Historic England

Research

Discovery, innovation and science in the historic environment

Uncovering our urban wetlands

Historic England

Issue 04 | Winter 2016-17

As a Commissioner of Historic England and a member of its Advisory Committee - and also as an architectural historian and editor - I am delighted to introduce the fourth issue of Historic England Research. This digital magazine illustrates the wide variety of research projects undertaken and commissioned by Historic England and the way that new insights, understanding and practice are ensuring that the historic environment continues to be relevant both to local communities and to the wider environmental debate.

Amongst other topics, this issue includes articles on important waterlogged archaeological remains; change to historic landscapes; the relationship between cultural heritage and the function of ecosystems; technological innovation in the 19th century; and procedural innovation in the 21st century.

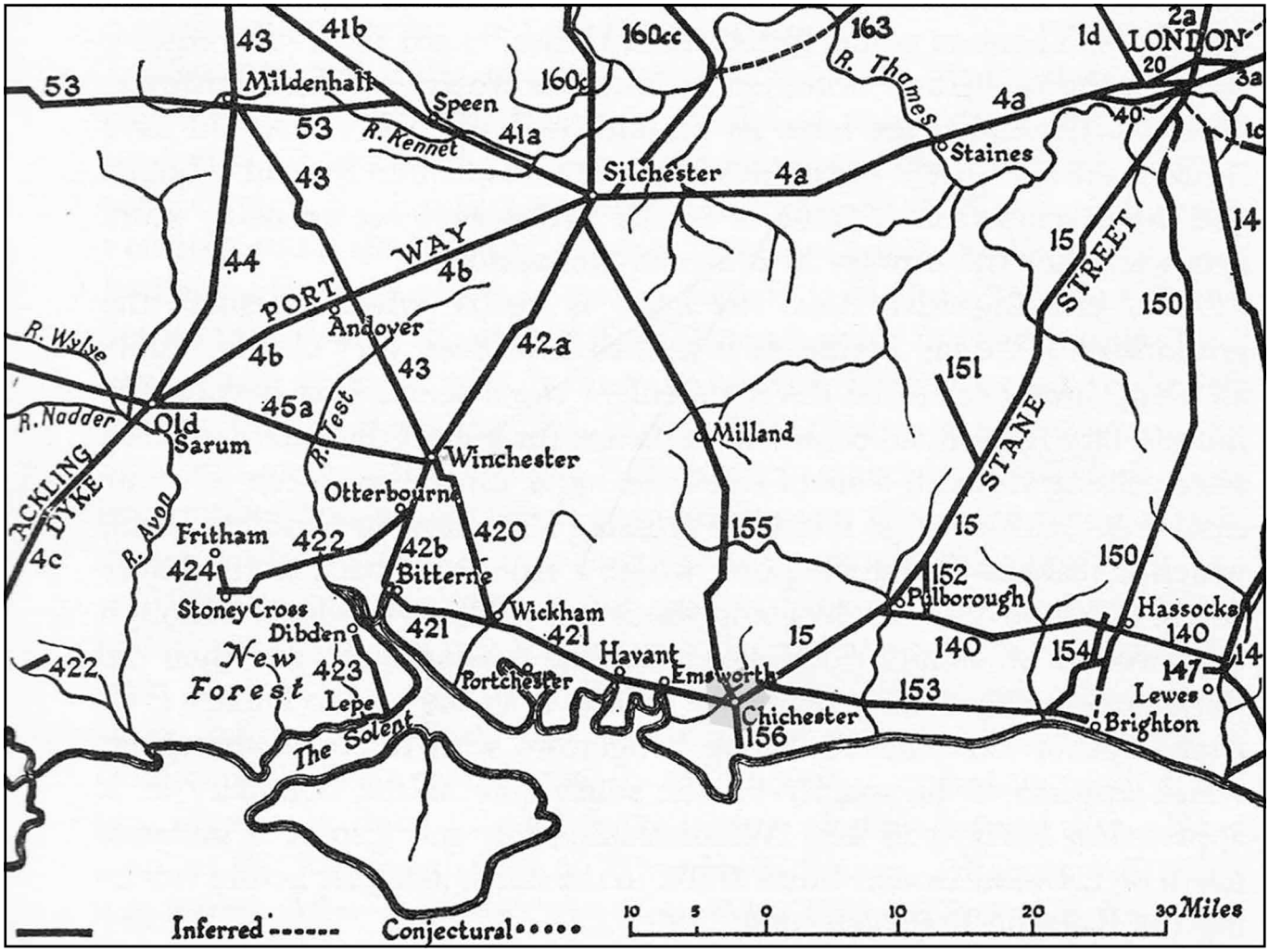
Previous issues of the magazine are available to download from the Historic England website. I hope you will enjoy this latest addition to the series.

Charles O'Brien
Commissioner, Historic England

In this issue...

The lost Roman road from Chichester to Arundel

Analysis of lidar and aerial photography leads to the rediscovery of a long-speculated route.



Margary's map of Roman roads in Hampshire and Sussex (Margary 1955, 30).

The success of the Roman Empire was founded on its network of trunk and secondary roads linking centres of military or commercial importance. Chichester (Noviomagus Reginorum) on the south coast was an important early settlement in Roman Britain, and developed into an important town and gateway port. A number of arterial roads headed inland and along the coast. Four of these have been identified, but the course of the road east along the coastal plain has remained elusive.

Recent aerial survey by Historic England for the Secrets of the High Woods Project (working in partnership with the South Downs National Park) has now firmly identified the remains of this Roman road, the existence of which has long been a subject for speculation. The discovery has depended on a combination of aerial photography and lidar (airborne laser scanning) data; the latter technique's great strength is its potential to reveal sites in heavily-wooded areas.

Roman roads were expertly surveyed and engineered, taking the shortest possible route the terrain allowed. Even in the provinces, roads were frequently solidly constructed, featuring a cambered and metalled causeway known as an *agger*, typically 4.5-7m (and occasionally up to 10m) wide, and flanked by side ditches which provided drainage as well as being a source of the material used to build the road (Margary 1965, 15). The quality of their construction has ensured the survival of many stretches of Roman road to the present day.

Speculations

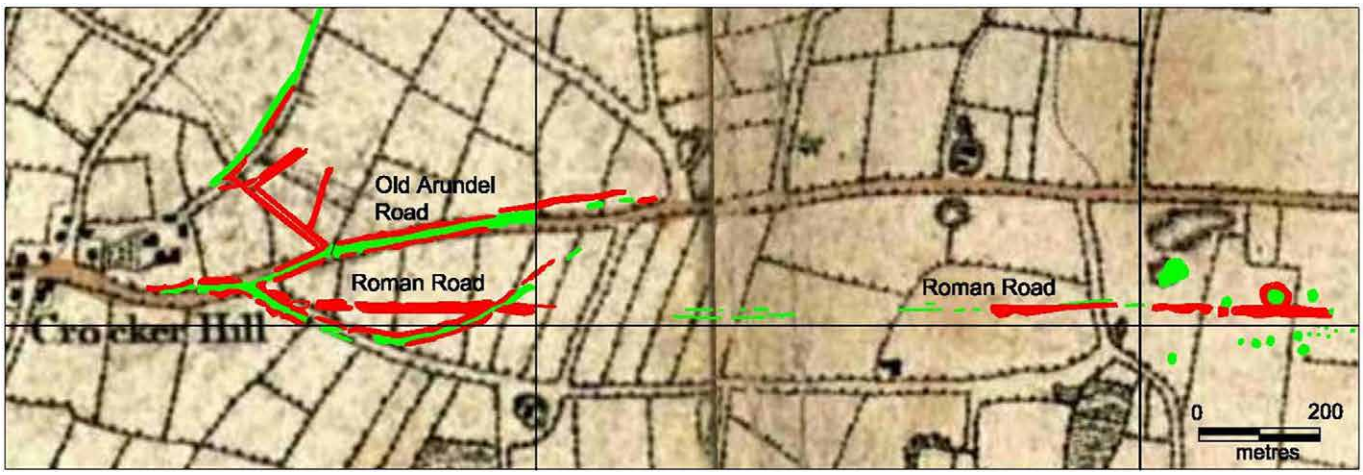
Ivan Margary was one of the 20th century's leading authorities on Roman roads. As well as undertaking extensive research of his own, Margary also generously funded excavation and publication by others; and he secured the preservation of the Roman palace of Fishbourne. His *Roman Roads in Britain*, first published in 1955, was the first definitive catalogue of all the major and minor Roman roads throughout the country. The maps it contained showed surviving, inferred and conjectured routes, each of which was allocated a unique number, now generally referred to as a 'Margary number'. Some of these routes were based on earthwork remains or alignments of current roads and boundaries, but others were more speculative.

Stane Street (Margary 15), was an early military road linking Noviomagus and Londinium (Manley 2002, 138), and probably the most important road for the Roman town of Noviomagus Reginorum. It sliced a north-eastern course through the South Downs. A second road (Margary 155) went north to Silchester (Calleva), while a third (Margary 421) headed west along the coastal strip towards Bitterne (Clausentum), on the upper tidal reach of the River Itchen. Finally, a short spur road (Margary 156) headed due south from Chichester to the coast (Margary 1955, 29-30).

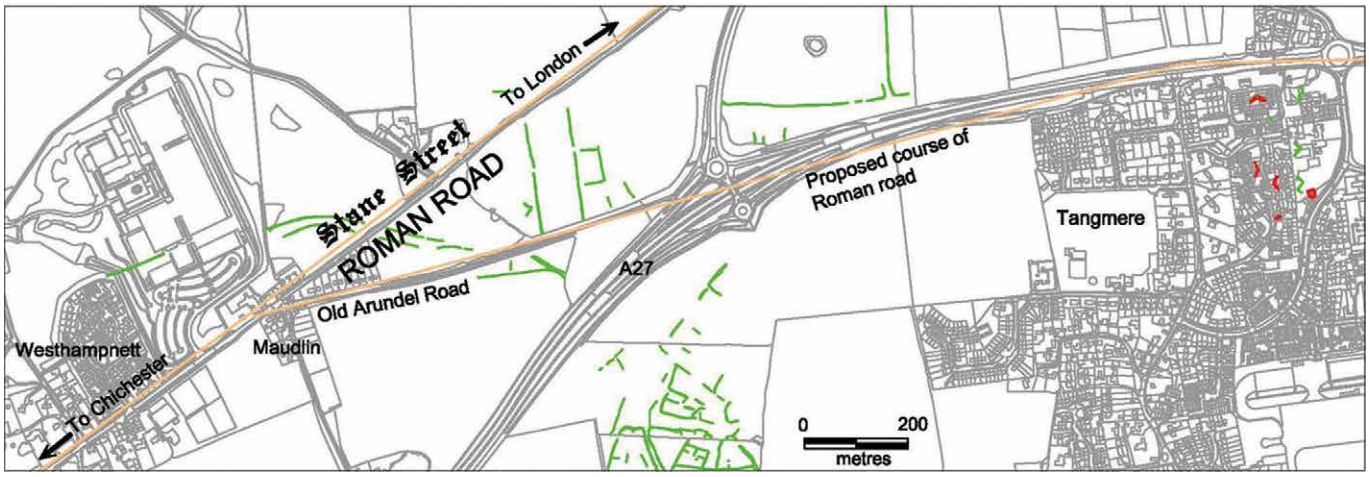
Logically, as Margary speculated in the late 1940s, a fifth road should run eastward along the coastal plain in the direction of Brighton, via Arundel (Margary 1947, 141). He investigated a number of potential routes for this, looking for possibilities that avoided both the hills to the north and the wetter ground to the south (ibid, 143-4). Margary discounted one suggested route, which followed the line of the modern road running eastwards out of Chichester towards Oving, because although its first couple of miles (to Shopwyke) were straight, it then dwindled into winding footpaths.

His second and preferred route, though not entirely straight, branched east-north-east off Stane Street at Maudlin, to the east at Westhampnett. From here, Margary believed, it followed the course of the Old Arundel Road, now superseded by the A27.

At Crocker Hill, the Arundel road dog-legs to the south before returning to a roughly east-west course. However, this is a result of the road being diverted around Aldingbourne House and its park in the late 18th or early 19th century. Margary suggested the original course was indicated by a line of trees that crossed the park. He thought the route then continued eastwards



The course of the Roman road east of Crocker Hill mapped from lidar and overlaid on Yeakell and Gardener's 1778-83 map of Sussex.



The junction of Stane Street and the Old Arundel Road at Maudlin, east of Westhampnett. The cropmarks of later prehistoric tracks and enclosures (green) can be seen on either side of both roads. Base map © Crown Copyright and database right 2016, all rights reserved. Ordnance Survey licence number 100024900

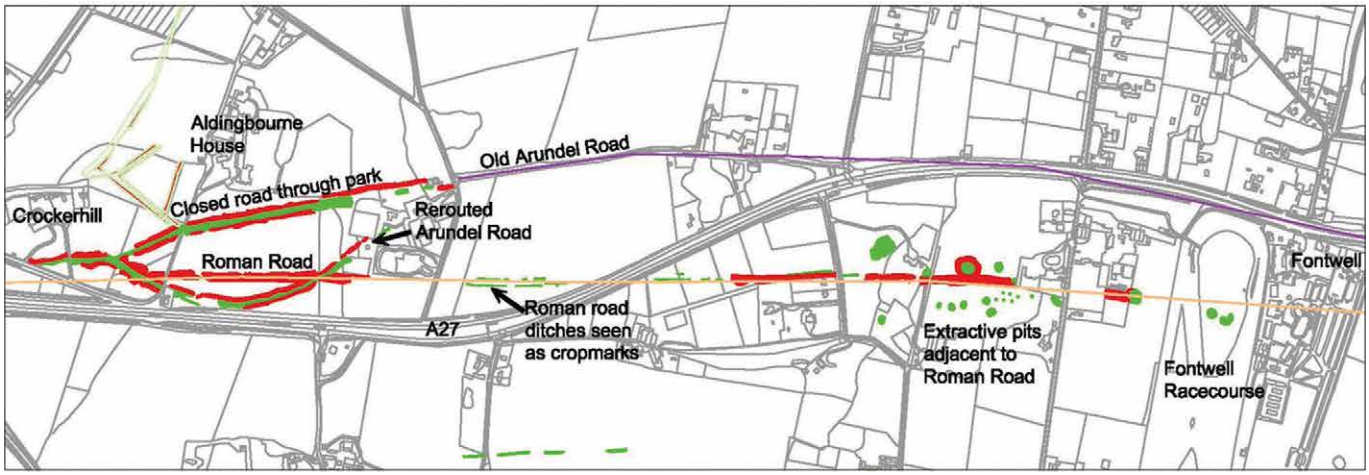
via Alvisford, crossed the small, steep-sided valley of Binsted Brook at Binsted Brook Crossing, and proceeded on to Arundel via the old road that ran between Arundel and Torrington Common (Margary 1947, 161–3). This course was published as a confirmed route of the western section of the road heading eastwards from Chichester in the direction of Brighton (Margary 153) in *Roman Roads in Britain* (Margary 1955, 68), remaining unchanged in subsequent revisions.

The evidence discovered

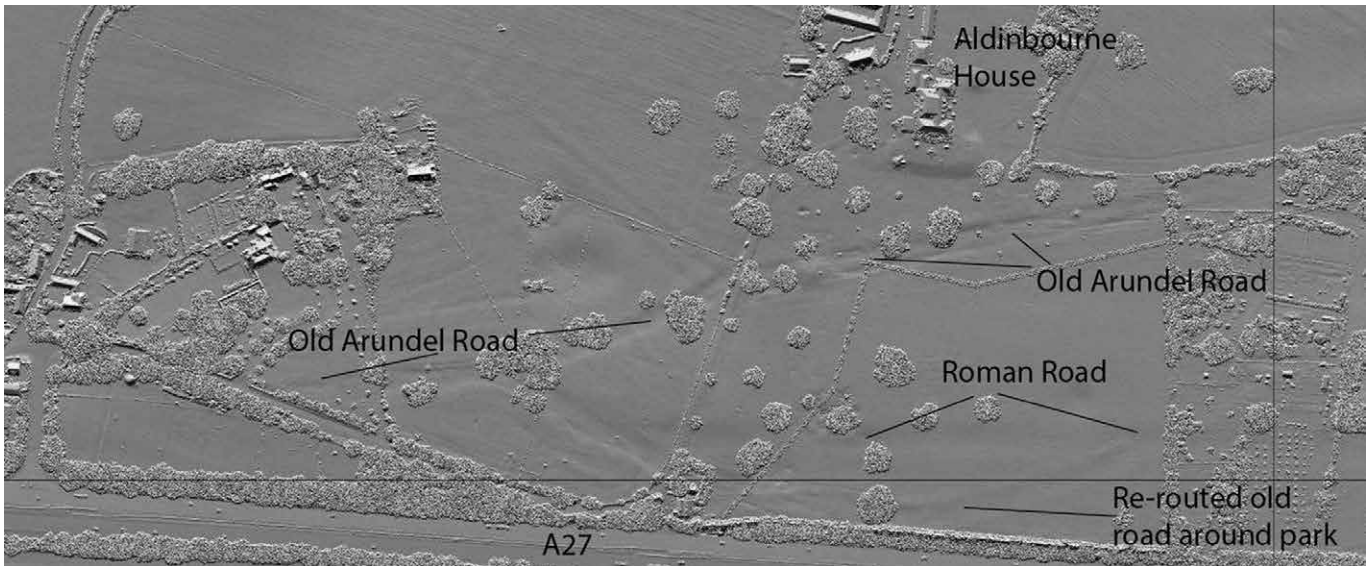
During the recent Historic England survey for the South Downs National Park, significant sections of the road's *agger* and side ditches were seen as earthworks and cropmarks on aerial photographs and 0.25m resolution lidar data. Traces of the road were identified over 8km of the total 15km distance between Chichester and Arundel.

The western end of the road is masked by modern development, but it is likely (as suspected by Margary) that it followed the course of Stane Street to a point north of East Hampnett, before branching off along what became the Old Arundel Road. This particular stretch is still fossilised as the surviving portion of the Old Arundel Road, which meets the new A27 as it sweeps in from the south-west between Boxgrove and Tangmere.

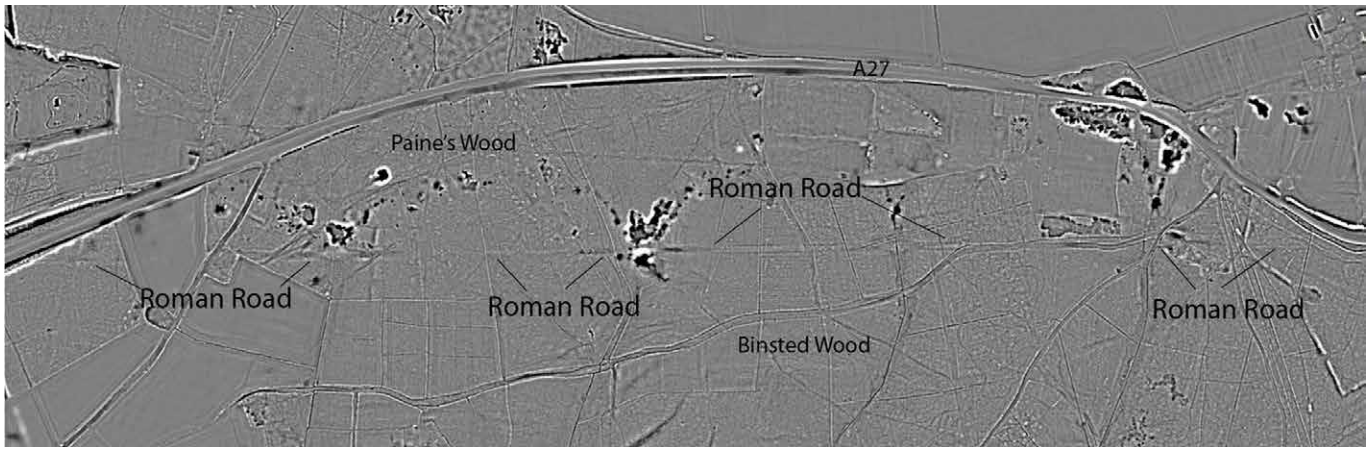
At Crocker Hill, the Old Arundel Road originally curved slightly to the east-north-east, but its Roman predecessor can clearly be seen, keeping its true east-west alignment as it crosses the park of Aldingbourne House as a slight linear embankment. Further sections of the *agger* continue eastwards, maintaining a straight course. With the exception of one section, where the remains of the parallel side ditches can only be seen as cropmarks on



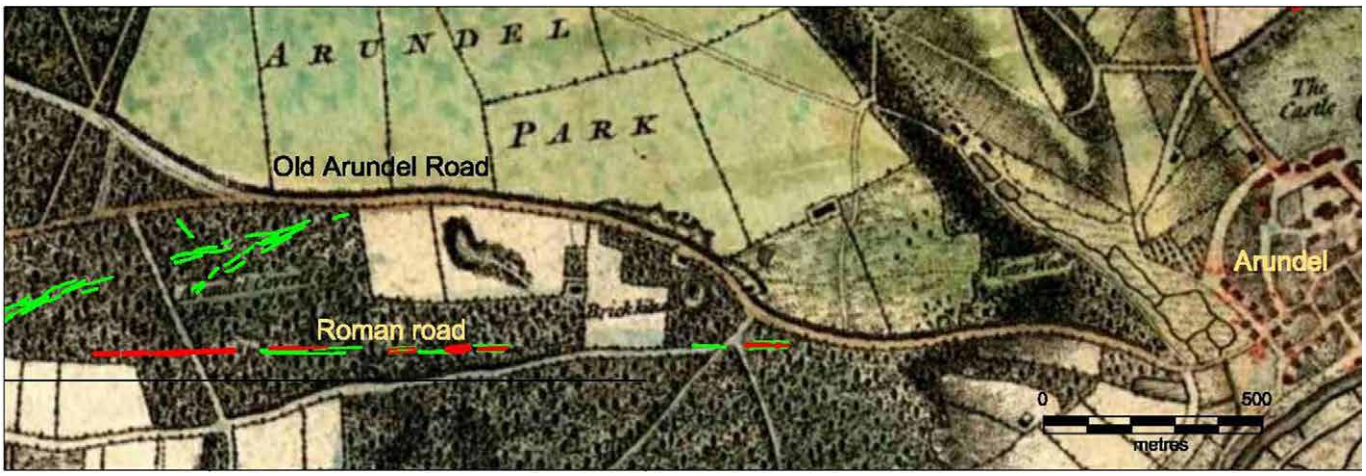
Transcribed remains and routes of the Roman road, Old Arundel Road and the modern A27, between Crocker Hill and Fontwell.
Base map © Crown Copyright and database right 2016, all rights reserved. Ordnance Survey licence number 100024900



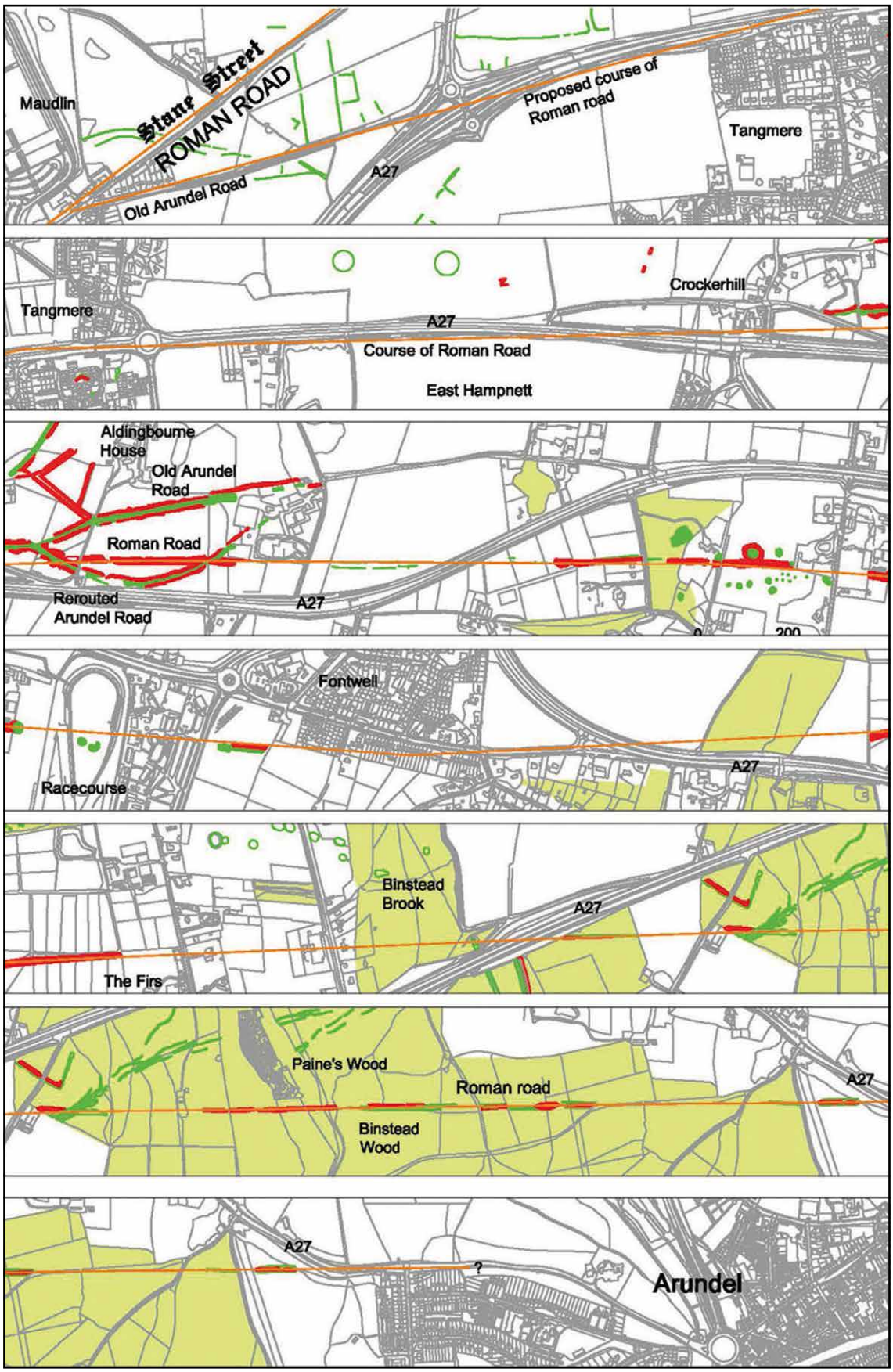
Lidar visualisation showing slight earthworks of the Old Arundel Road's original and re-directed course and the straight remains of the Roman road cutting through the park of Aldinbourne House. Lidar © Fugro Geospatial/South Downs National Park Authority



Lidar visualisation (trees removed) of the earthworks of the Roman road, running through woodland to the east of Arundel. The road appears to have been engineered over undulating ground, with causeways and slight cuttings. Lidar © Fugro Geospatial/South Downs National Park Authority



Mapped remains of the Roman road through Binsted Wood, following the alignment of the last section of the Old Arundel Road, overlaid on Yeakell and Gardener's 1778–83 map of Sussex. © Dr Dominic Fontana, University of Plymouth via Old Sussex Mapped website



Mapped traces of the Roman road from west to east between Maudlin (north-east of Chichester) and Arundel. **Red – bank; green – ditch; orange – suggested route.** Base map © Crown Copyright and database right 2016, all rights reserved. Ordnance Survey licence number 100024900

aerial photographs, all other traces of the road survive as slight earthworks. These appear to have gone unnoticed until now.

The longest stretch of the road is recorded on lidar images, and shows a raised causeway through the eastern end of Paine's Wood, where it is now followed by the course of a woodland track. At the eastern edge of the woods, the route again meets the Old Arundel Road, which follows the presumed alignment of this Roman road into the outskirts of Arundel itself.

Whether by accident or design, for much of its course the road closely follows a band of marine gravel and cobbles, remnants of a Quaternary raised beach deposit. Gravels quarried from this same marine deposit were used in the construction of Stane Street to the north (J Kenny, pers comm), and it is likely that the Chichester to Arundel road also exploited this source of aggregates. Extractive pits detected by lidar adjacent to the road east of Crocker Hill may represent contemporary quarrying for road construction or maintenance purposes.

The discovery of the road is important, putting into context the Roman-era sites along its route. It is a small but significant addition to our knowledge of Roman Britain. It is also immensely satisfying to be able to confirm Ivan Margary's theory through methods of remote sensing that would have been unimaginable sixty years ago.

Author

Fiona Small
Investigator with Historic England.

Fiona joined the Royal Commission on the Historical Monuments of England in 1992, trained as an air photograph interpreter, and subsequently worked as an aerial investigator for both English Heritage and Historic England. She has been involved in a number of major National Mapping Programme, multidisciplinary and multi-period projects. Fiona has particular interests in 20th-century military archaeology, and in the contribution aerial archaeology can make to understanding historic landscapes and the evidence for the continuity of human activity through time.

Further Reading

Aerial reconnaissance at Historic England, further information at: http://HistoricEngland.org.uk/ research/approaches/research-methods/airborneremote-sensing/aerial-reconnaissance/

English Heritage 2010 *The Light Fantastic: Using Airborne Lidar in Archaeological Survey*. Available at: https://HistoricEngland.org.uk/images-books/publications/light-fantastic/

Carpenter, E Small, F Truscoe, K and Royall, C 2016 *South Downs National Park: The High Woods from Above NMP*. Historic England Research Report Series **14-2016**, available at: http://research.historicengland.org.uk/redirect.aspx?id=6575|The%20High%20Woods%20from%20above%20National%20Mapping%20Programme

Manley, J 2002 *AD43: The Roman Invasion of Britain: A Reassessment*. Stroud: Tempus

Margary, I 1947 'The Chichester to Brighton roman road'. *Sussex Notes and Queries* **11**, 141-63.

Margary, I 1955 *Roman Roads in Britain: Vol I, South of the Foss Way-Bristol Channel.* London: Phoenix House

Margary, I 1965 *Roman Ways in the Weald*. London: Phoenix House

Margary, I 1973 *Roman Roads in Britain*, rev edn. Trowbridge: Redwood Press

Yeakell and Gardner's Sussex 1778-83 map, available at: http://www.envf.port.ac.uk/geo/research/historical/webmap/sussexmap/Yeakell_36.htm

Coastal heritage at risk

Historic imagery used to support management.

Lyme Regis, Dorset by G Hawkins. Aquatint Engraving, *c* 1830. This view looks eastwards towards Black Ven and Charmouth. Rapid erosion and coastal landsliding is a feature of this frontage. Private Collection

In January 2016 Historic England commissioned a new study, CHeRISH (Coastal Heritage Risk – Imagery in Support of Heritage Management), which demonstrates how artworks, photographs and postcards from the period 1770–1950 can support the management of vulnerable sites on the coastlines of south-west England. The great strength of this imagery is its ability to illustrate in detail changes that have affected coastal heritage sites over a greatly extended time period.

A threatened coastal heritage

The character of the coastline of south-west England has been influenced strongly by human activity over the last 10,000 years. A rich legacy of buildings and sites has resulted, including archaeological remains, military and coastal defences, harbour walls, monuments, lighthouses, and piers. Collectively such features form the coastal historical environment. Particularly where the rocks are soft or the coastline unstable, such sites are becoming increasingly affected by marine erosion, landslides, flooding and the impacts of climate change.

Long stretches of coast, containing a wide variety of sites, are undergoing rapid change. For example, sections of the coastlines of Dorset and south Devon with their soft rocks (for example east of Weymouth, near Lyme Regis, and Sidmouth), are eroding rapidly. Even sections of harder-rock clifflines, as between Hartland Point and Westward Ho! on the north Devon coast, can experience retreats of up to 50m in a single event. The settlements of Ilfracombe, Combe Martin,

Ilfracombe, North Devon by Alfred Robert Quinton. Watercolour, *c* 1920. J Salmon Limited, Sevenoaks

Lynmouth and Countisbury Hill by Albert Goodwin. Watercolour, 1877. Chris Beetles Gallery, London

Treryn Dinas, Cornwall a headland and promontory fort depicted by the Pre-Raphaelite artist John Brett, painter of highly detailed coastal scenes. Oil, 1880. Private collection

Lynmouth and Porlock are also at greater risk from flooding than they have been in the past. Indeed, the increasing ferocity of coastal storms is, over the next century, likely to have a visible impact on such Cornish harbours as Mullion, Charlestown and Mevagissey, as well as on exposed Cornish headlands, often the sites of promontory forts. Iconic heritage sites whose setting and future are at risk include the gun battery on the shoreline below Pendennis Castle, parts of Tintagel Castle on the north Cornwall coast, the causeway leading to St Michael's Mount in Cornwall, and the Garrison on St Mary's, Isles of Scilly.

Managing risks

This increased rapidity of change has driven developments in Government policy. It is vital that such policies give the same weight to sustaining the historic environment as they do to protection of people, property and the natural environment.

Historic England and its predecessors have been active participants in this process, whether through publications (Murphy, 2014 and many others), policies regarding historic environment records, or the rapid coastal zone assessment surveys which have been carried out since the late 1990s.

As a result a range of tools is available to support understanding of coastal change and its impacts. However, there are few locations where accurate records of coastal change exist before the middle of the 20th century; indeed, aerial photography for much of the coastline only dates from the early 1940s. However, other images can improve our understanding of long-term coastal change and the resulting risks to some heritage assets. Paintings, watercolours, photographs and old postcards allow recognition of the scale and rate of coastal change over a much longer time frame than is normally considered by coastal scientists, planners and engineers. Such media enable assessments to be made of changes in morphology, land-use and development over the last 250 years, extending back long before the days of photography.

The CHeRISH Project

The project reveals the potential of these images to provide information that can support the protection and management of historic sites around the coastline of south-west England. This has been achieved by identifying and assessing a large number of sites at risk or potentially at risk, as indicated in shoreline management plans, local and national historic environment records, and rapid coastal zone assessments. Imagery relating to these sites has been gathered and 23 case studies selected, illustrating how such historical images can support site management. CHeRISH has provided a list of artists who painted England's south-west coast, ranking their work in terms of its accuracy, so as to maximise the value of each image in support of the management of the historic environment.

Old High Cliff House, Dorset from the East by Charles Stuart. Oil, 1783. The property had to be demolished because of coastal erosion. Nearby Highcliffe Castle was built further back from the coast in the 1830s. Private Collection

Off St Mawes Castle, by Charles Napier Hemy (1841-1917). Oil. Hemy painted castle and coastline alike in precise detail.
Elford Fine Art, Tavistock

Weston-Super-Mare. A fine lithograph of *c* 1855 showing the facades of grand properties lining the seafront of an elegant resort. Private Collection

The CHeRISH Final Report includes nearly 300 images (artworks and photographs) of heritage sites around the coastlines of Somerset, Dorset, Devon and Cornwall. Such illustrations can inform us of past conditions and, when compared with the site today, highlight changes that have taken place over time. Later this autumn, over 80 images of particular interest, reflecting the broad range of environments and issues in the south-west, will be available on an interactive web-based map hosted by the Maritime Archaeology Trust. A series of illustrated lectures are also being planned at suitable locations in the four counties over the coming months.

The CHeRISH project recommends that full advantage is taken of artworks and other images that depict the historic environment. These resources are underused as a record of change. The project guides readers to such images; it is hoped that the result will be invaluable.

Author

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Geologist, coastal scientist, art historian and author.

For 10 years Robin chaired the Coastal Defence Groups of England and Wales and was appointed OBE for Services to Flood and Coastal Defence in 2006. He is Managing Consultant at Isle of Wight-based consultancy Coastal and Geotechnical Services.

Further reading

Murphy, P 2014 *England's Coastal Heritage*. Swindon: English Heritage

Rapid Coastal Asssessment Surveys, available at: http://archaeologydataservice.ac.uk/archives/view/rczas/

The results of CHeRISH, available at: http://cherish.maritimearchaeologytrust.org/

New powers in historic places

The development of one of the first Local Listed Building Consent Orders.

Recent legislation has aimed to simplify the processes surrounding the granting of listed building consent. The Enterprise and Regulatory Reform Act 2013, for example, brought with it a range of new tools, including the Local Listed Building Consent Order (LLBCO).

An LLBCO enables a local planning authority to grant listed building consent for specified works to designated buildings within their area. For example, this might include common works such as kitchen fittings within a large, listed housing estate. The intention being that routinely consented works of a similar nature can be undertaken with less time and resource.

At first glance, this may seem fairly straightforward. The reality is that this is a relatively new power, and there is a great deal to be learned from early examples of its use. While a number of interesting cases are being developed, very few LLBCOs are up and running today: there is one, for example, at Little Germany in Bradford, – and one in the model village of Port Sunlight, on the Wirral.

A unique development

Port Sunlight holds a special place in English history. In 1888 successful entrepreneur William Hesketh Lever began construction of a new factory for the production of his Sunlight brand of soap. But his ambitions went considerably further than a new factory: he wanted to create a model village, not only to house his workers, but also to enrich their lives by providing education and a good quality living environment. The resulting settlement blended two ideals: the improvement of working-class living conditions (already seen, for example at New Lanark and Saltaire) and the Picturesque taste for organic layouts and appealing vistas. Indeed, Port Sunlight was a showpiece of the emerging trend for entrepreneurial social responsibility, embodying many of the wider social values of its era as well as the latest ideas in model village design. Today, the Port Sunlight Village Trust manages the green spaces and many of the principal buildings and houses

8-14 Bridge Street, Port Sunlight in 1896. © Historic England

of the settlement. The whole village is a conservation area, within which virtually every building is listed. This reflects its significance, but also raises real questions about how to manage change effectively and efficiently in such a special place.

The consent process in Port Sunlight had real time and resource implications for both the local planning authority and the trust. For homeowners too, there was an opportunity for greater clarity about best practice. Two central objectives, then, drove the creation of the Port Sunlight LLBCO: reduce strain on the local planning authority for commonly consented works, and empower listed building owners to address poor or unconsented works to their homes.

With this in mind, the order focused on three main areas;

- the installation and/or relocation of satellite dishes in certain locations;
- the replacement of severely deteriorated or inappropriate back-yard gates and rear doors; and
- specified replacements for some types of severely deteriorated or inappropriate rear windows

Aerial view of Port Sunlight, 1934. © Britain from Above

Those who have dealt with historic window frames and fittings will already have spotted the most complex of these three. This is rightly a detail-orientated area, and in a place which has many listed buildings, and where these have been designed by a range of different architects, it is a real challenge to achieve efficiency through a blanket consent system without losing individual character. It is equally a challenge to make such a system straightforward for owners to understand and use. Both the trust and Wirral Council put a great deal of thought and effort into this issue.

Indeed, Port Sunlight Village Trust and Wirral Council worked in partnership throughout the development of the LLBCO, supported by grant funding and advice from Historic England. The process of developing the order was complex. It involved a great deal of thinking about what made the area special, what its key issues were, and how efficiency could best be achieved. Various tasks were involved: identifying problems, reviewing parameters, working through possible scenarios, going through the processes of consultation and community engagement, getting specialist input, drafting the text. Detailed window surveys were required, as well as the subsequent identification of window types. Needless to say (and quite rightly) the timescales of the project changed to accommodate these processes.

The Dell Bridge from Park Road, Port Sunlight, 1994.
© Historic England

Lessons learned

The Port Sunlight LLBCO is now live. As one of the first implementations of a relatively new form of consent, much can be learned from it. Early lessons are already clear, and more will be revealed as the process is reviewed:

- establish the need. The development of the Port Sunlight LLBCO took considerable time and effort. For such a measure to achieve the desired efficiency savings, make sure first that there is a history of frequently consented works which such an order could seek to address;
- partnerships are vital. In this case, teamwork between the Port Sunlight Village Trust and Wirral Council played a key role in unlocking the potential of the LLBCO;
- balance flexibility with efficiency. Particularly with more complex works (such as those to windows), flexibility is necessary if the LLBCO can respond to and conserve the character of individual buildings. On the other hand, the LLBCO has to be easy to understand and implement if owners are going to use it and the local authority is going to save resources;
- be prepared to adapt. A useful way of identifying potential problems, one which may lead to significant changes to an LLBCO, is to run through possible scenarios that could emerge after implementation. Periodic review of the finished order also plays an important role, and can be used to expand the scope of the LLBCO as well as to fine-tune its processes. For example, the current LLBCO includes only the most common window-types at Port Sunlight, and it is hoped that others will be incorporated over time; and
- make the best use of associated benefits. There were several of these, including a better understanding of how best to conserve the area's buildings; the positive addressing of unauthorised works; the improvement of local relationships; the greater clarity achieved for homeowners; and the improvement of craft skills.

Of course, no two sites are the same and perhaps some of the key factors at Port Sunlight were specific to the site: the nature of what makes it so interesting; the conservation issues it presents; the opportunities it offers; the people involved. Would an LLBCO work as well in a Georgian terrace? In a housing estate? What would the implications be for post-war buildings?

Ultimately, the LLBCO will not be an effective tool at all sites. Nevertheless, it is clear that in the right circumstances these orders can bring real benefits.

Author

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Christina joined the organisation in 2013, with a background in architectural design, conservation and town planning. She worked with the Project Assurance Officer for the Port Sunlight LLBCO and provided ongoing advice during its development.

Further reading

Historic England advice pages on the Enterprise and Regulatory Reform Act 2013, available at: https://historicengland.org.uk/advice/planning/consents/err-act-2013/

Historic England's advice note on drawing up an LLBCO, available at: https://historicengland.org.uk/images-books/publications/eh-good-practice-advice-note-drawing-up-local-listed-building-consent-order/

The Port Sunlight LLBCO, available at: https://www.wirral.gov.uk/planning-and-building/planning-permission/port-sunlight-local-listed-building-consent-order

The Port Sunlight Village Trust, available at: http://www.portsunlightresidents.com/home/about.aspx

The Little Germany LLBCO, available at: https://www.bradford.gov.uk/bmdc/the_environment/planning_service/local_development_framework/Little_Germany_local_listed_building_consent_order

The waterlogged deposits of Nantwich

Investigating the 'urban wetlands' of a historic town.

Four metres of archaeological deposits of national importance, including well-preserved salt-ships, barrels, timbers and wicker structures, as well as plant and animal remains, are known to lie beneath the ancient salt town of Nantwich, Cheshire.

The background

Recent discoveries at Must Farm (*Historic England Research*, 3) have reignited public interest in the extraordinary potential wetlands have for the preservation of biodegradable archaeological material. Unknown to most, however, were the eight years of monitoring the preservation environment that took place prior to excavation (Malim *et al* 2015a).

Must Farm is in a rural location on the edge of the Fens; yet comparable environments can exist in urban settings where the underlying conditions are waterlogged. Such environments allow the growth of organic-rich silty deposits which then act like a sponge, sucking up and retaining moisture, thereby excluding oxygen, and as a result preventing normal types of decay.

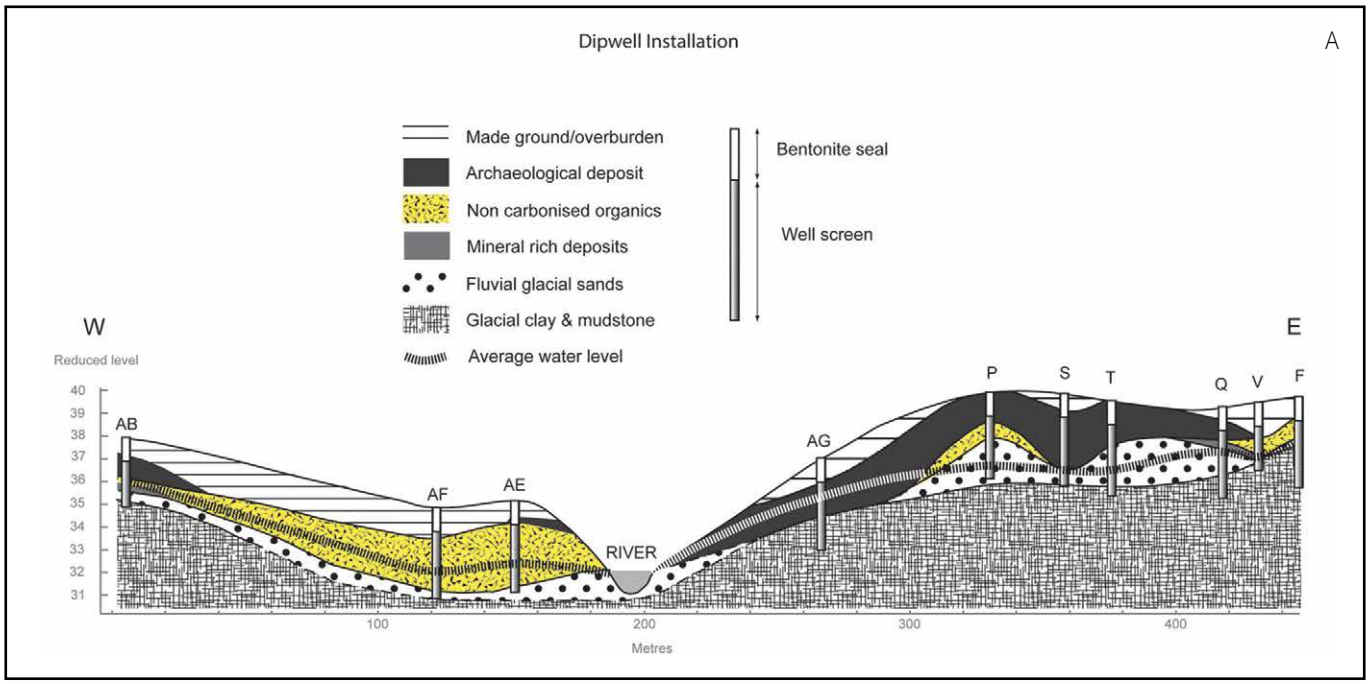
Such sites may also face threats that rural locations do not: extensive use of hard surfaces and drains, which remove rainfall that would otherwise percolate into the ground; and damage from building works, especially when basements and deep-piled foundations are included. At Nantwich local planning decisions depended largely on anecdotal evidence, and detailed knowledge was urgently needed if the nature and extent of the waterlogged deposits were to be understood before it became too late to protect them. There are more than 10ha of these deposits below the town.

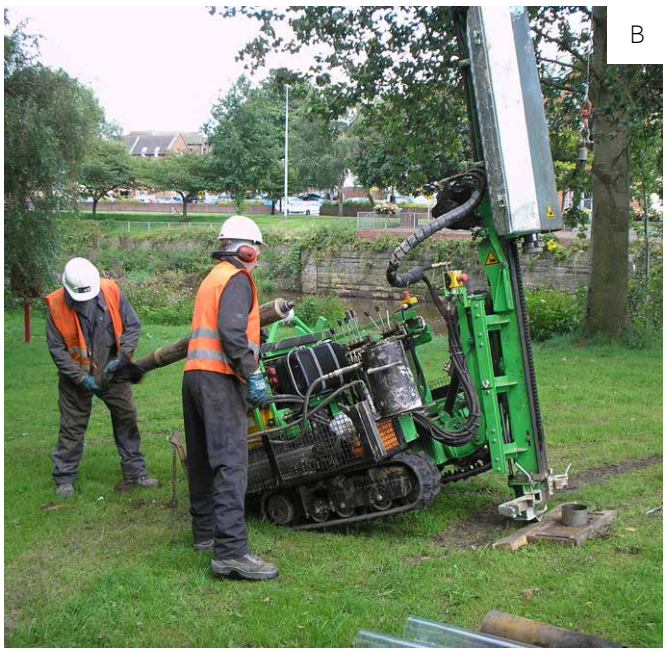
In 2007, SLR Consulting Ltd was appointed by English Heritage and Cheshire Council to undertake a desktop study, which would draw together current knowledge, and to model sub-surface hydrological flow-paths. The multi-disciplinary team included SLR

Lifting a salt-ship at 2 Wood Street, Nantwich, in 2004. © Mark Leah, Courtesy of Cheshire West and Chester Council

Consulting's archaeologists, geological engineers, hydrogeologists and GIS analysts, supported by experts from Palaeoecology Research Services and by York Archaeological Trust's Conservation Scientist.

30 boreholes were drilled to map the extent of the waterlogged zone and characterize the nature of the deposits. The sediment core samples were then recorded using the Norwegian Protocols (Riksantikvaren 2008), and sampled for geochemical analysis. Radiocarbon dating (from samples of plant remains and gasses generated by chemical change within the deposits)





A. Cross-section showing Nantwich deposit sequence. © Caroline Malim **B.** Drilling in 2007 using a windowless sampler rig, steel casing and Perspex tubes. © Tim Malim **C.** Recording extracted core in a Perspex tube. © Tim Malim **D.** Gas sampling from one of the dipwells, using a GA 5000 analyser and Tedlar bags for the C14 gas sample. © Tim Malim

established that waterlogging started in Anglo-Saxon times, with major growth in the 10th to 14th centuries. Drains and impermeable surfaces added in the Victorian and modern periods have, however, meant that the deposits have been drying out for 150 years.

The reason for the good preservation conditions is the saturation of the terrace sands on which the town is built, and the fact that they overlie impermeable glacial till. As a result the sands have become a water-retentive matrix above which organic and inorganic debris from human activity has accumulated. In some locations capillary action has sucked water up into a zone above the water table; here, the sediment retains water in its pores, and again the result is conducive to the preservation of organic remains. The lack of decay in the organic remains was due to such anaerobic conditions, and was especially marked at increasing depth, indicated by a decline in sulphate concentration and increases in suphide. Phosphate concentration, a potential nutrient source for the kind of microbial activity which causes archaeological deposits to rot, also declined (Malim and Panter 2012).

Water sampling using a low-flow cell with a multi-probe water quality meter and a peristaltic pump. © Tim Malim

It is critical to establish the ratios of various chemicals in such environments if their preservation potential is to be understood: particularly important here are the ratios of oxidised to reduced species (a relationship known as redox). Overall the conditions at Nantwich were generally favourable for the survival of organic remains.

These studies established baseline conditions for the waterlogged deposits. It was thus possible to move onto a second phase of the project: a five-year programme of monitoring, which took place from 2011-15.

A five-year monitoring programme

This was a pioneering study. Conditions in Nantwich were monitored for over five years, providing scientifically robust data on how preservation conditions within the urban waterlogged deposits beneath the town changed over time.

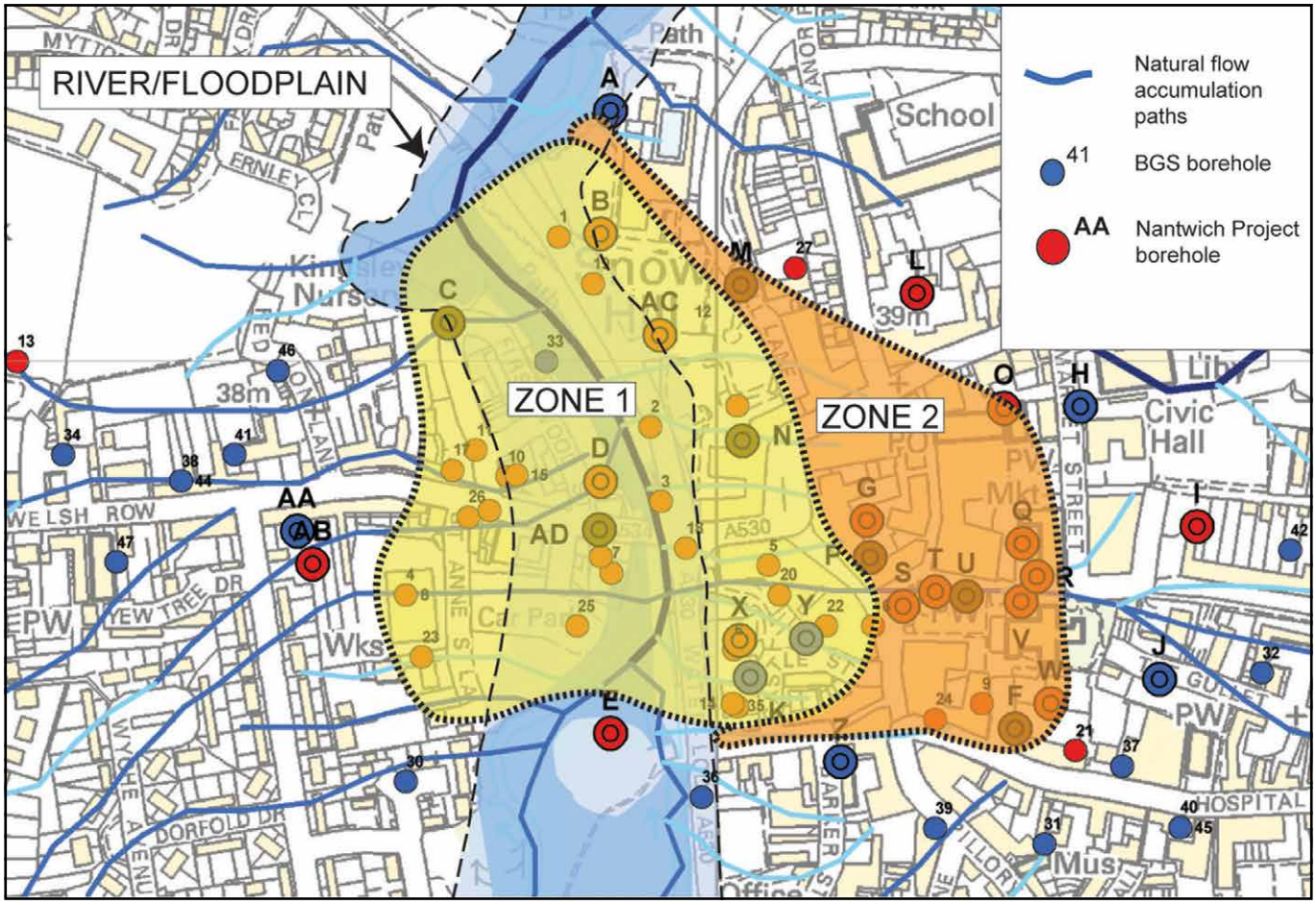
As part of this programme, 18 groundwater dipwells have been monitored every three months and sampled annually (Malim *et al* 2015b), while rainfall was recorded daily. Water quality was assessed for changes in dissolved oxygen, conductivity, pH, temperature and redox potential. Gas meter readings were also taken quarterly, staggered with the groundwater testing. Groundwater levels were measured using an audible dipmeter, whilst water quality was assessed by inserting a digital water meter into the dipwell. In addition the water level was measured automatically on a daily basis at six key locations, so as to provide more detailed data for comparison with the quarterly monitoring. Groundwater samples were taken annually so that they could be tested in a laboratory for what levels of specific chemicals were present. This provided comparative data and a good control, helping provide confidence in the quarterly results of groundwater sampling.

Monitoring and analysis of the results of these investigations help to decide whether the conditions are aerobic, in which case archaeological remains could be degrading rapidly; or whether they are anaerobic, in which case there will be little microbial activity and degradation will be slow.

Summary of Principal redox Indicators

Description	Species present/absent	redox value (mV)	Microbes present	Decreasing rate of decay
Oxidising	Oxygen present	400 and above	Aerobes	
Mildly reducing	Nitrate, Manganese (Mn^{4+}) decline,	100 to 400	Facultative anaerobes	
Reducing	Sulphate, ferric Iron (Fe^{3+}) present	-100 to 100	Facultative anaerobes and obligate anaerobes	
Highly reducing	Sulphate and ferric Iron (Fe^{3+}) disappear Sulphide (S^{2-}), ammonium (NH_4^{+}), ferrous Fe^{2+} and methane present	-400 to -100	Obligate anaerobes	

Table of principal redox indicators. © Ian Panter



Two zones of preservation were identified within the historic core of Nantwich. © Caroline Malim

Conclusions

This Historic England-funded study is a unique attempt to systematically characterize a specific urban environment in which organic archaeological remains have been well-preserved. In Nantwich, two zones of preservation were found: well-preserved organic remains, in areas bordering the river; and more variable preservation, with some active decay, in a higher part of the town. The first zone is a pH-neutral environment with high sulphide and low nitrate content. It is thus conducive to preservation of organic remains such as wooden artefacts and plant material. The second zone was once also waterlogged, and there is grave concern that the burial environment there is drying out more quickly as a result of modern changes in the town centre (Malim *et al* 2016). Historic England has recently drafted guidance on the characterization and monitoring of urban waterlogged deposits (Historic England 2016).

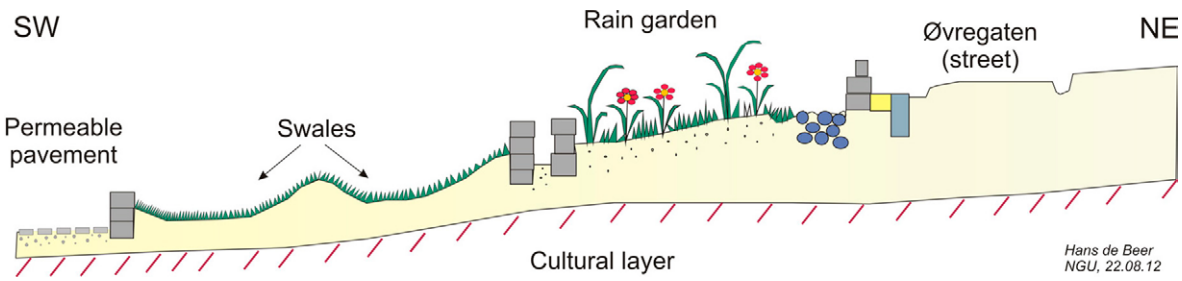


Diagram of methods for rainwater capture and recharge in waterlogged deposits. © de Beer and Seither 2015; reproduced by permission of Hans de Beer and Anna Seither

In the current socio-economic climate it will be difficult to establish an effective way of protecting these deposits. The best approach is to change behaviour so that future infrastructure, public realm and building projects in the town are designed in such a way as to encourage re-watering of the deposits. The aim is to raise awareness of the issue among decision-makers in the local authority (including spatial planners and engineers), whilst also educating developers in the importance of the archaeological resource and its sensitivity to intrusive works. Standing buildings are threatened if the drying-out of waterlogged deposits results in subsidence, a factor that might ultimately be more persuasive than concern for the buried archaeology itself.

The implications of this research are of value far beyond the Nantwich Supplementary Planning Document (Malim 2016), which has been produced to guide future development in Nantwich, and which has been included as part of the evidence base for Cheshire East Council's emerging local plan.

For example, the issues of ground stability, water management and sustainable development raised by the situation in Nantwich are equally applicable to all

Nantwich High Street: timber-frame built heritage in the conservation area. © Tim Malim

urban centres with comparable environments (these are generally those with poor drainage and that are prone to episodic flooding). The success of the Nantwich project in characterizing conditions beneath historic towns makes it a valuable comparator for similar projects in Norway, the Netherlands and other European countries. Indeed, considerable amounts of information and advice have been exchanged at international conferences between these various projects.

However the work has also identified the difficulties involved in producing a coherent understanding of all the complex issues that help to preserve, or threaten, buried remains. Equally challenging is the problem of how to influence decisions at a sufficiently strategic level to provide effective long-term management.

Many thanks to Jennie Stopford and Sue Stallibrass (English Heritage/Historic England), and to Dr Jill Collens and Mark Leah (Cheshire Archaeology Planning Advisory Service Cheshire Shared Services), who masterminded the project, steering it throughout Phase 1 (2007-10) and during the five years of monitoring (2011-15). Thanks are also due to all those colleagues who contributed to the project's success, especially John Carrott, Caroline Malim, Ian Panter and Mark Swain.

Author

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Tim graduated from the Institute of Archaeology in 1980 and has worked extensively throughout the UK and abroad. He was part of English Heritage's Fenland Survey in the 1980s, formed and directed Cambridgeshire County Council's Field Unit during the 1990s, became a consultant in 2002, and is chair of the Federation of Archaeological Managers and Employers.

Further reading

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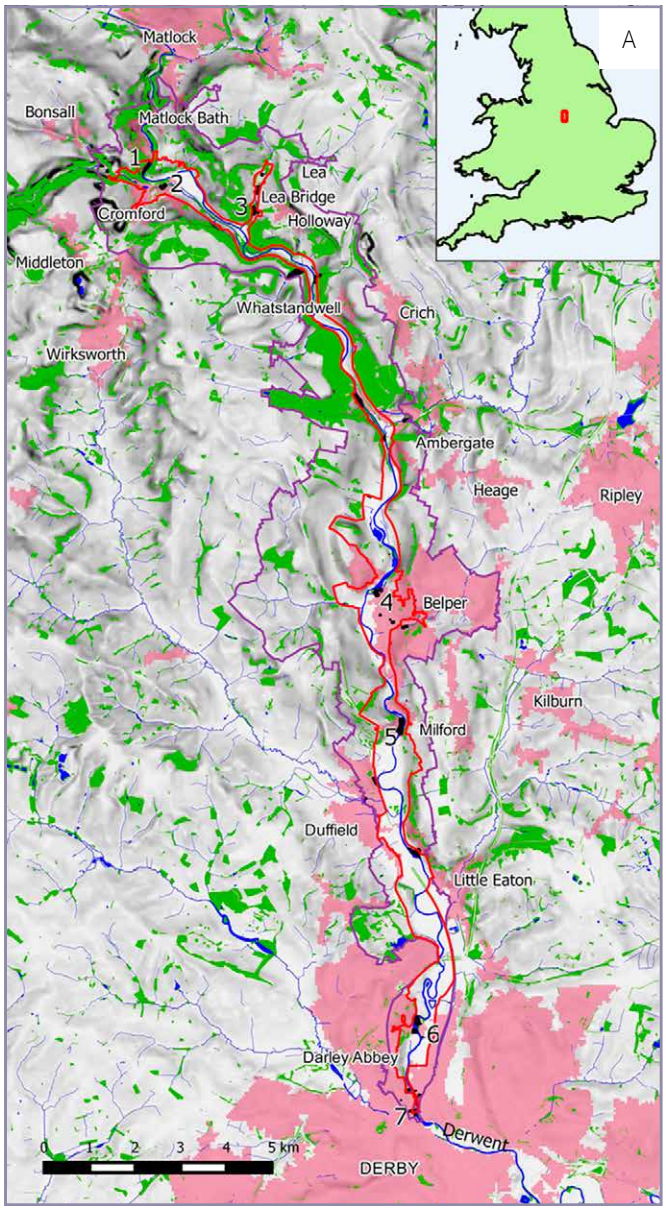
A research framework for a World Heritage Site

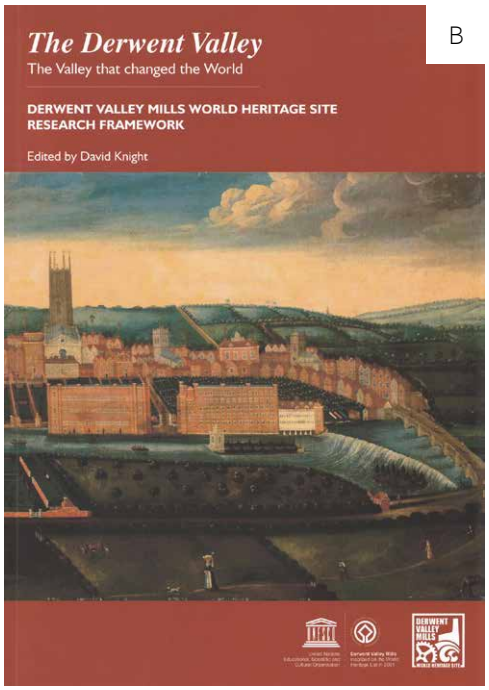
An innovative approach to studying the cultural heritage of the Derwent Valley Mills.

The Cromford cotton mills, as depicted by Joseph Wright (1734-97).

The Derwent Valley from Derby to Matlock was inscribed as a World Heritage Site by UNESCO in 2001 in recognition of its pivotal role in the growth of the factory system. Innovative building types were developed to house the machinery used in the manufacturing of textiles, initially at the Derby Silk Mill and subsequently for spinning cotton at Cromford, Masson, Lea Bridge, Belper, Milford and Darley Abbey. The need to provide workers' housing and other facilities resulted in the creation of early factory colonies by the owners: the Arkwrights at Cromford, the Strutts at Belper and Milford, and the Evans family at Darley Abbey. These have survived in a remarkably intact state.

The research framework is one of the first to be developed for any of the eight industrial World Heritage Sites in the UK and pioneers an innovative stakeholder-led approach that could be applied to other sites on the World Heritage List, both in the UK and beyond. It fulfils the UNESCO requirement that World Heritage Sites develop robust research frameworks and, by its focus upon research topics and strategies identified during stakeholder workshops, provides a rare example of a framework developed by rather than for the local research community. It was commissioned by Historic England and the Derwent Valley Mills Partnership in April 2013 and was published in August 2016 (Knight 2016).





A. The World Heritage Site is divided into 'core' (red) and 'buffer' (purple) zones. The key mill complexes are numbered: 1 – Masson; 2 – Cromford; 3 – John Smedley; 4 – Belper; 5 – Milford; 6 – Darley Abbey; 7 – Derby Silk Mill. Contains Ordnance Survey data © Crown Copyright and database right 2016; compiled by Steve Malone **B.** The cover of the World Heritage Site Research Framework. © The Derwent Valley Mills Partnership; cover image © Derby Museums Trust **C.** William Strutt's Round Mill at Belper, photographed in 1959 prior to its demolition. © Derbyshire Record Office

The Research Framework was developed in close liaison with stakeholders in the Derwent Valley, and is modelled upon the innovative template that was developed for the updated research agenda and strategy for the historic environment of the East Midlands (Knight *et al* 2012). Like that work, it has two key elements: a synthesis of current views on the priorities for research (the agenda) and an account of the measures required to advance understanding of these (the strategy). It is, however, much broader in its scope, extending beyond the historic environment focus of that framework to consider the wide variety of historical, literary, artistic and other data that assist study of the area's cultural heritage.

The project was guided by a steering group comprising representatives of a wide range of organisations with a strong interest in the World Heritage Site. It also benefited from the input of a specialist advisory panel comprising individuals who could give their input on such diverse subjects as the impact of the Enlightenment, mill architecture, workers' housing, the role of women and children in the mills, and representations of the valley in art and ceramic artefacts.

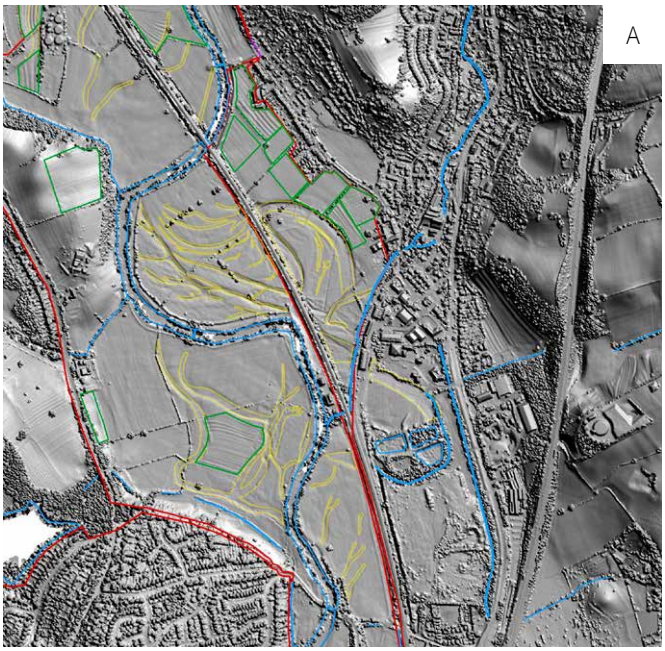
Defining the agenda

Discussions with stakeholders identified 11 key research themes, including assessment of the impact of the Enlightenment; the growth of industry, trade and settlement before the creation of the factory system; the evolution of factory-based industry and its subsequent metamorphosis; the changing relationships between factory owners, the landed gentry and the middle classes; the contrasting urban and rural labour forces; the role of transport, power and public utilities; the built environment; landscape and environmental change; and the national and global impacts of developments in the valley.

Within each theme, stakeholders identified up to 10 topics as priorities for investigation. The breadth of coverage may be illustrated by a summary of those established for the Enlightenment theme. Here, consultees highlighted the importance of topics such as the contribution of 18th-century studies of the earth sciences and antiquities to perceptions of the valley's past; the impacts of Enlightenment philosophies upon valley communities; changing interpretations of the Derwent Valley as a result of artistic depictions of the region; and the social and economic impacts of 18th-century tourism and consumer culture.

Developing the strategy

Once the agenda had been established, four stakeholder workshops were convened with the aim of agreeing strategies for each research theme. The resulting measures for advancing understanding, or strategic objectives, form the heart of the research framework. It was recommended, for example, that built environment research focus upon the functional, social and cultural factors that impacted on textile mill design; the influence of mill owners on the planning of industrial settlements; the impact of pre-factory industrialisation on the architecture of domestic buildings and associated structures; the potential of laser survey for analysing variations in machinery layouts and the circulation routes of factory workers; and the impact of industrialisation upon farming, including agricultural processes, building traditions and the layout of farms.



A. Lower Derwent Valley, showing the potential of lidar survey for studies of landscape change: yellow outline – palaeochannels; green outline – ridge and furrow. Source data © Environment Agency
B. 18th-century angling, boating and riding at Hopping Mill Weir, Milford, as portrayed by Thomas Smith (1720–67).
© Derby Museums Trust

The agenda and strategy will be updated regularly as research priorities change and as investigations shed light upon the various topics that need study. The framework is not intended to be prescriptive, but is a tool to facilitate research on topics judged by the valley's stakeholder community to be of particular interest. We have every expectation that both the priorities and the strategies it contains will change as knowledge advances, and as survey and analytical techniques develop.

Long Mill, Darley Abbey: laser survey showing in red/magenta the slight pathways on the floor eroded between machine locations, which are shown in green/blue. © Derbyshire County Council

Authors

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David was closely involved in the development of the East Midlands Historic Environment Research Framework and is active in research into the archaeology and landscape of the Derwent Valley and the Peak District. He has recently been involved in Historic England projects to investigate the potential impact of climate change on the historic environment of the Derwent Valley and to establish a research framework for Peak District farmsteads.

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Director of the Derwent Valley Mills World Heritage Site.

Mark was previously Head of Bradford Museums and Galleries, Director of St Albans Museums, and Assistant Director of Yorkshire and Humberside Museums Council. He has been Director of the Derwent Valley Mills World Heritage Site since 2011. He was also Keeper of Social History at York Castle Museum and Assistant Keeper of Social History at Salford Museums and Galleries. He has been a Board Member of the Museums Association, ICOM UK and World Heritage UK. Mark has published and lectured widely on museums and cultural management throughout Europe.

Further reading

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Ecosystem services and the historic environment

The potential of an approach common in the natural environment sector.

'Ecosystem services' are the ways in which the natural environment provides benefits to humans. The term is increasingly used to describe a methodology which assesses the value of these benefits. The ecosystem services approach is becoming popular with policymakers and land managers, as well as within the planning system. However, the historic environment is not always included in these assessments. Historic England has begun to explore how the heritage sector might more fruitfully engage with this influential methodology.

What are ecosystem services?

The approach is used to identify and assess the services that the environment provides people, and the impact of any change to those services. This value is sometimes, but not always, expressed in monetary terms. Ecosystem services first emerged in the 1980s but the current iteration stems from the Millennium Ecosystem Assessment commissioned by the United Nations in 2001 and published in 2005. Subsequently the UK Government commissioned the National Ecosystem Assessment, the reports of which were published in 2011 and 2014.

The wreck of the SV *Carl* in Booby's Bay, Cornwall, exposed after winter storms in February 2014. As physical structures (supporting services) wrecks can provide cultural interest (cultural services) but also be habitats for wildlife. © D Hooley

Ecosystem services has a focus on people, and the benefits that the natural environment can provide to their health, well-being and prosperity. It identifies four categories of services:

- supporting services: these are the environmental processes that underpin the other services. Such things as soil formation, the nutrient cycle and oxygen production are examples;
- provisioning services: these are concerned with the provision of the things we need or use, including food, fibre, fuel and water;
- regulatory services: these regulate our environment; examples include the processes which keep water pure, the self-regulation of the climate, and the way in which landforms serve to mitigate the damage potentially caused by floods; and
- cultural services: these are typically intangible. They include such things as the educational, recreational, and aesthetic value of the natural environment. The historic environment is usually included within this category.

Ecosystem services places people and their well-being centre stage. This is very familiar territory for the heritage sector, which has people and their stories past and present at its heart. However the historic environment is often overlooked by those using the ecosystem services approach. There are clear challenges and opportunities here. On the one hand, the breadth of approach and the specificity of language used by practitioners of ecosystem services can be challenging. On the other, the approach offers a fresh way of considering the benefits provided by the environment, and places 'cultural services' among these benefits.

The focus of the 'cultural services' category is frequently on intangible types of value. The way in which the historic environment contributes to the value of the

As a historic landscape that aids water management, this water meadow at Alderbury, near Salisbury contributes supporting, provisioning, regulating and cultural escosystem services.

physical environment is less often acknowledged. One notable exception is a recent Scottish Natural Heritage working paper, in which the role the historic environment plays as a supporting service is explicitly recognised as contributing both to the physical components of space and to the more intangible qualities of place.

The heritage sector has gathered considerable information about the value of the historic environment, whether in terms of 'sense of place' or more tangible measures. The Heritage Counts reports produced annually by Historic England on behalf of the Historic Environment Forum are a key source of information here. This work has not been drawn on by those applying the ecosystem services approach, but there is a case that it should be.

A joint workshop

Clearly, there is a need to explore how ecosystem services is being used, the extent to which the historic environment should be taken into account by those who employ the approach, the potential of ecosystem services for the historic environment sector itself, and the challenges posed by its application. In response to this, Historic England organised a workshop in June 2016, with support from the Valuing Nature Network, which aimed to bring ecosystem services experts together with representatives of the heritage sector. Delegates were asked to consider five questions:

- what are the opportunities for integrating the historic environment into ecosystem services?;
- what are the obstacles to this integration?;
- what do you think are the priorities for research?;
- how can the historic environment be used in the practical application of ecosystem services?; and
- at what scale do you think an integrated approach is most effective? National, regional, landscape, site – or all of these?

The presentations at the event covered a wide range of projects.

Indeed, the benefits of engaging with the ecosystem services approach were highlighted by many speakers: as a way of structuring community engagement and recording what people value and how; as a means of identifying areas of mutual interest; and as a way of putting people at the centre of both the history and the future of the environment.

At the event, Dr Vince Holyoak (Historic England) introduced the challenges and Dr Robert Fish (University of Kent and Valuing Nature Network) provided some background on cultural ecosystem services. Dr Patricia Rice (Natural England) explained how ecosystem services lay behind the development of National Character Areas and the importance of recognising the interconnectivity of people, natural systems and landscapes. This was echoed by other speakers, including Dr Rice's colleague Andy Wharton who looked at two local projects which used Natural Character Areas, participatory GIS and landscape 'apps' to work with local people on the mapping of their

Sefton Park, Liverpool. Parks help to regulate temperature and air quality (regulatory services) in urban areas; they also contribute to health and well-being (provisioning and cultural services). © Historic England

cultural landscapes. This helped to improve the future management of these places.

Looking at an urban context, Dr Erini Saratsi (University of Kent and Valuing Nature Network) highlighted the ecosystem services provided by green spaces in towns and cities. Reflecting on a brief placement with Historic England through the Valuing Nature Programme, she challenged us to scrutinise what we in the heritage sector really mean when we talk about 'cultural value'.

Examples of collaboration between historic and natural environment experts were highlighted in several talks. Dr Stewart Clarke (National Trust) presented the National Trust Spirit of Place approach, which recognises the importance of integrating the cultural, the natural, the tangible and the intangible if site management is to be successful. Tim Yarnell (Forestry Commission) looked at the importance of understanding the historic character of places and how sensitive to change their special qualities were. He used as an example his experience of collaborative work with Historic England on woodland expansion. The benefit of collaboration was a theme picked up by Jonathan Porter (Countryscape and Ecosytems Knowledge Network) who emphasised the importance of Historic Landscape Characterisation in bringing many of these different threads together. Following this, Emily Hathaway (Worcestershire County Council) and Dr Jeremy Lake (Historic England) discussed collaborative work in Worcestershire that looked at settlement patterns and changing landscape use. The importance of understanding the cultural and historical context of places was emphasised by Dr Anthony Firth (Fjordr Marine and Historic Environment Consulting) who explored the challenges of doing such work in the marine environment.

A policy perspective was offered by Jill Bullen (Natural Resources Wales), who looked at how the historic environment is playing a role in delivering key objectives for the social, economic, environmental and cultural well-being of Wales, in the wake of two recent Acts of the Welsh Assembly, the *Well-being of Future Generations (Wales) Act 2015 and the Environment (Wales) Act 2016*.

Discussion sessions were wide-ranging, but issues surrounding communication and integration were persistent themes. It was recognised that better contact between sectors, with improved clarity of terminology, was essential if awareness of the role of human agency in the environment was to be raised. Some opportunities were highlighted by Worcestershire County Council's collaborative work with ecological colleagues. This identified a close correlation between particular historic landscape features and key species. It was crucial to understand the relationship between the historic environment and the natural habitats it created.

Many of the challenges identified by participants centred on the barriers created by mutually exclusive technical language and by 'silo' thinking. There was general consensus, though, that in order to address many of the challenges we need practical examples of the integration of the historic environment into ecosystem services approaches. Historic England is currently gathering information on how heritage is being incorporated within ecosystem services and whether there might be opportunities to improve this.

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Hannah has an academic interest in Pleistocene archaeology and over a decade's experience as a local government archaeologist in Hampshire and Oxfordshire. Hannah joined Historic England in 2015, and works on flooding, coastal change and ecosystem services; she is the author of Historic England's report on climate change adaptation.

Hannah is keen to be made aware of projects where heritage could be included within ecosystem services: contact her at hannah.fluck@HistoricEngland.org.uk.

Further reading

The Millennium Ecosystem Assessment, available at: http://www.millenniumassessment.org/en/index.html

The UK National Ecosystem Assessment, available at: http://uknea.unep-wcmc.org/About/tabid/56/Default.aspx

The Scottish Natural Heritage working paper 'Cultural ecosystem services – towards a common framework for developing policy and practice in Scotland' (October 2015), available at: http://www.snh.gov.uk/docs/A1882362.pdf

The Ecosystems Knowledge Network, available at: http://ecosystemsknowledge.net/. Issue 12 (Spring 2016) is devoted to cultural services and includes an article by Jeremy Lake of Historic England, which explores some of the opportunities for the historic environment to be more fully integrated with those using ecosystem services

Heritage Counts, available at: https://HistoricEngland.org.uk/research/heritage-counts/

Draft report from the Your Place Matters Project (Worcestershire County Council and Historic England), available at: http://www.worcestershire.gov.uk/downloads/file/7136/your_place_matters

An elevated view of Sefton Park, Liverpool. © Historic England

Community-led research

Assessing the value of voluntary projects.

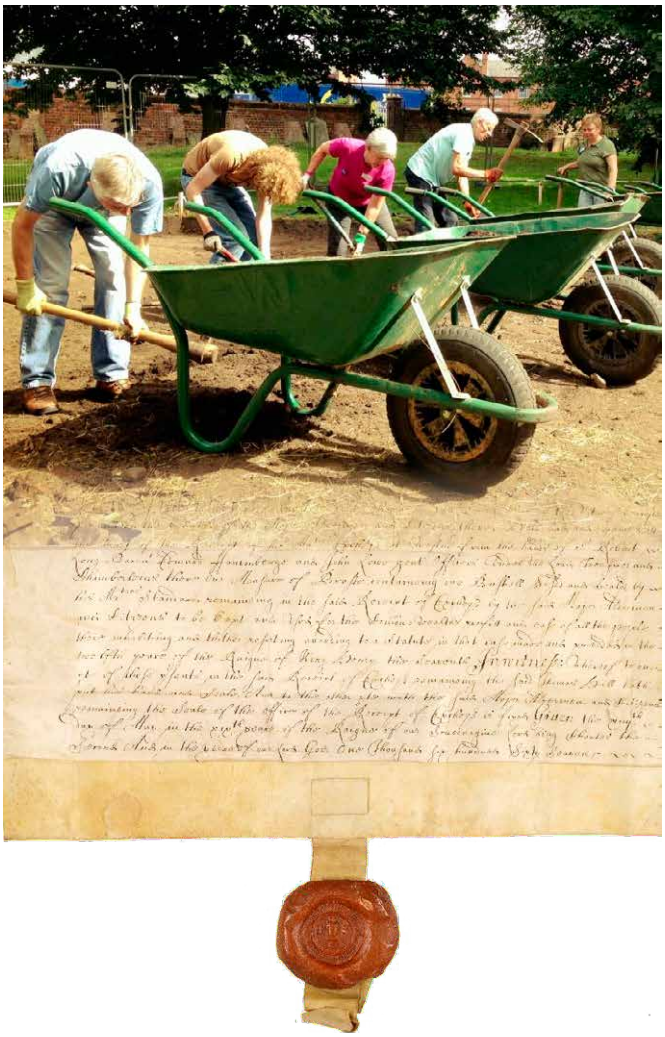
Introduction

The heritage sector has a long history of volunteer involvement, the social and communal benefits of which are widely recognised (English Heritage 2014, Heritage Lottery Fund 2015). The significance of this is reflected in the grant-giving policies of the Heritage Lottery Fund and other providers, which favour those projects featuring community engagement, interaction and development.

Very little attention, however, has been paid to the research outputs generated by such projects. This is in spite of the increased acknowledgement of the value of research carried out outside of the academic sphere, for example by development-led investigations (for example the recent Roman Rural Settlement Project; also discussed in the Winter 2015-16 issue of *Historic England Research*, 2).

In 2015, Historic England commissioned Worcestershire Archive and Archaeology Service to establish a clearer picture of the volume and range of heritage research undertaken on a voluntary basis. The project also assessed the potential of this research to inform the planning system through the enhancement of Historic Environment Records (HERs) and research frameworks. The project did not aim to provide a commentary on the quality of work produced, but rather to assess its potential value.

The Assessing the Value of Community Generated Research Project covered both terrestrial and maritime archaeological groups, as well as those recording historic buildings, and – for the first time – local history groups. This connection with the local history community was facilitated through a partnership with the British Association for Local History. Data was gathered through an online survey and case studies focusing on specific regions provided qualitative as well as quantitative information.



The project looked at all aspects of archaeology and local history, from excavation to archive research. © WAAS

Main findings

The data produced a number of interesting, in some cases surprising, results. The amount of research generated by heritage community groups was substantial: an estimated 12,000 projects were carried out in the last five years alone, resulting in the production of 20,000 pieces of research. These figures are likely to be a conservative estimate, as information on community-led research is not systematically gathered.

Volunteers recording structures during the fieldwork phase of the DigBromsgrove project. © WAAS

Worryingly, 60 per cent of this research is not fed back to HERs. While 67 per cent of archaeological groups pass on their work to HERs (which in turn means a third do not), only 23 per cent of local history groups do the same. This can be attributed to the history of HERs, which have long had an archaeological focus; the local history community has had a closer relationship with local studies libraries and archives.

Respondents who had consulted local authority services, archaeological units or professional freelance archaeologists were 78 per cent more likely than those who had not consulted professional archaeologists to submit their results to HERs. This demonstrates the importance of the relationship between voluntary/community researchers and professional practitioners. The survey also showed that while grant-funded projects are more likely to consult HERs or advisory services than purely voluntary organisations, only 51 per cent of these submitted their final results to HERs; this is worryingly low.

The project also found how varied the motivation is for carrying out research. Many respondents were directly responding to planning and development issues. In spite of this, much of their work is not making its way into research resources, and is thus not being considered in strategic planning decisions. An alarming statistic involves the fate of physical archives, with only 23 per cent of respondents who undertook intrusive fieldwork without grant funding sending the resulting material to museums.

The case studies demonstrated that a vast quantity of research is being generated by heritage community groups; this material has significant value, with a great potential to enhance both HERs and research frameworks. The inclusion of such material would enable the sector to more effectively manage and protect the historic environment, particularly in those areas of the country which have seen very little planning-led activity.

Research frameworks

One of the key aims of the project was to assess the potential value of community-generated research for the development of research frameworks. As a result, the online survey aimed to understand how these were viewed by community groups and researchers. Only 45 per cent of respondents, it was found, were aware of existing research frameworks. Of those who had heard of them, however, 78 per cent had consulted the relevant documents. Community groups and researchers have not to date been active participants in the collaboration between local authorities, commercial and academic sectors which saw the development of the frameworks in the 1990s, so it is perhaps not surprising that there is a low awareness of their existence.

Tithe map transcription research in Worcestershire Archives. © WAAS

Encouragingly, 94 per cent felt that their was of value and could contribute to a wider understanding of their field of research. There is thus a real opportunity to engage with these groups, involving them in the process of developing research frameworks. This would ensure that local research agendas are more fully considered and incorporated into the frameworks, and that they have a stronger sense of community ownership and collaboration. The recommendations in this report are currently being taken forward in the recently commissioned projects to revise the regional research frameworks for the east of England, north-east and north-west.

Wordcloud generated from survey responses on project funding. © WAAS

Moving forward

So what happens now? The project presents an ideal opportunity to start addressing the issues surrounding community-generated research. The work will involve partnerships between Historic England, the Council for British Archaeology, the Chartered Institute for Archaeologists, the British Association for Local History, voluntary groups and the wider heritage community.

Some of the recommendations are already feeding into existing initiatives, such as Historic England's Heritage Information Access Strategy, and the redevelopment of OASIS (the system for reporting investigations online) which is being carried out through the HERALD Project. The Chartered Institute for Archaeologists Voluntary and Community Special Interest Group was reinstated with a new committee in February 2016 with a commitment to take forward the findings of this project.

The project has been a timely one, especially in light of the current financial situation within the heritage sector. The solutions to the issues raised cannot fall to one section of the sector or to a single organisation, but should rather be seen as the responsibility of all within the profession: from national heritage bodies to commercial units, local authority services to academic researchers – not to mention voluntary organisations.

Wordcloud generated from survey responses on publication. © WAAS

Authors

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She manages the HER as part of her role and has a lot of contact with community groups and researchers. She has a background as a field archaeologist, with a wide range of experience in outreach and community archaeology.

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Originally a field archaeologist, he joined the service on a Council for British Archaeology bursary, and has since worked on a variety of public archaeology projects aimed at enhancing public awareness of archaeology in the West Midlands, and in addition to his role as a Finds Archaeologist.

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Research Resources Officer with Historic England.

He is responsible for developing research frameworks and reference resources. He has an archaeology degree and an MA in Museum Studies, and has worked in the heritage sector for a number of years in England and Spain.

Further Reading

The Assessing the Value of Community Generated Research project report, available at: https://historicengland.org.uk/research/support-and-collaboration/research-resources/assessing-community-generated-research/

British Association for Local History, available at: http://www.balh.org.uk/

CBA's Introduction to Standards and Guidance in Archaeological Practice, specifically aimed at supporting voluntary researchers, available at: http://www.isgap.org.uk/

CIfA's Voluntary and Community Archaeology Group, available at: https://volcomarch.wordpress.com/

HERALD (Historic Environment research archives, links and data), available at: https://oasis.ac.uk/pages/wiki/HERALD

Heritage Information Access Strategy, available at: https://historicengland.org.uk/research/support-and-collaboration/heritage-information-access-strategy/

Heritage Lottery Fund research on the values and benefits of heritage, available at: https://www.hlf.org.uk/values-and-benefits-heritage

Historic England Research Frameworks, available at: https://historicengland.org.uk/research/support-and-collaboration/research-resources/research-frameworks/

Heritage Counts, available at: http://hc.historicengland.org.uk/

Roman Rural Settlement Project, available at: http://archaeologydataservice.ac.uk/archives/view/romangl/

Worcestershire Archive and Archaeology Service, available at: http://www.worcestershire.gov.uk/info/20019/archive_and_archaeology

The world's most technologically-advanced house – in 1850?

The lost innovations of Osmaston Manor.

Many people think of Cragside in Northumberland, a building of the 1860s, as an example of the early adoption of industrial-era technologies in a domestic setting. Certainly, the achievements of Cragside's builder, the industrialist Sir William Armstrong, are remarkable. However, an industrialist of the previous generation, Francis Wright, built an even more technically advanced house, Osmaston Manor in Derbyshire, in the 1840s. The great pity is that, whilst modern visitors to Cragside (a National Trust property) can see the results of William Armstrong's forward thinking, Osmaston Manor was demolished in 1965.

Industrial patronage

Francis Wright was the son of a prominent Nottingham banker who rose to become a senior partner in the Butterley Company in Derbyshire. They were one of the leading iron and engineering companies of the 19th century, famous, for example for the roof structure at St Pancras Station. It is perhaps no surprise, then, that Wright made extensive use of iron columns and beams in his house, a revolutionary thing to do at the time. Particulars for the sale of the house in 1883, ten years after Wright's death, record:

Mid-19th century pump house with saw mill behind, Osmaston Manor. © Ian West

The south-east front of Osmaston Manor viewed from the gardens, *c* 1890. © Historic England Archives CC79/0052

> "The Warming and Ventilating is of a singularly complete character, and many miles of Iron Pipes are used. Almost every room in the house is artificially warmed, and hot and cold water (both hard and soft) is conducted over the premises"
> **Historic England Archives, SC00200.**

The provision of both hot and cold running water throughout a house was a rarity in 1883 – let alone in the 1840s, when they were installed at Osmaston. A railway in the massive cellars of the house carried coal to the boilers, and to a hydraulic lift which enabled coal and luggage to be carried to the upper floors; this was almost certainly the first example of a lift in a private house. A waterwheel at the side of the stable block drove machinery in the kitchen and laundry, a level of sophistication which, even forty years later, was only matched in a few other houses.

Only steps and terracing survive of the house today. These are on a private estate, used as a wedding venue, and not accessible to the public. However, the refinement both of the technology and of the design of the property are well illustrated by a surviving pump house built in the style of a Swiss chalet. It contains a waterwheel which drove two pumps, supplying water to two separate reservoirs situated on high ground above the house; one supply was river water, used for the hydraulic lift, and the other was spring water for the domestic supply. The waterwheel also powered a saw mill, which handled the timber from Wright's 1,400ha estate.

The hidden story of Osmaston is just one example of the development and deployment of domestic innovation explored in a new book *Technology in the Country House*. The book reveals not just how and why such inventions were adopted, but also what impact these developments had on the people who lived and worked in the houses of the era.

Author

Dr Ian West
Honorary Visiting Fellow
University of Leicester: Country House Technology Project

Ian gained a degree in Engineering in 1975 and worked in the gas industry until, in 2002, he left to study for an MA in Industrial Archaeology at Birmingham University's Ironbridge Institute. In 2008, he completed a PhD at the University of Leicester's School of Archaeology and Ancient History, researching the impact of artificial lighting on early factories. He has written and lectured extensively on utility industries, domestic technology and other aspects of industrial archaeology and is an honorary visiting fellow at the University of Leicester, working on the Country House Technology Project.

Further Reading

The Country House Technology Project, available at: https://www2.le.ac.uk/departments/arthistory/research/countryhouse/the-country-house-technology-project

West, I and Palmer, M 2016 *Technology in the Country House*. Swindon: Historic England

Historic England publications

Recent publications include a fascinating account of the introduction of technology into the country house and its impact on life in these buildings. Neo-Georgian architecture, often perceived as the architecture of 'good manners', is the subject of a new edited collection and rightly highlights the cultural and architectural significance of this ubiquitous and largely-overlooked style. And we have two new titles in our popular Informed Conservation series: a significant examination of the post-war development of Coventry, and an exhaustive look at the railway goods shed and warehouse in England.

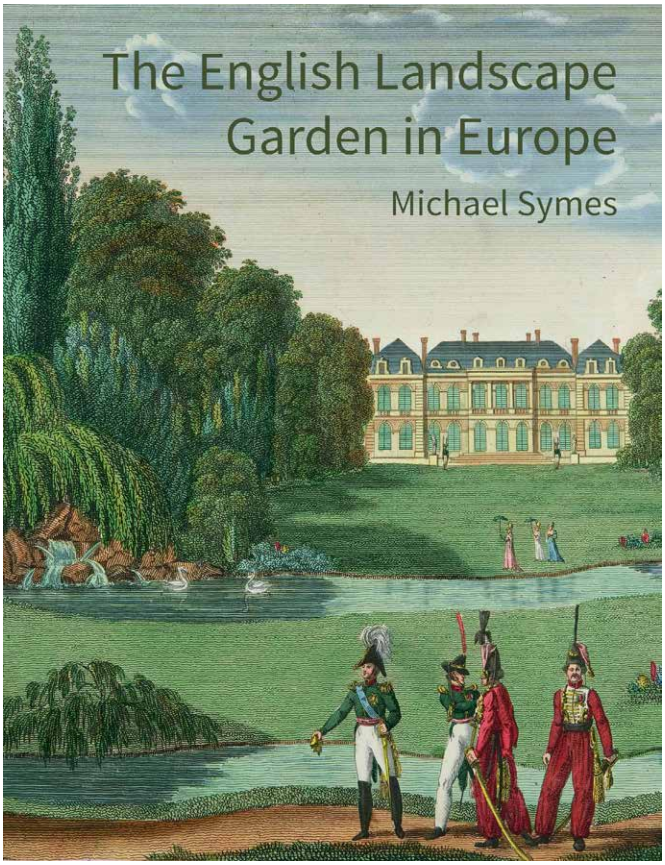
These new books are just a small sample of our publishing range – visit the Historic England Bookshop to discover a wealth of books on archaeology, architectural history, sporting heritage and heritage conservation.

Readers of *Historic England Research* can get **20 per cent discount** on all books sold through the online shop with **free postage and packaging** on orders where the catalogue price is £20 and over.

Enter discount code **HERES16** on the basket page before you checkout. Code valid until 31 December 2016.

The English Landscape Garden in Europe
Michael Symes

2016 is the tercentenary of the birth of Lancelot 'Capability' Brown, a giant of the English landscape garden tradition. In his new book Michael Symes looks at how the influence of Brown and his 18th-century contemporaries spread throughout Europe and Russia. While the English landscape garden was widely influential, it was not slavishly copied. Instead, it was adapted to local conditions, circumstances and agendas.



The idea of the landscape garden became influential in mainland Europe from about 1760. Due to the differing geopolitical character of several of the countries, and the distinct division between Catholic and Protestant confessions, the idea was interpreted differently from place to place: it proved to be a very flexible medium. Each country is considered individually, with a special chapter devoted to *le jardin anglo-chinois*, a genre in its own right. The gardens have been chosen to illustrate the range and variety examples that exist, while also reflecting those on which most work has been done in English.

£25.00 : April 2016 : 978-1-84802-357-4 : Paperback : 136pp : 246x189mm : 117 illustrations

https://retail.historicenglandservices.org.uk/the-english-landscape-garden-in-europe.html

Neo-Georgian Architecture 1880–1970: A Reappraisal

Edited by Julian Holder and Elizabeth McKella

This new book investigates how, where, when and why the Neo-Georgian has been represented over the course of the last century, assessing its impact as a cultural phenomenon through a consideration of its buildings, objects, institutions, and actors.

Different ideologies have been attached to the Neo-Georgian at different times and places, particularly notions of home, nation, gender and class. The papers explore the construction, reception and historiography of 'the Georgian' throughout the late 19th and 20th century – and most particularly its relationship to Modernism – through discussion of a range of building types, planning ideas (including the new concept of 'civic design') and design generally.

Re-interpretations and adaptations of the Georgian have been a constant theme over the past century and constitute a powerful and enduring strand in Anglophile culture across the globe. The papers consider interpretations of the Neo-Georgian not only in England but in places as diverse as New Zealand and America.

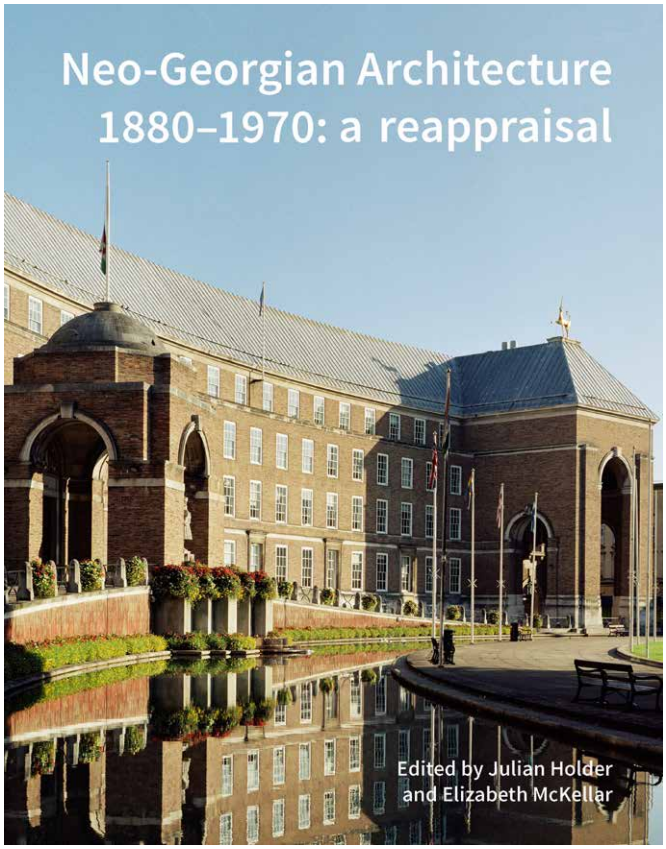
£50.00 : May 2106 : 978-1-8402-235-5 : Hardback : 232pp : 276x219mm : 150 illustrations

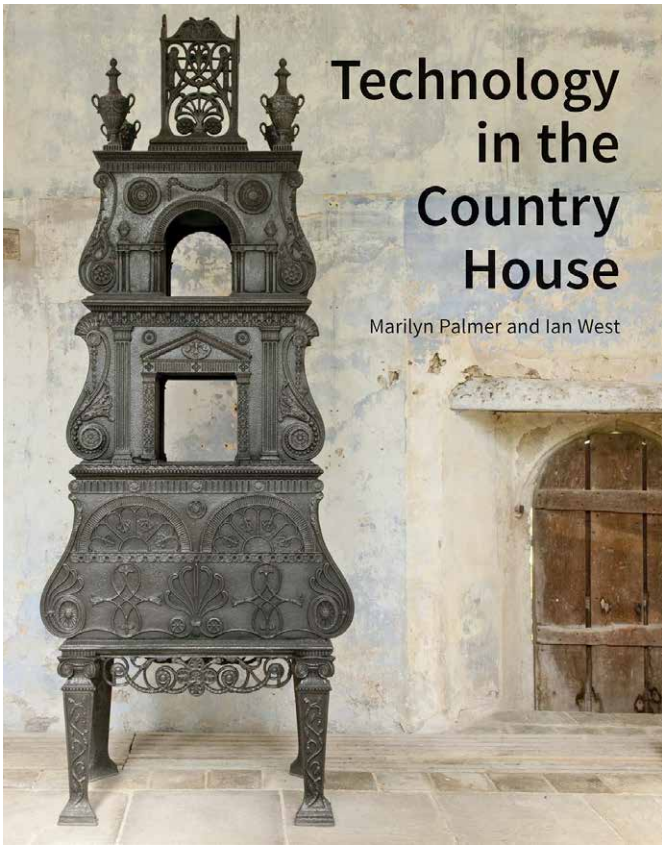
https://retail.historicenglandservices.org.uk/ditherington-mill-and-the-industrial-revolution.html

Technology in the Country House

Marilyn Palmer and Ian West

Visits to country houses are an important leisure pursuit throughout the British Isles – not only to appreciate their superb architecture, great paintings and elaborate furniture, but also to experience something of what life was like 'upstairs and downstairs'.





By the 19th century, life in most country houses was changing as a result of various technical inventions. These included improved water supplies; flushing water closets; boilers and pipes to provide central heating; internal communications by bells and, later, telephones; and better lighting by means of gas and electricity. This new book sets out to discover what evidence has survived for the impact of technological innovation on the buildings, contents, parks and gardens of country houses, as well as on the lives of the people within them.

Many books have been devoted to the life of those in domestic service in such houses. This one looks not so much at the social records of such lives as the actual physical evidence for the greater levels of comfort and convenience sought by landowners in country houses from the 18th to the early 20th centuries.

£60.00 : September 2016 : 978-1-8402-280-5 : Hardback : 272pp : 276x219mm : 250 illustrations

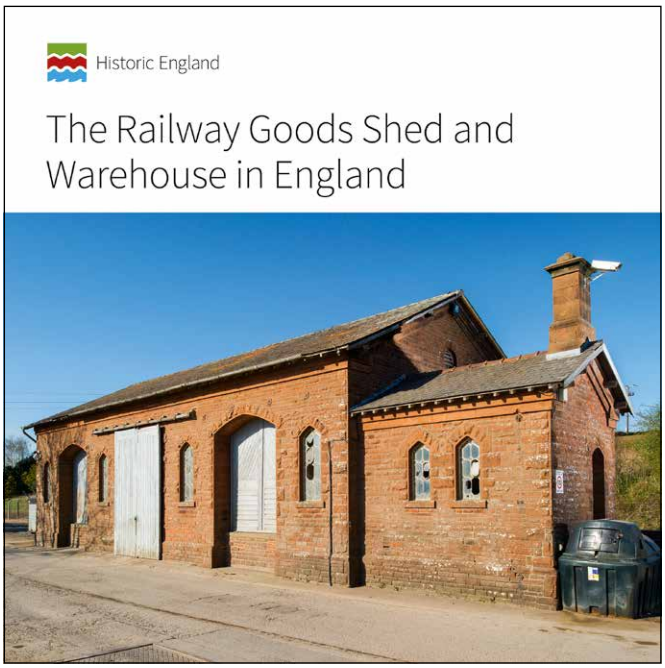
https://retail.historicenglandservices.org.uk/technology-in-the-country-house.html

The Railway Goods Shed and Warehouse in England

John Minnis

Although goods traffic often accounted for a higher proportion of railway companies' revenue than passengers, the buildings associated with it have received very little attention in comparison to their passenger counterparts.

The book shows how the basic design of goods sheds evolved early in the history of railways, and how the form of goods sheds reflected the function they performed. The book brings out how they varied considerably in size from small timber huts to the massive warehouses seen in major cities. It also looks



at how many railway companies developed standard designs for these buildings towards the end of the 19th century and at how traditional materials such as timber, brick and stone gave way to steel and concrete in the 20th century.

This building type is subject to a high level of threat, with development pressure in urban and suburban areas for both car parking and housing having already accounted for the demise of many such structures. Despite this, some 600 have been identified as still extant. The book will provide the first comprehensive gazetteer of surviving examples.

£14.99 : September 2016 : 978-1-84802-329-1 : Paperback : 140pp : 210x210mm : 85 illustrations : Informed Conservation

https://retail.historicenglandservices.org.uk/the-railway-goods-shed-and-warehouse-in-england.html

Coventry: The making of a modern city 1939-1973

Jeremy Gould and Caroline Gould

The Coventry Blitz of 14 November 1940 was a key event of the Second World War. The medieval city, already undergoing rapid change, was largely destroyed on that night. The destruction was seen as an opportunity by some, including the then City Architect, Donald Gibson – and the result was the first of the master plans for the post-war redevelopment of Britain's bombed city centres. Post-war Coventry was hugely influential and Gibson's ideas helped to shape the rebuilding of other city centres, the creation of the post-war new towns, and developments in Europe.

The modern demands a growing city makes on its centre are very different from those of the post-war years. Coventry needs to plan for its future and change will inevitably affect its city centre. This book aims to inform members of the public and decision-makers alike about the significance of Coventry, and especially its centre. It is hoped that that change can be managed in ways that will continue the life, use and enjoyment of the best of Coventry's remarkable post-war heritage.

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£14.99 : March 2016 : 978-1-84802-245-4 : Paperback : 164pp : 210x210mm : 138 illustrations : Informed Conservation

https://retail.historicenglandservices.org.uk/the-railway-goods-shed-and-warehouse-in-england.html

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