



EARLY STEAM POWER WALK

Point 1 – Visitor Centre and Horse Gin Replica

Middleton Park is well known for its remains of early coal mining, particularly the remains of over 200 early pits throughout the woods where coal would have been extracted, quite often by hand. The sinking of deeper pits led to increasing use of machinery such as Horse Gins where horses turned a wheel which wound a rope to haul buckets of coal out of the mine.

Until the early 1800s this was still considered to be the most economical means of extracting coal from all but the deepest coal mines. What made steam commercially viable was the Napoleonic Wars where huge numbers of horses were used by the military, causing a shortage of horses and fodder and therefore greatly increasing the costs of using horses.

The earliest use of steam power in mining was actually to drain water from the mines. The first practical engine for draining mines was the Savery Engine patented by Thomas Savery in 1698. In 1702 Savery published a book *“The Miner’s Friend; or, An Engine to Raise Water by Fire”* describing his engine’s application in draining mines.

On 16th March 1702 Ralph Thoresby mentioned in his diary visiting Middleton with the intention of seeing an engine used to drain Ralph Brandling’s mines. However Ralph Brandling wasn’t in so we get no further details of the engine.

“we called to see an ingenious engine, &c. lately erected by Mr. Brandling, to drain his coal-mines, &c. but missing of himself, received little satisfaction”. In 1717 Ralph Brandling was described as the owner of *“A Wrought Colliery or Coal Mine with a Water Engine and Smithy”* at Middleton.

It could have been one of the earliest steam engines, however there were other means of pumping water from mines using water wheels or animals, though these might not have attracted the same attention. Neither Thoresby’s book or Savery’s clearly state if it was a Savery engine that had been installed in Middleton.

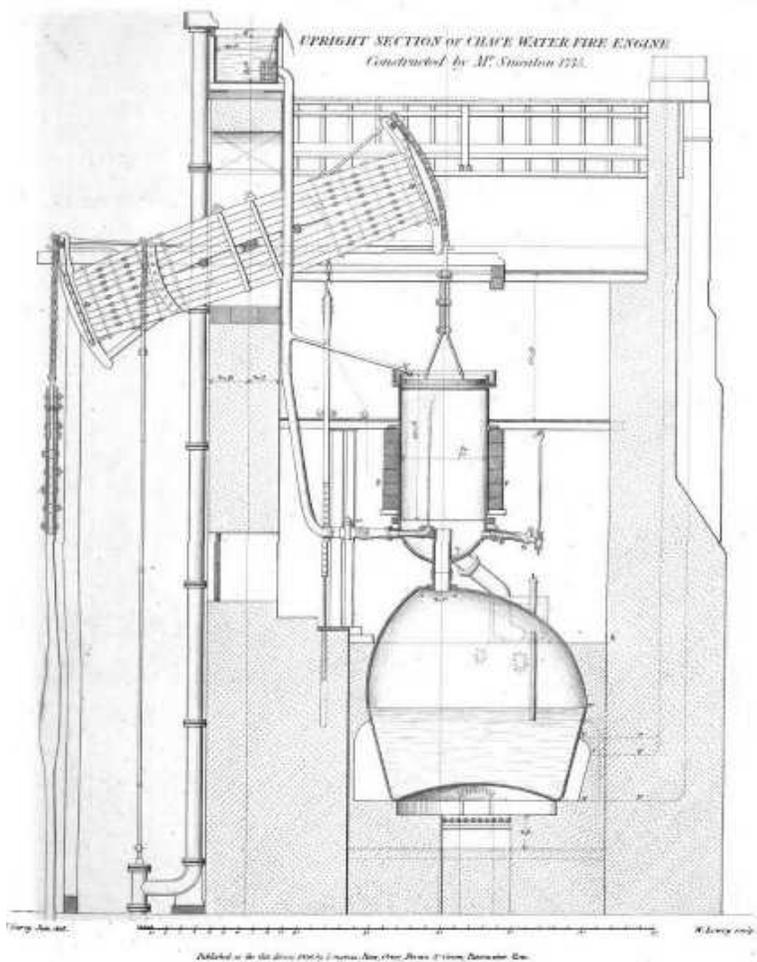
Point 2 – Wood Pit

Wood Pit is the best example of a mine that once used a steam engine to be found in the park. Close to the pit can be seen a dip in the ground that would once have served as a reservoir to provide water for the engine. Also close to the pit shaft is a flat area where the engine is likely to have been and pieces of clinker (metallic deposits caused by impurities in the coal) that would have been shoveled out of the fire can be found. The mine was sunk around 1814 and is thought to be the one shown in the illustration of the Middleton Collier in the book *Costumes of Yorkshire* as it would have been new at the time the illustrations were made.



Above – The Middleton Collier painting of 1814

From Wood Pit we follow a short section of old waggonway that once took coal from the pit.



One early example of an engine employed in Middleton was one designed by famous Leeds engineer John Smeaton. In 1780 one of his engines was put to use in the Middleton Colliery. It was of a similar design to one used in Chase Water mine in Cornwall and illustrations of that engine survive.

Smeaton also carried out experiments regarding the properties of coals from different mines, including coal from Middleton using a small engine of his own design set up in his own workshop.

“The performance of the Newcastle coals of the kind called Team -top were found superior to the common Yorkshire coals called Halton, in the proportion of 120 to 100. Cannel coal from Wakefield in Yorkshire was superior to Halton as 133 to 100. Hage-moor coals, and Flockton coals were superior to Halton as 133 to 100. Middleton-wood coals and Welsh coals, were superior to Halton as 110 to 100.”

Left – Smeaton's Engine

Point 3 – Another likely steam powered pit

The largest pit shaft seen in the park, this was probably another pit established around the same time as Wood Pit. This pit is not mentioned in a survey carried out in 1808 when the Middleton Estate was put up for sale (in the end the sale did not take place). The operating pits in 1808 were outside the area now occupied by the park and close to where the Ring Road is now.

1. *THE FANNY PIT - Which is Main Coal, 154 Yards deep, worked by a capital Half-patent Raising Engine of 18 Horse Power, 30 Inch Cylinder, Iron Boiler, Condensing Cistern, Air Pump, Cast Iron Beams and Flat Ropes, Iron Fly Wheel, Vertical Wheel, Sliding Spears and Pump, extra Metal Pipes, Engine House and Cabin*
2. *THE LADY PIT - Little Coal, 101 Yards deep, worked by a Raising Engine of 10 Horse Power 26 1/2 Inch Cylinder, Iron Boiler, Pump, Iron Shaft and Fly Wheel, Cast Iron Beams and flat ropes, Engine House and Cabin.*
3. *POCKETS PIT - Little Coal, 100 Yards deep, worked by a Raising Engine of 14 Horse Power, 30 Inch Cylinder, Iron Boiler, Iron Shaft and Fly Wheel, Pump, Cast Iron Beams and round Ropes, Engine House and Cabin.*
4. *ACRES PIT - Little Coal, 100 Yards deep, worked by a Raising Engine of 14 Horse Power, 30 Inch Cylinder, Iron Boiler, Iron Shaft and Fly Wheel, Pump, Cast Iron Beams and round Ropes, Engine House and Cabin.*
5. *EMMA PIT - Main Coal, 139 Yards deep, worked by a Raising Engine of 14 Horse Power, 30 Inch Cylinder, Iron Boiler, Pump, Iron Fly Wheel, Cast Iron Beams and flat ropes, Engine House and Cabin.*

Also a new pit Lyse Pit was under construction, as was Broom Pit. Two additional engines were mentioned in the 1808 survey. *“A Capital Patent Steam Engine, Built by Boulton & Watt, equal to the power of Eighty Horses, with a 60 Inch Cylinder, 8 Feet Stroke”* Boulton & Watt were the Birmingham firm that dominated early steam engine production and went to great lengths to stop Leeds engineer Matthew Murray taking their business. The other engine mentioned in 1808 was *“A Steam Engine, Equal to the power of One Hundred Horses with a 72 Inch Cylinder.”* This specification matches that of Smeaton's 1780 engine. It is thought the Boulton & Watt engine may have been a replacement for the Smeaton engine which would have already been very much out of date and inefficient by 1808.

Point 4 – Broom Pit



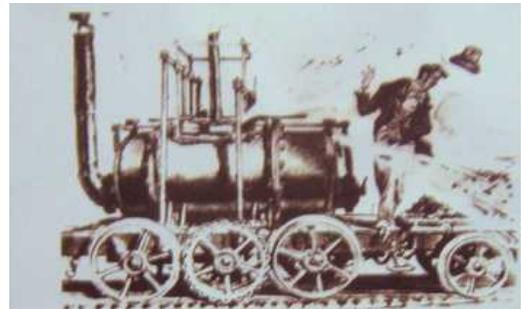
The biggest pit in the Middleton Colliery and the last to still be in use when it closed in 1968. The land is now landscaped over after the site was used for landfill after the mine was demolished.

In later years the colliery used a lot of machinery from the Sun Foundry which was close to their Kidacre Street Coal Staith. Their order records note items such as Coal screens, air vessels, pumps and a new piston for Henrietta Pit in the 1850s and 60s. In 1913 when just Broom Pit and New Pit were in use a large *“Compound condensing tandem rotative pumping engine & double acting pump”* was ordered from the works, then owned by Hathorn Davey.

Left – Surviving Hathorn Davey engine in Cambridge Science Museum

Point 5 – The Railway

The railway line from Middleton Colliery in to Leeds was the first railway to regularly employ steam locomotives in 1812, as previously mentioned a consequence of the increased cost of using horses due to shortages caused by the military use of horses in the Napoleonic wars. Four were built by Matthew Murray of Holbeck. They used a rack wheel patented by colliery manager John Blenkinsop, though it may have been Murray's invention rather than Blenkinsop's as Boulton and Watt were watching what patents Murray was taking out.



The rack wheel engaged on teeth on one side of one of the rails, allowing a light locomotive to haul a large load and avoid breaking the iron rails which was a common problem with early locomotives. It is sometimes said that the racks were to allow the locomotives to climb the gradients, however the railway had fairly level sections with rope worked inclines on the uphill sections where Old Run Road passes under the motorway and where Manor Farm Rise and the steps up to Town Street are now. It is recorded that the locos could haul 15 tons on the inclines but believed they generally operated on the level sections.

The Murray – Blenkinsop locos operated on the line until 1835, though two of them exploded in that time. The first in 1818 due to the safety valves being tampered with and the second in 1834 due to the poor condition of the engine at the time. In both incidents their drivers were killed.

In 1836 Nicholas Wood noted *“The Deep coals are led by Horses from the West Pit to the top of the Middleton Plane, thence by a self acting plane to the Day Hole at which place the coals from the Forty Yard and Little, join. The whole of the coal are then led from thence, about 1 mile by a fixed Engine to the top of another self acting plane by which they are let down to Hunslet and they are then taken to Leeds by horses, taking 6 waggons at a time.”*

Steam locomotives returned to the railway in 1866 with locos made by Manning Wardle in Hunslet.

As well as steam trains, the Middleton Estate and Colliery Co also bought a steam lorry in 1916. Again the First World War caused a shortage of horses and feed as huge numbers of horses were used by the military. Their steam lorry was made by the Yorkshire Patent Steam Wagon Co on Pepper Street.

Right – A Manning Wardle locomotive and a visiting Yorkshire Patent Steam Wagon at a Middleton Railway gala.



Though New Pit never reopened after the general strike in 1926 its pumping engine had to be kept running otherwise Broom Pit would have flooded. Broom Pit would have been using its steam engines right up to closure in 1968 and the trains remained steam powered to the end, by which time the preservation group at the Middleton Railway were already running their own steam engines.

Written by Kris Ward, 2020. With thanks to Sheila Bye, Jim Jackson and Paul Hebden.

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