

Aspects of the Management of the Remains of Limestone Industries in the Yorkshire Dales

ROBERT WHITE

Survey, protection, consolidation and interpretation of aspects of limestone industries in the Yorkshire Dales National Park is discussed, particularly initial results of the Yorkshire Dales Lime Kiln Survey including works to protect the two Hoffmann kilns in the National Park. Attention is drawn to recent investigations of clamp or sow kilns, two of which have been dated to the late 17th century.

Aspects of the management of the remains of limestone industries in the Yorkshire Dales

Carboniferous limestones are the dominant rocks of the Yorkshire Dales National Park. They were formed, around 330 million years ago, on the floor of a sub-tropical sea by the slow accumulation of calcium carbonate rich material, mainly through precipitation but also deposition of shells and corals. Limestone cliffs form many of the iconic landscape features of the Dales such as Malham Cove, Gordale Scar, and Kilnsey Crag while 36% (1,052 hectares) of Britain's limestone pavement lies within the National Park. Extensive cave systems, mainly formed by water percolating through and enlarging faults and bedding planes in the rock, make the area one of the main potholing regions of the country.

When the Yorkshire Dales National Park was designated in 1954, the area had a significant limestone quarrying industry. The industry had benefited from a number of quarry extensions being granted planning permission shortly before designation, mainly by the West Riding County Council, despite opposition from the National Parks Commission. The administration of the new National Park, Committees of the two constituent County Councils, the West Riding and North Riding of Yorkshire, appears to have had relatively little awareness of the industrial history of the area. This was little changed by the growth of interest in Industrial Archaeology in the 1960s, despite the activities of one appointed Committee member, Arthur Raistrick. Many of his writings, particularly his Dalesman article, 'The Story of the Limekiln', a chapter on 'Country Lime Kilns' in *Old Yorkshire Dales* and his *Industrial Archaeology: An Historical Survey*, drew attention to the industry.¹ In 1972 administration passed to a single North Yorkshire County Council Committee and, in 1996, to the independent Yorkshire Dales National Park Authority (NPA).

Today limestone is extracted from just three quarries in Ribblesdale and Wharfedale for aggregates for the construction industry, although historically it was also used for many other purposes. The earliest of these was probably for walling stone. Most late prehistoric walls are now only traceable as earth covered linear piles of rubble, but many of the thousands of kilometres of drystone wall which subdivide the Dales landscape are constructed of limestone. These use stone collected as part of the process of field clearance, extracted from convenient exposures, or won from small quarry pits adjacent to the line of the wall. Detailed survey has identified some probable late medieval or early post-medieval boundary walls, sometimes still standing to their original full height, constructed of quarried limestone blocks won from pavement or shallow scars.²

The Yorkshire Dales Lime Kiln Survey

Lime plasters and mortars at Bainbridge fort attest to lime production in the Roman period and medieval castles and churches also used lime in their construction but as yet no medieval or earlier lime kilns have been located in the Dales. Small quarries for building or walling stone, however, are one of the more ubiquitous landscape features of the area. Analysis of the first edition (1850s) Ordnance Survey 1:10,560 maps carried out by the RCHME as part of the Yorkshire Dales Project between 1989 and 1992 identified 994 quarries. This project, which covered all of North Yorkshire west of easting 420, also identified 942 lime kilns from map-based analysis and 485 from plotting of aerial photographs (Horne and Macleod, 2004). As a desk-based survey, however, it did not assess the condition of the kilns, while a further drawback was that the map work did not cover the 12% of the National Park which had become part of Cumbria in 1972. These shortcomings were rectified by the development of a lime kiln project with the Sedbergh and District

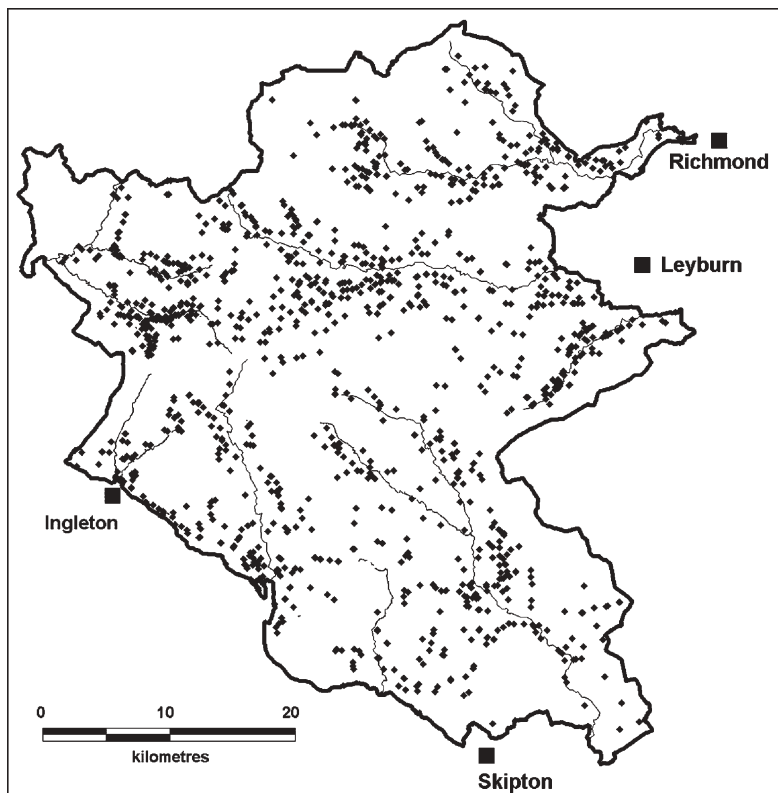


Figure 1.
Distribution of lime kilns and lime kiln sites in the Yorkshire Dales National Park. The majority of extant lime kilns are field kilns.

History Society. Between 1991 and 1992, 197 lime kilns or lime kiln sites were recorded as part of this project in the parishes of Sedbergh, Dent and Garsdale. Some results of the project were reported in the Society's journal and in 1995 they received a British Archaeological Award.³ The survey proformas, photographs and recommendations for further work were given to the Authority's Historic Environment Record (HER).

Other individuals and local societies have been encouraged to extend the Yorkshire Dales Lime Kiln Survey over the rest of the National Park, using as a basis a print out of the HER entry for each site. A major contribution to this project has been made by David Johnson who has surveyed all the lime kilns in the Craven district of the National Park, including revisiting those also surveyed by others, and who, by the end of 2006, expects to have recorded all previously unsurveyed kilns in the Richmondshire district, as well as covering large areas outside the National Park. Inevitably with several individuals involved there has been some variation in the quality of the survey reports although the effect of this is lessened by the supply of a photograph or photographs for each site while the resurvey of some areas has provided information on decay rates.

The distribution of recorded kilns is shown in Figure 1. By March 2006, 998 kilns or kiln sites had been visited. The nature of the project, with surveys initially based on

information from map based analysis or aerial photography, means that there has been a bias towards field kilns. Today these small draw kilns are the commonest type of kiln in the Yorkshire Dales, and it is likely that this was so during the 1850s, although it is possible that some features mapped as 'old lime kiln' by the Ordnance Survey may have been more primitive types.

The term 'field kiln' describes a wide range of structures ranging from small relatively primitive kilns with narrow draw hole openings, almost certainly built to provide lime for an individual farm or even an individual building project, to some much larger kilns which were effectively small commercial or selling kilns. There is considerable variation in appearance, particularly in plan form; kiln height; and shape, depth and construction of draw hole. Heights of complete field kilns recorded, range from 1.7m to 6.5m, with an average of 4m. Draw hole openings are normally arched, sometimes with a series of stepped, recessed arches leading into the kiln, although on some smaller kilns stone or even wooden lintels were used instead of an arch. Only five kilns so far recorded, all in the north-east of the park, have two draw arches serving a single bowl. That at Sharrow Hill, Grinton, near a scheduled lead smelt mill, is particularly unusual in that it has two draw arches, each with a single draw hole, and an apparently blind central arch. The position of this kiln, on a large limestone outcrop adjacent to the remains of at least five other kilns suggests that it was a late selling kiln. Bowls are usually circular or near circular in plan and lined with sandstone which would not react with the limestone fill during the burning process. The only recorded examples with two or more bowls are associated with large industrial-scale quarries. Firebricks are only found on some late selling kilns and industrial kilns. A handful of field kilns have associated lime huts while date stones have been noted on three kilns.

A few kilns are freestanding with built-up charging ramps, but most are built into a hillside or bank. The shape of the face of the kiln is partly dependent upon the position of the kiln in relation to the slope it is built into. Two distinct plan forms are distinguishable — those with an angular or 'square' shape at the base and those with curved or 'round' bases — but hybrid forms are also found, while a handful even make use of natural crevices in a rock face. Both principal plan forms are found throughout the Dales, although Cleasby suggested that in the north-western dales square kilns were generally later in date.

Data from the North Yorkshire Historic Landscape Characterisation Project which started in late 2005 is not yet available, but it is

anticipated that this will be of considerable use in analysing the correlation, if any, of kiln distribution with the enclosure of former common pastures.

Analysis of the results of the Yorkshire Dales Lime Kiln Survey for which data had been entered onto the HER by March 2006 suggests that 173 kilns survived in good or excellent condition, 281 were ruinous, 393 survived primarily as low earthworks, while 98 had been totally obliterated by development or could not be located. Not surprisingly, many of the better preserved kilns are in relatively isolated locations where they have been less vulnerable to stone robbing, although many such locations may also indicate a relatively late date.

The survey results have been used to target 29 kilns for consolidation and protection through various grant schemes organised and managed by the NPA. Funding has come from a variety of sources — the NPA's own resources; the European Regional Development Fund (ERDF) through Objective 5b; the Millennium Commission and the Heritage Lottery Fund through the Yorkshire Dales Millennium Trust; private individuals and in regrettably few cases, DEFRA's ESA agri-environment schemes. The NPA has a policy of not normally providing static interpretation in the open countryside, so few kilns have been directly interpreted.

Despite the large number of kilns, very few receive any form of statutory protection. Only 18 are listed as being of Special Architectural or Historic Interest (Table 1, Figure 2). These are all field kilns, in relatively good condition, but significantly they are all easily visible from public roads or, in two cases, close to historic buildings. Analysis of the survey data suggests that they are neither a representative sample of field kilns nor necessarily the best examples.

Eight kilns also benefit from being scheduled as Ancient Monuments. While the lime industry was included in English Heritage's Monuments Protection Programme (MPP) and field kilns are discussed in the Step 1 report, only consideration of large industrial kilns proceeded through to Step 6, the designation phase. In the Yorkshire Dales this resulted in two new schedulings and an enlargement of the scheduled area at Craven Lime Works. The Step 3 report noted that sites from the early post-medieval period (16th–17th centuries) were severely under-represented in the site assessments for the industry. It also commented on the existence of regional groups of kilns, based on technologically significant differences rather than vernacular variations.⁴ The Step 4 report further considered field kilns, noted that the number of field kilns with listed building status was noticeably lower than elsewhere in the

country and provided guidance for the selection of field kilns as candidates for scheduling. This specifically mentioned some sites in the Yorkshire Dales as examples.⁵ MPP was halted, in advance of the Heritage Protection Review, before further work on Dales field kilns was undertaken. The scheduled monuments are therefore also unrepresentative although a few 'field' kilns are scheduled, primarily because of their proximity to or association with monuments scheduled for other reasons.

The introduction of cross compliance as a result of the introduction of the single payment scheme, part of the reform of the Common Agricultural Policy in 2006 means that kilns on farms should now be protected, at least from the common practice of being used for the disposal of agricultural waste, although natural decay, particularly through erosion and tree and scrub growth will continue to be a problem. An additional 119 kilns gain some protection, at least from demolition, by being sited within two extensive conservation areas, Swaledale and Arkengarthdale (98) and Littondale (21), designated by the NPA. These were intended to help protect the cultural landscapes of these valleys and provide a mechanism for grant aiding conservation works to field barns and walls. Their boundaries do not include any moorland. Specific funding, however, has not been available to protect lime kilns in these areas.

Ingleborough Archaeology Group Investigations

The Step 3 assessment report noted that kiln sites from the early post-medieval period were severely under-represented,⁶ perhaps because of a problem with recognition. Not all lime kilns leave obvious surface remains. Two previously unknown kilns have been recorded during watching briefs required as part of the planning process; that at Franks House in Grinton being partly excavated. The possible significance of this was not recognised at the time, but in 2003 the Ingleborough Archaeology Group excavated part of a Romano-British settlement site at Broadwood near Ingleton. High magnetometer readings from a shallow circular earthwork had led to suggestions that this feature might be an iron-working site, but excavation showed that it was a basin shaped stone lined pit, *c.* 2.2m in diameter at ground level, constructed of coursed sandstone blocks with rough blocks of sandstone and limestone arrayed above voids at the base to provide an air flow from a stone-lined flue or feather (Figure 3). The kiln was still charged with partly burnt limestone. An archaeomagnetic date of 1650–1695 was obtained from the

TABLE 1. LISTED AND SCHEDULED LIME KILNS IN THE YORKSHIRE DALES NATIONAL PARK

<i>Name</i>	<i>Parrish</i>	<i>NGR</i>	<i>HER No</i>	<i>Description</i>	<i>Status</i>	<i>Position</i>
Craven Lime Works	Langeliffe	SD82376633	MYD3791	Continuous burning horizontal kiln — modified Hoffmann	SM	Railside quarry
Craven Lime Works	Langeliffe	SD82396615	MYD36737	Base of Spencer kiln	SM	Railside quarry
Murgatroyds	Stainforth	SD82356648	MYD36738	Bank of three large draw kilns	SM	Railside quarry
Meal Bank Quarry	Ingletton	SD69677352	MYD23909	Hoffmann continuous burning horizontal kiln	SM	Quarry
High Scarth	Scotchrop	SD88895987	MYD36127	Large selling kiln	SM	Quarry
Blakethwaite	Melbecks	NY93670184	MYD21701	Small field kiln	SM	Adjacent to lead smelt mill
West Stonesdale	Muker	NY88630358	MYD20705	Small field kiln	SM	Adjacent to lead mine and ore works
Ribblehead	Ingletton	SD76147962	MYD24555	Small selling kiln	SM	Within and predates scheduled railway construction camps
Grassington enclosures	Grassington	SE00166567	MYD15052	Small field kiln	SM	Within scheduled field system
Grassington enclosures	Grassington	SE00326567	MYD15053	Large Field kiln	SM	Within scheduled field system
Ormsgill Green	Airton	SD86995989	MYD25081	Large selling kiln	LB – II	Adjacent to listed building
Seal houses	Arkengarthdale	NY98910447	MYD34220	Field kiln	LB – II	Roadside
St Simons Chapel	Caldbergh	SE08628493	MYD34521	Field kiln	LB – II	Adjacent to listed chapel
Arkleside Bridge	Carlton Highdale	SE04458083	MYD34561	Field kiln	LB – II	Roadside
Yellow Gill	Dent	SD71238641	MYD34731	Field kiln	LB – II	Roadside quarry
Stonehouse Bridge	Dent	SD77128584	MYD34752	Field kiln	LB – II	Roadside
Gibbs Hall	Dent	SD73508640	MYD35895	Field kiln	LB – II	Adjacent to listed farmhouse
High Croft	Dent	SD72988643	MYD35896	Field kiln	LB – II	Roadside
High Chapel	Dent	SD72418670	MYD35897	Field kiln	LB – II	Visible from road
Keldishaw	Dent	SD68338640	MYD35910	Large field kiln	LB – II	Roadside
Appersett bridge	Hawes	SD85739069	MYD35051	Large field kiln	LB – II	Roadside
Salt Lake Cottages	Ingletton	SD77357838	MYD35163	Large field kiln	LB – II	Visible from road
Knipe Scar	Kettlewell	SD96867173	MYD35192	Selling kiln	LB – II	Roadside quarry
Clapgate Bank	Marske	NY11760214	MYD35336	Small 2 draw arch estate kiln	LB – II	Roadside
Black Dub	Muker	SD94969768	MYD35429	Field kiln	LB – II	Roadside
–	Muker	SD94549775	MYD35430	Field kiln	LB – II	Roadside
Smithy Holme	Muker	NY87760161	MYD35431	Field kiln	LB – II	Visible from road
Blackburn Beck	Muker	NY88270153	MYD35432	Field kiln	LB – II	Roadside

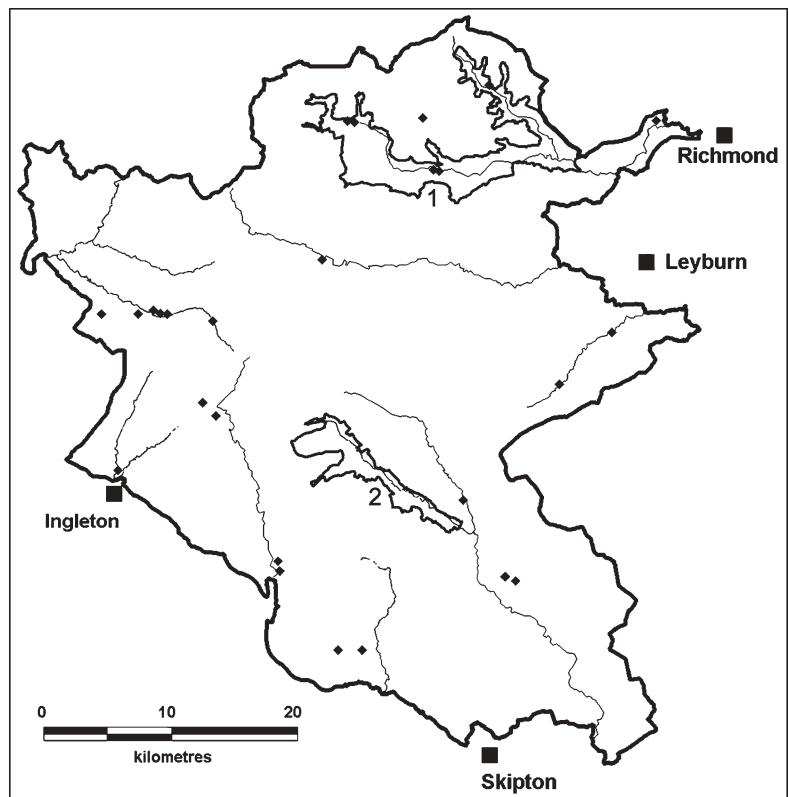
burnt kiln lining, a date supported by the finding of William III salt-glazed tankard within the flue.⁷

The excavation raised questions about the nature of other earthworks, previously interpreted as sow kilns, and in 2005 the Group, with support from the NPA, initiated a project to examine examples of these similar sized features at Chapel le Dale, Feizor, Bucker Brow and Newby Cote. A further site at Threapland, Cracoe, discovered during farmyard extension, was also investigated.

Three of these kilns had bowls constructed of coursed stone, while four had similar internal stokeholes consisting of large limestone capstones laid on sandstone sidewalls. That at Threapland proved to be a two-phase structure, with a smaller kiln being built inside the body of a larger stonelined bowl. The later kiln had an archaeomagnetic date of 1660–1700. Intriguingly, two kilns contained partial horse skeletons.⁸

Few sow kiln sites have been identified from aerial survey, in part due to the difficulty of interpreting small circular depressions in a landscape which has numerous shake holes formed by natural processes; extensive mining activity for both lead and coal, much of it carried out through shallow shafts; and occasional isolated hut circles. Survey is further complicated by the Dales containing several elling hearths or chop kilns, used for the kiln drying of coppiced or chop wood to produce white coal although their distribution tends to be restricted to areas of existing or former woodland. However, field survey has so far identified 53 sow kiln sites, mainly in the Craven area.

Although here referred to as sow kilns, the excavated kilns, and to some extent the earthwork sites, are only superficially similar to the sow kiln excavated by Jobey in Northumberland.⁹ His brief excavation report refers to a ring mound 15ft to 17ft in diameter: the mound on excavation consisting of burnt turf mixed with fragments of burnt limestone and flecks of carbonised wood, further fragments of burnt limestone being found in the featureless interior. This describes a much more primitive structure than those excavated in the Dales, although in the same article Jobey describes what might be a slightly more complex feature, with some similarities to the examples from the Dales, formed from scooping out a circular hollow on the hillside with one side of the circle open to the fall of the hill in which a mound of stone and fuel could be laid. He mentions provision for a flue and central hole or chimney and an outer covering of green sods, but significantly also states that no stone was used in the construction. This is clearly a very different structure to those excavated by the Ingleborough Group which suggests



that much further work is needed on the development of lime burning technology.

The Craven Lime Works

For centuries limestone working for lime production was an activity carried out on a basically domestic scale: the relatively difficult communications in this upland region limiting opportunities for industrial-scale production. This began to change with the construction of the Leeds and Liverpool Canal on the southern fringe of the Dales in the 1770s which provided both access to markets and supplies of cheaper, higher quality coal than that available in the local coalfields. The development of rail transport in the latter half of the 19th century, particularly the North Western Railway Company on the western edge of the Dales through Ingleton (1861), the Settle and Carlisle Railway through Ribblesdale (1876) and the North Eastern Railway through Wensleydale which linked to the Settle-Carlisle route in 1878 stimulated the expansion of large limestone quarries. Economies of scale led to the abandonment of most of the small field lime kilns though a few, especially in the more isolated areas, continued in use until the early 20th century. The story of the development of industrial lime production in the Yorkshire Dales and the entrepreneurs involved has been well documented by Johnson,¹⁰ while his two-part paper in this journal documents the development of the Hoffmann continuous

Figure 2.
Scheduled and listed
lime kilns in the
Yorkshire Dales
National Park and the
location of the two
valley-size
Conservation Areas.
1 The Swaledale and
Arkengarthdale
Conservation Area.
2 The Littondale
Conservation Area.



Figure 3.
The Broadwood kiln
during excavation
(Copyright N. Dray,
Ingleborough
Archaeology Group).

burning horizontal kiln of which there are two examples in the Dales, although only that at Mealbank survives in an unmodified form.¹¹

In the early 1980s Raistrick, together with Griff Hollingshead, lobbied for the protection of the Hoffmann lime kiln at Craven Lime Works — a site then known as Langcliffe Quarry — and for the kiln to be restored with funding from a government job creation programme. This lime works complex, one of the most remarkable industrial monuments in the Dales, has been described before in this journal.¹² Built in 1873 and last fired just before the Second World War, for many years the Hoffmann kiln lay redundant and slowly deteriorating. Although the Raistrick and Hollingshead initiative did not progress, it did raise awareness of the kiln whose national importance was recognised by designation as a Scheduled Ancient Monument in 1985. This did not prevent planning permission being granted by the then National Park Committee of North Yorkshire County Council (also the waste authority) for planned extension of a rubbish tip in the disused quarry, almost to the base of the kiln. Redesigning the tip to a greater height but smaller area was

subsequently agreed. It closed but was replaced by a waste transfer site in 1992.

The idea of the kiln again being of economic benefit, as a tourist attraction for the Craven area, resurfaced with the Ribblesdale Study.¹³ This led to the formation of the Ribblesdale Trust who adopted the kiln as their logo and promoted the kiln and its potential. In 1988 a national construction company, Jarvis Plc, took an interest in the Settle to Carlisle corridor and developed a restoration scheme for the kiln.¹⁴ This was also based on funding aimed at reducing unemployment, but the company withdrew when government funding priorities altered. The Ribblesdale Trust raised funds for an archaeological survey of the kiln and the surrounding quarries¹⁵ and for an economic viability study for the complex.¹⁶ This study attracted further private sector interest in the site, although this interest was primarily based on the idea of the council depot as a prime development site within the National Park. Some vegetation clearance and urgent repair work to the entrances to the firing chambers of the kiln was also carried out.

Private sector proposals to develop a holiday village and hotel complex in the depot area were discouraged by the National Park Committee who, following discussions with the quarry's owners, Craven District Council, agreed to take a lead in conserving the site.¹⁷ There was, however, still political interest in developing the commercial potential of the complex and a further feasibility study was undertaken. Derek Latham and Associates¹⁸ were given the difficult brief of protecting the archaeological and ecological interest of the site, attracting 100,000 visitors a year and having a revenue-neutral development. They considered four levels of development ranging from a low-key development to a major visitor attraction, but concluded that only the low and high options were likely to be viable. Their preferred scheme provided for a major tourism-based development with refurbishment of the existing buildings and a new interpretive centre linked to a new viewing platform on part of the top of the kiln. The scheme had a provisional budget of £7 million and would have had a major impact on the character of the complex. It also required extensive alterations to the access — the only vehicular access to the site is through a narrow bridge under the railway — and offered no guarantee that there would be sufficient visitors willing to pay the entrance fee of £5.25 necessary for the development to pay its running costs.

After rejecting the £7m scheme the by now independent National Park Authority developed the low-key option and submitted a bid to the Heritage Lottery Fund. The bid included a Conservation Plan which

described the history and special qualities of the quarry complex and the need for conservation. Consultation with the parish councils of Langcliffe and Stainforth led to the re-adoption of the site's original name, *Craven Lime Works*, instead of *Langcliffe Quarry*, the title which had been commonly used in association with the Council depot, or *Stainforth Sidings*, the name used by the Midland Railway.

The funding package included contributions from the HLF, English Heritage, NPA and ERDF Objective 5b funding, the latter to move the transfer site and depot entrance away from the Hoffmann kiln. The scheme involved leasing the main part of the site from Craven District Council (excluding the former rubbish tip and parts of the depot) and most of the Murgatroyds complex from its private owner. The main conservation work concentrated on the Hoffmann kiln but included the contemporary bank of three, very large, draw kilns of Murgatroyds Limeworks immediately to the north, the base and supports of a later pair of vertical Spencer kilns hidden in woodland to the south as well as ancillary buildings such as the winding houses, weigh houses, crushing plants and the tramway network which add to the site's archaeological interest. The importance of the complex, unusual in having three very different lime-burning technologies represented on one site, was further recognised in 2003 by an extension of the scheduled area to include the remains of both quarries, even the former rubbish tip being scheduled on the basis that significant remains may lie underneath it. A former office building, now a private house and other office buildings, were excluded from the scheduling but are included in the Settle and Carlisle Railway Conservation Area (1993).

A deliberate decision was made to try to enhance the ecological interest of the site as well as protecting the archaeological interest, and the conservation works were timetabled and designed accordingly. They were carried out in conjunction with a programme of detailed archaeological recording, including the excavation of abandoned quarry trucks.¹⁹ The Hoffmann kiln has been used by bats for both roosting and swarming, and it is hoped that restricting access to the central flue chamber with bat-friendly access hatches will encourage further activity. The kiln is also host to bee orchids, hawkweeds and cave spiders, ravens and a pair of peregrines nest on the scar above the quarry, while the rock faces and woodland show various stages of ecological succession.

Providing for public safety while not changing a site's character by over-provision of handrails, etc., is a difficult balancing act. A public footpath runs beside the Hoffmann

kiln, but there was no public right of access to the interior of the kiln or to other features on the site. Parts of the site, such as the former refuse tip, the tunnel and the unstable cliff face, are potentially dangerous and access has not been provided to these. Lighting inside the Hoffmann kiln has not been installed, not least because of its impact on the micro-environment of the kiln and on the underground feeling provided by the continuous burning chamber, a safe, accessible 'underground' experience much appreciated by some disadvantaged groups. A trail has been developed, linking the more important and stable features of the complex. Eleven information boards incorporate reconstruction drawings and quotations from former quarry workers designed to help visitors of all ages understand and appreciate the quarries and kilns and their conservation significance (Figure 4). A deliberate decision has been made not to promote the site from the adjacent road, although some car parking is provided in the former waste transfer site. The scheme was completed in 2002, the opening including a session at Langcliffe Primary School to view some of the children's interpretative work. The site features on the NPA's www.outofoblivion.org.uk web site and a teachers' pack provides additional supporting material.

The NPA recognises that maintaining the conservation importance will be an ongoing task. Ruins will always need some maintenance to withstand the vagaries of the Dales climate while vegetation can be rampant and needs careful management to conserve the conditions in which the bee orchids and other plants can flourish. The Authority's Dales Volunteers assist in carrying out vegetation management and also in interpretation by leading school parties and guided walks around this unique survival.

Despite the successful outcome of this conservation project, the character of the complex remains under threat: the site's owner, Craven District Council, and the Regional Development Agency, Yorkshire Forward, have commissioned proposals to develop the depot area, seeking to exploit the site by showing that 'high-quality development' can enhance the conservation interest and improve the management of the site. Those ideas which have been submitted so far, however, again appear to concentrate more on exploiting a development opportunity in the National Park and pay little heed to conservation interests.

Mealbank Quarry

Remarkably, Craven District Council also own another scheduled Hoffmann lime kiln

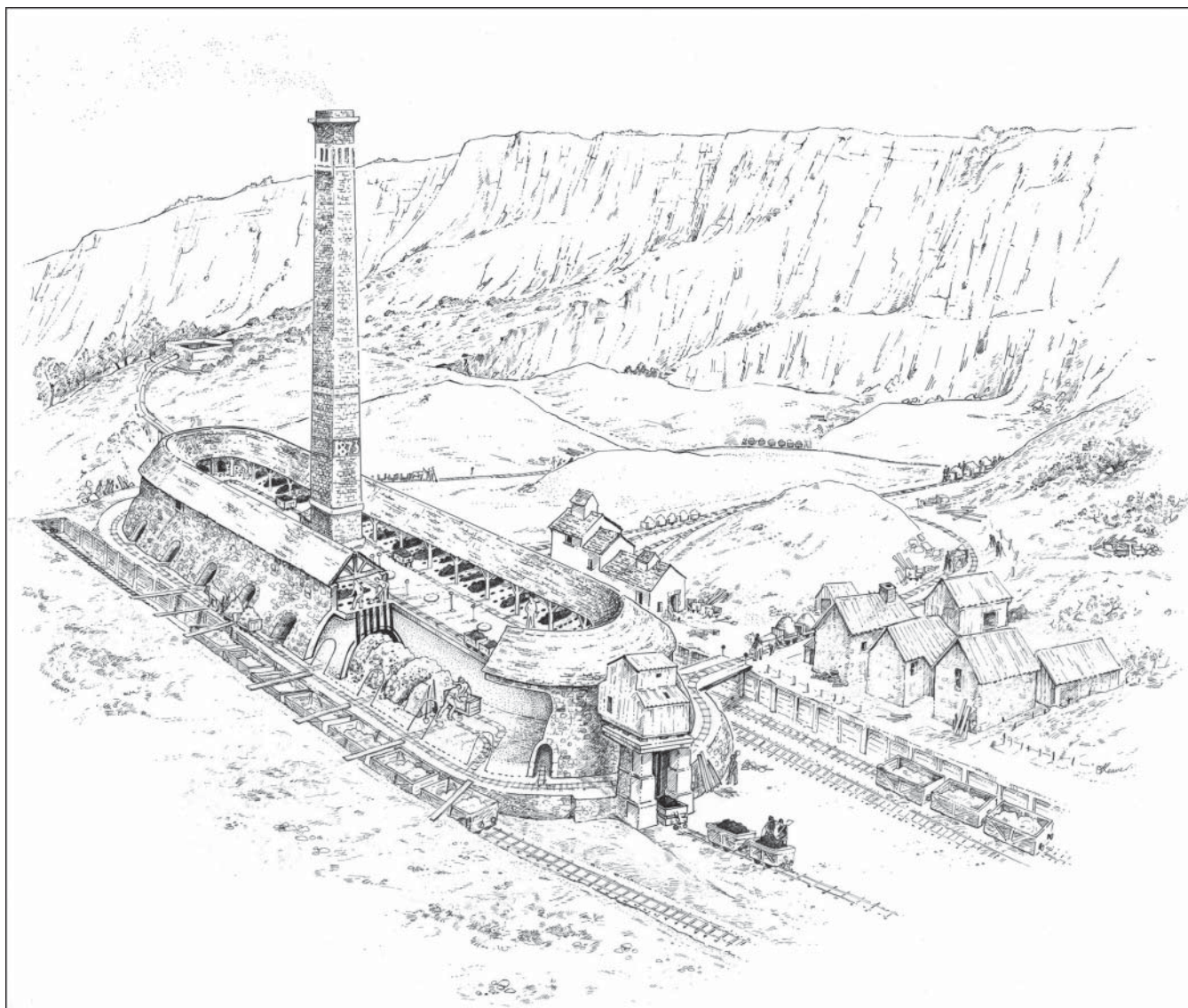


Figure 4.
A reconstruction
drawing of the Craven
Lime Works
Hoffmann kiln (Anna
Leaver. © YDNPA).

and quarry at Ingleton. Unlike Craven Lime Works, most of the Meal Bank complex has not suffered any development. The quarry area is a Site of Special Scientific Interest. The kiln, older and smaller than the Craven example, has also been surveyed for the National Park Authority.²⁰ In recent years local groups have put forward various suggestions for the site, and in late 2004 a Meal Bank Quarry Development Group was formed. This has commissioned a Conservation Plan for the complex as the first stage towards improving management of the complex. A second, more interventionist, phase of vegetation and rubbish clearance has been carried out by David Johnson for the NPA. The kiln is rather more ruinous and consolidation may not be an option, but it is better located for tourism development than the Craven complex. Like Craven Lime Works, however, there is also the complication of a residential property in the centre of the site, this time butting onto the kiln.

The Dent Marble industry

One other use of limestone deserves brief mention. From the mid-18th century until the early 20th century there was a local 'marble' industry, based on particularly fossiliferous limestones in the Yoredale series which could take a highly polished surface. The full extent of this industry is currently unclear, but an assessment for the NPA by Dennison identified a series of former marble quarries in Dentdale and Garsdale. These are all surface workings: it is not clear whether underground working was also practised. The rock was initially quarried and polished by hand, but between 1800 and 1810 a former corn and cotton mill, High Mill at Stone House in Dent, was converted to house marble-cutting saws. A Low Mill was probably specifically built as a marble-polishing mill and extended to house sawing machinery by c. 1815. By 1830 Dent marble was being carried to Newcastle, London and Liverpool, usually in

the form of fireplaces or floors. It was later used extensively for the Midland Railway's waiting-room fireplaces. The trade was dependent upon fashion and declined in the late 19th century, a decline accentuated by the removal of an import tariff on Italian marble, although the Low Mill polishing works remained in use until 1907. The surviving remains of the Stonehouse complex, which include a manager's house, waterwheel pit, probable polishing mill, water management earthworks and other structures, are currently being surveyed.²¹

Out of Oblivion

Over the last 20 years the industrial history of the Yorkshire Dales has been recognised as a significant element of the cultural history of the area and thus part of the statutory purposes of the National Park Authority. Like the lead industry, the other major extractive industry of the Dales, the remains of the limestone industry are now also beginning to play a part in what is now the area's principal economic activity — tourism. Fourteen sites to visit are featured in the two essays on the lime industry in the Authority's website, www.outofoblivion.org.uk/industry.asp. Although the limestone industry has not received the popular attention of the lead industry, it has had an even greater impact on the Dales landscape, not least through pasture improvement and its vernacular buildings, albeit one which to some eyes is still secondary to its iconic geology.

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Robert White is the Senior Conservation Archaeologist with the Yorkshire Dales National Park Authority. Address for correspondence: Yoredale, Bainbridge, Leyburn, North Yorkshire DL8 3EL; email: Robert.white@yorkshiredales.org.uk