

11. MINING IN HETTON: PART 1 – THE MAJOR COLLIERIES

We are not certain when coalmining started in County Durham but we know from excavations at the Roman camps of Ebchester and Lanchester that coal ashes were found then. The survey carried out in the Boldon Book in 1180 by Bishop Pudsey mentions the “coal smiths” of Bishop Wearmouth and Sedgfield who worked the coal from their own land. The importance of coal was recognised by 1239 when King Henry III granted a charter for raising coal to the townsmen of Newcastle-upon-Tyne. By 1250 coal mining was being carried out by drift mining at Finchale Priory where coal outcropped in the surface strata. Most of the early mines however were in the west of the county where the coal seams came close to the surface due to the tilt of the existing rock strata.

By the 14th century the demand for coal in the London area and throughout the near continent had grown so much that coal mines had opened on both sides of the River Tyne and as far south as Ferryhill. But by 1800 many of the early collieries had closed down as output declined and the search for other coal sources began. One of the major problems faced by the industry was the inconvenience of getting the coal to a river where it could be transported in bulk. Leading coals by private waggonway or by road was both tedious and expensive.

Although there were many small “bell pits” and collieries in operation in the Rainton area prior to 1820, production levels at each were not very significant. Coal was being worked successfully at the Dunwell Pit close to the eastern boundary of East Rainton by 1815 and had been doing so for the previous 20 years or so. Mining at Hetton, however is reckoned to have started with the winning of the Hetton Lyons Colliery in 1822.

This was not the first time that coal had been sought in this location for in 1810 the landowner John Lyon had attempted to sink the first pit in the area, and the first successful pit was later known as Hetton Lyons in his honour. The attempt bankrupted him and he was forced to give up the venture. There was also a widespread belief that the magnesian Limestone plateau which exists here precluded the possibility of practical coal production, so when eventually a few years later a further attempt was made to find coal it was done with some trepidation. Deep coal mining, at this point in time, was frowned upon as being a dangerous waste of time and this second attempt was looked on as being a doubtful experiment.

The following is a copy of a report made in 1816 when the guardians of Lady Francis Vane Tempest were considering buying the mining rights from John Lyon Esq.:

REPORT ON THE COAL MINES UNDER THE ESTATE OF JOHN LYON MADE BY MESSRS. STOBART, STEELE AND WATSON GIVING THE TERMS OFFERED BY LADY FRANCIS VANE TEMPEST FOR TAKING OVER THESE MINES.

22nd April, 1816.

We have viewed and examined the estate at Hetton belonging to John Lyon Esq. in the County of Durham and considered the situation thereof with respect to its containing coal, and on due examination of the metals put through in the boreholes that have already been made within the

estate in addition to the contiguity of the workings of the adjoining colliery at Rainton, we are of the opinion that out of the whole quantity of ground which the said estate contains viz. 851 acres, it is probably 571 acres of the Upper Main Coal and Hutton Seams will be found in perfection and may be fairly reckoned upon and will produce as follows:

CHALDRONS

Upper Main Coal 571 acres 6 feet thick will afford after allowing a reasonable portion for waste, 1938 Chaldrons per acre consequently the expectation from that Seam will be..... 1,106,598

Hutton Coal Seam 4 feet in thickness after allowing for waste will afford

1293 Chaldrons per acre and on 571 acres will yield 738,303

Total produce of Merchantable Coal1,844,901,

The above 1,844,901 Chaldrons will serve a vend of 60,000 Chaldrons annually for 30 years and we conceive from such vend being made an annual profit of £12,000 will be yielded. Therefore the total gains to be expected for the 30 years will amount to £360,000. We suppose it will require £60,000 to be laid out in winning the Colliery, laying the waggonways and with the other Establishment necessary to put the Colliery into a state to work 60,000 Chaldrons annually, but in the event of Lady Francis Vane Tempest not being able to renew the lease of Rainton Coal Mines with the Dean and Chapter of Durham, we calculate that the materials which will be supplied from that concern to go in aid of the winning will amount to £10,000, therefore in that case the net sum required to win this Colliery will be £50,000, leaving a total gain of £310,000:

This vend of 60,000 chaldrons was much smaller than the 100,000 later submitted by Mowbray and the Hetton Coal Company.

The document, following this preliminary assertion went on to advise Lady Francis Vane Tempest of the terms under which she should lease the mineral rights, and includes an interesting reference to an abortive attempt to win the Colliery made by John Lyon and his mother prior to her death.

11.1 The Lyons Colliery

In 1819 the Hetton Coal Company, the first major joint stock company in the north-east, was formed at the instigation of Arthur Mowbray, his son-in-law Archibald Cockrane and ten other shareholders. **(See the article on the Hetton Coal Company)**.The venture began, following negotiations with John Lyon and other landowners, at Hetton Lyons on the 19th of December, 1820, when Lady Cochrane cut the first sod and sinking operations commenced in February 1821.

The first shipment of coal from the Lyons mine was made to Sunderland Staiths in November 1822 along a specially built railway via Warden Law. The use of locomotives and inclines had been occurring at some collieries including Killingworth for a few years previously but the vision to use them throughout the eight mile stretch between Hetton and Sunderland was very much a step into the unknown.

It was in 1819 that the Hetton Coal Company owners decided to build a wagon-way from their new Hetton mine to the River Wear at Sunderland, a visionary decision at the time considering that the Company had no idea whether their coal mining efforts would prove successful. . George Stephenson was chosen as the engineer of the new eight mile long line (he had also been responsible for designing the Killingworth track) and after long consultations with his brother Robert he decided to keep to the natural contours and to use both locomotives and stationary engines. Some of the methods as well as machinery he initiated and adopted were still in use when the line finally closed for much of its length in 1959. The building of this railway was, in fact, as remarkable an achievement as the sinking of the pit shafts, not only from the engineering aspect but also from the financial risk to the investors.

It was a controversial point among geologists of the day whether coal existed beneath the 170 feet of magnesian limestone at the point of drilling, or whether the depth where the coal was to be found would be such that the coal would have so deteriorated in quality as to be worthless. Bearing in mind that this was the first deep mine to be drilled these doubts are not surprising. Once through the limestone some idea of the magnitude of the sinking of the shaft through the remaining coal measures became clearer. In fact it was later shown that there were a total of 94 beds of strata, coal being found at a depth of 109 fathoms (654 feet or 199 metres) (High Main). Further coal seams were soon to be found at depths of 131 fathoms (786 feet or 239 m) (Low Main) and then the Hutton seam at a depth of 148 fathoms (888 feet or 270m).

After the protracted and often difficult discussions between the Hetton Coal Company and the owners of the land, including John Lyon, which took in excess of 24 months prior to December 1820 when Lady Cochrane cut the first sod, it was another two months, in February 1821 before sinking the shafts actually started. Two shafts were sunk, an unusual procedure at the time, which were the Minor and the Blossom, the former being sunk to the Hutton seam at a depth of 144 fathoms (864 feet or 263 m). It was from this shaft that the first coals taken to Sunderland originated. The colliery was named as the Lyons Colliery after the owner of the land on which the mine was established.

These pioneering efforts did much to lay the foundations of the railways of the world and were evidence of the skill of the engineers of the day and of the faith and foresight of the local men who had made an 'impossible colliery' a success. These activities led to a great and rapid increase in the size of Hetton and over 200 houses for the miners were built at once, a few close to the colliery at Lyons but the majority at what is now known as the Brickgarth at Easington Lane where sufficient land was available. Hetton as we know it today did not exist then, it was basically a rural agricultural hamlet. Eventually the Hetton Coal Company acquired more land along the Downs Lane since as the colliery grew in size more workers were needed.

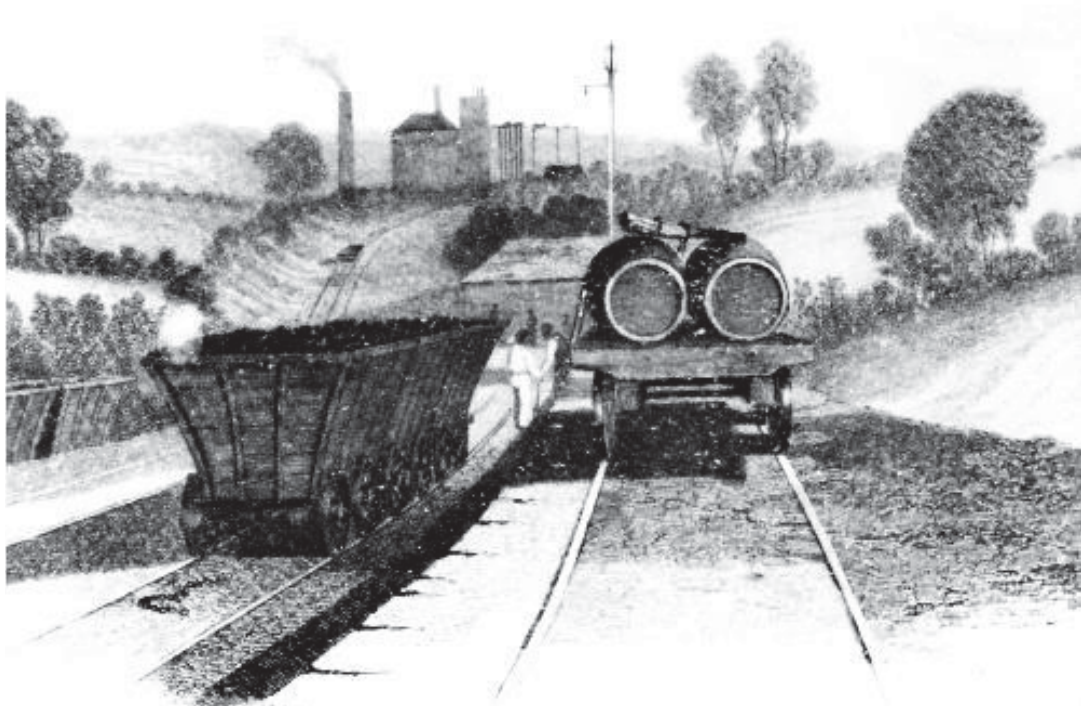
Some idea of the growth of Hetton caused by its industrialization can be gained from the census returns. The first census in 1801 gave the population as 212, in 1811 it had only risen to 264 but by 1821 it stood at 919 and, with the colliery established, it was growing rapidly. The village, however, was still a part of Houghton parish (eventually it and five other parishes were established from the large Houghton Parish). Hetton however, despite its population of just under a thousand, had in 1821, no less than 30 public houses and 5 breweries! There were also eight private schools or

academies in Hetton and Easington Lane (state schools were unknown) and local business folk included farmers, a miller, blacksmiths, a printer and publisher, tinsmith, stonemason and joiners. There were many shops and a physician; indeed the trade facilities were sufficient for those needed to support a town many times bigger than Hetton.

By 1825 two other collieries were being sunk, namely Eppleton Colliery no more than a half mile to the north east of the Lyons pit and Elemore colliery on land belonging to the Elemore Estate three quarters of a mile to the south west of the Lyons Colliery.

The pits in and around Hetton all faced the problem of water seeping into the workings. It was, to a degree controllable but needed constant attention. Over the years steam pumps were introduced in place of manual or horse pumps and gradually these were able to combat the large pressure of water found in wet strata. A serious burst through of water could devastate a whole mine in a short period of time if not remedied. By 1897 a steam pump could draw out 1000 gallons or more of water per minute.

In the Hetton area there were large sand dunes, laid down in the geological period 250 million years ago, which the shafts had to pass through and there were occasions when the influx of sand into the workings was not only dangerous but costly to control. Progress and improvements to mining machinery went on apace and these to some extent took away the tedious and slow drudgery endured by the early sinkers. Productivity increases were important also and machinery contributed both to coal output and health and safety. Improved ventilation not only increased output but also lessened the possibility of explosion of the gases underground. In the early days of the Hetton pits there was serious loss of life due to accidents and explosions.



*Part of the Hetton Railway with Hetton (Lyons)
Colliery in the background*

Some facts about Hetton (Lyons) Colliery

When the Lyons Colliery became operational in 1822 the temperature at the shaft bottom was 66 degrees and 70 degrees in the workings. The shaft was 15 feet in diameter and divided into three equal parts. The pumping engine for the shaft was 300 Horse Power and set in a strong stone building close to the shaft. The engine was supported by four large boilers. There were two winding engines used to haul up men and the coal brought to the surface. Each winding engine was supplied by two boilers. Two extra boilers were always kept on stand-by in case there was breakdown.

The rope for drawing the coals was made from hemp and wire, known as a composite rope. It was 220 fathoms (1320 feet, 402 m) in length, weighed two tons and cost over £100 (approx £10,000 today). Two cages came up at a time, each containing a tub carrying between six and nine hundredweights of coal (304 Kg – 457 Kg). The combined weight lifted (cage, tubs + coal) was estimated at 35 cwts (1750 KG) .

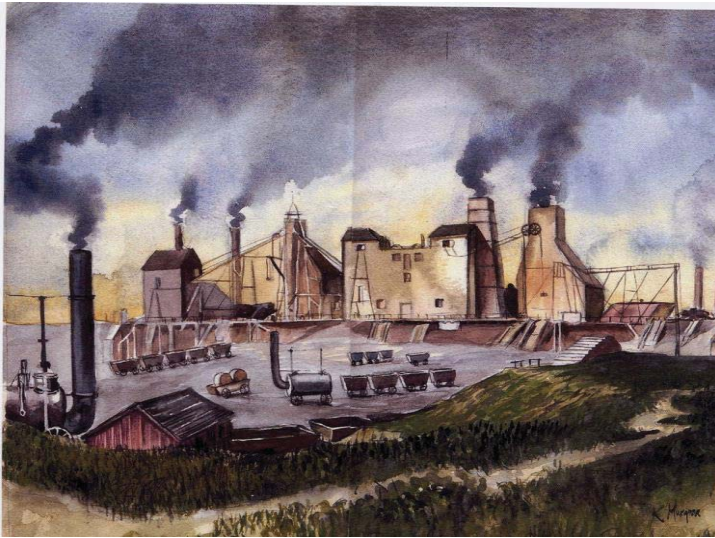
Over 600 tons of coal was brought to the surface every 18 hours- this is equivalent to 653,172 Kg. This amount of coal would fill at least 30 river barges or keels. Thus it was easier and obviously cheaper to ship this daily amount of coal directly to the loading staithes by rail where it could be dropped straight into the waiting colliers.

Initially there were about 300 men and boys employed underground and a further 180 above ground. By 1880 this had grown to 600 underground and 300 above ground with a daily output of approximately 1000 tons of coal produced on a daily basis. Ventilation underground of both the Minor and Blossom pits was maintained by furnaces and boiler fires. The three furnaces for the Hutton seam for instance circulating 180,000 cubic feet of air per minute.

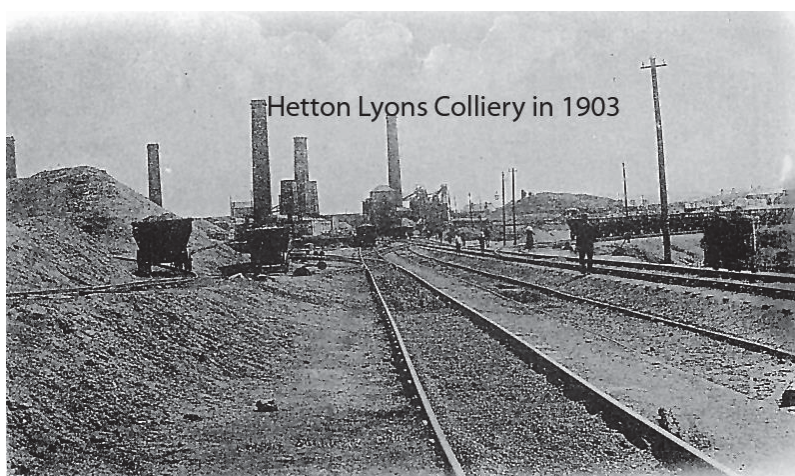
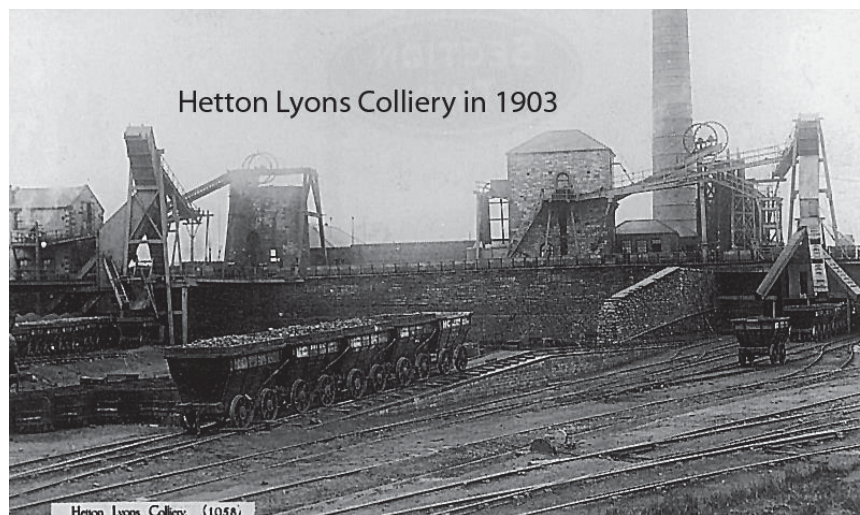
After 1880 two hundred beehive coke ovens were built above ground close to the colliery and an additional seven boilers were required to produce sufficient heat during the process of coke making. By 1885 the colliery was also involved in brick making at a brickworks close to the shafts where it could acquire the clay needed from underground. . With the advent of coal gas towards the end of the 19th century the colliery had established a gas works and gas was sold to private houses and public utilities such as local councils who provided street lighting and to companies who used it for industrial purposes e.g. making tar.

Working conditions during the first fifty years following the opening of the colliery can only be described as very bad even at the best of times. The miners and their families lived and worked in terrible conditions. Little attention was paid to fair wages or protection and safety of the workers whose treatment almost inhuman.

Hetton Lyons Colliery



A painting by Ken Munro of Hetton showing a representation of T.H.Hair's etching of the Lyons Colliery



Hetton Lyons Colliery



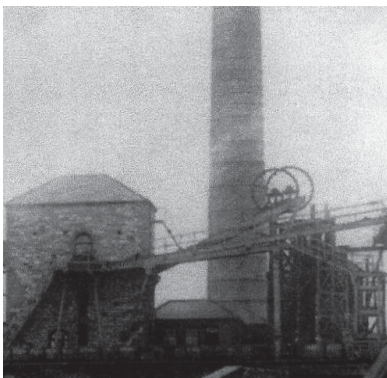
The two pictures relate to the closure of the Lyons Colliery by the National Coal Board in 1959. The colliery had by this time become unproductive and the coals from the working seams could be brought to the surface at Eppleton colliery. The picture on the left is taken at Durham Miners' Gala, the other in Hetton.



This picture taken in 1991 shows the remains of the pit canteen and colliery offices. Shortly after the photo was taken demolition took place



This photograph from about 1910 shows the colliery railway weighbridge. It was customary for all trucks which passed along the Hetton Railway to be weighed

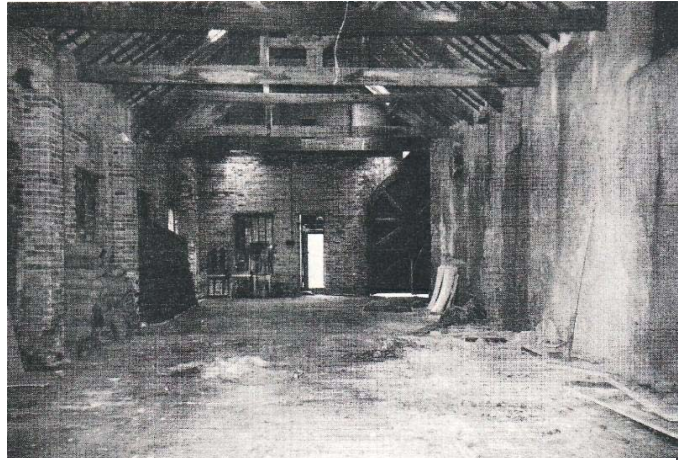


On the left is a photo of the Colliery chimney to the rear of the headgear, the other shows the base of the chimney being prepared for demolition in 1959

Hetton Lyons Colliery

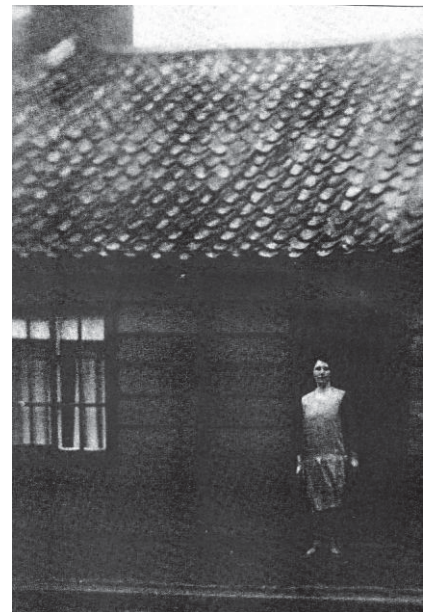


The Pit Yard



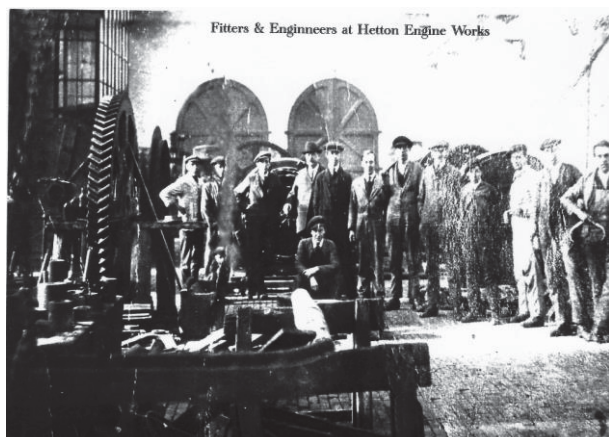
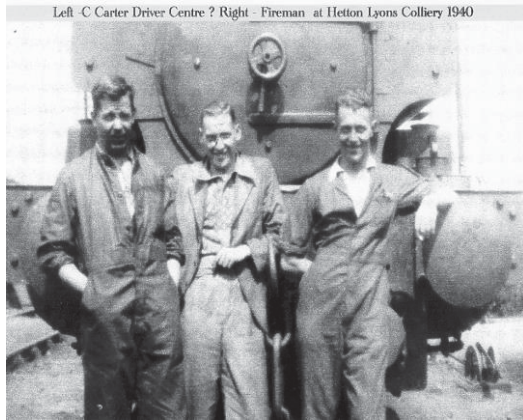
Above: Locomotive shed and engine works formerly used by George Stephenson for the building of his famous "Puffing Bilies"

Below a photo of one of the two pubs at the Lyons. The pub's rear yard backed on to a colliery boiler house. Right:- One of the original miners' cottages built of wood for the sinkers who sank the shafts in 1820



The Miner's Hall in Richard Street, Hetton. Which contained games rooms, a reading room a library and offices. Union meetings were also held here.

Hetton Lyons Colliery



Men who worked in the engine works and on the colliery railway at Lyons Colliery. Note the large stationary engine pulley wheel on the left.

Colliery Disasters at the Lyons Pit

It was often said that the Lyons pit was a safe pit but nevertheless it had two disasters with 22 men and boys killed on each occasion, the first in 1834 and the later in 1860. An account of the 1860 disaster follows below:-

Disasters in Durham coal mines were in the early days of coalmining all too common. What makes this one stand out is that it took place just five days before Christmas and the whole community felt its effects. On the 20th of December, 1860 an explosion occurred at the Hetton Colliery, Durham, by which 22 men and boys were killed. Fortunately this occurrence took place in the evening soon after some 200 men and boys had ridden to bank, and when none but the stone-men were down the pit, or the result would have been more terribly fatal. There does not appear to have been any suspicion of the presence of gas in this case, for the reports as to the ventilation, timed up to a very short period before the disaster, exhibit confidence in the quality of the air content of the pit from that dangerous element.

There were three collieries that constituted the 'Hetton Collieries' and they were owned by the Hetton Coal Company. They were the Hetton, Elemore and the Eppleton pits and they were about a mile apart from each other with the Hetton pit in the centre, Elemore lying about a mile to the south west and the Eppleton which was also known as the Downs pit lying the same distance to the north east.

All the collieries had separate ventilation systems with two shafts at each colliery, one a downcast for the air to be pushed into the workings and one an upcast where the exhaust gases and air could be drawn out.

Two seams were worked at the Hetton colliery, the Main Coal Seam at 109 fathoms and the Hutton Seam at 148 fathoms. The Low Main Seam at 131 fathoms had been partially worked but was not worked at the time of the disaster. The colliery had three ventilating furnaces in the Hutton Seam and one in the Main Coal Seam.

In the past, gas from the coal had exploded at the boiler doors working the furnaces but no damage had been done but in the case of this tragedy there was a long and nearly level flu in which a large amount of gas accumulated and it was here that the violent explosion originated

The group of men and boys who were all killed worked in the Minor pit and were known as stone men. Their job was to go into the workings after the main workforce had left the mine with the express intention of clearing away stone and other debris from the working areas and to clear roadways and make good repairs and refuges ready for the next shift coming in after them. Thus many who were killed were employed as shifters, i.e. those who shifted the stone and debris.

Those who died were:-

- William Marley aged 58 years a furnaceman.
- John Greeves aged 20 years a timber leader.
- Ralph Ross aged 16 years a timber leader. His father was in Australia and he supported his mother, two sisters and two brothers who were at work but reported to be delicate. These three were found near the furnace in the West Minor pit.
- Thomas Robinson aged 36 years a hewer.
- Henry Wonders aged 28 years a hewer.
- George Walton aged 16 years a putter.

Three were found in the workings up the new incline:-

- J. Soulsby aged 16 years a timber leader.
- James Walker aged 32 years a deputy.
- Fr. Gray aged 29 years a deputy.
- Joseph Scott aged 50 years a shifter.
- Thomas Wright, aged 43 years a shifter.
- John Jobling aged 40 years a shifter
- Thomas Sunderland aged 32 years a shifter. He supported his mother and two sisters and two children whose father had gone to Australia.

Three men who were making refuge stalls in the inclined plane of the Ridding South wagon way:-

- John Gibbon aged 63 years a shifter.
- John Ferguson aged 62 years a shifter.
- Anthony Young aged 52 years a shifter.

Two men who were riding in the south wagon way:-

- James Box aged 20 years a shifter
- Robert Hall aged 17 years a shifter.

Three men who were repairing timber at the station in the South-east Drift:-

- Thomas Mitchinson aged 61 years.
- Robert Wilson aged 54 years a shifter.
- John Lowdon aged 63 years a shifter.
- The inquest was held some days later at the Colliery Hotel, Hetton-le-Hole before Coroner, Thomas Christopher Maynard. George Lowden, overman, told the court that he went to work to examine the workings at 2.20 a.m. He had two colliers, Robson and Warders and two boys Walton and Soulsby under his charge. He was also with the rescue party and found the bodies of Hall, Box and Richardson in the return.

- Edward Wailes Hall was the master shifter at the colliery and one of the first to descend after the accident. He said:-
“I went to the pits and found there was no means of getting down and proceeded to Downs Pit and went down it. When I came to the wagon way I found all the timber had been blown down and several falls from the roof in the way. I got over a very large fall but the afterdamp prevented me going further.”
- Thomas Smith a master shifter in the colliery was down the pit at the time of the explosion. He was blown over and when he regained his senses he found that the ventilation was going the wrong way round the pit. He gathered some men together and led them out of the pit.

The inquest jury returned the following verdict by accident:-

- “We find that John Greaves and 21 other persons on the 20th day of December now last past, came to their deaths at the East and West Minor Pits at Hetton Colliery by an explosion of inflammable gas which had accumulated in the flue heading from the boiler of Davidson’s engine to the upcast shaft and which had not accumulated in the workings.”
- At the conclusion of the inquest it was suggested that, in order to prevent similar occurrences in the future, flues should be constructed to have a continuous rise. The fire in the north stables was not extinguished for about six weeks.

The cause of this explosion was easily established but in many explosions the reason for deaths and injuries was never explained. Coal Gas which did not explode was also very dangerous and there are numerous reports of deaths in pits due to the effects of inhaling toxic gases. In the past explosions were common and due largely to the exposure of the gas to a naked flame. It took many years and numerous generations of miners who suffered untold harm until legislation was brought in to prevent the dangerous use of naked lights underground and eventually led to the widespread use of the miner’s safety lamp.

Throughout 137 years of work carried out at the mine it is believed that in excess of 160 men and boys lost their lives in the colliery.

11.2 Elemore Colliery.

Undoubtedly the success of the Lyons Colliery was instrumental in providing the initiative to sink shafts a mile to the south west on land which was owned by the Baker Baker family who resided at Elemore Hall. At first the Baker Baker family investigated the likelihood of a pit on their land but within a short time realised that their expertise in mining was lacking and shortly after work began in 1823 the Hetton Coal Company took over the total management and ownership of Elemore Colliery.

The first valuation of the colliery to be sunk at Elemore was dated July 17th 1824. For an estimated outlay of £67,984. 14s. 0d (£67,984.70p) it was assumed that the annual production figure would be 60,000 tons yielding £23,750 per annum. This was a good return considering that the possible lifetime of the venture would exceed 60 years.

The sinking of the George and Isabella shafts began on 25th March 1825. The shafts were approximately 134ft (41m) apart – there was a geological dip fault of 41ft (12.5m) between the two shafts, which meant that the coal seams were encountered at different depths in each of the shafts. The shafts were named after George and Isabella Baker from Elemore Hall. George was a partner in the mine and owned the land on which the shafts were sunk. At the outset the two shafts were worked as separate pits, not as with present day regulations, upcast and downcast for ventilation purposes. Each shaft was divided by wood bratticing and had a fifty horsepower winding engine. The engines were installed ‘back to back’ in a double engine house built between the two shafts with the wooden headstocks situated above the shafts equidistant from their respective engines. It seems that the design and technology of the surface machinery of deep mines was already well known.

The diameter of the George Shaft was 12ft.6ins. (3.8m), and the diameter of the Isabella Shaft was 8ft.8ins. (2.6m). The Hutton Seam was reached in the Isabella shaft on 5th February 1827, at a depth of 756ft. (230m), almost two years after work began. It was not until the 5th July 1827 that the main coal seam was reached in the George shaft at a depth of 565 ft. (172m). The quality of the coal in the two shafts varied with the best coal coming from the Isabella shaft which also had a deeper seam.

Once the coal was brought to the surface it was despatched by rail in wagons called chaldrons via a rail branch line extension of about a mile from a junction close to the Lyons pit. From here it was run to the staiths at Sunderland along with coal which originated in the Lyons pit. For the next four years the Isabella shaft continued to work the quality coal of the Hutton seam whereas the George shaft worked the inferior coal from the Main coal seam. During the ensuing four years the George shaft was extended to a depth of 840 ft. (256m) and divided into two separate units called the George and Lady pits. At this greater depth the quality coal of the Hutton seam was reached which became the principal coal worked throughout the colliery.

In 1831 twenty six horses were employed to pull coals to the Shaft bottom in the Isabella pit and in the George pit six horses were used in the Main coal seam and a further eighteen in the Hutton seam. For the next 20 years the work in the pit progressed without much change, but following a re-organisation in 1850 production levels were increased and the George shaft became the more important with the development of the Low Main coal seam at a depth of 677ft. (206m) where good quality coal was found in a 42 inch thick seam. There were also considerable changes to the furnaces which improved the ventilation of the working faces and roadways in the mine. In 1880 a single furnace was installed sufficient to meet the needs of the whole colliery.

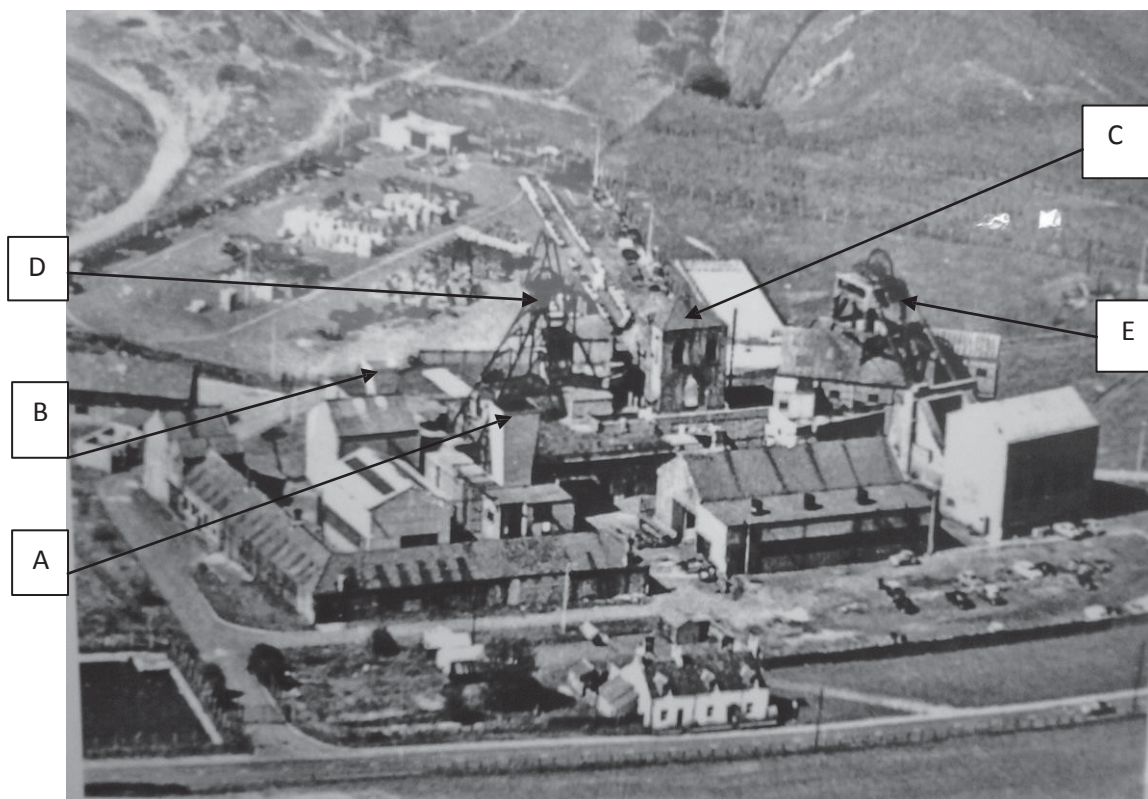
During the early years of Elemore the coal had been lifted to the surface in corves (wooden boxes on wheels) but after 1860 new cages were fitted to accommodate the tubs which had become the general practice throughout the Durham coalfield. Coal was cut at the face through a method long practiced called ‘bord and pillar’ where walls of coal were left in the workings to hold up the roof. This method was replaced by longwall coal extraction at some point in the middle of the 19th century.

The colliery expanded during periods when demand for coal was high but occasionally, when sales both home and abroad dropped, production levels were severely cut back. During these slack periods wage levels fell and many a mining family was faced with hardship. Occasionally production levels were so low that miners faced redundancy. By and large, up to 1890, Elemore prospered and miners’ pockets were full when paid at the end of each fortnight.

In the 1890s a crisis loomed as some seams, mainly the Low Main and Hutton were worked out and there was increased competition in a shrinking market. Additionally a strike lasting 13 weeks in late 1892 contributed to the problems. It came to a point early in 1893 when the pit was closed with the workforce, where possible, transferred to Eppleton Colliery.

During the next five years new sources of coal were sought at Elemore and the development of the Five Quarter seam at the beginning of 1898 saw the colliery re-opened and continue for the next 70+ years until its closure in 1974. During further boring new sources of coal mainly the Harvey seam and the Busty seam, were located and they became the mainstay. From 1947, following the formation of the National Coal Board, Elemore pit continued in operation until 1974.

Employment at the colliery in the early 20th century always exceeded a 1000 men and boys, the peak year being 1947 when just over 1600 men worked there. By its closure in 1974 less than 400 were employed.



Aerial photograph of Elemore Colliery

Photograph Courtesy of the Bob Moody collection

This aerial picture (from the Bob Moody Collection) shows Elemore possibly in the late 1960s/early 1970s (closed 1974, though demolition didn't start until around the early 1980s). The George Winder/Engine House was the first to go but it was reinstalled at Bentinck Colliery in the Nottingham coalfield.

The picture (taken from the south looking north with Elemore Lane in the foreground, note the pit reservoir bottom left corner) has captured the colliery in its later years after its 3rd and final reconstruction, The large white dwelling house is still present as is surprisingly the small garage.

The large L shaped workshops (Lower middle left) date from the 19th century, while the large single funnel of the Sirocco Type Fan (in the centre of the Workshops, A) dates from the late 50s/early 60s NCB reconstruction. Incidentally the Hetton Coal Company were one of the earliest to adopt this type of ventilation, replacing the Smokey, an expensive and inefficient furnace system that was used from the early days. It is just possible to make out the smaller funnel of the earlier fan house (B) to the north behind the new winder/ engine house, which would have almost certainly have been steam powered and possibly retained as a standby.

The new electric winder for the Isabella shaft (upcast shaft) required a new lattice headstock (now facing west) which in typical NCB fashion was of a purely functional design that replaced the possibly original wooden headstock. The new headgear was built over the old (hence the greater height) so that winding could still continue using the old original steam winder to the right during construction. Once completed the old headstock was dismantled and the original steam winder (middle) was abandoned and sat neglected until the mine closed (C). It has been said that it was the last in situ of its type, and initially there was talk of a preservation order but sadly Durham County Council were uninterested and it was lost to demolition. Beamish Museum archives have many pictures of the internal workings and there had been a possibility that they would dismantle and preserve it at some stage. A similar but smaller version exists at the Beamish mine today.

The main shaft buildings that the Isabella headstock (D) sits on, and the old winder, are thought to have been the oldest on site dating from the early shaft sinking. To the right in the beefy headgear of the George Shaft (downcast shaft) (E) which dates from the 2nd major reconstruction possibly around the late 1800s. The original headstock actually had two winding engines at right angles operating from the one shaft (which had separate names George/Lady Shaft), which explains its rather odd angle compared to the Isabella shaft.

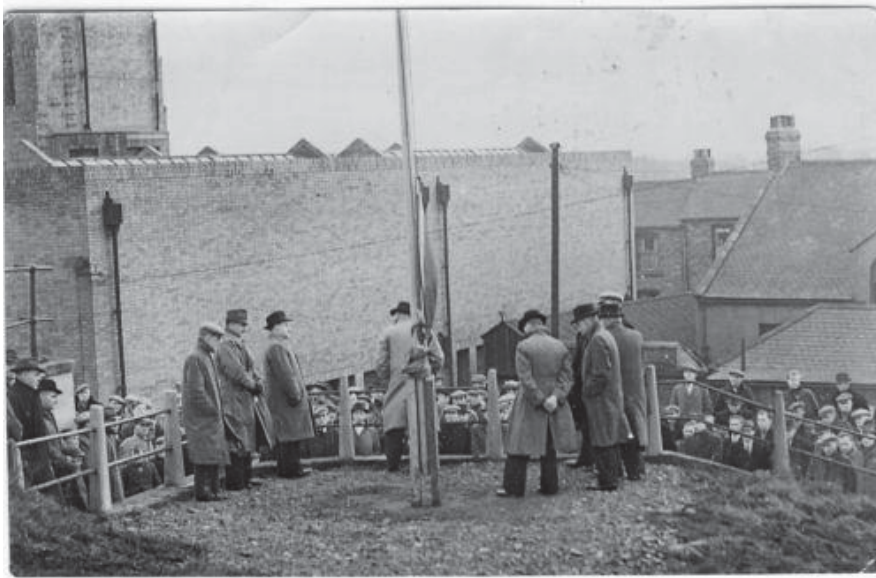
The George shaft also retained part of its old steam winder gable end because its stay legs were attached to it. This was a large and impressively styled building but sadly the need for modernisation meant it required a new functional electric winder built just behind the old one; unusual that it was mounted side on instead of the more usual orientation with ropes coming out of the gable end (Seaham Colliery No1 Pit was also a side mounted, one of only a few in the country).

Above the two headstocks can be seen the new 1960s stockyard with narrow gauge railway. This was abandoned after the mine closed. Interestingly the stockyard was also the site of the screens and washing plant which were still in place until the whole area was landscaped. It still had its rails in place. The fencing and lamp posts to the right are still there but damaged, rare relics, which give a small clue to the site's past.

The pit heap to the top left was one of the largest in the area. It is now a golf course but it is still possible to make out the line of the former wagon way linking it to the Lyons Colliery, an extension of the Hetton Railway. Elemore became part of the Hawthorn Combine Mine in the mid/late

1950s, which was constructed close to the nearby village of Murton, and consisted of a new central shaft, coke works and washing plant which made the plant at Elemore redundant.

Today the site has been landscaped and Elemore golf course has taken over the former pit heaps. One of the old chaldron waggons from the Hetton Coal Company sits near the entrance. However to the right of the picture (not in view), the strikingly styled F.D. pit head baths remain, now a listed building as it was one of the first in the country, but they are in need of maintenance. Dated from 1935, its upkeep was paid for by the miners themselves, with royalties from the miners' pay packets each week. To the right of the baths a small handful of buildings remain whilst on the opposite side of the road the former canteen (from the 3rd reconstruction early 1960s?) now lies derelict. It was used for a time by a coach company following closure but is now drifting into dereliction. The colliery wall also remains and can be seen in the photograph just north of Elemore Lane.



*Opening of the pit
head baths at
Elemore in 1933*

(Internet picture)

Accidents and Disasters

Throughout its lifetime it is believed that over 160 men and boys lost their lives in the pit. Most died as a result of individual incidents but others died when a major disaster occurred.

The winning of coal has always been a hazardous occupation and Elemore was generally accepted as being a "Safe" pit by both men and management. Nevertheless accidents occurred and at times but with improved safety measures within the mine, in its latter years Elemore had a very good safety record.

As early as 1834 the owners, The Hetton Coal Company, following an accident in that year when a steam boiler exploded killing one man and severely injuring three others, started an accident fund (Relief Fund) whereby each employee contributed from their fortnightly pay and the company added one sixth to the total of the fund. The money went to help the wives and dependents of those who were killed or maimed as a result of a mining accident.

This fund also assisted the miners at Hetton and Eppleton. Throughout the lifetime of the colliery it was a significant help to bereaved families though the amounts provided were a lot less than the money which could have been earned by the miner.

By far the worst accident at the pit took place on Thursday 2nd December 1886, at approximately 2 a.m., when 41 men were working underground. At the time a number of deputies were waiting at bank, ready to descend in order to examine the workings ready for the day shift, suddenly when they heard the sound of a muffled explosion accompanied by smoke, dust and debris thrown up the downcast George shaft, covering the recent snowfall with a grey dust.

The news was immediately sent to Mr Lishman, the Viewer (Manager) and to other viewers and under-viewers at the surrounding collieries. Following the removal of several bodies by rescuers who went underground, work commenced on clearing the debris from the two George shafts and by 10.00 o'clock this was completed enabling the eleven men working in the Hutton seam to be rescued alive.

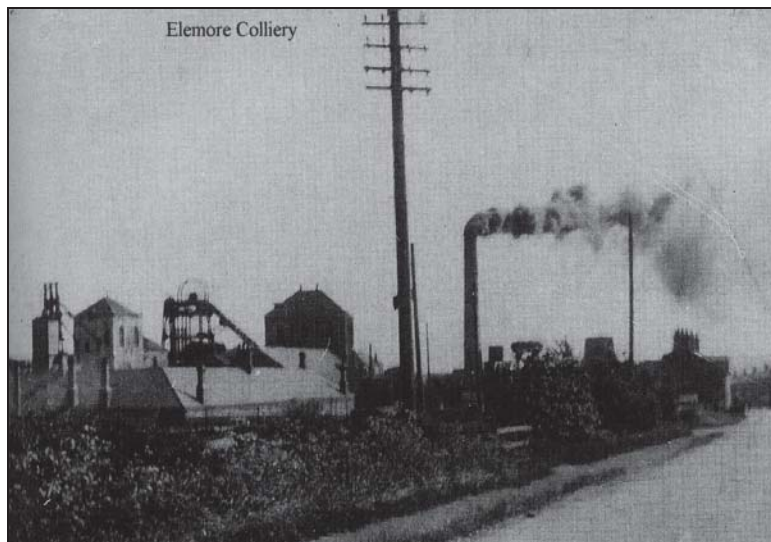
As daylight came, word spread through the community that there had been an explosion at the pit and people began to congregate in their hundreds, in spite of the cold, waiting for news. The rescue attempts continued throughout daylight hours to try and reach the trapped men. Progress, however, was slow since blockages had to be cleared in the Low Main seam and debris removed. Additionally the ventilation had to be restored to ensure the safety of the rescuers. At bank the damaged cages from the George shaft were being refitted ready for use.

By nightfall fifteen men had been rescued, but twenty one were still trapped and four were dead since two succumbed shortly after rescue. Nevertheless there was hope for those remaining in the mine and rescue teams continued to arrive.

It wasn't until Saturday morning, two days after the explosion, that all but one of the trapped men had been found. Alas they were all dead. All told twenty eight men and boys were killed in. A relief fund was established within a day of the disaster to take care of the eighteen widows and thirty six children.

The funerals were held with great solemnity in front of a very large crowd estimated to be in excess of ten thousand, drawn from the community and outside. Once the burials had been completed the relatives placed wreaths on the graves.

Following a lengthy investigation during which expert witnesses were called, the reason for the explosion remained a matter of conjecture. The preponderance of the evidence suggested that the explosion was caused by the firing of a shot in the location where the explosion took place. One of the witnesses suggested that the explosion could have been caused by a mixture of gas and coal dust, but all were agreed that there had been no infringement of the safety rules regarding the use of naked flames. So the exact circumstances surrounding the explosion will never be known. It is significant however, that, following the explosion at Elemore, the Hetton Coal Company never again used gunpowder for shot-firing, preferring the safer gelatine dynamite in water cartridges fired by electricity, for the purpose.



Elemore Colliery c.1900



Elemore colliery at closure in 1974. The headstock at the left is of the George shafts, following a series of reconstructions. The other headstock is the Isabella shaft, the first shaft sunk in 1827.

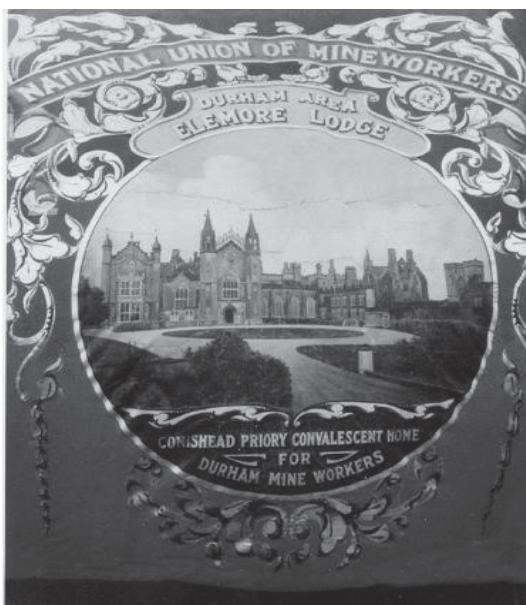


Elemore colliery in 1974 showing the small funnel of the early fan together with the fan house. Note the double winding wheel on the George headstock to the left.

*Elemore Pit Head Baths
mid1980s. Opened in 1933,
there are very few windows
as the flat roof has a number
of skylights providing light*



*A pony and putter at Elemore
colliery sharing bait (sandwiches
etc) during a break in work. The
stables for the ponies are behind
the putter*



Elemore Colliery Lodge Banner

11.3 Eppleton Colliery

The sinking of Eppleton Colliery was started following an agreement by the Hetton Coal Company with local landowners Francis Maskall and his son Francis on October 5th 1824. However, the venture soon ran into problems. So much debris was found during excavation of the shaft that the attempt was condemned as futile by leading mine experts of the period.

Another effort was made the following year and, after boring through 22 fathoms of limestone, sand and water poured into the newly dug shaft. This was a great setback. The sand originated from underground dunes formed about 250 million years ago. Additional pumps put in to pump out the water were unable to contend with the volume seeping into the shaft until newer much larger pumps were brought in. It took more than seven years, until August 1st 1833, before the Main coal seam was at last reached.

Just three years later, on January 28th 1836 the colliery suffered its first major mining disaster when 20 lives were lost in an explosion. The following year after a period of settling in, saw the start of the sinking of a new shaft, the Jane shaft which contributed to the eventual success of the colliery. Coal production increased steadily over the next 50 years and a report in Whellan's Directory in 1894 stated that 150 tons of coal came to the surface every hour after the installation of a very powerful winding engine.

In the late 19th century the pit employed almost 1500 men and boys with an average output of around 3000 tons per day. It outstripped the nearby Lyons colliery owned by the same company. In fact many of the underground workings of the two collieries were joined as if they were the same pit.

Miners worked at 174 fathoms (1,044 feet) in the Main seam and the ventilation of the mine was achieved using furnaces and boiler fires at the shaft bottom. Fortunately there were no major disasters at the pit although there was a steady count of deaths due to accidents both in the colliery and on the surface. The coal produced was shipped along a branch of about half a mile in length from the Hetton Railway as it ran on its way towards Copt Hill and Warden Law. The sinking of a new shaft, the New Pit, or Lindsay Shaft commenced, in 1870, and on the 16th March, 1874 it started coal drawing. The Jane and Caroline engine houses were built in the autumn of 1880 and an electrical signalling system was installed in the Caroline Shaft and commenced manriding in April 1883. This brought further prosperity to the community of Hetton as more miners were needed to draw the coal.

Eppleton, now with three shafts on daily coal drawing, was proving to be one of the major collieries of the area, and as it grew, so too did the community. With three collieries operating Hetton had become a closely knit mining community. The houses being built in the village were much improved from the original ones provided by the coal company in the early days. Each house generally had an allotment close by which did much to improve the welfare of the mining families.

The new century brought a feeling of optimism after a rather unsettled period during the 1890s when the coal trade fluctuated in its fortunes. Hetton was now a true mining community. In 1821, the population of the Hetton district was 919, and had risen by 1895 to over 12,700 and became an

urban district consisting of three wards, Hetton, Hetton Lyons and Easington Lane. With improving working conditions and higher wages in the mines, and a strong union to support them, improvements were evident in the life of the community. The outlook was good and the quality of life was more stable. This was also apparent with the building of Aged Miners' Homes in the county, relief funds for injured miners as well as death funds for relatives, welfare institutes, and playing fields and parks. There was an emphasis on non-work time which had never been the case previously and it is reasonable to suggest that the men building the local community, were also among the early pioneers in the kind of ideas which later helped to establish the modern Welfare State.

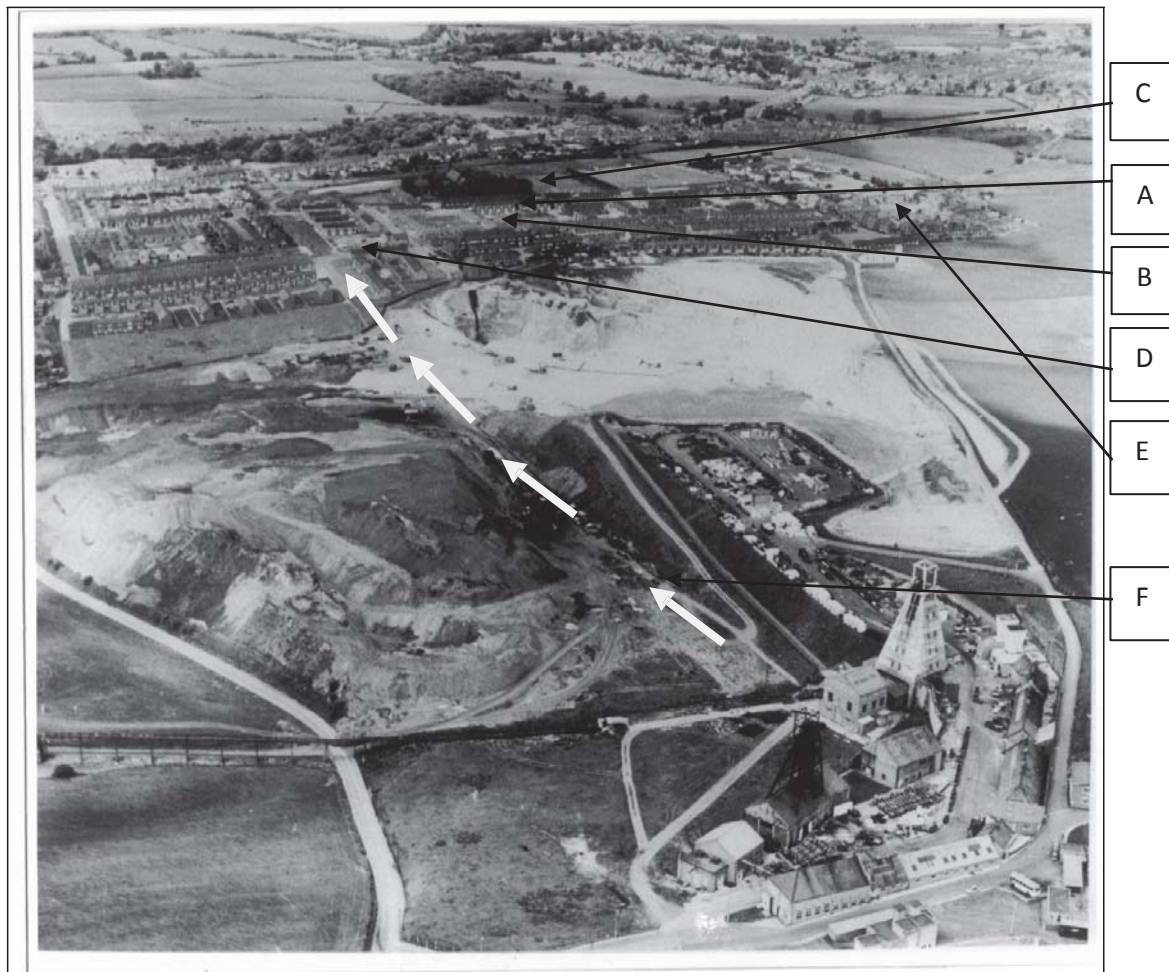
The year 1911 saw the pit pass into the ownership of the Lambton and Hetton Collieries along with the other pits owned by the Hetton Coal Company. Consolidation of mining in the area was necessary to reduce competition and operating costs. The change most welcome to the Eppleton Miners and their families was the building of the pithead baths. They were erected by the Miners' Welfare Committee, made up of representatives from the workforce, following the passing of the Mining Industry Act, 1926, which made provision for the building of such baths. The official opening, on 26th April 1930, was by Mr Austin Kirkup and the initial Management Committee. The Company was bought out by Lord Joicey, a prominent local coal owner, in 1934 and the Lambton, Hetton and Joicey Coal Company was formed. Difficulties had been experienced throughout the industry during years of depression and the reduction of both home and world markets exacerbated the situation. Even though Eppleton Colliery became one of the most profitable mines owned by the newly-formed company, the increased production of coal was only realised during the latter years of the second world war when the industry came under the control of the Government. Following the ending of the war in 1947 the National Coal Board was formed and by this time the colliery employed almost 2000 miners producing 459,245 tons of coal in that year.

However, this productivity was not to last long, for within three years two of the seams, the Hutton and the Main, were worked out, although four others, the five quarter, Maudlin, Low Main and Busty were still active and productively sound.

Disaster struck on July 6 1951, just a few weeks after the Easington Colliery disaster, when an explosion caused by an accumulation of firedamp left nine miners dead.

At the start of the new decade in January 1960, Eppleton Pit became part of the Hawthorn complex in a consolidation of mining interests in the area. The new combined mine based near Murton brought partial closure of some of the Eppleton facilities with the Caroline shaft being demolished in 1968. The pit finally closed in March 1986 after a full merger with Murton colliery. The closure was of course a detrimental milestone for the community who had, for the previous few years, been subject to the consequences of a disastrous miners' strike and the continued reduction of the Durham and Northumberland coalfield.

Eppleton Pit was open for a period in excess of 150 years which saw many changes. It was for years the most lucrative and economically sound of all the pits in Hetton-le-Hole. It also employed the largest number of men and boys and formed the basis of the wider community in Hetton. Once it had closed the land had to be reclaimed, a process which is still continuing.



Aerial view of Eppleton Colliery and High Downs (Picture courtesy of the NCB taken around 1975)

The picture shows the reclamation of the no.2 spoil heap. Just over 10 years later the mine was closed. Note the overhead gantry over Pit Lane - this was a conveyer belt for tipping stones on to the No.3 heap.

The picture has captured High Downs and the building of the present day Jane Street (A) and High Downs Square (B) (Opposite Eppleton Church, itself demolished in 2011) The present day "Pearsons Estate" is yet to be built on what was once part of the Eppleton Wagon Way, locally known as the "Store Field"(C). Interestingly the area leading up toward the mine which was once a very deep cutting with a bridge at Church Road and a small tunnel at the top of Downs Lane, (to the left of the present day Lady Street, which looks recently filled in) has yet to be tarmaced, as the road system will shortly be changed, The grassed area near the Top Shop which was also the site of two Schools(D) shows some activity.

To the top right, Low Downs Square is also under construction (E). The old whitewashed Eppleton School (just above) was quite a landmark and could be seen for miles around. Looking south from this point you will notice the old terrace rows of Henry Street (demolished 2011), Collingwood and Lindsay Streets (demolished early 1980s). The huge quarry dominates the picture (note how close it is to the houses) with the Top House Pub near the old quarry entrance (demolished around 2000) and the cliff top which was originally known as High Downs Hill, and once had a few houses

(possibly quarry workers' cottages). However in later years it became an area of Garages and a few allotments. There was also the colliery manager's house very close to the road (it is just possible to make it out opposite Lindsay Street). This whole area has since been removed by the quarry workings.

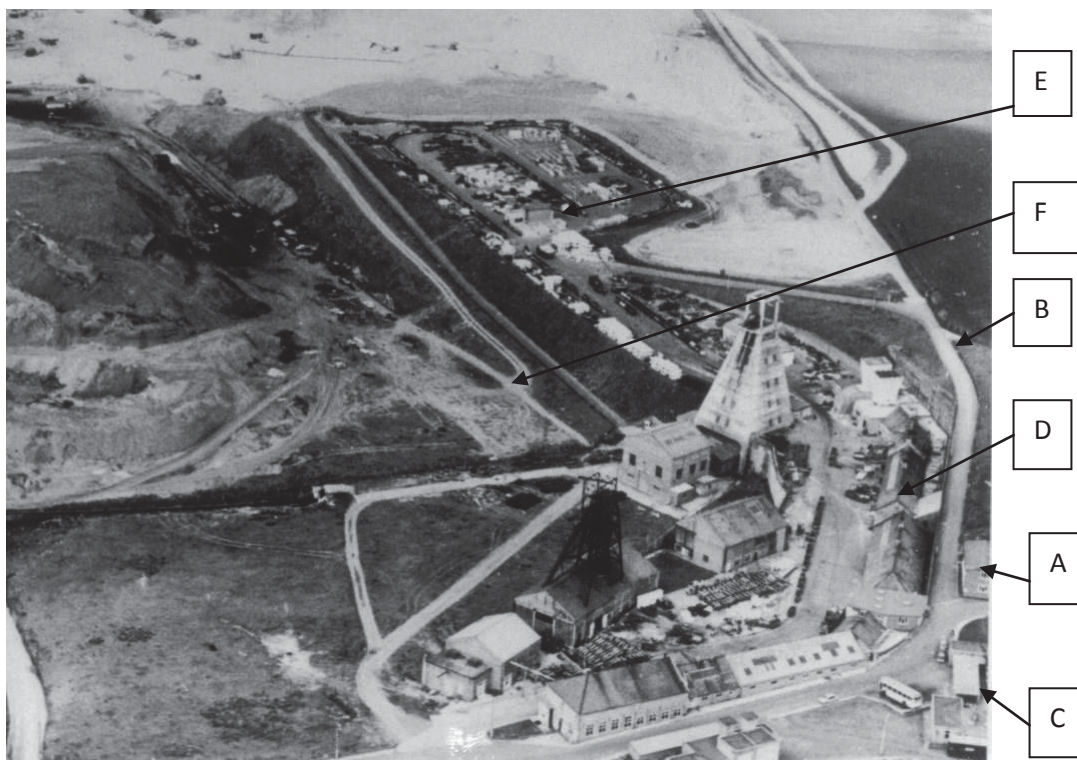
The track of the old railway heading away from the pit (F) can be seen although the central part is obliterated by the changes to the quarry and pit heap. The railway was demolished in 1959/60 once the Hetton Railway closed. The white arrows on the picture show the route of the railway.

The large pyramidal pit heap No.2 has largely been removed by the big drag-line machine in the picture and the spoil has been distributed and "buried" in the quarry or put on other nearby heaps.

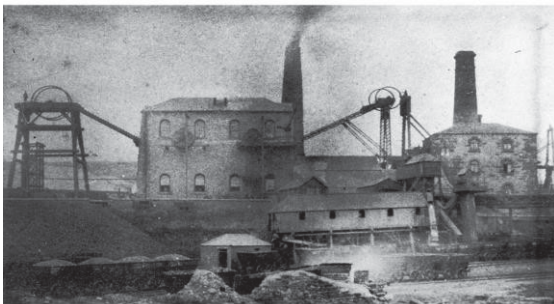
The picture has also captured the old farm buildings at the bottom of the old Pit Lodden which again have since been removed by the quarry which has eaten its way into the farmer's field. Other old sites are the long rows of Downs Lane, Nicholas Street and Thomas Street as well as the Eppleton Estate.

In the distance at the top left is a small cluster of trees (to the left of Hetton House Wood). On old maps this is shown as an "old trial shaft". It is not known whether it was originally the Hetton Coal Company or North Hetton Company which sunk this trial shaft with a view to prove the existence of coal measures.

Hetton Downs, now known as Eppleton, has seen a considerable number of changes over the years and many of the former Colliery rows are now grassed areas. It is likely to see many more changes in the coming years as the community re-establishes itself.



The picture above is a close up of the mine area. Just like the community of Hetton Downs, the pit on the Downs has seen many changes over the years. Sunk in the side of a hill it was split into 3 levels. Top level was where the main offices were located (just caught in view to the right of the Pit Lodden (B)). The baths, medical centre, canteen etc. (to the right of the waiting bus) (C). There was also a subway that linked the baths to level 2 and the electrical sub station, (just down from the bus). This was said to provide not just for the mine but also majority of Hetton, and was one of the last buildings to be demolished. The 2nd level was the main part of the mine with all the workshops (some were thought to date from the 1830s and would be the only original buildings left at the time of demolition)(D). This was the main level with 3 shafts and ventilation fans and also the stockyard (E) which was originally no1 pit heap, The lower level once housed the screens and a mass of railway lines with its own wagon way that cut through High Downs to join the historic George Stephenson line dating from 1822 (F).



*Eppleton Colliery in the 1880s.
Courtesy of the Beamish
collection*

The small picture above looking east shows the Caroline shaft on the left and the Jane on the right with two winding engines within the same building operating back to back, possibly of similar internal workings as its sister pit the Elemore Isabella shaft winder. The large building to the right of the Jane shaft was a pump house.



Eppleton Colliery 1980s Courtesy of David Witham collection

The headgear nearest to the camera was the Jane shaft (black metal lattice) which had changed completely from the time of the sinking of the mine. It was originally a primitive metal lattice headstock that faced the opposite way onto a shared winder house with the Caroline shaft. This could possibly have been one of the earliest metal headstocks in the UK, possibly the World. It was highly unusual in the 1830s to use such an expensive material as metal as they were normally made of wood. (Linton Colliery near Ashington, Northumberland, still had wooden headstocks in the 1960s). The newer headgear was thought to date to the early 1900s. The 1886 map appears to show the winder in its current location. Although this particular design has been commonly used throughout the UK, it could possibly have been one of the earliest of its type. Its newer winder and engine house was one of the first in the area to be electrified, drawing power from the Philadelphia power station near Newbottle.

The Jane headstock was dismantled girder by girder in 1987 and lay in parts at the back of the Council depot for years. It was to be rebuilt in another location but, for reasons best known to Hetton Council, a custom made stand, holding in place only one of its winding wheels, remains at Hetton lake.

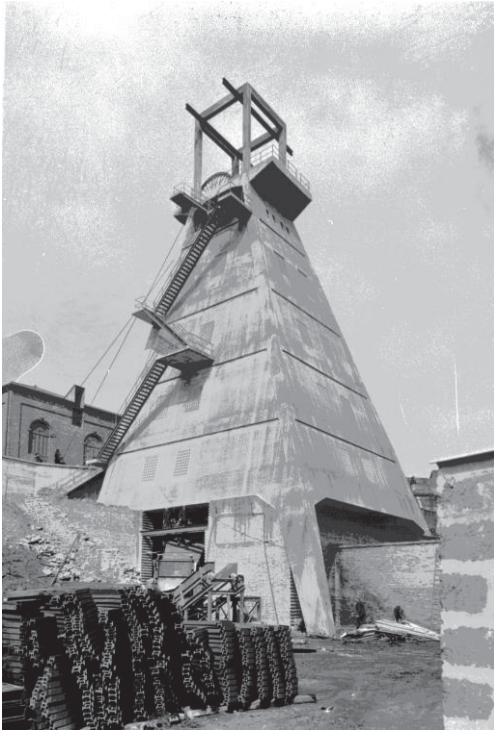


This rare picture showing the Jane (left) and Caroline Shafts pictured from the hill above the mine near the top reservoir looking south to the main gate. (Internet picture)

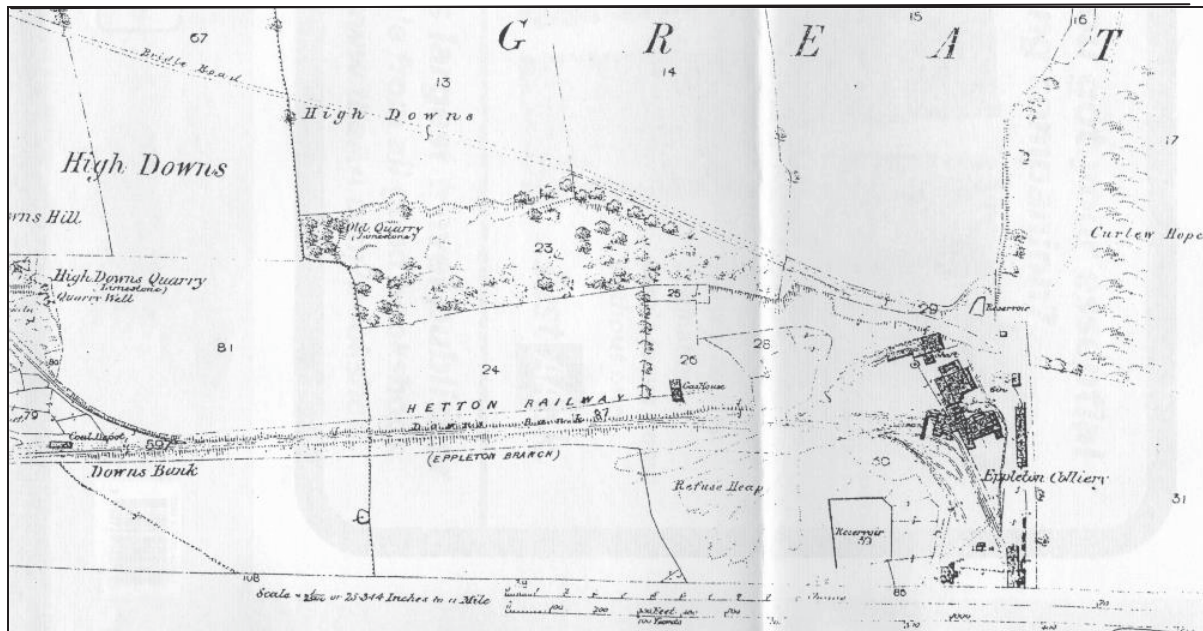
Just behind the Jane was the Caroline shaft. The original headstock was made of wood but bigger than the Jane headgear. It was replaced sometime later with the metal lattice type above which looks remarkably similar to the old one. The original winder worked right up to the 1960s when its headgear was demolished along with its original magnificent steam winder. It had been expected that the shaft would be filled in, however, it was kept open and a small Jack engine was in place to be used mainly as a spare or emergency shaft.

The Caroline steam winder is said to have been a work of art, being made of brass. Also it is said that due to its primitive construction the controls were quite lethal. The engine operator had to slow it down by grabbing hold of the levers that moved up and down at quite a speed as the drum spun round, then use the hand brake to hold it. In order to get it to move again he had to push and pull

the handles until it built up enough speed on its own then repeat the process to slow it down.... a very demanding job even for an experienced operator !



The Lindsay shaft sunk in 1870, the last shaft to be sunk and which outlived the others. This photo is possibly a publicity shot for the company that built the concrete coat, The British Concrete Company.



A map of 1856 showing the location of Eppleton Pit. The refuse heap had just started while the quarry was very small. It was later enlarged to meet the demand for stone to build the miners' cottages.

This series of photographs shows the end of the Lindsay shaft, its demolition in 1992 as part of the reclamation scheme for the Eppleton Colliery site.



Going.....

Pictures courtesy of R Moody Collection.



Gone!!!

Disasters at Eppleton

The following statement relates to the first disaster recorded at the colliery in 1836 when 20 men and boys were killed by an underground explosion. It was recounted by Henry Gustard, a deputy overman at the pit.

"The wind blew so strongly as to induce him to believe that an explosion had occurred in some other part of the Mine"

The explosion was eventually put down to an incident when a 12 year old boy trapper left open a ventilation door when it should have been closed. But there are other factors involved which obviously contributed to the accident. Naked lights were being used in the colliery at the time and in the working area where the explosion occurred. Additionally just prior to the explosion the young trapper involved had been chastised and probably abused by putters bringing full tubs of coal through the ventilation door and they wanted it left open for their convenience. Regrettably the trapper was one of the unfortunates who was killed in the explosion. Thirdly the working district had experienced a fire during the previous week but fortunately it had been put out without further action being needed.

Another incident, although not a disaster as such, is worth recording here because of the selfless comradeship among the group of miners who worked in Eppleton pit. Bravery and loyalty were demonstrated on a supposedly unlucky day Friday 13th December 1895. The report below is from the Durham Advertiser at the time.

"THREE LIVES LOST — GALLANT CONDUCT OF RESCUE PARTY" — A sad calamity occurred on Friday last at Eppleton Colliery, whereby three men lost their lives and two others were placed in extreme danger. The heroism displayed on the occasion stands out nobly as a direct contradiction to the aspersions cast upon the Pitmen of Durham by one of Her Majesty's Judges at the recent Assizes held for the County. From what can be gathered, it appears that on Friday morning Mr Mold, Manager of the Mine, during his usual rounds discovered an accumulation of bad gas in a district in the Main Coal Seam known as the Third East. He gave instructions that this particular place be abandoned and battened up. The duty, it seemed, for the completion of this work to be carried out, fell upon a young man named Thomas Brown, a Deputy aged 26 years. Before proceeding to put up the stopping Brown determined to bring out a tub which was in bye. Another Deputy named Heading endeavoured to dissuade Brown from so doing. Brown, however, persisted in his resolve and asked a putter, named R Lawns, 20 years of age, to go with him. The two men entered the place and from what was subsequently discovered it would seem that after getting so far they left their lamps behind, and must have then continued their journey in the dark. The action of Brown was known only to another putter named Laverick, who had been at work with Lawns. Laverick watched for the return of the two men with the tub. After a reasonable time had elapsed, and Brown and Lawns not appearing, Laverick became alarmed and hastened to the places of three hewers named James Evans, Anthony Harrison and Patrick McDermid, and informed them that Brown and Lawns had gone into the place condemned by the Manager, and he believed they had been overcome by the fumes of the poisonous gas which was known to be present. The three men at once rushed off to the rescue of their fellow workmen, never hesitating to think for a moment of the deadly peril they were subjecting themselves to. The noble trio failed, however, to reach Brown and Lawns, falling victims to the overpowering influence of the vitiated atmosphere which surrounded them. The lad Laverick was still on watch, and when also Evans, McDermid and Harrison did not come back he became seriously alarmed, and running about the pit from one part to another he made known his fears as to the fate which had befallen the men mentioned. At this juncture Robert Hawxby, a Deputy in a different part of the mine, heard of the affair and speedily made his way to the place which the five men had entered. Hawxby raised the regulator, an apparatus used for the purpose of increasing the current of fresh air which is sent through the workings of the mine. This soon proved a wise precaution and the bad air was to some extent beaten back. An attempt was then made to get to where the five men were

without doubt lying insensible. Hawxbly led the way. Hall took charge of the lamp so as to give light to the other brave men who were with him.

The rescuers could only creep on their hands and knees or drag themselves along flat on the ground. Hawxbly had a nail in his mouth. This he believed was effective in drawing in what good air there was to be got below the thickened cloud of noxious gas through which he was passing. Others of the rescuers kept their mouths to the iron tramplates and thus benefited to the same extent as Hawxbly did. In this way the rescuing party proceeded between 50 and 60 yards.

Hawxbly felt himself touch the hand of one of the men who were being searched for. By this time he was beginning to feel so overcome by the impurity of the air that he was unable to bring out the man he had touched. Fortunately the condition of Hawxbly was observed by Palmer who although suffering similar symptoms as the first named had sufficient strength remaining to drag his comrade out to a part of the place where the air was felt to be better. The other rescuers were compelled to follow, after a few minutes rest, and feeling themselves somewhat refreshed Hawxbly again headed a glorious band and made a second attempt to reach the five men.

The rescuers were this time however able to get only about fifty yards when, owing to the effect of the suffocating air, they again had to retreat. This, Hawxbly and his mates say, was a dreadful experience. They could hear the most agonising cries being given vent to by the poor fellows whom they were powerless for a time to reach. Their grief was such indeed that they declared that in their weakened condition they wept like children. After another short rest the party felt themselves efficiently revived to make a third attempt and this time in the course of a slow and tedious journey.

Hawxbly got hold of one of the men. This man proved to be Evans who was pulled out by his legs. Evans was found to be alive and efforts were at once made to fully restore animation, which ultimately proved successful. The rescuing party put Evans into the hands of a number of miners who had gathered from all parts of the pit ready to give assistance in whatever form it might be wanted.

The rescuers were now too exhausted to again return at once in the noisome dungeons. While resting previous to making a second rescue Mr Mold, Manager; Mr George Thompson, Undermanager; and Matthew Hall, Overman arrived. Mr Mold was at home when the accident occurred but he lost no time in getting to the Pit on hearing the serious nature of the accident. The Manager, Undermanager and Hall now formed themselves into a rescuing party, which Hawxbly, although gravely fatigued and exhausted, again joined. William Hall also accompanied with lamp, and Palmer and the others were likewise in the party. All being ready the rescuers made their way into what was truly the jaws of death, having to drag themselves along the bottom of the seam as had previously been done.

The party succeeded after a painfully slow journey in reaching another man who was identified as McDermid. This man was, like Evans, insensible but willing hands soon quickened his pulsation by a vigorous method of respiration.

Continuing their gallant labours the rescuing party were able to next bring out Harrison then Brown and Lawns last, all of whom it is mournful to relate, were dead.

When this became known the sorrow among the noble fellows who had dared so much was overwhelming.

The survivors were sent out of the pit to their homes where they were attended by Doctors. The bodies of the dead men were decently enshrouded in pit clothes and sent out of the pit and afterwards tenderly conveyed to the homes which they had left but a few hours before in the whole vigour of life. Brown and Lawns were not married. Harrison was married as was also Evans and McDermid."

The efforts of the three men who went into the gas area along with others was duly recognised by the Mines Inspectorate in their 1895 Report of the accident.....

"I should like to say a word or two in appreciation of the courage and gallantry shown by the men who were among the rescuers. The three hewers, as well as the manager, overman and back overman all showed that they possessed the qualities which in the past made pitmen famous for heroism in the time of danger, such conduct as theirs should not go without commendation."

John Harrison, one of the men who died, is the great great grandfather of Kate, the Duchess of Cambridge. He was living with his family at 18 Downs Lane, Hetton at the time of the accident.

The most serious recent disaster at Eppleton occurred on Friday 6th July 1951 when nine men were killed in an explosion at 2 a.m. in the morning. This was a sad accident which should never have happened and was eventually shown to have occurred because of the shoddy maintenance of equipment, namely an American made piece of machinery called a Joy Loader. An electrical spark from the starter motor ignited gas which was captured within the nearby coal face, triggering an explosion in the district where the machine was located.

The second inquest, carried out in early 1952, for the two men who died later as a result of their injuries, concluded:-

"There had been some negligence in the maintenance of a pit machine and also a lack of care in steps taken to discover the presence of gas". The findings of the inquiry together with the statements from the two inquests resulted in the veto of shuttle cars when used on long wall faces and adopted a long term policy of modification of foreign apparatus now installed in British mines to the correct British standards. They have also adopted a new improved design for the adaptor of the main entry cable on Joy loaders and raised the standard of supervision of the electrical apparatus, especially that which is employed on the coal face.

With every tragedy there are families and friends who suffer, particularly those who lose loved ones. Even though the Eppleton explosion happened 60 years ago, to many who are still living and to the families involved, the memories remain a constant feature of their lives. Miners have always been subject to danger while at work and a certain amount of stoicism was an essential feature of a mining community.

12. MINING IN HETTON: PART 2 – THE MINOR COLLIERIES

There were a number of smaller but still important collieries in the Hetton area which played a significant part in the development of Hetton and the surrounding villages. Today little remains of them save the memories of the people who lived close to them or who were in some way associated with them. Their prominence was mainly during the 19th century although a number were still working in the third decade of the 20th century.

The two most important of these pits were Moorsley Pit and the Hazard Pit, both situated less than a mile to the west of Hetton. Collectively they became known as North Hetton Colliery. In addition there was a collection of collieries north of East Rainton usually referred to as the Rainton collieries which included the Meadows Pit, Nicholsons Pit and the Adventure Pit. The latter although not strictly within the boundaries of Hetton was close enough to have much of its workforce coming from East and Middle Rainton.

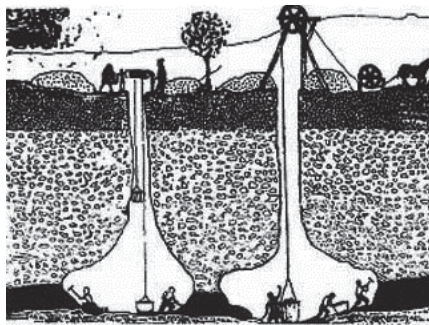
Coal seemingly had been mined in the Rainton area from the 14th century and there were more than 20 bell pits (the earliest form of pit worked from the surface) close to East Rainton. Probably the largest and most important was the Alexandrina colliery situated to the south of the village of East Rainton and only a few hundred metres from High Moorsley opened in 1824. The Alexandrina Colliery was owned by Lord Londonderry and although not large in size it came to prominence due to an etching by T.H.Hair during his visit to the Great Northern Coalfield in 1844.



The Lecht or Alexandrina Pit owned by Lord Londonderry by T.H.Hair 1844

The bell pits were often family owned and comprised a hole in the ground deep enough to reach the shallow seams of coal just a few metres below the surface. They were so named from the shape of the excavation, each pit had a narrow vertical shaft sunk into the coal or iron ore seam, which opened out into a small chamber. Little timber was used, so once the roof became unsafe following the removal of the coal, the pit was abandoned and another shaft sunk nearby. Coal was cut by hand using picks and shovels. Workers and the coal were lifted from the hole by a basket. Candles or

lamps were used for illumination as there was little danger from underground collections of gas. As shown in the picture, this is the earliest system of underground mining.



(courtesy internet drawing Swannington-heritage.co.uk)

In the drawing above the workers in the left pit are using a hand windlass to raise the coals whereas on the right a horse ginn is being used. To enable the latter to work a headstock has been made and it is from this primitive design that later deep coalmines evolved a headstock and wheel to raise and lower coal and manpower up and down the shaft.

On the map of the Hetton collieries there can be seen a variety of bell pits, some with unusual names such as Sandy Pits, Lecht Pit, Cold Pit and Corner Pit. It is known that part of the village of East Rainton was built around a pit called the Pontop Pit and eventually a school was built close to the shaft after it, had been filled in. Quite often when walking in fields close to the village one comes across rough circular depressions which have either been bell pits or the air shafts for deeper collieries. There have been a number of incidences in County Durham mining villages of houses built over bell pits which have later subsided and the houses have had to be evacuated. The map shows that the coal seams were all close to the surface in that area. Indeed the more recent development of strip or, as it is called in the UK, 'open cast' mining, has been carried out in areas similar to Rainton. Done on a large scale using huge pieces of machinery this type of mining is now much more economical than deep shaft mining.

From the early part of the 18th century through to the 19th century, up to 20% of the mining workforce would work in these smaller collieries. Also, when times were hard, miners were often laid off by the larger pits to save money and then many of them would get temporary employment by opening up these smaller units and selling the coal locally. The following is an exert from the East Rainton Women's Institute Report written in the 1960s. -

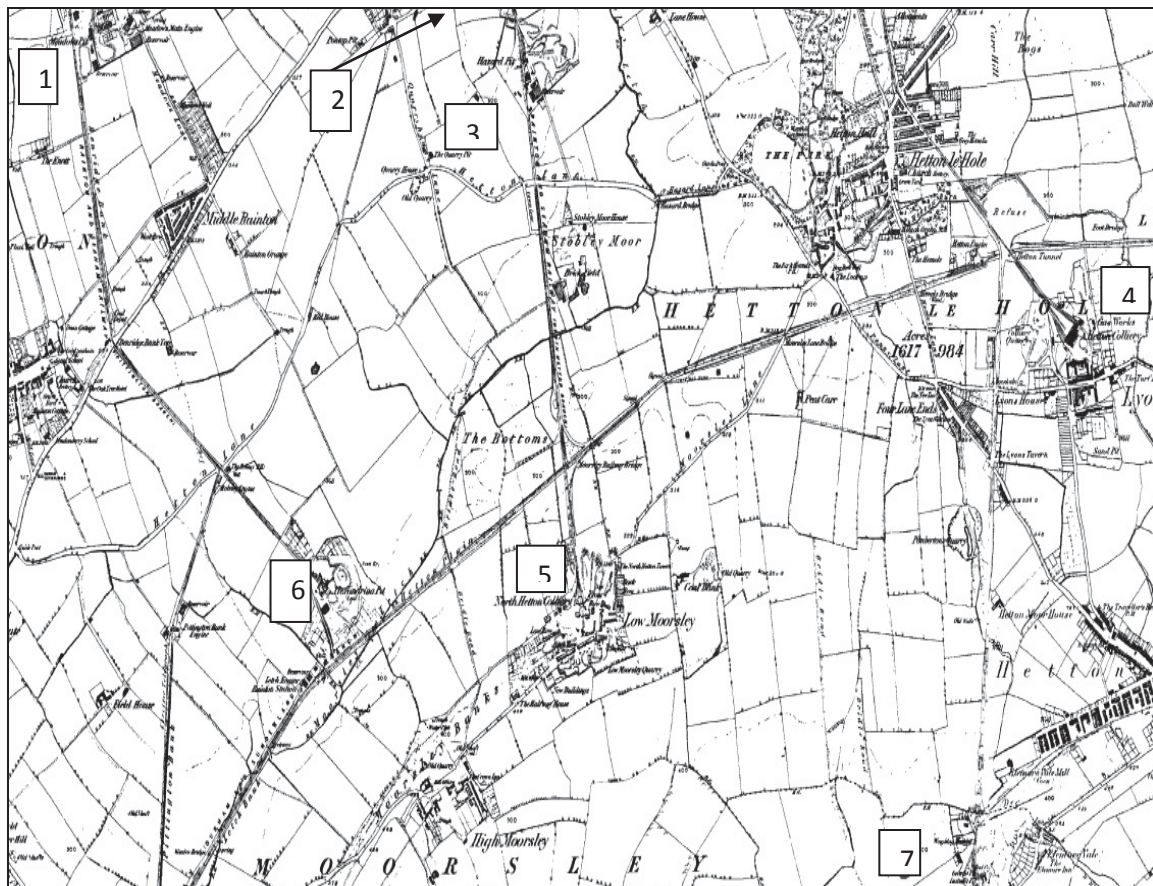
In East Rainton in 1824, there were living approximately 100 miners and their families. Miners were a race apart from their contemporaries and lived and thought differently from those employed elsewhere. Physically they were strong and healthy, they spent most of their time 'buried, just out of sight', away from the more genteel and civilised people. On Sundays they wore showy clothes, loved embroidered waistcoats and stockings and fluttered multi coloured ribbons from the knees of their velvetine breeches and from their hats. They usually carried a switch (small stick) and thus attired they would flaunt themselves, boasting about their physical powers. It was believed by many people from the south of England in the 15th and 16th century that coal miners and their families lived permanently underground and never washed themselves or their clothes. Contrary to many beliefs miners were generally in good health and their families benefited from a regular income when compared with many others belonging to the working class who lived in the large cities. In spite of this their working conditions were more often than not deplorable and dangerous. In 1817 many men

and boys had been killed in an explosion at the Plains Pit, close to East Rainton. A similar explosion occurred in 1823 and altogether the loss of life numbered 79.

The reliance on coal by the rest of England in the 16th and 17th centuries, and particularly in the large cities such as London, Bristol and Norwich, meant that there was an almost insatiable demand for the mineral and as a consequence coal mining in places like Rainton was profitable. With the coming of steam power and the industrial revolution the demand for coal increased beyond supply and fortunes were made by landowners who were lucky enough to have coal measures beneath their land. Much of the land and the coal beneath the surface in the Rainton area was owned by the Dean and Chapter at Durham who leased it out to men or partnerships willing to invest in the operation of mining. Collieries such as the Hazard and Moorsley were owned by such venturers. The North Hetton Coal Company was one such company which later included Lord Londonderry and Nicholas Wood on its board, both prominent and active in the development and management of pits in the area around Hetton. The North Hetton Coal Company owned both Moorsley and the Hazard Pits before they passed into the part ownership of the Hetton Coal Company in the 1840s.

12.1 Moorsley Colliery

Moorsley Colliery is more commonly known as North Hetton Colliery. (It is possibly named after the company that owned it since its geographical position is nowhere to the north of Hetton). It was situated to the west of Hetton-le-Hole on the north side of the Moorsley Road (Hetton to Pitlington) and opposite the Black Boy public house. There are some irregularities in the information provided by the Durham Mining Museum. It states that the pit opened in 1821, however it also states sinking started at a later date namely 1826. Like the nearby Hazard Colliery it was closed in 1935 both collieries having merged 20 years earlier. It seems likely that Moorsley colliery was sunk around 1825/6 and was operating at some time in 1827.



The map above from around 1856, shows a number of collieries in close proximity to both the Hazard and Moorsley Pits. 1. Meadows Pit (Rainton Pits (Lord Londonderry)), 2. Dunwell Pit (300 metres north of the Hazard Pit, (Dunwell Coal Company)), 3. Hazard Pit (North Hetton Coal Company), 4. Lyons Colliery (Hetton Coal Company), 5. Moorsley Pit (North Hetton Coal Company), 6. Alexandrina Colliery (Rainton Pits (Lord Londonderry)) 7. Elemore Colliery (Hetton Coal Company). The number of operating units did cause some competition but generally the market was buoyant enough to support them all.

North Hetton or Moorsley Colliery was sunk by the North Hetton Coal Company but, along with Hazard Colliery, was taken over by the more dominant Hetton Coal Company during the mid 1840s. The principal owner was the Marquis of Londonderry, who took over the collieries originally owned by his wife, Lady Francis Vane Tempest, Thomas Bellerby and Thomas W. Robinson who leased the land from the Dean & Chapter of Durham. In 1911 it was taken over by Lambton Collieries along with the sister pit the Hazard as well all the pits belonging to the Hetton Coal Company. The colliery was situated North of Front Street in Low Moorsley though the two shafts were located more to the west. The mine was so ringed by rival coal owners as to be practically under siege. This could have meant a limited life expectancy, but it worked for more than a hundred years, finally closing in 1935 when it was virtually worked out. The whole area where the colliery once stood has been landscaped to the point where it is difficult to believe that a pit was once located there. Not only have all the colliery buildings and associated plant including the railways been removed but all of the colliery housing has also been demolished and replaced. The colliery buildings, including a gas works and brickworks, together with a large pit heap, were removed shortly after the pit closed in 1935 and many of the associated village buildings e.g. miners' welfare institute, a mission church, school and chapel were removed between 1945 and 1953.

The township is first mentioned during the reign of Henry II (1154- 1189) as Moreslav or Moreslawe. In this document the land that was owned by Adam de Moreslawe was given away by him to the monks and Prior of Durham. As a result he was admitted into the Prior's household although his wife, because she was a woman, was not allowed in but was given a toft and 2 acres of land rent free for the rest of her life.

There were still a small number of freehold pieces of land left in Moorsley although one of 7 acres was given to the Convent of St. Cuthbert. Thus a large part of Moorsley passed into the possession of the church while the rest became leasehold land belonging to the Dean and Chapter.

By Elizabethan times a hay tithe was paid to the Rector of Houghton. A Poor Law Book compiled by the overseers in 1821 suggests that there were 7 inhabited houses accommodating 10 families. There were 8 families employed in agriculture, 1 independent and 1 employed in craft work. The total population comprised 28 males and 20 females.

The pit at Moorsley was certainly responsible for the growth of both High Moorsley and Low Moorsley, the former being made up mainly of streets of two bedroomed terraced cottages. Most of these were initially dispersed along the bank at Front Street and in small clusters behind the main street, close to the colliery. It wasn't long before pubs and shops appeared throughout the village.

By 1831 the population had grown to 748, due to the opening of local collieries. These would include Hetton, Eppleton, Elemore, Dunwell, Hazard, Alexandrina (Lecht), Pittington, Belmont and Lady

Seaham and of course North Hetton colliery at Moorsley. The population expanded during the 1820s, 1830s 1840s and throughout the remaining decades of 19th century. The table below shows the population figures for each decade of the century.

1801	36
1811	43
1821	48
1831	748
1841	821
1851	942
1861	973
1871	1025
1881	1078
1891	1108

As the population grew so did the amenities in the village. Two chapels were built by the Wesleyan and Primitive Methodists as well as a Mission church belonging to St. Cuthbert's of East Rainton. (situated where the houses forming valley view now stand). The latter was known as the tin church and was demolished in the 1940s. The old stone wall forming part of the church domain still remains today, situated immediately below the bungalows of Valley View.

The school was erected in 1871 by the North Hetton Coal Company for infant and mixed age pupils up to 14 years. It could accommodate 360 children and in the 1890s the average attendance was 320. The first houses located close to the colliery were Low Row (later to become Blue Row), Jewitt's Row, Back Row, Green Row and High Row. The houses which formed the four rows at High Moorsley were not built until the 1860s, their names not being notable, namely rows 1-3, and Westgarth's Row. High Row housed the officials in slightly improved properties. High Moorsley developed after 1850 with an increase in the number of miners' cottages in the 1860s. Laid out in a series of streets running north-south some 300 metres above the colliery they lacked the basic amenities of running water and flushing toilets. Water came from a series of stand pipes located in the street end and it has been recounted that during the winter the pipes froze and water for cooking and washing was in very short supply. It was necessary for water to be carried up hill from a perpetual spring located in the fields 200 metres below the village.

By 1892 there were 7 pubs in the village, North Hetton Tavern, Lamb Inn, Crown Inn, Grey Horse, Bonnie Pit Lad, Black Boy Inn, Wheatsheaf Inn, two of them, the Lamb Inn and the Crown Inn, being located at High Moorsley. The building which was once the Lamb Inn still exists today but as a private house. The Co-op (Part of Pitlington Co-op) was formed in the 1870s. There was a post office, 2 grocery shops and a butchers shop. There were 3 farms, High Moorsley, Coal Bank and a small farm just below the school.

By 1888 the colliery had attached to it an extensive firebrick works producing in excess of 60,000 bricks per week. Clay pipes for agriculture and water and sewage distribution were also made here. They used Seggar, a clay-like material found close to seams of coal. It came out of the pit and was classed as waste and tipped on the waste heaps. It is a grey substance when wet and forms more like a clay. It was dangerous on the floor of the mine where the men walked. At most collieries it was used extensively in the making of bricks. Waste heaps that had lain dormant for years would

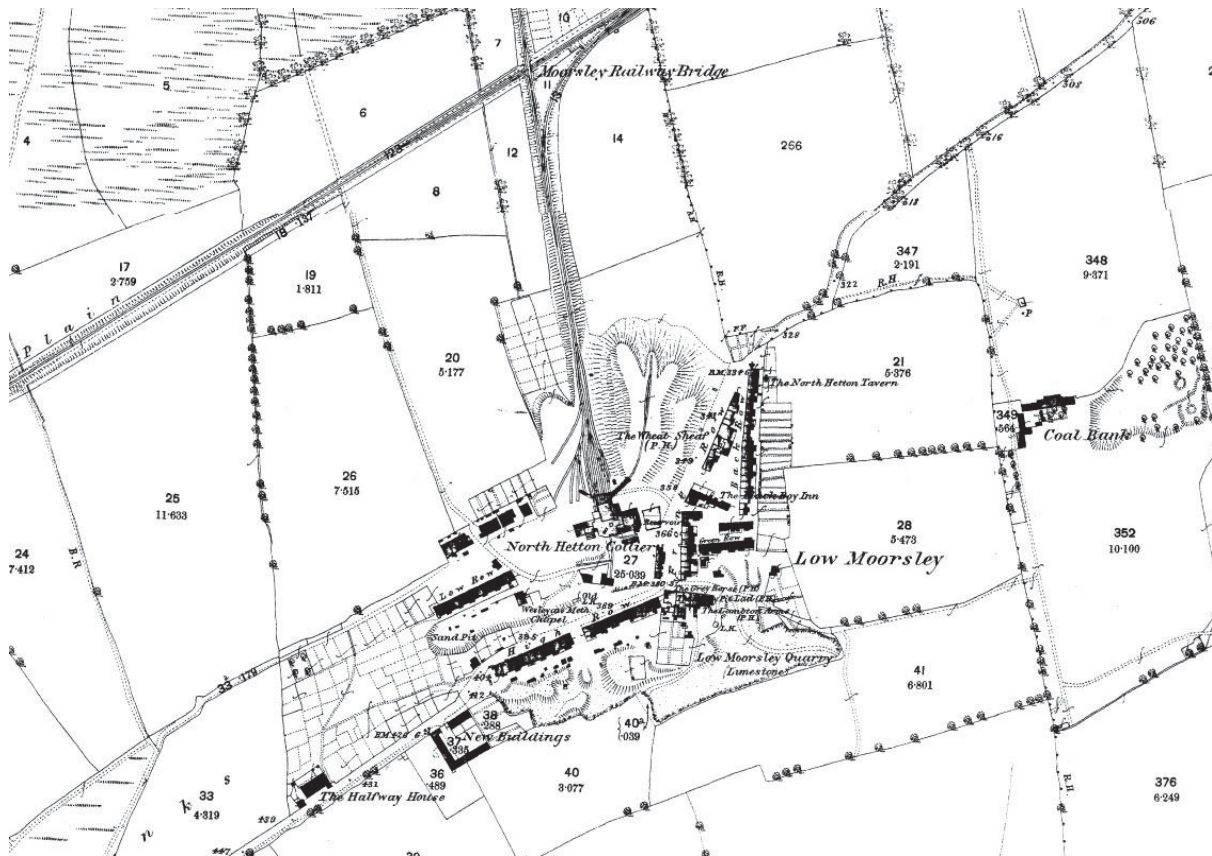
suddenly be opened again and the seggar extracted. If a brick is snapped in two and the inside is grey coloured then it had a seggar content. From the mid 1880s a gas works was founded with a number of retorts for the production of coal gas for domestic use and street lighting.

A waggon way ran down hill from the pit in a northerly direction to link in with the Hazard Pit railway which then joined the Hetton Railway. There was also a link with the Durham & Sunderland Railway. Much of the downhill section, including a bridge over the Durham & Sunderland line was raised on a wooden gantry. The connection with the Londonderry family meant that the coal produced at both collieries was sent by rail down lines to the north to join the Londonderry railway which initially ran on to Penshaw and the River Wear and later along the Londonderry Railway leading to Seaham Harbour where it was loaded into collier brigs after 1830.

Initially the miners' cottages were made of limestone which came from two local quarries, High Moorsley and Low Moorsley. Agricultural lime was also produced in a lime kiln in the quarry at Low Moorsley. The communities of both Low and High Moorsley were very strong and until the years of the depression employment was always available. After the closure of the pits some of the miners found employment at other pits and their families moved away. During the years of the World War 2 the population began to reduce. By the 1950s High Moorsley was categorised as a Schedule "D" village by Durham County, where "D" stood for demolition and the miners' cottages were soon vacated and removed. Nothing remains today except a rectangular copse of trees where the houses once stood. The school closed at the end of the decade, the Mission Church was demolished and a number of the shops closed for good. Only one chapel was left standing and in use. New council houses were springing up at Low Moorsley and a number of families from High Moorsley were re-housed there. Peat Carr, virtually a suburb of Hetton, was also growing to meet the demand for new housing as more and more miners' cottages were removed from the two villages.

Since both Moorsley Pit and the Hazard pit were owned by the same coal company men, who lived in both High and Low Moorsley often worked at the Hazard Pit rather than at Moorsley. It was less than half an hour's walk from Moorsley to the Hazard pit so it was convenient for many. As the villages developed they accumulated more amenities. Low Moorsley had a number of shops including a post office and a fish shop as well as a Co-operative Society. The miners at Moorsley had similar amenities to those elsewhere in the region. They had a welfare hall erected by the North Hetton Collieries Miner's Welfare Organisation for the use of the miners of Hazard Colliery in 1928 (Moorsley Pit had been temporarily closed in 1915) for their leisure activities and lodge meetings etc. It comprised a main hall at one end, the main entrance, and two small rooms, one for reading and one for games such as dominoes and cards, etc. Gambling on the premises was supposed to be banned but the lads played card games unofficially. It served the miners admirably in the lean years of 1930 – 35 when there was a lot of idle time at the pit.

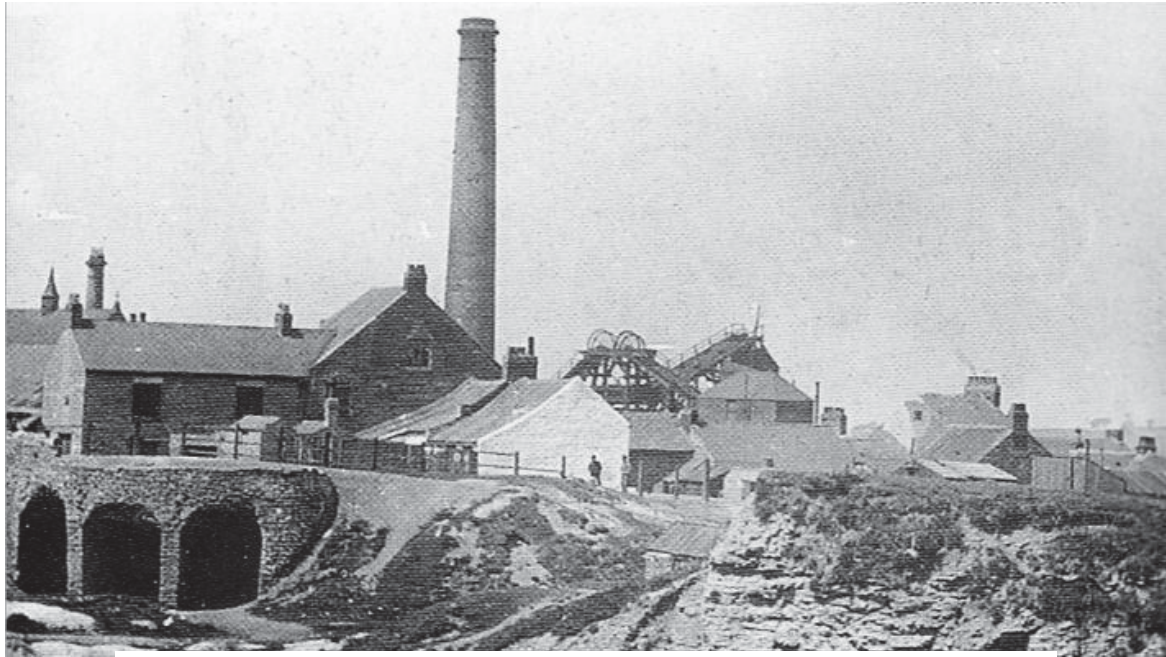
Later billiard tables were installed and dances and concerts organised. The concerts were both impromptu or planned by the men themselves and took place often on a weekly basis. The caretaker's room and a wireless room were at the other end of the hall. Quoits were played at the rear of the hall and in summer men would just lounge on the grass outside and talk.



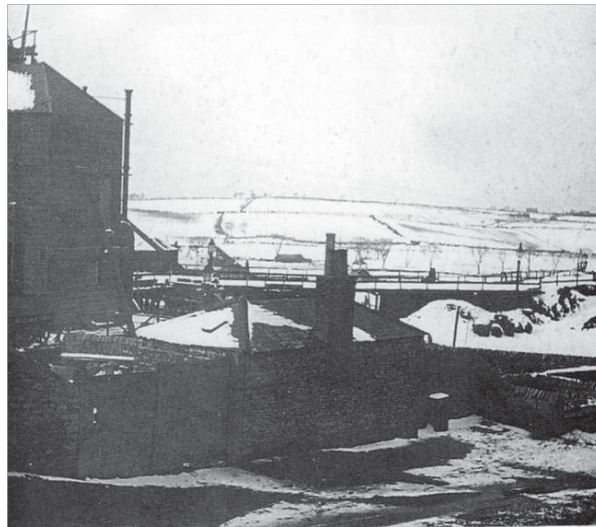
The map above from 1856 shows the development of Moorsley colliery as well as the disposition of miners' houses around the village. It also shows the railway heading north from the colliery in the direction of the Hazard Pit. Note the connection to the Durham and Sunderland Railway running across the top left hand corner of the map. The much clearer map of 1896 below shows little change to the colliery itself. A rudimentary brick works has appeared (top left of pit yard) and there was more housing out at Peat Carr (top right). The gas works lies north of the colliery. The waste heaps are bigger, Note the number of chapels and the Mission Church near the present day Valley View. On the opposite side is the new school built by the coal company, which was still in situ though abandoned and derelict until the mid to late 1990s when it was demolished and a private dwelling house was built on the site using the same footprint as the old school.



Moorsley colliery from the bank at Low Moorsley. On the left are the miners' cottages, directly opposite the coal depot. The colliery itself is higher up the bank and the large roofed building at the top is one of the two Methodist chapels.



View of Moorsley colliery about 1880 showing the headstock, engine house and associated buildings.



A wintry scene at North Hetton colliery c1880. Crossing the middle of the photograph is the railway gantry which ran down hill in the direction of the Hazard Pit.

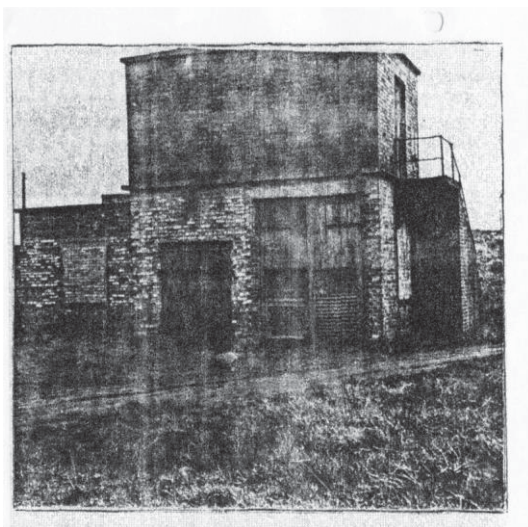
Living conditions for the miners were very basic both in Low and High Moorsley. Even though the cottages at High Moorsley were built after 1850, some 25 years or so after those at Low Moorsley there was little change in the design or quality. Cottages were built to a set pattern and a set price of about £14 in 1830. Below can be seen a photograph of the cottages built at High Moorsley.



The photograph above shows the 1st, 2nd, and 3rd rows of miners' cottages at High Moorsley shortly before they were demolished in the 1950s. The right hand end cottage was a little larger than the others and was generally occupied by a minor colliery official.

12.2 The Hazard Colliery

Situated within 400 metres of the village, it was located to the east of East Rainton. It was this colliery, which opened around 1825, which produced the increase in the population of the village. It followed the opening of the Dunwell Pit situated about 300 metres to the north of the Hazard. The precise date of opening of the Dunwell pit is not known and could have been as early as 1780. The ownership of the Dunwell is also a mystery but when the Hazard opened it was still in production. For a short time the shaft may well have been used as a ventilation shaft for the Hazard colliery and its pump house remained for years into the 20th century.



This poor quality photograph is one of the few showing Dunwell Colliery. The building, believed to be part of the pump house, lasted until the 1950s when it was demolished as part of a clean-up project.

There were three pits lodged in or close to East Rainton. The first and smallest of the three was the Pontop Pit located in the centre of the village in the position now occupied by the school. This pit probably started as a Bell pit but may, for its latter years, have existed as a small shaft pit. Its life was short and following demolition the shaft was filled in. Its usefulness would have been in question once the Dunwell went into production. There is a myth associated with the Pontop, that Mary Ann Cotton, when she lived in the village and looked after young children, was responsible for killing some of them by throwing their bodies down the disused shaft.

The Hazard Colliery, originally sunk in the early part of the 19th century, was owned for many years by the North Hetton Coal Company, who also owned the Moorsley Colliery. One of the owners of the North Hetton Coal Company was Lord Londonderry and during its early years coal was transported on the Londonderry Railway which initially ran to the River Wear near to Penshaw before it was diverted to the port of Seaham Harbour after 1828.

The colliery eventually passed into the ownership of the Lambton and Hetton Coal Company along with Moorsley Colliery. There are still a number of older residents in the village who worked at the pit in various capacities. Following its closure in 1934 it was some years before the site was cleared and landscaped though the headgear was removed within a few months.

The original headgear and screens of the Hazard were made of wood and lasted until 1915 when they were replaced with steel during the First World War. It is unusual to see photographs of wooden headgear but the photograph on page 257 shows the Hazard Pit in all its glory prior to renovation.

When the colliery site was cleared in the 1970s the last remaining buildings, including the shaft and engine house, were demolished and today it is impossible to tell where the colliery once stood as the whole site has been landscaped and covered with trees. The old railway which ran down from Moorsley and crossed the Hazard Road before running through the Hazard pit yard on its way to join up with an extension of the Hetton Railway, is now a walkway and cycle track shadowed by trees planted during reclamation in the 1970s.

Most of the miners who worked at the colliery lived in miners' cottages in the village. These cottages were replaced in the late 1930s and 1950s with council houses. There were also six cottages located within the confines of the Hazard pit although only four families of miners lived there along with the under-manager, while the spare cottage was used as a store for mining equipment including picks, shovels, etc.

There were four public houses in the village, The Fox and Hounds, The Village Tavern, The Rose and Crown and the Blacksmiths Arms. It was here, after long hours of working under primitive and dangerous conditions, that the miners spent much of their leisure time. As well as boxing contests, miners spent their time between labour and sleep in such hobbies as dog and cock fighting, card playing, live rabbit coursing, quoits, pitch and toss, bowls, etc, with always a few desperate, dark, designing crew intent upon winning their hard-earned wages. Miners were hired to a certain pit by a yearly bond. This they signed, often by means of a cross since most of them could neither read nor write and it was sealed by their employer by giving each employee a sum of money, often half a crown. For breach of the agreement they could be imprisoned, so, no matter what their grievances,

they could obtain no remedy and were debarred from work at other pits. Later the bond was for a

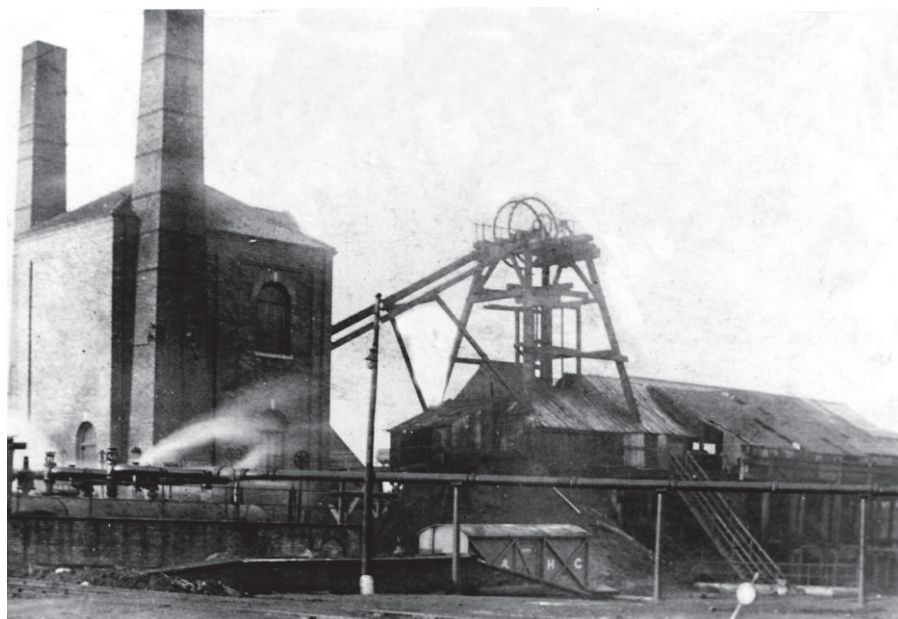
month and later for a week. So developed the need for miners to improve their rights, and to this end the Durham miner's gala was inaugurated, when men could air their grievances to their fellow workman from a public platform. These grievances were looked into and settled by the Miners' Union. The leaders for this Union were chosen from among their workmates- men who were anxious for the good of their fellows and hoped to redress their grievances. Religion went hand in hand with mining, for it was often local preachers of Methodism that were chosen to lead the Union, men of strong faith, sound principle and good courage, who were called upon to promote goodwill towards men.

In April 1747 it is said that John Wesley came to preach at Rainton, where there were many collieries and an abundance of people. After his discourse proclaiming the Lord God, gracious and merciful, the people declared that Wesley had been too long in coming. They were carried away by his preaching – when he knelt down they knelt down, they sang when he sang, and so Methodism was established in the village. The Wesleyan chapel was erected in 1823, but was rebuilt of stone and enlarged to hold 130 people in 1889 at a cost of £400. Religion became a dominant influence in the lives of the people. In 1825 the Church of England made Rainton, along with Penshaw and Hetton-le-Hole, into ecclesiastical districts separated from the parish church at Houghton-le-Spring. The church dedicated to St. Cuthbert in East Rainton was erected in 1866, a stone building in the English style, which has a nave, a chancel and south porch and will seat 150 people.



*The pit cage at Dunwell
lying inside one of the
abandoned buildings.*

*Hazard Colliery
Post 1915*





An old photograph showing the wooden headstock of Hazard Pit some years before 1915



Hazard Pit site during clearance



Hazard-Moorsley railway crossing on Hazard Lane in 1958.

Life was often a long and hard struggle and the following account tells of some of the hardships and the way of life in the mining villages, East Rainton included. In 1844 there was a strike in the mines in Durham and Northumberland which lasted 19 weeks. At last the Marquis of Londonderry visited the collieries he owned and told the miners that if they refused to go back to work he would bring men over from Ireland to take their places. This he did and men from Ulster came and settled in the district. At first, as one can imagine, this influx of Irishmen was not at all welcome and bad feeling ran high. Although it was an unwritten law that there were no quarrels fought out underground, the resentment and disputes found expression in action on a Saturday night, when the men had visited a local public house. They would strip to their waists to fight and onlookers gathered

round, shouting words of encouragement or otherwise as the fight progressed. The English miners were ever ready for a fight, and so were the Irish, but the latter had much more to lose. They had sold their houses in Ireland and undertaken a long perilous journey to England on the promise of a job. So they were not easily frightened back to Ireland. Some Irishmen did return to their native land, but many, in spite of all opposition, settled in the district and were gradually accepted. This feeling of resentment has not, even now, been completely forgotten- there are common expressions such as "He has Irish blood in his veins", or "He is as Irish as the pigs in Dublin".

In 1892 when again a dispute arose between the colliery owners and the miners of the county, another strike, lasting many weeks resulted. Severe suffering and distress was felt everywhere, and the soup kitchens were installed to provide meals for the needy. The Co-operative Societies played a great part in helping to relieve the distress as they supplied goods free to the soup kitchens and allowed their goods to be sold at wholesale prices, as well as giving generous donations to the relief funds. Such acts of generosity endeared the Co-operative Societies to the miners, and their trade expanded because of it. In Moorsley the Co-operative Society purchased land at Durham Road, East Rainton in 1925, but, because of the coal strike in 1926, the building of their premises was delayed until 1931, although trading operations were carried on from 1927 in part of a rented house owned by a Mr. Jopling. In 1931 when the new branch was opened and business was transferred to it, it became the foremost business premises in the district capable of satisfying the whole of the requirements of the people of East Rainton.

What of the women of the mining community, and what part did they play in this life so full of dangers and hazards for their men-folk? They were often left for long hours with the children and had to provide food, clothes and home comforts for their loved ones – often when money was scarce.

The women of this part of the country were known for their clean habits, hard working ways and their love for their husbands and children. The miner's cottage, however small and mean in appearance, was his 'castle' where he was virtually lord and master, but where his wife has done most of the planning for the benefit of all who lived under its roof. The miner prided himself on his wife's devotion, and was able to boast "*She waits upon me hand and foot --- I want for nowt that she can give me.*"

In the early days of mining this was not so easy to achieve. Water for drinking was obtained from springs and wells, and had to be carried to peoples' homes in pails. Water in East Rainton was brought from the seven local wells to the village on a donkey-cart and sold to customers at a penny per pail. Later water was laid on in pipes by means of a pump or tap at the end of the street, and families could fetch their own water. Inside the house the water was kept in stone jars or buckets covered with wooden tops. The fireplaces were built with round ovens and sett pots, the sett pots being used to boil the water for baths, for the miner indulged in a daily bath when he returned from work.

The miner's house was his wife's pride and joy; kept clean and tidy, with shining brass everywhere from the 'tidy Betty' on the hearth, to the various sized candlesticks displayed about the room.

The mother of a family could never be idle. She had her special days for baking, washing and cleaning and polishing the brasses..... her evenings were spent in knitting, sewing and mending.

When her husband worked in shifts, his meals and hot water had to be ready as he needed them. For a long time the miners were paid fortnightly, the week when they were not paid being known as a 'baff' week. In 'baff' week it was often difficult to make ends meet, but says the pitman...." However poor and plain was the better bits come a' te me!" That is to say the last one to do without was always the husband, since he was the bread winner.

The washing tubs and poss sticks were a common sight each Monday when the weekly wash was done- the elaborately frilled pinafores, underwear and night clothes of the women and children, the starched table and bed linen, and the 'pit hoggies' and dress clothes of the husband. Ironing was also a long and tedious task. Heaters had to be heated in the fire, removed by inserting poker into the special hole of the heater, and placed in a box-iron. The heat in the iron did not remain for very long, and spare heaters had to be kept in the fire in readiness. Having finished with an ordinary iron, frills and cuffs and collars had to be crimped with goffering irons and then all had to be hung to air. At first women used to wash in a communal wash-house, but when wages increased, they preferred to buy their own tubs, poss sticks and mangles.

So, also with baking, the housewife had to bake her bread on a certain day of the week, because it was her day to use the communal oven. The communal oven in East Rainton was in, what is now the boiler house of Mr. Bailey's farm. This oven was filled every day with rows and rows of loaf tins containing bread. Each woman knew her own bread by the special stamp on the top of the loaves. The 'stamp' was made by hammering nails into the top of each loaf when ready for the oven.

Family food years ago was much plainer than it is today. Almost every household had their own allotment where vegetables such as leeks, potatoes, carrots, cabbages, onion, peas and beans were grown with great pride and pleasure. Small shows of vegetables, especially leeks, were held in the village pubs and even today leek shows are held in 'The Tavern' and the 'Travellers Rest' in East Rainton.

Scraps of food left from the table were usually given to hens or a pig, kept also in the allotment. Hens provided eggs and the pig was usually killed about the time of the Houghton Feast or Christmas to provide the extra meat that was needed on such festive occasions. The bacon was salted and dipped in brine and used through the winter by the family, who had it for breakfast each morning.

The village then boasted just one butcher to supply the village meat. Mr. Robson carried on this business for over sixty years and killed three beasts each week. Today there is no resident butcher, but meat is brought to the village by vans belonging to the various co-operative societies and private businesses in Houghton-le-Spring and Hetton-le-Hole.

A woman also took pride in keeping her family neat and tidy, even if she had to cut down father's old suits to make 'every day' suits for her sons. It was the custom to have four sets of clothes in the careful days..... a best suit, when one went to church or chapel or for some other special occasion...., a second best into which one changed after attending church on Sunday and to mark Saturday afternoon as different from other afternoons..., an every-day suit into which the husband changed from his work clothes and which the children used for school, and an old suit used by the husband for gardening and jobbing about the house and by the children after school, to save the wear and tear on their school clothes when they were playing. Any clothes which survived this descent in care and importance could be washed, pulled to pieces, and cut into strips to make into

Hookey and Prodded mats and rugs to add warmth and colour to the kitchen fireside. Today many such rugs are made of wool since the joy of making home-made rugs persists.

Pieces of lighter material were used to make patchwork quilts, cushions, etc. Cotton wadding was placed between coverings of sateen etc. and quilting was done round designs made with cardboard templates, of feathers, shells, flowers, leaves etc. Many beautiful Durham quilts were produced, which were light and warm enough to be used as eiderdowns on beds. Later feathers and down took the place of wadding, but much of the quilting, connected especially with Durham County, is still done by hand.

The first school in East Rainton was built in 1822. The school master was Mr. Robert Lawson. Children were taught to read and write and do sums and how to sing and a sewing mistress, Mrs. Ramshaw, was employed to teach the girls to sew. After the church was built in 1866, the school was taken over by the church, and Mr. Croisdale, the vicar visited the school on two or three mornings each week to teach scripture and to examine the pupils on their knowledge of the Bible and the Church Prayer Book.

The school which was built on the site of the old 'Pontop Colliery' in the original colliery yard, could accommodate 136 children, including infants. In 1894 when Mr. Sager was headmaster, the average attendance was 118.

In 1930 plans were passed for a new school to be built in ground adjoining the old school. It was completed in 1933, but many cartloads of rubble were needed to fill in the original Pontop shaft before the toilets of the new school could be built over it.

Today there are no mining families living in the village, but older relatives recall the kind of life that existed when so many depended on the pits for a living. East Rainton is very much a dormitory village now with people working elsewhere, usually within a radius of a few miles. The much older rural connections hardly exists as much of the land associated with the older farms has been sold on. The technology of farming has advanced to the point where there are few opportunities for employment within farming since machinery now does the work of the farm hand. The hard labouring thankfully is a thing of the past.

12.3 Rainton Meadows and the Original Pits

Rainton Meadows pit was one of a group of pits located to the north of both East and West Rainton. There was a complicated group of shafts and drifts set quite close to each other. They included the Plains Pit, North Pit, Nicholsons Pit, Hunters House Pit, the Resolution Pit and the Adventure Pit, all under the heading of the Rainton Pits. Initially Frances Anne Vane Tempest leased them from the Dean and Chapter and following her marriage to the Marquis of Londonderry he became the chief operator. They produced coal on a stop start arrangement according to demand, the peak production years being from 1850 through to 1885. Nevertheless, all the pits were economic until the 1890s but a few years later most had closed down due to the lack of suitable coal. They were served by a complex but efficient railway system operating as the Londonderry Railway which sent coals either to the River Wear at Penshaw or to the east to Seaham Harbour, a facility owned and run by Londonderry himself. In later years coal from the Rainton collieries was sent direct to Sunderland.

A number of these collieries were still operating in the first decade of the 19th century and that is when we first hear about some serious mining disasters. Hundreds of men and boys were employed in the various mines and other ventures such as coke ovens, a sawmill, brick making or gas production.

The closest colliery to East Rainton was The Meadows Pit which opened at some time between 1821 an 1824. Close to the Durham and Sunderland road it soon attracted miners and within a short time houses sprung up in the area which became known as Middle Rainton. This hamlet had only one street of houses on a north-facing slope but was served by a pub. Very little is known about it except that the last house was still inhabited as late as 1950 by which time the houses were all dilapidated. As a result Durham County Council classified it as a schedule "D" village and it was quickly demolished with any remaining villagers re-housed locally.

By 1894 Meadows Pit was just a shadow of its former self and the mass of railway sidings serving its coke ovens were removed around this time. When functioning as a pit it had saw mills and a separate smithy as well as a large reservoir close by. It closed in 1894 but most of the buildings and shaft were retained and it periodically reopened right up to the late 1960s when it closed for good. It tended to be used as a ventilation shaft for the nearby Adventure Pit which was the last mine in the area to close.



A rare photograph of the Meadows colliery taken in 1963. Note that the head gear is still operational as a man shaft

The final operation of this unusual colliery was in April 1936 when the Lambton, Hetton and Joicey Collieries Ltd made preparations to open the shaft 40 years after it had been closed by the Marquis of Londonderry along with other Rainton collieries.

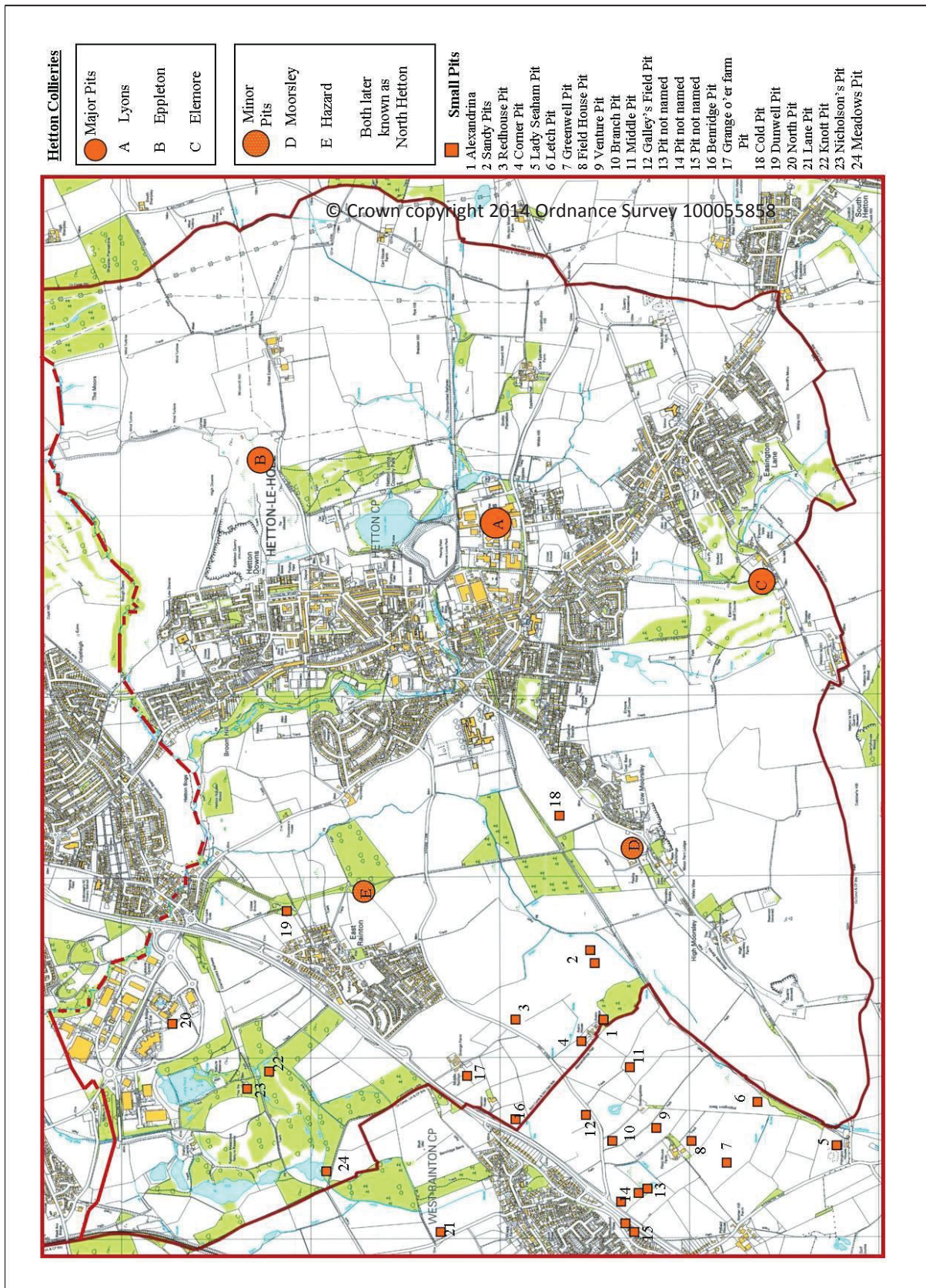
A new engine house and pulley headgear were erected with the object of re-opening the shaft to enable men employed at the neighbouring Houghton Colliery to ride from the Meadows to save time going to and from their work place. Thus Meadows coal was being extracted at Houghton Colliery at this time.

Practically the whole of the area where the collieries once stood has subsequently been landscaped as part of a reclamation scheme instigated in the 1990s following a widespread extraction of unworked coal deposits by Hargreaves Mining using opencast methods. The huge pyramidal shaped heap of Nicholson's Pit in the centre of the scheme was partially removed and landscaped with a

series of lakes and wild woodland areas around the site. Today it is a good example of what can be achieved by turning an immense industrial wasteland into a wildlife area.



This photograph shows the landmark pyramid shapes of the waste heaps of Nicholson's Pit. Closed in 1898 the heap remained as shown in the picture until the 1990s when land reclamation programmes were initiated to re-generate the whole of the Rainton Meadows area. The Meadows Pit was located just off the left hand side of this photograph.



Mining Locations in the Hetton Area

13. THE HETTON COAL COMPANY

In the early years of the 19th century Hetton was little more than an agricultural hamlet of some 200 souls adjacent to Hetton Hall, but by the middle of the century it had grown into a township of over 5000. The reason for this sudden expansion was, of course, the advent of coal mining and such rapid growth was by no means untypical of the Durham coalfield at the time. What singles out Hetton, however, is that this development was not the result of the local landowner exploiting the mineral resources of his estates, as did the Lumley, Bowes, Lambton, and Vane-Tempest families for example. These aristocrats operated in the tradition of the so-called 'Grand Allies' who, from the early 18th century onwards, jealously guarded 'the Vend', the amount of coal that could be produced, and so sustained the price it could command in the London markets, and they did not welcome new competition. However in Hetton the pits were developed, with great difficulty and in the face of much opposition, not by the landowner but by 'adventurers', i.e. a Partnership called 'The Hetton Coal Company', the first major public company in County Durham. It resulted from the initiative and enterprise of a most remarkable entrepreneur, Arthur Mowbray, whose plans at Hetton, not for the first time in his long life, very nearly came to grief. The aim of this article is to give a brief account of particularly the early years of the Company and why it is that Hetton developed as a 'company town'. It owes a great deal to the researches of Dr. John Banham (refs. 1,2) and Colin E. Mountford (refs. 3,4).

Early Mining in the Hetton Area

Coal had been mined to the west of Durham where the seams are fairly close to the surface from the earliest recorded times and by the 18th century pits were well established in the Lumley, Penshaw and Rainton areas not too far from Hetton, but there were considerable doubts among both mining engineers and exponents of the infant science of geology as to whether the coal measures continued under the magnesian limestone escarpment on the western edge of which Hetton lies.

In 1746 the Dowager Countess of Strathmore of Streatlam Castle purchased the Hetton estate from John Spearman of Thornley and gave it to her youngest son, the Hon. Thomas Lyon (1741-1796) who lived in Hetton Hall. The first known record of boring to try and find coal at Hetton is in 1772, at the instigation of a Mr. Thomas Swinhoe, which reached down about 130 meters but found only very narrow seams. Despite this Thomas Lyon decided to acquire additional mining rights in the area that were owned by a William Hutchinson too. However, it was not until 1796 that his son, John Lyon, employed an experienced 'borer', Thomas Rawling, to look for coal, which he did apparently find at a depth of about 160 meters. But little seems to have happened for some years after this until, in 1810, John Lyon commissioned Thomas Fenwick, the colliery Agent to the Dean and Chapter of Durham, to try and sink a proper shaft at Hetton. However he was thwarted by the discovery of a layer of what they called 'quicksand', beneath the limestone at a depth of about 40 meters, in which a lot of water collected. This required pumping and expensive iron shuttering to maintain the shaft and, having expended about £13,000, Lyon ran out of funds with still another 120 meters to go. It was estimated that a further £51,000 would be needed to reach any worthwhile coal seams, a sum which may usefully be compared to the typical cost of about £12,000 required to sink a pit at this time. So, not surprisingly, subsequent attempts by Lyon to lease out the mining rights at Hetton were not successful.

Quite apart from the projected cost, there continued to be serious doubts as to whether exploitable coal seams really did exist in the area. Colonel Braddyl, owner of the nearby Haswell estate, employed William Smith, the so-called 'father of English Geology', to undertake a survey of the area and he concluded that, as the magnesian limestone must have been laid down much later than the formation of the coal deposits, there was every reason to expect that the coal measures would continue into East Durham, but this optimism was widely contested at the time. However, one person who did take the idea very seriously was Arthur Mowbray.

Arthur Mowbray

Arthur Mowbray (1755-1840) began his career working mainly as a Land Agent, serving in this capacity for a number of East Durham estates including George Baker at Elemore, Edward Shipperton at Murton and George Silvertop at Hutton Henry. He also acted as Receiver General for the Bishop of Durham, Shute Barrington, dealing with the rents and fines due to the Diocese of Durham. It was probably in this capacity that he resided in Sherburn House adjacent to Sherburn Hospital. In addition he was a Commissioner for Enclosures in various parts of the area in the 1790s. His brother, John Mowbray, was a partner in the Darlington Bank of Richardson and Mowbray, and around 1800, when Richard Richardson died, John decided to withdraw from banking and so Arthur became its Manager and senior Partner. At this time the Bank was mainly concerned with farming business in north Yorkshire and south Durham but under Arthur's leadership it greatly expanded becoming the Darlington and Durham Bank of Mowbray and Co..

His involvement with coal mining seems to have commenced about 1795 when he became Land Agent to Sir Henry Vane-Tempest who had inherited mining interests in Rainton and Penshaw. As such, in 1805 he became a representative for the Wear Coal Trade on the Joint Coal Trade Committee of the Tyne and Wear, commonly referred to as 'The Committee of the Vend', which made him a significant figure in the local coal industry. From as early as the 1730s the 'Grand Allies', i.e. the major landowners and coal merchants, had ensured careful control of the 'Vend', the amount of coal being produced in the region, by buying up mining rights and restricting way-leaves over their land to thwart attempts by newcomers to enter the trade. They also agreed on how the permitted vend should be carved up among themselves. This appointment brought him into contact with John Buddle (1773-1843) who was appointed secretary to the Committee in 1806. Buddle was regarded as the greatest colliery engineer of his day being one of the first properly scientifically trained viewers. He took over from his father as viewer at the Lambton collieries in 1806 and was also appointed to that role at Heaton. With Tyneside engineer William Chapman (1749-1832), he was responsible for trialling the use of steam locomotives on the wagon-ways serving these collieries and attempting to improve their design. It is notable therefore that he concluded in a report written as late as 1825 that locomotives were not yet the answer to railway haulage! He was destined to become a serious obstacle to Mowbray.



John Buddle

When Sir Henry Vane-Tempest died in 1813 his heir, his daughter Lady Frances Vane-Tempest, was only 13 years old and so became a Ward in Chancery meaning that her affairs became the responsibility of the Master in Chancery, James Stephen. He had to decide whether Mowbray was a

fit and proper person to look after her interests. Until 1808 the Vane-Tempest collieries had been managed by 'undertakers' but when they went bankrupt Mowbray had taken on the role of Colliery Agent himself despite his lack of mining experience. In fact he succeeded in doubling the collieries' production and so was able, though not without difficulty, to persuade Master Stephen to allow this arrangement to continue. However in 1815 Mowbray's bank failed, probably in part because he had taken to paying creditors of the Vane-Tempest estate with bills of exchange drawn on his Bank. This may have been because he had to spend too much time in London answering to the Court of Chancery to be able keep proper control over the Vane-Tempest estates, but was also probably a consequence of the recession in national trade which followed the ending of the Napoleonic Wars. Despite this setback he succeeded in convincing the Court to allow him to continue as manager of the Vane-Tempest collieries with unfettered control, and this job provided his only significant source of income at this time.

In 1816 Mowbray considered purchasing the mining rights at Hetton for the Vane-Tempest collieries. The mining engineers who were consulted, William Stobbart, Edward Steele and John Watson, advised that it would be advantageous for Lady Frances to lease them from John Lyon. However it seems that the expected cost of the lease, £51,000, and the continuing doubts as to the existence of viable coal-seams, put Mowbray off. In any case Mowbray fell out with John Gregson, who had been Sir Henry's solicitor and was now the Receiver of the Vane-Tempest estate, and also with Mr. Whitton who was the solicitor for the Countess of Antrim, Sir Henry's widow. It appears likely that he only retained his job because he had the support of William Vizard the solicitor acting for Lady Frances herself. But when in 1819 she married Charles Stewart (1778-1854, who became the 3rd Marquis of Londonderry on the death of his half-brother in 1822) Whitton recommended to him that Mowbray should be dismissed because of the strife he had been causing through his alleged bullying, as well as his bankruptcy and his lack of expertise in colliery management. Even worse he was called a 'liar' and a 'swindler'. Whitton recommended that John Buddle should be appointed in his place. Lord Stewart acted immediately on this advice and so Buddle transferred from the Lambton to the Londonderry collieries, and, at the age of 64, Mowbray found himself out of work, bankrupt and seemingly with few prospects.

The Formation of the Hetton Coal Company

Whatever Mowbray may have lacked in expertise as a colliery manager, and however low his reputation as an honest man of business may have fallen by this time, it is clear that his entrepreneurial drive and self confidence were undiminished for almost immediately, in 1820, he set about becoming the 'Projector and Manager', to use his own titles, of a Partnership to develop mines at Hetton from a base at Little Eppleton Hall where his daughter and son-in-law were living.

It is believed that the Company was established by a deed of co-partnership. Initially there were 11 partners who between them acquired 24 shares of £250 each, producing a capital base of just £6,000, very much less than the £60,000 which it was estimated in 1819 would be required to develop the colliery and its wagon-way. The difference would, it was hoped, be made up by bank loans secured on the anticipated proceeds of the project.

Probably the most significant and certainly the most colourful of the shareholders, with initially 4 shares, was the Hon. Captain Archibald Cochrane RN (1783-1829). He was the 4th son of the 9th Earl of Dundonald, a Scottish landowner and colliery owner in Ayrshire, who had served as midshipman

on the ship captained by his eldest brother, Thomas Cochrane (1775-1860, 10th Earl from 1835) who had a remarkable career as Admiral in both the British and Chilean navies and in radical politics and the stock-exchange, and whose exploits are said to have inspired C.S.Forester's 'Hornblower' novels. Archibald similarly went on to command RN ships with distinction during the Napoleonic Wars but he retired from the Navy in 1811. He married Mowbray's daughter, Hannah Jane Mowbray, in 1812 and they came to live in Little Eppleton Hall from where he became a significant landowner.

Archibald's elder brother, William Erskine Cochrane, a Major in the Army living in London, also acquired 1 share, as did Robert Watson Darnell, a Brewer of Monkwearmouth and Mowbray's nephew, and William Lynn Smart, a landowner from Trehitt House near Rothbury, Northumberland. The other major shareholder, with 5 shares, was Richard Scruton, an attorney living in Durham City who was Under-Sheriff of Durham and had probably had to act in relation to Mowbray's bankruptcy. Another Durham attorney, John Dunn, had 2 shares and Alexander Whalley Light, a Lt. Colonel in the Army also from Durham City, had 3 shares. The remaining shareholders were people associated with the coal trade, William Hayton a coal fitter from Monkwearmouth who had 2 shares, as did Thomas Horn, likewise from Monkwearmouth, who had been a coal fitter for the Vane-Tempest collieries when Mowbray was manager, and William Stobart Jr., the Viewer and Manager for the Lambton pits from Picktree, Chester-le-Street, Hayton's son-in-law, whose father had advised Mowbray about the possibility of the Vane-Tempest group leasing the Hetton mining rights back in 1816, while John Wood, another colliery viewer from Washington had 1 share. So the Partnership consisted of 4 minor gentry and a business man (3 of them related to Mowbray), 2 Durham lawyers and 4 colliery engineers.

Apart probably from Archibald Cochrane none of them seem to have had the amount of spare money that was needed for such an ambitious project. So the funds required to sink the colliery and construct a new railway from Hetton to the proposed staiths in Sunderland would have to be borrowed from banks which was obviously a major problem for Mowbray, a bankrupt. But he still had good connections from his time as a prominent banker and it seems likely that he was able to obtain promises of funds from some London banks as well as more local ones, particularly, from Backhouse and Company's Bank in Sunderland. An independent assessment of the project at this time by Edward Steele, who Mowbray employed as a consultant, valued it at about £250,000 based on a vend of 100,000 chauldrons (a chauldron being approximately 2.5 tons) of coal per annum so the scheme must still have seemed potentially quite attractive.

Backhouse's support annoyed Buddle who was relying on that bank to fund Londonderry's own ambitious expansion plans. Buddle was also considering purchasing the mining rights at Hetton for the Londonderry Collieries, not least because he believed that, in view of his financial problems, Lyon would have to sell the mining rights cheaply and also he expected that considerable savings could be achieved by linking the Hetton pit to the Rainton wagon-way which carried coal to staiths on the Wear at Penshaw. However he prevaricated, probably in part because of his doubts as to whether there really was exploitable coal at Hetton. Initially Mowbray had considered linking Hetton to Nesham's Newbottle line which began just over 3 miles north of Hetton, and which was expected to become available because Nesham was experiencing considerable financial difficulties too at this time, but Buddle was determined to thwart him and, as we shall see, eventually encouraged Lambton to buy it instead.

More serious for Mowbray, it emerged that John Lyon did not enjoy full mining rights over the Hetton area. He and his mother had sold the rights over about 120 acres to a Mr. Clutterbuck and had also borrowed money from Everett and Company, Bankers, against the security of various other of their properties and mining rights to finance their abortive attempts to sink a pit in 1810-13. By 1820 Everetts had filed a bill to try and force Lyon to sell these rights to pay off these debts but it seems that instead, in order to buy them off, his lawyer, a Mr. Tahourdin of London, had purchased a life interest in the whole Hetton property. Mowbray therefore had to enter into an agreement with Tahourdin for £900 to buy out this life interest which he was able to do by getting Archibald Cochrane to stump up £600 towards the purchase of his shares in advance of the start of the project, and the lawyer Scruton similarly £300. He decided to circumvent the problem of having only partial control of the mining rights at Hetton by abandoning Lyon's old shaft and sinking a new one away from the area where the rights were divided. The other owners were thus not able to scupper the project as Buddle and Londonderry were hoping. It would seem that Mowbray's colliery engineer partners, Hayton and Horn, were instrumental in achieving this solution.

Attempts to Start Mining

A lease with John Lyon was signed on 13th May 1821 and a succession of further leases and way-leaves with the other local landowners were completed during the summer of that year. This was despite the fact that already in April the sinkers had struck excessive amounts of water and had to stop digging. More money was needed to buy pumping equipment and for the additional labour costs. Scruton, one of the two largest shareholders, attempted to borrow £22,000 against the security of the expected output while Mowbray appears to have raised some money on the Stock Market but it is not certain who raised how much. What is clear is that this combination of technical and financial problems caused considerable tension and ill will among the protagonists. It was reported (by Buddle in letters to Londonderry) that at a company meeting in early October 1821 Cochrane and Scruton threatened each other with pistols while the epithets 'scoundrel', 'rascal', etc 'flew like grape shot'. Scruton is alleged to have charged Mowbray with obstinacy and extravagance. It was claimed, evidently wrongly, that Mowbray was as a result dismissed as Manager. The main problem seems to have been that while some of the partners agreed to mortgage their property to raise the capital needed to complete the project others '...positively refuse to advance any more money'. At a full meeting of the partners on 24th October 1821 it was stated that £107,000 had already been expended but only £63,000 raised. Eventually it appears the Backhouse Bank was persuaded to increase its support, and in 1822 some new partners including William Shotton who had made a fortune in India, William Charlton of London and John Collingwood Carlton a landowner in Northumberland, brought in additional finance. And surprisingly, despite his previous financial embarrassments, Mowbray was also able to become a partner that year.

In 1822 Nesham's Newbottle colliery with its wagon-way from Houghton to the Wear at Sunderland finally came up for sale and there was considerable competition to acquire it between the Lambton and Londonderry groups and Mowbray, who considered bidding for it despite the parlous state of the Hetton Partnership's finances. If it had been possible to connect Hetton to the wagon-way at Newbottle it would have made the proposed Hetton railway redundant, but in the end it was purchased by Lambton. There was also a proposal mooted by Colonel Braddyll of Haswell and other local landowners to construct a railway to a new harbour at Hawthorne Dene, or perhaps Hartlepool or even Stockton, to enable the export of coal from pits they proposed to sink in the area just south

of Hetton, including on George Baker's Elemore estate. Mowbray got himself involved with this project too for a time but in the end few of the landowners were willing to support it. As we shall see, this abandonment proved crucial for getting further investment in Hetton.

Coal Production Begins

The new Lyons pit (so called despite the Lyon family's lack of involvement by this stage) reached the main coal seam in September 1822 and the newly completed railway from Hetton to staiths in Sunderland carried its first coals on 18th November 1822. But this was by no means the end of the problems and 1823 proved to be a particularly difficult year. The colliery's output did not meet the hopes and financial requirements of its investors. Several improvements to the railway, which did not meet its design capacity, were required adding further to the costs while in early 1823 the Coal Trade Committee insisted that Hetton's vend must be limited to 50,000 chaldrons per annum. Mowbray's failure to get this increased almost caused him to resign from the project. He was not on speaking terms with Scruton who was said to be willing to buy up Mowbray and Cochrane's shares and some of the other shareholders seemed anxious to sell up at almost any price. But it was Scruton who was most in debt and he appears to have suffered some sort of nervous breakdown at this point. He blamed Mowbray's inadequate management for the parlous state of the project and Mowbray felt obliged to defend himself by getting James Stephen, the Master in Chancery, to write a reference as to the effectiveness of his earlier management of the Vane-Tempest collieries when Lady Frances was in her minority. In a letter of 9th August 1823 Stephen wrote '....my views of your conduct and character were such that if I had myself been owner of the colliery I should certainly have left it in your care.' Mowbray ensured that his critics were made well aware of the contents of this letter. By the end of 1823 something approaching £150,000 had been expended but still only about £80,000 raised in investment capital so the Company was some £70,000 in debt. To be really viable they needed to increase their share of the vend but this was strongly opposed by Londonderry and Buddle in particular who had their own expansion plans. However Scruton was said to be willing to accept the limited vend originally allowed, hoping thereby to sustain a higher price for coal as preferred by the Coal Trade Committee. He even appears to have tried to get the Court of Chancery to appoint a receiver for the company so as to take it out of Mowbray's hands. Several of the other shareholders seem to have had similar doubts about Mowbray's management and the wisdom of seeking to 'break the vend'. But Cochrane and others agreed with Mowbray that the future of the Company could only be secured by increasing their vend even at the expense of lower coal prices.

In 1824 George Baker, who was well known to Mowbray from his days as his land agent, joined the Partnership with the intention of having coal from his proposed pit at Elemore transported to Sunderland on the Hetton railway. At the same time, becoming desperate, Mowbray's enemy Scruton felt forced to sell his shares. So the key partners, Mowbray, the two Cochranes, Darnell, Dunn and Baker set about overcoming the Vend committee's resistance to increasing Hetton's vend, and to acquiring Londonderry's rights over coal in the Hetton area owned by Clutterbuck and others. Mowbray seems to have been able to convince those representing Lyon's interests that it would be of benefit to Lyon if the Coal Company's rights were so expanded. Similarly Stobart tried to persuade Buddle to intervene with Londonderry for similar reasons, since Londonderry was himself becoming seriously overstretched financially and would profit if Hetton were able to extract coal in the areas

where he retained an interest. However the Hetton Company was still struggling to raise sufficient finance for these developments, partly because Baker was also experiencing problems and not able to invest as much as Mowbray had originally hoped. They both spent time in London trying to raise more bank loans. But eventually Buddle became convinced that, given the money problems being experienced by both Londonderry and Hetton, the time had come for a serious renegotiation between the two parties. Buddle consulted first with Stobart and then with Dunn who wrote to Mowbray asking him to come to terms with Buddle and eventually, in June 1824, they reached an agreement on splitting the vend between them. As a result, Baker and Cochrane, who were friends with Lambton the other key player, were able to persuade the Coal Committee to increase Hetton's vend from 50,000 to 100,000 chaldrons per annum and at last Hetton became viable.

This was quite a triumph for Mowbray since Hetton was by far the most capital intensive mining project in the region to date and had been achieved by a Partnership with very limited resources. Given that the scheme was also technically highly advanced, requiring the sinking of such deep shafts, the first to penetrate the magnesian limestone layers, and was the first to be wholly reliant on a steam operated railway with a combination of locomotive and rope haulage, the risks that had been borne still seem quite remarkable. That they finally succeeded appears to be largely due to the persistence of Arthur Mowbray who, despite being a failed banker with little technical expertise in mining, overcame the quarrelling among his somewhat impecunious backers and the hostility of the 'Grand Allies'. He had managed to obtain the services of some of the most expert mining engineers and of George Stephenson to design the railway and his brother Robert Stephenson to build it. There can be little doubt that this was much more Mowbray's personal achievement than that of the rather lacklustre group of partners that he led.

During 1824 Horn's shares (which had been inherited by his beneficiaries following his death in 1821) along with those of Light and, as already mentioned Scruton, were sold and, together with George Baker, a Rev. James Dalton, a clergyman from Croft near Darlington and John Tower, an Army Major joined the Partnership. Towards the end of that year Mowbray and Baker raised additional capital in London to develop the pit at Elemore and the extension of the railway to service it. Work started in 1825 it opened in 1827. Also in 1825 the Company began sinking another pit at Eppleton just north of Hetton but difficulties with sand and water, even worse than those which had been encountered previously by John Lyon, delayed its opening until 1833. In 1829 Archibald Cochrane, Mowbray's son-in-law whose support had been so crucial, and his nephew Robert Darnell, both died and their widows, Hannah Jane Cochrane and Jane Darnell, acquired their shares. John Lyon also died in 1829 and it seems likely that the Coal Company acquired a lease on Hetton Hall and the nearby Hetton House at this time. By 1832 the number of shareholders had risen to 20, including Thomas Cochrane, by now the 10th Earl of Dundonald. But despite these additions the Company was still very much in debt to the Backhouse Bank which gradually tightened its control. They decided that it needed more professional management than Mowbray was capable of providing and so finally in 1836 at the age of 81 he retired. He sold his shares which by then were worth a great deal of money and invested some of his profits in the new Clarence railway on Teesside in collaboration with John Backhouse, so he remained a railway pioneer to the very end. He died in 1840.

In 1836 the pits just to the west of Hetton at Moorsley and Rainton owned by a partnership led by Lord Boyne of Brancepeth Castle, rather confusingly called the North Hetton Coal Company, was

purchased by a partnership of Lambton, Londonderry and the Hetton Coal Company but it retained its old title.

An Established Company



Nicholas Wood



Statue at NEIMME

In 1836 Mowbray was replaced as Manager and Principal Partner at Hetton by Nicholas Wood (1795-1865), previously the Colliery Viewer for Lord Ravensworth and Partners at Killingworth, who came to live in Hetton Hall for the rest of his life. He was born in Ryton, Co. Durham, the son of a mining engineer, educated at Crawcrook school, and went to work at Killingworth, initially as an apprentice colliery viewer. There he collaborated with George Stephenson on the development of steam locomotives in the years around 1815 and his advice had been instrumental in the adoption of these locomotives from the start of the Hetton railway in 1822. He was the author of the influential 'A Practical Treatise on Railroads' (1825) which did so much to establish Stephenson's reputation and he was one of the three judges in the 1829 Rainhill Trials of locomotives for the Liverpool and Manchester Railway. He remained a friend of Stephenson for the rest of his life and played a major role in the education of his son, Robert, who was apprenticed to him at Killingworth from 1819 to 1821 and went on to become one of the pre-eminent engineers of the Victorian era. Wood was involved in the building of the Newcastle and Carlisle and other railways in the region, became a partner in the John Bowes and Co. collieries and went on to be a founding partner at the Harton Coal Co. where a pit was sunk in 1842. He also had his own firm, Nicholas Wood and Partners, which developed collieries in the Bishop Auckland area.

Wood was a founder and the first President in 1852-3 of the North East Institute of Mining and Mechanical Engineering whose remarkable premises still grace Westgate Road in Newcastle and is a major repository of industrial archives for the region. It contains several busts and pictures of its distinguished founder including a particularly fine one which graces the Wood Memorial Hall. He wrote an important report on the operation of the Hetton Colliery Railway in 1840 and during his tenure many improvements were made to both the railway and the pits which became increasingly profitable. He was elected a Member of the Institute of Mechanical Engineers in 1858 and a Fellow of the Royal Society in 1864. On his death in 1865 he was buried in the graveyard of the now demolished St. Nicholas Church in the centre of Hetton where his tomb can still be seen.



Sir Lindsay Wood.

His place was taken by his youngest son, Lindsay, later Sir Lindsay Wood (1834-1920, Baronet from 1897), who was one of the dominant figures in the Durham coal trade for many years, inheriting his father's interests in the Harton and Bishop Auckland pits as well as Hetton. He continued to live in Hetton Hall for a time but later moved to the Hermitage in Chester-le-Street. The company was changed from a Partnership to The Hetton Coal Company Ltd. in 1888.

However as the 19th century drew to a close the Durham coalfield was becoming concentrated in fewer and fewer hands. One of these was James Joicey (1846-1936, who became a Baronet in 1893 and the first Baron Joicey in 1906) the owner of James Joicey and Co. Ltd., originally founded by his uncle, also James Joicey (1806-1863), which controlled several collieries in the Stanley-Chester-le-Street area. He forced the Earl of Durham to sell to him the Lambton collieries on very favourable terms in 1896 and formed a new company, The Lambton Collieries Ltd., to run them. He also wanted to acquire both the colliery and the railway of the Hetton Coal Co. Ltd., not least because he could see the advantage of combining the Hetton and Lambton railways which ran to adjacent staiths on the banks of the River Wear in Sunderland. However, because the Hetton Company was so profitable Sir Lindsay had no intention of relinquishing control of it. So, unknown to Wood, Joicey bought up shares in the Company (and its share of the North Hetton Coal Co.) until he had acquired a controlling interest and was thus able to force Wood to sell up to him in 1911. He then merged the two companies to form the Lambton and Hetton Collieries Ltd. in that year. In 1924 he combined them with the original Joicey Company to form the Lambton, Hetton and Joicey Collieries Ltd., which was much the largest coal operation in County Durham. It remained under the control of his family, first his elder son, Arthur Joicey (1880-1940, the second Baron) and then his younger son Hugh (1881-1966), the third Baron Joicey of Longhirst Hall, Northumberland. Upon nationalisation in 1947 all the collieries and their railways were brought under the control of the National Coal Board (NCB) and the Lambton, Hetton and Joicey Company was formally wound up in 1952.

The Lyons colliery was largely worked out by this time and closed in 1950 but mining continued at Elemore and Eppleton which became part of the NCB's Hawthorn Combined Mine in 1959. Coal could then be brought to the surface at Murton which made the Hetton railway redundant and it closed in that year. Elemore Colliery continued until 1974 while Eppleton remained as part of the Hawthorn complex until closure in 1991 which finally brought mining to a close in Hetton after almost 170 years.

The Company's Legacy

The site of the old Lyons colliery is now mostly an industrial estate but the area once occupied by its extensive spoil heaps was converted into the Hetton Lyons Country Park in the 1990s. The site of Eppleton Colliery is still being similarly landscaped at the time of writing (2014) but the limestone quarry in what was once part of the colliery grounds continues to operate. The former pit baths at Elemore remain as offices but the rest of the site, including the old slag heaps, was turned into a golf course in the 1980s. So there is little now to remind one of the Hetton Coal Company's mining operations except for the many footpaths which follow the old railway tracks.

Yet the influence of the Company on the development of Hetton is everywhere apparent. The mainly 19th century rows of miners' houses, and the obviously superior ones for overseers and other officials, which were sold into private hands by the NCB, still provide the basic structure of the Town, though added to by the Council housing and private estates built in the 20th century. And the rows of shops and the pubs, chapels, etc., built in the mid 19th century to meet the needs of the rapidly growing mining community, still constitute the core of the town's facilities. The former Colliery Office, built for some unknown reason not near to the pits but in the centre of Hetton, in the not very imaginatively named 'Office Place' in about 1840, still survives with many of its original internal features and is now the headquarters of the local Air Training Corps. Next door are two former managers' houses, Glenside and Holly House, built by the Coal Company just before 1860. Ralph Dixon Cochrane, the son of William Erskine Cochrane one of the original Partners, became the Colliery Agent and then Secretary to the Hetton Coal Company and lived in Glenside from the 1870s until the early 20th century. His father lived with him there in the later 19th century. Ralph Cochrane went on to become a member of the Hetton Urban District Council which was created in 1885, just one of the many ways that the Company's influence on the town continued.

As we noted at the beginning of this article, Hetton was just a small agricultural hamlet at the start of the 19th century, and the three main communities, Hetton Lyons, Easington Lane and Eppleton, together with central Hetton, were all established during Mowbray's control of the Hetton Coal Company. So the Township's modern structure is very much the product of the audacious entrepreneurship of this remarkable but now often overlooked man.

References

- 1) J.D. Banham, *Arthur Mowbray and the Hetton Coal Company*, MA dissertation, Sunderland Polytechnic, 1988.
- 2) J.D. Banham, Coal, 'Banks and Railways', p. 279 in Andy Guy and Jim Rees (Eds.) *Early Railways – Papers from the 1998 First International Early Railways Conference*, The Newcomen Society (2001).
- 3) Colin E. Mountford, *The Private Railways of County Durham*, The Industrial Railway Society (2004).
- 4) Colin E. Mountford and Dave Holroyde, *The Industrial Railways of County Durham, Part 1*, (2006), *Part 2*, (2009), The Industrial Railway Society.

14. THE HETTON COLLIERY RAILWAY

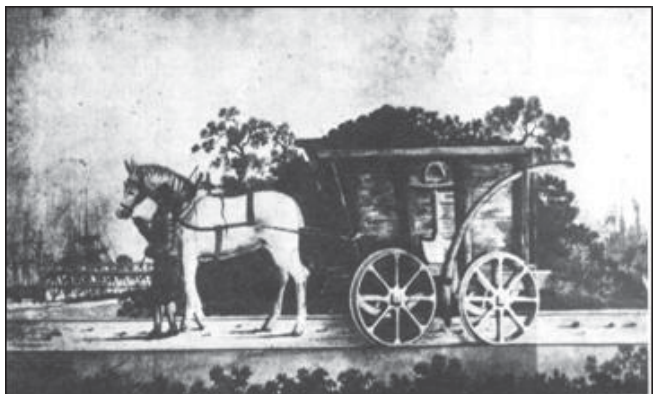
Introduction

If there is anything which gives Hetton a claim to significance, not just in local and regional history but nationally and internationally too, it is surely the fact that it was the site of the very first railway designed and built to be operated, in part, by steam locomotives. It can also claim to be the first railway operated almost entirely by steam power with little use of horses. And it constituted a major step in the distinguished career of railway pioneer George Stephenson (1781-1848), paving the way for his much more celebrated achievements with the Stockton to Darlington and Liverpool and Manchester railways which launched his international reputation.

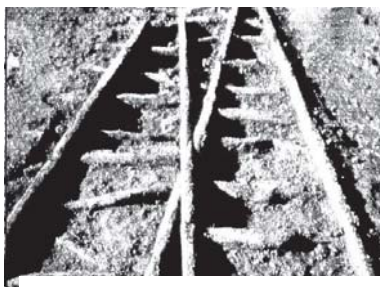
The aim of this article is to give a brief account of the part played by Hetton in the development of railways and, of course, the essential role that railways played in the development of Hetton. Readers seeking a more detailed survey are referred to the scholarly works of Colin E. Mountford and collaborators (see refs. 1-5).

The North-East Coal Industry

Coal has been mined in North-east England from the earliest times and by the Tudor era export to the lucrative markets in London and the SE was well established. The major costs involved in this trade were associated not so much with actually mining the coal as with transporting it over any significant distance (see ref. 6). Because coal is heavy, bulky and fragile (small coals being much less valuable than large lumps) waterways provided the preferred means of carriage, so the usual journey was from the pit-head to the nearest accessible point on a navigable river (such as the Tyne or Wear), then by a barge or lighter, known as a 'keel-boat', to the river mouth where it could be loaded onto a sea-going collier ship, and taken down the North Sea coast.



Horse and chaldron in the late 18th century



*Part of the old Lambton
Wooden Waggonway*

Initially the overland part of this journey, from the pit to the staiths on the river bank, was by pack horse but they could carry only about 2-3cwt. A horse and cart might manage about 8cwt. but, especially in bad weather, repeated passage over the same route soon made the roadways almost impassable and by the 17th century wagon-ways began to be constructed in many parts of the country, including the North-East. These consisted of wooden rails mounted on wooden sleepers, generally about 2ft. apart, resting on stone ballast. The horse walked along this ballast pulling a wagon or chaldron whose wooden wheels were fitted with flanges to keep them on the track. By this

means a horse could pull a chaldron containing about 50cwt. (2.5 tons) of coal on flattish routes whatever the weather. But they could only manage fairly gentle gradients and, not surprisingly, there were problems with the wooden rails which split all too frequently. This led to the introduction of iron plates fastened on top of the rails in the latter part of the 18th century and, by the beginning of the 19th century, to rails made wholly of cast iron. However, cast iron rails were both expensive and brittle, and so liable to fracture under the weight of the coal wagons, requiring frequent replacement. The 18th century also saw the gradual introduction of more durable iron wheels on the chaldrons.

As new collieries were sunk the distance between the pit and a navigable river increased, bringing the need for 'way-leaves', i.e. the right to run a wagon-way over someone else's land. This resulted in many disputes and anti-competitive practices since existing pit owners naturally sought to try and block new entrants to the coal trade.

Mining had taken place to the north and west of Hetton, in the Lumley and Rainton areas, since at least the Middle Ages, and by the 17th century there were several established coal roads to the R. Wear. For example there was one from Rainton to South Biddick along what is now Pithouse Lane. By the beginning of the 19th century several pits had been sunk in the Rainton, Moorsley and Pittington area, not far west of Hetton, which were all connected to a wagon-way which went through Newbottle and Penshaw to the Wear (ref. 6). This was the origin of what eventually became the extensive Londonderry colliery railway serving the many pits developed by the Londonderry family who became one of the principal owners of mines in the East Durham coalfield.

Newbottle colliery (also known as Houghton colliery) was initially linked to this wagon-way (ref. 6) but, with the sinking of several more pits in that area, the then leaseholder, John Nesham, decided in 1812 to build a new wagon-way, almost 6 miles long with cast iron rails, via East Herrington direct to staiths near the mouth of the Wear at Bishopwearmouth, Sunderland. This avoided the need for keels and, of course, for employing keelmen. As a result they rioted and burnt down the staiths in 1815 but the advantages of transporting direct to the river mouth could not be gainsaid for long.

Initially such wagon-ways were operated throughout by horses but, where the route from the pit to the staiths was down hill, gravity could do the work and the horse was needed only to assist with breaking on the way down and to pull the empty wagons back up again. In the



A horse operated gravity incline

later 18th century self-acting gravity inclines were developed whereby one end of a rope wound round a wheel or drum placed at the top of the incline was attached to the full wagons and used to lower them down the hill at a controlled speed, while simultaneously the other end of the rope

pulled empty wagons back up again, obviating the need for horses. Their first recorded use in the North-East was at Benwell in 1798 and by 1819 they had been incorporated into Nesham's Newbottle wagon-way too.

The Lambton family had developed several collieries on their estates near Chester-le-Street from as early as the 15th century, and by the 18th century their interests were very extensive with a wagon-way to the Wear at Low Lambton (ref. 6). However, by the early 19th century its capacity was quite inadequate for the tonnage being produced and so, when Nesham ran into financial difficulties and had to sell up in 1822, his Newbottle wagon-way was purchased by John George Lambton (1792-1840). He was created Baron Durham in 1828 and the first Earl of Durham in 1833. This wagon-way was modified to connect the Lambton mines in the Lumley area direct to Sunderland and became the foundation of the Lambton railway, the other great railway dynasty of the north-east Durham coalfield.

Steam Power

The invention of the steam engine by Newcomen in 1712 gradually resulted in major improvements to the functioning of the coal industry. For example stationary steam engines could be used to winch men and coals up and down a pit shaft enabling deeper mining, and they could be employed to drain and ventilate the underground workings permitting longer 'roads'. But, of greatest interest to us, they revolutionised the surface transportation of coal, and of almost everything else for that matter.

Initially stationary steam engines were used as the inverse of the gravity incline described above (see ref.3). An engine at the top of a hill, powering a rotating drum which had a rope wound round it, could simultaneously pull loaded wagons up the slope and lower empty ones back down. In 1805 the wagon-way from Birtley to Fatfield was modified to incorporate such a steam engine at Black Fell to haul wagons up the eastern side of the Team Valley and, closer to our region of interest, stationary engines were included in Nesham's Newbottle wagon-way at West Herrington in 1819.

The first steam engine light enough to be able to propel itself, i.e. a locomotive, sometimes referred to as a 'traveller' (see A. Guy, ref. 5, p. 117), is generally believed to have been built by Richard Trevithick in 1802 as a 'steam tram', which ran on the roads round Camborne in Cornwall. Variations on his patented design were used on a wagon-way in Shropshire in 1803/4 and on a plateway at Merthyr Tydfil in 1804. A third such locomotive was built to his design in the North-East at Gateshead by John Whinfield and John Steele. It was their intention that it should be operated on Blackett's Wylam Colliery railway but it was not a success and Blackett refused to purchase it from them. A more promising design was produced by Blenkinsop and Murray in 1811 for Middleton Colliery near Leeds of which at least three were built. They proved that steam locomotion could be an effective method of haulage and as a result three more were constructed for the Kenton and Coxlodge wagon-way near Newcastle. However, they did not last long, probably because of sabotage by those whose jobs they threatened!

However, Blackett was not completely put off by these failures and had locomotives built by William Hedley, his colliery's viewer, and Timothy Hackworth the foreman blacksmith, for his Wylam colliery line, which was re-laid with iron rails to accommodate them. After much trial, error and



Wylam Dilly

modification these travellers were made to work reasonably effectively, ultimately emerging as the world famous 'Puffing Billy' and 'Wylam Dilly' in 1813/4, perhaps the first really viable working travelling steam engines. They are preserved to this day in the London Science Museum and the Royal Museum of Scotland, respectively. William Chapman (1749-1832), a civil engineer from Tyneside with interests in several local collieries, also experimented with locomotive designs for the Heaton and then the Lambton wagon-ways in collaboration with John Buddle (1773-1843), the so-called 'King of the Coal Trade' who was the viewer for both the Heaton and Lambton collieries at this time. They encouraged several experimental designs of locomotive to be tried out on various Durham wagon-ways, including an 'iron horse' built by William Brinton (1777-1851) of Derbyshire in 1814 which was used to pull wagons up the two mile slope from Philadelphia to West Herrington on the Newbottle line, but it exploded in 1815.

Of course, the person who eventually became most famous as the pioneer of steam locomotive development at this period was George Stephenson (1781-1848)(see ref. 6). He was born in Wylam, where he must have observed Blackett's experiments with locomotives, but received very little formal education. He obtained employment as resident engineer at Lord Ravensworth and Partners's collieries at Killingworth. His first engine, called 'My Lord' of 1814, had some encouraging success in reducing the cost of transporting coal from the pit to the Tyne and, together with the colliery's viewer Ralph Dodds, he patented a basic design in 1816 which, after some improvements made in collaboration with his friend Nicholas Wood (1795-1865), who was also employed at Killingworth at this time, resulted in a locomotive design which came to be widely adopted in the NE over the next few years, including eventually on the Hetton Colliery Railway. He also patented a new design of iron rail with William Losh which they successfully deployed at Killingworth.

So by 1820 all the prerequisites for Hetton's railway - iron wagon-ways, gravity inclines, stationary steam rope haulage and steam locomotives - were operating in the Durham coalfield (see ref. 6).

The Development of Hetton Colliery

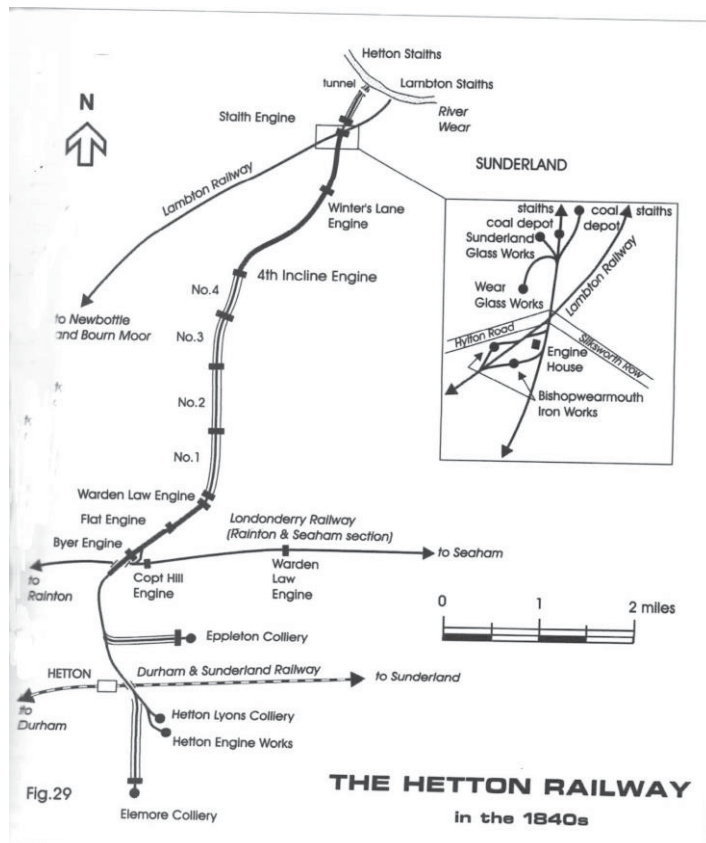
In 1772 Thomas Lyon, the owner of Hetton Hall and its estates, had a trial shaft sunk (perhaps the one noted on early Ordnance Survey maps at NZ 344484 near Hetton House Woods) and another in 1796, in the hope of finding coal under the magnesian limestone deposits of the area, but only very narrow seams were found. His son, John Lyon, decided to commission the sinking of a shaft in 1810 but many difficulties, including 'quicksand', were encountered and when, after an expenditure of £13,000, they hit a thick layer of stone Lyon's capital was exhausted. It was estimated that a further £51,000 would be needed to complete the project (see ref. 7) and so attempts were made to lease out the mining rights. At this time Sir Henry Vane Tempest was the owner of various nearby collieries, including at Rainton, and when he died in 1813, because his heir Lady Frances Anne Vane Tempest was only 13, his estates had to be administered by trustees (refs. 1-5). They employed Arthur Mowbray, a leading land agent and banker, as their Colliery Agent and he had a survey undertaken as to the prospects of finding extractable coal at Hetton with a view to purchasing the mining rights from the Lyon family. The results were quite promising, but in 1819 Lady Frances married Charles William Stewart (1778-1854, who became the 3rd Marquis of Londonderry on the death of his brother in 1822) and he soon set about re-developing the estate. He sacked Arthur Mowbray, who had gone bankrupt in 1815, in favour of John Buddle who had been the Agent of the Lambton collieries since 1806. So Mowbray decided that he would try and exploit the opportunities

at Hetton himself, and for this purpose brought together a group of investors, including Archibald Cochrane his son-in-law, to form the Hetton Coal Company, the first major joint stock company in Durham.

Initially Mowbray had thought of transporting the coal which the mine would produce via Nesham's Newbottle-Sunderland wagon-way which at that time began just over 3 miles NW of Hetton. But Buddle, who greatly disliked Mowbray and doubted his honesty, not least because of his bankruptcy, was determined to prevent this happening and persuaded Lambton to buy it instead. Hence Mowbray was left with little alternative but to have a new line constructed. In July 1820 an invitation was issued to local engineers to submit plans for a suitable route and it was the design proposed by George Stephenson which the Company decided to adopt, though he continued to be an employee of Ravensworth and Partners at Killingworth. The route was surveyed by Edward Steele who Mowbray employed as a consultant on the project.

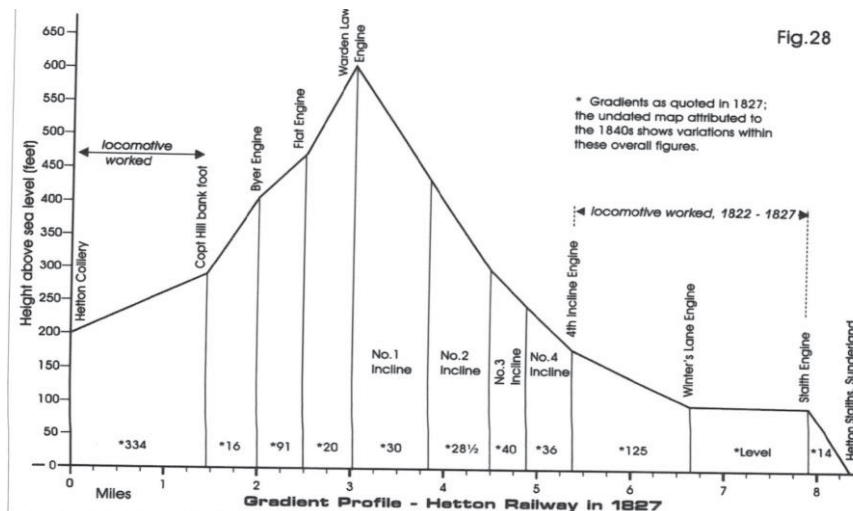
The Route to Sunderland

The 7 ½ mile route from Hetton to Sunderland was difficult because of the need to climb over the hills at Warden Law, some 636 ft above sea-level (see refs. 1-4). Stephenson's plan can conveniently be divided into 5 sections. The first, running almost 1½ miles north from Hetton Lyons colliery (NZ 360469, rather surprisingly so named after John Lyon) to Rough Dene at the foot of Warden Law, was fairly level with an upward gradient of about

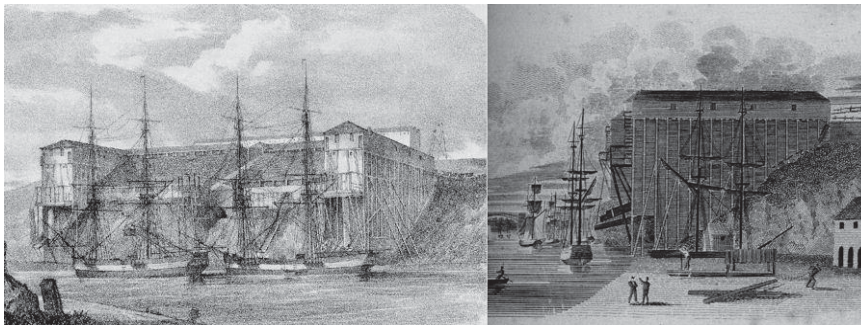


1 in 300 which was to be worked by steam locomotives which Stephenson would supply. The next 1 ½ miles north-east to the top of Warden Law was to be rope hauled by stationary steam engines. Initially there were two, the Byer Engine about ½ a mile up a 1 in 16 gradient and, at the top about a mile further on, the Warden Law Engine. However, this arrangement was soon found to be inadequate because of the length of the ropes it

required and by 1826 an intermediate engine, the Flat, was inserted half way between the Byer and Warden Law engines with gradients of about 1 in 20 and 1 in 90 between them, respectively. From Warden Law the descent of about 400 ft over 2 ¾ miles almost due north to North Moor was achieved by a sequence of 4 gravity inclines. The next 2 ½ miles of somewhat curving and undulating track to the River Wear was again to be operated by locomotives. This facilitated crossing the Hylton and Silksworth roads and the Lambton wagon-way since no ropes would be needed on this section. Then the final 325 yards down to the Hetton Staiths on the bank of the river was to be operated by another gravity incline with a gradient of about 1 in 14.



The Hetton Staith was a large wooden building with space to store coal awaiting the arrival of a ship. The chaultrons had doors at the front so that the coal was tipped forward onto the staith. Then when a ship arrived the coal could be sent down one of two chutes and dropped into its hold.

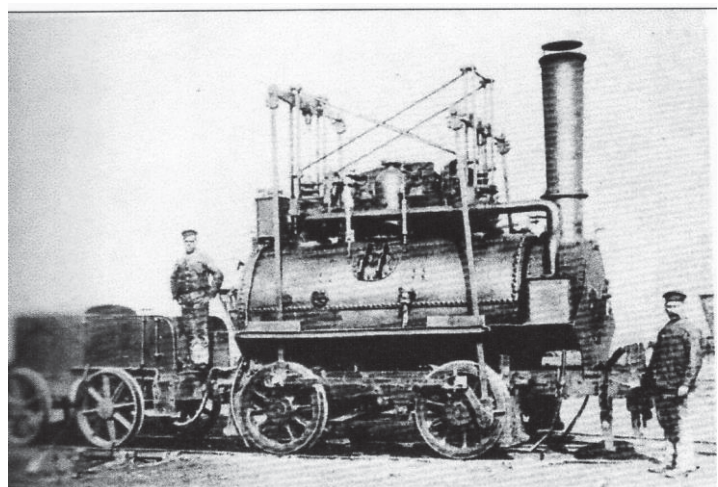


Hetton Staiths Courtesy of The Sunderland Site (Searle)

The track was constructed of Stephenson and Losh's patent cast iron rails mounted on stone blocks. The first rails were cast at the Walker Iron Works but the need to replace breakages very frequently soon led to the construction of a foundry at Hetton to manufacture

replacements. Except on the inclines, where two parallel tracks were required so that empties on the way up could pass the fulls on the way down, most of the route was single track with occasional passing loops.

Construction of this complicated track plan began in March 1821. But, only a month later, the by now increasingly well regarded George Stephenson, still only on secondment from Killingworth, was appointed as Engineer for the planned Stockton to Darlington Railway when its proposers, Edward Pease and partners, decided that steam haulage might be more effective than their original plan for a horse drawn wagon-way. So it was George's brother Robert (not to be confused with George's son, also Robert Stephenson, who was to become one of the most renowned engineers of the Victorian era), who had worked with George at Killingworth on his locomotives, who was appointed resident engineer at Hetton to supervise the actual building of the railway. The locomotives were built to George's design, at a cost of £500, each, probably at Killingworth where he had constructed his first locomotives, or just possibly at



Earliest known Hetton Locomotive

Walker. It seems likely that there were only three initially, one to operate on the southern section at Hetton and two on the North Moor 'Long Run'. Press accounts of the opening (see below) state that there were five but other information suggests that the fourth and fifth did not arrive until late 1823. There are also indications (see J. Rees in ref.5, p.145) that the famous 'Steam Elephant' built in Walker, a replica of which now runs at Beamish Open Air Museum, was also employed at Hetton from the mid-1820s. It is generally believed that the original stationary engines must also have been designed by George Stephenson.



Hetton Colliery

Those sinking the Lyons pit reached the main coal seam in September 1822 and the newly completed railway was able to carry its first load to Sunderland on 18th November 1822. It generated much public interest and excitement and on its first trip crowds of spectators lined the route cheering. The Newcastle Chronicle of that day reported that:-

'The Hetton Coal Company effected the first shipment of coals at their newly erected staithes on the banks of the

Wear at Sunderland.... with excited spectators, who had gathered to witness the first operations of the powerful and ingenious machinery employed for conveying the coal wagons. Five (sic) of Mr. G. Stephenson's patent travelling locomotives, two sixty horsepower fixed reciprocating engines and five self-acting incline planes under the direction of Mr. George and Mr. Robert Stephenson the company's resident engineers, simultaneously performing their various and complicated offices with a precision and exactness of the most simple machinery, exhibited a spectacle at once interesting to science and encouraging to commerce.'

The colliery owners and their guests went on to a celebratory dinner at the Bridge Inn at Bishopwearmouth.

The extent of George Stephenson's contribution to the railway remains somewhat controversial (see ref.4). The fact that he was only mentioned in a few of the newspaper reports of its opening (including the one quoted above)



An engraving to celebrate the opening of Hetton Colliery

and not at all in the lithograph produced by the Hetton Coal Company to commemorate the event, has led some to doubt the significance of his involvement. However, as we have noted, it seems most likely that he was responsible for the choice of route, though he may not have undertaken the surveying required to fix the detail of the line that was actually adopted, as this was not his forte.

Similarly it would appear that he designed both the stationary engines and the first locomotives, and that the latter were probably constructed at his base at Killingworth. But as it was Robert Stephenson who actually built the line, including the inclines and staiths, much of the detailed development of the designs must surely have been in his hands. And the fact that, when the deficiencies of the railway became apparent, Robert was dismissed in 1823, suggests that most of the blame fell on his shoulders. George's lack of recognition may stem simply from the fact that he had left the project just as construction commenced and so could hardly expect to be greatly acclaimed for its completion.

The First Improvements



Copt Hill bank foot at Rough Dene

Initially just one and then probably two locomotives worked the first section from Hetton Lyons to Rough Dene pulling 16 waggons at a time at a speed of 4-5 mph (refs. 1-4). The powered inclines were single track and sets of 8 waggons were worked alternately, fulls up then empties down, at about 3 mph. On the gravity inclines sets of 8 waggons were run simultaneously down and up at about 10 mph. On the Long Run 3 locomotives were employed, again pulling 16 waggons at a time, but, because of the rather sharp curves and varying gradients, they could manage only 2-3 mph.



Looking down the Warden Law Incline towards the Flatts engine and the Byer engine. The pointed waste heap of Nicholson's Pit at West Rainton can be seen on the right middle distance.

Photograph courtesy of C E Mountford

The line was designed to carry 60,000 chaldrons or 150,000 tons of coal per annum, but unfortunately it proved incapable of meeting this specification, and within a few months of its opening the Directors of the Hetton Coal Company appointed William Chapman, by then 74 years old but a man of great experience, to consider how it might be improved. Chapman's reports (ref.11), the first of many over the next few years, noted that Stephenson's cast-iron rails were brittle and subject to



Looking down the Copt Hill Incline

frequent breakages so the foundry at Hetton was kept very busy replacing

them. Instead more malleable iron rails were introduced from about 1827. Also the original design of chaldron was found to be 'very defective' and easily damaged, so more sturdy but inevitably more expensive replacements were produced. But the major problem was with the staiths in Sunderland at which the coal descended about 50 ft down the chutes, followed by a drop of a further 12-14 ft into the hold of the ship. This was causing the coal to break up into small pieces thereby losing about half its value. Accordingly, in 1823 a second gravity incline was constructed which could bring the wagons immediately over the ship's hold, requiring a much smaller drop. Also the stationary engines on Warden Law bank proved unequal to their task and, as we have already noted, the Flat Engine had to be introduced between the Byre and Warden Law engines to reduce the length of the ropes. Chapman also reported that there was a bottle-neck resulting from the low speed that the locomotives were restricted to along the Long Run because of the curves and changing gradients imposed by the difficult terrain, particularly on the approach to the fourth incline when returning from the staiths. As a result locomotive working of this section was replaced by three further stationary engines in 1827. They enabled an increase in the speed from about 3 to 10 mph. The three locomotives previously working this section were re-deployed to Hetton so that all five were available for the Lyons-Rough Dene section. However, the advent of more powerful locomotives enabled them to be restored to the Long Run in the 1850's.

Following Chapman's very critical report Robert Stephenson fell out with the Directors and, as we have noted, he was dismissed. It was only after the intervention of Nicholas Wood that he was able to obtain a reference from Mowbray which enabled him to get involved in other railway projects elsewhere. He was replaced as resident engineer by Joseph Smith who had previously been an engine-wright at Heaton Colliery and had been brought in to work on the locomotives at Lyons.



The Warden Law Engine

Extension to Elemore and Eppleton



Eppleton Colliery

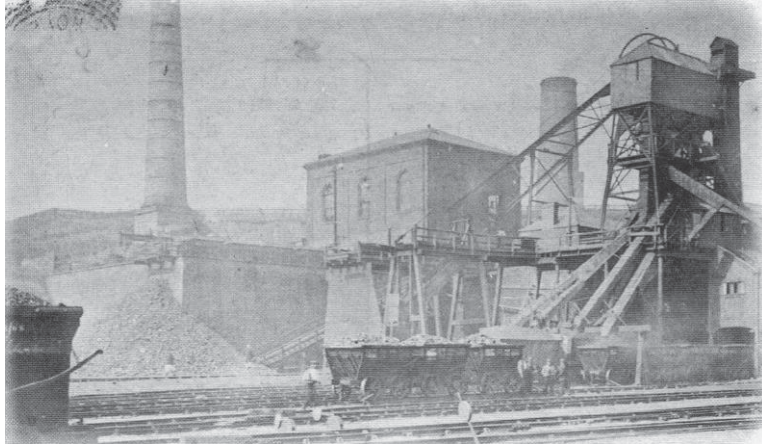
From the outset the Hetton Coal Company had been running into severe financial difficulties due to the considerable funds they had invested and the extra expenditure required to keep the line operating (refs.1-4). So they welcomed a proposal by George Baker, the owner of nearby Elemore Hall, that he should join the Partnership and that their railway should also carry the coal which would be produced by a new colliery that he intended to sink on his

estates. Work began on sinking Elemore Colliery at Easington Lane in March 1825 and coal seams were reached by February 1827. It was linked by a mile long gravity incline to the Hetton Colliery Railway at Lyons, from where coals could be transported through to the staiths at Sunderland. At more or less the same time, on 23rd May 1825, work commenced on sinking Eppleton Colliery as well, but, due to difficulties with the amount of sand and water which were encountered, it was not until 1833 that coal was finally produced by this pit. It was likewise connected to the Hetton railway by a $\frac{3}{4}$ mile gravity incline.

All these mining and railway operations required the support of extensive engineering workshops which were built by the coal company at the Lyons site adjacent to the pit-head. By 1855 there were substantial Engineering and Waggon Shops to the south of the colliery immediately north of the road to Murton which became 'Colliery Lane', together with a brickworks to exploit the clay dug up from the mine, as well as some coke ovens. They were served by an extensive array of sidings, as was the locomotive fitting shop which was situated immediately south of Colliery Lane. There was also a $\frac{3}{4}$ mile branch line south from Lyons to a coal depot in Easington Lane.



Railways at Lyons Colliery



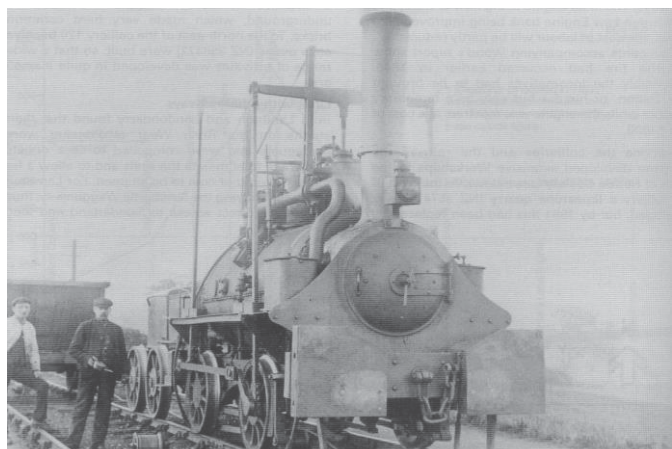
Eppleton Colliery

This pioneering railway quickly became a place of pilgrimage for engineers and others interested in finding out what these new steam railways were capable of. The Northumberland Record Office has a number of reports on the railway and evaluations of its cost-effectiveness which were produced both for the Hetton Coal Company and for other interested parties. In addition to William Chapman's assessments already

referred to (ref.11), George Dodds, who was the railway's superintendent in 1824, produced a detailed description of its operation and costs, at the behest of the proponents of the planned Newcastle to Carlisle railway, entitled 'Observations on Railways...' (ref.8, see the appendix) which concluded that locomotives would be more suited to that line than stationary engines. In 1827 C. Von Oeynhausen and H. von Dechen, engineers for the Prussian Mining Ministry, visited Hetton during their survey of English railways (ref.12) and appraised it as the 'finest in England' after the Stockton to Darlington railway. Similarly in 1829 John Rastrick was commissioned by the directors of the proposed Liverpool and Manchester Railway to advise on the relative merits of locomotives and stationary engines for their line based on the experience gained at Hetton (ref.13). It is evident from these and many other accounts that this pioneering railway had considerable influence on the development of steam haulage nationally and internationally.

A report by Matthias Dunn and George Hunter in the Northumberland Archives (ref.14) indicates that by 1830 there were some 83 men and boys employed on the railway, 52 as general labourers, 16 operating the various inclines, 9 working the staiths and 6 driving locomotives, a considerable labour force. They evidently worked long hours in a single shift and so log cabins were provided at the inclines, some of which were rather remote from other habitation, so that the operatives could rest between shifts. The complex operations needed to synchronize the workings of the locomotives, inclines and rope haulage made working on the railway arduous and potentially hazardous, as of course were most of the activities associated with mining coal. Roger Lawson has left us a fascinating account of working on the line in the 1850s (ref.7):-

'At this time there were three or four locomotives, they were called Puffing Billies. Those old engines had no closed backs on the jumping end of the boiler, simply a plain top from the fire through the boiler with a bend at the bottom of the jumping. On a dark night you could



"The oldest working engine in the world", at Hetton about 1895

see each one as it left the Dene House. I always had a fancy to get on one of these engines as fireman. I did ultimately succeed in getting on to fire, I was then a lad of 14 years old. They built a new locomotive in the Hetton Colliery Shops with many improvements. James Gair was then chief engineer and old Jim Young the foreman in the fitting shops. They built a similar engine to the Lyons which was called the Lady Barrington. This engine exploded in the year 1858 and killed the driver and his little son, William, who had taken his father's tea. The first job I had under the Hetton Coal Company was greaser lad at Dene Bank Foot and ringing the bell as a token to Copt Hill or Byre Engine to draw the set of wagons away....The whole of the coal-hewers, at that time the day shift, commenced drawing coals until 5 o'clock next morning. The line had to start 2 hours before the pits started to get their wagons. Old Harry Wilson, the caller, knocked me up at 2 o'clock in the morning. I had to walk from Hetton to the Dene Bank Foot, grease the full wagons that had been run in during the night and ring away the set precisely at 3 o'clock. I had one shilling a day for the job – no overtime. I remember coming home one Friday night at 11 o'clock. I was so tired I could not wash myself. I went to bed black and slept until Sunday morning when the Church bells were rung for the service.

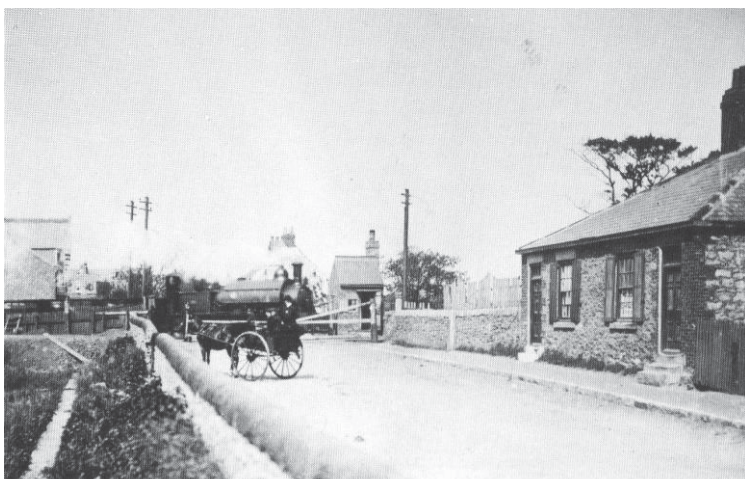
After being a year at the Bank Foot I was sent with Robert Potts the plate layer and after being at this job for a while I commenced firing on one of the old Puffing Billies. They called this engine the Lady Barrington. Jack Ford was the driver. Three of these engines ran the coal to Dene Bank Foot. Jimmy Ford drove the old Fox and Jimmy Green fired for him. They were all brothers and their wages were 3/- per day, and the firemen 2/-. In June 1857 William Moore the engineer brought a new engine, an up to date one built by Robert Stephenson of Newcastle. Jack Ford and Myself were the first to take charge of this engine, it dispensed with the old engines and ran the coals down to Dene Bank Foot. After this I started to line up the engines at night, then I commenced driving the old Lyons doing shunting work on the Colliery Branches. I was 16 years of age.'

This was responsible and dangerous work for someone so young. But the railway also posed hazards for the residents of Hetton since, as the maps show, in places the track ran along the roads (for example Railway Street) or crossed over them without any barriers, as at Caroline Street. If this now seems strange, it is worth remembering that the town grew up

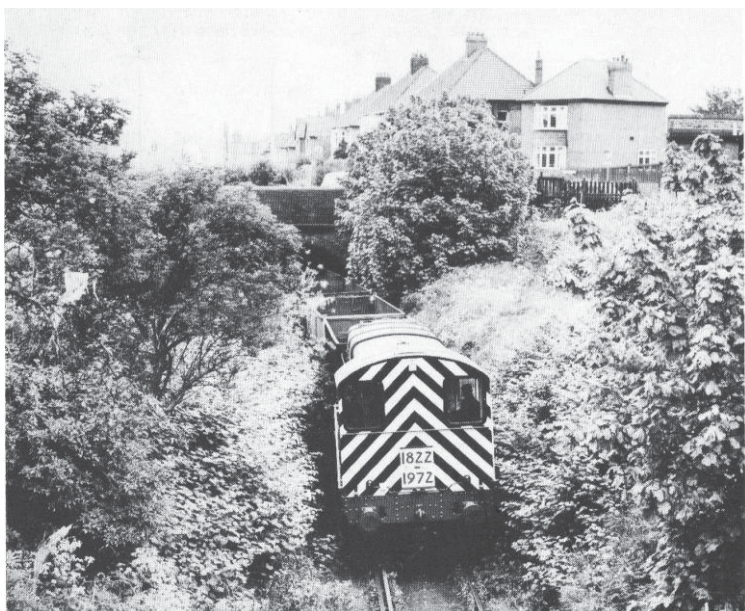


An Engine crossing Caroline Street

round the railway rather than it intruding into a pre-existing settlement, and its inhabitants would have been all too aware of the dangers associated with the coal industry. Safety was obviously not a prime consideration.



Hetton Colliery Railway crossing Silksworth Lane near the Barnes roundabout



The Tunnel under Durham Road

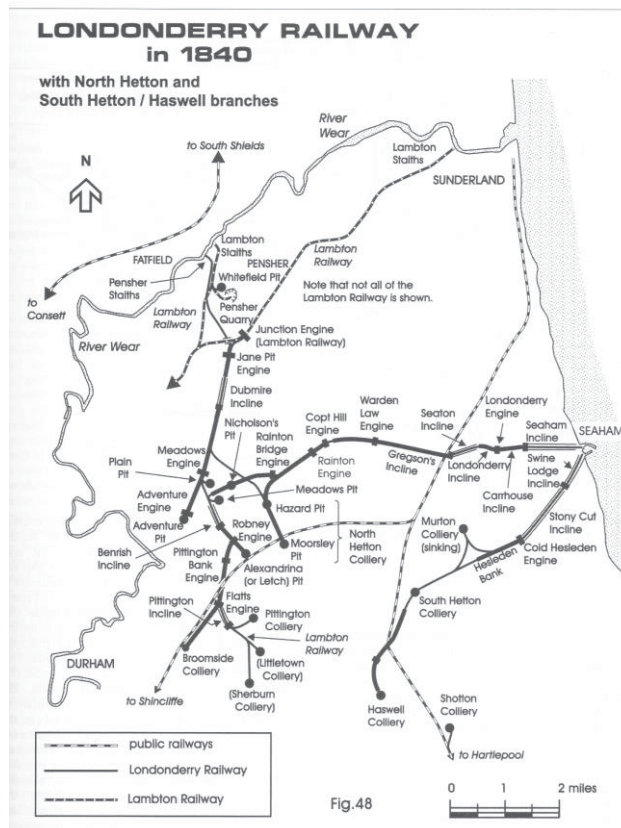
Over the succeeding years increasing output from the pits brought the need for still greater capacity on the line (refs.1-4). The Warden Law engine was replaced in 1836 by a more powerful beam engine which enabled twin track working with fulls up and empties down simultaneously. Similarly in 1876 the track-way up from Rough Dene was rebuilt to allow fulls and empties to be run at the same time by a new and more powerful Byer engine. Improvements in the capabilities of locomotives permitted them to replace rope working on the Elemore incline in 1897 and on the Eppleton branch in 1902. This facilitated the opening Eppleton quarry, which is still in operation just north of the colliery. We have already noted that the use of locomotives instead of stationary engines was resumed on the Long Run into Sunderland in the 1850s and they were also deployed to take wagons right down to the staiths. Sometime around 1890 the level crossing at Hylton Road in Sunderland was replaced by a bridge on a re-aligned route down

to the staiths while the level crossings of Silksworth Lane and Durham Road were superseded in about 1908 by diverting this section of the line into a cutting leading to a ¼ mile long tunnel underneath these roads.

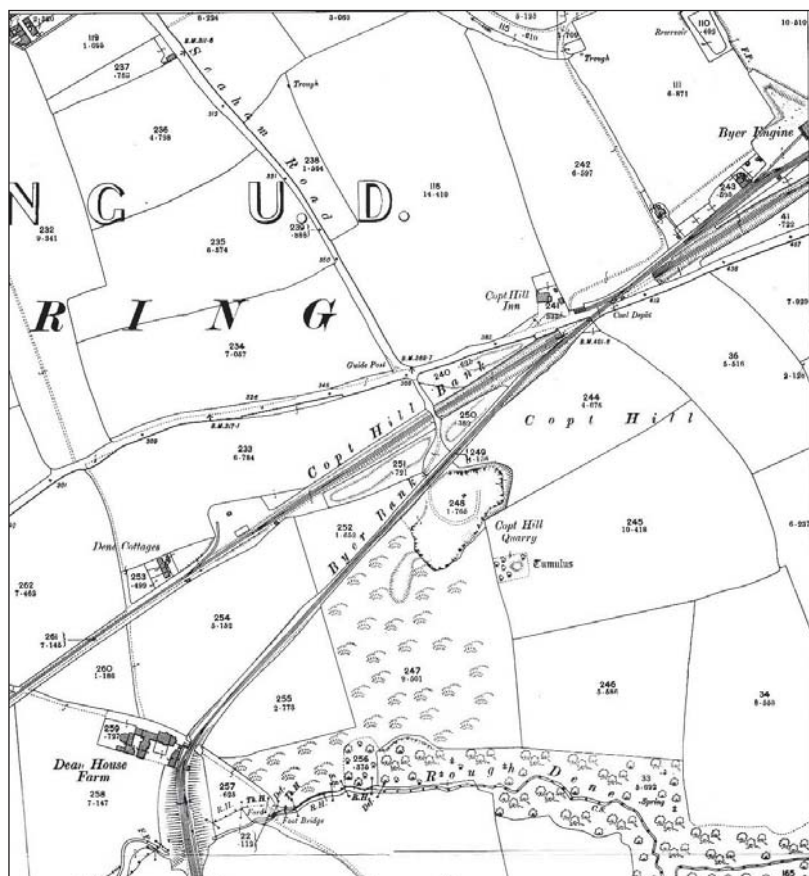
Other Railways near Hetton

The Hetton Colliery Railway was just the start of what became a remarkably dense and extensive network of railways in the area. West of Hetton were the Hazard and Donwell pits, opened in 1818, which were part of Londonderry's Rainton group and served initially by horse-drawn branches of the Londonderry wagon-way to the staiths at Fatfield (ref.6). But in 1825 these collieries were sold to a partnership led by William Russell of Brancepeth Castle (later Viscount Boyne) called the North Hetton Coal Company. They sank a new pit at Moorsley which was completed in 1828 and a stationary engine was built close to the Hazard pit to pull wagons up from Moorsley to the Londonderry line. Subsequently, in 1836, the North Hetton Coal Company was purchased by a

partnership of Lords Durham and Londonderry and the Hetton Coal Company, but it retained its old title.



By the 1820s both the Lambton and Londonderry wagon-ways, which led down to staiths at Penshaw, were becoming inadequate for the increasing quantities of coal which these rapidly expanding colliery groups were producing (ref.6). Lambton decided to buy the Newbottle wagon-way in 1822, to rebuild much of it, and connect to it his new Houghton Colliery which opened in 1827. Lord Londonderry was even more ambitious and planned to circumvent the limitations, not just of the facilities at Penshaw, but of the River Wear itself which often silted up badly near its mouth and required the payment of port taxes. Having purchased the Milbanke family's estate at Seaham in 1821, he determined to construct a completely new harbour there (refs.1-3). Work began on its construction in 1828, but, as he could not afford to build a railway as



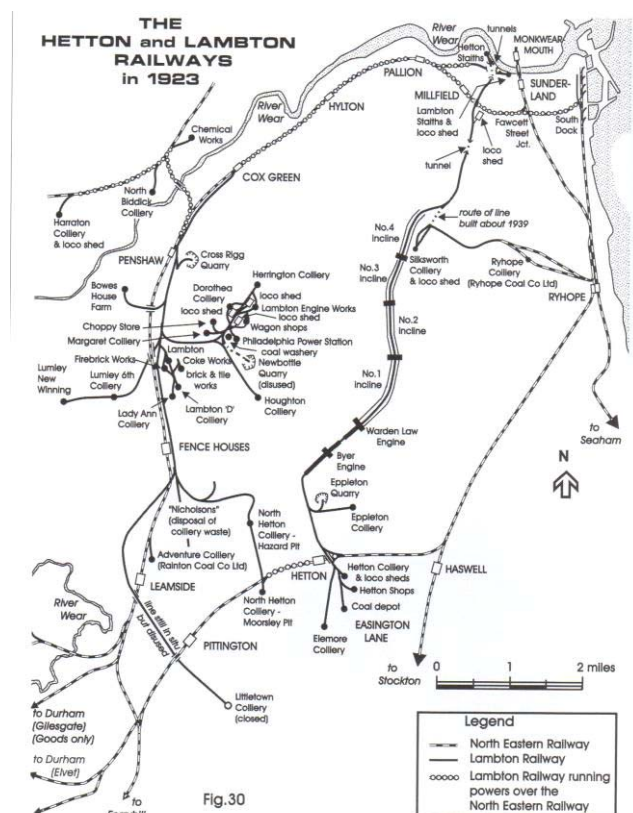
The Londonderry Railway tunnels under the Hetton Railway at Copt Hill

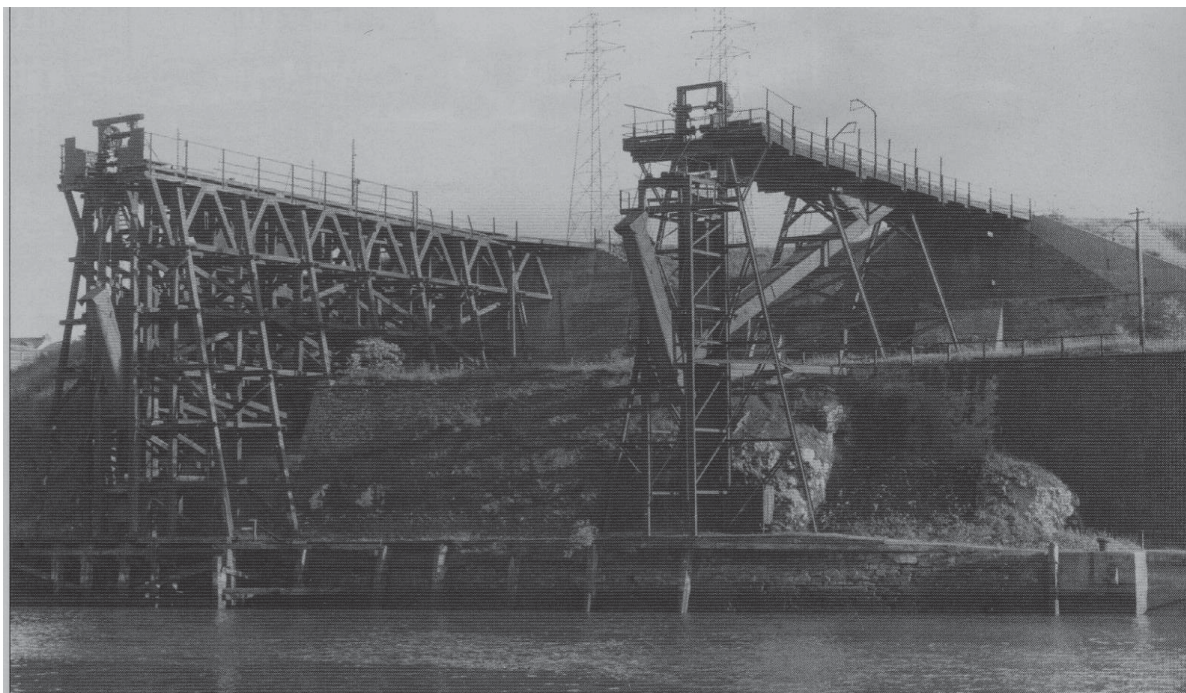
well, he came to an arrangement whereby a Mr. Shakespear Reed of Sunderland would build a line from Rainton Bridge to Seaham and operate it for him for 9 years from 1st January 1831 (subsequently deferred to 1st July that year when the railway actually opened), charging for each chaldron that passed along it, but with Londonderry retaining an option to purchase the line at the end of this period which he exercised in 1840. A stationary engine hauled wagons from the various Rainton pits as far as Rainton Bridge where the line was joined by one from the North Hetton collieries. It

tunnelled under the Hetton Colliery Railway near another engine at Copt Hill, close to the Byer Engine, and then further stationary engines and gravity inclines pulled the wagons to Seaham Harbour. Subsequently new lines from South Hetton, Haswell and Murton and from local pits in Seaham also converged on the harbour. Much of the funding for these railways came from the owner of the South Hetton pit, Colonel Braddyl, who had unrealised hopes of becoming a partner in the development of Seaham Harbour. By 1860 rope haulage was superseded by locomotive power in the Rainton area and later on some of the inclines too. But in the 1890s the closure of pits around Rainton led to the decision to close the whole line west of Seaham Colliery and it was pulled up in 1896. However, the North Hetton Coal Company's pits still needed an outlet and to achieve this a link from the Londonderry railway to the Hetton railway was constructed between Rainton Bridge and Copt Hill.

Consolidation by Baron Joicey

James Joicey and Company became one of the larger colliery groups in County Durham in the latter part of the 19th century, based in the Chester-le-Street and Stanley area (refs.1-3,6). It had been founded by one James Joicey and in 1863 came under the control of his nephew, also called James (1846-1936), who became a Baronet in 1893 and Baron in 1906. An ambitious and acquisitive character, he compelled Lord Durham to sell him all his mining and railway interests in 1896. And having thereby gained control of such a large part of the Durham coal trade he was able to buy a major shareholding in the profitable Hetton Coal Company and so force out its principal partner at that time, Sir Lindsay Wood (son of the famous engineer and principal partner from 1836, Nicholas Wood), in 1911. The resulting business, which had also acquired the assets of the North Hetton Coal Company, was consolidated as the Lambton and Hetton Collieries Ltd. Subsequently, in 1924, it was merged with the original Joicey Company as The Lambton, Hetton and Joicey Collieries Ltd.





The last Hetton Staiths , the highest and fastest in the North East

As a result considerable rationalisation of both the collieries and their railways became possible. Because the Hetton and Lambton railways terminated at adjacent staiths in Sunderland it was obviously advantageous to connect them and run them as a single operation, which was achieved by 1918. The old staiths were replaced by new ones with greatly increased handling capacity. Silksworth Colliery which was situated near the 4th incline, was connected to the Hetton Railway in 1938. The new company also invested in improved facilities at Hetton, including a new Locomotive Fitting Shop on the south side of Colliery Lane reached by a line running along this road.

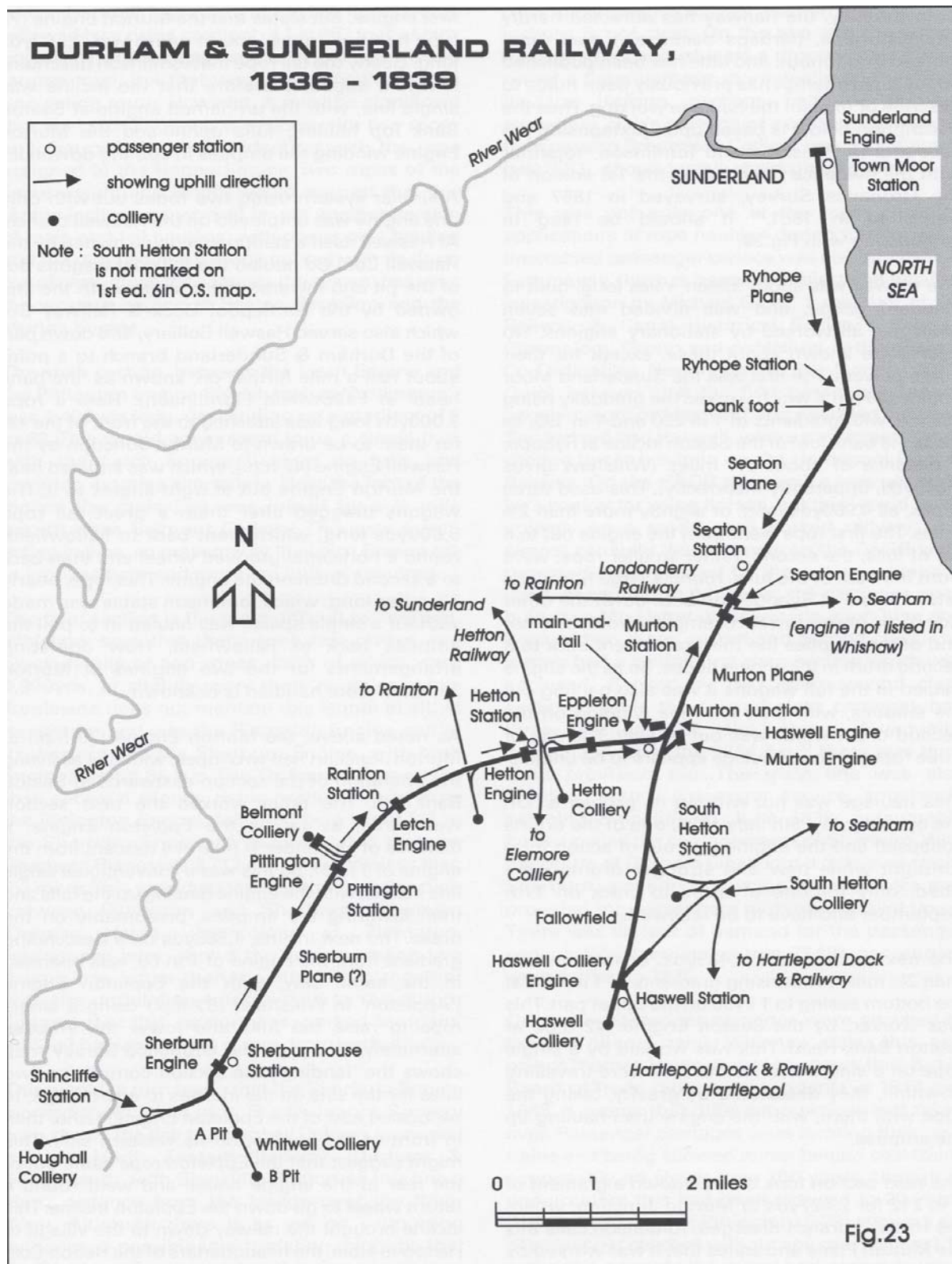
Arthur Temple, who was born in 1935 in one of the railwaymen's cottages at the top of No.3 incline between Warden Law and the Long Run, was the son of the brakes-man on that incline, as had been his grandfather who started work there in 1882. Colin Mountford has published (ref.15) a detailed account of the working of the inclines based on his interviews with Arthur. And as Arthur himself worked as traffic foreman at the Hetton and Lambton Staiths from 1952, very soon after he began working on the railway when he left school aged 14 in 1949, through until 1964, a short time before the staiths closed in January 1967, he was also able to provide a full description of how the staiths were operated.

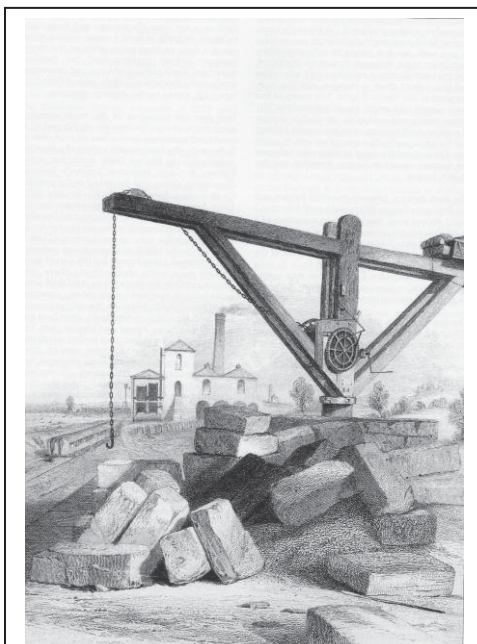
Passenger Railways

Though initially railways were built to transport coal and other goods, their potential as people carriers was soon apparent and so the Stockton to Darlington Railway, though planned originally for coal, carried passengers from the start in 1825, as did the Liverpool and Manchester Railway of 1830. The first railway in the Durham area to cater for passengers was the Stanhope and Tyne which ran from the moors above Stanhope through Washington to the Tyne at South Shields, carrying coal and lime from 1834 and passengers a year later.

It was closely followed by the Durham and Sunderland Railway (refs.3,9,10) which opened for both freight and passenger traffic between Sunderland and Pittington in 1836. It was extended to

Sherburn House in 1837 but, due to the opposition of the Dean and Chapter of Durham, it was not allowed to start actually in Durham City but at Shincliffe, which it reached in 1839, and where it was connected to several nearby collieries including those at Houghall and Whitwell. From Shincliffe the line went east through Low Pittington, where there was a station, and then on to Rainton where





The Pittington Engine about 1838

there was another station sometimes called the Letch Halt. It then proceeded along the valley of the Pittington Beck to Hetton, where there was a station immediately to the south of the town centre. Thence it continued on to Murton where it was joined by a line from Haswell and South Hetton at Murton Junction station. It then proceeded north-east through Seaton and Ryhope to a wooden station on the Town Moor in Sunderland, and then down to staiths on the River Wear at Low Quay. It was built by Thomas Forster (1802-75), a colliery engineer, who rather surprisingly and for reasons that remain unclear, decided that the whole 15 mile line should be worked by stationary engines rather than locomotives (ref.3) despite the fact that by the mid-1830s locomotive operation had become well established. It was, however, one of the first lines to have wooden sleepers rather than stone blocks. Seven engines were needed along the full length of the line. In the vicinity of

Hetton the Letch engine near Rainton Station pulled wagons nearly a mile up from Pittington and then the Hetton engine pulled them for about 1½ undulating miles to near Hetton Station. The line then tunnelled under the Hetton Colliery Railway immediately north of Lyons colliery and trains were pulled about a mile up towards Murton by the Eppleton engine, following which they were lowered ¾ mile down to the Murton engine situated at Murton Junction where the line from Haswell colliery joined.

Initially passenger carriages were simply attached to the back of coal trains, but the growing popularity of rail travel soon led to the introduction of separately timetabled, wholly passenger trains and the extension of the line at the Durham end from Sherburn House to Shincliffe Village. From there a connecting stage coach took passengers into Durham. It was not until 1893 that the railway was allowed to enter the heart of Durham City at Elvet



Hetton Station about 1950

Station, just behind the prison in Old Elvet. There were three trains per day each way, the whole journey from Durham to Sunderland taking about an hour. It was the longest public railway in the world worked entirely by stationary engines and it quickly became all too evident that it was something of an anachronism. There must surely have been reservations about the safety of rope haulage for passengers. On downhill sections the ropes were often disconnected and the carriages allowed to run free, while the constant stopping and starting to allow the ropes to be changed over

at each engine, or when they snapped, must have been an inconvenience. Certainly the line did not fulfil the hopes of its investors and, as part of George Hudson's comprehensive takeover of the north's rapidly evolving railway system (ref.10), the Durham and Sunderland Railway was purchased by his Newcastle and Darlington Junction Railway in 1846, and by 1854 all of the public railways in the area had been brought together to form the North Eastern Railway. It continued in this guise until it was incorporated into the London and North Eastern Railway in 1923 and eventually of course into British Railways upon nationalisation in 1948.



The Durham Miner's Gala Train at Hetton bound for Durham Elvet in 1950

Locomotive working was eventually introduced on the Durham to Sunderland line in 1858 and at the same time the Town Moor station was replaced by a more substantial building at Hendon. So Hetton had its place within a comprehensive national railway network and, if they could afford it, the townsfolk were, for the first time, able to travel with ease. It became possible to go away on day trips and for the miners' holiday fortnight. And special trains were laid on to take most of the community to the Miners' Gala in Durham each year.

Once locomotive power had been introduced to the Durham and Sunderland railway, it became natural to connect the colliery lines in the Hetton area to it as well, and so a ¼ mile link from the pit to the railway was constructed immediately north of Lyons and just east of Hetton station. Similarly the North Hetton Colliery line was linked to this railway north-east of the Moorsely pit.

However, the line did not long survive nationalisation (ref.10). The reduction in passenger traffic after the Second World War resulted in the closure of all the stations, including Hetton, in 1953 (long before the 'Beeching Cuts' of so many other British Rail routes) and the last section of track, from Hetton to Murton, closed to freight as well in 1963. Much of the old track-way has been restored as a public footpath and forms part of the Walney to the Wear Cycleway.

The End of the Line

The economic depression of the 1930s brought about a major rationalisation of the Hetton and Lambton railways under their joint ownership by the Lambton, Hetton and Joicey Collieries Ltd. (refs1-3). Much of the work on maintaining the locomotives seems to have been transferred to the Lambton works at Philadelphia, though repairs appear to have continued to be undertaken in Hetton, and the Waggon Shops remained open. The North Hetton Company's Hazard pit was closed in 1935.



Finally removing the ropes at North Moor following the closure of the line in 1959

The Lyons, Eppleton and Elemore collieries, along with their railway, were taken over by the National Coal Board upon the nationalisation of the coal industry on 1st January 1947. The Lyons Colliery, by then largely worked out, did not long survive this change of ownership and was closed in July 1950. However, mining continued at Elemore and Eppleton and there was major investment to connect them underground to the newly created Hawthorn Combined Mine complex at Murton which opened in 1959. It enabled the coal produced by all the pits in the Combine to be brought to the surface at Hawthorn making the Hetton

Railway redundant. Hence it was closed in September 1959 and the track began to be lifted almost immediately, a task which was completed in November 1960.

So ended, without ceremony, a railway which had served the local coal industry for 137 years. Up to its closure it was still providing employment for about 140 people on the locomotives, inclines and stationary engines, trackside staff and signal-men, and as tradesmen in the Wagon and Locomotive Shops. It had been an essential feature of the economic development of Hetton from the very small agricultural village of the early 1800s to the large township we have today.



Lifting the track in Railway Street Hetton in 1959

Despite its historic significance very little now remains. The old Locomotive Fitting Shop came to be used as a garage and loomed as a major monument at the entrance to Hetton from Murton until it was pulled down and replaced by housing estate in about 2005. Some of the old offices and wagon-shops survived as a courtyard on the north side of this road until about 2010. However, the Lambton, Hetton and Joicey Waggon-Shop survives and was still in use by railway contractors Hall and Blenkinsop Ltd. in 2013. The cottage in Colliery Lane where Robert Stephenson lived while constructing the line in 1822 survives with a commemorative Blue Plaque. Much of the old track-way from Hetton Lyons to Sunderland can still be walked, though with some diversions where the land has been redeveloped, on a footpath designated as 'The Stephenson Way'. But, apart from the odd bit of brick- or stone-work, there is little to show that it was once a railway. One substantial remainder should be the Warden Law stationary engine which was dismantled in the early 1970s

and taken to the Beamish North of England Open Air Museum, but it has not been reconstructed there. One of the old Hetton locomotives, which was still working in 1909 and is just possibly one of those employed at the opening of the line in 1822 (though if so it must have been very extensively rebuilt subsequently), is housed at Beamish and is often referred to as 'The World's Oldest Locomotive', a reminder of that brief but heroic period when Hetton was at the very forefront of railway development.

References

1. Colin E. Mountford, *The Private Railways of County Durham*, The Industrial Railway Society (2004).
2. Colin E. Mountford and Dave Holroyde, *The Industrial Railways of County Durham, Part 1*, (2006), *Part 2*, (2009), The Industrial Railway Society.
3. Colin E. Mountford, *Rope and Chain Haulage*, The Industrial Railway Society (2013).
4. Colin E Mountford, The Hetton Railway – Stephenson's original design and its evolution, talk to the Hetton Local History Group, 26th March 2012.
5. Andy Guy and Jim Rees (eds.), *Early Railways – Papers from the 1998 First International Early Railways Conference*, The Newcomen Society (2001).
6. Les Turnbull, *Railways Before George Stephenson – a Study of the Waggonways in the Great Northern Coalfield 1605-1830*, Chapman Research Publishing (2012).
7. Hetton Community Association 1973 (with additions by the Hetton Local History Group, publishers), *The Development of a Community* (2011).
8. George Dodds, *Observations on Railways..... Hetton Colliery* (1824). Copy from Colin Mountford in possession of Hetton Local History Group.
9. Alan Maitland, *Durham City and the Railway Age*, University of Durham History of Education Project (1995)(1997).
10. Neil T. Sinclair, *Railways of Sunderland*, Tyne and Wear County Museums (1985).
11. William Chapman, *Northumberland Archives* 725/F, pp. 57-61, 62-67, 68-72.
12. C. von Oeynhausen and H. von Dechen, *Concerning Railways in England*, trans. E.A. Forward, Newcomen Society.
13. John Rastric, *Report on the comparative merits of steam locomotives and stationary engines*, Special Collections section of the Senate House Library, University of London, unpublished (1829).
14. Matthias Dunn and George Hunter (1830), *Northumberland Archives* 725/F/17259.
15. Colin E. Mountford, The memories of Arthur Temple, *Part 1 The Hetton Railway*, Archive No. 43, September 2004, *Part 2, The Lambton and Hetton Staiths, Sunderland*, Archive No.44, December 2004.

The railway gradient diagram and maps courtesy of C E Mountford. *The Private Railways of County Durham*, C E Mountford, Industrial Railway Society 2004, pp 116.

APPENDIX: Transcript of George Dodds '*Observations on Railways ...*'

[Extracted from a book of unknown origin but contemporary to the period, purchased at an auction in Carlisle in 2002; this copy made by Russel Wear, September 2004: minor revisions October 2004. The book contains other items relating mainly to Scotland and has a label on the cover of Anderson & Co (successors to Cameron & Co), stationers, 2 Bank St, Edinburgh. The paper is watermarked 1825. Original spelling, abbreviations and layout retained as far as possible. Where two fractions occur together the second one is a fraction of a farthing. The name M Stewart, 17 Kier St, Laurieston, a district of Glasgow, has at some time been written in the book]

Observations on Railways with the most Eligible Motive Power for Carriages travelling thereon humbly addressed to the Committee for enquiring as to a better communication between Newcastle and Carlisle by their most obediently Humble Servant George Dodds. [Dated] Hetton Colliery, Decr 1824

Gentlemen

Having had the charge of the Hetton Colliery Railway for the last two years, and during that time made several observations, and experiments on the advantages and disadvantages in the construction of that Railway, with the cost of leading the coals by various kinds of Machinery etc shall in the following pages give a general outline of that concern with remarks on other Railways which have been used in the Coal trade upon the Rivers Tyne and Wear since 1819 intended with a view to obtain a more accurate knowledge of the outfit and expenses of the intended Railway between Newcastle and Carlisle.

Line of Railway from the Hetton Pits to the Staiths near Sunderland

Station s		No of yards	Descent p yard	Ascent p yard	Whole Descent	Whole Ascent
1	From the Pits to Rough Dean	2541	1/6 of an inch	-	35ft 4in	-
2	From Rough Dean to Byre Engine	882½	-	2 1/8 in	-	151ft 0in
3	From Byre Engine to Meetings	775½	-	7/16 in	-	30ft 0in
4	Mill Engine Bank	775½	-	2 1/8 in	-	115ft 0in
5	1st Incline to top of 5 incline	1302	1 3/16inch	-	130ft 4in	-
6	2nd Ditto Do	1224	1 ¼inch	-	129ft 6in	-
7	3rd Do Do	716	0 15/16 inch	-	54ft 7in	-
8	4th Do Do	902	1 inch	-	76ft 5in	-
9	From 4th incline to top of 5 incline	4350	5/16 inch	-	63ft 5in	-
10	5 Incline to Staith	325	2½ inch	-	67ft 9in	-
Total		13793½	-	-	557ft 4in	296ft 0in

Explanation of the preceding table

Station 1st – When it is said the distance from the Pit to Rough Dean is 2541 yards, at $\frac{1}{6}$ of an inch descent to the yard; it is not intended to be understood that the whole distance is one continued plane, but that the average descent is $\frac{1}{6}$ of an inch to the yard and whole descent 35 feet 4 inches.

Station 2nd – From Rough Dean to Byre Engine 882½ yards at $2 \frac{1}{8}$ inches ascent p yard. It is intended to be understood that the allowance for the Bank head etc is included in the distance, but not in the ascent p yard, the whole ascent being 151 feet.

Station 3rd – From Byre Engine to Meetings 775½ yards at an ascent of $\frac{7}{16}$ of an inch to the yard. The wagons are taken up this ascent by means of a tail rope attached to the wagons ascending the Mill Engine Bank, allowance for Bank head etc is included in the distance but not in the ascent p yard.

Station 4th – Mill Engine Bank 775½ yards at an ascent of $2 \frac{1}{8}$ inches p yard, allowance for Bank head etc is included in this distance but not in the ascent p yard. Station third and fourth being equal distances, the Mill engine brings a train of wagons up the lesser ascent in the same time that the another train is ascending the Mill Engine Bank. Both Bank head & foot are included in this distance all the rest of the way ascends @ $2 \frac{1}{8}$ inches p yard whole ascent 115 feet, and the whole ascent at $\frac{7}{16}$ inches p yard 30 feet.

Station 5th – First inclined plane self acting 1302 yards long. Descent $1 \frac{3}{16}$ inches p yard. The Bank head & foot are included in the distance but not in the descent p yard and the whole descent being 130 feet 4 inches.

Station 6th – Second inclined plane self acting 1224 yards long, descent $1 \frac{1}{4}$ inches p yard, Bank head & foot included in the distance but not in the descent, the whole descent being 129 feet 6 inches.

Station 7th – Third inclined plane self acting 716 yards long descent $\frac{15}{16}$ of an inch to the yard, Bank head & foot included in the distance but not in the descent p yard, the whole descent being 76 feet 5 inches.

Note – Self acting planes can only be used where the preponderancy of weight is always in the same direction, and with such declivities, as will nearly equalize the resistance of the empty & loaded wagons, but in Railways where no material difference of weight carriage is to be expected either way, they could not be used with any advantage.

Station 9th – From 4th inclined foot to the top of 5 incline 4350, the whole descent which is 63 feet 5 inches is contained in 2602 yards, the other 1748 bring nearly level.

Station 10th – Fifth Inclined Plane; this is a Horizontal Wheel 14 feet diameter with a groove [sic] for the rope to run in, and a Brake wheel attached to it, the distance is 325 yards, and descends $2 \frac{1}{2}$ inches p yard. Bank head and foot included in the distance but not in the descent p yard – the whole descent being 67 feet 9 inches.

The whole length of the way then is 13793½ yards or a little more than 7¾ miles with a rise and fall of 853 feet 4 inches viz from Rough Dean to Mill Engine an ascent of 296 feet and from Mill Engine to Staith 557 feet 4 inches descent.

Weight and Price of one Rope for each Plane viz two Engines and five Inclined Planes – tail rope etc

	Length of rope (fath)	Size of ditto (in)	Weight of ditto Cwt qrs lbs	Price p p cwt	£ s d
Byre Engine	500	7¼	62-0-0	@50/-	155 0 0
Mill Engine	450	7¼	56-0-0	@50/	140 0 0
Tail Rope	400	5	26-0-0	@50/	65 0 0
1st Incline	650	5	42-0-0	@50/	105 0 0
2nd ditto	650	5	42-0-0	@50/	105 0 0
3rd ditto	400	4	15-0-0	@50/	37 10 0
4th do	500	5	32-2-0	@50/	81 5 0
5th ditto	190	7¼	24-0-0	@50/	60 0 0
					748 15 0

Note – Oweing to the great weight of 8 loaded wagons coming up the Bank at one time, where the fixed engines are placed the thickness of the rope and smallness of the drums (7 feet diameter) the rope having to traverse 4 times over itself is greatly injured.

An account of the Wear of Ropes on each Plane with the cost p Chaldron from 18 Novr 1822 to 26 Sepr 1824

Byre Engine Plane	Length of Time Weeks Days	Quantity Chaldrons	Cost p chaldron d
First rope laid on Byre Engine bank Novr 18th 1822 and taken off 12 April 1823	20 5	11,702	@3¼ nearly
Second rope taken off 19 Janry 1824	39 0	44,242	@1 d nearly
Third rope taken of 4 June 1824	20 6	22,047	@1¾ nearly
Fourth rope taken of 26 Sept 1824	16 2	25,247	@1½ nearly
	96 6	103,238	

These four ropes in ninety six weeks & six days took up the Bank one hundred & three thousand two hundred & thirty eight chaldrons & cost £622 which on an average is 1¼ 4/5 p chaldron nearly for ropes.

Mill Engine Tail Ropes to Meetings	Length of Weeks	Time Days	Remarks
Byre Engine First tail rope on Novr 18th [1822] & taken of 27 Decr 1823	57	4	This rope 400 fathoms 5 inch rope cost £65
The second taken of 28 Sept 1824	39	3	This rope 875 fathoms 5 inch rope cost £145
The first tail rope at Mill Engine was laid on 18 Nov 1822 and taken of 25 July 1823	35	4	This rope 875 fathoms 5 inch rope cost £145

These ropes cost £355 and led 98,475 chaldrons 775½ yards up an ascent of 7/16 inch to the yard, there being 1160 left at a land sale near Byre Engine, 873 for the use of the engine and 1853 chaldrons of small etc laid on the way near Byre Engine, making 4763 to be deducted from the quantity led by the Byre Engine Rope, cost ¾ 5/9 p chaldron nearly for ropes.

Mill Engine Bank Rope	Length of Weeks	Time Days	Quantity of Chaldrons	Price of chalds d
First rope laid on 18 Nov [1822] & taken of 24 July 1823	22	5	11,020	@3 p ch a little more
Second rope taken of 24 April 1824	51	6	52,741	½ ½ nearly one half penny ½ farthing
Third rope taken of 25 Sept 1824	22	1	34,714	1 penny a little less nearly

These three ropes led 98,475 chaldrons 775½ yards up an ascent of 2 1/8 inches p yard and cost £420, which is a little above one penny p chaldron for ropes.

1st Incline Rope	Length of Weeks	Time Days	Quantity of Chaldrons	Cost p chaldron d
The first laid on 18 Nov [1822] and taken of 24 July 1823	35	3	24,205	1d p chaldron nearly
Second rope taken of 21 June 1824	47	5	56,824	¼ 4/5 p ch nearly
Third rope to 26 Sept may be considered as one third worn being on as yet	13	5	16,573	½ p chal nearly

These three ropes have led 97,602 chaldrons 1302 yards, and cost £245 which is nearly ½ 1/3 p chaldron. The other 873 chaldrons were used by the Mill Engine etc. Note – One third the value of the rope £35

2nd Incline Rope	Length of Time Weeks Days	Quantity Chaldrons	Cost p chaldron d
First rope laid on 22 Novr 1822 & taken of 10 Jany 1824	59 4	52,190	½p chald a little less
Sept 26 The 2nd rope nearly worn out	37 2	44,912	½p chald a little less

These two ropes have run 97,102 chaldrons 1224 yards and cost £190 which is considerably below one halfpenny p chaldron, but being so often repaired with pieces of new rope may fairly be reckoned one halfpenny p chaldron allowing £85 for the second rope. 500 chaldrons of small coals were put upon the battery of the 1st incline consequently were not run by this rope. The length of this incline 1224 yards.

3rd Incline Rope	Length of Time Weeks Days	Quantity of Chaldrons	Cost p chald d
First rope laid on 18 Novr 1822 & taken of 9 Octr 1824	96 6	96,652	7/9 of a farthing nearly

Owing to this rope being repeatedly repaired with pieces of new rope, and 350 fathoms of it twice laid the whole cost was very near £80 for 96652 chaldrons which is considerable below on[e] farthing p chaldron for this rope. The length of the plane 716 yards. 450 chaldrons were put upon the 2nd Incline Battery and were not run by this rope.

Each of these three Inclined Planes have a very strong turn in them, which is a great disadvantage.

4th Incline Rope	Length of Time Weeks Days	Quantity of Chaldrons	Cost p chaldron d
First rope laid on 22 Novr 1822 & taken of 29 July 1824	88 3	87,390	7/8 of a farthing nearly
2nd rope may be said to be one tenth worn out	8 3	8,938	¼ nearly a little less

These two ropes have run 96328 chaldrons and cost £90, which is 7/8 of a farthing p chaldron. 324chaldrons were put upon the Battery of the 3rd incline, consequently were not run by this rope. The length of the plane 902 yards. The one tenth of the rope valued at nine pounds nearly.

This plane being remarkably straight has cost considerably less trouble and expence in various ways than any of the others. 161 chaldrons were put into the way on this incline.

Between incline foot and the staith there were 3000 chaldrons of small put upon different Batteries & into the way.

5th Incline Rope	Length of Weeks	Time Days	Quantity of Chaldrons	Cost p chald d
First rope laid on 18 Novr 1822 & taken of 16 Augt 1823	38	5	26,702	½ 1/6 nearly
Second rope taken of 27 March 1824	32	0	29,726	rather less than ½
Third rope taken of 7 July 1824	14	4	20,789	½ 4/5 nearly
Fourth rope may be said to be one half worn having been on	11	4	14,944	½ nearly

These 4 ropes have run 92,161 chaldrons and cost £210, which is ½ ¼ p chaldron nearly.

The incline (5th) has a break wheel & having a turn to pass round which is nearly a semicircle is very much abused. If the inclines were straight and a rider on each set of wagons the ropes would wear more than twice the time. The other 1167 [chaldrons] went to two land sales, staiths & were not run by this rope.

Cost p chaldron on each station for labourage, keep of engines etc from 18 Novr 1822 to 26 Sept 1824

1st station from Pits to Rough Dean	£ s d
One Locomotive Engine 54 weeks at £5 7 p week	288 18 –
Two ditto “ 43 “ £10 14 “	460 2 –
	£749 - -

During which time they have led 109,279 chaldrons at the rate of one penny three farthing & 4/5 of a farthing nearly p chaldron, the distance being 2541 yards at a descent of 1/6 of an inch p yard which is nearly ¼ 1/5 p ton p mile including the weight of the wagon – the empty wagon being 3472 pounds, the laden wagon 9408 pounds allowing 53 cwt for coals.

From an average of 6 months ending 30 June 1823 each Locomotive Engine cost p week as follows viz

	£ s d
One engineman p week	1 1 6
One fireman “	13 -
Wheels “	17 6
Grates & Repairs “	7 6
Grease, oil, tallow , spun yarn etc	7 6
Coals for fire 2 chaldrons second best @ 20/-	2 - -
	£5 7 0

2nd Station from Rough Dean to Byre Engine	£ s d
From the same average of 6 months the Byre Engine cost as follows viz	
2 enginemen at 21/- p week	2 2 -
1 boy @ 7/6 “	7 6
Grease, oil, tallow , spun yarn etc	1 8 6

9 chaldron of nutt coals @ 10/- p chaldron	4 13 -
Repairs, fire barrs etc	1 5 -
	9 13 -
One rider up and down with the wagons 18/- p week	18 -
One man Bank top @ 14/-	14 -
A Boy at meetings to ring the Bell owing to a great turn in the bank	5 -
Grease for Rollers	5 -
A man at the Bank foot	12 -
Cost p week	£12 7 -

97 weeks at £12 – 7 p week 1197 19
Cost for Ropes 622 =
£1819 19 -

103,238 chaldrons were led up this bank 882½ yards at an ascent of 2 1/8 inches p yard for the above sum which is 4d ¼ p chaldron nearly or 2d p ton p mile.

There was laid on the way from Pits to the Staith during this time 12,202 chaldrons of small coal – 6041 of these chaldrons went to raise the Rough Dean Battery 4 feet and the rest of the Way towards the Pit in order to equalize the Way for the Locomotive Engines, consequently were not drawn by the Byre Engine rope.

3rd Station from Byre Mill Engine including both banks	£ s d
From the same average of 6 months the Mill Engine cost as follows viz	
2 enginemmen at 21/- p week	2 2 -
1 boy @ 7/6 “	7 6
Grease, oil, tallow , spun yarn etc	2 4 -
9 chaldron of nutt coals @ 10/- p chaldron	5 - -
Repairs, fire barrs etc	1 5 -
	10 18 6
Two riders @ 18/- p week	1 16 -
Two labourers at Bank top & meetings @ 14/-	1 8 -
A Boy 7/6	7 6
Another boy greasing rollers & grease	5 -
A man at the Bank foot	10 -
Cost p week	£15 - -

& 97 weeks at £15 p week 1455 - -
Cost for Ropes during the above time 755 - -
£2230 - -

The Mill Engine has taken 98,475 chaldrons 1551 yards, the one half of which is an ascent of 7/16 of an inch to the yard, the other half an ascent of 2 1/8 inches p yard and cost the above sum which is rather above 5¼ p chaldron or 1¼ 2/5 p ton p mile – The weight of both wagons and coals are included. Note – There being no permanent springs it has been found exceedingly expensive to keep these two engines with a sufficient supply of water through the Summers and what with leading water, making Reservoirs, open cast drifts etc have cost upwards of two thousand pounds the last two years, and indeed whatever Engines are fixed on the tops of hills there will be considerable difficulty and expence in procuring a permanent supply of water for the engine. Even an engine of

the high pressure kind will use more water than a Condensing Engine were it not for the waste of slab water etc. In a Condensing Engine the steam is converted to water again in the condenser, while the high pressure engine by exhausting into the chimney or open air [the steam] is entirely lost.

1st Incline Plane to second station 4th	£ s d
2 riders, one with the loaden the other with the empty wagons @ 18/- p week each	1 16 -
A boy at the Bank top	7 6
Cost p week	£2 3 6

& 97 weeks at £2. 3. 6 p week 210 19 6
 97602 chaldrons cost the above ropes 245 - -
 £455 19 6

This inclined plane has run the above quantity for the above sum 1302 yards down an ascent of 1 3/16 inches p yard and cost about 1¼ 2/5 p chaldron or ¼ 2/5 p ton p mile.

2nd Inclined Plane to third station 5th	£ s d
2 riders as the other each @ 18/- p week	1 16 -
A boy at meetings owing to a turn in the way	6 -
Cost p week	£2 2 -

& 97 weeks at £2. 2. - p week 203 14 -
 Ropes during the above time 190 - -
 £393 14 -

This inclined plane has run 97,102 chaldrons and cost £393 14/- for 1224 yards at a descent of 1¼ inches p yard which is about ¾ 8/9 p chaldron or about ¼ 1/3 p ton p mile.

3rd Inclined Plane to fourth station 6th	£ s d
2 riders as the other each @ 18/- p week	1 16 -
A boy to grease rollers etc with grease	10 -
Cost p week	£2 6 -

& 97 weeks at £2. 6. - p week 223 2 -
 Ropes during the above time 80 - -
 £303 2 -

This inclined plane has run 96,652 chaldrons 716 yards at a descent of 15/16 of an inch to the yard and cost £303 2/- which is about ¾ p chaldron or about ½ p ton p mile

4th Inclined Plane to the Locomotive Engines Station 7th	£ s d
2 riders same as before each @ 18/- p week	1 16 -

& 97 weeks at £1. 16. - p week 179 12 -
 Ropes during the above time 90 - -
 £269 12 -

This inclined plane has run 96,328 chaldrons and cost £269 12/- the length of the plane 902 yards at a descent of 1 inch to the yard and cost about $\frac{1}{2} \frac{2}{3}$ p chaldron or nearly $\frac{1}{4} \frac{1}{4}$ p ton p mile.

From 4th Incline foot to top of 5th Incline Station 8th	£ s d
Two Locomotive Engines 54 weeks @ £5 7 each	577 16 -
Three Engines do 43 " @ do	690 3 -
One man pumping & warming water for the engines 60 weeks @ 12/- p week	36 -
Whole Cost	£1303 19 -

These engines have led 96,328 chaldrons 4350 yards and cost the above sum which is about $3\frac{1}{4}$ - chaldron or nearly $\frac{1}{4} \frac{1}{4}$ p ton p mile. 3000 of these were small laid on the Batteries and on the way and would have been less trouble had the[y] gone the whole distance. The whole descent in the above distance being 63 feet 5 inches.

5th Incline to the Staith station 9th	£ s d
2 riders at the Bank head each @ 18/- p week	1 16 -
Another @ 12/- p week	12 -
	£2 8 -

& 97 weeks at £2. 8. - p week	232 16 -
Cost of ropes during the above time	210 - -
	£442 16 -

This inclined plane has run 92,161 chaldrons 325 yards at a descent of $2\frac{1}{2}$ inches p yard and cost £442 16/- which is considerably above $2 \frac{1}{3}$ p ton p mile.

The distance the coals are conveyed by Machinery with ropes on the Hetton Colliery Waggonway is 6902 yards or nearly four miles and has cost in 97 weeks £2212 - for ropes alone £1185 16 - p annum.

Ropes lying on railways are exposed to be cut by malicious or mischievous persons, we have had several instances of this kind on the Hetton Railway and several accidents by ropes breaking with a train of loaded wagons on the ascending planes which causes great breakage of wheels & rails which are expensive and it is more than probable some of the accidents happened from the same quarter as ropes may be very seriously injured by malicious persons without being detected in such a manner as to bring them to justice.

Expence of keeping Waggonway

The whole length of Waggonway from Pits to Staith, including branches at Pits, different sidings, Bank tops, third rails for Inclines, Land Sales, and different branches at Staiths is 13 miles nearly of single way.

On this way there are 6 men at 20/- p week each	£312 – p annum
One Superintendant @ 25/-	65 “
Breakage of rails p annum not including accidents	120 “
	£497 “

Which is nearly £38 p mile p annum for single way.

Had the whole line of way been on such levels that Locomotive Engines might have gone the whole distance 4 men without any Superintendant would have kept the way, which would have been a saving of £13 p mile p annum and on such a railway as between Newcastle and Carlisle £832 p annum. Were horses employed on the whole line it would take at least double the expence in creasing [?] and ballast to keep the same way.

Expence p mile for laying Railways sufficient to bear Locomotive Engines

The Rail and Chair on the Hetton Colliery Railway as cast by Losh & Co weighs 73lbs @ 9/6 cwt and lays three feet nine inches in length. There will then be in one mile of single way 2816 rails and chairs which at the above price cost

£871.16.6

2816 blocks of wood or stone for the way to rest upon at 6d each 70 8 -

Laying the way, filling up covering, including gates, styles, fences, quicks etc at 1/- p yard

88 - -

£1030.4.6

There is at present a very great advance on iron of all descriptions, the above was the price of the Hetton rails & if I am not mistaken the[y] had to be kept good for three years.

Outfit expence of different kinds of Machinery on the Way

5 Locomotive Engines Each £500 complete	£2500
2 Sixty Horse Engines Reciprocating or fixed engines at £3000 each	6000
5 inclined planes, including walls, arches, framing, wheels, pullies etc	1000
Ropes, one for each engine & incline	748
Sheaves, rollers etc on the engine & incline Banks	£11061

Were the whole intended line of Railway between Newcastle and Carlisle varied from the dead level to a rise or fall of one fourth of an inch to the yard, according to the different situations of the ground through which it might pass, 16 Locomotive

Engines would be able to lead 500 tons p day the whole distance if required and the outfit expence of Machinery for 64½ miles would be the small sum of £8000. A sum £3061 less than the Hetton Railway which is only 7¾ miles.

If the precise line were determined upon and the levels taken and the expence found to be such as not to warrant the whole line to be brought to a rise or fall not exceeding 5/16 of an inch, cog rails might be laid on greater ascents where absolutely necessary with very little more expence, and the Locomotive Engines have a cog wheel so placed as to suit these rails, and need only be used on such ascents.

One great reason why the Locomotive Engines, and the cog rail were laid aside at Coxlodge Colliery, they were not so well understood as at present, and owing to some explosions which took place

about that time either by neglect or want of judgement particularly one at Newbottle Colliery on the Wear where several persons lost their lives & several more badly wounded a general panic pervaded the public mind which has hardly yet subsided although the dangerous effects from the bursting of their boilers is much lessened by being at present generally made of the best malleable iron plates, and sufficiently strong to bear at least 5 times the pressure the are loaded at, and experience has proved that they have gone several years at Killingworth Colliery on the Tyne and led the coals without any interruption and the[y] have likewise led all the coals at Hetton Colliery on the Wear for 2 years, a distance of 4 miles without the loss of a single day, and this proves that by proper management there is little fear of explosions.

The only disadvantage to the Locomotive Engines is the density of the materials of which are composed, and having to convey the cause of motion itself as well as the carriages on which they have to operate.

Fifty strokes p minute being sufficient speed for the engine pistons to travel, by increasing the size of the wheels from three to four feet would increase their speed upon the way from upwards of five to upwards of seven miles p hour without the speed of the engines pistons being altered by it, which undoubtedly would be one great improvement – at the same time it is certain that other improvements might be made which would increase the power of the engines far beyond the power lost by increasing the size of the wheels as there will be the same friction for five miles by the three feet wheel that there is for seven miles by the four feet wheel, the rubbing surfaces being the same in both cases.

Dimensions and Powers of some other Engine Planes, which have been at use on the Railways since 1819 or are now at use in the Coal Trade on the Rivers Tyne & Wear

Three Tons Engine Plane, 30 horse power cost erecting £1500, length 364 yards, ascent 65 feet 6 inches $2 \frac{15}{100}$ inches p yard, drew 4 full chaldron wagons and 4 empty running immediately down at the same time, at the rate of 125 feet p minute or a little above $1\frac{1}{2}$ miles p hour.

Black Fell Engine Plane, 36 horse power, length 1111 yards ascent 216 feet 6 inches $2 \frac{34}{100}$ inches p yard drawing 15 full waggons at the rate of 230 feet p minute, or a little above $2\frac{1}{2}$ miles p hour.
[Black Fell Engine on Ouston Waggonway]

Ayton Bank Engine Plane, 25 horse power, length 323 yards and ascent 113 feet 6 inches $= 4 \frac{21}{100}$ inches p yard, drawing 4 full waggons at the rate of 184 feet p minute, a little above 2 miles p hour.
[Ayton Bank Engine on Ouston Waggonway]

Kenton New Engine Plane, 26 horse power, length 403 yards, ascent 141 feet 4 inches $= 4 \frac{2}{5}$ inches p yard and draws 4 full chaldron waggons at the rate of about 5 miles p hour.

All engines of this kind are pretty much the same in point of work and attendance on the Planes, including engineman, keep of the engine, such as coals, grease oil, hemp, ropes etc and every other particular are generally above one penny p ton p mile without reckoning interest for outfit expence in the engine, rollers, sheaves etc upon the way. From an account which I have of one of the above planes it cost $1\frac{1}{4}$ d p ton p mile.

On the Powers of Horses as applicable to Carriages on Railways

The Hetton Chaldron Waggon when empty weighs 3472 pounds & from experiments made takes 134 pounds to move her forward on the dead level.

The loaded chaldron wagon weighs 9408 pounds & takes 55.2 pounds to move her forward on the dead level.

A table, showing the power required to move an empty wagon forward on a cast iron railway on the dead level and up different acclivities from a quarter on an inch rise in the yard to 2¼ inches. And likewise a table showing the power required to move a loaded chaldron wagon along a cast iron railway on the dead level, and up different acclivities from a quarter of an inch to the yard to 2¼ inches p yard.

Empty chaldron wagon weighing 3472 lbs

Rise in the yard	Level	Inch ¼	Inch ½	Inch ¾	Inch 1	Inch 1¼	Inch 1½	Inch 1¾	Inch 2	Inch 2¼
Power required in lbs	13.4	33.4	53.7	73.8	94.3	114.1	134.2	154.4	174.5	194.6

Loaded chaldron wagon weighing 9408 lbs

Rise in the yard	Level	Inch ¼	Inch ½	Inch ¾	Inch 1	Inch 1¼	Inch 1½	Inch 1¾	Inch 2	Inch 2¼
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Power required in lbs	55.2	121.4	187.6	253.9	320.1	386.3	452.6	518.8	585.4	651.3
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According to Boulton & Watts method of calculating the horse power, 187½ lbs upon a shaft over a pulley at the rate of 2 miles p hour is equal to one horse power. By assuming these as a data we find them at accord pretty near with experience.

One horse will draw 4 full chaldron waggons 53cwt each of coals on a level and will stand to it at 24 miles a day viz twelve miles with full waggons & twelve miles with empty.

One horse will also draw 6 full waggons down a descent of 1/8 on an inch to the yard *bring back the empty ones.

One horse will draw three full waggons up an ascent of 1/16 on an inch to the yard, two waggons up 3/16 of an inch and one wagon at ½ inch to the yard.

From 18 Novr 1822 to 30 Novr 1823 there was led from the Pits to Rough Dean 53,823 chaldrons of coal a distance of $1\frac{1}{2}$ miles nearly.

From 18 Novr 1822 to 30 Novr 1823 is 54 weeks at six working days each week is 324 days. Then 5 horses 8 gait [journeys] each day with 4 full chaldron waggons each gait and bring back the empty ones is 24 miles each day for 324 days, steady work.

The keep of these 5 horses @ 20/- p week	£5 - -
5 drivers @ 15/- p week	3 15 -
Shoeing, gears etc for each horse at 1/- p week	5 -
	£9 - -

54 weeks at £9 p week, £486 for 51,840 chaldrons. One Locomotive led 53,823 chaldrons in the above 54 weeks & cost £5. 7 - p week £288. 18 - Leaving a profit of £197 2. - in 54 weeks besides leading near 2000 chaldrons more.

Every impartial reader will perceive that every [dis?]advantage is thrown to the side of the horses, they are reckoned full work every day 6 days in each week for 54 weeks together, while the Engine had to take coal as she could get them sometimes be[?] of two or three days together at one time – one instance among many that might be brot forward:

On Friday 27 June 1823 this engine led 388 chaldrons the above distance, and travelled the ground 23 times backward & forward which was upward 66 miles in 16 hours – it would have taken 12 horses to do the work.

The same day two of the Locomotive Engines on the lower part of the way took 336 chaldrons the distance of 4350 yards taking 16 waggons at a time each way the ascent

For the empty waggons being about $\frac{5}{16}$ of an inch to the yard upwards a mile of the way – each engine travelled $47\frac{1}{4}$ miles in 16 hours.

From the preceeding accounts one of the Engines travelled in 54 weeks during all kinds of weather $9713\frac{1}{2}$ miles with a load never less than $24\frac{3}{4}$ tons and on an average 46. The ascent with the empty waggons being $\frac{1}{6}$ of an inch p yard and during that time cost £288. 18/- including every item of charge for labour, keep of engine, repairs etc which is about $\frac{5}{6}$ of a farthing p ton p mile including the weight of both waggons & coals.

From these views of the subject in various situations, and under various circumstances, the three different modes of conveyance of carriages on Railways viz Locomotive Engines, Fixed Reciprocating Engines, and Horses may be fairly reckoned at the following prices p ton p mile, not including the outfit expences of any of three different modes:

Locomotive Engines	$\frac{5}{6}$ of a farthing p ton p mile		
Horses	$\frac{1}{4}$ $\frac{1}{2}$ d	do	on the same ground
Self acting planes	$\frac{1}{4}$ $\frac{1}{4}$ d	do	on suitable ground
Fixed Engine reciprocating	$1\frac{1}{2}$ d p ton p mile up an ascent $2\frac{1}{8}$ inches p yard and varied in proportion to the different ascents p yard on which they may be placed.		

It is then evident that whatever mode of power be applied to Carriages on a long line of Railway such as that intended between Newcastle & Carlisle, the nearer the whole line approaches to a level, the cheaper will be the conveyance of goods etc p ton p mile and that the Locomotive Engines will at least on[e] fourth cheaper than any other kind of power less expence at the outfit.

These things being ascertained by matter of fact and experience, it now remains to be shewn whether the small outfit expence of Locomotive Engines, with the advantages gained by this leading on nearly level ways (or varied from the dead level to a rise or fall one fourth of an inch to the yard according to the variation of the ground through which it might pass} would compensate for making such a line of way, but as this cannot be ascertained til the line be surveyed and levels taken, the following remarks may throw some light on the subject.

According to Mr Chapman's report there must be 6 or 7 or perhaps more inclined planes, & where the weight of articles conveyed is not decidedly the greatest on the downward line, a steam Engine must be placed on the summit beyond which it will answer for one end of a reciprocating line. Mr Chapman it seems has studied his subject & from his perfect knowledge of the line of way is well informed on a variety of particulars relative thereto.

Seven engines with two ropes to each engine, and sheaves, rollers etc for two Banks cannot be reckoned at less than £14,000 for these inclines alone at the outfit whatever length they may be we shall say 14½ miles, then 50 miles is still to be provided for,

Either by Locomotive Engines or horses which we shall call £6000, making the whole outfit expence for the conveyance of goods etc £20000, which is £12000 more than the outfit of 16 Locomotive Engines which would be fully adequate to the work in all weathers even on their present construction and doubtless they are capable of great improvements, whether Mr Samuel Brown's gas engine should realize the effects expected from it or not.

Should the tonnage come near to what Mr Chapman thinks it may viz 500 tons p day for 300 days in the year the whole of distance 64½ miles, and the way made that Locomotive Engines might go through from Newcastle to Carlisle or from Carlisle to Newcastle the Public Company who may execute it must necessarily become carriers at a given rate which by locomotives would be one farthing p ton p mile, less expence than any other mode of conveyance which on 500 tons for 300 days over 64½ miles would be £10,078 p annum which added to £12,000 less outfit expence makes £22078 a sum which at 5d p square yard would remove upwards of one million yards of metal.

This is a important consideration at the outset of a long line of railway.

Where engines are fixed on railways the ascent is generally from 1 to 4 or 5 inches p yard so that whenever any thing happens to the engine (which will be the case sometimes) horses are comparatively little use owing to the rollers being set on the middle of the way and the ascent so steep that hardly any number can do much business and in these cases the whole line would be stopt until the engine was repaired, which in some instances might be a day or two as it might be a great distance from any foundry or factory where materials might be had for such repairs.

And on a Public Railway when passengers would almost constantly be going backward and forward should a rope break several lives might be lost, and considerable damage done to the baggage.

Should anything happen to a Locomotive Engine, horses might be applied immediately without loss of time as there would be no sheaves or rollers to hinder them, or the next engine that came might pull her to the nearest siding where she might stand till repaired, and if such engine happens not be heavily laden might take her carriages to their place of destination along with her own without employing any horses at all.

If two single railways were laid the whole distance $64\frac{1}{2}$ miles, parallel to each other & six feet asunder which would give sufficient room for carriages of all descriptions to pass each other on any place of the line, these sixteen Locomotive Engines might leave Newcastle, one every three hours night & day for Carlisle, and one leave Carlisle every three hours night & day for Newcastle, those going from Newcastle to Carlisle might take one way & those from Carlisle to Newcastle the other. There then would be no stoppage at all, but for coals & water which might be every eight or ten miles at the most convenient places, where coals & water might be had, eight of such places on the whole line would be sufficient & not cost more than £200. The stoppage at such places need not be above 2 minutes at each place – proper sidings might be taken of where any considerable quantity of tonnage was wanted either to or from the Railway.

Where engines are placed on the summit of hills there is generally no permanent spring to supply water, in these cases large reservoirs are to be made, that besides the expence of the Engines there may be some hundreds if not thousands of pounds expended in providing a constant supply of water for 7 engines.

The changes from one kind of machinery to another, & from one machine to another is also attended with considerable expence, danger and loss of time; there would necessarily have to be men at the Bank head, Bank foot etc besides the Engineman otherwise there would very often accidents happen.

On the Hetton Railway there is 9 changes, from Locomotive Engines, to Fixed Engines, from one Fixed Engine to another, four changes from one incline to another & from inclines to Locomotives again, & from Locomotives to inclines again; through these changes it takes nearly two hours to take a train of waggons from the Pits to the Staith, and owing to these changes we have had several accidents which have cost a considerable sum of money to repair them again – had the way been for a Locomotive to have gone between Pit and Staith she would frequently have done it in half the time without such accidents happening., but this was not practicable, the fall being one half inch to the yard the whole distance. Whereas the rise and fall between Newcastle and Carlisle in $64\frac{1}{2}$ miles is less than the rise and fall on Hetton Colliery Railway of $7\frac{3}{4}$ miles. Now if we suppose the $64\frac{1}{2}$ miles is divided into two planes, the one to have the ascent from Newcastle $\frac{1}{11}$ of an inch to the yard, the other to descend to Carlisle at the same rate, this would be more rise and fall than there is [sic] actually is in the whole distance and this might be varied to one quarter or $\frac{5}{16}$ of an inch according as the cutting or other circumstances might require; the cost for labour would be about one third were the Locomotive engines to go the whole distance.

The following is the expence for labour on the 4 miles led by Locomotive Engines on the Hetton Colliery Railway:

13 men & boys weekly wages	£11. 4. 6
32 Men & boys weekly wages on the other 3¼ miles	25. 3. 9
	£36. 8. 3
Or to shew it more clearly there is	
5 Travelling Engine men @ 21/6	£ 5. 7. 6
5 Firemen 13/-	3. 5. -
2 Waggonway wrights 20/-	2. -. -
1 man pumping water etc 12/-	12. -
3 houses and firing p week 3/-	9. -
	£11. 13. 6
On the other 3¼ miles	
10 incline men on the 5 inclines @ 18/-	£ 9. - . -
6 men & boys at the fixed engines	4. 19. -
4 waggonway wrights @20/-	4. -. -
12 men & boys at Bank ends, bank foots, greasing rollers etc	7. 4. 9
16 houses and fireings @ 3/- p week	2. 8. -
	£27. 11. 9

The distance being at 16 to 15 makes a difference of £4. 8. 9 p week p mile in favour of Locomotive Engines from the keep of the way alone.

Enough has already been said to prove to every dispassionate mind the superiority of a Locomotive power in preference to any other than can be adopted on such a line of Railway as that intended between Newcastle and Carlisle.

First – in the quickness of the mode of conveyance which may safely be reckoned at 6 miles p hour while that by horses or Reciprocating Engines must necessarily fall short of 3 miles p hour.

Second - The cost to the undertaking will be one farthing p ton p mile less

Thirdly – the outfit expence for sufficient power to travel the whole length of the line more than one half less.

Fourthly – The labourage and keep of the way more than one half less.

Fifthly – Ropes, Rollers, Reservoirs for water, Engine Houses, Dwelling Houses, except at each end of the way, accidents by breakage of ropes, destruction of carriages and baggage, breakage of wheels and rails and the probable loss of lives by such accidents are taken out of the way and envious and malicious persons prevented from doing mischief on such like property.

Estimate of a Railway between Newcastle and Carlisle such as described the preceding pages, suitable for Locomotive Engines drawings trains or loaden carriages

64½ miles at £1030. 4. 6 p mile	66449. 10. -
64½ miles “ Double way ditto	66449. 10. -
Land inclusive of fences (embankments and cuts) average width 45 feet on 64½ miles equal to 352 acres at £60 p acre	21120. - -
Cuts & Batteries (Excavations & Embankments) under the variations sufficiently level for Locomotive Engines or horses, assumed at an average of £1000 p mile	64500. - . -
Short tunnel at Lemington, wooden bridge to Ryton Haughs, over the North Tyne, the Eden etc according to Mr Chapmen’s report	20000. 0 0
	283,519
Temporary damage to land, Superintendence, incidents etc at 15 p cent	35777 15 -
	274,296 15 -
16 Locomotive Engines	8000
8 Watering places	200 - -
	282,496 15 -

The above sum includes the outfit, expence of sufficient machinery to lead 500 tons p day for 300 days p annum which at one penny p ton p mile on the whole distance is

40312, 10 -

The actual expence for conveyance one farthing p ton p mile

10078. 2 -

30234. 8. –

For Agency, keep of the way, broken rails, incidents etc

4000. - -

26234. 8. –

Clear annual revenue or 9 p cent p annum on the capital employed.

There is nothing in the preceeding accounts which is theoretical, but one item of charge viz £1000 p mile for making the line of way suitable for Locomotive Engines to travel the whole distance, and in the present uncertain state of information as to the whole localities of the way nothing can be ascertained without an accurate survey, and all the particular levels taken. (So far as my knowledge goes and I have travelled the whole distance twice over and great part of it some hundred times being born at Bells Fell near Bradley in the Parish of Ryton and not far from Stanley Burn.) £1000 p mile will be more than sufficient. All this part of the Country abounds with coal at an easy depth, the greatest part of which is unwrought, the Royalties of Bradley Moor, Stanley Burn & Hedly Fell where there are three or four different seams of coal from 3 to 12 feet thick. One of my uncles, still living on a small farm near Bradley Hall wrought in a Pit somewhere on Bradley Fell where the coal was upwards of 12 feet thick. There were collierys at Hedley Fell & Stanley burn between 40 & 50 years ago, and so far as I know they were discontinued on account of disagreement among the Proprietors of the different Royalties. A long lead of 6 or 7 miles to Stella where the coals were put into keels, & from thence taken to Sheilds, which was very costly owing to the bad navigation of the River Tyne to

Lemington which in the winter time was frequently frozen for weeks together, added to which the powers of Steam Engines of any kind were very imperfectly understood. It is more than probable that if a line of Railway were to go right through this part of the Country and coals would be led for one farthing p ton p mile, and the mines completely drained at a trifling expence, being of an easy depth and for most part using little timber being generally what is called Post Roof, these collieries would immediately be wrought and owing to the quality of the coal would be able to compete in the London Market with the best collieries on the Tyne or Wear – there would in all probability be 1000 tons p day for 8 or 10 miles, where they might br put either into keels or ships somewhere about the high end of the Close at Newcastle or at any place higher up between there and Lemington.

It is then pretty evident that Locomotive Engines will be the most eligible motive power that can be applied, and will form the cheapest and most expeditious mode of conveyance, and that it is highly probable that the whole line may be made to suit such conveyance for a sum less than that proposed.

And observed by Mr Chapman in his report “The design is also worth the aid of Goverment, as it will afford certain easy and rapid means of conveyance for troops and military stores, across that part of the Island & that exclusive of an increased carriage of minerals, from the line of Railway passing in front of every opening into the mineral country, the parties who may subscribe to carry the work into effect will meet with an ample remuneration for any expenditure requisite for its execution.