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Building Conservation Journal

In search of a conservation plan for Brymbo Steelworks

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Building Conservation September 2009

From the chairman

In this issue of the journal, we are preoccupied with one subject: the conservation of the Brymbo Steelworks near Wrexham in north Wales. I almost said 'one project', but sadly, at present, there does not appear to be one. The site is hugely important in terms of our industrial heritage and our social background – a factor not lost on local enthusiasts, who are determined to research and record every detail of this slice of history before it is lost forever.

As a site in limbo, Brymbo is not alone. I've been lucky enough to get to know several others over the years and one very similar industrial site stands out in my mind: Robinson's Shaft at the South Crofty Tin Mine in Cornwall. I was part of a team bid for the site's regeneration and, though we did not win, the sense of history and very strong link with the community made a lasting impression.

Providing a sustainable solution was never going to be easy (there are other restored, well-presented tin mines in Cornwall), but in the Heartlands Project's vision and the attitude of the local authority there was always a definite commitment to ensuring that any presentation and/or interpretation would respect the site's position within the community and ensure a sustainable future.

The South Crofty Tin Mine was in operation until 1988, when it closed with a significant number of job losses, so its story is not just about a shaft sunk in 1903, but reflects the recent decline of mining in the 20th century and how it links back to that era. Brymbo closed just two years after the South Crofty mine, with the loss of 1,100 jobs, and both sites went through periods of uncertainty about the future. But planning for the Robinson's Shaft site began quickly and, thanks to the Heartland Project, the Kerrier Council and the community, a £22.3m grant was secured from the Big Lottery Fund in 2007.

Brymbo's future is very much less secure. In 2002, the BBC reported that the Brymbo buildings and their artefacts – traceable back to the establishment of the ironworks by John Wilkinson – would be preserved and transferred to the ownership of Wrexham Council. For whatever reason, that has not yet happened, and the buildings and site are crying out for conservation. A project needs to take shape if they are not to suffer more serious, and possibly terminal, dilapidation.

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ISSN: ISSN 1469-5421 (Print) ISSN 1759-3379 (Online) **Front Cover:** The historic No.1 blast furnace at Brymbo Steelworks dates back to 1794 and the era of John Wilkinson, a pioneer in the use of cast iron. The buildings are gently decaying and will be lost forever without a conservation plan *© Peter Napier*

Iron in the soul

The Brymbo Steelworks near Wrexham in North Wales is a complex historic site desperately in need of a conservation plan and the funds to implement it. Peter Napier reports

When the Brymbo Steelworks was closed in 1990, it was the end of an era of iron and steel making in Britain that had spanned two centuries. Since the closure, and the sale of the plant to Chinese buyers (who dismantled it part by part and transplanted it to China, where it produces high-quality steel from scrap metal to this day) the massive site has been cleared and the land reclaimed for housing. Left behind are the original 18th century ironworks with several listed buildings and a scheduled monument. The buildings are at risk: disused and empty and requiring extensive conservation work to consolidate and reinstate them.

The challenge is to find suitable new uses for the site, so that it does not have to compete directly with the other 18th century ironworks attraction (Bersham Heritage Centre) nearby. The Brymbo site is privately owned by a land reclamation and development company, whose long-term development plan for the reclaimed land has been held up by the economic downturn. Interest among local people is considerable and has resulted in the formation of the Brymbo Heritage Group, supported by the site's owner, with the long-term objective of seeing the site conserved, along with other industrial sites in the area.

And it turns out that the architectural and social interest of the site is not all that needs preserving: in 2006, workers at the site unearthed a 'fossil forest' the size of a rugby field in which the 'trees' (actually a kind of moss that grew up to 40m high) are 300m years old – older than the dinosaurs and dating back to a time when Wales had a hot, tropical climate. The hope of conservationists is that this area will be incorporated into the overall development of the site and protected by a geodesic dome similar to those at the Eden Project.

The ironworks itself is not unique, but the site is of exceptional interest, with all the features of an intact, original, mid-to-late 18th century ironworks, including the blast furnace; the foundry and casting floor; the workshop where the casting patterns were made; the original 18th century road through the site, which was diverted by the development of Brymbo from ironworks to steelworks; the early-18th century agent's house; the track bed of the railway line, and

© Colin Davies, Brymbo Heritage Centre

the colliery that produced the coal for the blast furnace. Add to this the great crested newts and other flora and fauna that inhabit the site and you have some insight into the built and natural heritage value of this site.

The colourful history

The original ironworks was founded in 1790 by the legendary 'Iron Mad' John Wilkinson, who was at the forefront of the development of iron-making on an industrial scale in Britain.

John Wilkinson learned about melting and casting hot, fluid iron from his father, Isaac Wilkinson, at Blackbarrow Ironworks near Newby Bridge in Cumbria. Peat was the first fuel used in the furnaces, but when that proved not to be the success Isaac had hoped, peat was abandoned in favour of wood and charcoal.

Meanwhile, the young John had shown he was a man of ideas by manufacturing the first-ever iron boat to transport the peat to the furnaces. Why, he reasoned, should he go to the expense of getting a wooden boat, when he had the iron and the skill to fashion it himself?

The boat was a success, but the peat failed, and this setback to the business meant that John's opportunities at his father's ironworks were limited. So, in 1748, he set out for Coalbrookdale in Shropshire, where the now famous ironmaking Darby family was smelting iron ore with coal, with some success.

No.1 blast furnace, known locally as 'Old Number One', (1794) is a scheduled monument. This is a stone structure, open at the top to receive iron ore, coal and other materials. At the bottom are three arched openings used for removing ash and slag, tapping off the molten iron and injecting the blast of air from a nearby engine house now gone.

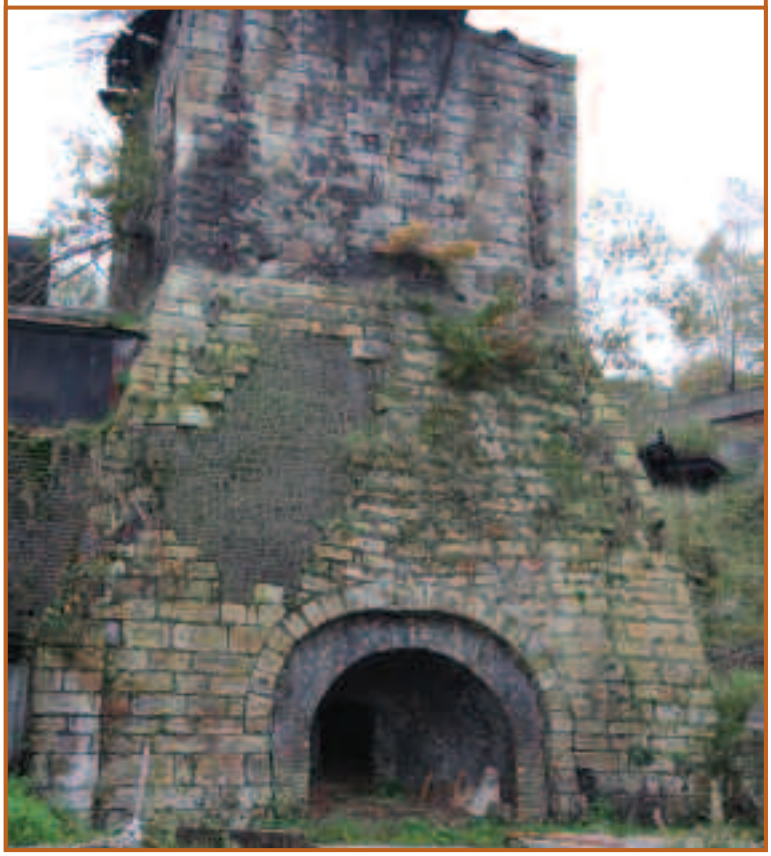

Image courtesy of Peter Napier

View of the ironworks in the mid-20th century. The agent's house (see page 6) is on the right and the No.1 blast furnace on the left. The foundry is at the front centre and the machine shop is just to the right of centre. Everything in the background has now gone.

Main image: © Peter Napier Inset: © Colin Davies, Brymbo Heritage Centre

Part of the foundry in its present state and (inset) the furnace in use in the 20th century. Some elements of the original 18th century external walls survive.

© Peter Napier

The agent's house (1794 or earlier); is a Grade II* listed building. This is a two-storey building situated on the south side of the heritage area. It has stone walls under a hipped slate roof and was extended at some stage at its west end, using materials of construction and design to match the original building.
There is some conjecture as to whether this building pre-dates the John Wilkinson era. It is thought possible that it may have been the land agent's house for the Brymbo Estate when it was bought by John Wilkinson, in which case it would predate the building of the original ironworks by some years.

The prospects for coal were limited, however. The problem was that the iron became contaminated with the sulphur impurities from the coal, producing what became known as 'red, short iron', because the iron split and crumbled when it was reheated and worked at the forge.

The only efficient fuel for smelting in those days was charcoal, which was expensive and came from great forests and woodlands now in great danger of extinction as a result of excessive use. While John was working in Coalbrookdale, his father came up with the idea of smelting iron with the abundant, but at that time almost worthless, mineral coals in the area and moved his ironmaking business to Bersham in the Clywedog Valley, near Wrexham.

But it was the development of coke as a fuel for smelting iron that completely revolutionised ironmaking and changed the course of history by making iron available in the quantities needed for the Industrial Revolution. Abraham Darby had come across coke as a fuel in his early foundry work producing brass, and became convinced that it would be suitable for smelting iron, with none of the disadvantages of coal because the impurities were removed in the manufacturing process. He developed the method of smelting using coke, but John Wilkinson helped refine it.

John and his brother William inherited their father's ironworks in Bersham in the early 1760s and founded the New Bersham Company. One of the activities the company became well known for was the manufacture of cannons. In those days, the barrels were cast in one piece with a core, but this method tended to introduce imperfections that could have

catastrophic consequences for those doing the firing. In 1774/5, Wilkinson invented a cannon-boring machine that produced safer and more accurate cannons. He later patented a method to make spiral grooves in cannons that would project the ball further and straighter.

Another of John's noteworthy achievements was helping Matthew Boulton and James Watt develop the Boulton and Watt steam engine. Wilkinson developed the machinery to manufacture pipework and connections that allowed steam engines to opreate at higher pressure than ever before. The improved steam engines were then used to pump air into the blast furnaces at higher pressure and at a controlled rate, resulting in better quality iron being produced and productivity increasing.

However, by 1790, mainly owing to a lack of convenient raw materials, the ironworks was gradually being run down. It was at this time that the neighbouring 500-acre Brymbo Estate came up for sale and John Wilkinson, having fallen out with his brother, decided to buy it and set up an ironworks. The site was perfect: it had water, it had limestone nearby for use in the smelting process and it had coal.

Brymbo produced armaments for many of the ships of the Royal Navy and exported cannons to other countries. However, after Wilkinson's death in 1808, the ironworks entered a bleak period of more than 30 years, when it came close to ruin. First a board of trustees, then Wilkinson's son, then a partnership tried to run the works profitably, but all failed.

It took a young engineer named Henry Robertson to inspire a revival. After the site had been sold for the fourth time, the new owner sought development finance and the bankers in turn asked Robertson to prepare a report on the viability of the Brymbo works. So impressed were they with Robertson's report, that they offered him an advance of capital to acquire a share of the venture, and he bought the works outright in 1842. So began the second major phase in the history of Brymbo under the stewardship of Henry Robertson.

Robertson planned to develop a steel-producing plant and the first trials of steel making were undertaken in 1883. In 1885, the first steel made in the UK using the basic open-hearth process came from Brymbo, and steel continued to be produced successfully by the same process for 107 years.

After World War II, the works were acquired by GKN – and so began the third and final phase in the history of this site. Brymbo was eventually closed in 1990 and sold to the Chinese buyer. Strange to think that the very same works are still producing good-quality steel – albeit from scrap metal – in the 21st century on the other side of the world.

Back at the site, after the dismantling of the works, massive earthworks were required to reclaim the site for housing and industrial development. More than two million cubic metres of natural and slag material were excavated and placed in compacted layers to form new development platforms.

And within the Brymbo Steelworks heritage area are preserved elements from three major phases of the site's development, as illustrated on these pages.

Now the site is lying peacefully decaying, but it would be an ideal opportunity to provide a building and nature conservation area that could be a rich educational resource, as well as a valuable heritage attraction, for north east Wales on a par with Blaenavon.

After Wilkinson's death in 1808, the ironworks entered a bleak period of more than 30 years

Machine shop (1920). This building, though not listed, is a very fine example of the industrial buildings of its time. Inside are the remains of a stone wall that survives from the John Wilkinson era.

Forging ahead

Iron was mankind's source of strength from pre-Christianity to the Industrial Revolution

The Bronze Age ended and the Iron Age began about 2000 BC, when humans first began to extract iron from stone in the form of iron oxide by heating the ore to as high a temperature as they could achieve at the time. Then, as since, it was instinctive for man to seek an advantage over his rivals.

Once iron had been discovered, it was but a small step to learn that iron combined with a small amount of carbon produced a metal that was harder, more durable and held a sharp edge for longer than bronze, which is fairly soft. Thus, it was better than bronze for making weapons and implements and gave users an advantage over their rivals. While it tended to rust more quickly than bronze, bronze had the additional disadvantage that its key component, 10% tin, was hard to come by.

Iron remained the metal of choice for all manner of uses for more than 3,000 years, until it was replaced by steel around 1870.

All about iron

Iron is the planet's fourth most abundant element and makes up more than 5% of the earth's crust. When iron ore is heated in a charcoal fire, it begins to release some of its oxygen, which combines with carbon monoxide to form carbon dioxide and leaves behind a spongy, porous mass of relatively pure iron. Mixed in with this are small remnants of charcoal and extraneous matter picked up from the oven and known as 'slag'. Slag is separated from the molten iron ore by the addition of calcium flux in the form of limestone or sea shells.

Wrought iron was the most commonly produced metal through most of the Iron Age

In the early days, the blacksmith would take the iron mass and form it into a 'bloom' by hammering it on an anvil to drive out the impurities and consolidate the metallic particles – hence the name of the iron produced by this process: 'wrought iron'.

Wrought iron typically contains between 0.02 and 0.08% of carbon absorbed from the charcoal. This carbon content is enough to make the metal both tough and malleable, capable of being formed into shapes by the blacksmith's art, 'forging' – the process of beating the metal heated by fire until soft with a hammer. Wrought iron was the most commonly produced metal through most of the Iron Age, until the invention of the blast furnace in the late Middle Ages, which allowed the iron ore to be smelted at much higher temperatures than had previously been possible.

Smelting iron at very high temperatures produces a radical change in the iron, which begins to absorb carbon rapidly when it melts. The resultant metal is cast iron, which contains between 3% and 4.5% carbon. Such a high proportion of carbon makes the cast iron hard and brittle and liable to crack or shatter under a heavy blow. As a result, cast iron cannot be forged.

Turning on the heat

The blast furnace of old was a tall, bottle-like structure, wider at the base than at the top, in which the fire creating the heat for the smelting process was intensified by a blast of air hand pumped through alternating layers of charcoal, flux and iron ore. In the Middle Ages, ironworkers learned to harness the power of water by using a water wheel to operate the bellows that pumped the air through the blast furnaces and to power massive forge hammers. This means of propulsion prevailed until the mid-18th century, when James Watt invented and then perfected the steam engine, which quickly became used for the same purpose.

Molten iron would flow directly out of the base of the blast furnace into a channel formed in sand which fed into a number of smaller channels called 'troughs'. Because this configuration resembled a sow suckling a litter of piglets, the resultant ingots of iron became known as 'pig iron'.

Iron could also be cast directly into moulds at the blast furnace base or remelted from pig iron to make cast-iron stoves, pots, pans, firebacks, cannons, cannonballs, or bells ('to cast' means 'to pour into a mould', hence the name 'cast iron').

Medieval ironmakers learned how to work cast pig iron into wrought iron by oxidising the excess carbon out of the pig iron in a furnace fuelled with charcoal, called a 'finery'. In 1784, Englishman Henry Cort invented a method of refining cast iron by heating the iron in a puddling furnace. The process involves molten iron in a vessel heated by charcoal being constantly stirred by a skilled operator called a 'puddler'. The stirring ensures even exposure of the metal to the heat and combustion gases in the furnace, which causes the carbon to be released through oxidation.

As the carbon content decreases, the melting point of the metal rises and semi-solid lumps of iron begin to appear in the liquid mass. The puddler would collect these lumps into a single mass, transfer it to an anvil and then work them with a forge hammer to remove impurities and produce a 'bloom', which would then be run through rollers to produce flat iron sheets or rails.

The problem of how to mechanise the puddling process defeated medieval ironmakers until the mid-1800s, seriously limiting their ability to produce large amounts of good-quality iron. Machines designed to stir the thick, gloopy, liquescent metal simply could not replace the skill of the human eye and touch to separate out the solidifying, decarbonised metal.

Fuel for the future

In the 18th century, Abraham Darby significantly advanced the manufacturing process by discovering that coke was a better fuel for iron making than coal. The impurities in coal, such as sulphur, tainted and weakened the iron, while coke was produced by baking coal at high temperatures, which drove out the impurities. The discovery was well-timed, since the woodlands that had been used to produce charcoal for iron making for centuries were rapidly becoming deforested.

It was at this stage in the development of iron making that John Wilkinson and James Watt came together to perfect the steam engine. John Wilkinson had developed a method of producing accurately machined tubes, which Watt needed to create the tight seal that would maintain steam pressure. From this point on, air could be blasted by steam engines through furnaces fuelled by coke, and mass production of good quality iron had arrived.

Peter Napier
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The Brymbo site in 2006 after reclamation. The area in the foreground is the fossil forest covered over with a protective membrane and soil until it can be properly protected and displayed.

Fossil find

Fascinating though they are, the relics of two centuries of human endeavour on the Brymbo site are thoroughly outranked in age and status by the fossilised remains of a tropical forest dating back to the Carboniferous period 300m years ago.

Workers clearing the Brymbo site in 2006 unearthed a fossil forest that pre-dates the dinosaurs and extends over an area the size of a rugby field. The find proves that Wales was once hot and humid and covered with what probably looked like Amazon rainforest, although the 'trees' were really composed of club moss, which grew up to 40m high. Geologists have uncovered one club moss tree trunk 6ft in diameter, 10ft high and still standing upright.

Although there are other fossil forests in Britain – in Scotland, Dorset and Sheffield – this is by far the largest and is unique in the world. Apart from the moss trees, it is also richly endowed with plant and leaf fossils, animal remains and fish fossils – including mussels no different from today's specimens.

The fossil forest discloses exactly what kind of vegetation went into the formation of Wales's famously rich seams of coal. Excavation of the coal and other materials has left the fossil forest exposed to the elements, so it is a race against time to protect the area. At the moment, it is covered with plastic sheeting and gravel, but the ultimate ambition is to cover it with a dome in which a tropical climate could be created, which would display the find, while protecting it.

Peter Napier

An example of Calamites, the genus of the extinct tree-like vegetation of the Carboniferous period that formed a major component of coal

A model restoration

The structural and ecological challenges of restoring a Victorian farm to its former beauty were more than matched by some unexpected rewards. Richard Fairs reports

The essential starting part of work on any historic building is getting to know your subject in terms of its past, current and potential future uses

Even on dark days, through a forest of temporary props keeping the roof in position, and in spite of water dripping from where tiles and gutters once were, the elegance and quality of Tyntesfield's farm structures shone brightly. This elegance prompted the National Trust, when it acquired the estate, to move quickly on the conservation of the perilous structures and, thus, save Home Farm for posterity.

A model heritage

Public attention is naturally directed towards Tyntesfield's magnificent Gothic Revival house, (inset opposite) but the estate has many other buildings of interest. The complex of farm buildings was completed in 1881 and has remained largely unaltered since then. It was built at a time when farming was in depression and investment in new farm buildings on this scale was rare. Indeed, finance could come only from interests outside farming and fortunately, the Gibbs family had amassed a fortune by importing guano (as fertiliser) from South America. This revenue funded the remodelling of the main house and the construction of numerous estate properties.

Home Farm, therefore, is a Grade II* complex of buildings that collectively represents a rare example of a Victorian model farm of this period. It was designed to showcase the most up-to-date techniques of animal husbandry. Architecturally, the centrepiece of the complex is a largely open-plan, five-bay covered yard whose purpose was to house and rear cattle and pigs, instead of allowing them to graze in the open. To operate effectively, the buildings needed to provide an efficient means of supplying food to the cattle and an effective system to collect waste in a quasi-industrialised production process.

The design made the most of the sloping site, with the animal feed stored and prepared in an adjacent building situated above the covered yard and then fed down to the animals through chutes and hoppers. Animal waste was collected and stored under cover in the centre of the building. Keeping it covered was thought to maintain its value as a fertiliser and possibly help to raise the temperature inside the yard. Thinking at the time suggested this might reduce the quantity of feed required for the animals' well-being. The liquid was drained to an underground tank and was also recycled as a valuable fertiliser.

How fitting it seems then, that the current proposal for the covered yard is to use it as Tyntesfield's visitor reception with shop, café/restaurant and toilets.

The challenges of restoration

The covered yard was naturally lit and ventilated through raised roof lanterns on each bay. The roof covering was constructed of rows of king and queen post roof trusses on cast-iron columns. The diagonally laid sarking boards provided a strong visual feature in the interior.

Inevitably, the decline in the estate's fortune was reflected in the condition of many of the buildings, and Home Farm was no exception. Large areas of roof tiling had slipped or been removed, and as a result, significant sections of the timber sarking board and secondary roof frame had suffered widespread decay. Valley gutter linings between the bays had comprehensively failed, leading to sustained water ingress and the decay of valley beams and truss ends.

The raised roof lanterns had been completely removed from two bays and the openings tiled over, resulting in a space that was dark and dreary compared to its unaltered neighbour. If it had not been for the prompt action of the National Trust in providing temporary support, the speed of deterioration would quickly have led to collapse.

With the building open to the elements as it fell into disuse, cattle had long given way to different occupants, who had had uninterrupted enjoyment for many years. The large internal voids, the numerous crevices and gaps formed by dilapidation and the vaulted stores all became perfect habitats for nesting swallows and a variety of bat species for which Tyntesfield is now celebrated.

So, before the significant disrepair could be addressed in a manner that retained the architectural integrity and significance of the building, very careful planning and programming was required to protect the wildlife. The variety of roosts and nest sites were assessed and a site-wide strategy developed to mitigate the unavoidable disturbance that would be caused by the historic fabric being repaired.

With an eye on future use, the brief also demanded the sensitive introduction of thermal insulation, for visiting humans would be less hardy and more energy-consuming than the present nocturnal residents.

As for the missing roof lanterns, having considered all the various issues relating to the restoration of features of the building, it was decided to seek listed-building consent for their reinstatement during the works.

The solutions

The essential starting point of work on any historic building is getting to know your subject in terms of its past, current and potential future uses. This meant many hours of background research, not just on estate history, but to gain a wider understanding of the history of farming practice and the design development of farm buildings.

Top: South elevation of the covered yard before works began. Inset: Tyntesfield's magnificent Gothic Revival house has also gone through extensive refurbishment

For Tyntesfield's bat inhabitants, this also meant a programme of dawn and dusk vigils to see exactly how the bats were using the buildings at Home Farm. A series of 3am summer alarm calls is not for the faint-hearted building consultant, but regular observation proved invaluable as a means of gaining a deeper understanding and appreciation of these mysterious and intriguing creatures.

Parts of the building had become maternity roosts and with the roof open and glazing missing in sections, the bats had almost unrestricted access to all areas. Developing a site-wide strategy for Tyntesfield contributed to the granting of a licence for the bats to be excluded from parts of the building, as long as areas were provided for their exclusive use. Having seen first hand how and where the bats accessed the smallest holes and gaps between tiles and under flashings and ridges, we were able to specify works to recreate as many – if not more – opportunities for the bats and the building to continue their symbiotic relationship.

Working with the Trust's ecological consultant at every stage highlighted how little is known about the ways certain contemporary building materials affect resident bat populations. There are different opinions on how the use of vapour-permeable membranes – a key component of insulated roof structures – affect bats. There is evidence that some membranes, when scratched, produce fibres in which young bats can become trapped. Another theory suggests that the predominantly white/grey colour of some commonly used membranes increases light levels in the voids, making them less attractive as roosting sites. As a result, to contribute to understanding in this area, the trust has incorporated a research zone in the restoration work, where long-term investigations will be carried out using a range of different materials in various combinations.

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© Richard Fairs

Above: Interior shot of the covered yard before works began. Top right: Decay to valley beam and truss end bearing.

With no ceiling void and the exposed sarking boards forming a key internal architectural feature, the only practical solution to the introduction of thermal insulation was to have it lie above this level.

To minimise the effects this would have on the roofline and abutment details, a thin multifoil insulation was chosen that increases the overall height of the finish by only about 70mm. Gable and eaves detailing would have to be adjusted, but since the change would be relatively small, this would be accomplished without obvious effects or awkward detailing problems.

By developing a thorough repair specification for the structure with an experienced and sensitive structural engineer, we were able to opt for restoration on a timber-by-timber basis, so that as much of the historic fabric would be preserved as was reasonably practical.

Through consultations – led by the National Trust – with local and national heritage and ecological authorities, we were able to achieve consensus on all these issues and balance the sometimes conflicting needs of building and wildlife in a timescale that suited both. The repair contract started in January, removing the roof coverings, repairing the structure, reinstating the roof lanterns and installing thermal insulation.

Visitors can see these works in progress and – for the first time on this scale at a National Trust property – view at close quarters the major project to replace roof coverings and rewire and renew the plumbing in the main house.

© Richard Fairs

***In situ* repairs to valley beams and king post roof truss**

A sustainable future?

Success can be measured on a number of levels. A structure will have been saved from imminent collapse; an important historic example of a Victorian model farm will survive for the education of future generations; and the complex of buildings will provide the basis for a long-term use, becoming an integral part of a nationally important estate.

A less obvious measure of success (and a significant cause for celebration) will come about when an alarm clock goes off at 3am one morning and an intrepid building consultant witnesses the spectacle of pipistrelles and brown long-eared bats flitting around the building and ducking into the spaces, crevices and holes left specially for them. It helps to be slightly batty when farming for posterity!

Client – The National Trust
Lead consultant – The Building Consultancy
Ecological consultant – Wildworks Ecology
Structural engineer – Mann Williams
Contractor – Ellis & Co.

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Decline is in the detail

We are passionate about heritage conservation on a grand scale, but blind to the destruction on our own streets, says Duncan McCallum

English Heritage (EH) has made a concerted effort over the past decade or so to get to grips with the condition of the historic environment. The annual audit Heritage Counts is entering its 8th edition; the Buildings at Risk initiative has been operating nationally since 1998, and the much more comprehensive Heritage at Risk initiative, which incorporates Buildings at Risk, is entering its second year. Where trend data exists, it suggests that, by most measures, the historic environment is in a relatively stable condition and that the number of heritage assets at risk is slowly declining.

However, ask almost anyone about the historic area they live or work in and they are likely to say that it is getting worse and its character is being lost. The newsletters of local amenity societies are full of stories of damage done and battles fought to save buildings or spaces.

How to explain these apparently conflicting perspectives? I think the answer is that, as a society, we have become generally quite good at protecting 'set-piece' architecture – the listed chapel or the design-conscious Victorian villa – but we still haven't mastered the art of managing the fine detail of the architecture and spaces of the typical town or village. What is happening before our eyes is insidious decay; happening slowly enough not to be immediately obvious, but cumulatively wreaking havoc on our treasured urban and rural landscapes.

The Conservation Areas at Risk survey, published by EH in June as the focus for this year's Heritage at Risk report, has provided us with a stark picture of the challenges we face. In a heroic effort, conservation officers in more than three-quarters of all local authorities assessed the condition of almost two thirds of all conservation areas in England. Analysis of the results by EH showed that one in seven of these conservation areas was at risk, and there was an improvement in only 15% of them since 2006.

The scourge of uPVC

The most common cause of that loss of character was the introduction of unsympathetic replacement doors and windows. This was identified as a key issue in more than eight out of 10 conservation areas. The second most frequently mentioned threat was poorly maintained roads and pavements (six out of 10 conservation areas) followed by, in diminishing frequency of mentions, street clutter, loss of boundary walls, fences or hedges, satellite dishes, traffic management measures and alterations to front elevations, roofs and chimneys. Other threats to character – such as development pressures, which have the potential to destroy character in one knock-out blow – were mentioned much less frequently as a problem.

The challenge faced by local authorities, which designate and manage conservation areas, and EH, which supports them in their efforts, is that the small-scale changes are much more difficult to control. While 'Article 4' directions are well-established tools that enable local authorities to stop some of the worst excesses of poor taste, judgement and investment, only 13% of conservation areas surveyed had them in place. However efficiently handled, these directions take time to administer and, in these days of leaner government, it is unlikely that they will ever become near-universal in their application.

It would be wrong, however, to fall into a slough of despond. Even Slough has five conservation areas and our national survey highlighted lots of great examples of management and action that residents, owners, developers and local authorities can take to make vibrant and successful places. The key points are that protecting the character and history of neighbourhood heritage does not need to involve more money or extra bureaucracy. Local authorities just need to use, where appropriate, the powers that already exist. They need to appoint a 'heritage champion' from their elected members, if they don't already have one. And they need to work in partnership with local residents' groups or civic societies, harnessing the knowledge and enthusiasm of local people to help assess, survey, spread knowledge of and enhance support for, keeping conservation areas special.

This late 19th century terraced house in the Noel Park Conservation Area in the London Borough of Haringey has had its historic character severely eroded by inappropriate uPVC windows and doors and unnecessary painting of part of the brickwork. A survey of estate agents carried out for English Heritage suggests that the value of properties that have been insensitively altered is likely to be lower than those that retain their original features intact

Further information

For details of English Heritage's Conservation Areas at Risk campaign, including a short film and interactive street, visit *www.english-heritage.org.uk/conservationareas*

Duncan McCallum is Policy Director of English Heritage