

Association for Industrial Archaeology
Annual Conference 1997, Newcastle upon Tyne

Tour Notes

Prepared by
Ian Ayris & John Clayson

5th -12th September 1997

SATURDAY 6th SEPTEMBER

EXCURSION A BOWES RAILWAY

Guides - Phillip Dawe and the members and volunteers of the Bowes Railway Company

The Bowes Railway was one of a number of extensive colliery railways in North East England which date from the pioneering period of locomotive development, its first sections being laid out in 1826. The first section was built for Lord Ravensworth and Partners and ran from Mount Moor Colliery at Black Fell (south of Gateshead) to Springwell Colliery (then being sunk) and then on to new staithes on the River Tyne at Jarrow, a distance of 6.25 miles. As their engineer the Partners employed George Stephenson, though in view of his commitments to the Stockton and Darlington Railway at the same time it is unlikely that he supervised its construction. Although the line was to use three rope-worked inclines for its first 2.25 miles , the last four to Jarrow were to be worked by two locomotives, these almost certainly being the first two to be ordered from the famous locomotive builders Robert Stephenson & Company of Newcastle. However their delivery was delayed and so the section from Springwell to Jarrow was opened using horses on 17th January 1826; the extension to Black fell followed about six months later.

In May 1842 an extension to this line was opened to Kibblesworth Colliery, 2.5 miles further west on the opposite side of the Team Valley and comprised two more inclines. Meanwhile John Bowes, the son of the 10th Earl of Strathmore had formed the Marley Hill Coal Company to re-open the Marley Hill Colliery near Sunnyside, four miles west of Gateshead.. The colliery was completed in 1840 and was originally linked to the Tanfield Railway and the line extended by another rope-worked incline to Burnopfield Colliery. The involvement of Charles Mark Palmer in the Marley Hill Company led to its expansion and under the name of John Bowes and Partners bought up all the line and collieries from Marley Hill to Burnopfield and the line and collieries from Kibblesworth to Jarrow. The link between these two systems was made in 1854. With the final extension of the line top Dipton in the following year the Bowes Railway was complete - fifteen miles in length and working under the name of the " Pontop and Jarrow Railway " - a name which it kept until 1932 when it took its present title. For most of its working life the first 4.75 miles from Dipton were worked by locomotive, then followed six miles of inclines - Birkheads (gravity), Kibblesworth (haulage engine with load), Black Fell (engine against load) Blackham's Hill West (against load) and East (with load), both worked by a stationary engine at Blackham's Hill and finally Springwell (gravity). At Springwell Bank Foot locomotives from the shed there took over for the run to Jarrow.

Apart from the closure in 1940 of the Dipton -Burnopfield section the Railway continued to handle well over a million tons of coal per year well into the nationalisation period, and from 1959 it also handled coal from Pelaw Main Railway as well via a link between the two at Blackham's Hill. It remained in tact until August 1968 when by degrees the line began to close. The closure of Kibblesworth Colliery in 1974 meant the end of the Railway's five remaining inclines and its engineering and wagon shops at Springwell. At its closure three stationary electric haulers, one gravity inclined plane and diesel locomotives were all used; this being the last such system in Great Britain.

Special features of the line are the Blackfell and Blackham's stationary haulers and their associated inclines. The Blackfell engine rope-hauled full wagons up from the bottom of the Team Valley and lowered empties at the same time. The Blackham's engine took up the full wagons at Blackfell and drew them up to the summit. It also lowered empties back down, but in separate operation. Moreover it also worked the Blackham's East incline down to Springwell, the hauler having two separately clutched winding drums. Both of these engine houses originally housed steam powered haulers and signs of that system can still be seen in the provision of water, coal sidings, re-used boilers etc. Stone sleeper blocks edge the tracks near Blackham's West crossing and the rope sheaves, pulleys, kip and dish system, rope marks, jack points etc. can all be studied here.

Springwell Yard is the foot of the Blackham's East incline from which the full wagons passed to the head of the Springwell self acting incline plane where descending full wagons were used to pull empties back up. Springwell Colliery was located to the east of the tracks in the yard and the site of one of the shafts can still be determined. The former coal store for that colliery, a heavily buttressed building, was converted to a wagon repair shop when the colliery closed. On the opposite side of the tracks are the railway and coal mine repair shops.

Railway systems such as these were born and nurtured in the north east and gave George and Robert Stephenson and other great railway engineers their earliest railway building and operation experience.

This section of the Bowes Railway, which is a Scheduled Ancient Monument, is managed by a voluntary body - The Bowes Railway Company Limited - on behalf of the Sunderland and Gateshead District Councils.

EXCURSION B

THE STEPHENSON RAILWAY MUSEUM/NORTH TYNESIDE RAILWAY AND WALLSEND COLLIERY 'B' PIT EXCAVATION.

Leader : John Clayson

Guides : SRM/NTR John Clayson, Mike Forrester
 Wallsend Bill Griffiths, Roger Oram

1. DIAL COTTAGE, KILLINGWORTH (North Tyneside Council)

On the way to the Stephenson Railway Museum the coach will pass Dial Cottage in Great Lime Road, the home of George and Robert Stephenson from c1804 until 1823 (IATW p9). The sundial over the front door was set up by the Stephensons in 1816.

2. THE STEPHENSON RAILWAY MUSEUM/NORTH TYNESIDE RAILWAY (North Tyneside Council, Tyne and Wear Museums, The North Tyneside Steam Railway Association)

This is a developing project which was established in 1981 on the present site, though it actually originated several years before in Sunderland. The Museum opened in the summer of 1988, and the associated Railway commenced operation in 1991. A major City Challenge funded extension programme was substantially completed earlier this year, providing a new administration and services building at the Museum and a mile-long extension of the Railway. The extension awaits final completion, and it is expected that trains will begin to run to a new terminus (adjacent to the redevelopment of extensive former railway and dockside land now known as Royal Quays) in Spring 1988. Meanwhile trains run about 1½ miles to Percy Main and return. The site is jointly managed by the three organisations listed above.

The location is of particular note as the site of the second of three haulage engines (for returning empties) on the route of the Brunton & Shields colliery wagonway of 1826 - hence the name of the approach road, Middle Engine Lane. Later, three other railways funnelled together from the north at this point from which they ran, independently but on adjacent alignments, down to the river Tyne two miles to the south (IATW p9). The ruins of the B&S engine house remained visible here until the present building was constructed in the 1970s as a test centre for the Tyne & Wear Metro. The display *From Pits to Staiths* explains something of the changes wrought in the landscape locally in recent years.

Among the exhibits at the SRM are Robert Stephenson & Company's *Billy* of c1826, a Kitson (Leeds)-built but locally designed long-boiler locomotive of 1883 (the Consett Iron Company's *A No.5*), a NER Tyneside electric parcels van of 1904 (on loan from the NRM), and a Berlin-built Siemens Schuckert electric locomotive *E4* of 1909 from the Harton Coal Company/NCB system in South Shields. Tyne and Wear Museums has recently received an award from the Heritage Lottery Fund toward the restoration and display of this locomotive, and a specification is currently in preparation.

3. HYDRAULIC ACCUMULATOR TOWER, ALBERT EDWARD DOCK (Tyne and Wear Development Corporation)

Built c1881 for the Tyne Improvement Commission's new dock at Coble Dene, named Albert Edward Dock in 1884 upon its opening by Prince Albert. The nearby dock gates (now powered by modern oil hydraulics) were, until quite recently, operated by hydraulic machinery supplied by Sir W.G. Armstrong & Co. of Elswick, and the tower houses the necessary deadweight accumulator (an invention of Armstrong's). It is significant as the only remaining *in situ* representative on Tyneside of Armstrong hydraulic dock gate equipment. A major renovation scheme was recently completed as part of the redevelopment of the area, though this regrettably also involved the demolition of many other interesting buildings.

4. WALLSEND COLLIERY 'B' PIT ARCHAEOLOGICAL SITE (part of the Segedunum project promoted by North Tyneside Council and Tyne & Wear Museums)

Wallsend Colliery's 'A' and 'B' shafts were sunk, 95 yards apart, between 1778 and 1781. The colliery became probably the most successful and productive mine of its day. The quality of the coal won here was such that the top grade of household coal was henceforward marketed under the name *Wallsend* no matter where it had been hewn. Wallsend Colliery closed because of flooding in 1854/55, by which time its workings extended over a large area and were accessed by seven shafts - 'A' to 'G'. In the late 1860s and early 1870s the workings were pumped out through a new shaft, 'H', and the mining of the vast reserves recommenced, though the coal was drawn from shafts at Hebburn, south of the Tyne, until 1898. The Rising Sun Colliery, opened in 1908 some two miles to the north, enabled further exploitation of the same reserves. It closed in 1969 and the remaining older shafts, including 'B' pit, were infilled.

The present excavations began early in 1997 as part of the Segedunum project to excavate and display the Roman fort of that name at the eastern end of Hadrian's Wall (hence Wallsend - Wall's End). Although the presence of the shaft was known, the appearance of the foundations of one (or possibly more) engines, of boiler settings and of ventilation passages was unexpected. Fortunately, the importance of the site was recognised at an early stage; its excavation has been supervised and thoroughly documented by TWM archaeology staff and the remains will be preserved *in situ*. Interpreting the site is proving to be a considerable challenge to local archaeologists and industrial historians, and contributions to the debate are welcome!

EXCURSION C

WOODHORN COLLIERY MUSEUM AND BLYTH 'A' POWER STATION

Guides : Woodhorn - Barry Meade, Curator, and colleagues
Blyth Power Sta. Ray Charlton, Ann Purdy and colleagues

1. WOODHORN COLLIERY (Wansbeck District Council)

Woodhorn Colliery was the third pit to be sunk by the Ashington Coal Company, the work on the first shaft beginning in 1894, sunk to the Plessey Seam at 873ft, first drawing coal in 1898. The second shaft

began production in 1901. The relatively short distance between the Woodhorn site and the main Ashington Colliery meant that the two could share washing facilities and could be easily linked underground. The opening of the Bothal Drift in the 1960s provided a combined coal drawing point. When the steam winder was removed from the site in 1975 it marked the end of steam winding in Northumberland. The pit closed in February 1981. Now a mining museum for Northumberland the site is centred on a fine pair of turn of the century winder houses but particular attention has been given by the Royal Commission on Historical Monuments for England to the survival of the Cappel fan house and the Blacksmith's shop and stables.

The fan at Woodhorn, installed in 1900 originally was powered by a horizontal steam engine supplied by Robey and Company of Lincoln. The engine at Woodhorn was capable of turning the fan's 16ft diameter chamber at 160 revolutions per minute at which speed the fan extracted 120,00 cubic feet of air per minute from the workings below. The later installation of a 300 horsepower electric motor increased these capacities to 225 revolutions and 180,000 cubic feet per minute. The building which houses the fan is of yellow Ashington brick. The engine house has gauged arches to doors and windows and a cogged and stepped eaves cornice. The curved outline of the fan casing is visible behind the engine house.

The survival of the blacksmith's shop and stables is testimony to the long history of the use of horses underground in the Great Northern Coalfield. Horses were working underground in larger mines by the middle of the eighteenth century and were still in use in 1992 when 24 pit ponies were being used for salvage work at Ellington Colliery. Although underground stabling was common practice, collieries also maintained surface stabling - examples of which can be seen at Woodhorn.

2. BLYTH 'A' POWER STATION (National Power plc)

Blyth Power Station is situated at Cambois (pronounced 'Cammus') on the northern bank of the river Blyth. The site comprises two stations, Blyth 'A' and Blyth 'B' with a combined generating capacity of 1,180mW (originally 1,730mW). The 'A' station, commissioned in 1959/60, contains four Babcock and Wilcox boilers and four 120 mW Metropolitan Vickers turbogenerators the earliest of which, when commissioned, was the largest in the country. These units are now believed to be the oldest large-scale generating plant remaining in full commission in the world, and Blyth 'A' is certainly the oldest coal-burning main generating station in Britain. The 'B' station was completed in 1966.

3. THE HARTLEY COLLIERY DISASTER MEMORIAL, NORTH TYNESIDE

Within Earsdon Churchyard is the memorial "erected to the memory of the 204 miners who lost their lives in Hartley Pit, by the fatal catastrophe of the engine beam breaking 16th January 1862". The disaster was instrumental in the passing of legislation requiring mines to have at least two means of escape. Perhaps the most moving and eloquent of the County's memorials, the names and ages of all those lost are recorded, including that of a visitor to the mine who also died in the tragedy. The site of the doomed Hester Pit of Hartley Colliery is marked within the village of New Hartley in Northumberland.

SUNDAY 7th SEPTEMBER

GUIDED WALKS

NEWCASTLE AND GATESHEAD QUAYSIDES - AN INTRODUCTION

Until the decline in the economic importance of the River Tyne in the years following the end of the Second World War, Newcastle's Quayside area had been at the heart of the growth and development of the city as both a regionally and nationally important location. The origins of the Quayside lay in the origins of the town itself, for the two are inextricably linked. The formation of the settlement known as Pons Aelius was based initially upon the Roman river crossing. The later growth of the town as an important trading port developed partly from these origins but also as a result of the topography of the dramatic Tyne Gorge and the geological strata of the surrounding land. On both sides of the river the land climbs steadily and rapidly over 250 feet. The valley sides are at their steepest immediately behind the riverside. This terrain led to the concentration of the early town around the river and in time led to the notoriously overcrowded living conditions which survived near the Quayside until the nineteenth century.

The post-medieval economic development of both the Quayside and the town of Newcastle was based on coal - initially through the mining of the outcropping seams in the river valley but later by the wholesale exploitation of the Great Northern Coalfield. The transportation of this vital fuel became the lifeblood of the river. In time not only did an elaborate rail system develop to bring coal to the river but also the whole industrial basis of the region was built upon it. The development of the railways and the locomotive, the rise of the North East shipbuilding industry and the region's reputation as a centre of heavy engineering and industrial innovation were all a result of the mining and transportation of coal. The profit to be made in overcoming the obstacles presented in the navigation of the narrow, shallow channels of the River Tyne and plying the coal trade was at the centre of the growth of the town and the river - a trade which generated the national and international importance of Newcastle. By the end of the seventeenth century 90% of the ships leaving the port carried coal to London and other British ports as well as European markets. For many centuries ships on their return journey to the Tyne carried only ballast. A number of industries, notably the pottery industry, grew up utilising the chalk and flint contained within the ballast stone. On occasion some items of use were carried as ballast, clay roofing pantiles being one example. By the early eighteenth century, however, ships began to bring in the many and varied cargoes which fostered and supported the development of the thriving town and port of Newcastle upon Tyne. The Quayside was at the centre of this bustling activity.

SUNDAY 7th SEPTEMBER

WALK D - NEWCASTLE - RIVERSIDE AND RAILWAYS

1. SOUTH STREET LOCOMOTIVE WORKS, NEWCASTLE

The site was first developed in c1821 at a time of industrial expansion on the west side of Newcastle city centre. The development, on land leased from the Hospital of St Mary the Virgin, was known as Forth Street after the new service road to the site. The first building was erected in South Street as a foundry by Isaac & John Burrell. George Stephenson was a partner in the firm. The locomotive and general engineering firm, in his son's name, Robert Stephenson & Co was founded on the adjacent site in 1823. The Stephenson Company premises were the World's first locomotive factory. The company became one of the premier manufacturers of locomotives and other steam engines in home and overseas markets. The pre-1830 development occupied the east side of South Street. The buildings survive, albeit with partial alteration to roofs and interior layout. The site on the west side of South Street underwent progressive development and alteration throughout the nineteenth century. The main years of development were 1837, 1846, 1855 and 1867. The Burrell foundry site was absorbed in 1867.

Robert Stephenson & Co Ltd left the site in 1902 having established a new factory in Darlington. The various leases and premises were acquired by the General Post Office who occupied the oldest buildings (being the former Burrell's premises) and by R & W Hawthorn, Leslie & Co, the locomotive and marine engine company of the adjacent Forth Banks site, who absorbed the major part of the site to the west of South Street.

The Stephenson Company returned to the site in 1937 on its merger with Hawthorn, Leslie. The manufacturer of industrial locomotives by Robert Stephenson & Hawthorns Ltd and its successors continued at the enlarged 'Forth Banks' works to the West of South Street. Production at the site ceased in 1960 and the site was released for other purposes.

Whilst many of the buildings are incorporated within a DIY retail warehouse, No. 20 South Street survives relatively intact. It includes parts of the former offices but more significantly it features an important fully glazed wall which gave light into what was the boiler manufactory. The building is currently held by the Robert Stephenson Trust who are looking to develop the site as a museum to the life and works of one of the country's foremost engineers.

2. FORTH BANKS AND THE SKINNERBURN

The Skinnerburn was one of a number of streams which ran down to the Tyne, the existence of which is now almost completely forgotten. The stream ran along the west side of Forth Banks and in medieval times its steep sided valley helped to protect the western approach to the town. For many years the burn formed part of the boundary between the medieval town of Newcastle and the township of Elswick, until the two were united in 1835. The burn was later filled in.

In the eighteenth century the Skinnerburn, along with the banks of the Ouseburn to the east of the City, became one of the area's early centres of industrial activity. Along the burn were glasshouses, lime kilns, a large brewery, a pottery and a foundry. Houses grew up round these concerns but conditions for residents were unpleasant, the burn being, according to one historian, ' little better than an evil-smelling sewer '.

In the nineteenth century this area became closely linked with the growing railway and heavy engineering industries. In 1818 Robert Hawthorn opened a small engineering works on Forth Banks and was joined by his brother William in 1820 to form R. & W. Hawthorn. The firm was to become one of the largest engineering concerns in the region, with interests in both railway and marine engineering. Adjacent to the