

A HISTORY OF THE WIGAN COALFIELD

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I have chosen the history of the Wigan Coalfield as the subject of my project because I have for a long time been interested in the origin and uses of the various old shafts, mineral railways and other colliery surface establishments which, before reclamation, were very much in evidence in the Wigan district. I had read various small articles on the Great Haigh Sough, the shaft sinking at Rosebridge Colliery and other famous local mining engineering projects, and, living at Hindley and having also a great interest in Geology, I began to explore the local countryside for outcrops and looking around any old colliery sites that I came across. Finding these derelict buildings, shafts and former railway tracks gave me an ambition to find out about their history, ownership, area of working etc. and when the project for O.N.D 2 was set and each person was given a free hand, I jumped at the chance to satisfy my ambition by making it my project.

GEOLOGY OF THE WIGAN COALFIELD

Few areas in this country were more richly provided with accessible coal seams, and few have been more extensively worked over the centuries. I think we should define the Wigan coalfield as that area lying between the Great Upholland fault on the west, the Scot lane fault on the east, the outcrop of the Mountain seams in the north and the Bickershaw lane and Aqueduct faults in the south. This area comprises approximately 70 square miles, and falls almost wholly within a radius of five miles from the centre of Wigan. From this small territory, if it is reasonable to hazard an estimate, something in the order of 725 million tons of coal have been extracted. The number of all known shafts which have been sunk in the area is no less than 1,013.

Mining of coal took place mainly in the Middle Coal Measures, particularly from the Arley, Haigh Yard, Cannel, Wigan Four Feet, Pemberton Four Feet and Crombouke seams, all of which were of excellent quality. In the early history of the gas industry, at the latter part of the nineteenth century, the famous Haigh Cannel was used extensively for gas production, one ton of cannel yielding about 7,500 cubic feet of gas. The Arley and Haigh Yard coals were used for many years in the manufacture of high-grade coke. In the Lower Coal Measures the Mountain seams have been worked to some extent on the outcrops at Billinge and Chorley, producing excellent coking coal, as well as a high-grade fireclay from the floor of the seams which has been used for the manufacture of refractory bricks etc.

The maximum number of seams available is twenty-six (listed on next page), which vary in thickness from two to seven feet.

The Wigan coalfield is extensively faulted. The direction of the main faults is parallel to the Pennine Chain (that is, in a N.N.W.-S.S.E. direction), and the resulting blocks of strata are again shattered by cross-faulting. The main faults run fairly parallel to each other and are approximately 1,500 yd apart. They are the Pemberton fault, a downthrow to the east, varying in throw

from 250 to 400 yd; the Shevington fault, running from Edge Green to Heskin, a downthrow to the east of 600 yd; the Giants Hall fault, running from Abram to Standish, a downthrow to the west of about 600 yd; the St. Catherine's fault, which passes by Amberswood Common under St. Catherine's Church in Wigan to Boars Head, a downthrow to the east of 160 yd; and the Great Haigh fault, running past Bickershaw colliery, Kirkless, Haigh and Ellerbeck, a downthrow to the west of 600 yd.

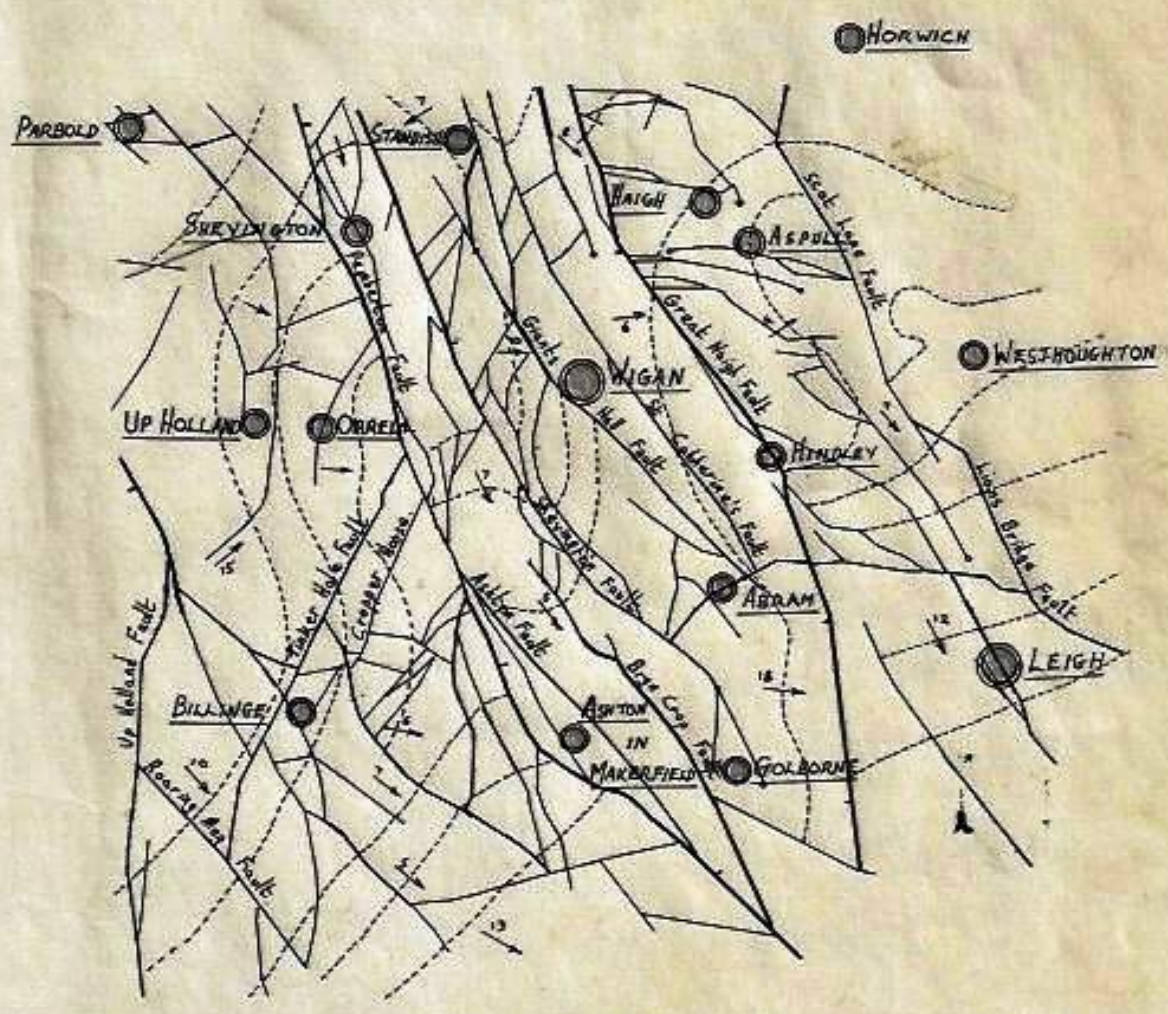
LIST OF SEAMS IN THE WIGAN COALFIELD

Name	General Thickness	
	ft	in
RIDING	2	9
PARK YARD	2	6
INCE YARD	2	0
BINN or BULLDOG	3	0
INCE DEEP YARD	2	0
CROMBOUKE or INCE FOUR FEET	4	0
INCE SEVEN FEET	7	0
INCE SIX FEET or FURNACE	4	0
PEMBERTON YARD	3	0
PEMBERTON FIVE FEET	5	0
PEMBERTON TWO FEET	2	0
PEMBERTON FOUR FEET	3	9
WIGAN FIVE FEET	4	6
WIGAN FOUR FEET	3	8
WIGAN TWO FEET	2	0
WIGAN SIX FEET or TRENCHERBONE	7	0
PEACOCK	3	6
CANNEL	3	0
KING	4	0
RAVINE or PLODDER	5	0
HAIGH YARD	3	0
BONE	2	0
SMITH	3	0
ARLEY or ORRELL FOUR FEET	4	6
UPPER MOUNTAIN	1	0
LOWER MOUNTAIN	1	9
SANDROCK	0	9

THE HISTORY

Wigan is the oldest borough in Lancashire. Indeed, it is among the first ten boroughs in England, having received its borough charter in the first year of the reign of Henry I, in A.D. 1100. Wigan was already then an established township; it held a strategic position covering the crossing of the River Douglas, and the town commanded the main routes to the north and east. Here, King Arthur had fought four of his greatest fights against the Saxons; earlier, the Romans had made it a military post, under the name of Coccium; and before that it was probably a Celtic settlement.

Throughout its history the town has proved vigorous in its allegiances; indeed its motto is "Ancient and Loyal". It was seven times plundered during the Civil War on account of its loyalty to the cause of King Charles; the inhabitants showed forthright support for the Mayor and Corporation against external authority, and it was an early centre of trade unionism. I mention these things briefly in order to suggest the spirit and temper of a people who were as ready to accept the hazards of mining as their other adventures.



<u>The Wigan Coalfield</u>	<u>Reference</u>	
	Faults 1000' and over shown	—————
	" 500' - 1000' "	—————
	" 200' - 500' "	—————
<u>Main fault lines</u>	Contours	- - - - -

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For a long time, the local use of coal was extremely limited. This is surprisingly remarkable, considering the great quantities of coal which lay so close at hand.

Turf was the chief fuel, and remained so for a long time. The reason why turf was preferred is not hard to find. It was largely owing to the large tracts of moss land present which supplied the people with fuel procured easily with no detrimental effect on agricultural land. Also preference may have been given to turf on account of the more aromatic and less sulphurous smoke given off in the days of draughty chimney-less rooms.

Records and disputes relating to much inferior materials such as turf are very common, but those to coal very few. In the early days coal was most probably used in the burning of lime, which was transported on the backs of "lime-gals", Galloway ponies, for use in building places of importance or for manure. The coal would probably have been obtained first by "drifts", "day-eyes", or "breast-highs" in places where the seam cropped out at the surface on hillsides, in those parts of the country where turf was inaccessible, and next in places where it could be delved or dug in "delfs", quarry-like openings in waste ground belonging to the Lord of the Manor. Tenants of agricultural land weren't entitled to open delfs to get minerals without arranging a royalty payment with the Lord, while common rights may interfere with explorations in waste grounds.

In enquiries or inquisitions held after the death of persons, into their possessions or heirs, little notice was taken of the mineral resources of the deceased's property. We constantly find messuages, mills, fisheries, gardens, orchards, land, meadow, pasture, wood, underwood, briar, moor, moss, furze, heath and marsh set down but seldom coalmines.

Caesar does not mention coal among the treasures of Britain but there is little doubt that it was worked to some extent before the Romans. A coal axe was found in Monmouth by Pennant and coal and ashes were found in Roman station ruins.

The twelfth century was far advanced before there were any reliable indications of a commencement to bring coal into some use. By 1307, coal was being dug, doubtless on a small scale, in most of the coalfields of the east, south and west. The only patrons at first were smiths and limeburners then brewers and dyers for their furnaces.

At the beginning of the fourteenth century, the coal trade was growing to a small extent on the Dee estuary and small workings at points in the interior supplied coal required in the immediate district.

About the middle of the sixteenth century, Dr. Kaye (founder of Caius College, Cambridge) speaks of coalpits in Northern England; "the unwholesome vapour whereof is so pernicious to hired labourers that it would immediately destroy them if they did not get out of the way as soon as the flame of their lamps becomes blue and is consumed"

Turning to Lancashire and Cheshire, noted coal crops to the surface at many places and the combustible qualities must have been known at an early date. Several of the early charters mention "minera carborundum", mines of coal, as existing in the neighbourhood and there is mention of a dower made at Warrington in 1330 in which minera carborundum are mentioned as existing at Burnhill in Ashton in Makerfield. Also in one of the Standish deeds, dated 30th November 1350 is a reservation of "Fyrston" (firestone) and "Secole" (sea-coal)

"if it be possible to find them within the property at Shevington, 3 miles north-west of Wigan

From Lelands Itinerary of 1540:

"Mr Bradeshau hath a place caullid Hawe a myle from Wigan. He hath founde moche Canel like Se Cole in his gronde very profitable to him"

In 1575-6 Edward Fleetwood, clerk and parson of Wigan, filed a bill in the Duchy Court complaining that, "Charles Banke, Robert Asteley, Ralfe Fayrebrother and Reynold Maudesley since Michaelmas last past had entered into one parcel of waste ground known as Whelley Lane containing 12 acres and lying on the east part of a parcel of the said manor called the Scoles, with force and wronge, and thereof have by like force and wronge disseised and expulsed your seid Orator and (deprived him) of the proffittes thereof in digginge coale pyttes and taking coales out of the same to a great value and had appropriated the same to their own use."

On the 30th May, 1595, Parson Fleetwood preferred a bill in the Duchy Court complaining that the Mayor and Burgesses of Wigan "have unlawfully digged, delved and made myres for coules in divers parts of the Demesnes of the said Mannor or town of Wigan without the assent of your seid Orator, whereby the roads thereof are made impassable."

In 1600, there was a coalpit being sunk, probably on the property of Ralph Worsley, of Worsley Hall and Worsley Mesnes, Pemberton and Wigan. An account of the expenses shows the sinking and the merry-making at finding the coal, at the removal of the stone and water, and at the scouring of the pit. It shows the prices realised, which indicate two qualities and the output was apparently about 25 horse-loads per day.

Probably the first pit dug within the township of Wigan was that of one Peter Plat, a chandler, in Millgate, in 1619. The site of the pit is in fact beneath the Wigan and District Mining and Technical College building and the shaft was exposed when the foundations were excavated for the building of the College. Bishop Bridgeman, then rector of Wigan, and Lord of the Manor recorded the granting of a licence to drain the water from the pit into Millgate. In the next year he records as follows:-

January 7th 1620,

"Ann, the widow of Peter Plat comes to me with Roger Bullock and Bayliffe Jolley desiring me to give leave to cast the water which springs out of their new dug cole-pitt upon my waste, for they say that the water riseth so fast in their said cole-pitt on the side of Millgate Street, as unless they may be suffered to empye it into the street that so it may run down into the river, they can make no benefit of their coles. Therefore they offer to give me 52 shillings yearly rent, that is to say 12 pence every week, and 50 loads of coal which they will dig for me out of the pitt and lay for me on the ground fit to be carried, yearly, so as I will suffer them to cast the water from their said pitt upon myscreet, and he also offers to pave the way all along so as the water so cast out shall not hurt the said highway, but will from time to time keep it in good sort so long as any coles shall be diged out of the said pitt, and will so leave it."

By September, of that year, widow Plat's pit had, he says,

"now so filled up with springs of water and, as she can get no one to empye it, so fast does the water come in, and

therefore she is enforced to leave digging coles there and hath stopt up the pitt three weeks since: and so she desires a discharge from paying any more rent for the said cole-pitt

The pit was retrieved, however, by her son Oliver Plat, who a year later got approval to dig a second pit lower down this street to drain the water from it.

The growth of coal mining within the town in the next few years is well illustrated by the following entry in the Bishop's Ledger;

"Whereas I am given to understand that divers inhabithants within the Towh and Burrow of Wigan have presumed to dig for coles under the wastes and streets thereof, I do now forbid all and every of the inhabithants of the said Town and Manor to dig for Coles or make any soughs under any of the streets or any part of the waste, within that Town and Manor; as they will answer at their perills"

Dated at Lever, 17th September, 1635.

"This prohibition I sent by Mr William Brown, gentleman, to the curate of Wigan to be published by him in t he church on Sunday next."

The Civil War 1642 - 1649

A few years later saw the beginning of the Civil War when Wigan and Warrington lent strong support to the Earl of Derby and the Royalist cause. The Earl's family seat at Lathom House, some ten miles to the West of Wigan was the last stronghold in England to fall to the Parliamentary forces. The Earl of Derby's memoirs describe how, during the famous two years siege of Lathom House in 1644-45.

"That which proved a great relief to them was plenty of fuel, for the colliers being set to dig by way of trial, found coals and water both in abundance within the house to their great comfort, the water in the mote being spoiled and rendered unfit for use by the enemy."

The colliers were more than a match for the assaulting engineers, for it is described that upon the North side of the house, which was the lowest ground, Major Morgan, the Parliamentarians engineer;

"ran a deep trench near the very mote, hoping thereby to lay it dry and then to undermine the house, but there being within it some skilful colliers, who had as much experience of drawing off water as he was master of, and they being employed by the governor to oppose him, they always wrought counter to him, and keeping full chambers of water above him, they at pleasure opened them and drowned both his works and his men, to their entire disappointment and confusion

Before and after these civil disturbances, pits were being extensively worked at Haigh and Aspull by Bradshaigh of Haigh and Myles Gerrard, and by the Worsleys, the Winstanleys, the Orrells, and the Bankes, the Sherringtons and others in the Winstanley and Orrell district. There was no stopping either, the digging for coal within the town of Wigan, and in the Wigan Court Leet records there are several complaints around the year 1700 of undermining and obstruction of the highway, nuisance to neighbours and trespasses in the getting of coal.

Disputes between owners of neighbouring pits were frequent. There are many examples among the Duchy of Lancaster Pleadings, such as the complaint of William Orrell in 1598 that Katherine Sherrington's workmen had tunnelled under the highway and stolen his coal, and had smoked out his workmen with straw. Katherine on her part alleged that William had dug a hole and flooded her pits and obstructed her carts. The Orrells had doubled the price of coals so that she,

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"having a coal pit in her said close, opened up the same for the good of her poor neighbours and not for any profit to herself,"

a very laudable object. She won her case, but complained again of the Orrells having shot four arrows at her; they were obviously poor marksmen, as she was apparently still able to complain.

Drainage and ventilation of mines in those days was assisted by "soughs", which were tunnels driven from the valleys to meet the coal seams at higher levels. A dispute recorded between Bradshaigh and Gerrard, which was contested in the courts from 1634 to 1636, arose partly from the problems arising from flooding and from trespass. It was claimed that Gerrard's men from Aspall were being sent with candles during the night into the Haigh workings to take measurements secretly, to steal coal from pillars, to set fire to them or to weaken them so that the places fell in. Gerrard complained that water from the Haigh workings was flooding his pits and that the extra weight of water was destroying his sough. The evidence, however, appeared to support Bradshaigh's contention that the sough fell in due to poor workmanship and lack of maintenance by Gerrard's men.

This is only one among many such cases recorded, and by 1740 the possibility of trouble from deliberate flooding was considered so serious that an Act of Parliament was passed,

"Whereby anyone maliciously damaging his neighbour's mine by water was subject to pay treble damages and full costs"

In 1673, R. Blomes' Britannia states that Wigan is famous for the choicest coal in England, called Cannell. Dr. Charles Leigh, in his Natural History of Lancashire and Cheshire and The Peak in Derbyshire, - Oxford, 1700, mentions;

"the Kennel Pits at Haigh and the coal mines adjacent to Lathom" and states that,

"Coal and Kennell mines are always found in strata shelving towards the centre or as the miners call it, Dipping, insomuch that the seam which in one part perhaps cannot be discovered under Twenty Fathoms, is yet at the rise of the mine frequently found near the surface of the ground. If the mines lie in any considerable strata, or as the workmen style it, ly true, their usual dip is East or West or, as they vulgarly word it, to the Twelve-a-Clock or Four-a-Clock sun. If the luxuriant springs of acidulae did not ly in this shelving pasture, the quantities of water would be too great for any engine to discharge.

The vague notions of Geology then prevailing are shown by his remarking that;

"No specifick gravitation is observed; for coals, strata of marle, coal slats always ly promiscuously. From which it is evident that in their subsidence they were not determined to any specifick gravitation".

About the beginning of the eighteenth century, the great drawback to the Lancashire coal industry began to be remedied. Under an act passed in 1720, the River Douglas was rendered navigable, so as to afford a cheap outlet for the coal treasures of Wigan. It was in 1720 also, that the Mersey and Irwell were made navigable up to Manchester.

The Duke of Bridgewater had long contemplated converting Worsley Brook into a canal from the Irwell to the important coalfield North of Worsley and in 1759, an act was passed to cut a canal between the Irwell and Worsley Mills as preferable to canalising the Brook.

In 1755, an act was passed for forming the Sankey Canal to provide the Haydock coalfield with a waterway.

In a pamphlet (about 1790) advocating "a proposed canal from Kendal to the Duke of Bridgewater's canal leading to Manchester, it was stated that by extending the canal to Kendal, a want of coal and cannell will be more plentifully supplied for limestone in exchange. The coal would be brought from the coal districts between Chorley and Worsley.

Mr. Chadwick's coal near Chorley lies in different beds 7 feet thick, Mr Morriss's 9, Mr Livesey's 9, Standish 16, Blackrod 20, Arley 20, Haigh 46, Cannell 3, Sir Thomas Gerrard's 3, Mr Halliwells 3.

About 3 months ago a fresh mine of coal 9ft thick was discovered at Haigh which dips one yard at twenty."

In 1767, the Leeds and Liverpool Canal was projected at a capital cost of £260,000. Work commenced in 1770, and in 1791 the canal was being constructed from the Liverpool Canal north of Ormskirk to Wigan.

With the construction of the canal Wigan became increasingly important as a coal-mining and engineering centre, and the prosperity and accessibility of the town led to still greater development of the pits and coal trade.

Some time after the completion of the Wigan branch of the Leeds and Liverpool Canal the mines at Standish were directly connected to it by an underground canal. The work was arranged as one of the conditions of a lease from Charles Towneley and Edward Towneley-Standish to the Standish Colliery Company dated 26th January, 1798, which required that an open cut or trench, and a sough or tunnel, be made from the canal between Wigan and Liverpool to connect with the mines under Standish, during the first 25 years of the term of the lease. Quoting from this lease it is stated that:

"This sough or tunnel to be on a level with the said canal and to be of such dimensions and to contain such a quantity and depth of water as was usual for receiving or admitting boats and vessels of seven feet wide and drawing the same depth of water as the boats and vessels usually navigated upon the said canal between Wigan and Liverpool, so as such parts of the said mines hereby demised as shall then remain ungot may be won, recovered, raised and made dry".

This canal was constructed and used for many years to transport the coal from the underground workings to the Wigan and Liverpool Canal and also to drain the water from the mines.

The underground portion of it was a continuation of an open-cut branch canal commencing from the Wigan and Liverpool Canal at Crook. At the Standish end it went underground about 600 yd to Taylor pit shaft, where it intersected the Ince Seven Feet seam at a depth of 100 ft from the surface and continued northwards for a further 500 yd in coal. The seam was worked extensively to the rise, the coal being brought in baskets to an underground wharf in the pit and discharged directly into the canal boats. The boats were propelled by the men lying on their backs, putting their feet on the roof and "walking" the boats along.

It was not in use in 1845 as the original Ordnance Survey Maps of that date mark it as "old tunnel". Possibly the development of railways was responsible for its falling into disuse.

The two main problems which confronted the early mining engineers were drainage, as I will describe later, and secondly, the limited means of transport which restricted the marketing of the coal which I have partly covered under the section on canals.

In the eighteenth century the principal means of transport was by horse and pannier, and later, when roads were better, by horse and cart. But these means were soon unable to cope with the increasing tonnages. The need for better transport led to the construction of tram roads from the mines in the vicinity of Wigan to the River Douglas.

TRAM ROADS

The most important of the tram roads were:

- a) A tramway serving both the collieries and the flag-stone quarries, which ran from Ashurst Beacon to Gathurst.
- b) Hustlers tramway, from Billinge Hill to the River Douglas at Gathurst.
- c) Clarke's tramway, from Winstanley to the River Douglas at Crooke.
- d) Winstanley tramway, from Billinge to Goose Green and Wigan (Wigan Pier).
- e) Standish colliery tramway from Robin Hill to Crooke.

These tram roads were used to carry the coal to the River Douglas, which was rendered navigable by cutting canals across the bends formed by the winding of the river.

In addition to these tram roads, constructed in the second half of the eighteenth century, several "wagon roads" were constructed by Blundell in the Orrell district to service his collieries there. Some were joint-owned lines with other coal-owners. For instance, there was an agreement between Hustler and Blundell for the construction of wagon ways over the lands each other had in lease,

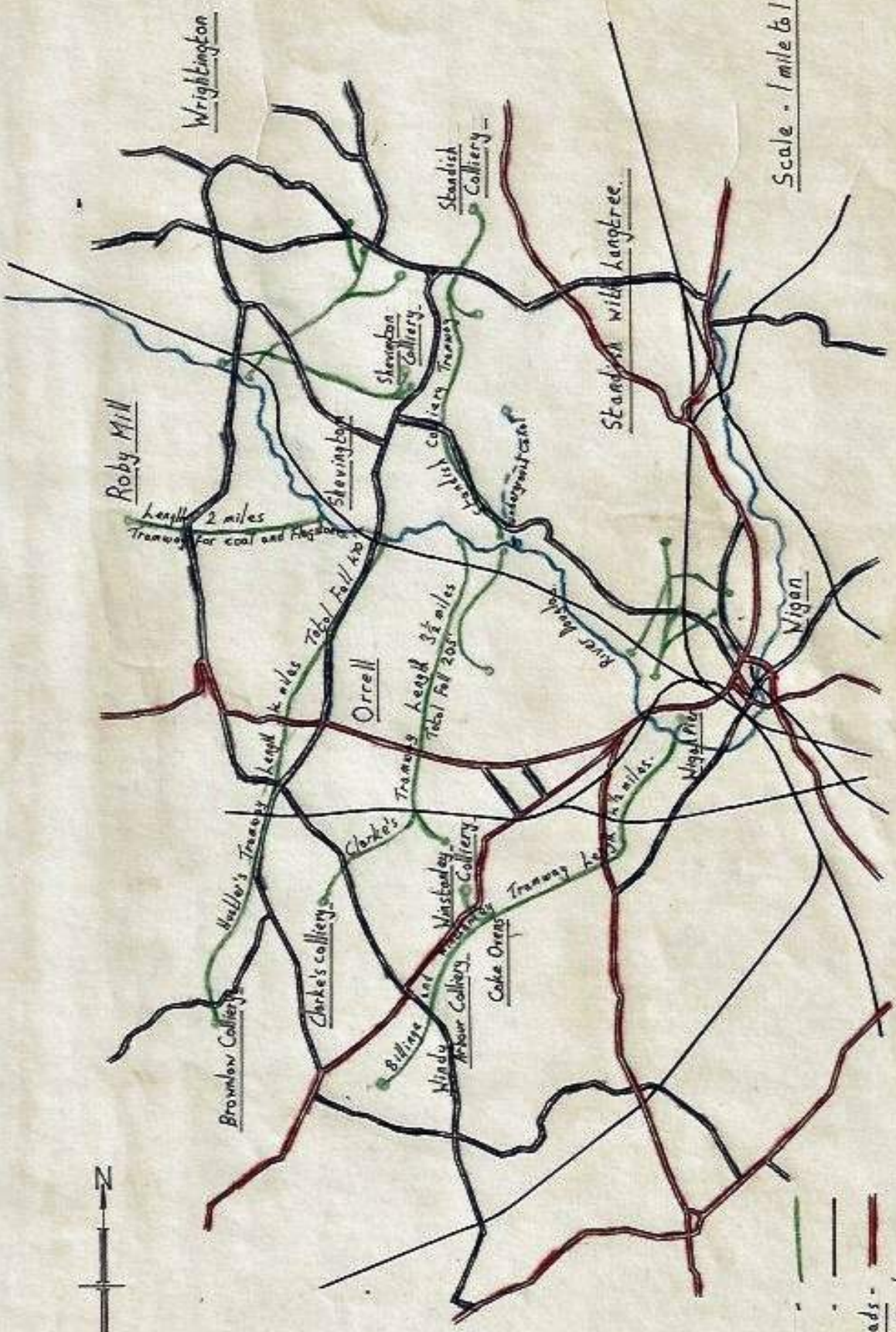
"for the purpose of conveying the coals of each to the River Douglas and the Leeds Canal."

In connection with the making navigable of the river, the entire cost of this was borne by one public-spirited individual, Alderman Alexander Leigh of Hindley, who resided at Hindley Hall. His intention was to make Wigan a great inland port. The Douglas Navigation Bill became law in 1720; work on the river began in 1738 and was finished a few years later, being engineered by Thomas Steer.

The Douglas Navigation Company contracted with the colliery owners in Orrell for the supply of 800,000 baskets of coal, each of 72 lb, at 3s.2d. a score of baskets, onto the banks of the Douglas near Gathurst Bridge (which was the discharging point of Hustlers tramway). Competition in the coal market was keen and in 1743 the Navigation Company were seeking to restrain the colliery owners from disposing of their coals by land-sale at Poulton; they had evidently developed overland haulage in competition with the water-borne trade. The Navigation Company was of some importance as is shown by the fact that one-half of a thirty-sixth share was sold in 1746 for £112 17s. 6d.



Scale - 1 mile to 1 inch.



Plan showing early tramways, Wigan district

RAILWAYS

The rapid development of the Wigan coalfield at the beginning of the nineteenth century required the provision of still better transport facilities. This development, together with the invention of the steam locomotive, gave impetus to the construction of railways in south-west Lancashire.

It is interesting to note that Mr. R. Daglish, a local engineer, claimed to have constructed a steam locomotive in 1813. This engine, which was said to be the first to work in Lancashire, was used to work the trains on Clark's tramway which ran from the collieries in Winstanley and Orrell to Crook. This would probably be shortly after William Headley constructed, in 1813, the first practical steam locomotive in Durham, the famous "Puffing Billy". Mr. Daglish was concerned for it to be accepted that his was the first locomotive, and the following is from a record in Wigan Library:

Orrell Cottage, near Wigan.

April 1st, 1856

To all whom it may concern:

This is to certify that I made the first Locomotive Engine in Lancashire in the year 1812 and put it into action the beginning of 1813 on an extensive Colliery under my direction belonging to the late John Clark Esq., in the township of Orrell near Wigan for the conveyance of coal and by trains of wagons from his Colliery near Orrell Mount to the Leeds and Liverpool Canal which was upwards of 16 years before any Locomotive Engines were put fairly in action on the Liverpool and Manchester Railway.

(signed Robert Daglish)

The first railway at Pemberton (Blundell's collieries) was constructed in 1827 of iron rails and stone sleepers to a gauge of four feet. There was a gradient in favour of the loads which averaged 1 in 80 from the Bye Pit to the Pier head at Seven Stars, Wigan. There were branches to the Bottom Venture, No. 11, and Farrymans pits, the distance from the latter to the canal being 3,300 yards. A wagon way belonging to Martha Ann German, a neighbouring coal proprietor, ran closely parallel to Blundell's line through what is now known as the Newtown district.

When the Liverpool - Bury line was built in 1841, Richard Blundell constructed a new system of wagon roads to the standard gauge of 4 feet 8½ inches. Locomotives were purchased to replace horses and by 1852, three were in use at Pemberton. At that time the rolling stock consisted of 389 wagons, mostly with a capacity of 3½ to 5 tons.

A man named Joseph Hilton, born in 1849, recollected that an old man, describing the speed of the "Iron Horse", said he used to run at a slow trot alongside it when old Will Twink (William Taylor) was driving it by the Bell (a district in Pemberton). This district, it is thought, takes its name from the bell erected at the road and rail crossing, which was rung when the locomotive was about to cross.

The cast iron wheels from the wagons used on the railway were often used for fenders in front of the fireplaces in the local public houses. The spokes and hub were broken out and the rim and flange, which were of cast iron and about 30 in. in diameter, cut in half. The local story is that they were so used because their weight made it impossible for them to be used in the fights which often occurred when the local colliers went on the "spree";

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This was the beginning of the railway era, and several Acts of Parliament were passed in quick succession for the construction of railways in the Wigan district.

THE DRAINAGE PROBLEM

The Wigan Coalfield has long been troubled by immense problems. It was very susceptible to large water makes, particularly in the Northern half. The mining engineers of the period, however, devised fairly effective methods of de-watering the strata.

The Soughs

Level drainage tunnels, or soughs, as they were known in Lancashire and adjacent counties, were used from early times to keep mines free from water. These were particularly suitable in hilly country, but where the seams were fairly flat, the soughs drained quite large areas of coal down to the lower levels of the local brooks, even though the surface did not generally rise steeply away from the brooks.

There were quite a number of these soughs operating locally. One of the longest was the one that drained the seams from Hawkley to Smithy Brook near the Bye pit at Pemberton, and this was $1\frac{1}{2}$ mls in length. Its construction was begun by William Mollineaux of Hawkley about 1797. William Banke's eighteenth century sough, discovered in recent years during the working of the Wigan 5 ft seam at Summersales Colliery, Pemberton, was over half a mile in length and was driven four feet square in stone and about two feet wide and the same height as the seam when in coal. These soughs were driven on contract by gangs of men who specialised in this work.

When the seams above the level of the soughs were exhausted, and it became necessary to sink pits deeper, pumps were installed which, whenever possible, in order to save power, delivered the water into the sough and not to the surface of the pit.

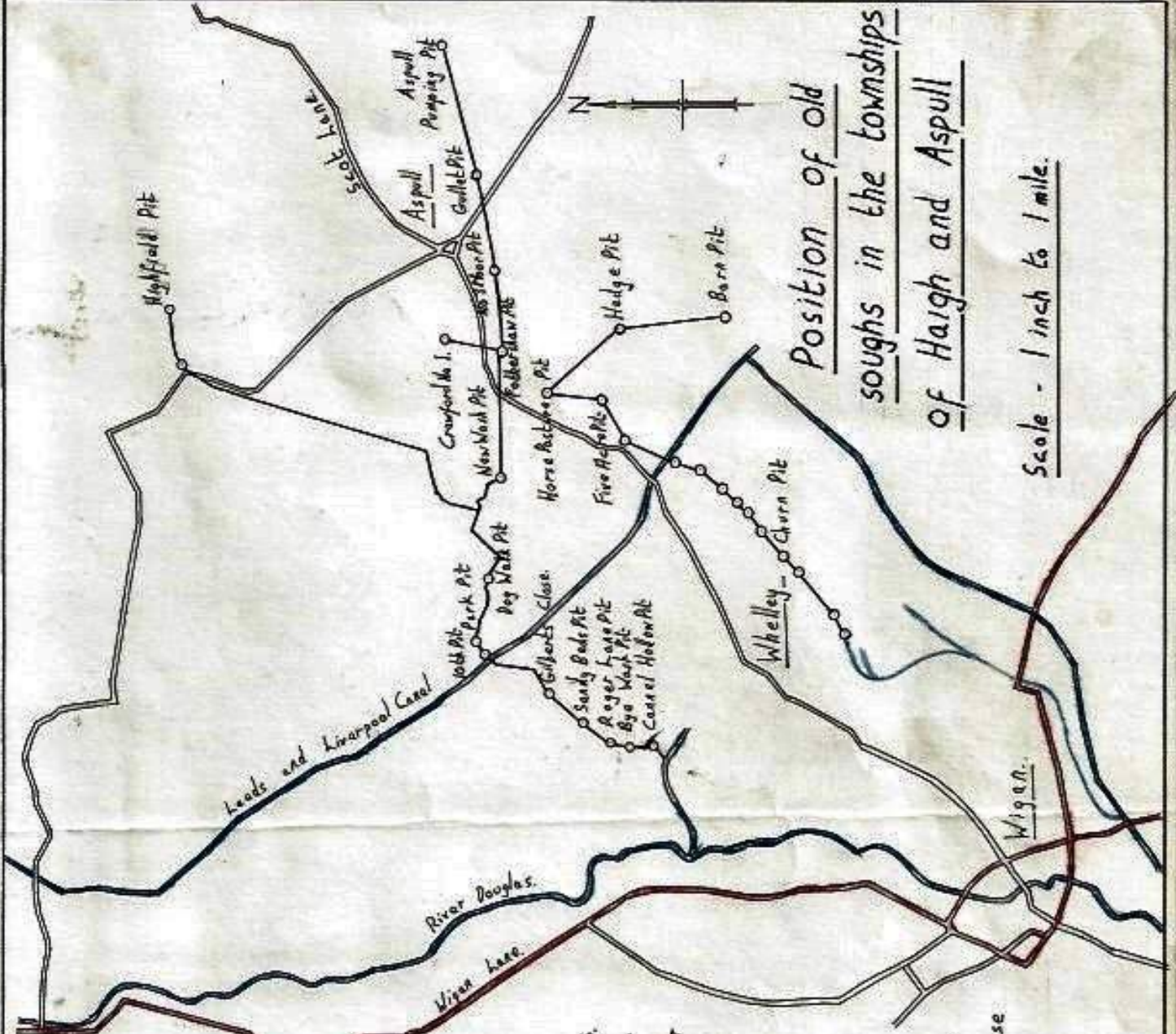
The Great Haigh Sough

One of the outstanding mining engineering achievements of the seventeenth century was the construction of Great Haigh Sough from the River Douglas to Park pit in Haigh by Sir Roger Bradshaigh, which was completed in the year 1670.

This sough or tunnel, ventilated by ten vertical shafts, was constructed to enable the Cannel under Haigh to be worked without fear of inundation from various old workings which were full of water. The total length of the sough from the outlet in the brook at Bottling Wood to Park pit was 1,121 yd. The sough was later extended to Fothershaw pit in Aspull, probably in 1856, and later still, after the formation of the Wigan Coal & Iron Co., to a distance of 4,600 yd from the outlet to Aspull pumping pit, where pumping engines of the beam type were installed in 1874. These pumps delivered about 1,400,000 gallons per day into the sough. Pumping was discontinued in August, 1952. Thus the original tunnel constructed by Sir Roger Bradshaigh has been used in the draining of the Haigh and Aspull mines for nearly 300 years, and it still functions to this day. Indeed the workings from Dairy colliery were drained to the sough, and in 1958 were delivering 180,000 gallons per day into the river.

The Soughs shown on the plan were constructed to drain the early Cannel and King Coal workings. They are:-

1. Bradshaigh's sough:- The length from the Yellow Brook at A to Park Pit at B was finished after 17 years labour in, October 1670 by Sir Roger Bradshaigh. The length from Park Pit at B to Fothershaw Pit at C was constructed about the year 1856. The length from Fothershaw Pit at C to Aspull Pumping pit at D was constructed after 1866, when the Wigan Coal & Iron Coy. was formed, to enable the pumps there to deliver water directly into the sough.
2. Gerrard's sough:- It is not certain when this sough was constructed, but it is probable that it was some short time after the making of Bradshaigh's sough because of the rivalry between the two concerns.

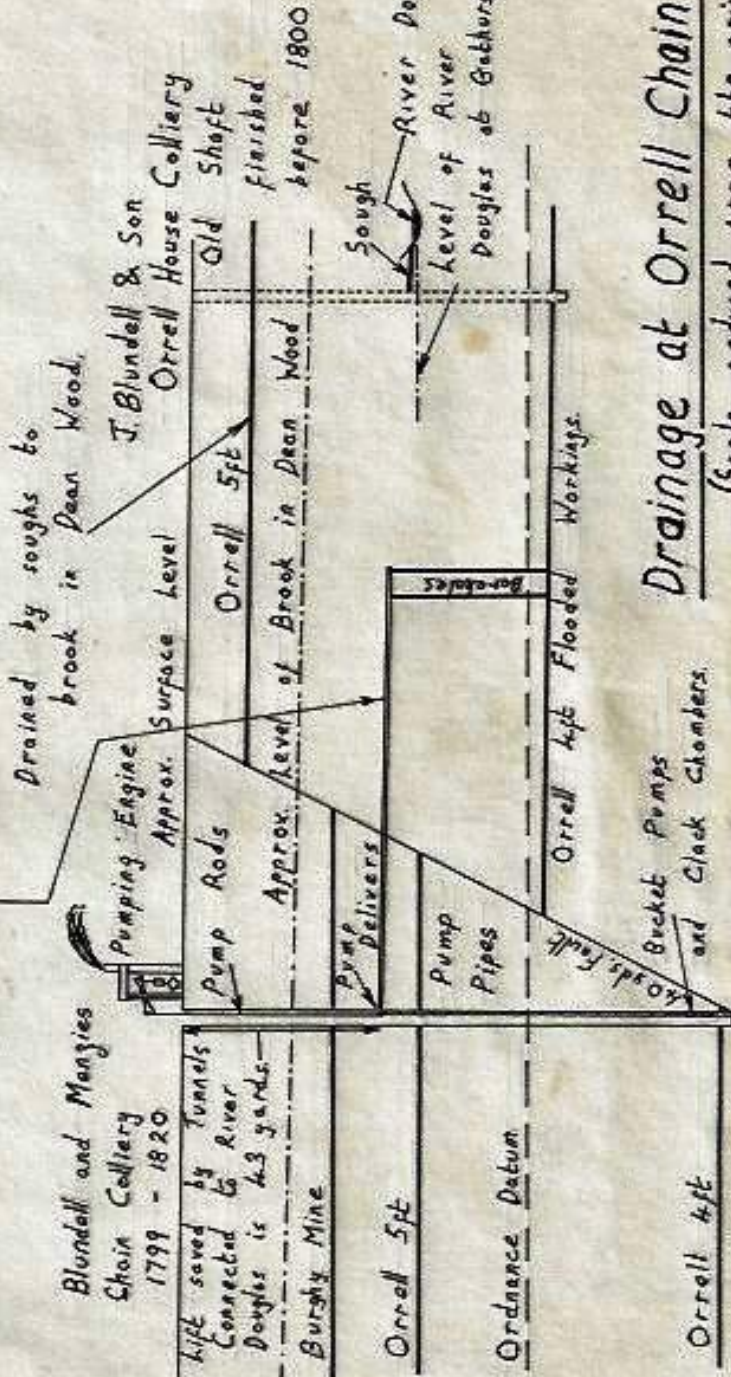


Position of old soughs in the townships of Hargh and Aspull

Scale - 1 inch to 1 mile.

Section on line due north through Engine Pit

Stone dripts along which water from the Orrell left flowed and thence down boreholes to Orrell left old workings on the north side of the fault. Finally water rose up the old shafts and flowed down soughs into the River Douglas.



Drainage at Orrell Chain Colliery
(Scale reduced from the original)

Natural Scale 1 inch = 20 yds.

Amongst the 'Haigh Colliery Orders', an early attempt at mining legislation, there is an entry by Sir Roger Bradshaigh giving this advice on the maintenance of the Great Haigh sough:

"Let thear all wayse bee taken to apoynt some psons(persons) to go quite through the Mayne Sough every two months at least to prevent Decaise in tyme, that the benefitt of my 16 years Labour, Charge and Patience (which it pleased God to crown with success for me and my posterity) may not bee lost by Neglect".

This advice, given so long ago, was faithfully observed until as recently as 26th July, 1923, when it became impossible any longer to travel the sough owing to subsidence. It had long entailed travelling in parts up to the neck in water. An entry made in 1907 in his diary by R. Hart, who was then shaftsman at Haigh and had the duty of travelling the sough, gives a laconic description of the experience:

"Went through this sough from Bottling Wood to Wash pit on September 20th/07, leaving Bottling Wood at 8.52 a.m., at Sandy Bed 9.6 a.m., arriving at Gilberts Close 9.15 a.m., Leaving Gilberts Close 10.17 a.m. arrived at Park pit 10.37 a.m., left Park pit at 10.55 a.m., arriving at Wash pit 12.10 p.m. R.Hart, R. Leigh, and J. Makinson went through from Bottling Wood to Gilberts Close and J. Valentine, R. Gibson and G. Webster from Gilberts Close to Wash pit. It took 2 hrs. 26 minutes to go through. 1 pint Whisky allowed".

I mentioned in connection with this sough the closing down of the Aspull pumping station in 1932, and it is in recent memory how this led to the flooding of the Westhoughton Coal and Cannel Company's pits and to an important lawsuit.

The collieries which were flooded after pumping ceased were those in the area bounded by the Great Haigh fault on the west, the Scot Lane fault on the east, the outcrops in the north and the Bickershaw Lane fault in the south. As well as the Westhoughton pits they included Scot Lane Collieries, Stott's pits, and the Crawford, Rose Bridge and Industious Bee pits.

The water problem in this part of the area was always one of difficulty, but with the unification of ownership it was possible to dewater gradually the Westhoughton and other workings involved and to enable some of the upper seams to be worked.

Installations such as the Aspull pumping station were needed when the seams above the level of the soughs were exhausted and it became necessary to sink the pits deeper, pumps were installed, which, whenever possible, in order to save power, delivered the water into the sough and not to the surface of the pit.

MINING METHODS

In the early days of mining, the coal was worked by the excavation of small pits up to 25 feet in depth at the outcrop and at very shallow depths, by bell pits.

Of the pits dug in the 16th, 17th and 18th centuries, it is recorded that the cost for sinking one in 1600, amounted to a total of £3 : 2s : 3d; it being started on March 3rd and coal being dug on March 16th. Towards the latter part of the 16th century, the pits were being dug or more correctly, sunk, to a depth of 70 to 120 feet. The usual cost for one of these was about £50 to £100.

It is an interesting fact that during the working of opencast coal in this area, during the past few years, numerous remains of old workings, many in an excellent state of preservation, have

been encountered at very shallow depths below the surface.

In connection with pits in the Winstanley and Orrell area, there is a record that in 1678, a new pit was sunk and cost £22 : 15s : 6d. There is a remark to the effect that the cost was far more than usual owing to the depth of the pit and the rise of the ground, the pit being 24 yds deep. These early pits were naturally limited in depth by the necessity of providing means for the removal of water, the practice being to sink the shaft on rising ground and dig a drain or sough, as it was termed, from a level so as to drain away the water to lower ground.

The normal custom was to work coal outwards from the shafts until the roof showed signs of collapse, and then the shaft was abandoned and another shaft sunk down to the seam elsewhere. This was found more convenient than to sprag, prop, and wall extensive roads underground. The coal was filled into corves (circular baskets), and placed on wooden sleds and dragged to the shaft bottom. Horse gins were usually used for winding the coal.

As these shallow workings were exhausted and the demand for coal increased, deeper pits were sunk and more careful planning became necessary. The rough and ready method of working described before prevailed right through until the commencement of the deeper shafts about 1800. The Haigh Colliery Orders showed that systematic methods of working were being instituted by the middle of the seventeenth century.

Surveying was in its infancy, but this was still 200 years before the first National Ordnance Survey maps were produced. Among the Orders there are records of depths worked, dip of seams, and the amount of fall available for drainage purposes to the Great Haigh sough, but there is no reference to maps or working plans, and generally there do not appear to be surface maps extant from this period except those made in connection with leases or lawsuits. We read, in the Haigh Colliery Orders, this description of a parcel of Cannel for future development, and of some prospective purchases, which indicate the commercial instincts of these pioneers of mining in the Wigan field:

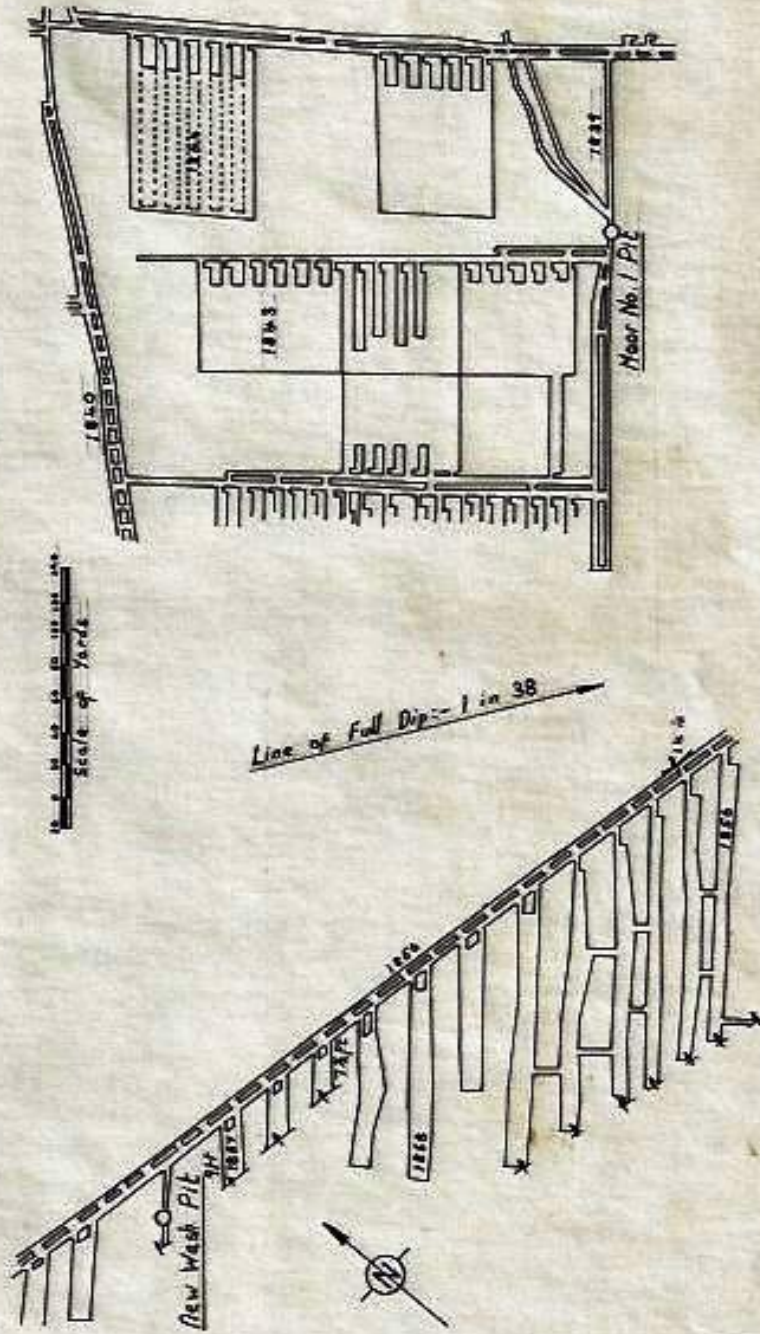
"Theare is another stager hole board to the Cannel a little on the Right hand from the last Clost by the Nooke of the Copy, neare the Ditch wheare in theare is a Axle sticks up. Betweene the Rough Hey and the Kilne Medow neare a young Ash tree wh. growse in the hedge, theare is an end wough or wall of Cannel, which bends down towards the Copy Woodq and theare is an ould Pitt only wants opening aboute 4 Roods from the hedge in the Rough Hey, in or against the ould Copy Pitt.

That if any gett Cannell (without great necessities) past Whitle or Muncksley tenement that they will probably lay Cannell Dry in Greley Tenement, and one W. Shaws land, now in the possession of Roger Browne.

It weare happy if Browne's Tenement could bee bought before they had notice of Cannell wch. they yet know nothing of.

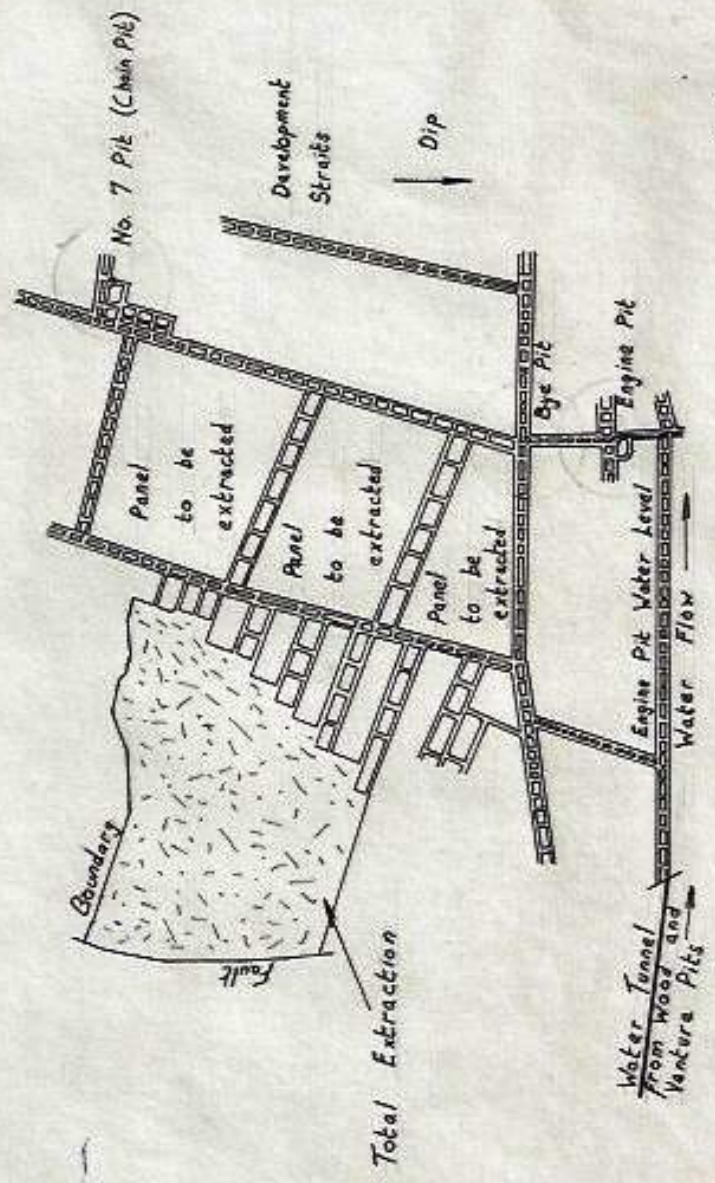
Thear is reason to beleeve that theare is Cannell in Rigby's ground of the Corsses, wch Joynes to my owne, I wish it could be bought (or the Cannell) at a venture."

The achievements made in Winstanley and Haigh in planning and development in the eighteenth century, despite the lack of the instruments and technical resources available today, are the more remarkable when it is remembered that up to the middle of the

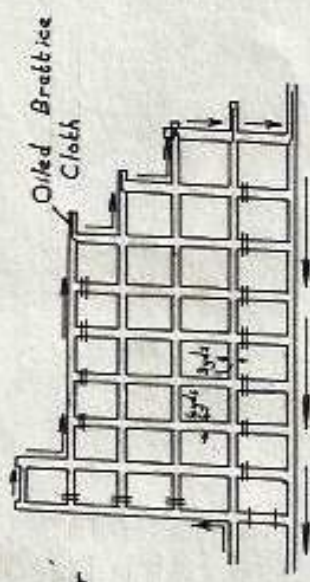


o Fothershaw Pit

Plan Showing Methods of Working in the King seam,
Haigh and Aspall area



System of Working at Pemberton Colliery 1830
The Lancashire System

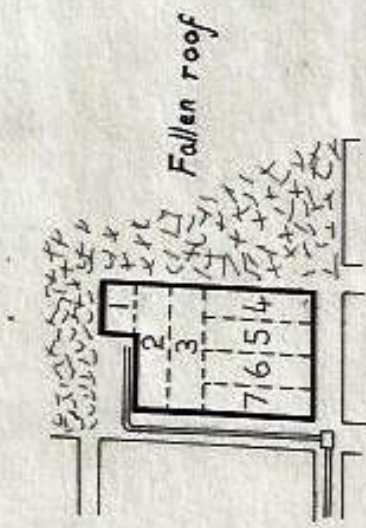


Self acting
incline - Trog or
Spunney

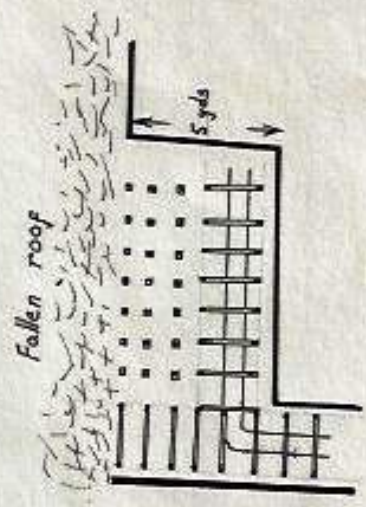
Main and Tail
Heavies in intake
Return Airway

Pillar and Stall System
Pemberton 1880

SHOWING METHOD
OF COURSING THE AIR



SEQUENCE OF OPERATIONS
IN PILLAR EXTRACTION



METHOD OF TIMBERING LIFT
DURING PILLAR EXTRACTION

nineteenth century the method of transport underground depended on the use of gravity or on manhandling. The diagram accompanying shows a typical example of the bord and pillar method, used in working the King and Cannel seams in the eighteenth century. At the Patchcroft and Bawkhuse pits in Haigh in 1845, when the system of development had then been practised for at least fifty years, the levels were carefully set out, more or less parallel to each other, on a slightly rising gradient, and each area was mined in succession. The development panel was well in advance of the production district, and a roadway which was used as a drainage level was said to have been travelled until the year 1880. Bawkhuse shaft was the pumping shaft, the water being raised by a beam pump to a sough which delivered into the River Douglas. The quantities of coal being raised per annum in 1866 from the two pits were 40,000 tons from Patchcroft and 30,000 from Bawkhuse.

For many centuries, the method of mining was the bord and pillar system, but by about 1900 the longwall face was becoming the accepted method of working in the Wigan area.

VENTILATION

It was normal in the days of the bell pits to let down a lighted candle into the shaft to discharge accumulations of gas. Explosions of firedamp in the workings were a frequent hazard. Reports by the manager and overseer at Haigh in 1688 (quoted by the late Earl of Crawford from the Bradshaigh papers) illustrate the dangers, and the fortitude of the colliers in facing them. In August the manager writes that "the fiery damp went off twice . . . but did little hurt". A month later, the overseer writes to Sir Roger: "They will tell you much of the fiery damp. It's very strange it should trouble them now when it has not appeared at there first opening the pitt. I do believe it will let them alone if these Knaves will let it alone, for there is more aire now than there ever was for four against it" (this probably means over and against it). Two days later he reported that the faredamp had gone, which as he remarked, was "a great happiness . . . if dark it wd. have been more tedious".

But in any case, apart from the firedamp, these were hard days and the cost of candles was to be watched. A hundred and fifty years later, the Commission of 1842 reported that in the pits on Aspull Moor children worked from five o'clock in the morning to six at night, all the time in entire darkness, as candles could not be afforded for them.

ENGINEERING AND MECHANIZATION

Adam Walker, the inventor, writing in 1792, remarked that Wigan produced many excellent self-taught mechanics, and mentioned as an example Dick Melling, who simplified the steam engine, gave a windmill an equable motion and the means of turning itself to the wind, designed and constructed a bucket engine which drained a valuable cannel mine for many years at a small expense, and invented many other contrivances of such a kind.

Pits in the Wigan district were among the first in the country to employ engines for pumping. There is a record that about 1710 Edward Holme of Upholland had an engine in his pit, probably for raising water.

Walker Bros of Wigan designed and produced in 1869 a disc machine which was, perhaps, the first cutting machine to be put to work in a coal mine in this country. It was at Ladies Lane colliery

in Hindley and Mr Peter Higson, H.M. Inspector of Mines, writing to the Manchester Guardian and Times in December, 1869, described the machine as follows:

"The machine is 7 ft 4 ins long, 2 ft wide, and 1 ft 9 ins high. The cutters are 2½ ins long, fixed on the circumference of a horizontal wheel projecting 2 ft 7 ins beyond the side of the machine which consists of two cylinders, each 7 ins diameter, worked with compressed air at an average pressure of 18 lbs on the square inch. In an hour it holed along a working face 2 ft 4 inches in a hard band under the coal, and 79 ft in length. The maximum rate of holing was 3 ft 9 ins in a minute."

Mr. Higson in his letter also refers to Bidder's hydraulic press, used to break down the coal, which apparently was an early type of hydraulic burster.

Another disc machine, described as the Winstanley coal-cutter, was at work in Platt Lane colliery in 1872. This also was driven by compressed air, working at 22 lb, and we are told that the depth of cut was 33 in., height of undercut 2½ in., thickness of the seam 28 to 33 in., length of cut 110 yd per shift, and output 75 tons per shift. With 22 men employed (driver, 2 assistants, 15 rippers and fillers, 3 drawers, and engineer and firemen half-time), the district O.M.S. was apparently some 68 cwt,

The earliest coal-washing plant in England was erected at Marsh House for the Wigan Coal & Iron Co. between the years 1880 and 1885. This was a jig washer of two separate units, and it continued at work until 1935. The great bulk of the Woodshaw dirt heap, near Kirkless, is formed of the discard from the Marsh House washer, and is now a landmark dividing Aspull and Hindley.



The next part of the project deals with the history and progress of Blundell's Collieries, one of the more prominent coal concerns in the Wigan area during the nineteenth century. It traces the development from the Blundell's early enterprises in the eighteenth century to the build up of extensive mining operations in the Orrell, Winstanley and Pemberton areas. The purpose of the section is to fill in the gap in the history of the coalfield from about 1800 to about the early 1850's. In it are detailed the wages and conditions of work of the persons employed at the pits, the disputes and disturbances that they caused and also the general progress of Blundell's colliery business which may be a guide to what was happening in the rest of the coalfield.

BLUNDELL'S COLLIERIES

During the first quarter of the twentieth century, Pemberton Colliery was the largest colliery in Lancashire. It was one of the 22 biggest out of 2670 collieries which Britain boasted in 1925. The only Lancashire collieries which approached it in size were Abram, owned by the Abram Colliery Co., Mosley Common, owned by the Bridgewater Colliery Co. and Bickershaw, owned by Ackers, Whitley and Co. Bickershaw is now a very large unit of the National Coal Board as was Mosley Common until it's closure in 1968.

In 1925, Pemberton Colliery still belonged to the great-great grandchildren of Jonathan Blundell, merchant and freeman of Liverpool the founder of the Blundell Colliery concern. Jonathan was the fourth son of Alderman Bryan Blundell, merchant and master mariner, one of the founders and chief benefactor of the Blue Coat Hospital in Liverpool, and said to be the greatest "Skallop Racer" from the Mersey to the West Indies. There are many entries in the Liverpool Plantation Registers of ships owned by Bryan and his family. According to J.A. Picton, the Liverpool historian, he was a Protestant descendant of the Roman Catholic Blundell's of Ince Blundell. Jonathan and his brothers owned or were part-owners of several privateers during the eighteenth century and old ledgers kept in the head office of the collieries at 7 Romford St. Liverpool until the 1920's gave details of transactions in gold-dust, ivory and slaves as well as coal.

The first step taken by Jonathan towards a stake in the rich Wigan Coalfield is recorded in a Winstanley estate deed.

"On or about 1774, William Earle the elder, Samuel Warren and Jonathan Blundell, together with Edward Chaffers of Liverpool agreed to become partners under the firm of Samuel Warren and Co. in the buying of coal and cannel from the several mines near the River Douglas and carrying the same in flats, barges and other boats or vessels by means of that navigation and the Leeds and Liverpool Canal for sale and disposed thereof at Liverpool.....About the month of April that year they entered into contract with Thomas Doncaster, James Hudson and Holt Leigh for all the cannell to be gotten during the term of 7 years from September 1st next in the estate of Kirkleys (kirkless) in Aspull, Ince and Wigan not exceeding 7000 tons in the year at the rate of 5d per basket."

Most of the baskets in use at that time in the district would seem to have had a capacity of 1 1/2 cwts. Thus 5d per basket would give a price per ton of 5s 6d. In November 1792 we are told,

"coals are sold in Orrell at 4d per basket each 1 1/2 cwts."

This is equal to 4s 5d per ton.

Buying coal from pits under other ownership was clearly much less profitable than producing and selling their own, and not long afterwards Jonathan and his friends became colliery owners. Michael Jackson, owner of Orrell House Farm, and colliery, leased the colliery to them in 1776, and when he went bankrupt in 1780, Jonathan bought him out. The colliery continued under the style of Warren and Co. until 1783; then the firm became known as Blundell and Co. and we hear no more of Warren, Earle and Chaffers. At that time it was the largest colliery in Orrell employing 13 colliers (hewers) in 1781, 16 in 1783 and 18 in 1784. When Jonathan Blundell and his partners took over the colliery in 1776, the rate paid at Orrell to a collier for getting, filling and drawing a "score" of

24 baskets, each weighing 150 lbs., was 1s 0d - an almost exact equivalent to 7½d per ton. The average amount of coal produced by each collier per day was two "score" so that an average week's wage was 12s 0d. for a six-day week. Men on day wage received 8s to 10s a week, but girls, youths and old men got from 4s 0d to 6s 0d.

In the lean years after poor harvests, when the price of bread rose, colliers wages were often insufficient to provide food for their families. Consequently there was much unrest which very often lead to rioting, quelled only by the calling in of troops. The first of these riots in Orrell and Pemberton that we know anything about occurred in 1779, when food prices were high. Perhaps colliers were not involved in this, because the main object seems to have been the smashing of some of Arkwrights spinning frames in Pemberton. Thirteen years later, however, there was again much unrest, and Henry Blundell, who was then a partner in the Orrell Collieries with his father Jonathan, and was also Mayor of Liverpool, wrote to William Pitt, the Prime Minister, in April 1792 about the threat of the journeymen carpenters to pull down the houses of people agitating for the abolition of the slave trade, if they were successful in getting that trade abolished. Blundell's house was not threatened, however, as he and his father and brothers were engaged in the trade.

Blundell also wrote to Henry Dundas, the Home Secretary, regarding the masters of the coal flats on the rivers and canals:

"There seems too general an appearance of discontent amongst all artificers and labourers, which must be, if possible, prevented from spreading into tumult. Annexed is the copy of of a note I have this moment recieved, which comes from a large body of men, and we must either comply with this demand or be guarded against the consequences. The other owners of collieries and flats in this neighbourhood have recieved a like notice.

Liverpool
26th. May 1792."

Enclosure.

"The masters of the coal flats in your employ do hereby give notice that they will not proceed in the said flats after the ninth day of June next ensuing, under 1/- per ton per trip - which they hope you will agree and consent to give, without any stop being put to the said business, as we are determined not to proceed under that price from that date."

Dundas replied that:

"Although there may not be any immediate disposition to riot among these people, it appears from your representation, that you should be watchful over their conduct and that you should pursue every legal and constitutional means of suppressing such combinations and bringing the leaders to punishment. From the disposition which has recently been shown by a certain class of people at Manchester it is not conceived to be advisable at this moment to remove any part of the troops now there from thence, unless in a case of absolute necessity and if such necessity should hereafter exist, of which you must of course be the most competent judge, the Commanding Officer at that place will have instructions to comply with any requisition from you for a detachment from the forces under his orders"

In the following October there was trouble at the collieries at Orrell, and Blundell again applied to Dundas for troops.

"The agents from the extensive collieries in the neighbourhood of Wigan (and on which the town Liverpool depends for its fuel) came this evening with the news of the colliers having left their work and collected in a riotous manner to the number of near five hundred, and had been with them thus assembled to demand an extravagant advance of wages, They have given them only till tomorrow at 3 O'clock to consider of it and if their demand is not complied with, they threaten to destroy the Works by pulling up the engines, throwing down the wheels and filling up the pits. The consequences to the coal proprietors would be very serious and to the country in general, if this combination is not immediately suppressed. I am requested by the coal owners who are now with me to entreat of you to give orders to Major Campbell and the Commanding Officer at Manchester, to march part of their men to Wigan in aid of the Magistrates."

Dundas instructed Major Campbell to give,
"every assistance in his power to the Civil Magistrates in preventing any mischief"

He also remarked that such combinations had lately become so frequent that it required more than ordinary exertion of the civil power to suppress them and they should enforce a rigid execution of the law, against those on whom it can clearly attach. The strikers had only been out for two days when Blundell again wrote to Dundas:

Liverpool
3rd October 1792

"I returned this morning from Wigan...Our grand object is to save our steam engines for drawing the water. No material mischief had been done last night but they threatened much for today if their terms were not complied with. A good collier and his drawer can at present earn from 5/- to 8/- per day between them and if we were to comply with their demands the advance would be near 2/- per day more."

These earnings are nearly as high as those a collier and his drawer got a hundred years later in 1892 at Blundell's Pemberton Colliery. The appearance of the military had the desired effect, and on 10 October the colliers began to return to work. No damage was done to the engines; they were prevented from working for two days.

"but from which I expect we shall none of us sustain any material injury.

Many colliers and cannellers from distant works had come to observe the progress of our people and had they succeeded it would certainly have spread far over this country."

In 1774, Jonathan and his partners purchased two closes of land at the north end of Old Hall St. Liverpool, near the canal. Shortly afterwards, Jonathan built a large house there, on the ground floor of which he opened his first coal office.

The coal mines apparently prospered, because the number of employees increased year by year. In 1789, according to the land tax returns, they were employing 24 miners, a number only exceeded in Orrell by Messrs. German & Co. By this time, Jonathan's son, Henry, was helping to run the colliery business and in 1791, he and his father took out their first lease of coal Sir Robert Holt Leigh of Hindley Hall, who had a large estate in Orrell, and, after the death of James Hudson, took over the working of the Ince Cannel Works.

The new lease from Sir Robert was for the Orrell Four Feet Seam, under Edge Hall estate near the present-day Orrell station

and under Catterall's farm at Kitt Green. The next extension of Blundell's mining interests was the lease taken out by Henry Blundell and two partners, John Menzies of Liverpool, "Gentleman" and John Harvey of Orrell, "coal master", for 60 Cheshire acres of Orrell Four Feet Coal under land belonging to the Reverend Thomas Holme and extending from Abbey Lakes on the east side of Dean Wood to Orrell House Farm boundary. The colliery which the Company subsequently worked here was known as the Chain Colliery, and it was from the Chain and Edge Hall or Slycroft Collieries that Blundell raised a company of pioneers to serve with the Liverpool Volunteers, in which he was a lieutenant-colonel, during the Napoleonic invasion scare.

The accounts for the Orrell Fire Engine Colliery on Sir Robert's estate, near the present Old Engine public house and adjoining Blundell's Chain Colliery, have been preserved at local collieries in the second half of the eighteenth century. In 1772 there were three pits and the output for the week ending 11th April that year was as follows: Higham's pit, 35 score 1 basket; Berry's pit, 32 score 72 baskets; and Park pit, 12 score 20 baskets; in all 78 score 7 baskets at 150 lb per basket and 26 baskets to the score. This amounts to 137 tons for the week, and an annual output of 7,000 tons. This was produced by 12 colliers. Assuming an 11 day fortnight, these figures give an output per man shift on the face of two tons. There were also three winders, three browmen, one smith, one engineman and the auditor or manager. The overall O.M.S., therefore would seem to have been about 24 cwts. From the fact that there was only one engineman, the pumping engine could only have been worked one shift per day, which of course could have lasted from 10 to 12 hours. This pumping engine, probably a Newcomen engine, used 2 tons 5 cwts of coal during the week, and 9 baskets were used to keep the brow fire burning at Park pit which was 42 yds deep. Concessionary coal was supplied to all workmen at 2 baskets per week.

In 1791, when Henry Blundell and his father Jonathan had taken over the Ince Cannel Works at Kirkless near Wigan, Cannel commanded a higher price than coal, but it was harder to get and a higher storage rate had to be paid. Weekly score sheets, signed by John Harvey, the agent, for the cannellers at two of the pits at Blundell's Works at Ince, have been preserved. They cover the period from Michaelmas 1792 to Lady Day 1793 and show that the maximum amount of cannel produced in a week of six days by one man (a Christopher Santus) was 9 score at 24 baskets of 150 lbs to the score which is equal to 14.4 tons or 2.4 tons per day. The average was very much less than this however, at 1.43 tons per day. Getting cannel was an unenviable task as, after it had been holed or undercut, pieces burst off the face due to pressure, and, while it was being holed, sharp splinters of it flew from the pick point. For this reason, gauze masks were used by cannel getters in the cannel seam at Ince during the latter part of the nineteenth century. A cannel getter's face and body generally had more blue marks from this cause than a collier's.

During the 25 weeks under review, the pits were idle for eleven odd days. These included Michaelmas, Christmas Day, Boxing Day, New Year's Day and Lady Day. In addition to these holidays there was a considerable amount of absenteeism: for instance, John Green absented himself on 23 days, James Miller on 27 days and Henry Etock on 21 days. This was typical of all the cannellers.

A cash ledger of the last decade of the eighteenth century has recently been found among the Blundell family papers. It covers the activities of the Orrell Collieries and the Ince Cannel Works, and

gives us a number of miscellaneous but interesting facts. Blundell sent practically all his Orrell coal to Liverpool either along the canal or the Douglas Navigation. His Liverpool sales increased from £9,737 in 1788 to £27,308 in 1800. He also sent cannel from Ince to Liverpool - his price varied from 8s 4d per ton in 1792 to 10s 6d per ton in 1799 - and much smaller quantities of 'slack' and 'coal charcoal'. The wages and stores bill at Orrell Collieries rose rapidly from £2,077 in 1788 to £7,806 three years later. At Ince Cannel Works it varied between £1229 in 1791 and £2,197 in 1800. When John Harvey, the manager at Ince, also took over the management of Orrell Collieries in 1796 he received a salary of £100 per annum. His sales agents in Wigan, John Martlew and Ralph Ackers earned £50 each. These were considered to be reasonable wages, but Blundell's profits for the 13 years from January 1788 to December 1800 totalled £12,687.

Jonathan Blundell, who had been in failing health for some time, left Liverpool in 1796 to take up residence at Blackleyhurst Hall, Billinge. He died on 11 December 1800 and left £200 to the hospital, £100 to the 'lunatic asylum', and £100 to the Sunday School in Heather Lane, Liverpool. To each of his three daughters he left £5,000, and bequeathed the same sum to John Blackburne, the widower of his daughter Mary. To his son Thomas, who had graduated at Brazenose College and was a clerk in Holy Orders, he left the advowson of Halsall Church. To Henry he willed the rest of his estate with all the freehold and leasehold property.

Very soon after his father's death, Henry Blundell's colliery empire expanded again. John Hollinshead of Hollinshead Hall, Tockholes, died in 1802, and left his estate and colliery at Blackrod to Henry on condition that he assumed the name and arms of Hollinshead. He also bequeathed him £1000 and his shares in the Grand Trunk Canal. To Alice Blundell, Jonathans widow, he left £200. About this time Henry began to take an interest in Pemberton: he paid land tax on property there in 1800. He gradually bought more land, mostly in the Highfield district of Pemberton and carried out a boring programme in the search for coal there. The sinking of the Pemberton Engine Pit and Bye Pit began about the year 1815. These formed the nucleus of the great establishment which was to develop on the same site and they were in use until recent times. They were sunk to work the high grade Pemberton five feet and four feet seams. Very shortly afterwards, the Brickcroft Pits were put down to a fairly shallow area of Ince Seven Feet coal north of present day Pemberton railway station.

Considerable amounts of water impeded the sinking of the Engine and Bye pits through the two hundred feet of sandstone known as the Pemberton Rock. Two large Cornish beam engines were installed, one a few years after the other, to work lift pumps in the shafts. The first of these was scrapped in 1873, but the second one survived till 1932. An inscription on the 30 foot long beam of the latter stated that it was made at Haigh Foundry in 1820. It generated about 160 hp and, together with the foundations and all the pit shaft work, must have cost an enormous sum of money. According to a Haigh Foundry price list of 1819, now in the Crawford Collection in the John Rylands Library, a 50 hp engine cost £1,870. Between 1815 and 1827, eleven shafts were sunk at Pemberton.

Many shafts had been sunk in Orrell, Winstanley and Pemberton before Blundell began operations there. The majority of the early shafts in Orrell were sunk to work the Orrell five feet seam. This seam, over the greater portion of Orrell lying to the west of the Pember

Pemberton fault, is nowhere more than 60 yds deep and is often found at much shallower depths. However, with the opening up of the Orrell four feet seam, 63 yds below the five feet, during the second half of the eighteenth century, much deeper shafts became necessary, Blundell's Chain Colliery Engine Pit, sunk towards the end of the eighteenth century, was 860 feet deep and rectangular in section, approximately 9 feet by six feet. Other shafts sunk at Blundell's Orrell Collieries were generally 6 feet to 7 feet in diameter although there was at least one oval one 8 feet by 5 feet. All these shafts were unlined, except for a few yards at the top lined with stonework or 9 inch brick work.

Galloway states that gunpowder was not used for sinking in the North-East coalfield before the last quarter of the eighteenth century. It is obvious from an account book of 1788 onwards that Blundell was using gunpowder at that time and presumably for sinking.

1789	To Jonathan Blundell Senr.	for Pine Balks + Gunpowder	£	s	d
			51	6	9
1790	" " " "	for Timber + Gunpowder	37	17	3

A surprisingly large number of shafts were sunk by Blundells, up to at least No. 58 in Orrell. The policy seems to have been to keep well ahead with shaft sinking, so that when a shaft became uneconomic, owing to long drawing, bad ventilation etc. a new one was down to the coal to replace it.

As his Orrell Collieries became exhausted, Henry Blundell began to open up his new at Pemberton where the aforementioned 11 shafts were sunk before 1827. A quoted rate for sinking in that year was 18s per yard. Depths were again increasing, the Pemberton Engine Pit being 426 feet to the sump and Ferrymans pit 555 feet. The Bye Pit, 390 feet deep, took 179 weeks and 3 days to complete - an average progress of just over 2 feet per week. This pit was sunk before the invention by Bickford of the patent fuse, and the shots would have to be fired by means of squibs made of straw or paper and filled with fine gunpowder. It is clear that there would be mis-shots in a shaft as wet as the Bye Pit. Diameters increased with depth, the Engine and Bye pits being 9 feet 6 in diameter. Both of these shafts were lined except near the top.

Up to 1827, all coal from the Pemberton collieries had been landsale, or had been carted to the nearest point on the canal at Seven Stars, Wigan. However, for 1827, a time book, preserved in Wigan Library, records a number of payments for the drilling of stone sleepers, and Blundell Hollinshead, as he was now known, began in that year to construct a railway from No. 6, or Wood, pit, running past Bye Pit and Chain, or No. 7, pit to the Leeds and Liverpool canal at Seven Stars Bridge. It was later extended to the Ferrymans and Venture pits. The gauge of this railway was, from the evidence available, four feet, and the long straight length down what is now Victoria St. Newtown, is shown on the 1846 Ordnance Survey map as an inclined plane. At the canal end of this railway, a boatyard was opened for the construction and repair of boats, because Blundells had their own canal boats.

Blackrod Colliery, fortunately situated on the banks of the Leeds and Liverpool Canal north of Arley Hall, had no transport problem, and in Orrell, Blundell and Co. had constructed a wagon road from Orrell House Colliery to the canal at Gathurst as early as 1776. Nothing is known of wagon roads to Blundell's other collieries in Orrell, but Clarke's and Hustler's tramways ran close to these

collieries and it is possible that Blundell acquired running rights over them.

Henry Blundell Hollinshead died on 8th February 1832. His son, Richard Benson Blundell Hollinshead took over the collieries and initiated major developments during the next few years.

First, he completed the purchase of Highfield - Highfield House and the remaining 8 Cheshire acres - from Bedford Kenyon, the grandson and heir of Robert Kenyon, who had died at Highfield House in 1801. Bedford Kenyon had raised money on mortgage from time to time, and the need to meet contingent liabilities compelled him to part with Highfield. By this time, the Orrell Collieries had finished but an extension of Edge Hall under the Bridgewater Trustees estate in Winstanley, known as 'Dukes', was still operating. Secondly, Richard Hollinshead, who resumed the name of Blundell by royal licence in 1836 and added it to Blundell Hollinshead, sank several new pits. Between 1839 and 1842 he sank Amberswood Colliery in the Walmesley estate on the Ince-Hindley boundary, the Mesnes Colliery to work the famous Cannel mine under the Glebe land in Wigan in the Mesnes Park, - Market Square, - Bull Hey, - Frog Lane area, the Tanhouse Colliery under the Bridgewater Trustees estate at Tanpits, Pemberton, and the Venture pits near Summersales, Pemberton.

Amberswood worked the Ince and Pemberton seams, Tanhouse and Venture pits, the Orrell four and five feet seams. Richard also took over the Chorley Colliery from Messrs. John Whittle and Partners; this worked the Mountain seam under Chorley town centre. But Blackrod Colliery was going through difficult times. An explosion there in 1836 killed 11 men, and a still more disastrous one in 1849 caused great destruction in the mine. Blundell decided to close it.

The venture and other pits sunk in the 1840's were twelve feet in diameter and for the most part lined with brickwork. The Low Venture was lined, or partly lined with special bricks curved to the diameter of the shaft. The shafts at Amberswood, sunk through several beds of rock, were only partially lined. A report by Grimshaw, a mining engineer, dated May 1868, states that:

"In No. 9 shaft the rock was so broken and dislocated that it was positively dangerous in passing through: in fact during one descent, the underlooker had to signal to the enginmen to stop while we moved pieces of dislocated rock before we could continue down."

During the famine winter of 1800 serious riotings again occurred in the Wigan district, and there were many disturbances during the following 20 years, notably in 1812 and 1819. In 1812, the situation was so serious that a meeting of the lieutenancy was held in Wigan. The Earl of Derby, the lord lieutenant, presided, and 56 deputy lieutenants were present, including the following who had interests in the coal industry: Sir William Gerrard, Meyrick Bankes, Sir T.D. Hesketh, Sir Richard Clayton, Nicholas Ashton, Isaac Blackburn, George Case, John Clarke, T.S. Standish, R. Willis, J. Walmesley, William Hulton, Michael Hulton and R.G. Hopwood. A statement after the meeting said they viewed,

"with horror and extreme sorrow the riots, tumults and breaches of the peace that have occurred in this country which disgrace civilised society and are most dangerous to the Commonwealth or public polity of the Kingdom. Any of His Majesty's subjects may arm themselves and of course may use the ordinary means of force to suppress riots and disturbances."

They advised the forming of regular associations for mutual defence.

There was great distress at this time, and it was said that the common necessities of life had become luxuries to working people. The maximum earnings of a collier employed at Orrell Collieries in 1817 were from 6s 1d to 6s 6d per day, out of which the colliers had to pay their drawers. Day wages varied from 10d to 1s 2d for boys and 2s 0d to 2s 2d for men. The score price for 24 baskets of 150lb was 2s 11d which is the approximate equivalent of 1s 10d per ton.

A wage-book from Pemberton Collieries, covering the years 1825-6 and 1827, has survived, in which the rates of pay quoted for day-wage men differ only very slightly from those operating at the Orrell Collieries a decade earlier. Men's wages varied between 1s 6d and 2s 10d per day and boys between 8d and 1s 4d per day. In 1830, however, as much as 3s 8d was paid for a day-wage, and 2s 6d per day was quite common.

The Combination Laws, passed in 1800, had been repealed in 1824, but during the 25 years of their existence, the colliers had used the many friendly societies as a cloak for trade union activities. At least 10 of these societies were operating in Wigan before 1800, and during the period of the Combination Laws, 11 new ones were formed. The Union Society was formed at Orrell on 2nd May 1808 and the Brotherly Union Society, which functioned at the Ben Jonson Inn in Pemberton from Oct 1794, was active during the whole period of the Combination Laws.

By 1830, a Collier's Union had been formed at Wigan, and, indicative of the violence of the times, is the conviction of six colliers who broke into the house of a fellow collier, smashed his furniture and raped his wife and daughter because he refused to attend a union meeting. These vicious and violent assaults by union zealots upon those of their fellows who did share their own enthusiasm, and especially later on 'blacklegs' were known as 'ravin', and although 'ravining' was condemned by the unions, it was an all too common occurrence. The first action of this new Colliers Union was a strike in 1831 in the Wigan area, after which a general increase in wages was given to the miners. During the 1830's food prices continually rose, but wages were slow to follow, and consequently there was again great distress in Wigan. A National Holiday and strike was proclaimed by the Chartists in 1839, but at that time there were only about 150 Chartists in Wigan, less than a dozen of whom, it was said, would resort to violence. By 1842, however, the situation had changed completely and on 12th August of that year, a mob of 10,000 Chartists from surrounding areas descended on Wigan, forced their way into all the collieries and cotton mills, stopped the engines, and turned 3,000 people out of work. It is beyond doubt that Blundell's important collieries, especially their Mesnes Pits in the centre of town, were among those affected. On the following day, some 3,000 Wiganers assembled, and after parading around the town with banners flying, marched off up Wigan Lane, where they were dispersed by a detachment of the 72nd Highlanders stationed in the town.

About this time, efforts were being made to form a National Miners Union, and at a meeting called for that purpose in April 1843 at Newcastle on Tyne, a representative from a 'Pemberton Colliery' was present. If this Pemberton Colliery was Blundell's and not Pemberton Main Colliery at Sunderland, it was the only Lancashire colliery represented, and it is highly probable that the delegate was John Berry, who, born at Standish in 1806, had been prominent in four previous unions. During the latter part of August 1843, placards were posted in Wigan and it's environs headed, "Slaves, stop and read"

They announced a meeting, to be held on Amberswood Common on 27th August, to be addressed, among others, by David Swallow of Wakefield, one of the founders and the first secretary of the new Miner's Association of Great Britain and Ireland. Henry Dennett presided, Daniel Thompson of Newcastle on Tyne proposed the resolution that wages paid to the miners in the Wigan district were insufficient to maintain themselves and their families and that it was the opinion of the miners present that the only remedy was cordially to unite with their brethren of England, Scotland and Wales. During the afternoon, the delegates held a meeting at the Crofter's Arms in Wigan, there they appointed Berry and Thompson to attend a conference of delegates to be held at Newcastle on Tyne.

There were strikes in Wigan during the following months, and some colliers were prosecuted for not giving notice and thereby committing a breach of contract to which they had legally bound themselves. There was great distress everywhere in the district, and further meetings proclaimed that,

"nothing short of strict union can have the effect of extricating the miners from their fallen condition".

Wages were abysmally low, and two quoted cases of miner's earnings, after paying their drawers and paying for candles, tools, pick sharpening etc: were 7s 4d and 10s 5d per week. The score price in the King seam at most of the Wigan pits working it had been reduced during repeated depressions from 24s 0d to 15s 0d.

The new National Union rapidly gained in strength and funds. It paid £1,000 a year to William Prowting Roberts, a very able lawyer to fight it's cases. He was probably responsible for the printed addresses from the colliers employed at the largest collieries in Wigan, which appeared before the public during the last weeks of November 1843.

The largest meeting of colliers that had been held in the district up to that time took place on Aspull Moor on 20th October 1844 to hear an address from Mr. Roberts, the 'miner's attorney general.' The colliers from Pemberton and Orrell joined their Wigan brethren and formed an impressive procession. The next big meeting was at Lamberhead Green Pemberton. George Ramsden, a Burnley miner, occupied the chair, and over 2,000 persons were present. Mr. Roberts, who gave the main address, advocated peace, law and order, and said that if work was available for 950 men and 1,000 applied for work, it was better that 950 should work and support the other 50 in idleness rather than that 1,000 should work and thus reduce the wages of all. Local colliers spoke in support, stressing the need for every miner to join the union and claiming that the union could bring men great benefits. About this time, the colliers, on the advice and direction of their 'Attorney General', brought a number of legal cases against the owners. In one of them, Roberts represented a collier, who wanted to be released from his contract because he alleged that the manager of his company, Harrison and Turner of Clapgate Colliery Pemberton, was incompetent. The magistrates who heard the case were William Gerrard Walmesley, a royalty owner, and John Woodcock and James Acton, both coal owners. Not unnaturally, they found for the defendant, and, we may assume, they were unanimous in their verdict.

From now on, Blundell's collieries expanded to become one of the three largest, most important and most famous of the many coal mining concerns in the Wigan area, the other two being the Wigan Coal & Iron Co., of which more will be said later, and the Pearson and Knowles Coal and Iron Co.

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THE WIGAN COALFIELD IN 1851

The next part of the project discusses the Wigan Coalfield in 1851. It contains information concerning the production, manpower, and size of individual pits and also of the area in general. Most of the information is taken from an article by A.J. Taylor M.A., who studied an old manuscript notebook with the cover title, List of Collieries around Haigh 1851.

The notebook was found among the nineteenth century accounts of the Haigh collieries and in it are notes of 103 collieries with details of location, owner, seams worked, colliers employed and daily output. For the historian of the Lancashire coal industry, this list supplements the printed lists of J.L. Kennedy in the 'Report of the Childrens Employment Commission' (1841-2) and of J. Dickinson in the 'Return of the Mines Inspector' (from 1854). Kennedy's list, though lengthy, is selective, naming only those collieries which he himself had visited and furnishing details of employment for less than half of these: Dickinson's list, on the other hand, though professedly comprehensive in it's coverage of the Lancashire coalfield, and probably coming close to this ideal, provides no detailed figures either of employment or of output. The Haigh list, however, though patently inaccurate in detail and restricted in scope to the Wigan area, is much the fullest of the three in it's incidental information. Taken together the lists provide material for the construction of a clear picture of the structural framework of the West Lancashire coal industry of the nineteenth century.

What was the purpose of the Haigh List? Much hinges upon this question, for an estimate of the accuracy and completeness of its information depends largely upon an answer to it. Unfortunately, the manuscript itself gives little or no clue to the reason for its existence. Certain possibilities present themselves: that this was a list compiled for the purposes of a trade association - such an association existed in the south-west Lancashire coal industry at this time; that it was intended to put on record Haigh's competitors in the local Wigan market; or that it was merely a mine-agent's exercise. Of these possible explanations the first seems the least plausible, if only because of the demonstrable omissions and errors of the list. A less official and less formal 'raison d'etre' seems therefore probable.

The area covered by the Haigh survey extends to Billinge and Shevington in the west and to parts of Chorley in the north; it touches Westhoughton and Leigh in the east and Ashton in the south; it reaches as far as - but not beyond - Haydock and Parr in the south-west. Within this section of the Lancashire coalfield, according to the compiler of the List, one hundred operating collieries were producing upwards of 3,500,000 tons of coal a year. These figures may be compared with Dickinson's official return for the entire coalfield in 1854 of 363 collieries producing 9,800,000 tons. The average annual output for each colliery, some 30,000 tons, was appreciably higher than that of the majority of inland coalfields, but below that of the "seasale" collieries of South Wales, Cumberland, and, above all, Northumberland and Durham.

It is in detailed analysis, however, that the Haigh returns are most revealing. Although the majority of collieries were small-fifty-eight per cent of them were each yielding less than 100 tons a day- the greater part of the district's output was accounted for at

this time, as later, by a handful of large collieries. Six collieries, each producing upwards of 450 tons a day, provided more than a quarter of the district's output; nine, with a daily output of over 300 tons, more than a third. When attention is turned from collieries to firms, the disparity between the productive significance of the larger and smaller collieries is even more marked; for though at this time few individuals or firms owned more than a single colliery, such concentration of ownership as had occurred had affected the larger rather than the smaller collieries.

The "typical" colliery of the district, however, was that raising from 100 to 300 tons a day. Almost a third—thirty-one—of the collieries fell into this category, and of these twenty-two, or almost a quarter, were raising between 100 and 200 tons; in all, the thirty-one collieries were responsible for forty per cent of the district's output. For once the 'average' colliery was the 'typical' colliery. The mean average output per colliery was 134 tons and no fewer than fourteen collieries came within thirty tons of this figure.

The average daily output of each man may be computed as four tons. This is an extremely high figure, and it must therefore be assumed that the compiler counted as colliers only hewers employed at the face. Such a daily output for each hewer is similar to that calculated for the whole of Lancashire by Dickinson; and, following Dickinson, one may therefore assume that each recorded collier represented approximately three additional offhand workers. The total labour force for the one hundred collieries would thus be about 13,000, and output per head about one ton per day.

To this point discussion has been of collieries rather than of pits, of business rather than technical units. So far as it is possible to make calculations on the basis of the Haigh List, there were 201 pits in operation in the 100 collieries of the Wigan district in 1851. The number of colliers employed in individual pits was small by comparison with later standards, or by comparison with the great collieries of Northumberland and Durham. Though the No. 1 pit at Messrs. Bromilows' Parr colliery was estimated to employ 100 faceworkers, with a daily output of 800 tons from the Rushy Park seam, such a pit was quite exceptional. It may be compared with Messrs. Eccles and Stocks' colliery at Ashton which was also producing in the region of 800 tons a day, but doing so with the labour of 134 colliers dispersed among ten distinct pits and fifteen different workings. Messrs. Evans at Haydock likewise had eight workings pits employing 116 face workers to produce 675 tons of coal. Deeper winnings meant greater concentration of workers in the individual pit, and in those districts, particularly towards the boundaries of the coalfield, where the search for productive seams had demanded deepening shafts, the total numbers of workers in each pit might be high; but, even in the case of the collieries of large output, the daily production of a hundred tons of coal and the employment of a hundred persons in total in a single pit was still in 1851 the exception rather than the rule.

The List as its compiler left it has one important omission, Haigh itself. Haigh, though not the largest of the West Lancashire collieries, was a concern of the first rank. In the three years, 1846-9, 651,881 tons were produced by the Haigh pits, an average of some 750 to 800 tons a day. In March 1849 this quantity was being raised from eighteen pits, less than fifty tons a day from each pit.

The picture that emerges, therefore, is of a coalfield in which the larger collieries were in the ascendent but had as yet

not risen to a position of dominance. Already Lord Crawford, Jonathan Blundell, David Bromilow, John Case, John Darlington, Richard Evans and Ackers and Company were names of importance in the local coal trade: little less significant were the concerns of Ralph Thicknesse, John Lancaster and Meyrick Bankes, all destined to make their mark in the industry in the next half-century. But the day of the small coal-owner was by no means yet past; and the shallow pit of 500 feet or less was still the predominant technical unit on the coalfield.

The list of collieries which follows is in its essentials a transcript of the Haigh manuscript List, but it differs from it in the following respects: in omitting all details of pits and merely presenting figures of total manpower (i.e. colliers) and output for each colliery; in formalizing the presentation of the material; and in correcting the figures where errors of addition are clearly perceptible. Additions and corrections to the manuscript are indicated by square brackets. Doubtful words and figures-- the calligraphy is generally poor -- are queried; those more familiar with the area will perhaps find more appropriate renderings in these instances than A.J. Taylor has been able to make.

THE HAIGH LIST

Principal colliery owners, with outputs of more than 120,000 tons per year or over in 1851.

	<u>Colliers</u>	<u>Daily Output</u>
BROMILOW	140	1000
EVANS	176	875
ECCLES & STOCKS	134	852
BLUNDELL & SON	165	802
DARLINGTON	170	800
EARL CRAWFORD	?	700-800
ACKERS & Co.	115	690
LEIGH & Co.	135	547
CASE	153	476

LIST OF COLLIERTIES IN 1851

<u>No.</u>	<u>Place</u>	<u>Owner</u>	<u>Colliery</u>	<u>Number of</u>		<u>No. OF</u>	<u>OUTPUT</u>	<u>Seams</u>
				<u>Pits</u>	<u>Workings</u>	<u>COLLIERS</u>	<u>PER DAY TONS</u>	
1	CHORLEY	BLUNDELL	MILLSTONE	2	2	32	100	Mountain
2	"	HARGREAVES	-	1	1	12	50	Arley
3	"	JOHN WHITTLE	-	2	2	23	67	Arley
4	WIGAN	CASE	DOUGLAS BANK	3	3	28	56	Wigan 7/-
5	"	INCE HALL COMPANY	-	2	2	100?	300	Cannel, King
6	"	CHARNOCK & COMPANY	-	3	3	77	335	Mountain

7	WIGAN	THOMAS ASPINALL	-	11	1	7	15	Mountain
8	"	MRS. FOURACRE	-	1	1	23	60	Pemberton
9	"	ACTON	-	1	1	7	30	Wigan 4/-
10	"	HY. WOOD	HOLME HOUSE	1	1	42	120	Wigan 4/- 5/-
11	"	J. BLUNDELL	MESNES COLL.	2	2	41	110	Cannel
12	"	JN. PARK	SPRING MILL	1	1	5	12	4ft.
13	"	JN. WOODS	FACTORY PIT	1	1	2	12	9ft.
14	"	JN. LAMB	WALLACE LANE PIT	2	2	13	30	Wigan 7/-
15	"	WRIGHT & TAYLOR	-	2	2	26	106	Pembtn. 4/- 7/-
16	INCE	ECCLES	WATER SKYE PIT	1	1	16	70	Ince 4/-
17	WIGAN	CASE	DOUGLAS BANK	4	4	81	260	Pembtn. 4/- 5/-
18	INCE	R. PRESTON	-	1	1	18	50	9ft.
19	"	WARLEY & CO	-	2	3	27	100	Wigan 4/- 5/-
20	"	MOSS HALL & CO.	MOSS HALL	4	4	81	260	Pembtn. 2/- 5/-
21	"	NUTTALL & CALDWELL	-	3	6	46	105	Ince 4/- 7/-
22	"	CASE	ROSE BRIDGE	2	4	44	160	Ince 4/- 7/-
23	"	NUTTALL	LOW GROUND	1	1	7	15	King
24	"	HALIBURTON	HIGH HOLLINS DEEP PIT	4	5	75	184	King, Cannel Arley
25	BLACKROD	GORE & CO	ARLEY	1	1	8	70	Smith's
26	LEIGH	FARRINGTON & CO.	SPRINGFIELD	2	2	22	105	7/- 6/-
27	ASPULL	JN. JOHNSON	-	1	2	10	25	Cannel, King
28	WESTHOUGHTON	SCOWCROFT	W'HOUGHTON	2	2	22	55	King
29	"	TRUSTEES OF ALBERT JP CRAIG	-	1	1	10	15	King
30	"	HOULTON	WHITEHORSES	1	1	40	86	Yard
31	"	WOODWARD	-	2	2	20	45	Yard
32	"	NUTTALL	-	1	1	10	28	Cannel
33	WIGAN	LEIGH & CO	CHASH PIT	3	3	135	547	Yard, Arley, Haigh
34	HINDLEY	JN. BLEAS- DALE	CASTLE HILL	2	2	11	20	5ft.
35	"	BLUNDELL	AMBROSE WOOD	2	2	41	174	5ft.
36	ORRELL	BANKES	WITHY HOUSE	3	3	124	195	Cannel, King 4ft.

37	PENBERTON	HUGH BROWN	DELF PIT	1	1	5	15	Pembtn 5/-
38	"	JOHN DAGLISH	-	2	2	24	96	Ince 4/-
39	WIGAN	MAY HULL & CO.	PLATT BRIDGE	2	2	27	69	4ft, 1
40	"	PRESTON & SON	-	3	4	29	124	Wigan 9/-
41	"	THICKNESSE & CO.	PLATT BRIDGE	1	1	18	90	Pembtn. 2ft.
42	HINDLEY	WHITE	"	1	1	25	110	" "
43	"	J. MARSH	-	1	1	4	24	" "
44	"	HY. HARRISON	GLAP-GATE	1	1	6	20	Pembtn. 5/-
45	"	WHALEY	LOW HOUSE	1	1	6	30	" "
46	"	GRIMSHAW	-	2	3	27	130	" 4/- 5/-
47	"	J. BAKER	DON GREEN	1	1	3	15	Wigan 4/-
48	LEIGH	EVANS	GOLDBORNE	4	8	60	200	4ft. 7/-
49	"	ASHTON	LONG LANE	2	2	12	50	7/-
50	"	RYLANDS	STAR PIT*	1	1	45	117	King, Cannel
51	"	HALIBURTON	-	3	3	27	80	Cannel, Haigh Yard
52	BLACKROD	RIDGEWAY	VICTORIA MAIN	2	2	32	56	King
53	"	T. WINNARD	DARK LANE	1	1	3	18	King, Cannel
54	BLACKROD BROW	DUTTON & CO.	-	1	1	10	36	King
55	LEIGH	HULL & CO	-	2	4	41	150	5/- 4/-
56	"	LIVERSEY	LOW COLL.	1	1	12	35	4/-
57	"	SCOWCROFT	BICKERSHAW LANE	1	1	6	15	Yard
58	"	BANKS & GREGORY	JACOB'S WELL CO.	2	2	16	30	7/-
59	"	CLEGG & CO	PARK	2	2	20	140	7/-
60	"	LOWE	PICKLEY GREEN	1	1	9	30	6/-
61	"	BOON	BLACK CROFT	1	1	20	70	6/-
62	HINDLEY	P. JOHNSON	LOW GREEN	1	1	9	45	Pembtn. 4/-
63	"	SCOWCROFT & CO.,	-	4	5	42	155	3/- 4/- 5/-
64	"	WORSLEY	Nr. SWAN INN	3	3	18	72	4/- 5/- YARD
65	"	WOODS	OLD HINDLEY GREEN COLL.	1	1	14	77	5/-
66	"	D. HOWARTH	DANDY PIT	1	1	5	12	Pembtn. 5/-

67	RAINFORD	HARDING	-	2	2	10	50	5/6
68	HINDLEY	MACKAY & Co.	-	1	1	4	20	5/6
69	"	LANCASTER & Co.	-	2	2	32	155	Ince 4/-
70	ABRAM	ACKERS & Co.	BICKERSHAW COLLIERY	6	6	115	690	4/- 6/- 7/-
71	STANDISH	T.GASKELL	BYE LANE COLL.	1	1	10	50	7/-
72	"	TAYLOR	TUNNEL COL.	2	3	31	168	Ince 4/-
73	"	HOLT (STOTT)	WIGAN CHURCH	1	1	10	42	5/-
74	"	J.STEVENS	LAMBERHEAD GREEN	1	1	6	36	Pembtn. 5/-
75	PEMBERTON	BLUNDELL & SONS	BYE, HIGHER VENT MILL	3	4	51	408	4/- 5/-
76	WINSTANLEY	BANKES	-	3	3	32	111	3/6 4/- 5/-
77	ASHTON	STOCK	-	2	2	11	60	4/- 5/-
78	HAYDOCK	EVANS	-	8	9	116	675	4/- 5/-
79	PARR	BROMLOW	BROMLOW	2	2	140	1000	Rushy Park
80	INCE	THICKESSE	-	3	3	93	206	King
81	SHEVINGTON	BARTON & WINDEN	-	2	3	38	175	Arley, Smith
82	"	STOPFORD (TH)	-	1	1	8	40	Haigh Yard
83	"	DICKENSON	-	1	1	8	28	" "
84	"	TAYLOR	-	1	1	25	68	" "
85	"	BARTON & WINDEN	-	1	1	10	40	4/-
86	STANDISH	BRADLEY COL.	BRADLEY	2	2	24	60	4/-
87	"	SMITH & CHARNOCK	-	2	2	55	214	Mount, Ince 4/-
88	"	J.DARLINGTON	-	3	3	77	335	Mountain
89	LEIGH	MORT & KEASP	-	1	1	10	50	4/-
90	"	HEDFORD COAL CO.	-	2	2	46	230	4/-
91	"	BYROM & TAYLOR	-	2	2	52	208	4/-
92	WINSTANLEY	WINDERS	-	-	-	standing	-	-
93	BILLINGE	M. JONES	SHALEY BROW	2	2	14	36	Mountain
94	"	BRANKER & CO	BILLINGE	2	2	100	200	"
95	"	DARLINGTON	ASTLEY	3	3	93	465	4/-
96	"	ALEXANDER	HOLLAND MOOR	1	1	7	28	Mountain
97	COPPULL	DARLINGTON	COPPULL	-	-	standing	-	-

98	COPPULL	HARGREAVES	-	2	3	65	250	Arley, Smith
99	STANDISH	WANES	-	2	2	18	72	Yard
100	ECCLESTON	WHALEY	-	-	standing	-	-	-
101	ASHTON	STOCKS	-	5	5	48	282	5/- 4/- Little
102	"	ECCLES & STOCKS	-	10	15	134	852	6/- 9/- Little R.Park 4/- 7/-
103	BILLINGE	SAM STOCKS	ASH GROVE PIT	1	1	6	21	Little

The Wigan Coalfield up to the formation of the Wigan Coal & Iron Company Ltd.

The Wigan Coalfield from about 1851 onwards continued to expand. The colliery units became larger, production increased and also the numbers employed in the pits. A sign of the increased expansion came with the ever increasing shaft depths being attained. In fact, during the second half of the nineteenth century, the Lancashire pits took the lead in progressive shaft deepening with Astley deep pit at Dukinfield reaching 350 fathoms in 1858, Rosebridge, Wigan, 408 fathoms, 1869 and Ashton Moss Colliery, Audenshaw, Manchester on 5th March 1881 to 448 fathoms.

By now, coal had become the major industry of Wigan and district and the area had become the principal mining centre in Lancashire, primarily because it had the largest number of coal outcrops for each square mile in the whole county.

In 1863 there were some forty-eight colliery companies operating in the Wigan district and according to the list given below, were producing nearly 4,000,000 tons per annum. This was the beginning of the period of peak production of coal from the Wigan area.

LIST OF COLLIERIES IN THE WIGAN AREA IN 1863

<u>Name of Colliery Co.</u>	<u>Owners</u>	<u>Tons raised annually</u>
1 Chorley Colliery	James Darlington	50,000
2 Red Bank Colliery	Whaley	10,000
3 Welch Whittle	James Darlington	55,000
4 Charter Lane	Whittle & Coy	10,000
5 Coppull	Exors of J. Hargreaves	20,000
6 Standish	John Taylor & Son	100,000
7 Broomfield	Stone & Moor	20,000
8 Bradley	Fisher	25,000
9 Standish & Shevington Coal & Cannel Works	Standish & Shevington Coal & Cannel Company	60,000
10 Crook		10,000
11 Kirkless Hall	Kirkless Hall Coal & Iron	500,000
12 Haigh	Earl of Crawford and Balcarres	400,000
13 Chapel Field	Roscoe & Lord	15,000
14 Dooton & Vauze Hall	Leather	18,000
15 Blackrod	Thomas Whaley	30,000
16 Victoria Main	Ridgway	40,000
17 Scot Lane	Hy. Woods	35,000
18 Brinsop	Longworth	12,000
19 Albert	Gerrard	10,000
20 Walthew House	Brancker	75,000

21 Holland	Earl of Crawford and Balcarres	120,000 120,000
22 Norley	Norley Coal and Cannel Company	70,000
23 Pemberton	Lamb & Moore	15,000
24 Meadows House	Anthony Eccles	10,000
25 Gidlow Lane & Bank Hill	William Barton	15,000
26 Springs, Hindley and Barley B.	Pearson & Knowles	350,000
27 Swinley	Rylands & Cross	35,000
28 Ince Hall Coal & Cannel Works	Ince Hall Coal & Cannel Company	450,000
29 Mesnes	Taylor & Turner	20,000
30 Bank Hill	Bank Hill Coal Company	12,000
31 Old Hey	J. & I. Platt	5,000
32 Round House	Wright & Mercer	40,000
33 Birkett Bank	Shawcross & Crompton	25,000
34 Rose Bridge	Case & Morris	300,000
35 Osier House & Hindley	Thomas Gidlow	60,000
36 Pemberton Colliery	Messrs. A. Blundell & Sons	300,000
37 Winstanley	Meyrick Banks	30,000
38 Stone House	John Stephen	20,000
39 Worsley Mesnes	Nathaniel Eckersley	10,000
40 Ince Hall	Robert James & Co.	20,000
41 Moss Hall	Moss Hall Coal Co.	150,000
42 Low Hall	Yates	10,000
43 Strangeways	Strangeways Hall Co.	100,000
44 Platt Bridge	Platt Bridge Coal Co.	12,000
45 Bryn Moss	Messrs. Whittle	20,000
46 Hindley Green	Hindley Green Coal Co.	55,000
47 Park Colliery & Broadfield	Speakman	60,000
48 Snapes	John Gregory	22,500

Total Tonnage 3,831,500

Some of the companies listed amalgamated to form the two main mining operators in the district in the twentieth century, the Pearson and Knowles Coal & Iron Company and the Wigan Coal & Iron Company.

It was against this background of expansion and amalgamation that the formation and the subsequent working of the Wigan Coal & Iron Co. was brought about. This development, discussed in the next section, was possibly the most important local mining event of the nineteenth century.

(40)

THE WIGAN COAL AND IRON COMPANY

The Wigan Coal and Iron Co. was registered under the Companies Act of 1862, on December 2nd 1865 to work coal, iron, limestone and other mines and comprised the amalgamation of several existing collieries and ironworks: Haigh and Upholland collieries, Kirkless Hall Coal and Iron Works, Standish and Shevington Cannel Works, Broomfield Colliery and Wegber Quarry.

All branches of the Company were conveniently situated near to one of the main railway lines (Lancashire & Yorkshire or London & North Western) so that their products were easily transported to their major agencies in Preston, Blackburn, Bury, Liverpool, Manchester and Wolverhampton. However, in the case of London, the product was sold direct to that market rather than shipped to an agent who then sold it.

Prior to amalgamation, Haigh and Upholland Collieries and Wegber Quarry were owned by the Earl of Crawford and Balcarres whose ancestors had mined coal in the Haigh area of Wigan since the sixteenth century. Kirkless Hall Coal & Iron Works were owned as a co-partnership between the following Coal & Iron masters:

John Lancaster of Hindley Hall near Wigan.
John Swire of Llanelly
Jephtah Pacey of Higher Broughton near Manchester
Samuel Swire of Southport and
James Reynolds of Bayswater Middlesex

In addition, Lancaster, in conjunction with John Taylor of London and Thomas Part, Chorley, was one of the lessees of the Standish and Shevington Cannel Works. Finally Broomfield Colliery had been leased by Alfred Hewlett, a native of Wigan.

Upon the incorporation in December 1865, Hewlett became managing director of the company with Lancaster as Chairman. Although no trace can be found of the remaining directors of the company at the initiation of the company, it can be fairly safely said from the evidence of a later record that they were the Earl of Crawford & Balcarres and Thomas Part.

The Wigan Coal & Iron Co. was formed during the early phase of company promotion after the passing of a series of acts permitting Joint Stock Companies the protection of Limited Liability. Indeed late 1865 saw an upsurge of general company promotion, coinciding with a boom resulting from the end of the American Civil War. The Company's nominal capital was £2,193,100, of which £1,809,725 was paid up; 21,931 shares were issued at a nominal value of £100 each. However only 6,596 were taken at the full amount and the remaining 15,335 were paid up at £75 each.

Wigan Coal and Iron Co. Shareholders 1865

EARL OF CRAWFORD & BALCARRES	-	8577
JOHN LANCASTER	-	5162
JOHN SWIRE	-	1190
JEPHTAH PACEY	-	1454
SAMUEL SWIRE	-	1454
JAMES REYNOLDS	-	1454
THOMAS PART	-	1196
JOHN TAYLOR	-	1196
ALFRED HEWLETT	-	248

Shown above are the number of shares taken by the founders of the Company from which can be seen the predominance of Crawford and Lancaster in the Company's shareholding, totalling approximately 60%. The paid up capital remained at the aforementioned figure up to at least 1885. Though a private limited company, its capital size was much greater than the average figure for public companies.

In 1885, for coal, iron and steel companies, the average paid up capital per company was £362,000 and for companies classified by the Stock Exchange as "commercial and industrial" this figure was £129,000. For all companies, irrespective of the type of ownership, the average capital per company in the same year was £59,000. Only two companies of comparable type to the Wigan Coal & Iron Co. had, at this time, a larger nominal capital; that of Bolckow and Vaughn was £2.5million, and that of Ebbw Vale Coal & Iron Co. was £2.2million. Indeed at this time, the Wigan Coal & Iron Co. must have ranked as one of the nation's largest firms. In 1905 it was 42nd largest but most of those firms that preceded it had been formed after 1865, either independently or as a result of amalgamation.

Thus on the whole, the Company was extremely typical of limited companies then being formed in the coal and iron industries with regard to the character and denomination of its shares. These new companies were mainly conversions of private mines, furnaces and ironworks, and the shareholders were chiefly the original owners, local men of some standing, and a few town investors.

The capital and shareholdings were large, but the number of investors was generally small; e.g. in 1868, Ebbw Vale Coal & Iron Co. had a capital of £2.2million, with 596 shareholders and in the same year, Bargoed Coal Company's capital was £20,000 and the number of shareholders was 16.

Having briefly outlined the formation of the Company, named the leading participants in the amalgamation and looked at the financial organization, it could be worthwhile to look at the personalities who dominated the Company and its subsequent operations.

The Chairman, John Lancaster, a native of Radcliffe, spent all his working life in the coal and iron trade. In 1845, at the age of thirty, he started Kirkless Hall Collieries and combined the ownership of these mines with the management of others such as Earl Granville's ironworks and collieries in North Staffordshire. Between 1856 and 1860 he assembled five blast furnaces at Kirkless, which were the first iron smelting furnaces in Lancashire. A member of the Liberal party, he became one of Wigan's two M.P.s between 1868 and 1874. In the House he took a prominent part in the support of the Mines Regulation Act of 1872, and for his work there on behalf of the working class he earned the praise of William Pickard, a mining Trade Unionist and fellow Liberal candidate in an election speech of 1874.

In contrast to Lancaster the manager of the company, Alfred Hewlett, was a keen member of the local Conservative Association. Though both men during their careers became President of the Mining Association of Great Britain, their views on certain aspects of mining differed. For example, while Lancaster supported the Mines Regulations Act of 1872, Hewlett was an arch-enemy of any such restriction on the power of the colliery owners. Despite these differences, the careers of the two men exhibited some similarities. Both had been mining engineers and had worked their way to an elevated position in their profession. Hewlett, the son of a clergyman, spent all his business life largely in connection with the Wigan

district, and was a respected member of the mining trade. As well as holding the presidency of the Mining Association of Great Britain from 1873 to 1875, he was president of the Lancashire and Cheshire Coal Owners Association from 1862-3. As a leading figure in the coal trade he was called upon to give evidence before the Select Committee on Mines of 1866 and the Select Committee on Coal of 1873 as well as before the Royal Commission on Depression and Trade and Industry in 1886 and the Royal Commission on Mineral Royalties in 1890.

Upon Hewlett's retirement as chairman of the Wigan Conservative Association, the chairman of the presentation meeting remarked that there was no one His Lordship (the Earl of Crawford and Balcarres) looked upon and considered a truer friend than Mr. Hewlett. It was this friendship that formed one side of the struggle for control of the company during the first five years after its formation.

During the period 1865 to 1885 the title of the Earl of Crawford and Balcarres changed hands twice. The first occasion was in 1869 when the 24th earl James Crawford died and was succeeded by his eldest son Alexander William Crawford who held the title until 1880, when, upon his death, again the eldest son, James Ludovic Crawford (Lindsay ?) became 26th earl.

The 24th earl belonged to that category of landed gentry, described by David Spring as "more unconventional and adventurous," who were not content to lease out their mineral rights, but who mined a good part of their own coal. However, after his death in 1869 it may fairly safely be said that throughout the rest of the period, his successors took relatively little active part in the running of the firm and were content to leave their interests in the hands of the other directors, especially those of Alfred Hewlett.

By 1870 control of the company had devolved into the hands of Alfred Hewlett as a result of fundamental disagreement between the directors about the running of the day to day affairs of the firm. After a disagreement over various policy decisions at a meeting, a vote was taken on the issues and the voting was equal and so the motion was not carried as Lancaster and Part were for the motion and Crawford and Hewlett against. Lancaster called an Extraordinary General Meeting at which they were defeated and so Lancaster resigned as chairman and disposed of his interest in the company.

After looking at the formation of the company, its leading personalities and the determination of leadership, its subsequent performance can now be discussed. But first a brief description of the company and its constituent parts must be made. Its products were limited to coal of various types and pig iron. Its most famous coal was "Wigan Cannell", the most valuable and highest priced of its coals which has been described as "the noblest fuel in the world". The significant feature about the ironworks was that little diversification of its product was attempted, though "spiegeleisen", an iron alloy used to reduce the sulphur in steel, was introduced towards the end of the 1880's. However, no large scale innovation, such as the manufacture of steel was attempted.

The company was of course situated primarily in the Wigan District and significantly this area has been described as "the country of the Wigan Coal & Iron Co.", a tribute to its size. Land was leased by the company in Wigan itself and in the neighbouring townships of Haigh, Upholland, Shevington, Aspull, Standish and Orrell and outside the immediate vicinity of Wigan, in Westhoughton and Westleigh.

Though occupying a minor role in the company's operations,

the iron works at Kirkless Hall has nevertheless an interesting history. The connection of the Balcarres family with the trade goes back to the eighteenth century. An ironworks, owned by the Earl of Balcarres from 1788, had been in operation on his Haigh property during the eighteenth century and into the nineteenth century. Balcarres sold out in 1830. Despite this connection, the company's ironworks did not originate from this source. They were established at Kirkless Hall by a partnership headed by John Lancaster. Between 1856 and 1860 five blast furnaces were constructed. The Haigh ironworks had used local coal measure ironstone, but the Kirkless Hall plant did not depend on this source. From the very beginning, haematite ore from the Furness area was smelted with coke from the Kirkless Hall collieries to produce pig iron. Upon incorporation in 1865, it was the only smelting works in South Lancashire and second, in the number of furnaces, in the whole county.

Figures on the numbers employed by the company are difficult to find, especially with regard to a breakdown between those employed in the coal mines and those in the ironworks respectively. However, total employment in 1866 was 7,000 and in 1873 was 10,000 which figure remained approximately the same until 1885. From the coal and iron sales' figures which are only available from 1870 to 1874, it can be seen that the proportion by value of iron in the total sales of the firm varies from between $\frac{1}{3}$ to $\frac{1}{4}$. Therefore, if the value of someone employed in coal is the same as that of someone employed in iron, from this it would appear that coal mining occupied 7,000 persons and the ironworks 3,000. Comparison with the total employed in coal mining in the Wigan Area is possible: for example, in 1874, there were 18,000 in the whole area, the Wigan Coal & Iron Co. thus employed approximately 40%.

WIGAN COAL & IRON CO. COAL AND IRON SALES 1870-74

Half-year ending	December 31 1870	"	Coal sales £335,015
			Iron sales £177,534
Half-year ending	June 30 1871		Coal sales £331,349
			Iron sales £190,754
Half-year ending	December 31 1871		Coal sales £364,138
			Iron sales £188,598
Half-year ending	June 30 1872		Coal sales £407,699
			Iron sales £202,820
Half-year ending	December 31 1872		Coal sales £509,721
			Iron sales £211,231
Half-year ending	June 30 1873		Coal sales £574,197
			Iron sales £260,583
Half-year ending	December 31 1873		Coal sales £624,399
			Iron sales £245,636
Half-year ending	December 31 1874		Coal sales £373,982
			Iron sales £169,080

Output figures are a little better, especially with regard to coal in the earlier period. In the following table, a full list of the output of the individual collieries, prior to the amalgamation, can be found. Their combined output was 1.1 million tons at a time when the total output for the area was 3.8 million tons.

OUTPUT OF WIGAN COAL & IRON CO'S CONSTITUENT COLLIERIES IN 1863

BROOMFIELD COLLIERY COMPANY	- 20,000 tons
STANDISH AND SHEVINGTON COAL & CANNEL WORKS	- 60,000 tons
KIRKLESS HALL COLLIERY COMPANY	- 500,000 tons
HOLLAND COLLIERY COMPANY	- 120,000 tons
HAIGH COLLIERY COMPANY	- 400,000 tons

The Kirkless Hall Colliery was the biggest producer in the Wigan area, with the Haigh Colliery the third largest. By 1873, the company's output was just under two million tons and was still at that figure in 1885.

Comparison with the Wigan area can be seen in 1873, for example, when the total area output was 5.5 million tons. Figures for iron output are very poor, the only available one being for 1885, when with only half the furnaces working, 100,000 tons was produced, an average of 20,000 tons per furnace, a slightly larger figure than the British average. In 1880, the average British output was 13,000 tons per blast furnace and by 1890 had risen to 19,000 tons.

The most important market for the company's coal was provided by domestic users. In 1873 it was estimated that these absorbed between 40 and 50% of the firm's output. Gasworks were another important customer, particularly for cannel coal which was exclusively used for gas purposes. The company's ironworks naturally took a proportion of the coal output but coal was supplied to other iron manufacturers as well.

'THE COAL FAMINE'

The years from 1867 to 1870 were depressed ones for the coal trade of the Wigan district: stocks were built up on pit banks and wharves, prices were extremely low and subsequently wage reductions were enacted. Indeed many pits were working short time, which in some cases was half of normal working time. Yet despite this gloomy picture of the area, the Wigan Coal & Iron Co., by way of contrast, in both halves of 1869 was dividing between £60,000 and £70,000 as profit, an amount never reached in the years from 1875 to 1885. This was achieved despite the fact that several pits were being run at a loss, though it would have paid the company to close them, the problems with leases and the difficulty presented by the reopening of pits once closed, resulted in them being continued in work.

However, by 1870, demand had turned upwards with a subsequent increase in coal output. At first the increased demand was met by the large stocks which had previously accumulated at the pit banks. The company at the most had 300,000 tons in stock. But gradually the stock melted away and by 1872 had vanished altogether. Its cushioning effect was thus removed and the deficiency in output was reflected in abnormally high prices. By 1872, coal production had not reached the level of 1867.

It is probable that the Wigan Coal & Iron Co. was non-typical during the 'Coal Famine'. Having procured reasonable sales during the preceding period, the company was in a position to benefit tremendously from the coal shortage and the subsequent high prices.

Demand for the company's coal was somewhat inelastic, being mainly from the gasworks market, which expanded as a result of significant urban growth at this time, and domestic users in a variety of local markets. This played a great part in its successful performance during the depressed years from 1867 to 1870 and in its abnormally high profits during 1872/3

Within the apparently favourable environment of the 'Coal Famine', a paradoxical situation existed: in the two years of greatest profit, 1872/3, output was decreasing. Production was down on the previous period even in spite of the addition of a new colliery, situated in Hindley and Westhoughton which added approximately 110,000 tons per annum to the company's output.

The explanation of this phenomenon does not lie in labour disputes as the collier's wages had increased: first by 15% in 1871, then by advances of 10 and 15% in 1872 with a final increase of 10% in January 1873. Yet it is probable that this rise in wage level was the crux of the problem. Absenteeism became more marked as wages rose; because the colliers were paid piece-rates, their desired level of wages was subsequently reached more quickly. Their wants were at a very simple level and were easily satisfied by the local beershop and similar amenities. Thus in the majority of cases, it is extremely doubtful whether their cultural environment provided sufficient incentive to stay down the pits for longer periods, thereby raising output and enlarging their wage packet.

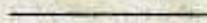
The labour problem was not just confined to absenteeism as there was in addition great difficulty in obtaining labour to work pits that were being started at this time. Constant reference was made in the Chairman's reports of 1872/3 about the problem of finding labour for a new pit at Westhoughton and a pumping pit at Aspall. The latter was an important innovation as it concentrated the work of several pumping establishments, which drained the Cannel and King Coal mines to the east of Wigan, thereby making the plant more efficient; the pit at Westhoughton was opened up on land leased from the trustees of the Duke of Bridgewater.

Given these adverse factors, it is possible that the firm could have increased the productivity of each unit of labour and thereby its output, by the greater use of machinery. Underground machinery was applied more extensively than ever before to reduce the numbers necessary for the haulage of coal, thus making more men available for hewing the coal. But the hoped for increase in output was not forthcoming. Some efforts were made to cut the coal by machinery but there were so many difficulties to overcome that this had little success.

The 'Coal Famine' was a temporary phenomenon. By 1874 prices and profit margins were beginning to fall and the descent was beginning into the era of the so-called 'Great Depression'. Yet the years of the famine had given the Wigan Coal & Iron Co. a glimpse of the opportunity that might have beckoned if the demand had not turned down to such a disastrous extent. Higher wages and the shortage of labour gave the company an incentive towards mechanisation to improve productivity. But the incentive was only short-lived, the mineowners regained there extremely strong bargaining position with the subsequent slackening in the demand for labour and were thus enabled to keep wages low. Given that the labour shortage had continued, the company might have persevered with its efforts towards greater mechanisation of the mining processes, thereby becoming more capital intensive and more productive.

From 1874 the major theme of the company's history was one of declining profit margins and dividend payments. During the 'Coal Famine', the company had regularly been placing between 20 and 30% of their profits in a Reserve Fund. From 1874, this trend was reversed; in order to bolster up profits the Reserve Fund was constantly raided.

The traditional picture of this 'Great Depression' was as follows: the sudden, but temporary boom of 1872/3 and the steady drop into slump thereafter, occasionally relieved by definite, but temporary, revivals, as in 1881/2.



From about 1888, the coal trade began to pick up again from the effects of the 'Great Depression' discussed in the section above. Indeed the Wigan Coal & Iron Co. had felt the benefit of three new projects; opening new pits at Alexandra Pit, Wigan, Sovereign Pit at West Leigh and another new pit at Westhoughton. These had been started about 1872/3 and from now until the end of the nineteenth century no new shafts were sunk but several shafts were sunk on the sites of older pits. Blundell's Pemberton Colliery sank the King and Queen Pits in 1870, the shafts at the Taylor and Giants Hall collieries were sunk on the sites of the old Tunnel and Billy pits respectively. In 1901 the sinking of the shafts at Victoria pits in Standish began. This was the last colliery to be sunk in the area which I have discussed.

Before I continue with the narrative concerning the history of the coalfield in the twentieth century, I have provided a list of collieries in 1900 giving the parish in which it was sited, the name of the company operating it and the numbers employed there. Also provided is a similar list showing the situation in 1918.



LIST OF COLLIERIES IN 1900

<u>Colliery</u>	<u>Parish</u>	<u>Numbers employed</u>		<u>Operators</u>
		<u>below</u>	<u>above</u>	
ABRAM No. 1	BICKERSHAW	114		ABRAM COAL Co. LTD.
" 2	"	232	268	"
" 4	"	250		"
" 5	"	333		"
ALEXANDRA	HAIGH	477	90	WIGAN COAL & IRON Co.
ALLIANCE	WIGAN	50	26	ALLIANCE COAL & CANNELL Co. LTD
AMBERSWOOD	WIGAN	56	15	HENRY ATHERTON, 5 PARK CRESCENT, PARK RD. WIGAN
AMBERSWOOD Nos. 1 & 3	WIGAN	511	118	CROMPTON & SHAWCROSS LTD. PLATT BRIDGE, WIGAN
ARLEY	WIGAN	139	26	JOHN SCOWCROFT & Co. LTD. HINDLEY GREEN
ARLEY YARD	WIGAN	169	14	"
ASHTON	ASHTON	179	36	GARSWOOD COAL & IRON Co. LTD
ASPULL PUMPING PIT	ASPULL	9	9	WIGAN COAL & IRON Co.
BAMFURLONG No. 1	BAMFURLONG	192	32	CROSS, TETLEY & Co. LTD BAMFURLONG
" 2	"	45	9	"
" 3	"	424	146	"
" 4	"	401	98	"
BAWKHOUSE	HAIGH	1	1	WIGAN COAL & IRON Co.
BIRCHENEDS	WIGAN	21	30	ALMOND & STONE BIRCHENEDS COLLIERY, DOWNALL GREEN
BIRCHLEY	BILLINGE	6	3	J. ATHERTON GREENFIELD HOUSE, BILLINGE
BIRCHLEY HALL	"	7	6	WILLIAM HILTON, BIRCHLEY HALL COLLIERY, BILLINGE
BISPHAM HALL	"	129	38	BISPHAM HALL COLLIERY Co. LTD
BLACKROD Nos 1,2,4 & 5	BLACKROD	-	-	WILLIAM WOODS AND SONS SCOT LANE COLLIERIES BLACKROD
BLAINSCOUGH KING	COPPULL	219	68	BLAINSCOUGH COLLIERY Co. LTD
BRIDGE	HAIGH	1	-	WIGAN COAL & IRON Co.
BRIDGE HOUSE	COPPULL	5	4	BRIDGE HOUSE COLLIERY Co. LTD
BRINKS	BLACKROD	-	15	WIGAN COAL & IRON Co.
BRINSOP	IOSTOCK	24	8	BRINSOP HALL COAL Co. LTD

BROOKSIDE		WESTHOUGHTON	112	23	UNSWORTH & COWBURN, HINDLEY GREEN
BROOMFIELD		STANDISH	125	39	WIGAN COAL & IRON Co.
BILLINGE LANE		BILLINGE	205	29	WINSTANLEY COLLIERIES Co. LTD.
BROWN HEATH		"	14	4	BROWN HEATH COLLIERY Co. LTD
BRYNN HALL No 1		ASHTON	88	20	BRYNN HALL COLLIERY Co. LTD
"	2	"	335	59	"
"	3	"	118	25	"
"	4	"	38	12	"
BYE PIT		WIGAN	166	10	JONATHAN BLUNDELL & SONS
CRAWFORD No. 1		ASPULL	471	57	WIGAN COAL & IRON Co.
"	2	"	335	116	"
DEEP PIT No 1		ASHTON	191	31	GARSWOOD COAL & IRON Co. LTD
"	2	"	444	43	"
DOUGLAS BANK NORTH		WIGAN	320	144	ROSEBRIDGE & DOUGLAS BANK COLLIERY Co. LTD
"	"	SOUTH	554		"
CHISNALL HALL No 1		COPPULL	325	77	PEARSON & KNOWLES COAL & IRON Co. LTD
"	2	"	278	41	"
DUKES		WIGAN	85	50	CROMPTON & SHAWCROSS LTD
EAST CANNEL		WIGAN	185	33	LATHAM BROS. ROSEBRIDGE COLLIERY
EATOCK Nos 1 & 2		WESTHOUGHTON	450	75	WIGAN COAL & IRON Co.
EDGE GREEN		GOLBORNE	155	33	RICHARD EVANS & Co.
EDITH & MABEL		WIGAN	479	114	CROMPTON & SHAWCROSS
ELMS		WIGAN	170	44	WIGAN CANNELL COLLIERY LTD
ENGINE		WIGAN	109	16	JOHN SCOWCROFT & Co. LTD HINDLEY GREEN
GARSWOOD HALL No 2		ASHTON	285	106	GARSWOOD HALL COLLIERIES Co. LTD
"	3	"	14	1	"
"	5	"	443	111	"
"	6	"	137	98	"
"	7	"	773	150	"
GIANTS HALL		STANDISH	254	55	WIGAN COAL & IRON Co.
GIDLOW		STANDISH	177	66	-
GOLBORNE No. 1		GOLBORNE	275	30	RICHARD EVANS & Co.
"	2	"	146	21	"
HEWLETT No. 1		WESTHOUGHTON	328	67	WIGAN COAL & IRON Co.
"	2	"	582	89	"
ELLERBECK		COPPULL	537	143	ELLERBECK COLLIERIES LTD, BANK CHAMBERS, WIGAN

HINDLEY FIELD	WIGAN	358	92	HINDLEY FIELD COAL Co. LTD
HINDLEY GREEN 6/-	WIGAN	3	-	JOHN SCOWCROFT & Co. LTD HINDLEY GREEN
HINDLEY HALL	WIGAN	132	24	PEARSON & KNOWLES COAL & IRON Co. LTD
INCE PARK LANE	ASHTON	365	55	GARSWOOD COAL & IRON Co. LTD
JOHN KING COAL	STANDISH	224	32	WIGAN COAL & IRON Co.
KING PIT	BLACKROD	Pumping		WIGAN COAL & IRON Co.
	WIGAN	656	42	JONATHAN BLUNDELL & SONS
KIRKLESS Nos 1 & 2	ASPULL	1	1	WIGAN COAL & IRON Co.
LADIES LANE Nos 1, 2 & 4	HINDLEY	214	44	WIGAN COAL & IRON Co.
LANGTREE	STANDISH	313	44	WIGAN COAL & IRON Co.
LEYLAND GREEN	BILLINGE	289	76	WINSTANLEY COLLIERIES Co. LTD
LILLY LANE	GOLBORNE	117	19	WINSTANLEY COLLIERIES Co. LTD
LINDSAY Nos 1 & 2	HAIGH	285	47	WIGAN COAL & IRON Co.
LINDSAY No 3	HAIGH	1	1	WIGAN COAL & IRON Co.
LONG LANE Nos 1 & 2	ASHTON	860	141	GARSWOOD COAL & IRON Co. LTD
LONG LANE 5/-	HINDLEY GREEN	94	25	SWAN LANE BRICK & COAL Co. HINDLEY GREEN
" 3/-	"	56	17	"
LOW HALL Nos 4 & 5	WIGAN	342	144	MOSS HALL COAL Co. LTD
" 6	"	273		"
" 7 & 8	"	88	15	"
MAINS No 1	WIGAN	228	59	CROSS, TETLEY & Co. LTD BAMFURLONG
" 2	"	362	78	"
MAYPOLE Nos 1 & 2	WIGAN	156	94	CROSS, TETLEY & Co. LTD BAMFURLONG
MEADOW	HAIGH	190	44	WIGAN COAL & IRON Co.
MEADOWS	WIGAN	159	59	LAMB & MOORE, WIGAN
MIDDLE PITS	ASHTON	231	36	GARSWOOD COAL & IRON Co. LTD
MOOR No 5	ASPULL	79	21	WIGAN COAL & IRON Co.
MOSS No 1	WIGAN	278	28	PEARSON & KNOWLES COAL & IRON Co. LTD
" 2	"	196	24	"
" 3	"	391	40	"
" 4	"	361	38	"
" 5	"	118	25	"
" 6	"	591	68	"
NEWTOWN	WIGAN	44	12	LAMB & MOORE, WIGAN

NORLEY No 2	WIGAN	242	38	S.W. HIGGINBOTTOM,
" 3	"			NORLEY COLLIERY WIGAN
NORLEY No 4	WIGAN	206	33	ORRELL COAL Co. WIGAN
" 5	"	122	24	"
NUTTALL	WIGAN	9	6	BLACKLEDGE BROS CHANCERY ST. WIGAN
ORRELL No 2	WIGAN	155	51	ORRELL COAL Co. WIGAN
" 3	"	156	62	"
" 6	"	7	3	"
PARK	WIGAN	16	9	CROMPTON & SHAWCROSS
PEMBERTON HOUSE	WELCH WHITTLE	161	22	JAMES BARKER & SONS WELCH WHITTLE CHORLEY
PENNYGATE	HINDLEY	2	2	WIGAN COAL & IRON Co.
PEWFALL Nos 3 & 4	ASHTON	147	26	RICHARD EVANS & Co.
PROSPECT Nos 1 & 2	STANDISH	280	61	WIGAN COAL & IRON Co.
QUEEN PIT	WIGAN	505	35	JONATHAN BLUNDELL & SONS
ROBIN HILL	STANDISH	3	4	WIGAN COAL & IRON Co.
ROSEBRIDGE	WIGAN	143	51	LATHOM BROS. ROSEBRIDGE COLLIERY
SEVEN FEET	WIGAN	211	90	CROMPTON & SHAWCROSS
SNYDALE HALL	WESTHOUGHTON	61	15	WESTHOUGHTON COAL & CANNEL Co. LTD
STONEHOUSE	WIGAN	16	2	JOHN SCOWCROFT & Co. LTD HINDLEY GREEN
THE PARK No 1	ASHTON	353	69	J. & R. STONE, ASHTON
" 2	"	377	95	"
TRAFFORD	WIGAN	258	100	CROMPTON & SHAWCROSS
VICTORIA	WIGAN	30	61	WIGAN COAL & IRON Co.
VICTORIA	BICKERSHAW	272	55	VICTORIA COLLIERY Co. LTD
WELCH WHITTLE	WELCH WHITTLE	274	95	BLAINSCOUGH COLLIERY Co. LTD
WESTHOUGHTON No 4	BLACKROD			WILLIAM WOODS & SONS SCOT LANE COLLIERY
" 6	"	183	77	"
" 7	"			"
WESTHOUGHTON NEW Nos 1 & 2	WESTHOUGHTON	428	91	WESTHOUGHTON COAL & CANNEL Co. LTD
WESTHOUGHTON DIAMOND COLLIERY	WESTHOUGHTON	21	10	WESTHOUGHTON COAL & CANNEL Co. LTD
WIGAN JUNCTION	WIGAN	262	87	WIGAN JUNCTION COLLIERY Co. LTD, ABRAM
WOODSHAW	ASPULL	105	21	WIGAN COAL & IRON Co.
WORSLEY MESNES Nos 1 & 2	WIGAN	878	207	WORSLEY MESNES COLLIERY Co.
WORTHINGTON HALL Nos 1 & 2	WIGAN	116	30	WORTHINGTON HALL COAL & CANNEL Co.

LIST OF COLLIERIES IN 1918

Colliery	Parish	Numbers employed		
		below	above	
ABRAM Nos 1 & 2	BICKERSHAW	342	74	ABRAM COAL Co. LTD
" 4	"	490		"
" 5	"	318	300	"
CHESHIRE HOLES	WIGAN	7	4	E.R. BIBBY 1 CHERRY CROFT, WIGAN LANE
BIRCHLEY	BILLINGE	25	11	BILLINGE COLLIERIES LTD
BROWN HEATH	BILLINGE	94	38	BILLINGE COLLIERIES LTD
BIRKACRE No 1	CHORLEY	132		BIRKACRE COLLIERY Co. LTD
" 2	"	110	90	"
GAUNTLY No 1	BILLINGE	174	76	BISPHAM HALL COLLIERY Co. LTD
" 2	"	35	9	"
MOUNTAIN	UPHOLLAND	124	22	"
ROGER SHALE	BILLINGE	26	5	"
BLAINSCOUGH	COPPULL	304	102	BLAINSCOUGH COLLIERY Co. LTD
WELCH WHITTLE	WELCH WHITTLE	290	107	"
BRYNN HALL No 1	ASHTON	27	17	BRYNN HALL COLLIERY Co. LTD
" 2	"	143	55	"
" 3	"	179	47	"
" 4 & 5	"	13	12	"
MOOR ROAD	CHORLEY	174	67	CHORLEY COLLIERY Co. LTD
GRANGE Nos 1 & 2	WIGAN	319	78	CROMPTON & SHAWCROSS
HINDLEY HALL	"	-	19	"
STRANGWAYS HALL (Dukes)	"	463		"
(Trafford)	"	395	285	"
BAMFURLONG No 1	"	168	53	CROSS, TETLEY & Co LTD
" 3	"	386	119	BAMFURLONG
" 4	"	302	95	"
MAINS No 1	"	391	81	"
" 2	"	309	53	"
ELLERBECK Nos 1 & 2	COPPULL	716	149	ELLERBECK COLLIERIES LTD
DUXBURY PARK	CHORLEY	11	10	"
EDGE GREEN	GOLBORNE	313	55	EVANS & Co. LTD
LILLY LANE	"	42	6	"
GOLBORNE Nos 1, 2 & 3	"	857	122	"
INCE PIT	ASHTON	95	16	GARSWOOD COAL & IRON Co. LTD
LONG LANE No 1	"	583	110	"
" 2	"	832	156	"

DEEP PIT Nos 1,2 & ASHTON 3		907	265	GARSWOOD COAL & IRON Co. LTD
MIDDLE PIT	"	154	46	"
GARSWOOD HALL No 2	"			GARSWOOD HALL COLLIERIES LTD
"	3	799	253	"
"	"			"
"	6	1589	341	"
"	7			"
HINDLEY FIELD	WIGAN	342	94	HINDLEY FIELD COAL Co. LTD THE GRANGE, HINDLEY
INCE HALL	WIGAN	60	20	INCE HALL COLLIERIES LTD MANCHESTER RD. HIGHER INCE
LOSTOCK LANE	WESTHOUGHTON	236	87	LOSTOCK COLLIERY Co. LTD WESTHOUGHTON
LOW HALL No. 4	WIGAN	322		MOSS HALL COAL Co. LTD
"	5	138		"
"	6	162	272	"
"	7 & 8	56		"
MAYPOLE Nos 1 & 2	"	834	208	"
ORRELL No 3	"	358	111	ORRELL COLLIERY LTD
"	4 & 5	306	76	"
CHISNALL No. 1	COPPULL	376	115	PEARSON & KNOWLES COAL & IRON Co. LTD
"	2	580	117	"
MOSS No. 2	WIGAN	250	120	"
"	3	392	131	"
"	4	92	125	"
"	5	259	116	"
"	6	430	130	"
PEMBERTON BYE PIT	"	7		PEMBERTON COLLIERY Co. LTD
"	KING PIT	1133		"
"	PRINCE PIT	441	677	"
"	QUEEN PIT	441		"
DOUGLAS BANK NORTH	"	741	201	ROSEBRIDGE & DOUGLAS BANK COLLIERIES Co. LTD
"	SOUTH			
SCOT LANE No. 4	BLACKROD	533	108	SCOT LANE COLLIERY Co. LTD
"	5			
HINDLEY GREEN	WIGAN			J. SCOWCROFT & Co. LTD THE GRANGE, HINDLEY
Arley Spring Pit	"	221	44	"
Arley Yard Pit	"	243	48	"
Grammar Pit	"	186	46	"
Springs Six Feet	"	142	23	"
California and Engine Pits	"	200	42	"
PARK No 1	ASHTON	270	110	J. & R. STONE LTD GARSWOOD
"	2	356	120	"
"	4	29	11	"
SWAN LANE	WIGAN	432	87	SWAN LANE COLLIERIES LTD

BROOKSIDE	WESTHOUGHTON	154	133	UNSWORTH & COWBURN
CARR COMMON	HINDLEY GREEN			
STARKIE	WESTHOUGHTON	165	30	WESTHOUGHTON COAL & CANNEL Co. LTD
WESTHOUGHTON Nos 1 & 2	"	568	124	"
ALEXANDRA	HAIGH	236	81	WIGAN COAL & IRON Co.
BROOMFIELD	STANDISH	7	9	"
LANGTREE	"	277	72	"
CRAWFORD Nos 1 & 2	ASPULL	3	8	"
EATOCK Nos 1 & 2	WESTHOUGHTON	356	78	"
GIANTS HALL	STANDISH	200	72	"
GIDLOW	"	1	17	"
HEWLETT Nos 1 & 2	WESTHOUGHTON	389	78	"
JOHN	STANDISH	251	54	"
LINDSAY Nos 1,2 & 3	HAIGH	233	61	"
MEADOW	"	312	72	"
WILLIAM	"	-	2	"
MOOR No. 5	ASPULL	176	53	"
ASPULL PUMP	"	14	7	"
PROSPECT 1 & 2	STANDISH	4	16	"
TAYLOR	"	129	43	"
VICTORIA 1 & 2	"	640	118	"
WIGAN JUNCTION	WIGAN	177	24	WIGAN JUNCTION COLLIERY Co. LTD
LEYLAND GREEN	"	615	150	WINSTANLEY COLLIERIES Co. LTD
WORSLEY MESNES 1 & 2	WIGAN	605	250	WORSLEY MESNES COLLIERY Co. LTD

THE WIGAN COALFIELD IN THE TWENTIETH CENTURY

As a productive centre, the Wigan Area began to reach its apex in the early years of the twentieth century and possibly was at its best between the years 1906 to 1914. The expansion in the early years was a natural consequence of the increase in demand, and the contraction which set in during the 1914-18 war was a consequence of the exhaustion of the better seams in the more easily accessible areas.

During this era coal was got by hand and individual small Colliery Company fortunes fluctuated rapidly as coal was won and lost through hazards such as underground water and geological problems.

After the First World War there was a gradual drift towards machine mining; steel roof supports gradually replaced wooden supports and steel pit tubs replaced wooden ones. Pit ponies were replaced by mechanical haulage and electric safety lamps were gradually introduced.

The general trend of industrial enterprise was consistently progressive throughout the lives of the various collieries and at most of the collieries, mining machinery was introduced and efforts were made to keep such machinery in line with the latest developments. An example of this was experimental development of the Meco-Moore Cutter Loader at Chisnall Hall Colliery, Coppull, in 1933.

The Wigan Coal & Iron Co. Ltd., the Pearson & Knowles Coal & Iron Co. Ltd and the Garswood Hall Colliery Co. Ltd had close connections with iron and steel firms, and certain developments at the collieries were intimately linked with those of the iron and steel industry.

The collier in those days had to purchase all his tools for his work, such as picks, spades, hammer, wedges, powder, tallies, lamps and oil. There was usually a stores shop in the village where all these were kept. The collier would make cartridges from brown paper at home and fill them with loose powder. If the drill holes were damp in any way he would collect grease from axle boxes and smear the cartridges with it as protection.

In the year 1930 the Wigan Coal & Iron Co. Ltd and the Pearson and Knowles Coal & Iron Co. Ltd merged to form the Wigan Coal Corporation Ltd and this was the largest group in the Wigan area.

Gradually the capital expenditure on the collieries decreased, and little was spent even after the above amalgamations had taken place.

This was the position in 1947 when, as we all know the coalmines were nationalised. The progress of the Wigan area after Vesting Date, when it was known as the No. 2 (Wigan) Area, is told in the next section

(55)

THE WIGAN COALFIELD AFTER NATIONALIZATION

When the coal mines were nationalized in 1947 the number of collieries in the Wigan Coalfield was 17, these varying widely in size.

The statement below indicates the size of the collieries with relation to the average weekly output on a saleable basis.

Tons per week saleable

UNDER 1000	-	ELLERBECK
OVER 1000 and under 2000	-	JOHN, ALEXANDRA and ALBERT
" 2000 " " 4000	-	GIANTS HALL, WELCH WHITTLE and MAINS and WIGAN JUNCTION
" 4000 " " 6000	-	VICTORIA and ANMOSS
" 6000 " " 8000	-	CHISNALL HALL and MAYPOLE

The other collieries in the Wigan Area were; Summersales colliery at Pemberton, Albert pit at Bickershaw, Garswood Hall, Landgate, Long Lane and Park.

Standards of Mining Techniques

The majority of the working was Advancing Longwall. Machinery for coal cutting and conveying was used extensively and a number of the collieries were approaching 100% mechanization. The technique of the mining system employed was comparable with any other advancing longwall system in areas where similar geological difficulties are presented.

In the early days of Nationalization, at a few points, the American system of pillaring with subsequent pillar extraction was adopted but it cannot be claimed that this system was new as the Wigan area is honeycombed with isolated patches of coal which have been cut out into pillars with a subsequent total or partial extraction. The area being excessively faulted, and, coupled with the extraction of the seams which has proceeded practically over the whole area in so many horizons, seemed to preclude future development by the horizon methods, except for perhaps limited patches of coal.

Effects of the War-time control

Probably the main effect of the War in the Wigan area, was to restrict generally, and in a few instances to stop completely all development work. The effects of this was to increase the difficulty of individual to maintain anything like a consistent output now that the reserves they held in the early days of the War were exhausted. Minor development proceeded at all the collieries, extraction followed immediately behind and it was a considerable time before the pits could be got into such a position as to have reasonable reserves in hand.

Competitive Industries

During the War years, all industries which started locally were mainly of a munitions character. Since the War the above premises have been turned to produce various types of goods; a case in point is the Bradley Munitions Works at Standish, one part of which has been turned to rayon and nylon works and the other part

to canned food preparation. (Heinz)

In Hindley Green, a large works has been erected to manufacture asbestos goods and also rubber belting etc. (Turner Brothers Asbestos)

Between Wigan and Bryn a large new factory was erected. This one built to manufacture rayon goods for Messrs. Courtaulds.

In the Pemberton area a number of new premises have been erected to tender for light industries of various types.

The most serious competitors for labour from the No. 2 (Wigan) area of adult mining personnel were the two neighbouring areas, the No. 1 (Manchester) and No. 3 (St. Helens).

Water Problems

Underground water presented a serious problem in most of the area and over many years much thought has been given to devising methods of control.

The Great Haigh Sough was an important contribution to the solution of the Underground water problem in the extensive cannel workings of the Haigh and Aspull districts.

More recent work was the plugging of shafts to safeguard existing workings, and to concentrate the make to central pumping stations at which it can be more efficiently and economically controlled. Such central pumping stations were at Victoria Pit in the No. 1 Sub Area, Maypole, Low Hall shaft and Ince Moss in the No. 2 Sub Area.

Particular care was required in many of the workings and all new development required careful investigation to ensure that no danger of breaking into water-bearing old workings could arise. Exercise of the special precautions against the risk was carried out in all known or doubtful cases.

Following heavy rain, several of the shallower collieries, for instance, Alexandra and Welch Whittle, were extremely wet. On occasions this caused much discomfort and inconvenience to the employees, as well as introducing difficulty in strata control, the roof, floor and sides of the workings frequently being saturated to the extent of being water-logged.

The quantity of water pumped in the Sub Areas varied with the seasons, but the average weekly quantities during 1947 are given below; -

<u>No. 1 Sub Area</u>	<u>No. 2 Sub Area</u>
18,071,830 gallons	13,002,400 gallons

The gradient at the Northern end of the Coalfield is relatively easy but to the South and East of Wigan increases considerably, being probably at its maximum at the Maypole and Wigan Junction collieries where gradients of 1 in 3 and even 1 in 2½ were not infrequent.

The strata conditions were varied. In certain parts of the Area and in certain mines there was little or no convergence on the roadways and to a very limited extent on the faces. In other parts of the Area, convergence both on roadways and faces was much more pronounced. This increase in convergence rate seemed to have some relation to the depth of the workings but it is possible that it was more pronounced in steeper measures, from the experience gained

at the Maypole and Wigan Junction collieries. This feature seemed to obtain both in roadways and faces, wide work areas and strait roads of pillaring areas.

At nationalization there were, as has been said, 17 collieries operating in the Wigan area. In addition three new installations were put into action to work coal in areas previously unworkable due to excessive water makes but, since Vesting Date, cleared of this problem by efficient pumping. These installations were, in order of opening, Standish Hall Drift (1950), Robin Hill Drift (1953), and Dairy Colliery, which was a former Wigan Coal Corporation colliery, closed down before 1 . 1 . 47 but re-opened in 1954.

However, in the early 1950's the signs of exhaustion and run-down of the Wigan Coalfield became evident. In April, 1955, John Pit near Wigan closed down, closely followed by Long Lane in April, 1955 and Alexandre in June, 1955. The next collieries to close were Victoria (June) and Garswood Hall (August) both 1958. In March 1959 Maypole closed along with Welch Whittle in December of that year and in 1960 Mains, Park (both June) and Lendgate (Sept) were shut down. Giants Hall and Standish Hall collieries in January and July of 1961 closed next followed by Wigan Junction in May 1962, Dairy and Moss in November 1962 and Robin Hill in November 1963. The last four collieries to close were Ellerbeck in August 1965, Albert, November 1965, Summersales in March 1966 and the last of all Chisnell Hall in March 1967.
