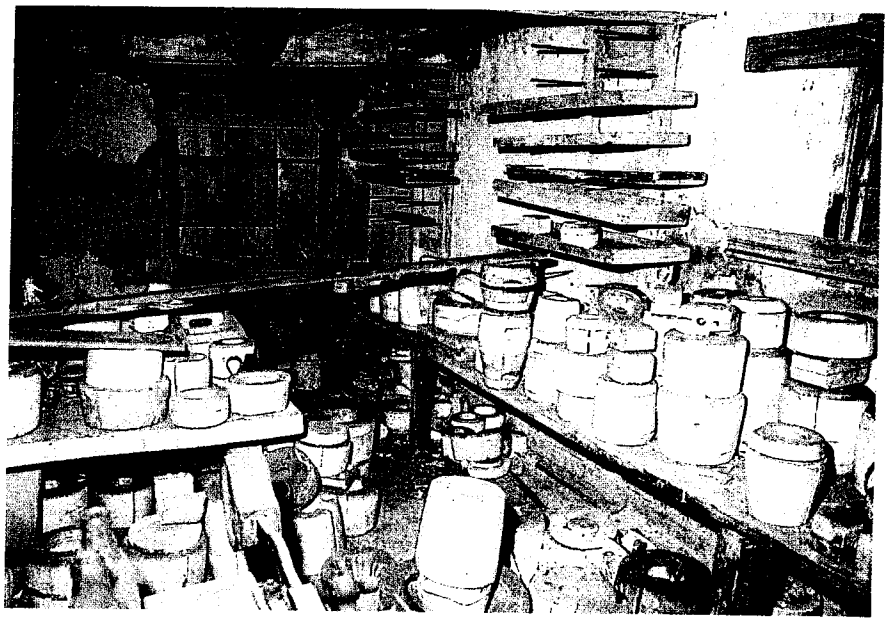


Fig 8 Southorn's Pipeworks, Broseley, Shropshire (above). This claypipe manufactory dates from the early to mid-nineteenth century, and is listed Grade II. It is believed to have been the last working claypipe manufactory in the country when production ceased in the 1950s. In 1991, English Heritage made a grant towards the cost of acquisition by Bridgnorth District Council as the first step towards long-term preservation and establishing a museum. Before tackling repair of the building, it was necessary to record and remove to safe storage the abandoned equipment and contents of the pipeworks, which contribute so greatly to the special interest of this site. A grant of £8,591 was offered in 1992 towards photographic recording and making an inventory. A further grant of £64,590 has been provided for structural repairs. (Photograph by Michael Worthington: copyright © The Ironbridge Gorge Museum Trust Archaeology Unit)*

Fig 9 Ancoats Mills, Manchester (right). The Ancoats district of Manchester has one of the historically most significant groups of early cotton spinning mills to be found anywhere in Britain. Dating mainly from the late eighteenth century to the 1840s, these were huge buildings by the standards of the time, employing a workforce of well over 1,000 in the 1790s. More than 2,400 mills are known to have existed in the Manchester area, but over half of them had been demolished by 1992. English Heritage has identified over 100 of the most important surviving textile factories in Greater Manchester – including some already listed – which deserve protection so that their architectural and historic interest can be given due recognition in the management of economic change. (Photograph: English Heritage Listing Branch)

effort particularly on those projects which will help to inform recommendations for statutory protection and contribute to the effective management of industrial sites and landscapes.

Statutory protection and other designations

English Heritage is the statutory adviser to the Department of National Heritage on the listing of historic buildings and the scheduling of ancient monuments. We also advise local authorities on the designation of conservation areas and the preparation of development plans.

The role of English Heritage in statutory protection and recommending other designations therefore includes

- defining criteria and drawing up guidelines for statutory protection and publishing these to promote public acceptance of rational and consistent standards
- identifying and assessing the importance of buildings and monuments and advising on their suitability for scheduling and listing, or other management approaches
- maintaining the heritage database of scheduled monuments and collaborating with the Department of National Heritage and the Royal Commission on the Historical Monuments of England in computerisation of the statutory list to improve its accessibility
- advising Government on the designation of World Heritage Sites
- advising local authorities on the identification, characterisation and designation of conservation areas
- advising local authorities on proposals for sites and landscapes deserving special recognition in development plans

Fig 10 Oxford Canal, Napton, Warwickshire. Construction of the Oxford Canal, begun in 1769 under the distinguished engineer James Brindley, was typical of the early so-called 'contour canals'. By following the contours of the land, the costly engineering of tunnels and aqueducts was avoided. Typical among rural canals in the Midlands, this view of the Oxford Canal at Napton includes examples of the brick structures which contribute to the distinctive architectural character of inland waterways. English Heritage has funded jointly with British Waterways an Architectural Heritage Survey providing information for a computerised database to help with conservation and management of historic waterway structures. (Photograph reproduced by courtesy of British Waterways)

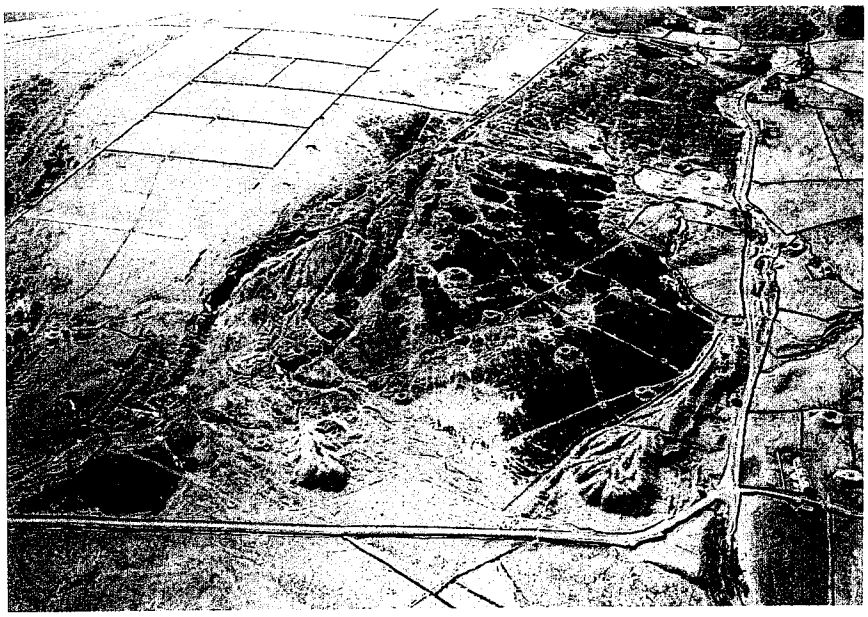


Fig 11 Hurst, North Yorkshire (above). This landscape of lead mining and farming includes mounds for shallow and deep shafts surrounded by nineteenth-century and earlier enclosures. Scheduling is only appropriate for a few of the most important lead mining remains, but palimpsest landscapes such as this one in the Yorkshire Dales National Park deserve sensitive management to preserve the legibility of former land uses. Priorities for nature conservation often coincide with areas of interest in terms of historic landscape. (Photograph: R White, Yorkshire Dales National Park; reproduced by kind permission)

Communicating the results of current research is an important part of public consultation on English Heritage recommendations for listing. The publication of a booklet in our *Understanding Listing* series dealing with *Manchester Mills* (1995) has focused attention on the development of the cotton mill as a specialised building type and has helped to raise awareness, especially of the later mills which had been overlooked in previous lists.

We have also been working with British Waterways to survey the architectural heritage of England's canals. This has helped with reviewing the statutory lists, and the local character of both urban and rural waterways has prompted the designation of several canal conservation areas. English Heritage guidance on *Conservation Area Practice* (1993) is helping local authorities to make reasoned justifications for their designations based not only upon the quality of the historic environment, but also upon the way in which conservation area status could serve the management needs of individual waterway corridors.

Statutory protection is not always an appropriate response to the growing awareness of

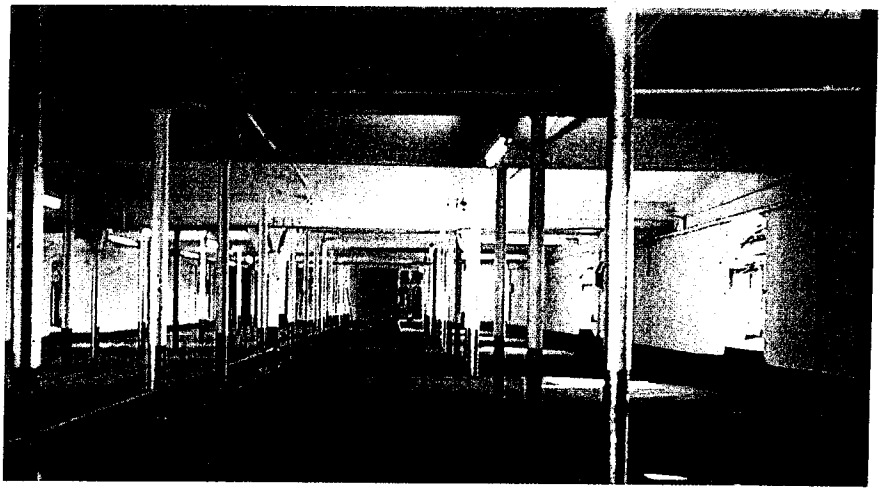


Fig 12 Ditherington Flax Mill, Shrewsbury (above). Bage's Mill occupies an important place in the early development of fireproof mill construction. Progressing from the jack-arched floors with plaster-covered timber beams supported on cast-iron columns which had been pioneered by Jedediah Strutt at Derby in 1793, Bage's Flax Mill at Ditherington was the first iron-framed mill incorporating iron beams (and windows), as well as columns. Significantly, this innovation took place in an area already renowned for pioneering developments in the manufacture and use of iron. Detailed recording undertaken with the help of grants from English Heritage has revealed other important early fireproof buildings on the site at Ditherington, dating from c 1805, 1812 and c 1820, thereby reinforcing the understandable correlation between the use of power-driven mechanised processes and the adoption of fireproofing. Research has shown that fireproof construction could cost up to 25% more than timber during this early period, so investment was confined to those buildings which were most vulnerable to destruction by fire. The Ditherington complex was adapted subsequently as a maltings, but has been unoccupied for many years. Robust buildings of this kind are potentially capable of reuse for a variety of purposes, but the challenge is to identify a scheme which is both financially viable and retains at least parts of the building with an uninterrupted appreciation of the former spinning floors. (Photograph reproduced by kind permission of Dr B Trinder, The Ironbridge Institute)

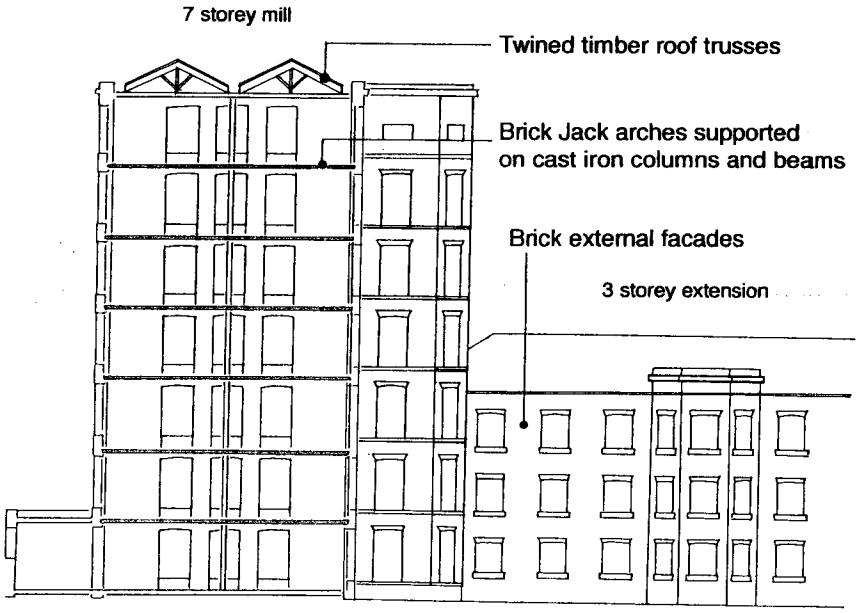


Fig 13 Hunslet Mills, Leeds (right). Built between 1838 and 1840 as a steam-powered flax spinning mill, this iron-framed structure is listed Grade II. The mill was converted for blanket manufacture in the 1870s, but by the First World War it was divided for a variety of manufacturing businesses. By the mid-1970s only the lower floors of the main seven-storey mill were occupied and, following demolition of the spinning sheds in the 1980s, Hunslet Mills has remained unoccupied despite several proposals for redevelopment. A feasibility study, including an engineering assessment, has been commissioned to encourage phased redevelopment of this important site fronting the River Aire. The Leeds riverside is a focus for regeneration involving the restoration and reuse of historic buildings and new development, including a new building for the Tower Armouries. (Redrawn after an original by Troughton McAslan Architects)*

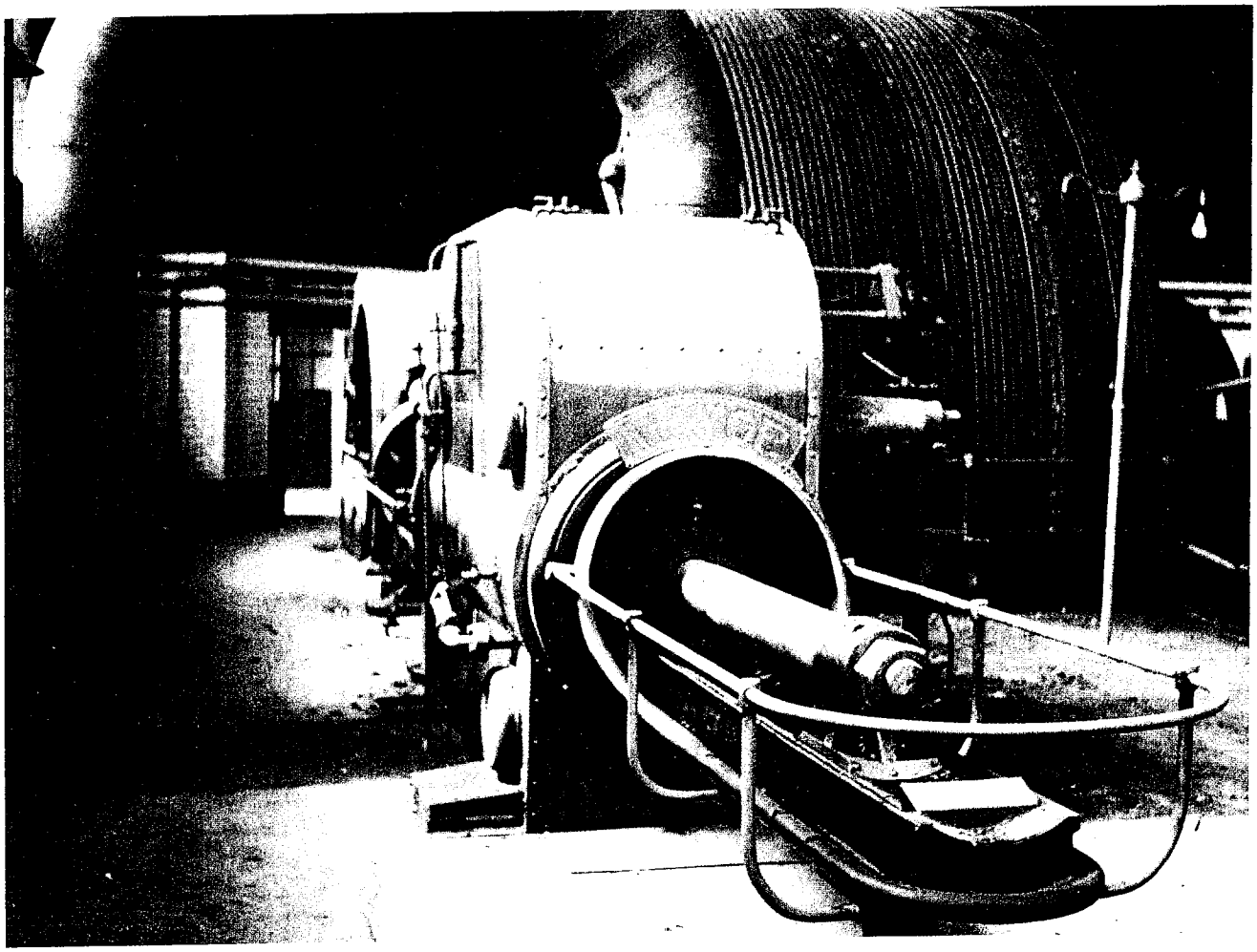


Fig 14 Leigh Mill, Wigan. The massive double spinning mill at Leigh was built in two stages between 1913 and 1923 by Bradshaw and Gass during one of the last bursts of commercial expansion in the Manchester area which justified investment in new building on this scale. The mill, now listed Grade II, has been adapted for the production of carpets. English Heritage argued successfully at a public inquiry in 1994 that the large horizontal cross-compound steam engine, built and installed by Yates and Thom of Blackburn in 1925, should not be removed to provide additional storage space. The Secretary of State for the Environment gave careful consideration to the operational needs of the company, but concluded that other options were feasible and took the decision to refuse listed building consent for removal of the engine, because of the desirability of preserving in situ this rare surviving example of a once-typical arrangement in the Lancashire textile industry. (Photograph by courtesy of Wigan Metropolitan Borough Council)*

industrial sites in their landscape context. We are therefore developing a range of approaches to historic landscape character assessment and planning guidance. These will provide adequate recognition for landscapes where individual sites may not be of outstanding significance in their own right, but may be important by association – perhaps as evidence of former agricultural, industrial, and economic systems or in their contribution to local character or regional diversity.

Conservation and management of the industrial heritage

English Heritage promotes conservation and management of the industrial heritage through a balance of advice, controls, and incentives.

Government guidance on *Planning and the historic environment* (PPG 15) and *Archaeology and planning* (PPG 16) provides the framework for the English Heritage approach to conservation issues supported by detailed guidance, particularly *Development in the historic environment: an English Heritage guide to policy, procedure and good practice* (June 1995). The treatment of historic fabric is guided by our published *Principles of repair* (1995) and we also publish planning guidance on conservation in conjunction with English Nature and the Countryside Commission [*Conservation issues in strategic plans* (1993); *Conservation issues in local plans* (forthcoming)].

Industrial buildings are prominent in our conservation work, presenting us with some of the most difficult challenges, yet offering exciting opportunities for conservation-led regeneration.

Conservation, regeneration and land management

By encouraging and enabling local authorities to identify and assess buildings at risk, we have helped to raise awareness of conservation as a potent force in economic regeneration. Realistic structural surveys and feasibility studies,

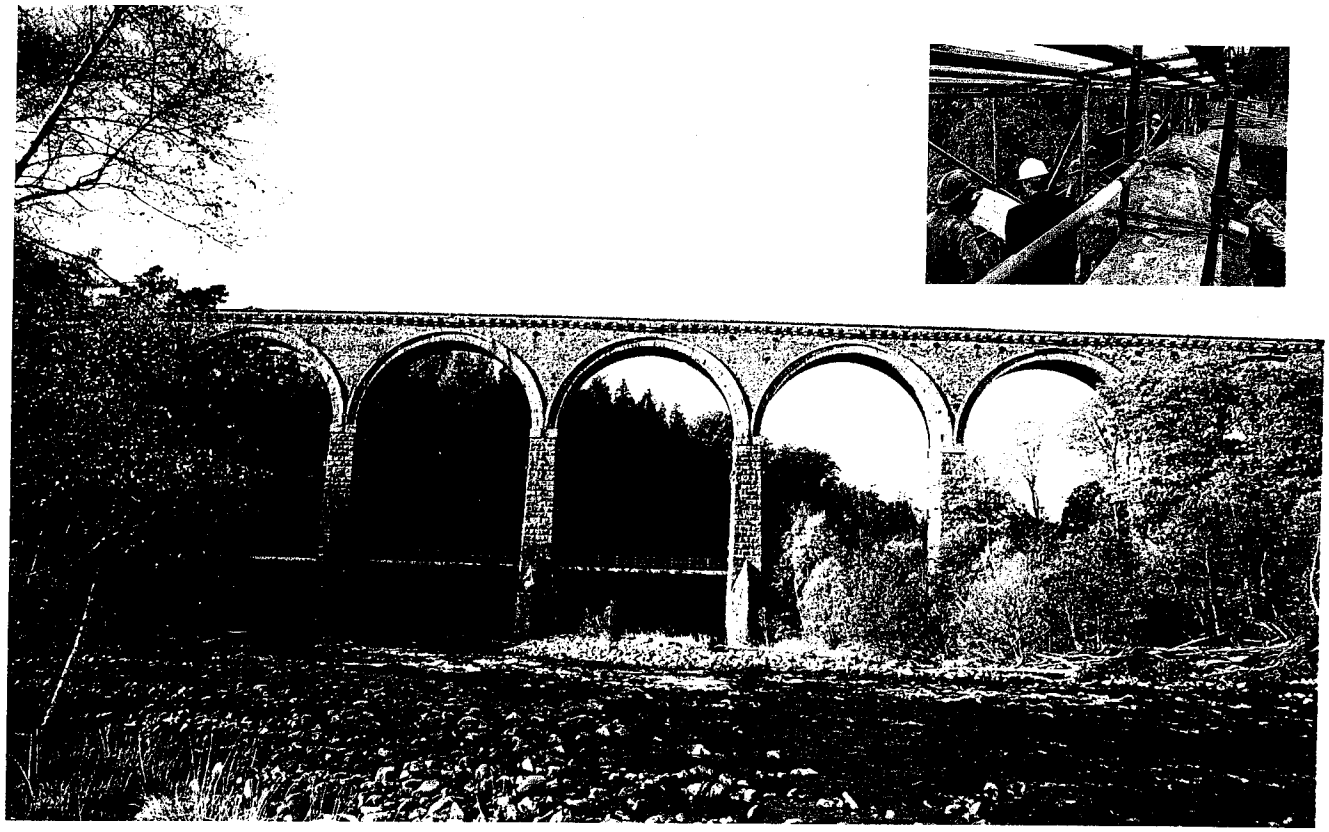


Fig 15 Lambley Viaduct, Northumberland. This stone viaduct of nine arches was built in 1852 to carry the now disused Alston branch of the Newcastle and Carlisle Railway across the South Tyne Valley. Listed Grade II, this is one of the viaducts undergoing repair [inset] with funding from the British Rail Property Board and the Railway Heritage Trust, and with a grant of £225,000 from English Heritage. Once repaired, Lambley Viaduct will be maintained and managed as an amenity by the North Pennines Heritage Trust with opportunities for pedestrians to appreciate once again the magnificent view from the former trackbed. This successful project highlights the value of funding partnerships and the benefits of commitment by local authorities and trusts to safeguarding the future of the country's most important disused viaducts. (Print of Lambley Viaduct © copyright British Rail Property Board)*

working to a clear brief, can hold the key to imaginative and viable opportunities for the reuse of industrial buildings. We have helped where we can to commission specific studies, and example projects agreed with the Department of National Heritage – such as the feasibility study for Hunslet Mills (Fig 13) – are intended to encourage others and set standards for similar work elsewhere.

The results of the English Heritage Monuments at Risk Survey will extend to field monuments and archaeological remains a quantified measure of condition and vulnerability. This will help us to judge the impact of land use changes and the extent to which conservation initiatives such as Countryside Stewardship and the designation of Environmentally Sensitive Areas are capable of safeguarding relict industrial landscapes. We are also working with the Countryside Commission and English Nature towards the preparation of a Regional Character Map of England which will provide a framework for both strategic and

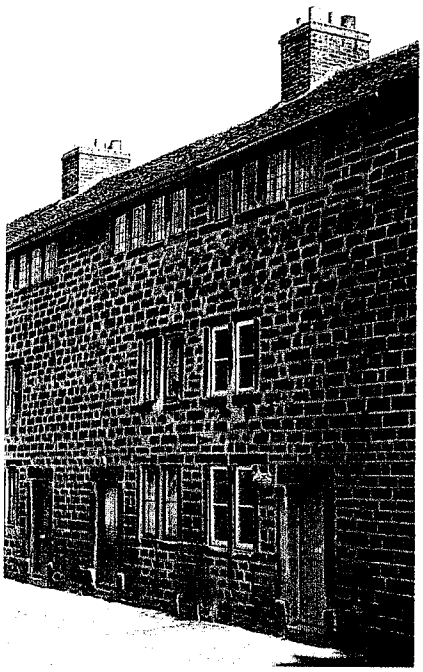
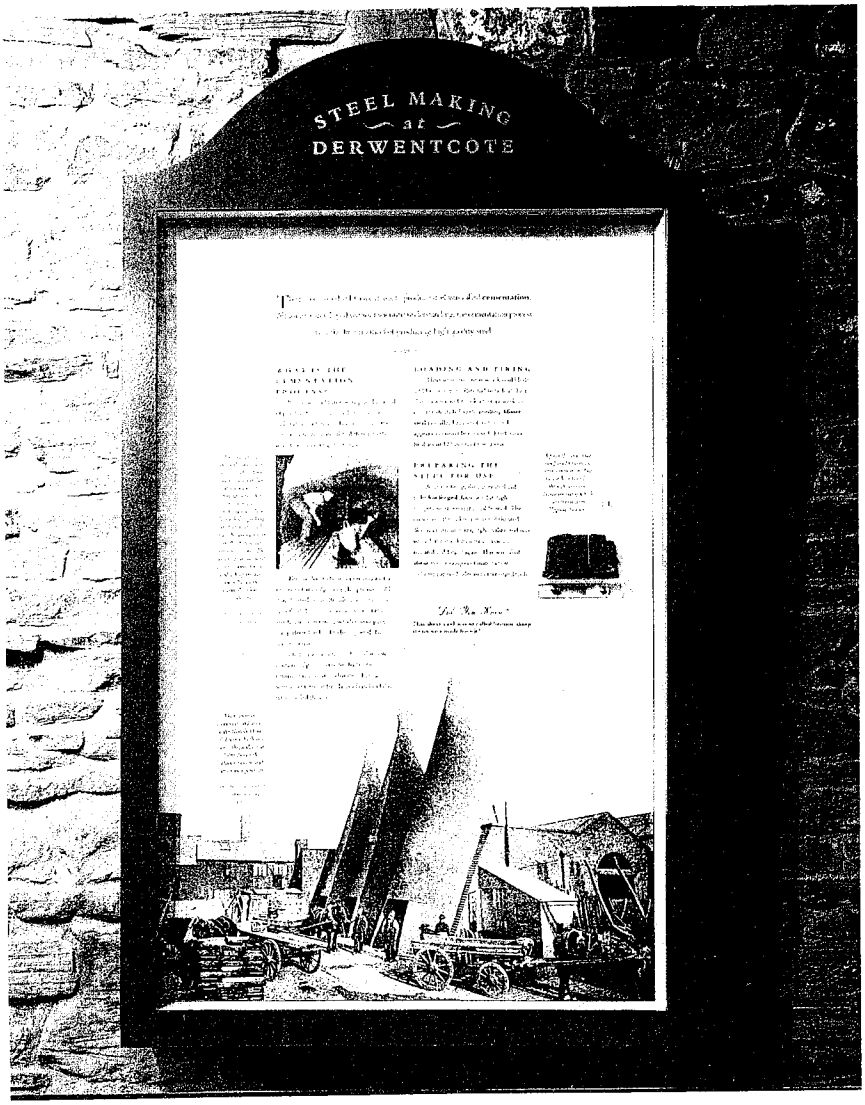


Fig 16 North Street, Cromford, Derbyshire (left). The terraces of three-storey stone houses at North Street, Cromford were built c 1777 for workers at Arkwright family cotton mills nearby. Town Scheme grants to the owners of properties in the Arkwright settlement at Cromford have helped with repairs and have encouraged the restoration of traditional features such as those on North Street preserved by the Landmark Trust. In 1995, English Heritage entered a Conservation Area Partnership with the local authorities to extend this work to other important buildings in the Cromford Conservation Area. This new scheme is intended to identify and tackle specific local conservation priorities, notably for buildings at the head of the Cromford Canal, thus complementing English Heritage grants for the repair of buildings at Cromford Mill.

Fig 17 Masson Mill, Cromford, Derbyshire (above). Masson Mill, built by Arkwright in 1784–5 in the limestone gorge south of Matlock, lies about half a mile downstream from the earlier Cromford Mill. The elegant brickwork and Venetian windows of the central bays contrast with the local stone of the mill and workers' housing at Cromford. Masson Mill was extended substantially in the early twentieth century and ceased production in 1992. Assisted by a derelict land grant, and with the help of an English Heritage grant of £400,000 for repairs, the complex is being converted to commercial, office and retail use with facilities for visitors in the oldest part of the mill.



more local conservation and management decisions in the industrial field.

Advice to Government and regeneration agencies on the appropriate targeting of resources for reclaiming derelict land or the restoration of disused buildings has reinforced the value of conservation in projects ranging from the historic waterfronts of English towns and cities – such as Gloucester and Liverpool – through the strategy for Woolwich Arsenal and other military industrial sites, to the rural lead mining landscape of Snailbeach in Shropshire.

Advising and assisting landowners, national agencies, and others in the strategic assessment and management of their historic estates is another cost-effective means of promoting our conservation objectives. Investment in repair of the Ribblehead Viaduct, North Yorkshire, has yielded wider benefits, not only for conservation but also in sustaining the transport infrastructure for rural communities and their visitors.

Statutory controls

English Heritage is the Government's statutory adviser on applications for scheduled monument consent. The most significant planning and listed building consent applications are referred to us by local authorities and through the Government regional offices. We also advise

Fig 18 Derwentcote Cementation Furnace, County Durham (left). English Heritage has in its care a unique eighteenth-century cementation furnace. Situated in an area long associated with iron-making, the furnace itself is inside a conical stone hovel. The complex has been carefully recorded and conserved with display panels to explain the significance of this unique site for visitors on those occasions when the monument is open to the public. This is a case where English Heritage has intervened with the conservation of a small but immensely important structure of specialist interest as a means of last resort to secure long-term preservation. (English Heritage Photographic Library)

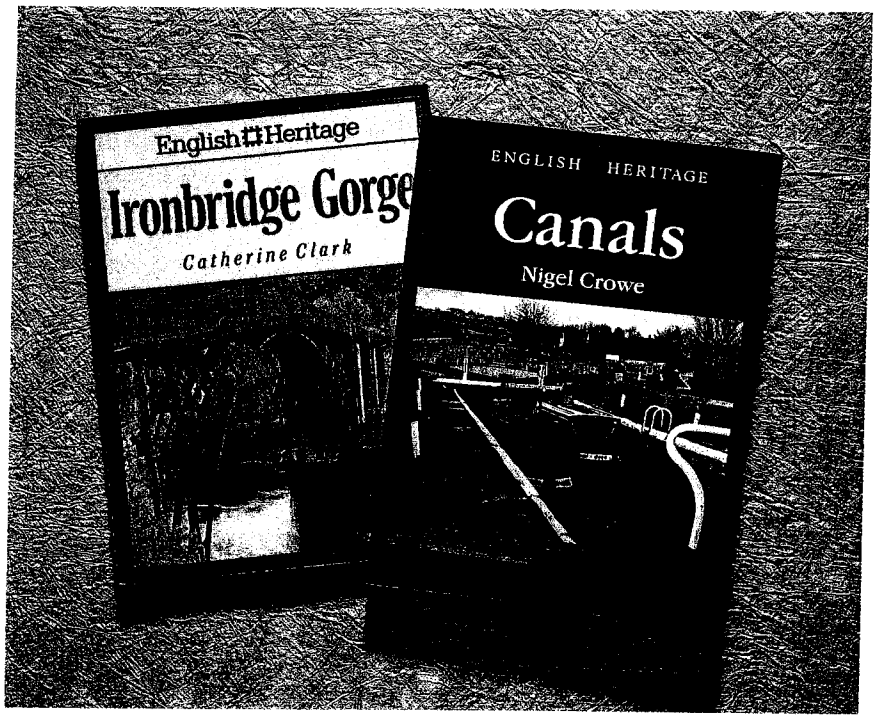


Fig 19 English Heritage/Batsford publications on industrial archaeology (left). Titles in this series include Ironbridge Gorge *(1993) and* Canals *(1994), presenting in a readable style the results of current research. (English Heritage Photographic Library)*

Fig 20 Saltford Brass Mill, Avon (above). Saltford was the last working brass mill in an area with 200 years' tradition of brass manufacture. The site is notable for the continued use of battery hammers to produce hollow wares. An inventory of 1830 mentions a rolling mill powered by two water wheels and a further two water-powered battery mills. The brass annealing furnaces, built to an innovative design probably shortly after 1769, are of great technological interest. In a European context, the date and survival of the mill buildings is unparalleled. The site is a scheduled monument and English Heritage recommended in 1987 that consent be withheld for schemes of conversion respectively to a restaurant or other mixed uses. This has paved the way for a less intensive scheme of partial conversion and public access. English Heritage grants were offered for urgent repairs during the 1980s and we have subsequently met a large part of the cost incurred in repairing the mill buildings, notably the complex pantile roof. (Photograph by courtesy of Avon County Planning Department)

local planning authorities on conservation matters and help them to assess and determine the impact of development proposals upon the historic environment. Encouragement for local authorities to appoint suitably qualified and experienced conservation officers is an effective means of ensuring the satisfactory integration of conservation within the planning process.

In exceptional listed building cases called in for determination by the Secretary of State for the Environment, it is necessary for English Heritage to argue the conservation case at a public inquiry, but the prospect of an inquiry can itself provide new impetus and fresh ideas for dialogue and negotiation. Leigh Mill, Wigan (Fig 14), is a recent example where English Heritage argued successfully with other conservation interests against the proposed removal of an engine from No 2 Mill. The engine and its associated rope race are the sole *in situ* survivors in the north in a major Grade II* listed building of a type of mill engine once common and typical of the Lancashire textile industry. For large volume industrial buildings in particular, we are commissioning research and building up our own expertise in assessing the economics of conservation. This rightly comes under close scrutiny in determining whether or not retention rather than redevelopment is a realistic option.

English Heritage grants

English Heritage provides grants and technical advice for the repair and associated recording of outstanding industrial buildings and monuments which meet our eligibility criteria of importance, financial need, and urgency of repair. The targeting of resources

Fig 21 Braunston, Northamptonshire (left). English Heritage is providing conservation training for British Waterways staff. On this canal accommodation bridge at Braunston, Northamptonshire, techniques of cutting out defective mortar and careful repointing are demonstrated on site by specialists from the English Heritage Training Centre at Fort Brockhurst. (Photograph courtesy of British Waterways)

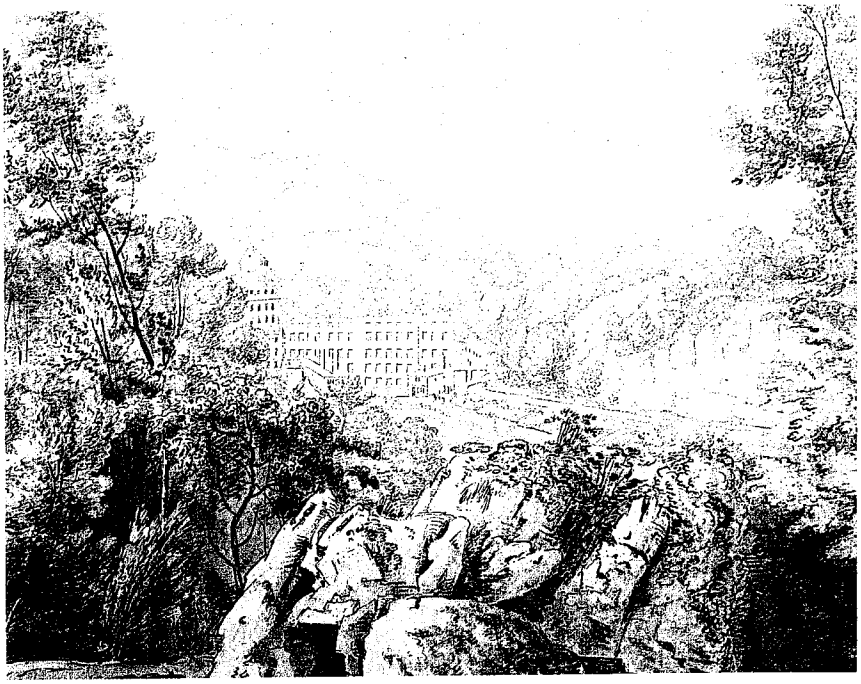
at buildings and monuments which are not capable of beneficial use has enabled us to help increasingly with conservation of the industrial heritage.

We are publishing separately an analysis showing the substantial increase in real terms of the grants which have been offered for industrial archaeology since 1984. In 1994/95 alone, offers for industrial buildings and monuments (excluding other types of grant for historic areas) amounted to just over £2.5 million, ranging from modest increases on existing offers to grants of £500,000 for House Mill in the London Borough of Newham, and offers of more than £200,000 each for Queen Street Mill, Burnley, Lancashire, Stanley Mill, Gloucestershire, the Calshot Hangars, Hampshire and Lambley Viaduct, Northumberland.

In addition to grants for important buildings and monuments, we are collaborating with local authorities in the preservation and enhancement of important conservation areas, through our Conservation Area Partnerships and selective grants for listed buildings at risk. Funded jointly with local authorities, the partnership agreements are in many cases building upon experience and achievements with former Town Schemes. This approach is enabling us to tackle the repair and restoration of industrial workers' housing – at Belper and Cromford (Fig 16) in Derbyshire, for example – where relatively low property values would otherwise offer little incentive for individual owners to enhance the character of historic industrial settlements by carrying out necessary repairs and reinstatement of features damaged by previous alterations.

This partnership approach underlines the need to integrate funding for conservation with sound planning policies and appropriate development control. In areas selected for their industrial

Fig 22 Cromford Mill, Derbyshire (below). Richard Arkwright built the first water-powered cotton mill at Cromford in 1771. By 1790 it had become part of a group of multi-storey spinning mills and warehouses. This view by William Day (1789) shows the rural setting for the cradle of Britain's cotton manufacturing industry where Arkwright's techniques of factory production were developed and copied throughout the world. Cromford Mill was acquired by the Arkwright Society in 1979; with the help of English Heritage grants and with funding and sponsorship from many sources, the site is gradually being restored for a variety of uses with interpretation for visitors. (Print reproduced by courtesy of Derby Museums and Art Gallery)



archaeological interest, such as Cromford (Figs 16, 17, 22) in the Derwent Valley, we are able to develop coordinated strategies which recognise the architectural and historic importance not only of the mills themselves, but also of associated industrial housing.

Display, interpretation and public appreciation

English Heritage promotes public appreciation of industrial archaeology both directly through properties in our own care and indirectly by means of advice and, exceptionally, through grants. Interpretative media are used to explain the history and technological interest of the few industrial sites managed either directly by English Heritage or under local agreements on our behalf as at Stott Park Bobbin Mill, Cumbria.

The publication of archaeological and technical research makes available for public scrutiny the results of industrial archaeology surveys and excavation, and the English Heritage/Batsford series (Fig 19) published for a general readership now includes titles on *Ironbridge Gorge* (1993) and *Canals* (1994).

Museums and other heritage uses are often regarded as a convenient means of securing the preservation of industrial sites, especially where alternative uses have failed to emerge.

In such cases, we are sometimes able to help with feasibility studies to evaluate the practical and commercial realities of revenue funding before making a major commitment to repairs and encouraging ambitious presentation for visitors. At Saltford Brass Mill, Avon (Fig 20), for example, before proceeding with expensive repairs, we commissioned a detailed investigation of the options for display. It was essential to promote dialogue with the local interests who would be responsible in the long term for handling public access and carrying forward plans for the interpretation of this internationally important survival of the brass industry.

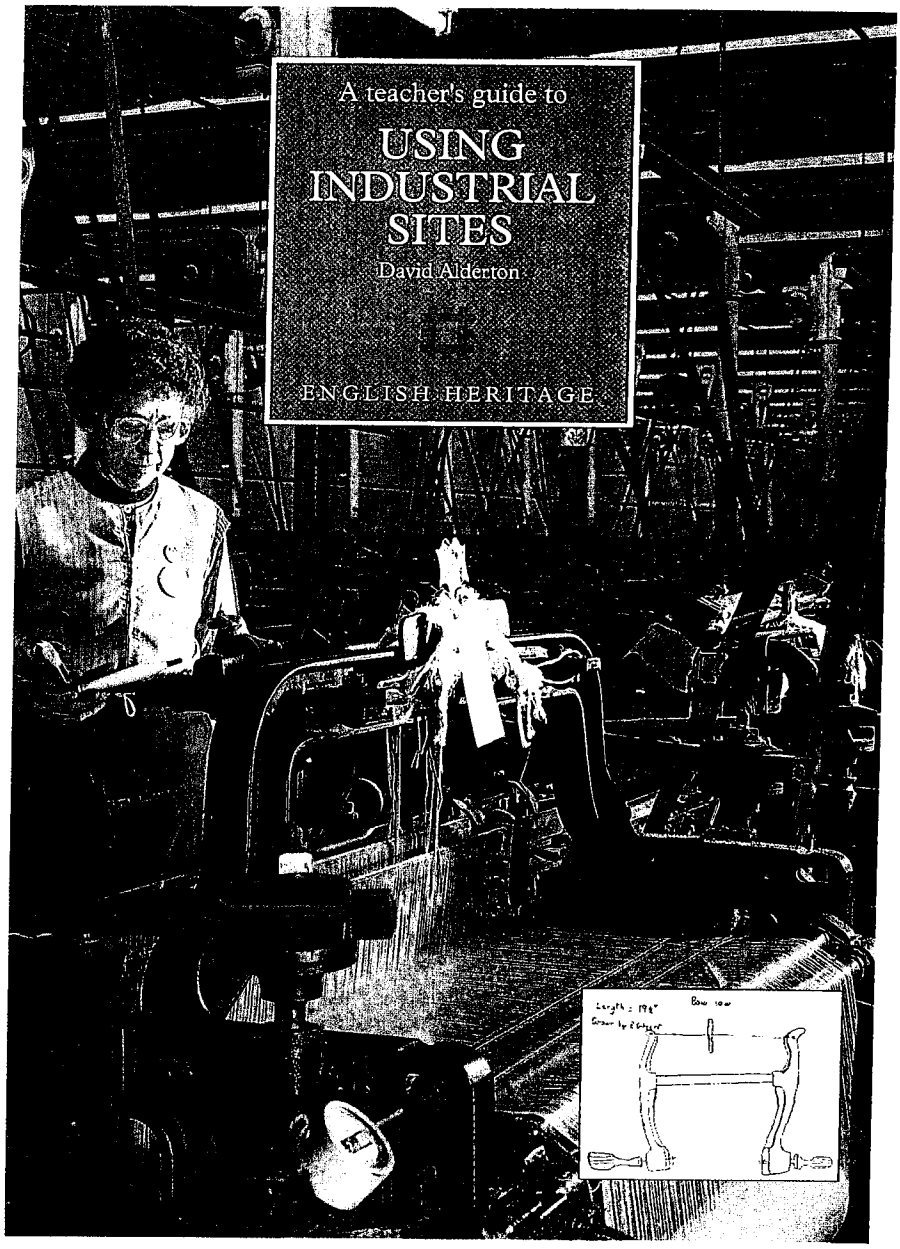


Fig 23 English Heritage. A teacher's guide to using industrial sites

Education

English Heritage runs educational programmes and publishes teaching materials for use within the National Curriculum. We also contribute to professional conservation training through advice and lectures by members of English Heritage staff and formal teaching at the Fort Brockhurst Training Centre. Our education work in the field of industrial archaeology includes

- publishing teaching materials (eg *A teacher's guide to science and the historic environment* (published 1992); *Using industrial sites* (forthcoming)
- devising and implementing teaching programmes based upon English Heritage properties and other locations (eg Stott Park Bobbin Mill, Cumbria)
- contributing lectures and presentations for university training courses and technical training programmes, handling science-based studentships, and participating in professional conferences and seminars

English Heritage staff contribute regularly to the heritage management coursework for students at the Ironbridge Institute. Recently, our

involvement with British Waterways has been extended to provide practical building conservation training tailored to the requirements of staff responsible for repairing and maintaining historic waterway structures.

Conclusion

English Heritage's achievements in the field of industrial archaeology during the last five years have gone a long way towards ensuring the full integration of work on the industrial heritage within the remit of its regional conservation teams and other groups of specialist staff. New initiatives have ranged from the Monuments Protection Programme of industrial assessments and the acceleration of identification surveys to the significant increase in grants for industrial buildings and monuments, from archaeological research in historical metallurgy to the raising of public appreciation of industrial archaeology through publications, and from our successful appearances at public inquiries to practical conservation training.

Guided by the Industrial Archaeology Panel, we have succeeded not only in securing the preservation of important industrial sites, but also in raising the expectations of what can be achieved in the field of industrial archaeology.

Important challenges lie ahead, since questions of scale necessitate tough decisions on the sustainability of long-term preservation, and in some cases we need to be realistic in accepting full recording as a response of last resort.

Although we can confidently point to significant achievements over the past five years, we recognise equally that four issues remain problematic

- obtaining appropriate protection for important machinery
- achieving adequate coverage for the timely recording of industrial buildings and monuments which are not capable of conservation
- coordinating the archival recording of industrial processes
- meeting the special (revenue) funding needs of certain selected outstanding sites

These issues will have to be tackled in partnership with others including government. Effective responses require either additional resources or the redefinition of existing priorities.

Key issues for the future

More generally, we set out on the back page the key areas in which we intend to develop the role of English Heritage in the field of industrial archaeology. Faced with the complexity and scale of more recent industrial plant which is susceptible to an escalating pace of change and replacement, we expect increasingly to consider priorities for conservation and recording not only at the UK level but also internationally. We hope that this brief review and statement of intent will not only signal our own commitment to industrial archaeology, but encourage the discussion and debate which must continue to support successful conservation of this important part of the heritage.

Fig 24 Anderton Boat Lift, Cheshire (opposite). This boat lift linking the Trent and Mersey Canal and the River Weaver navigation is important as the first ever hydraulic lift and the first in a series of lifts throughout Europe designed by the engineer Edwin Clark and his associates. Built in 1872–5, the hydraulically operated caissons were originally counterbalanced by transfer of water. The lift was later modified for electric operation in 1908 with each caisson counterbalanced by weights. The structure has suffered severe corrosion and is no longer in use. With technical advice and the promise of financial assistance from English Heritage, British Waterways intends to restore this scheduled monument to working order. (English Heritage Photographic Library)

Industrial archaeology: a policy statement

1 English Heritage recognises the unique international significance of the country's industrial heritage and will complete theme studies of industrial buildings and monuments under the Monuments Protection Programme and List Review in order to identify important sites and structures which deserve to be retained and recorded. We will encourage the government to provide appropriate statutory protection for the industrial heritage and we will offer planning guidance where necessary for the management of significant sites in their landscape context; we will also seek urgent action where needed to safeguard important threatened industrial sites which are suitable for long-term preservation.

2 Encouragement will be given to the identification and repair of industrial buildings and monuments which are at risk, through commissioning example feasibility studies, targeting repair grants in accordance with financial need, and promoting the suitable and flexible reuse of former industrial buildings.

3 Responding to a period of rapid economic and technological change, English Heritage will work with RCHME, local authorities, and the Science Museum to encourage the timely identification and recording of significant industrial landscapes, sites, buildings, structures, machines, and processes, and to help with their effective management. Where the option of retention cannot realistically be achieved, a record of last resort is essential.

4 Public appreciation of the industrial heritage will continue to be promoted through education and publication and through access to, and the interpretation of, our historic properties.

5 English Heritage will explore with the national agencies – particularly the Museums and Galleries Commission and the Science Museum – the suitability of existing arrangements for management of the country's most important preserved industrial sites and monuments.

6 We will review the adequacy of existing resources to sustain the special needs of display and demonstration for industrial archaeology where appropriate and will cooperate with government agencies and others, including the National Trust, to preserve important industrial sites.

7 Our commitment to education and training in industrial archaeology and conservation of the industrial heritage will be maintained through relevant publications and lectures by English Heritage staff.

Produced by English Heritage, 23 Savile Row, London W1X 1AB 0171 973 3434 September 1995