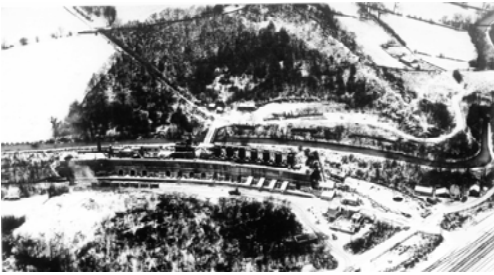


2 UNDERSTANDING THE CANAL



George Stephenson's lime kiln structures at Ambergate in the process of demolition in the 1960s. The length of the Canal which can be seen curving around behind them was destroyed shortly afterwards. The Canal water now runs away into the River Amber just to the left of the picture.



Calladine Winding Hole, between Poysers and Grattons Bridges, where boats could turn. Potentially a good aquatic habitat, it has been degraded, like the rest of the Canal, by vegetation encroachment, low water levels and lack of a through flow.



Hayes Wharf dates from the early 19th century and at one time housed a shop which served the boat people.



The pre-Canal Derwent Hotel building at Whatstandwell, with the stables and smithy behind on the right. Above the smithy is the Canal Company's boat-building wharf, tunnelled under by the railway.

The badly damaged southern section

The Derwent Valley section of the Cromford Canal has been isolated from the rest of the Canal and the national network since the collapse of the Butterley Tunnel in 1900. Subsequently substantial lengths of the southern section were removed for open-casting and road improvements and, on the edge of Ambergate, a large section was excavated for a gas plant.

The northern section—a lock-free contour canal survives

However, from Ambergate, where the Canal enters the World Heritage Site and County Council ownership, a continuous waterway survives through to Cromford, cut into the steep sides of the Derwent Valley. Engineered by Jessop and Outram (1790-94) to follow the contours of the hillside, it is supported for long stretches by high banks and retaining walls at 50ft above the river's floodplain, with an aqueduct across the river where the valley narrows at Leawood. A rocky outcrop, which squeezes the valley too tight to circumnavigate, is cut through for a short distance at Gregory's Tunnel. In places the later railway, forced in between the canal and the turnpike road below, has cut dramatically into the original banks and contrived to support the canal and its wharfs with substantial walls, tunnels and aqueducts.

Ambergate

Once a major railway and turnpike junction, Ambergate serves as an important entry point to the northern section of the World Heritage Site. A station still serves the local line and much of the lofty viaduct survives, bringing the railway north to draw alongside the Canal as it turns into the Derwent Valley. The viaduct is George Stephenson's legacy - it was he who engineered the tortuous route of the railway up the valley. His vast bank of lime kilns stood next to the Canal on the site what is now the gas depot.

Woodlands, wharfs and pre-canal industry

The stretch to Whatstandwell from Ambergate has few public access points from the road, but is crossed by three original stone accommodation bridges, serving pre-canal farmsteads and the ancient woodlands of Crich Chase. Coppiced oaks provided fuel for lead-smelting and for the extensive 1760s ironworks established by the Hurt family on the river below. There are two wharf buildings, Mold's and Hayes'. The former pre-dated the Canal and served the ironworks. Railway bridges were built to serve both wharfs and high retaining walls supported the buildings allowing the track to cut through way below.

Managed in conjunction with Derbyshire Wildlife Trust, this section of the Canal was designated by DCC as a Local Nature Reserve and since 1987 has been included in the SSSI. Bordered by wooded slopes on the upper side and below by the railway—the embankmented strip between water and track is now thickly covered by self-sown trees. Old photographs show open views up and down the valley, now obscured by dense vegetation.

Whatstandwell

At Whatstandwell space for Stephenson's railway was particularly constricted. This settlement had grown up around an ancient river crossing and turnpike road. The canal, bridged by the ascending turnpike, cut close to the cliff face of Duke's Quarry on the up side, but had extensive wharfage on both sides of the road on the downside, where boats were built over a long period. Later the railway builders, barely finding space between canal and riverside-inn and stables, were forced to dig out the wharfs, construct a tunnel beneath and reinstate them. The retaining structures, bridges, two wharf buildings and two pre-canal inns are there to see and in largely good condition. Florence Nightingale, who lived at Lea, put up the finance for a canal-side tearooms in one of the warehouses.

Dukes Quarries and Robin Hood

Above Whatstandwell the Canal served a large interconnected maze of gritstone quarries owned by the Duke of Devonshire. The canal channel is stone-lined here, with a series of narrows which may have been wharfs or temporary crossing points. When quarry traffic moved to the railway a permanent bridge was built over the Canal which took a tramway down to the railway 'wharf'. Extensive archaeological evidence remains on both sides of the Canal and spoil from the excavations is deposited in a landscape of steep lumpy mounds. The attractive hamlet of Robin Hood emerges through the trees as the Canal turns. The function of the different buildings and structures which range up the hill here is not certain, but the settlement was developed from the mid-19th century to serve the quarries and included a water-powered saw mill. The mill stream here drops into a cavernous stone-lined pit which discharges into a large culvert under the canal.



The sawmill building at Robin Hood, with the rim of the stone-lined pit visible to the right. The gardens cover the extensive wharf area.

Gregory Tunnel and Winding Hole

The Canal, following the curve of the hill through woods and open pastureland, passes Leashaw Farm (pre-dating the canal) and its bridge. Beyond, the channel widens at Gregory's winding hole before narrowing into the tunnel. A vulnerable section of high embankment supports the Canal as it snakes around the hillside below Leawood—this has been the scene of a number of dramatic breaches and over-toppings. Stephenson's cast iron aqueduct takes the canal over the tracks as the railway tunnels into the outcrop which Jessop chose to circumnavigate above ground. This important aqueduct, whilst holding water (mostly), is badly in need of repair and restoration.



Gregory Tunnel from the north. Fully-lined and 40 yards long, despite the hilly terrain, this is the only tunnel along the Derwent Valley length.

The Leawood Arm

Constructed for Florence Nightingale's great uncle, this arm was built to serve his lead mills at Lea Bridge. The channel, which is not in County Council ownership, is in a much worse condition than the main canal and completely dry in places. The arm now ends at the wharf cottage before Lea Bridge, shortened when a dispute arose over the water supply. Nightingale's textile mill complex which grew up at the end of the branch (now Smedley's) is still in production and original worker's cottages overlook the site of the first wharf. The much-loved but derelict 'Aqueduct Cottage', overlooking the junction, housed the lengthsman for the arm.



Gregory Winding Hole from the tunnel mouth with the cliffs and monument of Crich Stand on the horizon. The canal retaining wall here is doing the job of a dam, collecting water from the streams which drain the hillside above. The richest habitat for aquatic communities on the Canal is here, but dense vegetation is fast encroaching on the area of open water and degrading the habitat.

Leawood Aqueduct and Pumphouse

Jessop's most celebrated feat along this length was the substantial stone aqueduct spanning the River Derwent. Metal ties and vast buttresses bear witness to the struggle he had to stabilise it and remedial work delayed the completion of the canal. The structure is now surrounded by trees and the views which show the scope and function of the aqueduct to best advantage are obscured even in the winter months.



The Canal narrows at the Derwent Aqueduct and the towpath changes side over a swing bridge. The chimney of the Leawood

The Pumphouse, too, once a significant landmark is hidden by trees. The architectural and historical importance of this classically composed structure (1849), whose pump pulls water up from the Derwent and pushes it into the Canal, is recognised both by its statutory status and by the hoards of visitors who attend the steaming days which are run a few weekends a year by the group of volunteers who maintain the magnificent machinery. The beam engine is in full working order, enabling tons of water gush into the canal with every stroke, but despite many hours of dedicated volunteer effort, significant work to the boilers is anticipated.

2 UNDERSTANDING THE CANAL



High Peak Junction Workshops, demonstration track and wagon. The water tank (right) supplied domestic fresh water to villages up the line and served the engines.



The Wharf Shed (transhipment warehouse) at High Peak Junction.



Lawn Bridge linked Arkwrights 'lawns' across the Canal at Cromford Meadows—indeed the grassy surface of the fields either side continue over the bridge. This is one of the six original bridges on the Derwent Valley stretch—each built to the same elegantly engineered design but adapted according to topography and function.



Cromford Wharf viewed from Arkwright's mills. The 'Gothic' Warehouse to the left and the Counting House in the foreground were contemporary with the building of the Canal. The Second Warehouse to the right, behind, was built by the canal carriers, the Wheatcrofts, in 1824.

High Peak Junction see also page 10 'The High Peak Trail'

At the Junction (the earliest surviving railway and canal interchange) goods were transferred to the Cromford and High Peak Railway (1830) for carriage across the Peaks to Manchester. Track beds extend from here up the first incline of the railway and south along the canal to the transhipment point. The main components of the 19th century junction survive:

railway workshops, transhipment warehouse, weighbridge office, ticket office, lengthsman's cabin, railway agent's house, the paddock for the working horses, the water tank which supplied the steam engines, the railway marshalling area, canal wharf and winding hole

Lost are an engine shed alongside the canal to the north and the railway tracks — only a short demonstration section and wagon, the incline wheelpit and track running into an inspection pit in the workshops are there to see.

The workshops were used for wagon and locomotive repair and assembly. Now the main workshop is displayed just as it was left when the railway closed. A visitor centre/shop and exhibition occupies the rest of the space. The Transhipment Shed has been converted into a residential country pursuits centre and the three other buildings on the canal-side are used by the County Council for storage.

When the mainline railway was realigned here, to make room between the canal and the river, the canal was edged over and re-supported on yet another of those high retaining walls. The Junction Inn was demolished in the process, although the carriageway down to it survives.

Cromford Wharf

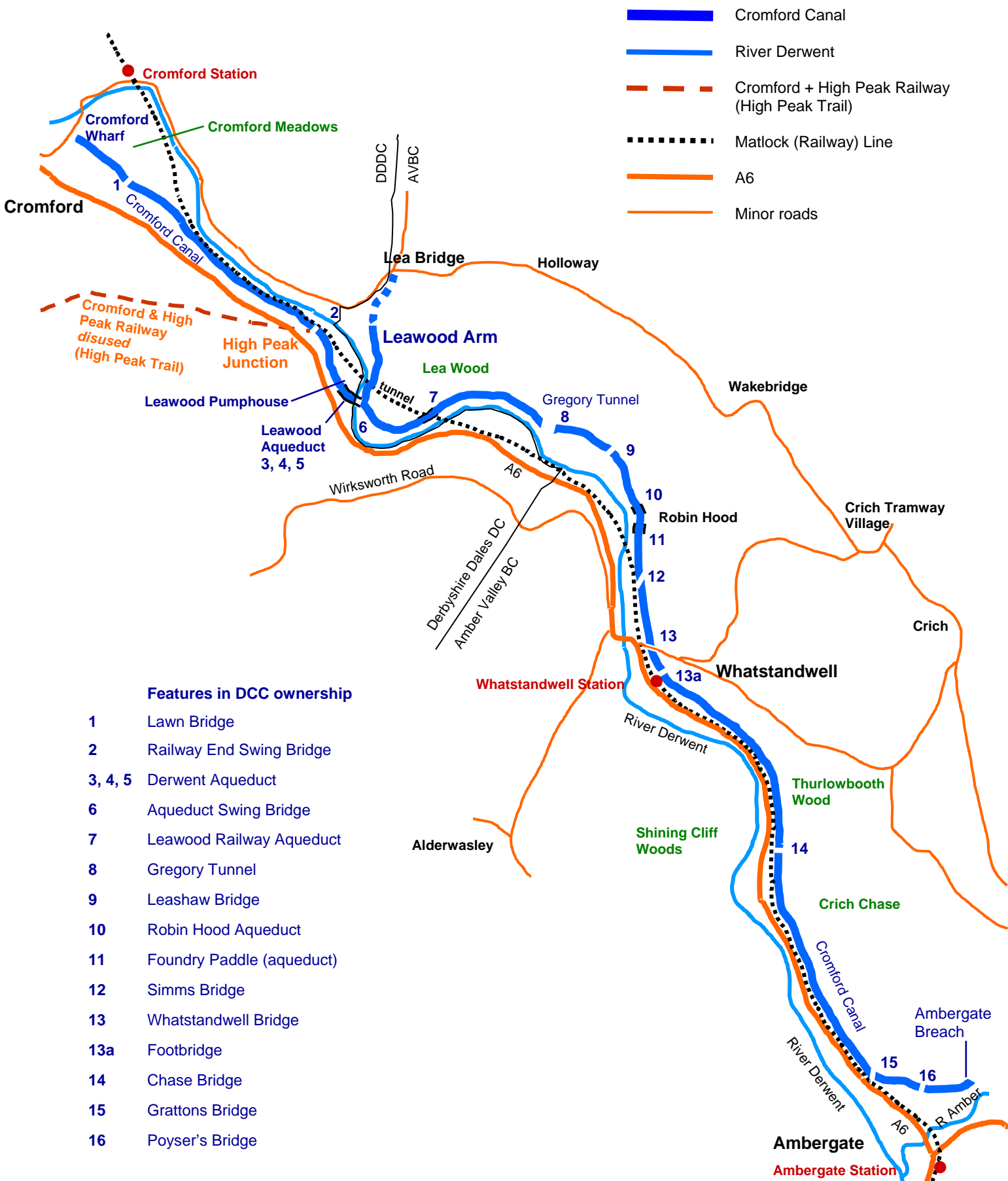
The Canal terminates in what still reads as an 18th century park setting, little changed in the two centuries since organised industry remodelled the landscape of the small settlement and opened up this remote valley to the outside world.

The canal, curving above the river meadows, arrives at what was the secure walled compound of the wharf, and before that, Richard Arkwright's garden. His residence, Rock House, still occupies a position of superior vantage, topping the cliff which towers above the wharf and, across the turnpike road his complex of cotton spinning mills bring thousands of visitors every year.

In most respects the terminus retains its early 19th century form: the canal widens into a winding hole and then divides into the two channels which serve the two warehouse buildings with their canopies, warehouse doors and remains of loading cranes. The wharf offices and a pair of canal company cottages complete the scene. The perimeter walls have been reduced, and some stabling and outhouses have gone, but in most respects the original complex of stone buildings survives intact.

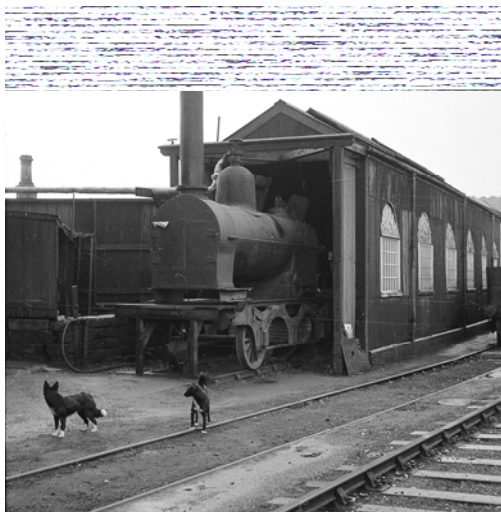
The Wharf was the headquarters of the canal carriers Wheatcrofts. Goods handled included coal, timber, limestone, agricultural and domestic items.

MAP 1: THE CANAL: County Council ownership



3 UNDERSTANDING THE TRAIL

THE HIGH PEAK TRAIL (CROMFORD + HIGH PEAK RAILWAY) to Middleton Top



Stationary boiler at the Middleton Top loco shed which latterly supplied steam for the incline (John Marshall). All this is now lost.



Locomotive in steam next to the workshops at High Peak Junction, 1928. The workshops survive; the tracks were taken up when the railway was closed in the 1970s.



The Engine House at Middleton Top

Jessop and Outram 's collaboration on the Cromford Canal was the beginning of a journey which was to lead, via canal tramways, to the development of the concept of the long distance railway. Of these, the Cromford and High Peak Railway, engineered by Jessop's son, was to be one of the first.

Originally planned as a canal, linking the Cromford with the Peak Forest Canal across the pennines, the CHPR was conceived when a waterway was found not to be feasible—the cost was too high and the water supply inadequate. Among the first cast-iron edge rails were used to transport wagons along the track, initially pulled by stationary steam engines up the inclines (used instead of locks) and by horses on the level. Rail- (or tram-) ways had previously been used as a supply route from mines and quarries to canals or as a temporary link during the construction of locks. Now they were to be used as a 'permanent way'.

The section of railway to Middleton Top demonstrates the use of two major inclined planes linked by an almost level section between Black Rocks and Coal Hills. The first of the inclines, Sheep Pasture, commences at High Peak Junction and the large catchpit there, into which runaway wagons were directed, has recently been restored. The engine house at the top is still standing, but stripped of its machinery. The second incline, at Middleton, is topped by its engine house and chimney, within which much of the original 1829 Butterley Company beam engine survives, now demonstrated to visitors using compressed air. These steam engines powered the rope-worked system which pulled the wagons up and down the incline.

Gritstone and Limestone quarries and their spoil heaps line the route and it was this trade which eventually made the railway a success. Appropriately, the National Stone Centre is located in a geological SSSI which straddles the railway. The limestones of this area and their fossils are of national importance. Ancient lead mines with their ruined structures and spoil can also be identified. The vision had not merely been to create a through route but to open up the mineral resources of the Peak District, thus extending the penetration of this remote region started by the Canal.

Like the Canal the railway track was supported by high embankments and retaining walls for much of its length. These walls and a number of fine stone bridges ensure that even without the track (removed when the railway was closed) there is still a finely engineered monument to admire.

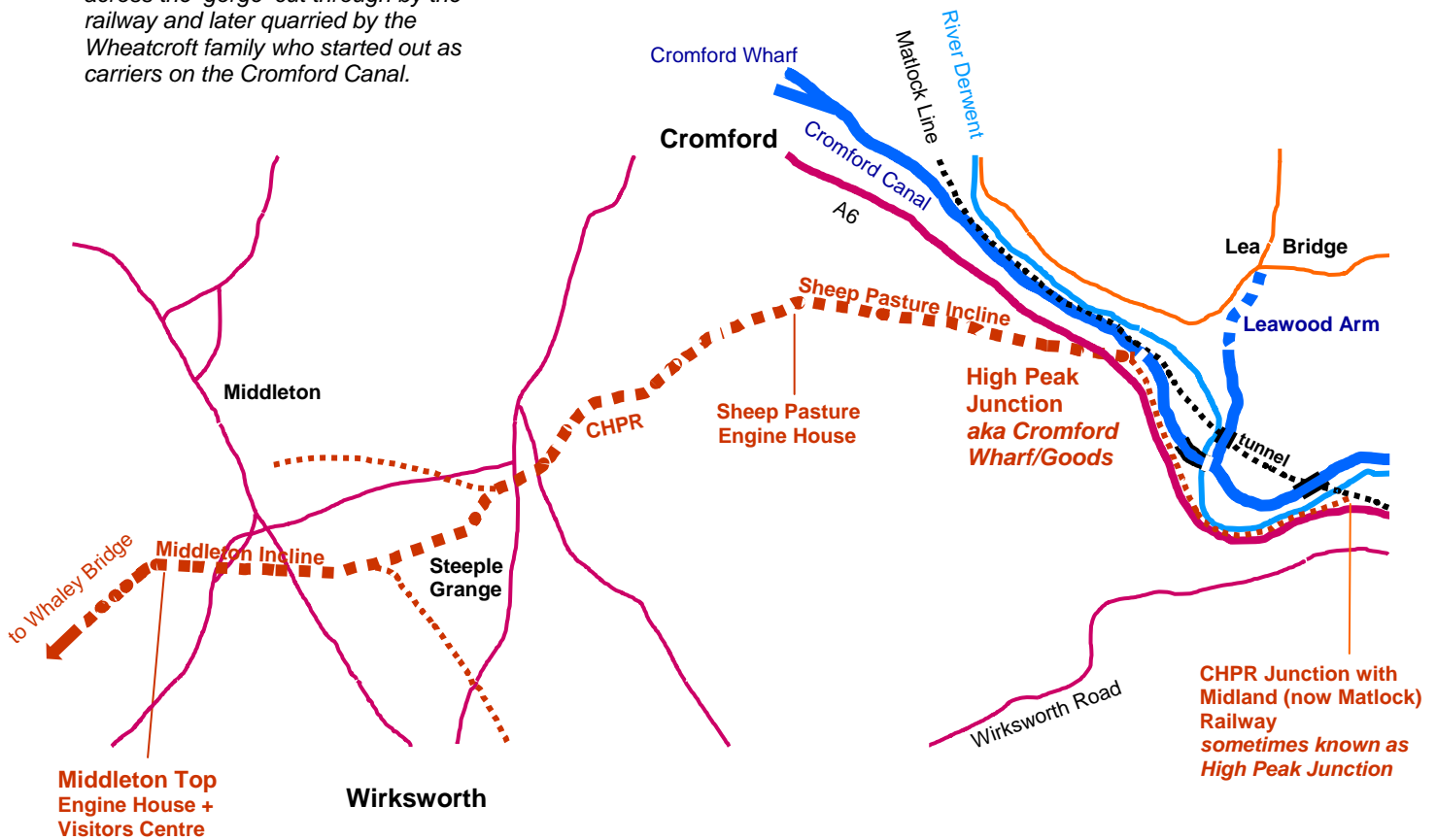
MAP 2: CROMFORD + HIGH PEAK RAILWAY CHPR High Peak Junction to Middleton Top

- ■ ■ ■ ■ ■ ■ ■ Cromford + High Peak Railway *disused* (High Peak Trail)
- Subsidiary lines or links *disused*
- Matlock (Railway) Line*
- Cromford Canal
- River Derwent
- A6
- Minor roads

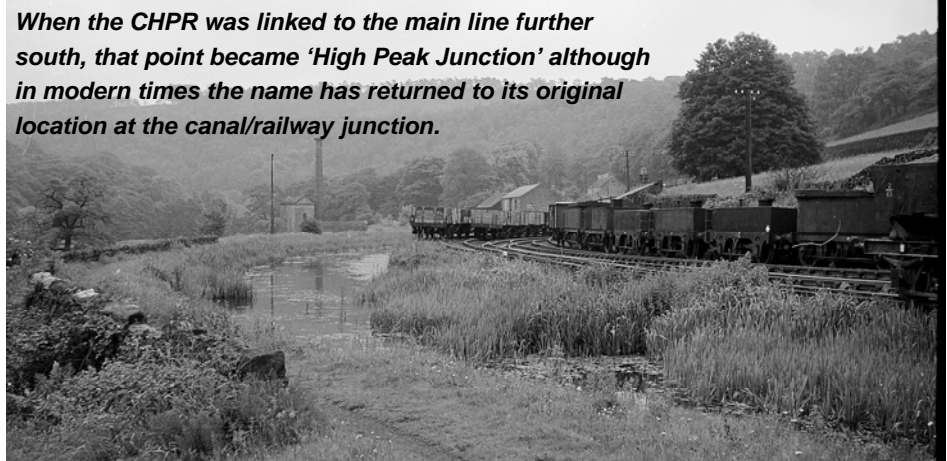
*
Currently 'Matlock Line'; originally Manchester, Buxton, Matlock and Midlands Junction Railway (MBMMJR) and subsequently Midland Railway



The impressive bridge which takes the old Middleton to Wirksworth road across the 'gorge' cut through by the railway and later quarried by the Wheatcroft family who started out as carriers on the Cromford Canal.



Signalling equipment at the bottom of Sheep Pasture incline which communicated to the winding engineman at the top of the incline.



When the CHPR was linked to the main line further south, that point became 'High Peak Junction' although in modern times the name has returned to its original location at the canal/railway junction.

4 HISTORY



Jessop's Derwent Aqueduct— structural problems with this impressive edifice held up the opening of the Canal



River, canal, road and rail vie for position in the Derwent Valley, calling for skilful engineering solutions from the canal and railway engineers. Pre-1918 photograph.



Hump-backed stone bridges took the few pre-existing roads and farm tracks across the Canal. All of the six original bridges on the Derwent Valley section survive.



The working canal: Cromford Wharf with the original 'Gothic' warehouse centre and coal being unloaded onto the wharf.

An isolated section of the original canal

The northern Derwent Valley section of the Cromford Canal originally connected to the national network at its junction with the Erewash Canal at Langley Mill. It terminated, as now, at Cromford Wharf. The Canal was breached at Ambergate in the 1960s by major industrial development and parts of the line south of this point have been built over or are dry.

An early canal, but not the earliest

An Act of Parliament to construct the Cromford Canal was obtained in 1789, at the beginning of the second great period of canal building which its engineer, William Jessop, was to dominate. Earlier canals had cut a series of major routes across the country to which the Erewash Canal was connected.

Reasons for the Canal

The stimulus for the Cromford Canal came from the need to carry bulk materials such as lead, limestone and gritstone from the upper Derwent Valley and coal from the Erewash Valley to markets elsewhere. These isolated rural areas were served only by hilltop and cross-routes - there were no level routes along the flood-prone valleys.

The Canal promoters

The key promoters of the Canal were local land owners with an interest in further exploiting the natural resources on their property. Sir Richard Arkwright, who was pioneering the new factory system at his cotton spinning mills at Cromford, was persuaded to support the project.

Construction work and the engineers

Work started on the Canal in 1790 under the direction of Jessop. With Benjamin Outram, a local surveyor, as his assistant (also destined for a national role) they took over management of the construction of the Canal from the initial contractor for whom the project had proved too much. Together the two further exploited the mineral wealth of the route by establishing the Butterley Company on the Canal. The company's iron foundry went on to fabricate many of the significant engineering structures of the industrial age from bridges in India to the arches of St Pancras railway station.

The route of the southern section

The route chosen for the Canal took it along the Erewash Valley to Codnor Park and Ironville rising through 14 locks. The Pinxton Arm which branched off at Ironville served the mines along that route. A broad canal, it could take river barges up to this point, but from here the 1³/₄ mile Butterley Tunnel took the Canal through to the Amber Valley where the channel width was reduced to accommodate only narrow boats. After crossing the valley on a long embankment/aqueduct, the Canal turned north into the Derwent Valley.

The Derwent Valley section

The summit level of the canal was constructed on the level as a contour canal, supported high on the hillside along much of its length by substantial embankment walls thus dispensing with locks, but cutting through the hillside briefly at Gregory Tunnel and spanning the wide Derwent River with a spectacular stone aqueduct. The route terminated at Cromford Wharf—at the gates of Arkwright's Mill and on land taken from his private garden at Rock House.

The Nightingale Arm to Lea Bridge, constructed a few years later (in 1802), branched from the main line just south of the aqueduct to serve the lead processing mills already established there.

The Canal is a commercial success

The Derwent Valley section of the Canal finally opened in 1794, having overcome a number of engineering problems, and was a success from the beginning. The major long-distance carriers on the Canal were the Wheatcrofts, initially based at Cromford Wharf. They were responsible for much of the boat-building activity which took place there and at Whatstandwell, as well as on other locations in the southern section.

The Cromford and High Peak Railway (CHPR)

The completion in 1830 of the pioneering CHPR, engineered by William Jessop's son, initially boosted the Cromford Canal trade by linking it across the Peaks to the emerging industrial centres of Manchester and Liverpool. First conceived using canal technology, horses drew wagons along this railway and it was not until 1834 that steam locomotives were employed to do the work. Stationary steam engines hauled wagons up the many long, steep inclined planes. The Junction was the site of the first ever canal/railway transshipment shed and the second oldest railway workshops. These survive as part of the near-complete assembly of the early Junction buildings.

The decline of the canal and ascendancy of the railway

The Canal operated commercially throughout the 19th century. Traffic peaked in the 1830s but the relentless advance of the railways saw the trade of the Cromford canal decline, along with the rest of the national canal network, and by 1852 the Cromford Canal Company was forced to sell up to the railway. Stephenson's through route to Manchester had opened in 1859 and ran along the same valley in direct competition with the Canal.

Canal closure; CHPR survives much longer

In 1900 the under-used and poorly-maintained Canal was finally closed to through traffic after a collapse at the Butterley Tunnel. 1938 saw the last boat traffic pass along the Derwent Valley section.

The CHPR had had a much less successful early life than the Canal, with the anticipated through trade being taken by other routes. However, business had picked up considerably by the late 19th century with increase in output by the many limestone quarries of the White Peak. By the 1950s around 140,000 tons of limestone a year were still being transported, but from then trade declined and in 1967 the line was closed.

Acquisition by Derbyshire County Council

In 1974 the County acquired the Derwent Valley section of the Canal and the CHPR trackbed for the development of leisure and recreational routes. The Canal was to be restored and managed by the Cromford Canal Society with the ecology managed by the Derbyshire Wildlife Trust—the Canal was declared a Site of Special Scientific Interest. Three of the five miles from Cromford were duly restored to navigation and a horse drawn trip boat was enormously popular. However, the Society hit problems, ceasing trading in 1990 when the management of the Canal was returned to DCC.

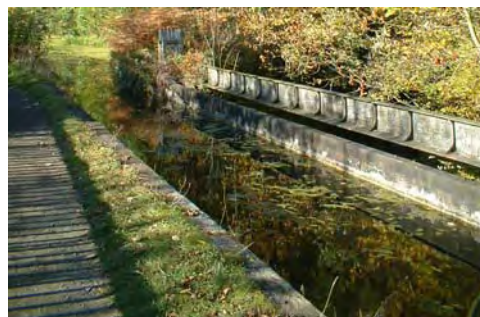
The High Peak Junction Workshops and the Middleton Top Engine House are open on a regular basis and the Canal and High Peak Trail are well used 365 days of the year by walkers and heritage and wildlife enthusiasts. The Arkwright Society is due to acquire the Nightingale Arm from the local Trust who now own it. In the last few years a new group, the Friends of Cromford Canal, have taken up the restoration baton and are campaigning for restoration/reconstruction of the full length of the Canal from Cromford to Langley Mill.



The very early example of railway workshops at High Peak Junction and the bottom of the first inclined plane of the Cromford and High Peak Railway.



One gain from the railway takeover was the building of the magnificent Leawood Pumphouse to pump water from the Derwent up into the Canal. Volunteers continue to steam up the Leawood Pump on regular open days.



Another bonus for later generations (although death to waterways at the time) is the survival of George Stephenson-designed railway structures along the canal route including the Leawood railway aqueduct (above) and the tunnel under the ca-



The Canal is an important component of the Derwent Valley Mills World Heritage Site, inscribed in the year 2001.