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Editorial

This is the third issue of the new style Journal and I am pleased that members are still submitting a wide range of articles for it. It is almost getting to the point where I won't have to twist any arms in future!

You will find a wide range from the academic to the practical and this is exactly how it should be. Our Club is strong because we have members with wide ranging interests and skills and it is by pooling them all that we have obtained the successes that we have had.

It is also satisfying to see that the interest in non-metalliferous mining is continuing. In the past, we have perhaps been guilty of concentrating on the South West Shropshire metal mines whereas these were only a small part of mining in the county. Several people (members and non-members) are currently working on producing histories of the Coalbrookdale, Forest of Wyre, Clee Hills and Shrewsbury Coalfields. We hope that these will form future Accounts.
One area where we are glaringly lacking in knowledge, however, is the coalfield around Oswestry and it is good to see an article from Ivor that suggests the way forward for a researcher. Isn't there a member out there who can take up the challenge and start to put together a history of this coalfield?

This is not to say that we are ignoring metal mines! Several projects are under way including an update of Account 12 and Accounts on Clive Mine and barytes mining in Shropshire.

As well as recognising authors of articles and Accounts, it is also appropriate to acknowledge the unseen work carried out by members to get the Club publications printed and bound for you to enjoy. Several members help in this but we should especially mention Nick Southwick and Mike Moore who have spent many a night walking round a table collating a publication while fighting off the effects of a fierce curry.

Read on and enjoy this year's offering.

Adrian Pearce

Surface Mining Remains in Shropshire

The following list was drawn up from information provided by several members for delegates at the 1995 NAMHO Conference. It is reproduced here so that Club members can also benefit. It excludes several sites of a sensitive nature.

1. COALBROOKDALE COALFIELD

Bottomcoal Colliery (SJ68130200)
The remains of a brick powderhouse stand beside the road.

Colliers Side Limestone Quarry (SJ735165)
The flooded quarry hides underground limestone workings. The Nook (SJ734165) is now a long black and white house north east of Barrack Lane and it is the last remaining 18th century barrack block built for quarry workers. Further up the lane is the house mis-named "The Barracks" which was actually the quarry stables. At SJ734164 are a bank of three limekilns served by a tramway. Immediately on the left of the tramway path are two of the kiln shafts, 7.6m deep surrounded by barbed wire. Some 50m further down the path are the remains of a much larger kiln and a tunnel.

Dawley Parish Church (SJ687064)
Here you will find the communal grave of eight miners who were killed in a shaft accident at Springwell Pit in 1872.

Grange Colliery (SJ721114)
Following the A5 east from Limekiln Bank roundabout, the tandem headgear of Grange Colliery can be seen on the left. Be careful if you visit this site as it is used by very aggressive nudists who react violently to the sight of cameras!

Muxton Bridge Colliery (SJ722133)
The remains of this colliery, which acted as a central pumping station for the area, are now in the Granville Country Park. The main remains are the rotative beam pumping engine house and a very large horizontal winding engine house.

Lloyds Pit (SJ689030)
The fenced pumping shaft is open and the top of the wooden pump rods can just be seen, as well as the recess for the balance bob. Only the foundations of the pumping enginehouse remain.

Madeley Wood Colliery (SJ713055)
The pithead baths, canteen and office still remain.

New Works (SJ660090)
In this area are the rounded humps of old bellpits.

Pitchcroft Limestone Mine (SJ739172)
The main dump is to the south-east of the A518 and covered with trees. A fenced off area on the summit protects the twin drawing shafts, now flooded 18m down. To the south of the dump are the holding down bolts for the last engine.

St Michael's Church, Madeley (SJ696041)
To the rear of the church is a mosaic tombstone under a tree close to the back wall. This commemorates 8 year old Arthur Turner who died at Meadow Pit in 1906 when he went to rescue his younger brother who had fallen into a ditch of boiling water (drained from the pit boilers). His mother was a mosaic worker at Maws Tile Works and made the tombstone herself. Nearby is the communal grave of nine miners who were killed in Brick Kiln Leasow Pit in 1864. The top of the vault is cast iron with a ridge for each miner but the headstone inscription is sadly becoming eroded.

Tuckies Pit (SJ693024)
Following the road past the Boat Inn and, just before a railway bridge, a pumping enginehouse can be seen incorporated into houses on the right.

2. OSWESTRY COALFIELD

Ifton Colliery (SJ321375)
The site is now used by other firms but a number of old colliery buildings still remain, including the pithead baths and office block. A small coal tub mounted on rails has been preserved as a memorial to the mine and the miners welfare building still survives in the village. If you feel active, the line of the old mineral railway can be followed to its junction with the main line at Preesgweene.

3. SHREWSBURY COALFIELD

Nags Head Colliery (SJ40850637)
A pumping enginehouse has been converted into a dwelling and can be viewed from the main road at Pontesford. The boiler house was incorporated into the local blacksmith shop which was built onto the west wall. The remains of another pumping enginehouse (SJ40830644) is situated opposite the Rea Valley Tractors garage, in a clump of trees

Pontesford Colliery (SJ40960669)
A pumping enginehouse has been incorporated into two cottages.

4. NORTH SHROPSHIRE OREFIELD

Clive Copper Mine (SJ51392386)
"Mine House" was the old manager's house and in front of it is a stone building built over the pumping shaft. The latter was converted to a well when the mine closed and the building once contained a steam engine to operate pumps in the shaft.

5. CLEE HILL COALFIELD

Brown Clee Hill (SO595865-SO595845)
In this area are the rounded humps of old bellpits dating back to the 13th century.

Catherton Common (SO620780)
In this area are the rounded humps of old bellpits dating back to the 13th century.

Cornbrook Sough (SO603756)

This was a drainage level from Cornbrook Colliery but it also unwatered several other smaller pits on the way. It is gated and used as a water supply so no access is possible.

6. FOREST OF WYRE COALFIELD

Alveley Colliery (SO752842)
The large tips have been landscaped to form the Severn Valley Country Park and the colliery site is now an industrial estate. A number of buildings remain, including the lamp room, pithead baths, offices, workshop and weighbridge. A visitor centre in the park has a small display with photographs, plans and a mine truck. The bridge linking the colliery to the screening plant over the river was the first bridge in the country to be constructed by cantilever methods. At either end of the bridge are pylon bases for the aerial ropeway and, on the ground on the Highley side, the remains of an angle station and return wheel which were part of the rope-worked tramway. A footpath follows the route of the old tramway to the site of the screening plant, now a picnic site.

Billingsley Colliery (SO717843)
The site is on private land but can be viewed from the road. Most of the red brick buildings date from just before the First World War and include the mine office, weigh house, power house, workshops and garage. To the south are the remains of an incline which led to the screens.

Highley Colliery (SO747830)
The colliery offices are now houses and the bulk of the site has been turned into a country park. A winding wheel erected in 1994 as a tribute to local miners came from Bagworth Colliery, Leicestershire. The incline which linked the colliery to sidings at Highley Station is now a footpath.

The Deserts (SO707842)
A large area of collapsed bellpits can be found in a wood.

7. SOUTH WEST SHROPSHIRE OREFIELD

Bog Lead Mine (SO358978)
The site is owned by the County Council and they have placed some interpretation boards near the car park. The magazine is intact and next to it is the grilled Somme Tunnel. Most of the other buildings are now only foundations. At SO360979 are the remains of an aerial cableway terminal which carried barytes 5 miles for treatment at Minsterley.

Central Snailbeach Lead Mine (SJ368016)
The winding enginehouse has been converted into a private dwelling. This and the stub of the square chimney can be seen from the road. If there is a car parked at the house, call and ask the owner if you can see the Lancashire boiler preserved in situ inside the house. He doesn't mind showing it to interested people.

Cothercott Barytes Mine (SJ409002)
The foundations of the crushing mill remain beside the road with some of the burr stones. The course of a light railway can be followed to where the main mine lay in the next valley to the east.

East Grit Lead Mine (SO327980)

The winding enginehouse at New Engine Shaft is fairly intact but the pumping enginehouse at Old Grit Engine Shaft only consists of one wall.

East Roman Gravels Lead (SJ336002)
Most of the buildings have been completely destroyed, with the exception of a stump of the square chimney near the road.

Huglith Barytes Mine (SJ403015)
Adjacent to the main shaft are a number of remains, including the engine bed for an electric winder and a large metal chimney which has fallen onto its side. A modern brick building appears to have contained an electrical transformer and an older blacksmiths shop is sited nearby.

Ladywell Lead Mine (SO328992)
The winding enginehouse stands beside the road and is almost complete.

Pennerley Lead Mine (SO352989)
There are remains of enginehouses and other buildings on either side of the road.

Pontesford Smelter (SJ409062)
The remains can be seen from the road and are now used as farm buildings.

Roman Gravels Lead Mine (SO333999)
Large tips can be seen beside the road but most other features have been destroyed. On the hillside are several hushes, reputed to be of Roman origin.

Snailbeach Lead Mine (SJ375022)
The surface buildings rank amongst the best in the country. Shropshire County Council own most of the buildings and are preserving them. Leave your car in the car park at the bottom of the mine tips and walk up the hill to the mine. Of the many features, the most impressive are the locomotive shed, orehouse, crusher house, office, blacksmiths shop, George's Shaft & engine houses, Day Level, compressor house & chimney, Black Tom shaft & engine shed, candlehouse, Lordshill Shaft & engine houses, Lordshill chimney, magazine, Perkins Level, Chapel Shaft & engine house.

Stiperstones Smelter (SJ411064)
The building can be seen by the side of the road, now used by a firm called Wynnstay.

Tankerville Lead Mine (SO355995)
The remains of the enginehouse and square chimney can be seen from the road.

White Grit Lead Mine (SO319980)
The remains of the enginehouse can be seen by the side of the road and the magazine is opposite.

Wotherton Barytes Mine (SJ277005)
The old pumping and winding enginehouse is in good condition and can be seen from the road. A dwelling was built onto the side after the mine was abandoned.

Mines of the North Shropshire Coalfields - Some Sources of Information

Ivor Brown

Shortly after nationalisation, surveyors from the new National Coal Board produced a map of Shropshire showing the locations of all known mines (coal and metal) from its own records, as well as the Abandoned Mines Catalogues for 1929-39 and evidence from official maps. These locations were marked on a One Inch OS map gridded into 440 yard squares, with every square that contained a mine entrance or known area of working being outlined. The portion of the map for the North Shropshire coal mining area is shown at Fig.1 with the names of principal towns, roads and mines added.

The map clearly shows three main areas of working, with a few outlying mines or trials. It is, however, indicative only since many workings were never recorded. The mines in each area are shown in the following list with some notes and probable sources of further information. The information available from Thomas, Lerry and Wedd (see list of references) usually provides ownership, precise location, general geology and an indication of surviving features, buildings, tramways, railways and canals. Being chiefly in a rural area, there are many surviving features but there have been some recent losses. No modern survey of the industrial buildings is known but consultants for English Heritage are at present looking at this.

Among possible survivals are the Miners Institutes at Ifton/St Martins and Weston Rhyn, the Chaltermasters' Rooms in local pubs, eg Efel Inn at Trefonen and Hen & Chickens at Drill (chaltermaster was a local name for chartermaster or butty and his room, often called the Rogue's Hole, was where he distributed the miners' wages on a Saturday night). Other remains include cottages, converted mine buildings, waste heaps, tramways and canals. The miners institute for the St Martins miners was said to be one of the finest. Built in 1931, it had rooms for reading, games and billiards, a hall for entertainments and dancing and a library. Outside there was a bowling green and two hard tennis courts.

Geologically, the mines are considered to be in two separate coalfields, those from Daywall northwards are in the Denbighshire Coalfield (southern part) and those south of Oswestry are in the Oswestry Coalfield proper. In the following list, the mine abandonment plans are in order of location, the date of abandonment is shown in brackets, eg (AP 1890). The date may not be the date of closure since it could indicate the cessation of work in a seam or be the date the plan was sent in, some years after a mine stopped production.

1. St Martins area (see Ref 2)

    a) Chirk Bank. Believed to be the scene of a canal embankment collapse in 1816, it dammed the river downstream causing the flooding of many pits in the valley. No lives were lost but the horses perished.

    b) New Chirk Bank.

    c) Flannog. Northernmost mine in Shropshire, may have been a trial only.

    d) Ifton Rhyn Nos.1 & 2. Listed in 1860, Lord Trevor's "St Martins Pit". Was standing in 1891, shafts 210ft deep.

e) Ifton No.3 (Brynkinalt Colliery). Originally a shallow sinking in 1871, closed before 1891, re-opened and deepened as Gertrude Pit about 1914. Produced

Fig.1 - Colliery Workings in North Shropshire

coal from 1921. Largest pit ever in Shropshire in 1928 (1,350 men). Again deepened in 1940s to Main Seam at 500yds, employed 1,250 men in 1960, closed in 1968 (numerous plans available in Coal Authority Collection).

2. Weston Rhyn area (see Refs 1 & 5)

a) Lodge or Preesgwyn, Furnace, Hall. Listed in 1860, also in 1891 (shafts 525ft and 354ft deep), furnace ventilated, used ponies and donkeys for haulage. Connected to the railway, closed about 1890 (AP 1890 - plans nos. 2710, 14905).

b) Moreton Hall Nos.1 & 2, Hall, Preesgwyn. Connected to canal and railway (see Ref.6) by tramway. 160yds deep to Main Seam (AP 1867, 1871 - plan nos. 14642, 14904).

c) Quinta or Trehowell. Listed in 1860, 37yds down to Main Seam (AP 1878, 1889 -plan nos. 1118, 2361).

3. Whittington area (see Refs 1 & 5)

a) Daywall. Two shafts sunk 1875-76, 330ft deep, it is believed that they never produced coal. Several more recent borings for coal have been made in this area.

4. Oswestry area (see Refs 5 & 7)

a) Allmands (Coed-y-Go) [near Llywnynymaen] No.1 & 2 (Savins, New or British), Nos.3, 4, 5, 8, 9, 10, 11, 12, Clays No.3, Dog, Old Dog, Dongey, New, Partridge or Gate, Rogers, Speedwell. Many pits in this complex opened by the Croxons and others in 1820s and 1830s. Listed in 1860 as "British", shown as "coal pits" on 1840s OS map (AP 1865, 1867 - plan no. 14903).

b) Drill, Sweeney, Gronwen (Barnfield). Gronwen sunk c.1836, Sweeney 1842 or earlier, became the most important pit in later years in Oswestry area employing about 100 in 1860s. Tramway to canal at Redwith. Listed in 1860, closed 1879. Brick and tile works adjoined. Sweeney was most easterly shaft in the coalfield and is shown on 1840s OS map (plan no. 15009).

c) Old Gronwen [south of Llywnymapsis Farm]. Leases of colliery survive dated 1730, still working in 1808. Brick and tile works adjoined.

d) Gwerni. 250yds south of the British Shaft (see Allmands above) in a fault zone, only reached the shallowest seam.

e) Hen & Chickens. Near Drill Colliery and close to an inn of that name (now closed?).

f) Llywynymaen. At least 140 colliers employed in 1798, only colliery in whole of Shropshire fully named on Walkers Map 1830, further 2 unnamed pits close by. Closed about 1840 due to flooding.

g) Penylan [near Penylan Mill]. Sunk by Croxons about 1825, had to close about 1850 when water from flooded Llywynymaen Colliery rose and flooded it. Still listed in 1860s.

h) Pwll-y-Glouge. Sunk during early working of Trefor Clawdd Colliery.

i) Radfield [west of Llywnymapsis Farm].

j) Roberts [near Llywnymapsis Farm]. Part of Drill Colliery complex, close to an important fault.

k) Trefor Clawdd. At least 70 colliers employed in 1798, several old shafts, owner supplied food to miners during 1801 famine, closed 1830s.

l) Trefonen No.1 & 2. Last substantial pit to close in Oswestry area about 1890 (AP 1891).

m) New Trefonen [north of Trefonen village, lose to Poverty Cottages]. Opened 1881, closed 1891 (AP 1886 - plan no. 2619).

n) Old Trefonen. Listed in 1860, working in 1869, closed finally in 1886 due to flooding (AP 1880).

o) Tan-y-Coed, Tynycoed. This was one of the old Trefor Clawdd pits, it is said to have worked cannel as well as coal and was "drowned out" about 1820.

Two other documented sites (see Ref 7) during the 1780s to 1830s were :-

p) Llwynymapsis. This was between Sweeney and British pits. Two members of the owning family, both solicitors, were hanged for forgery in 1789.

q) Tynytwmpath. A very old pit still being leased but not working in the 1870s.

Buildings from both (p) and (q) survived in the 1940s as housing and outbuildings (Thomas 1939). They may still survive.

Full shaft sections are available in Ref 5 for Preesgwyn 588ft, Moreton Hall 640ft, Daywall 330ft, Coed-y-Go (Sewins Shaft) 343ft and Drill (Sweeneys Shaft) 503ft. Individual seam depths are available for many other shafts. Wedd (Ref 5) also describes the location and geology of the following collieries, pits and shafts: Barnfield, British, Chirk Bank, Clays, Coed-y-Go, Daywall, Dog, Drill, Gate, Gronwen, Gerni, Hen & Chickens, Llwynynymaen, Lodge, Moreton Hall, New, New Trefonen, Old Trefonen, Partridge, Penylan, Preesgwyn, Quinta, Roberts, Savin's New, Sweeney, Trefor Clawdd, Trefonen, Tynycoed. He makes reference to Ifton and Ifton Rhyn but this northern area is covered by the Memoir and Sheet "The Country around Wrexham".

The abandonment plans (AP) and other deposited plans may now be inspected, along with an up to date catalogue, at the Coal Authority, Mining Records Dept, Bretby Business Park, Ashby Rd, Burton-on-Trent, Staffs DE15 0QD. Tel (01283) 553463. Note that the mine names on the

plans are often spelt slightly differently, but recognisably with, the names of places on modern maps.

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The Coalbrookdale Coalfield

David Coxill

Geology

The Coalbrookdale Coalfield, centred on the new town of Telford, stretches some 15km from Linley in the south-west to Lilleshall in the north-east. At its broadest, it only has a width of 5km. It is fault bounded to the north by the Boundary Fault against Triassic strata; dips beneath later sedimentary rocks to the east; and rests unconformably on older strata at its southern and western margins.

The coalfield has yielded an abundance of minerals, chiefly but not exclusively from the Productive Coal Measures. The simplified structure of the Productive Coal Measures is of a series of folds that have been multiple fractured, predominantly by a series of major faults with a south-west to north-east trend. The most significant fault is the Lightmoor Fault, which has divided the coalfield into an exposed western coalfield and a concealed eastern coalfield.

After the Productive Coal Measures were laid down in the classic tropical swamps, Variscan earth movements folded the sequence and subsequent erosion removed part of the antiform (domes) of the folds before the Upper Coal Measures were deposited. This produced a sharp angular contact between the Productive and Upper Coal Measures, the famous Symon "Fault", incorrectly named because it is an unconformity. Beneath the plane of the Symon, the Productive Coal Measures are preserved in the synform (basins) of the folds. As the core of an antiform is approached, coal seams successively pitch against and are cut out by the Symon until sometimes even the whole workable succession has been removed. This has produced a localised south-west/north-east trending barren zone in the Brookside-Hinksay area of south Telford, between the Donnington Wood and Madeley synforms, which has no mines.

The deep gorge at Ironbridge, cut by escaping glacial melt waters from Lake Lapworth in late Pleistocene times, has exposed the Productive Coal Measures on either side of the River Severn between Ironbridge and Jackfield. Mineworkings and borehole evidence indicate that the Donnington Wood synform extends into Staffordshire at increasing depth due to faulting and the general north-east dip of the seams. The concealed coalfield has never been worked east of Sherrifhales.

Mining History

The earliest evidence of exploitation comes from the discovery of coal that is believed to have come from this coalfield in the central heating system beneath the baths in the Roman city of Viriconium, near Shrewsbury. The Romans certainly would have come across coal when they were constructing their military highway, Watling Street (A5), in the vicinity of the Nabb at Oakengates, where the Fungous coal seam outcrops.

The first known record of mineral working comes in 1250 when Phillip de Benthall granted the Buildwas monks the right of way over his estate for the conveyance of coal and ironstone. Mineral extraction would have led to the progressive deforestation of the area to be worked. This was apparently considered a problem from an early date for a proclamation was issued in 1308 prohibiting the use of coal as a fuel, to safeguard the interests of the timber growers. How much emphasis was given to enforcing these early laws is not clear, for 14 years later the

Wenlock Prior granted Walter de Colebrook a license for "the digging of coles at the Brocholes (Madeley)" on the payment of six shillings a year.

By the 16th century, ironstone extraction from near surface outcrops was widespread, supporting the iron making industries of the Ironbridge Gorge and adjacent areas. Coal extraction was also widespread but on a small scale. In 1535, Wombridge Priory recorded an annual income of five pounds from one of their mines and in 1541 the Wenlock Priors had a "mine of ironstone" valued at £2.6s.1d. Coal mining continued to expand in the 17th century and Treasury records show that Coalbrookdale produced 95% of the entire output in Shropshire. It was, however, Abraham Darby's successful use of coke instead of charcoal to smelt iron in 1709 at his Coalbrookdale ironworks that provided the catalyst for rapid expansion of coal and ironstone mining in the area. He was fortunate in that the Coalbrookdale coals, particularly the Clod Seam, were low in sulphur. It was this coal seam that was much sought after by the miners of the early industrial age, often to the initial exclusion of the others. Had the coals been high in sulphur, like those experimented with earlier by Dud Dudley of Dudley, his experiments would have failed.

Coal and ironstone were initially mined from seams that outcropped near to the surface in the southern and western areas, particularly around Ironbridge. As these eventually became exhausted, mining generally moved to the northern part of the coalfield. A copy of the lost original plan of Donnington Wood Colliery, dated 1788, shows several areas as "Coal Got" or "Worked Out"; over 100 inter-connecting shafts; two underground canal systems (at the Cockshutt and Donnington Wood) onto which coal would have been loaded directly into barges; and several staple shafts between the underground levels, through which coal from a thin seam of 18" could be transported in a thicker seam.

During this period, limestone extraction also expanded, mainly for use as a flux in the iron making process. It was won by quarries and shafts from the Carboniferous deposits at Steeraway, The Hatch, Little Wenlock, Lilleshall and Church Aston; and the Wenlock Limestone deposits at Lincoln Hill and Buildwas. Developing alongside the iron industry was an important clay industry in the southern part of the coalfield that produced tiles, bricks and ceramic products. It was during this period that the great company partnerships were formed. Well known companies including the Coalbrookdale Company, the Botfields, Madeley Wood Company and the Lilleshall Company came to dominate industrial activity in the coalfield. The last two companies were multi-industrial based and, during the 19th century, the Madeley Wood Company became the major concern in the southern half of the coalfield and the Lilleshall Company in the northern part.

Developing the coalfield led to many acts of ingenuity. Using the River Severn to transport coal by barge was adequate in the early days but, as the focus of mining moved north of Ironbridge, a more intricate system was needed. The road system was poor and solutions often involved the driving of tunnels, especially by Richard Reynolds who was described as "tunnel mad". The most innovative approach was the development of a canal system that linked the various components of the industrial process together. The forerunner partnership to the Lilleshall Company constructed the first canal in Shropshire, the Donnington Wood Canal, in the 1760s, based on the principles of the Duke of Bridgewater's first canal in Britain at Worsley.

This canal linked the limestone workings at Lilleshall with the coal and ironstone mines and iron works at Donnington Wood. It was later extended to Church Aston, Pave Lane and the Lodge Ironworks (which replaced the old Donnington Wood Ironworks). This proved an

outstanding success and more canals were built that were eventually linked up to form the Shropshire Union Canal. Locks were introduced to overcome sloping ground, which later gave way to incline planes, as at Hughs Bridge near Lilleshall and at Wrockwardine Wood. This system of transport dominated until the mid-19th century, when it gave way to the railway building mania which provided much quicker transport.

The next major stimulus to the mining industry was the invention of the steam engine, in the latter half of the 18th century, which greatly increased the pumping capacity of the mines. This led to the development of larger and deeper mines on the eastern part of the coalfield, where exploitation had previously been limited because the valuable mineral reserves lay beneath the water table. This was particularly important as the exposed coalfield was becoming exhausted. These new mines were fewer in number but the advantage of economies of scale led to vastly increased output which far exceeded that of the many smaller primitive mines of the exposed coalfield. The new mines also differed from the earlier ones by using chain instead of hemp rope and they were legally required to have two separate shafts. This followed the New Hartley Pit disaster in Northumberland where the sole shaft of a mine collapsed, causing the miners to die of suffocation. Many primitive mines bypassed this legislation by linking up underground with another mine, thereby providing more than one access.

Miners were normally employed by chartermasters, who were a kind of labour sub contractor to the mine owner. This system was often abused causing great hardship to the miners. For example, chartermasters often owned "tommy shops" where miners under their employment were required to buy their goods, often at inflated prices for poor quality products. This system came under increasing attack during the 19th century but it survived into the 20th century. The last chartermaster, a Mr Cooper, retired from Granville Colliery in 1913.

Shropshire is credited with developing the "longwall" method of mining, where all the coal is taken out in a designated panel of coal. This system eventually spread across the country and took over from the more primitive "pillar & stall" method, which left a large proportion of coal in situ acting as pillars for support. Despite this, the pillar & stall method remained in use for working ironstone, common clay and limestone. Sometimes in the search for coal, unexpected minerals would be found. The Tar Tunnel, on the north bank of the River Severn at Coalport, was driven in 1797 with the probable intention of assisting in the transportation of coal from the nearby Blists Hill Pits. The drivage hit a spring of natural bitumen and this "tar" was pumped for commercial use well into the 19th century. Part of its course now forms one of the tourist attractions at the Ironbridge Gorge Museum.

Coal production reached a peak in Shropshire in 1871, when over 1 million tonnes was produced, and ironstone production reached its zenith two years later. The actual output for the Coalbrookdale Coalfield is not known as the production figures are for Shropshire as a whole, including the other coalfields. The output of fluxing limestone from Church Aston came to an end in 1860 when the mines became flooded. Good quality fluxing limestone had long been exhausted at Lilleshall by this date. Underground limestone mining at Lilleshall finally came to an end when the Willmoor Mine, which worked the hydraulic limestone seam, closed in 1882. Limestone mining in the Steeraway and Lincoln Hill areas fared a bit better and lasted into the early years of the 20th century. The last recorded limestone mining took place at The Hatch near Steeraway in 1918.

The 20th century is a story of decline and finally termination of underground mining in this coalfield. Many pits closed through exhaustion of reserves but economics played its part. A

combination of the great depression, losses occurred during miners strikes (particularly the 1921 and 1926 strikes), manpower shortages and increased competition from the Staffordshire Coalfields led to a series of pit closures. Ironstone production ceased completely in the early part of the 20th century but clay mining remained active in the southern part of the coalfield. The last fireclay mine, The Rock, which actually lies in the northern part of the coalfield, closed in 1964.

At nationalisation, there were 3 principal deep mines remaining open - Granville and Grange Collieries of the Lilleshall Company and Kemberton Colliery of the Madeley Wood Company. A few small private pits also operated. Most of the small mines were soon closed but small private drift mining did not finish until Shortwoods Mine, near Wellington, closed in 1971. Under reconstruction, Granville and Grange Collieries merged into a single unit in 1952. After this date, the Grange shafts were used solely for ventilation purposes. Kemberton Colliery finally closed in 1967 through exhaustion and, with the closure of Granville Colliery in 1979 through heavy faulting, underground coal mining ended in Shropshire. It is thought that over 6,000 mineshafts have been sunk throughout the coalfield.

There was a renaissance of coal extraction in the 1970s in the western part of the coalfield. To the north-west of Dawley, large areas of the exposed coalfield have been opencasted for coal and fireclay, the restoration of which formed part of the major land reclamation projects associated with the development of Telford New Town in the 1970s. This continues at a reduced rate today. It is unlikely that underground mining in the coalfield will resume. Even until the 1950s there was hope that a new colliery would be sunk in the vicinity of Sherriffhales. That is now not likely to happen and, given modern day concerns for the environment, some would argue it is a blessing in disguise.

Accidents

The history of this coalfield is part of our national heritage. It helped to lay the foundations of the Industrial Revolution that provided that industrial and financial power to create the British Empire. But let nobody be under any illusion that this was achieved by anything other than much toil and misery. Working conditions were at the best grim and, although Shropshire managed to escape the great mining disasters, like at the Oakes Colliery near Barnsley where 361 men died from a methane explosion in 1866, it did not get off lightly. Mining could involve accidents in many ways such as methane explosions, roof falls, flood waters, suffocation from inhaling carbon monoxide in shallow workings, shaft collapse, chain/rope breakage, collision with equipment, etc. There are cases of intoxicated people falling down shafts and shafts unexpectedly opening up in people's homes. On an eery note, there is the tale of a young engaged girl who was picking ironstone nodules on a tip. Asked by another girl where the wedding reception was to be held, she replied "In Hell". On that note, she lost her footing and fell down a mine shaft.

The worst case of fatalities in the coalfield was at the Dark Lane Colliery, near Priorslee, in 1862 involving a shaft accident. Lodgebank Colliery, Donnington Wood, was renamed the "Slaughter Pit" after 1875 when toxic gases from an underground fire caused the death of 11 men and a horse. Against this background, it is easy to see how religion took hold on the mining community. An accident at Woodhouse Colliery, near Priorslee, in 1916 resulted in a notable act of heroism when 5 men were injured by a winding mishap. While they were being rescued a local doctor, Justin McCarthy, descended the shaft by a sling to give them medical supervision. Such conduct, beyond the call of duty, should never be forgotten and be a source

of inspiration for us all. Limestone mines were surprisingly even more dangerous then coal mines, reflected by the higher wages limestone miners received. Accidents at Church Aston and Lilleshall are recorded in 1858, 1875 and 1881, normally involving roof falls. It is surprising that no miner got killed at Church Aston in 1860
with the inrushing flood waters that led to the mine's closure. There was insufficient time to bring out the horses who were drowned, polluting the local water supplies for some time after.

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Point of Ayr Colliery - a Change in Working Methods

Adrian Pearce

The Point of Ayr Colliery, near Prestatyn in Clwyd, was the last working coal mine in North Wales at the time of going to press. It was originally sunk in the 1880s and most of the workings extended out under the estuary of the River Dee. Traditional pillar & stall methods were used until 1960 when the first longwall face was introduced, pillar & stall being finally phased out in 1967.

Several coal seams occur in the strata as follows :-

SEAM	THICKNESS (m)	DISTANCE BETWEEN SEAMS (m)
Five Yard	2.75	
		40
Three Yard	3.58	
		36
Two Yard	3.04	
		38
Durbog	3.65	
		23
Stone	4.50	
		28
Hard Five Quarters	4.60	
		8
Badger	0.30	
		73
Bychton Two Yard	2.17	
		34
Bychton Three Quarters	0.91	

There were thus seven main seams but safety regulations meant that longwall methods could not be used to extract three of the seams due to potential strain on the overlying sea bed. This was not the case with pillar & stall workings, which left support in situ, but the method had been phased out. The colliery was thus faced with a dilemma over workable reserves.
The total workable reserves had been estimated at around 46 million tonnes but 17 million tonnes of this could not be touched for the above reasons. Of reserves which were accessible without costly development work, there were only 2 million tonnes which could be worked by longwall methods but around 6 million tonnes (about 10 years output) which were unworkable. Economics meant that an alternative to longwall mining had to be found to extract this valuable reserve.

In 1981-82, a development team became available and a trial was carried out of mechanised pillar & stall working in the Durbog Seam. For the technically minded, they used a Dosco Dintheader for the driving and an Eimco 913 front tipping bucket to move coal from the face to the conveyor. The latter was the first FSV (Free Steering Vehicle) to be used in the colliery. During the trial, 1,900 metres was driven producing 34,000 tonnes, the maximum weekly output being 2,400 tonnes. The trial was judged to be a success and in 1985 it was proposed that full scale operation should be introduced, ie a zone of the Two Yard Seam could be worked by 3

longwall panels to the north of the laterals and pillar & stall to the south. Staff visited Ellington Mine in Northumberland to see the system in operation there, ie 14ft x 10ft roads with 30m square pillars, the roadways being supported by 5 x 4½" steel bars with wooden legs. The "long run" method was used whereby the machine finished each roadway to the next crosscut before proceeding to the next roadway. The coal was moved by a shuttle car from the face to a mobile conveyor terminal.

Unfortunately, the proposal was rejected by head office at that time for financial reasons and the colliery continued to use longwall methods. During the late 1980s, there was intense interest in rockbolting as a method of stabilising passages and reducing costs. Point of Ayr Colliery actually did some pioneering work in this and it was found that up to 60% saving on support costs could be obtained and T-junctions were more stable on retreat, thus allowing faster working. In 1991, the cost of coal production at the colliery using longwall methods led to investigations into how extraction could be made more economical. In the same year, a British Coal directive requested all Groups to investigate alternative working methods and thus a proposal was made to revive pillar & stall working, this time using rockbolting. The operating areas were to be called "Miner Panels".

The proposal was to change over from longwall to pillar & stall working over two years, ie

Miner Panel 1 - in the Two Yard Seam from April 1992
Miner Panel 2 - in the Three Yard Seam near the end of the Loco Tunnel from October 1992
Miner Panel 3 - in the Three Yard Seam above Panel 1 from December 1993.

The scheme was approved and the first Miner Panel began production in June 1992. The new mechanisation meant that the manpower required for each shift was only :-

1	Continuous Miner driver
1	Continuous Miner assistant
2	Shutle Car operators
4	Roofbolter operators
1	Fitter
1	Electrician
1	FSV driver
3	Service/ventilation men
1	Deputy
15	TOTAL

New machinery had to be purchased for the following tasks :-

a) A Joy 12 CMII Continuous Miner excavates the roadway using a cutting head and the coal is passed back on its conveyor. It is electrically operated and the cable is anchored in the last cross cut to allow it to move freely anywhere forward of this.

b) One of two Joy 10 SCII Shuttle Cars receive the coal, carrying a maximum of 10 tonnes. These are electrically operated four wheel drive vehicles with the cable anchored at the Feeder Breaker and controlled at the Shuttle Car end by an automatic reel.

c) The shuttle cars empty their loads into the hopper of a Joy JFB/530 Feeder Breaker, which breaks the coal down to a manageable size and passes it to a conveyor for transport to the shaft at a rate of 300 tons per hour.

d) If the hopper becomes blocked, the coal can be dumped on the floor and later picked up and loaded by a Joy 14BU-14B Gathering Arm Loader. This machine can also

Fig.2 - Method of Working a Miner Panel

be used to load from roadways driven using conventional blasting methods if required.

e) After roadways have been driven, they are rockbolted using one of two Fletcher HDDR Roofbolters. These are electrically operated and the cable is hung over junctions to allow the Continuous Miner and Shuttle Cars to move freely.

The method of working a Miner Panel (see Fig.2) is as follows. In Stage 1, five parallel roadways are driven with up to three roadways being "active" at a given time, ie one mining and two bolting. Roadways are not driven their full length at once, since this would leave the roof unsupported for too long before rock bolts could be inserted. The Continuous Miner thus excavates a short length of the roadway only and moves on to the next one, leaving the roofbolts to be inserted later. By the time it returns to the roadway, the roof has been bolted and it is safe to continue with the excavation. In this way, the roadways are progressively advanced to the point where the next crosscut is to be. In Stage 2, this crosscut is excavated for the full width of the roadways. Stage 3 is where the crosscut has been completed, the Feeder Breaker moved up one crosscut and the conveyor belt extended. The power cables are relaid and the process begins again.

The Shaft Sinking Saga at Ifton Colliery 1912-44

Ivor J Brown

Ifton Colliery is situated in the northern part of the spur of the Denbighshire Coalfield, which passes into North Shropshire. This area was already being mined in the early 19th century and the Ifton Colliery is referred to in the Mines Inspector's list for 1860. The mine workings in Wales, however, completely overshadowed the Shropshire operations (Fig.3). By 1912, the company that operated Brynkinalt Shaft in Wales (W Y Craig & Son) were working towards Ifton and decided to develop it further. The Ifton Rhyn Company already had a 135yds deep shaft at Ifton, about 1½ miles South East of Brynkinalt Shaft, and it was decided to take this over and deepen it. The workings in Wales and England would then be connected.

In March 1912, a German company was employed to start sinking and by 1914 they were 415yds down. Due to the war, the Government stepped in and stopped the sinking but the colliery company formed an inset at this level and got the coal by driving two tunnels, one north and the other south (Fig.4). The tunnels reached coal in 1921 and 1923 respectively and, during the years of development, Brynkinalt Colliery continued to produce coal. The old workings and new shaft were connected in 1921 and for some years both Brynkinalt and Ifton produced coal until Brynkinalt was closed for coaling in 1928. It then became the upcast and emergency shaft for Ifton Colliery, which was a single shaft site. At this time, production was about 1,000 tons per day with 1,357 men, the largest mine Shropshire was ever to have. In 1940, it was decided to deepen the shaft by a further 75yds to cut out the two sloping tunnels put in temporarily in 1914 when sinking had previously been stopped. The principal problem was that the Ifton shaft was an all-purpose shaft and could not be used for the deepening activities themselves. The solution was to drive a tunnel back from the workings in the lower seams under the present shaft and then to "sink" upwards to the shaft bottom.

A borehole, commencing at 18" diameter, was put down from the base of the existing shaft to the full depth of 75yds without interfering with production but there was no guarantee that it was truly vertical. The borers gave a guarantee, however, that it would be less than 2ft out and later it was found to be less than 1ft 10ins. To do the boring, it was necessary to make a small engine house in the shaft side. Work was done on night shift and at a rate of 4-6ft per shift, the hole being completed in 2 months. The deep level tunnel reached the position beneath the existing shaft and located the borehole in May 1942. The cavity for the new pit bottom was then formed and bricked 2ft thick, 16ft high and 15ft wide to accommodate the new 15ft shaft. It was then necessary to sink downwards from the new pit bottom for 20yds using conventional methods to form the new sump (see Fig.5). After the sump was completed, shaft "raising" commenced. The company used its own employees, partly as they felt the work needed careful treatment since they would be driving upwards to connect with their working shaft. The shaft raising method used was fairly conventional and it is described in "Iron & Coal Trades Review" for September 14th 1951. The drawings accompanying that article (see Fig.6) show the method clearly. The work of raising continued without affecting the shaft operations above until a point had been reached where only 10yds remained solid. From here, all work was carried out at night when the shaft winding operations above were at a standstill. The shaft was completed in August 1944 and the total cost of the new shaft, which was done entirely by one chargeman and two men including the borehole, worked out at £47-4s-0d per yard. A shaft about half this diameter 80 years before on the Titterstone Clee Hill cost this much. Before full depth winding could commence, a larger winding drum had to be fitted to take the extended rope. Ifton Shaft was now 482yds deep.

Fig.3 - Location Plan

Fig.4 - Shaft Deepening Proposals

Fig.5 - Normal Shaft Sinking in Sump

Fig.6 - Section of Shaft Bottom

In 1947, the colliery was nationalised along with its neighbour in Wales, Black Park Colliery only 1.75 miles away. At that time Ifton Colliery, then still known as Brynkinalt although this was now only a ventilation shaft, had seen its number of employees fall to 974, while Black Park had 402 employees. In 1949, it was decided to close Black Park and to work the remaining coal from Ifton. For this, a 910yds long tunnel had to be driven at over 1 in 5 gradient to connect the underground workings. Black Park Colliery was at least 117 years old (as shown on old mine plans) and was close to the western outcrops of the coal seams. Its main shaft, however, was only 272yds deep.

By 1960, the modernised Ifton Colliery had a manpower of 1,250 and a daily output of 1,750 tons. The colliery eventually closed in 1968.

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Geology & Extraction History of the Non-Aggregate Mineral Resources of Staffordshire

David Coxill

Disclaimer

This is the work of the author and the views are not necessarily those of his employer, Staffordshire County Council, for whom he works as a professional geologist in the Department of Economic Development.

Introduction

Staffordshire is a geologically and topographically diverse county occupying some 2,716 square kilometres, ranging from the limestone uplands in the north-east, much of which lies within the Peak District National Park, through the productive farmlands of the Vale of Trent, to the ancient woodlands of Needwood Forest and the Cannock Chase Area of Outstanding Natural Beauty.

It is rich in valuable mineral resources including coal, ironstone, clay, gypsum/anhydite, sand & gravel, limestone, building stone and silica sand, the exploitation of which has taken place for several centuries. This article deals with the non-aggregate resources (excludes sand & gravel and limestone) in the area of the County outside the Peak District National Park.

Simplified Geology

This is shown in Figs.7 & 8. The oldest rocks in the County are the Stockingford Shales that outcrop as small faulted inliers at Dosthill, near Tamworth. They were deposited during Tremadoc times, traditionally classified as part of the Upper Cambrian but now considered by some authors to belong to the Ordovician. Into these beds have been intruded diorite sills, forming the Dosthill "Granite", at a later date. Silurian strata does not outcrop at the surface, although a borehole sunk at Smestow Bridge, Wombourne, penetrated Wenlock Shales at a depth of about 380 metres.

The Lower Carboniferous is represented by the Dinantian Limestone Series that outcrop in the Peak District National Park and Cauldon Low area in the north-east of the County. Fissures in the limestone have locally been mineralised by copper, lead, haematite and barytes from intruding hydrothermal fluids.

The Upper Carboniferous is divided into the Namurian Series ("Millstone Grit") and the Coal Measures. The Namurian Series was laid down at the start of the Upper Carboniferous, characterised by hard "grit" sandstones, outcropping over a wide area in North Staffordshire, between the northern coalfields and the limestone area of Peak District National Park / Cauldon Low. It also contains a few localised, thin coal seams eg between the Rough Rock Sandstone and Chatsworth Grit. The Coal Measures were deposited in Westphalian times and form the outline of the several coalfields in the County. The Productive Coal Measures (Lower and Middle) are famous for the formation of coal seams, fireclay and ironstone. The overlying Upper Coal Measures are mainly barren of workable coal seams, the exception being the Blackband Formation at the base of the Upper Coal Measures in the Potteries Coalfield where they have been worked. They are largely composed of collectively red marls, mudstones, siltstones and sandstones. They are represented in ascending order by the Etruria Formation;

Newcastle Formation in the north and Halesowen Formation in the south; Keele Formation and Enville Formation (possibly of Permian age). Valuable clay deposits are extracted from the Etruria Formation.

Fig.7 - Geology & Mineral Workings in Staffordshire

Fig.8 - Economic Deposits throughout the Solid Stratigraphical Succession in Staffordshire

PERIOD ROCK/	SERIES	DOMINANT STRATA	EXTRACTED MINERAL
	Mercia Mudstone Group ("Keuper Marl")	Silty Mudstone	Brine (Stafford Halite Formation)
	Sherwood Sandstone Group Hollington Formation, Helsby Formation & equivalent ("Keuper Sandstone")	Sandstone	Building/ Ornamental stone
TRIASSIC	Wilmslow Sandstone Frm. Wildmoor Formation ("Upper Mottled Sandstone")	Sandstone	Moulding Sand
	Huntley Formation Hawksmoor Formation Cannock Chase Frm. Chester Pebble Beds Kidderminster Conglomerate ("Bunter Pebble Beds")	Sandstone	Crushed Sandstone / Aggregates
UPPER CARBON-IFEROUS	Upper Coal Measures	Coal, Mudstone, Siltstone & Sandstones	Coal, Fireclay, Common Clay, Sandstones
	Productive Coal Measures	Ditto	Coal, Fireclay Sandstones
	Namurian Series ("Millstone Grit")	Sandstones & Mudstones	Silica Sand, Mudstones for cement manufacture, building stone
LOWER CARBON-IFEROUS	Dinantian Limestone Series	Limestones & Mudstones	Limestone for building, cement aggregate, veins of copper, barite, haematite & lead
	Intrusions	Diorite	Aggregate

Triassic strata consisting of the Sherwood Sandstone Group and the overlying Mercia Mudstone Group outcrop across the majority of the County area and dominates the central region. They provide an important source of crushed aggregate and also contain the Staffordshire Saliferous Beds and Tutbury Sulphate Seam. In the Needwood Forest area is a small insignificant outcrop of Jurrasic strata. Glacial drift and river deposits have selectively produced valuable sand and gravel.

Non-Aggregate Mineral Resources and their Exploitation

A) COAL

There are several individual coalfields from which deep mine and opencast coal has been won. For convenience, their extent, structure and stratigraphy are each discussed in turn.

1. North Stafforshire Coalfield

a) Potteries Coalfield

Geology - The exposed part of the coalfield, centred on the North Staffordshire Coalfield, is triangular shaped and covers about 100 square miles, from Congleton in the north, south-eastwards to Mucklestone and southwards to Moddershall. The southern base of the triangle is irregular, where the Coal Measures dip beneath later Triassic strata and extend southwards to the Swynnerton Fault. To the west, the coalfield is bounded by the Red Rock Fault against the Trias, while the eastern flank is formed by the outcropping of the underlying Namurian Series as the axis of the Werrington antiform (dome) is approached.

The structure within is dominated by two antiforms, the Western and the Werrington, that converge to the northern apex of the coalfield, and the Potteries synform (basin) that lies between them and broadens out to the south. The coalfield is broken up by faults, most notably the Apedale Fault.

Over 50 horizons have been worked for either coal, clay or ironstone in a 2,000 metres thick Coal Measures sequence. The main workable coal seams that have been worked are Blackband, Red Shagg, Red Mine, Clod, Hoo Cannel, Bassey Mine, Peacock, Spencroft, Great Row, Cannel Row, Cahlkey, Bungilow, Bay, Winghay, Blackmine, Rowhurst, Burnwood, Twist, Birchenwood, Moss, Five Feet, Yard, Ragman, Rough Seven Feet, Hams, Bellringer, Ten Feet, Bowling Alley, Holly Lane, Hard Mine, Banbury, King, Crabtree, Ribbon and Two Foot.

History - Early references to coal mines at Tunstall (1282), Norton-in-the-Bog (1316), Shelton (1291) and Keele (1333) indicate that coal extraction has taken place in the Potteries since at least medieval times. These early workings would have been shallow operations from prototype opencast coal sites, bell pits, inclined tunnels (footrails) and shallow shafts.

The number of pits in production steadily increased, supplying the Nantwich salt industry in the 17th century, as well as the local market. With the advent of the Industrial Revolution, the demand for coal increased, primarily from the pottery industry but later also from the iron industry, for coking coals. With improvements in ventilation and the

invention of the steam engine for pumping the mines dry, pits were sunk to very deep levels throughout the 19th century.

Some 50 collieries were operating in 1835 and output rose from 1,295,000 tons in 1856 to 3,900,000 tons in 1870. The continued boom in the iron industry in the 1870s led to further expansion but this was curtailed somewhat by the depression of the 1880s. By the beginning of the 20th century, coal was being mined from Stafford Colliery (1873-1968) from a shaft 823 metres deep, the Deep Pit at Hanley at 810 metres, Sneyd at 823 metres and Florence at 792 metres. Output rose to 6,784,000 tons in 1907 and was maintained at that general level until the 1970s.

Pits became bigger but fewer as the century progressed, with the exhaustion of reserves, need for rationalisation during the Great Depression of the 1930s, oversupply in the 1960s, competition from cheap subsided imported coal in the 1980s and 1990s. Coupled with geological problems, this has resulted in only Silverdale Colliery and Hem Heath Colliery of the largest pits remaining open. Even these two pits were temporarily mothballed in the last massive pit closure programme prior to privatisation, now only producing and employing a fraction of their former output and workforce under private control.

A few small drift mines continue to operate in this harsh economic environment on a reduced scale from peak post war production in 1956. Opencast production has been continuous until recently, mainly in the western part of the coalfield. With the completion of coaling operations at the High Lane and Brown Lees opencast sites recently, there are currently no opencast operations coaling in this coalfield.

b) Cheadle & Other Minor Northern Coalfields

Geology - To the east of the Potteries Coalfield, a series of folds have preserved Coal Measure strata in basins, forming the Shaffalong (narrow, north-south trending basin of 2 square miles), Goldsitch/Moss (actually in the Peak Park area) and Cheadle Coalfields. Of these, only Cheadle is significant, being roughly diamond shaped and 18 square miles in area. The Coal Measures are preserved in a symmetrical synform with the strata dipping more steeply to the west. The strata also dips beneath Triassic cover to the south.

The main workable coal seams are Two Yard, Getley, Half Yard, Litley, Four Feet, Dilhorne, Alecs, Foxfield, Mans, Cobble, Rider, Woodhead, Sweet and Crabtree. Only the basal beds of the Productive Coal Measures occur in the small Shaffalong and Goldsitch/Moss Coalfields.

History - Although the Cheadle Coalfield dates back to early times, due to poor transportation, relatively thinner and fewer seams compared to the Potteries Coalfield, it was never fully developed. Production reached 200,000 tons per year in 1875 but deep coal mining ended with the closure of Foxfield Colliery in 1965. Small scale opencast coal sites have been worked until 1994. Production has currently ceased.

2. South Staffordshire Coalfield

Geology - The exposed coalfield is elliptical in shape, extending from the Linley Hills in the south to Rugeley in the north. It is bounded to the west by the Western Boundary Fault and to the east by the Eastern Boundary Fault respectively. The main southern coalfield is

separated from the northern Cannock Chase extension by the east-west trending Bentley Faults in the proximity of Walsall.

The County boundary lies just to the north of the Bentley Faults, adjacent to the Wolverhampton and Walsall Metropolitan Districts. The only part of the exposed main southern coalfield that lies within Staffordshire is a small area around the Himley Wood/Gornal area, west of the adjoining Dudley Metropolitan District. North of Cannock, the Productive Coal Measures extend and dip northwards beneath Triassic cover to the Swynnerton Fault, and beyond the two Boundary Faults where they have been downfaulted, also beneath Triassic cover.

The chief seams of the main coalfield in descending order are Brooch, Flying Reed, Thick, Heathen, Sulphur, New Mine, Fireclay Coals and Bottom. Of these, the principal seam is the Thick Coal which is up to 30ft (9m) thick in the Himley/Dudley area. This seam is composed of several individual horizons that have come together.

When traced northwards, the Thick Coal splits up into distrinct coal seams with a gradual increase in thickness in the intervening mudstones and siltstones beneath each coal seam. At Littleton Colliery, near Cannock, the thickness of strata corresponding to the Thick Coal is 52 metres. This seam splitting continues northwards into the North Staffordshire and Lancashire Coalfields where the Productive Coal Measures sequence becomes very thick. The main coal seams in the Cannock Chase Coalfield are the Top, Robins, Bottom Robins, Benches, Wyrley Bottom, Old Park, Heathen, Stinking Yard, Bass, Cinder, Shallow, Deep and Mealy Grey.

History of Cannock Chase Extension - Coal seams lie close to the surface in the southernmost part of the Cannock Chase Coalfield. These were the first to be extracted and early records indicate that small scale mining occurred around Beaudesert from 1298 onwards and at Cheslyn Hay, Easington and Great Wyrley in the 17th century. Mining was first by bell pits and later by shallow shaft mines. These very small scale workings were mainly confined south of Watling Street (A5) to the Bentley Faults.

As these early workable deposits of coal started to become exhausted in the mid-19th century, deeper and more productive mines were sunk to the north of Watling Street in the second half of the 19th century and first quarter of the 20th century.

The years 1860-1880 particularly saw intensive growth in which William Harrison and John R McLean were the pioneers. McLean founded the Cannock Chase Company to sink Uxbridge Colliery at Hednesford in 1852. New sinkings took place at West Cannock, Walsall Wood, East Cannock, Cannock & Leacroft and Cannock Old Coppice in the 1870s, which saw the population of the Urban District of Cannock increase from 2,913 in 1861 to 20,613 in 1891.

The economic depression of the 1880s saw many pits become unprofitable, many were closed and othes sold cheaply. An upturn in the economy led to the resumption in pit sinkings in the 1890s and, in 1905, Littleton came into production. By this time, pits had become quite deep, one shaft at Littleton being 500 metres on its completion in 1902. The tendency of mining to move north and west as the older pits in the south were abandoned continued and, in 1900, Cannock Wood Colliery had 837 underground workers and COnduit Colliery 870 against under 100 in the main South Staffordshire Coalfield. This is refelcted by the figure that 33 pits in Cannock Chase produced as much coal as 276 in the main southern coalfeld.

There were some 20th century pit sinkings apart from Littleton (abortive sinkings had occurred much earlier at this mine). Hilton Main in 1919 and West Cannock No.5 in 1912, but the depression of the 1930s saw many pit closures and declining output. The coal industry was nationalised in 1947, which ended until privatisation in 1995 private owership of all but very small mines employing less than 30 men.

The nationalisation years saw progressive massive pit closures and, with the closure of Littleton Colliery in 1992, no deep coal is mined in this coalfield. Even Lea Hall, opened as recently as 1960, could not escape the intensive pit closure programme of the 1980/90s, closing in 1990 due to heavy faulting. The coal from Littleton and Lea Hall had a high chlorine content which required blending with low chlorine opencasted coals for it to be acceptable to power stations. Now the only productive coaling operation in the coalfield within Staffordshire is the Bleak House opencast coal site.

3. Main Southern Coalfield

This coalfield has been worked from early times, principally for the Thick Coal. With exhaustion of shallow reserves, the coalfield declined rapidly in the 19th and 20th centuries. The shallow mining around Himley Wood saw many pit closures in the 1920s. The only major mine to be sunk this century was Baggeridge in 1912, west of the Western Boundary Fault. Deeper lying reserves were exploited, mainly of the Thick Coal, but also of the subsidary Brooch, Heathen and New Mine seams. This mine worked coal using the pillar and stall method. Only 6ft of the Thick Coal was worked, the remainder being considered too inferior. Its closure in 1968 marked the end of deep mined coal production in this coalfield within present day Staffordshire.

4. Warwickshire Coalfield

The north-western part of the Warwickshire Coalfield, which is fault bounded, just extends into Staffordshire in the Tamworth area. Here the Productive Coal Measures are about 260 metres thick. They contain the following main coal seams Four Feet, Thin Rider, Two Yard, Bare, Ryder, Ell, Slate, High Main, Smithy, Seven Foot, Deep Rider, Deep, Top Bench and Bench. Underground coal extraction has now ceased although potential opencast coal resources exist by the River Anker.

5. Concealed Extensions to the Coalfields

The exposed coalfields represent areas where the Coal Measures have been uplifted, bringing them to the surface. In the north-east of the County, around the Peak District National Park/Cauldon Low area, the Productive Coal Measures have been eroded to expose older strata. Between the coalfields, the Coal Measures, in part at least, have been preserved at depth and are concealed extensions beneath later Triassic cover.

Borehole and seismic data have indicated several deep mine prospect areas where workable coal reserves lie at accessible depths. In their project "Coal 2000", conducted in the late 1970s, British Coal identified three deep mine prospecting areas affecting Staffordshire :-

a) South/East Staffordshire Prospect. The Lichfield Basin, lying between the Warwickshire and Cannock Chase Coalfields.

b) West Staffordshire Prospect. The Stafford Basin, lying between the Cannock Chase, South Staffordshire, North Stafforshire and the East Shropshire Coalfields (Coalbrookdale and Forest of Wyre).

c) The Cheshire Basin, lying between the North Staffordshire, North Wales and South Lancashire Coalfields.

The most promising prospect was the Park Project, immediately east of Stafford, which proved the interconnection of the North Staffordshire and Cannock Chase Coalfields. It was intended to sink a colliery at Hopton in the 1980s but the project was abandoned because of the high chlorine content of the coals. Nevertheless, this is a proven reserve of 300 million tonnes, 100 million of which could be extracted from 10 workable seams.

B) OIL & NATURAL GAS

Petroleum has been discovered to impregnate coal seams in the Potteries Coalfield at Hanley Deep Pit and Trentham Colliery but wild cat drilling has never discovered commercially retrievable deposits in the County. Exploration for natural gas, either on its own or in connection with potential oil traps, has been equally fruitless to date. However, there is a greater possibility of success where future exploratory drilling is concentrated on the exposed and concealed extensions to the coalfields to extract methane directly from coal seams. Oil has been experimentally extracted from oil shale in and above the roof of the Red Shagg Ironstone and in the roof of the Cannel and Great Row coal seams of the Potteries Coalfield. This remians a potential resource for the future.

C) MINESTONE

Minestone mainly consists of a variable mixture of burnt and unburnt colliery waste composed of mudstones, siltstones, sandstones, ironstones and ash where it has been converted by spontaneous combustion. The Minestone Executive was established in 1971 by the then National Coal Board to direct and control its commercial exploitation.

The traditional uses for minestone include common fill, land reclamation, sea and river defence, road and rail embankments, brick and aggregate production. The demand for minestone is therefore linked to the construction industry. The brick industry no longer has any block making light aggregate plants utilising minestone in the UK because the market demand is now for much higher quality products. Colliery spoil from Baggeridge Colliery (1912-1968) was formerly used to make low quality bricks by Baggeridge Brick PLC. In recent years, colliery spoil has been successfully used as an ingredient in a rock paste for infilling disused limestone mines in the West Midlands.

Where Minestone is locally available, it can often compete effectively in direct cost terms with primary fill materials, although where borrow pits adjacent to construction sites are used, the transport costs of any imported fill are a major barrier to overcome. Problems with variable quality and wet weather placements can lead to its exclusion from contract specifications and can sometimes involve additional costs. With the presence of so many former colliery waste tips in the coalfield, minestone is a potential resource where environmental safeguards permit its excavation.

D) IRONSTONE

Nodules and bands of ironstone, often as distinct horizons, occur within the Coal Measures sequence. They are normally continued to the Productive Coal Measures, although in North Staffordshire they are also developed in part of the Upper Coal Measures known as

the Blackband Group. In the South Staffordshire Coalfield the main seams are Lambstone & Brownstone, New Mine [*Editor's Note - in the south-east "Mine" was the old name for ironstone itself and possibly it was the same here]*, Pennystone, Poor Robins, Gubin & Balls, Blue Flats, Silver Threads and Diamonds. In the Warwickshire Coalfield they are represented by the White, Black, Brown and Balls seams.

In the North Staffordshire Coalfield the main seams are Halfyards, Red Shagg, Red Mine, Gubbin Mine, Cannel Row, Wood Mine, Pennystone, Deep Mine, Chalky Mine, New Chalky, Hanbury Measures, Ragmine, Priorsfield, Knowles, Black Mine, Brown Mine, Rowhurst or Ash and Burntwood or Little Mine. These ironstones are composed of the mineral siderite (iron carbonate), although those horizons in the North Staffordshire Coalfield including and higher than the Burntwood Seam became progressively more carbonaceous in content.

History - The North Staffordshire Coalfield is rich in ironstone. It is believed t have been worked at Holditch by the Romans in the 2nd century AD. Records of it being worked date back to medieval times but it was not until the Industrial Revolution that output and demand expanded rapidly. The mineral was worked from progressively deeper mines that normally also extracted coal.

Output in North Staffordshire was almost 2 million tonnes per annum in 1884 but had dropped to below 1 million tonnes per annum in 1902. The importation of cheaper foreign ores in the 20th century led to a steady decline in production which had ceased by the time the coal industry was nationalised.

Ironstone mining was also important in the southern part of the South Staffordshire Coalfield in the 19th century but likewise declined this century, ceasing about 1930. It was never of significant importance, however, in the Cannock Chase Coalfield. Ironstone was once extensively mined in the Glamcote and Wilnecote area of Tamworth and production continued into the present century.

E) OTHER METALLIFEROUS DEPOSITS

The south-western part of the Derbyshire orefield extends into the Peak District National Park and marginally into administrative north-east Staffordshire in the vicinity of Weaver Hills and Oakamoor. Here, some of the fissures in the Carboniferous Limestone have been mineralised, often as steeply dipping vein lodes of copper, haematite, lead, zinc and barytes.

The metal mines recorded in Staffordshire in this area are Ribden (Ingleby's, Gilbert's, Hodgkinson's and Swallow Shafts), Old Shafts, Thorswood and Star shaft and level near Oakamoor. Extraction in this area is periodically recorded from the late 17th century until the 1830s.

Occasionally, ore deposits have been discovered outside the main orefield but these are rarities. In 1873, a shaft sinking at Fair Oaks Colliery came across a lead (galena) vein and a copper deposit was worked at Shore Hill, both in the Cannock Chase area.

F) IRONWORKS SLAG

Tips of former ironworks can provide a very tough slag varying to a mixture of furnace ash and slag. This has been used in the manufacture of cement blocks and these tips have been quarried in recent years at Apedale. Other similar tips remain to be worked, although development would be restricted by environmental constraints, particularly as some have already been landscaped and/or built upon. Blasting sand from furnaces can be used as an aggregate where it is found in such tips.

G) CLAY

Clays for the manufacture of bricks, tiles, pottery and pipes have chiefly been exploited from the Productive Coal Measures and Etruria Formation, particularly in the Potteries. Seat earths that lie directly beneath coal seams are no longer commercially exploited from collieries. Limited quantities are extracted from surface workings, on occasion in conjunction with opencast coal workings.

In the Potteries Coalfield, mudstone and siltstone horizons have been worked between the Spencroft and Hoo Cannel Coal seams extensively between Tunstall and Longton. Other horizons have been worked, mainly between the Twist band Bungilow coal seams. Until recently, Birchenwood Quarry produced bricks from Productive Coal Measures clays.

The most favoured source for brick clay is the soft Etruria Formation of the Upper Coal Measures, which has been extensively worked in the coalfields. In the Potteries Coalfield, the Etruria Formation has been sub-divided into three divisions recently by the British Geological Survey. The Lower and Middle divisions are the most valuable, although the Lower contains thick sandstone horizons. The Upper division is less valuable because it contains calcareous veins, pellets and nodules that can burst during firing, particularly at its top.

A similar classificaiton of the Etruria Formation has not been carried out for the South Staffordshire and Warwickshire Coalfields. In the area around Cheslyn Hay, west of Cannock, the Etruria Formation contains thick sandstone units and a high lime content. However, unlike in the north, the lime here is finely disseminated in the clay, rather than forming discrete concentrations, and is apparently suitable for brick making. A fundamental problem is that large tracts of the outcrop of the Etruria Formation has been built upon, thus sterilising this valuable resource.

The Newcastle and Radbrook Formations are a potential resource for brick clay, for blending purposes at least. At Willoughbridge Wells, near Market Drayton, a small quarry currently works clay from the Radbrook Formation. On a localised basis, clays have been periodically worked from small, shallow quarries in the Mercia Mudstone Group. Their relatively inferior clay mineralogy compared to the Etruria clays, however, has prevented extensive development of this widely outcropping group in Staffordshire.

H) SHALES FOR CEMENT

In the proximity of Cauldon Cement Works, a low sulphur turbiditic mudstone in the Namurian Series is currently worked to be used in the manufacture of cement at the nearby works.

I) SILICA SAND

Silica sand is an industrial term for material with a high proportion of quartz, which is marketed for purposes other than for the construction industry, eg glass making and foundry/moulding sand. It can be produced from both crushed sandstone and unconsolidated sand. Current, and most of the past, production of silica sand in Staffordshire has been from the Rough Rock Sandstone horizon of the Namurian Series. This horizon is up to 30 metres thick and contains up to 15% clay and over 0.5% iron oxide.

At Moneystone Quarry, Oakamoor, crushing, grinding, fines rejection and acid leaching improve the quality sufficient for the silica sand to be used in glass manufacture, as a silicate in soda manufacture and fillers in asbestos cement. It is still worked on a small scale at Hurst Quarry, Biddulph, in this same horizon and here the silica content is 98.8%. The Wildmoor Formation of the Triassic has in the past been worked in the Wombourne area as a source of moulding sand used in the foundry industry.

J) WHETSTONE

Whetstone is a fine-grained, very hard, well sorted sandstone with a high silica content of up to 95%. At Gillow Heath, Biddulph, it forms a 1.4m to 2.1m thick seam near the base of the Lower Coal Measures , lying within a 158m thick sequence of mudstones, siltstones and sandstones between the King and Crabtree Coal Seams. In the vicinity of Gillow Heath, the Productive Coal Measures form a south-south/west plunging synformal syncline between two east-west trending faults. The whetstone seam outcrops on both the east and west limbs of this synform, dipping towards its axis.

The peculiar property of whetstone is that, after grinding, it has a glass-like smoothness and does not scratch the surface of the material it is being used on. It has also been used in the printing industry to smooth down copper plates and can also be used as an abrasive stone for sharpening. Whitestone, a similar sandstone which is also found at Gillow Heath, was used for high quality smoothing, known as honing.

History - The extraction of whetstone has been recorded from the mid-19th century, either at outcrop or from shallow underground workings, normally in conjunction with working coal and clay seams. Small quantities of whitestone have also been produced. Extractive operations had ceased by the 1980s. During this century, the following mines have been operational - Mow Cop (1927-28), Hill Lane, Freehay, Hollington (1930), Park Lane, Audley (1930), Gillow Heath (c.1870-1970s?) and Oxhay (?-1950).

K) IGNEOUS ROCKS

Diorite has been quarried at Dosthill, commonly known as the Dosthill "Granite", for roadstone but this has not taken place for some years. The Swynnerton and Butterton dykes of North Staffordshire are too narrow in width in themselves to be a valuable aggregate resource.

L) BUILDING STONE

Extraction of snadstone for building purposes has taken place in Staffordshire since early times. The most notable horizon to be exploited is the Hollington Stone (red, white and

mottled varieties) in North Staffordshire. This belongs to the Hollington Formation at the top of the Sherwood Sandstone Group.

The Hollington Stone is highly prized by stone masons throughout the country as a freestone and has been used in the construction and maintenance of churches, cathedrals and other public buildings. Current extraction of the stone takes place at a few quarries in the Hollington/Cheadle area but none now work the "White" variety.

Other horizons have been worked in the lateral equivalents to the Hollington Formation at Beech, Fulford, Chapel Chorlton, Penkridge, Hopwas and Brewood. Small scale underground pillar and stall working at Beech Cave provided the stone to build Trentham Hall in the 17th century. Another limited underground working at Little Haywood, near Stafford, took place in the mid-19th century.

The Chapel Chorlton Stone, quarried at Fulford and Chapel Chorlton, is white and free of iron stains. It was once in great demand but by the 1830s gave way to the superior Hollington Stone. A small mine in the Kent Hills, near Audley, worked the Chester Pebble Beds ("Bunter") in the early 20th century but this was for aggregate, not building stone.

The hard sandstone horizons of the Namurian Series have been extensively quarried for building stone on the flanks of the North Staffordshire Coalfields. Only a very small quarry in the Minn Sandstone at Hollins Farm, near Leek, now utilises sandstone for building and ornamental purposes from these beds. Two underground mines working the Namurian Series are recorded in the 19th century, at Mow Cop and Longnor.

In the past, limited quarrying of snadstones in the Coal Measures has taken place, eg Ten Feet Rock of the Productive Coal Measures, Hanchurch Sandstone of the Newcastle Formation and the red sandstones of the Keele Formation. Only the latter have produced good building stone, other sandstones generally being too soft.

M) EVAPORITES

1. Gypsum & Anhydrite

These are two natually occurring mineral species of calcium sulphate that are found in Staffordshire within the Tutbury Sulphate Seam of the Mercia Mudstone Group, Upper Triassic. The Tutbury Seam is up to 4 metres thick but is not uniform, consisting of discontinuous masses of gypsum/anhydrite, separated by silty mudstones, with mior amounts of alabaster (a very pure form of gypsum) and rock salt.

In Staffordshire, the Tutbury Seam appears to lie in a synformal syncline known as the Needwood Basin, plunging to the south-west. The axis of the syncline is situated approximately at Tatenhill Aerodrome, trending in a west-south west to east-north east direction. It has been mapped as outcropping from near Hound Hill to Tutbury, dipping generally southwards.

The current Fauld Mine works the Tutbury Seam on the southward dipping limb of the Needwood syncline. The mine is affected by an east-west trending faulted monocline

between Hanbury Park Gate and Home Farm, which takes the Tutbury Seam to its deepest levels on a north-south line through the mine workings.

As the mine progressed southwards to greater depths, it was found that the Tutbury Seam changed in composition and contains an increasingly higher proportion of anhydrous gypsum known as anhydrite. The difference between the two minerals is whether or not the calcium sulphate has bee hydrated. Shallow deposits that have come into contact with groundwater will become hydrated forming gypsum, while anhydrite contains no water and is consequently found at deeper levels.

On the southern limb of the Needwood syncline, the Tutbury Seam has been mapped as outcropping from Horninglow, west of Burton, to Tatenhill village. This outcrop dips north-west towards the axis of symmetry extending to Tatenhill Aerodrome. The Tutbury Seam is recorded at shallow depth further west near Chartley at Normanswood Farm, just east of Stowe where it was formerly worked (1930s-1956).

History - Gypsum has been mined in the vicinity of Fauld and Hanbury for many centuries. The earliest extraction appears along the outcrop where bell pits were sunk. The second rim of the arch of the west door of the Norman Tutbury Church is constructed of alabaster. It was not until the second half of the 19th century, however, that large scale underground mining commenced. The most westerly working was Draycott Mine, which closed around 1939. Underground mining has taken place at Fauld since 1868. It commenced when both J C Station & Co and Peter Ford & Sons Ltd established mines to provide raw materials for the increased demand for building plasters.

These continued to operate separately, even after 1936 when both companies were incorporated into the British Plaster & Boards Company. The mines became united as the Faulds Mine in 1944 with the construction of a new access adit. In that same year a detonation in an armaments store, located in an abandoned north-east sector of the mine, led to the ignition of 3,500 tonnes of high explosive bombs. Over 100 people were killed and a large surface crater remains in the wooded escarpment of Stonepit Hills. Only part of the seam is worked but production reached 521,845 tonnes in 1970-71, although it has since declined. Changes in the nature of the Tutbury Seam led to a changeover in production in 1989 from gypsum for bagged plaster to anhydrite as a retarder for the cement industry.

2. Brine

Rock salt or halite occurs as saliferous marls within the Mercia Mudstone Group. Their top lies 107m below the Tutbury horizon and salt bearing marls are known to occur within the underlying 61m. In the Stafford area, they form discontinuous lenses rarely exceeding 12cms thick in a gradational zone 50-65m thick, extending from 150m from the base of the Mercia Mudstone to about 50m below the surface. Here the Mercia Mudstones form a gentle, north-north/west to south-south/east trending synfomral syncline. The north-south trending Hopton Fault uplifts the Sherwood Sandstone against the Mercia Mudstone about 1 mile east of Stafford and forms the limit of the salt deposits to the east.

The outcrop of the Mercia Mudstone extends northwards to Stone, to the west for about 8 miles and to the south-west for about 14 miles, but little is known of the extent of the salts other than they occur in the central axial (deepest) part of the synform. Just north of

Marston village, 3 miles from Stafford, only 15cms of salt was found in a borehole, while at Ivetsy Bank, 10 miles south-west of Stafford, only thin laminars 3mm thick are recorded in the middle of the gypsum veins. Thin beds of salt are recorded from boreholes around Stafford. It would appear that the salt beds are relatively thin and have no wide distribution around Stafford, their greatest and thickest extension possibly being to the north-west and west of Stafford. Brine occurs in a natural salt well south of Stafford on the banks of the River Penk.

The Mercia Mudstone reappears east of the Hopton Fault and has an extensive surface outcrop extending beyond the county boundary with Derbyshire to the east and to the Cheadle Coalfield to the north. Apart from recorded brine streams at Weston-on-Trent and Shirleywich, deposits of rock salt have been proven between depths of 95-162m at Chartley Castle, 6 miles north-east of Stafford, and at depths between 175-213m just north of Abbots Bromley. The extent of these beds is unknown but it is possible that they occur as a thin deposit under a wide area between Weston, Uttoxeter, Abbots Bromley and Needwood Forest.

The salt beds are approximately equivalent to the Upper (Wilkesley) Halite in Cheshire, although two separate salt horizons occur there as opposed to the one around Stafford. Rock salt is a soluble material which naturally dissolves into brine when it comes into contact with circulating ground water, forming a "wet rockhead" horizon. Natural solution at this horizon results in a zone of permeable residual broken strata being formed where the mineral has been dissolved, causing collapse and leading to surface subsidence.

In the case of the Stafford Basin, natural solution has also occurred westerly adjacent to the Hopton Fault, where freshwater from the Sherwood Sandstone has leached out the mineral in a 1km wide zone westerly parallel to the fault. The "wet rockhead" horizon lies at a depth of 55-90m beneath Stafford, gradually extending westwards. Former brine pumping operations accelerated this leaching process by drawing in freshwater from adjacent areas that dissolved the salt, causing voids to form, often along fissures in the mineral deposit. The resulting inherent instability caused collapse and upward migration of the voids that caused subsidence features at the surface, forming linear "brine runs". The Cheshire Saltfield extends just into the north-western corner of Staffordshire, around the Betley area near Madeley.

History - Brine springs have been referred to in the 17th and 18th centuries at Weston-on-Trent, Ingestre and Chartley, north-east of Stafford. In 1873, the salt produced at Shirleywich and Weston-on-Trent totalled 3,750 tons but production ceased at Shirleywich at the end of the century and at Weston-on-Trent in 1901.

Brine was discovered at Stafford Common, just north of Stafford town, abut 1881 in a boring for water put down by Stafford Corporation. The first boring for brine started about 1887 and production commenced in 1893. Production rapidly increased to 80,000 tons of salt per year in 1914, before declining until just before World War II when it started to increase again.

In 1948 four companies, subsequently amalgamated as British Soda Ltd, were pumping here as well as ICI. Production reached 72,000 tonnes in 1947 and increased further to 95,000 tonnes by the early 1960s. ICI withdrew in 1969. Subsidence from brine pumping had been reported since 1948 but it was becoming a more serious problem after 1964.

This led to Lotus Ltd bringing an action in the High Court alleging that damage to their shoe factory had been caused by subsidence resulting from brine pumping. British Soda Ltd were ordered to cease production from August 1970. It is estimated that by this time a total of 5 million tonnes (2.25 million cubic metres) of rock salt had been extracted as brine from beneath Stafford.

Early Mining Maps of the Ironbridge Gorge

Ivor J Brown

A report was published in 1988 by Catherine Clark and Judith Alfrey for the Nuffield Archaeological Survey. The volume "Jackfield and Broseley" is in the Ironbridge Institute and most of the following has been extracted from this or from one of the two books by the report authors that are listed at the end.

The collieries of the Ironbridge Gorge were of national importance during the 1600s, important enough in fact to have been seized during the Civil War to prevent their produce getting into the hands of the Royalists. It now seems likely too that the mining maps produced at this time may be some of the earliest in Britain. The report by Clark and Aldrey gives some information on several of these early maps as detailed below. It is unlikely that any of the insetts (adits) will still be accessible, even if they survived later mining activity, since they would probably have been destroyed during construction of the Severn Valley Railway (see Fig.9).

a) "The Plott of Broseley by Samuel Parsons" (SRO 1224/1/32)

Four insetts (c.1621) are shown beneath present-day Ladywood. Two insetts belonged to a Mr Cage, another called "Priory Insett" was occupied by John Eves and the fourth is not described. A "Priory Insett" was recorded in 1545 and may be the same, all of the insetts seem to have been in use since at least 1608. The map shows four single entries, each about 90yds long. The same map shows "Croppers Holes", ie Outcropper's diggings (?) which is perhaps the earliest map showing opencasting in Britain. It also shows "Mr Benthall's Coalworks" and "The Olde Cole Pitt on Fire" on Coalpit Hill (now called Fiery Fields).

b) "A map of those lands in Broseley through which the Several Insetts do pass, Anno Dom 1676, RH 1730"

A plan showing two long adits with branches and commencing close to the present Free Bridge. They were searched for but not located during recent excavations for the new bridge. "Williams Insett" is about 1,000yds long with 500yds of branches, "Reynolds Insett" is about 750yds long. The last dated workings on the plan are marked December 1676 but the title indicates that it was used after this date. It shows several shafts including Calcutts Pit, which is recorded as early as 1588. It is known that working continued in the adits beyond 1679 (SRO 3703/10).

c) "A Description of ye Widdow Crompton's Insetts in Broseley taken Dec 6th 1675"

This is similar to the above map and is also signed "RH 1730". It shows two roughly parallel adits, each nearly 800yds long but varying in separation by 40-100yds (original measurements were in perches). At the mines end they seem to be connected by a 50yds long longwall face and there is also a fine drawing of a section along the adits showing the cover thickness to an undulating surface. This may be the first diagram of a longwall face and the first colliery section. These adits were situated on the upstream side of the Free Bridge. Until 1940, there was a pub here called the "Dog & Duck" which had an inscription "C - AM May 30 1634" reputedly recording Crompton-Adam and Margaret's marriage date. The house remained in this family for many years. Crompton's Insett

appears to cross Reynolds Insett underground so it was likely that they were in different seams (SRO 3703/10). One of these insetts must have

Fig.9 - Mapped Insett Locations at Ironbridge Gorge in the 17th Century

Fig.10 - Probably the First Depiction of a Shropshire Mine 1686

been (or been close to) the Ladywood Sough, still producing water, and described in SMC Journal 1973/74, p.19 as the Hairpin Bend Levels.

d) "A survey of several lands in the Lordship of Broseley, etc plotted by W C Anno Domini 1686" (SRO1224/1/34)

This map does not show any underground workings but it is notable because it has a mine depicted by a form of hand winch on it (see Fig.10). The mine was situated between Benthall Brook and Cockshutt Lane, it is probably the earliest depiction of a Shropshire mine.

Notes

1. 17th century Shropshire terms for mineworkings are very interesting, eg an adit can be a Footridd, Insett, Waggonwaye, Gatewaye, Comegate Waye or Windway. Surface routes are usually shown as Horseway, Wayboard or Railroad. Inclined planes were Tylting Rails and drainage levels were Soughs, Suphs or Sows. A mine would be shown as a Pit, Delph, Gin or Head.

2. From 1700 the maps became more sophisticated, that of 1728 mentioned in the report shows five workings, one at Woonhay being particularly complicated.

3. The report also describes two late 18th century or early 19th century pumping houses now used as dwellings at Jackfield. The Tuckies Hill enginehouse has been proved to be a pumping house but the Lloyds Head enginehouse, although it certainly looks like one, has yet to be proved.

The authors of the report have also produced two books which provide background detail for the above. These are :-

"The Landscape of Industry", 1993 Routledge

"English Heritage Book of the Ironbridge Gorge", 1993 Batsford.

Frongoch Mine - an Underground Exploration

Roy Fellows

The Frongoch Lead & Zinc Mine is situated about 2 miles from Pontrhydygroes in mid Wales. The history and surface remains have been well documented in an excellent book by David Bick but I shall start by giving a brief description of the surface remains as they exist today.

Surface Features

Geographically, the site may be divided into two areas, bisected by a council road. The upper workings to the East comprise the main group of shafts, enginehouses and other associated buildings. The lower workings to the West comprise the dressing floors and workings of the Wemyss Mine which once worked separately. Passing through the iron gate which leads into the upper workings, you pass a heap of spoil on the left and at the top is a rubbish filled depression which is Williams Shaft. Passing the ruins of the mine office, you next reach the ruined enginehouse associated with Engine Shaft. Climbing up to the shaft collar, it is possible to look down to where the shaft APPEARS to be filled with rubbish with the pump rod protruding through the fill.

Looking East, a huge opencast can be seen and, beyond that, an isolated shaft in the middle of a field marks the Eastern extremity of the workings. At one time it was possible to climb down into the open workings and reach a huge stope with a timber floor. A few years ago a fall of rock blocked this off. Above the enginehouse is a level, only a few metres long leading to a blockage, which may have been a manway down into the workings.

Back through the gate and down the road for a short distance, there is a panoramic view of the lower workings - dressing floors to the left, Wemyss Mine to the right and other workings on the same vein extending as far as Graiggoch Mine in the distance. Below and to the right of where you are now standing are the spoil heaps of Boundary Shaft. This shaft is oval and stone lined and again APPEARS to be filled with rubbish. Looking down at the Wemyss Mine, the square powder magazine stands out and, just above this, a depression and adjacent concrete engine bed mark the position of Balls Shaft. Below the magazine is an open incline shaft, connecting after a short distance with the top of a vertical shaft about 60ft deep. This is overhung with the actively collapsing false floor of an adit which has run in at the portal. I have not descended this shaft due to its condition and the lack of a suitable belay. Adjacent to the dressing floor is an open adit which leads to the blockage in Balls Shaft with some minor workings off.

Exploration of Deep Adit

To visit the Deep Adit, it is best to park your car just off the council road below the dressing floor and then enter the site via the gate. If you walk down hill parallel to the road, you will reach a cutting leading to the adit (Fig.11). This is a grotty looking hole with a large volume of water pouring out. It was not until the dry spell of 1995 that I felt like going in and even then in a full wet suit. My first visit was late April, at which time there was chest deep water at first followed by a series of three flat out crawls in fast running water. After this, normal progress is possible in waist deep water from a point where daylight enters from above. This is a narrow stope and, from below, looks about 10 metres. Standing by this "Adit Shaft" on the surface, however, and looking at the fall of ground down to the adit, it would probably be more than

double this. There is no suitable belay point to use as a means of access to this shaft, you would have to drive a stake or something into the ground.

Fig.11 - Frongoch Deep Adit

Near Pontrhydygroes (NGR SN713743)

WARNING - ENTRANCE SECTION SUMPS OUT IN WET WEATHER.

Fig.12 - Pump Rods in Engine Shaft

Proceeding inbye, you pass through an area where the roof has been stoped out to a height of up to 5 metres with much old timberwork. A "bait area" is also passed on the left. The adit trends E.N.E. with many twists and turns, passing the Wemyss workings altogether although two blocked passages on the right may have once connected. After about 400 metres, a 17 metre high chamber is reached. The adit then continues for another 60-70 metres to a forehead but, about 20 metres before this, there is a cross cut South to Boundary Shaft. The adit has a timber catwalk, a feature that was to prove useful later on.

In the vicinity of Boundary Shaft, there is an iron kibble and a long hooked bar used for pulling it in from the shaft. The shaft itself is blocked with rusting scrap metal just above roof height and also at floor level, but open to the height of the adit. The adit itself circumvents the shaft to the East and then cross cuts a major working. From here, going right (West) passes a blind heading on the left and reaches a flooded understope where water rises. This has a short length of ladder up to what was once a timber platform. Here there is a rise to higher workings. This place is the subject of one of the photographs in David Bick's book. Turning left (East) at the cross cut takes you about 30 metres under a stull to a forehead. A climb up a short length of ladder, however, takes you into a continuation of the adit, which again trends E.N.E. At one point the adit turns North and passes through an area which has been stoped in each direction, here the adit has been heavily timbered. This is the subject of the other photograph in David Bick's book.

After passing a flooded winze on the left, the adit reaches Williams Shaft which is solidly filled. As before, the adit circumvents the shaft to the left. About 20 metres further on, the adit was blocked by a solid collapse which had formed a cavity in the roof. There were signs that other explorers had attempted to dig through this without success (they were digging in the wrong place!). After this initial exploration, it became obvious that further exploration would be possible in two ways, ie by digging through the collapse or crossing the flooded understope. Regarding the latter, my instincts told me that there would be other flooded understopes and this was proved correct. Both "projects" were to prove successful and one at least was to lead me into workings where no modern explorer had been.

<u>Exploration West (the flooded stopes)</u>

The first was easily crossed using a 15" inner tube as a buoyancy aid. I also decided to fit traverse lines which were to prove invaluable later on. After the crossing, a climb over some rubble led me to an area where it was possible to look up into stope workings 70-80ft high. The next obstacle was a section of what appeared to be underwater false floor covered in rocks. I think now that it is more likely to be backfill that has settled over the years. It took my weight but I fitted a traverse line of sorts here. Next came another flooded understope, this time about 15 metres across, where another traverse line was fitted. It would have been very difficult to climb out of the water at the end but for a ledge on the left hand side. Here I found myself standing on a "bridge" of rock across the stope, a mere foot wide. The "hole" in front of me, although only a few metres across, had sheer sides rising several metres from the water. The opposite side also had a pile of loose rocks perched right on the edge. It was crossed by a rotten plank on two rotten stemples, clearly unsafe to cross.
My solution to this problem was to return to the adit and remove a section of the catwalk, however, being well sodden it wouldn't float! This was overcome by tying a tape sling round it and clipping it into the traverse lines. Once this was in position, the hole was safely crossed. A few metres further on, however, there was another flooded understope, this time with a timber catwalk in situ. The catwalk ended about 10 metres short. The stope was much narrower here

so I was able to propel myself along using my hands, again with the inner tube as an aid. A bit of extra fun was three stemples a few inches above the water which had to be ducked. Out of the water and onward, the adit went for another 40-50 metres to a forehead, with blind headings to the left. At one point, I passed a laddered winze going down into blue water. There were clog prints everywhere and only one set that could have been modern wellies. However, I have to say that I had removed my heavy boots for the last "swim" as a safety precaution and it is possible that other explorers may have done likewise.

Exploration East (the dig)

I attempted this by digging in the same place as previously attempted by other explorers, without success. At one time I was absolutely exhausted, working in a confined space, in a wet suit, with poor ventilation. On 14/5/95 I returned with a long iron bar as well as my digging implement. This digging was being done by working inside the roof cavity formed by the collapse and all previous effort had been directed at the back, ie forward. Probing around with the iron bar, I was able to generate a draught by working on the left. Taking off my wetsuit top (what relief), I set to with a vengeance and was through in about two hours.

The passage beyond was in a few inches of water and after about 20 metres reached a Y junction. The right branch went into a large stope with a wooden launder in the floor. One section of mud was a mass of clog prints, some small enough to be those of children. The adit continued through the stope to a collapse. The left hand branch continued for another 80 metres to Engine Shaft, which is well and truly open underground. It is possible to look up to a height out of range of a caplamp. The pump rods, rising main and associated bits and pieces are all in situ. There are many other artefacts in this area, including a wooden wheelbarrow in an adjacent adit. Further digging past this point would be impossible, as the collapse is on the vein. I would like to end this article with a note of caution. It is only possible to enter these workings during a prolonged dry spell. Apart from the first section of the adit sumping out, there is every indication of the inner workings in the vicinity of Engine Shaft being under several feet of water at times.

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Miners' Housing in the Shropshire Hills

Ivor J Brown

There have been several drawings reproduced recently of imposing double storied "miners cottages" in the Stiperstones area - but were the miners' homes really as grand as these? For a start, until the 1870s there seems to have been few whole-time miners dependant on that craft in the area. The average lead miner's working day appears to have been short, reportedly sometimes as little as six hours, in order that they could continue their principal life-supporting occupation of subsistence farming, albeit on a very small scale.

All of this is made clear in the Kinnaird Commission Report of 1863. It contained evidence that very few of the miners lived in the villages but were "scattered over the hills". Captain Henwood of Snailbeach said that "during the week the miners use cabins and barracks near the shaft and the smelters have bedrooms in the melting house yard". At busy times on the farms and smallholdings, work at the mine took second place and it was a common complaint of the mineowners that their workers were firstly farmers and only secondly miners. In the owners' view, this was also often the cause of closure of many a mine.

While dossing down in cabins and barracks for a few nights each week solved the itinerant miner's own problem, he still had to provide a home for his family and, from this, the practice of "squatting" grew up. This involved the construction of a simple dwelling or hovel on any odd piece of land. It was often actively encouraged by the landowners and mineowners who felt that they would be better served by persons who lived close at hand and who were dependant on them for the space of their habitation. The process of squatting was first described to me by the last of the Bennett family, who lived in Perkins Beach just before he moved out of his cottage in the mid 1960s. The remains of this cottage/holding can still be seen, the walls now only being about 1 metre high. A good description appears in an essay written by an anonymous writer in 1898 and preserved in the Shropshire Records & Research Centre under the heading "A Short History of Perkins Beach Mine". The period described is just prior to 1860 and the description is worth quoting in full.

"In those days it was customary with the mining population for want of better accommodation to select a site on the mountain, then obtain assistance of a few of their fellow workmen. Some of (these) would then repair to the adjoining plantations and for a nominal price purchase a quantity of larch or other small poles that had been cut down to give room for the growth of those left standing. Meantime the other portion of men could be employed building walls with sods. The first consignment of timber arriving, one or two, who were considered to be the most expert with axe and saw, would commence forming a roof to the habitation. This would be 'slated' with the class of material the walls were built of. When convenient a scanty coat of straw, generally mixed with heather, may be laid on the top to ensure it was waterproof. The ground floor (would) consist of the natural subsoil."

"Usually the whole family would quarter in this (structure). The following morning the next on the scene would be the farmer terribly chagrined at the damage done to the mountain sheep run. Following hard after him would come the Lord of the Manor or his Agent to demand a nominal rent. In most cases (they would) grant an allotment adjoining for a garden plot. Many of these structures as time went on, and with an agreement between the Landlord and the squatter, have been made into convenient dwellings and a cow, sometimes two, have been kept thereby greatly enhancing the value of what aforetime was nominally a barren mountain."

Fig.13 - Squatter's Cottage at Plox Green

Fig.14 - Workers' Cottages at Tankerville Mine 1893

Fig.15 - Pontesford No.1 Engine House Converted into Domestic Dwelling

"Out of these huts have come many a stalwart, intelligent miner to find his way to different parts of the mining world and his family to respectable positions in society. The discovery (of Perkins Beach Mine) was made one moonlit night by a miner ditching round one of these aforementioned gardens. He struck a very fertile lode in which he found a fine lump of rich lead ore close to the surface."

Genuine "ruined miners' dwellings" would today most often be found as broken down walls on flattened platforms scattered around the hillsides. The walls of the living area would form small enclosures while alongside there would be one or two larger enclosures made to keep stock in or to keep sheep out of the garden plots. The buildings would have been covered with sod or thatch roofs, long disappeared although some thatched cottages remained at Pennerley until recently. Others will of course have been re-roofed by later generations with slates or tiles or more often the ubiquitous corrugated sheeting (see Fig.13).

Several surveys have been carried out by various authorities over the years of the conditions in which the workers of the Shropshire Hills lived. Even as late as 1869 a Government Survey (quoted by Trinder in his History of Shropshire 1983) found that labourers' cottages in the county were worse than in any other English county apart from Dourest. The situation in Pontesbury Parish is described in the Victoria County History. "... Most of the cottages erected between 1785 and 1848 were originally hastily contrived turf huts". Two such cottages had been recorded as early as 1793 and in 1836 a "vestry resolution" refers to "huts wherein several men, women and children are living together in one room, whereby the morals of many children are corrupted and vice and immorality encouraged to a great extent". The VCH continues by stating that nearly all of these huts had been replaced by stone cottages before 1857. In the later 19th century, the common house type was a single storey stone cottage having two or three bays but by 1968 very few remained, at least 30 having been demolished in this century.

All of the evidence therefore must lead to the view that the Shropshire Hills' miner lived in much smaller dwellings than those considered to be "old miners' dwellings" today. The buildings that survive as ruins may well do so only because they were non-miners' dwellings. Several other styles of miners' housing are of course to be found, including detached houses built for key personnel at particular mines such as the engineman, manager or agent. Purpose-built groups of dwellings, most commonly in the form of rows, were built to accommodate essential workers at times of expansion (see Fig.14). Another form of dwelling is that of a conversion from enginehouse or workshop to houses and outbuildings (see Fig.15). This was a fortunate practice for the industrial and social historian because it has preserved so many of the features that are cherished in Shropshire today.

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Ketley Hill Tunnel System

Adrian Pearce

Introduction

In July 1995, David Adams was approached by a David Gwilliam who lives at Hillside, Woodside Rd, Ketley. Mr Gwilliam had uncovered a number of strange tunnels in his garden (NGR SJ678107) and wanted to know what they were. As a result, four members visited the site in August to carry out a survey.

Description

The brick arched entrance to a tunnel was exposed in a bank of earth which Mr Gwilliam had been removing close to his house (see Fig.16). There were circular brick foundations outside this arch which looked like the base of a chimney but this has not been proved. The tunnel system is brick lined throughout and the first section was 0.9m high and wide with heavy carbon deposits, indicating that it could possibly have been a flue. This led into a circular brick-lined chamber which had a brick beehive cover. The latter had accidentally been broken into from surface by Mr Gwilliam. The floor of the chamber was obscured by rubble. A further section of tunnel led to a similar but smaller chamber which was open to surface as a result of a demolished beehive. A short length of passage led from this to an arched entrance, with a smaller diameter side passage leading to a further entrance, albeit collapsed. Another curving passage led off from the collapsed chamber in the opposite direction, ascending slightly, and eventually ended at a collapse. In the floor of this section were a number of spaced channels with no apparent egress to the sides.

The first impression was that the tunnels formed a flue system, hence the carbon deposits and a possible chimney. However, the shape of the tunnels and the presence of the chambers makes this far too complicated for such a simple explanation. So what do we know from physical examination :-

- There have obviously been some fumes passing through the system to leave the carbon deposits.

- There appears to be the base of a chimney at the end of one of the tunnel sections.

- The chambers have the appearance of condensing chambers.

- There appears to be a manway access into the system.

- The channels in the floor appear to have been to collect something.

Information from Records

a) In 1781, Archibald Cochrane built experimental tar distilleries at Calcutt and Benthall. Following liaison with William Reynolds, the latter built his own one at Ketley in 1789 but the location is unknown.

b) The 1840 tithe map (see Fig.17) shows "Hillside" as parcel 712. This is described in the Apportionments as House & Garden (30 perches) occupied by Benjamin Dawes. Landlord was the Duke of Sutherland.

Figure 16 - Ketley Hill Tunnel System

Figure 17 - Area in 1840 Tithe Map

Figure 18 - Area in 1894 Sale Catalogue

c) The adjacent Ketley Hall was parcel 760 and is shown as occupied by Henry Williams, landlord again being the Duke of Sutherland. Williams also occupied parcels 719 and 761, both shown as pits. Henry Williams was appointed Agent and General Superintendant of the Shrewsbury Canal in 1797. William Reynolds was one of the canal's promoters.

d) The 1894 sale catalogue of Ketley Estate (see Fig.18) shows parcel 712 as Cottage & Gardens (30 perches) occupied by Jeffrey Jones. The latter is described in an 1886 trade directory as a farmer.

e) Ketley Hall was occupied by managers of the Ketley Iron Works until later in the 19th century. The owner of the iron works was William Reynolds.

f) The inclined plane of Ketley Canal went past the house just to the south. The house would be near the top of the inclined plane but there is no record of a winding engine, only use of gravity.

g) Ketley Canal was built 1787-88 by William Reynolds to transport coal and ironstone from Oakengates to Ketley Works. It was driven level to the south side of Ketley Hall and then west down an inclined plane with a drop of 73ft. Ketley Works closed in 1816 and the inclined plane was disused by 1818.

h) At Ketley, in dry periods, a small steam engine pumped the water lost from the top of the lock back up from the bottom of the plane.

Conclusion

There are two possible conclusions that spring to mind but the definitive answer still avoids us. Any suggestions will be gratefully accepted.

a) That this was the experimental tar distillery built by William Reynolds. The latter had a connection with Ketley Hall but the site may equally have been at his Ketley Works to the west. It might explain features such as the carbon deposit, condensing chambers and collecting channels. If it was, it must have been abandoned by the beginning of the 19th century since the site became a farmhouse.

b) That it was associated with the nearby inclined plane. Again there is a connection with Ketley Hall, and thus William Reynolds and his canal agent. Could the house have been the site of the pumping engine? If so, the flue does not fit the standard design associated with the engine's boilers and chimney. Could it have been a conduit for the pumped water? If so, why the chambers?

I am afraid that the conclusion is that there is no conclusion at this stage.

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Survey of Stanley Colliery, Highley & Associated Features

David Poyner & Robert Evans

Introduction

Stanley Colliery was situated on the banks of the River Severn in Highley and worked for 20 years at the start of the 19th century, employing perhaps 100 people and sending coal down the Severn to Bewdley, Worcester and beyond. It was to be the largest and most successful example of a colliery in the Wyre Forest Coalfield until the Highley Mining Company's efforts in the late 19th century. Its existence was largely forgotten until recently, however, partly because its remains were obscured by the construction of the Severn Valley Railway, and then by the subsequent colliery of the Highley Mining Company. This article presents a survey of the main surface features to be found on the site of Stanley. It also gives an account of observations made on a trench and shallow excavations arising from building work currently being undertaken in the vicinity of the mine.

History

Although the history of Stanley has been dealt with elsewhere [(1)], a brief overview will be given here. The mine appeared to have started in 1803/04 and the owners were John & Benjamin Thompson, ironmasters and entrepreneurs. In December 1804 George Sheffield, a miner, was killed "in a certain footrid ... called Stanley footrid". Thus it seems that the initial mine was a drift from the surface. The shallowest coal seam found here is the Brock Hall Seam, thin and full of sulphur, but worked at a depth of 20-30 yards elsewhere in Highley and Chelmarsh. This was the most likely target of the drift. However, at about 100 yards depth are to be found the Main Sulphur and Hard Mine Seams, much thicker and with a lower sulphur content. These lower seams were the mainstay of the mine. A 100 yard shaft with a steam winding engine had been sunk by 1807, when best "tops" and "bottoms" coals were both being sold, and in 1810 a miner was killed in the No.3 pit [(2)]. Benjamin Thompson have up his share in the mine about 1811 and, in 1812, the collirey was purchased by William Hughes and partners, together with the lime and brickworks the Thompsons owned at Arley and Stourport. Hughes eventually came to lease at least some of the sandstone quarries adjacent to the mine and also in Arley, as well as houses and farms in Highley. The mine finally closed by 1824 , as a result of the coal being lost through faulting.

The dispersal sale of the colliery gives some indication of its size. This included a 20HP pumping engine with 120 yards of 8" pumps, two 7HP winding engines, 170 yards of flat rope, 150 pairs of 6ft iron rails with rail and road waggons, "a variety of blowing tack", smiths tools, counting desks, weighing machines, timber, two Severn barges each of 60 tons and a theshing machine, presumably from the farm owned by Hughes. The shafts reached to 110 yards and the colliery had rights to coal under 180 acres. The sale did Hughes little good, however, for by 1826 he was bankrupt.

Although not mentioned in the sale documents, a substantial settlement had grown up around the colliery, with 24 families living there in 1822. This gradually shrank in size but was still one of the most densely populated parts of the village 30 years later. The quarries continued in production until the end of the century and, with the river adjacent, the area retianed some of its economic base. The area was mapped by surveyors for the forerunner of the Severn Valley Railway, firstly in 1846 (see Fig.19) and then 1852 [(3)]. These show several houses, other

buildings, areas of quarrying and two of the Stanley shafts. The buildings compare well with those shown on a 2":1 mile plan of the area prepared by the Ordnance Survey in

Figure 19 - Stanley Colliery Area in 1846

Figure 20 - Stanley Colliery Area Today

1815 [4], although the scale of this latter survey unfortunately makes it of limited use. The remains of the colliery were quite obvious at this time for, when in 1858 a report of the construction of the Severn Valley Railway appeared in the *Bridgnorth Journal*, the author described the area as being a dangerous place on account of the remains of a coal mine. It appears that the railway was driven through the middle of the colliery, for the shafts are now to the west of it, whilst a spoil tip is to the east. Most of the houses were probably pulled down at this time but a brick terrace remained occupied until the 1950s. It subsequently fell down but is now being rebuilt. A stone cottage, Stanley Cottage, remains as a dwelling house.

The Highley Mining Company established their colliery on an escarpment above the Stanley Colliery. To provide a connection with the railway, a standard gauge self-acting incline plane was constructed, this time cutting the colliery site in a north-south direction. A further encroachment was made by the construction of the exchange sidings, where part of the site was cut away and then dumped to create a level area. The area of Stanley taken by the Highley Mining Company is now part of the Severn Valley Country Park. The rest of the area to the west of the railway is largely wooded. Between the railway and the river there is a strip of woodland and then pasture. Here a drive has been constructed in association with the rebuilding of the riverside house.

The Site Today

Visible features of the site are shown in Fig.20. The incline of the Highley Mining Company (1) emerges from a cutting in the solid sandstone escarpment and almost immediately starts cutting through softer ground as it headsd towards the sidings site (2). This site was extended in the 1950s, truncating the incline which now ends 20ft above current ground level. Between the sandstone escarpment, the sidings and the railway is an area of undisturbed ground marking the site of early 19th century activity. Cut into the sandstone are quarries (3) & (4). These have associated access roads; that at (3) is deeply sunken below ground level whereas that for (4) rests on an embankment on its east side, as the ground slopes towards the river. Quarry (4) is substantially larger than (3); the northern face shows many toolmarks indicating that it was worked by hand; blasting seems to have been used on the southern face reflecting use in the late 1920s to obtain stone for road building. There is a suggestion of a steep track leading straight from (4) to the river, which might have been an incline to a riverside wharf.

About 20 yards due south of the incline, just above the edge of the HMC sidings, is the site of one of the shafts marked on the 1846 survey (5). There is a distinct mound containing brick fragments, on the east side of which is a track leading down to the river; this was probably a tramway but its route is now curtailed by the sidings. On the other side of the mound is a conical depression approximately 15ft deep, probably marking the shaft itself. This depression is separated from a second depression immediately to its north by a ridge, about 4ft high and 10ft long. We speculate that this second depression may mark the site of an engine house but this can only be proved by excavation.

The incline seems to have been cut through the earthworks of the Stanley Colliery, leaving a triangle of elevated ground bounded by embankments to the north (6). According to the 1846 survey, the second shaft should be close to this but its position is no longer obvious. It may have been sufficiently close to the Highley Mining Company's incline to have been infilled in the 1880s. The elevated ground rests on what may itself be an additional platform of made-up ground, sloping towards the road to the north, and with embankments to the east and west. It must have functioned as a general reception area for the colliery and quarries. The whole area

between the incline and the road appears largely undisturbed by subsequent mining and quarrying events. Across the road is a triangle of land bounded by the railway station to the east. In the northern corner of this is a shaft, marked on the 1882 O.S. map but not the 1846 survey. Its position close to the documented features of Stanley Colliery is clearly intriguing but its absence from the 1846 survey suggests that it may post-date the colliery.

Beyond the southern edge of the sidings is another area of undisturbed ground, although rendered somewhat inaccessible by fallen trees. The most striking feature is a low embankment, which runs in an east-west direction and disappears into the railway embankment (7). It roughly aligns with a spoil heap on the other side of the railway and it is tempting to assume that there was a shaft in this area with which these features were associated. The 1846 survey marks a cottage close to this but, although there are bricks scattered here, the conditions preclude detailed survey.

Between the railway and the river, the ground is much flatter. According to the 1846 survey, this was the location of much of the colliery housing and, in addition, must have been the site of the colliery and quarry wharves. This is the area recently sectioned by a 3ft deep trench for drains and cables. The only house currently standing is Stanley Cottage (8). This is a long 1½ story building, with thick sandstone walls. There are grounds from documentary evidence and from its style of construction to think that it predates Stanley Colliery. The current excavations have extended to its boundary hedge, from which two 17th-18th century clay pipes have been recovered, supporting this early dating. Within the present garden of the cottage is a large spoil mound, marked on the railway survey, and clearly from Stanley (9). As the trench passes through this point, a layer of red ashes is apparent, presumably representing clinker and burnt shale from the colliery. The red ash is most apparent by the spoil tip but it occurs periodically further south along the trench.

Beyond the garden is a brick storage tank (10), built in the 1880s to supply water to Highley Colliery, and the cast iron pipe which carried this to the pump house has been exposed in several places. South of this, the 1846 map marks the site of 3 cottages. At the first of these, the excavations have sliced a bank, rising about 4ft from the ground and extending back to the railway (11). About a 15ft section of this is white clay, with a band of unburnt coal debris up to 1ft thick towards the top of it. The clay contains fragments of brick, tile, red and white sandstone, and on either side is surrounded by soil containing pottery fragments. Beyond the section, on top of the bank are 3 low mounds. We speculate that these represent the sites of the first set of cottages and outhouses marked on the 1846 map, and that spoil had been dumped in front of them to create the present bank.

Beyond the mound is a spring, leading to the river. Arising out of this boggy area is a low mound, about 15ft x 20ft, the site of the second cottage (12). The trench here reveals fragments of brick, tile, stone and pottery. The third cottage is set on the bank overlooking the valley and about 10ft of sandstone wall, one course high, still stands (13). This is adjacent to a track leading to another sandstone quarry, partly infilled (14). However, below the second cottage the trench contains a layer of unburnt coal debris approaching 1 ft in thickness (15). This seems to be interrupted by brick and tile from a "building" shown on the 1846 survey. It is difficult to interpret the significance of the coal layer, unless the area was used for stockpiling from Stanley. Close to this deposit, and about 10ft from the river bank, the recent excavations have revealed very large sandstone blocks, approaching 3ft in all dimensions, which may have formed part of a quay for loading the coal (17).

Below this building, the 1846 map shows an area clear of houses. However, the trench has thrown up further quantities of stone, brick and tile, suggesting the sites of further buildings (18). The final set of features are the gardens and remains of the brick terrace currently under reconstruction. This was originally 4 separate dwellings, each 2 up and 2 down with individual rooms 10'6" x 15'9". Beyond was a further quarry, working Keele Sandstone, which was probably abandoned in the mid 19th century.

Artefacts

The current building operations have revealed a number of artefacts of interest. A large number of fragments of domestic pottery have been recorded. These seem to be mainly earthenware cooking or storage vessels, or brightly decorated plates and jugs, either slipware or printed "blue & white" pottery. Most of the pottery is consistent with an early to mid 19th century date.

Three items which may be specifically associated with Stanley Colliery have been recorded. A length of winding chain was found in the garden of a bungalow erected close to the site of cottage (b) on the 1846 survey. Chain of this type was never used at Highley so it is possible that it may have come from Stanley. A wheel hub was found in a mound of earth which came from the immediate area of the spoil tip. This is 4" long with 4 spokes, with the hole for the axle tapering from 1.75" diameter to 1.125". It may have run on plate rail. A length of this, covered in red ash, was recovered from the area of the spoil tip. This is 2" wide with a 1.5" flange. At its unbroken end is a lug, 1.5" x 2", which must have been used to locate the rail into a sleeper.

Conclusion

In spite of a very disturbed history, it seems that there are significant remains at Stanley of the colliery and workers' houses. We suggest that they would merit further investigation.

Acknowledgement

We would like to thank Dr Gwyneth Nair for her comments on the text.

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Penrhyn Mawr Diggers Reach Rock Bottom

Harold Morris

It was recently reported that the great Penrhyn Mawr dig had indeed come to an untimely end. Hopes had been high for the continuation of the shaft to a final breakthrough into the old workings of the Penrhyn Du Lead Mine.

Tales of mysterious happenings in the cove of Porth Bach in bygone days have been repeated over the years, passing from generation to generation. Residents of Bwlch Tocyn speak of the days when boatloads of contraband were landed under cover of darkness, carried up the beach, then to disappear from sight into the dark maw of the Penrhyn Du mine drainage adit. Here, deep underground, casks of wine and brandy together with tobacco and exotic French perfumes would be safe from the clutches of the revenue officers who regularly patrolled this rockbound coast.

With safe distribution organised, the goods would be carried further into the depths of the mine via a network of passages, known only to a few of the older miners, to a place directly beneath Penrhyn Du farmhouse. Here, a narrow shaft led upwards for over 100ft to emerge in the kitchen of the house.

Any officer of the crown removing the stone slab and peering into the dank depths of this shaft would have been told that it was indeed a well, dug many years before. It had given good service until, with the deepening of the mine shafts a short distance away, it had run dry. Any stones dropped down to prove this point would have landed on the floor of the level deep below with a resounding crash. Even the lowering of a lantern would not have revealed the true nature of the shaft, it would have taken more than a brave officer to have attempted the descent dangling on the end of a rope. The zealous few who insisted on removing the cover to inspect the hole were more than glad to replace it after little more than a glance into its fearful depths.

Small gifts, or sometimes threats, in the right quarters would have sealed the lips of any who knew of these unlawful activities and therefore ensured the success of the enterprise for a great number of years. It would have ended with the closing of the mine, and the subsequent deterioration of the timbering in the underground workings, which resulted in heavy falls of debris closing the route from beach to farmhouse.

Over a period of years the shaft was filled with debris and abandoned.

Was this just another yarn or had there indeed been an underground connection between the house and the mine workings? I met Mrs Jill Whip, the owner of the property, late in 1993 and she was eager to discover the facts behind the old story so readily gave permission for a dig to take place. First, I examined the shaft and found it to be open to a depth of about 12ft. It was known that a couple called Penny and Shaun, who had previously lived in the house for a short time, had done some digging. They now live further up the lane at Penrhyn Uchaf.

A metal jack roll was constructed for hauling buckets up the shaft, together with a small trolley that could be used to carry the buckets down the hall and out through the front door.
A crew of diggers was mustered - Brian Grimston, Paul Smyth and Mark Carhart. I assumed the role of mine captain, my chief concern being the safety of a large Japanese vase standing close to the front door.

The first visit by Brian and I saw good progress being made, with invaluable assistance given by Penny in removing the debris raised to a suitable location using a wheelbarrow. An increase in depth of 6ft was achieved.

The second trip saw the whole team in action, with no shortage of volunteers for duty down the hole. It is, however, fair to say that Brian elected to stay at grass. Progress was poor due to a change in the nature of the debris in the shaft, now being mostly stone and sticky wet clay. This resulted in a gain of just over 2ft.

The third and last dig was made just after the Whit Bank Holiday, during June of 1994. Al the team were present and rapid progress was made due to an improvement in the material being raised. Brian worked the grass crew to their knees with his enthusiastic bucket filling and soon reached a depth of 23ft from grass, only to find that he had reached a solid bottom.

This abrupt end to the operation was a great disappointment all round and succeeded in killing off a very romantic story about the smugglers of yesteryear.

It remained only to lower a couple of buckets of water down the shaft so as to test the well failure theory. This was done when the mine captain was down the shaft making a final inspection, needless to say sloppy winding by the winch man ensured that the captain got very wet. Howls of rage from the depths of the shaft served only to increase the merriment of the muckers above. The water did not immediately drain away and the well theory therefore remains unproven.

Clee Hills Colliery near Ludlow

Nigel Chapman

Between June 3-7th 1850, Samuel Dobson of Aberdare, who was probably a mining engineer, visited the Clee Hills coal and ironworks near Ludlow belonging to the Honourable R H Clive and Sir William R Boughton, Baronet. At some unknown date, the works had been leased to a Mr Lewis but, following his death, had been operated since February 7th 1843 by his Trustees. The owners were considering what to do next and decided to commission a report on the mines and works from Samuel Dobson.

The mining field covered the whole of Knowbury basin, with the Gutter Coal seam being drained by an adit making it independent. The Knowbury Collieries required a pumping engine to effect their drainage and the engine lifted water 53 yards up a shaft to the Whitton Court drainage level at 79 yards from the surface.

In the Knowbury basin, four coal seams existed but poor records of past mining activities meant that precise information on the seams required an underground visit. At New Pit the coal seams were :-

Depth from Surface	**Dist. Apart**	**Name**	**Average Thickness**
180 yards		Great Coal	7-10ft
181 yards 6ins	1 yard	Three Quarter	2ft 6ins to 3ft 6ins
184 yards 6ins	3 yards 1ft	Smith Coal	4-6ft
191 yards 6ins	7 yards	Four Foot	2ft 6ins to 4ft.

The Great Coal was said to be the best domestic coal, while the Three Quarter produced a large amount fit for lime burning, only a small amount was available for domestic use. The Smith Coal provided about 50% for domestic use, while the remainder found a ready sale for use as a forge coal. It also made a good gas producing coal and was used to make coke. Of the Four Foot Coal, a large quantity was only rubbish or supplied an inferior house coal. During the cutting, a lot of small coal was made and this found a use on the farm for burning lime. The Gutter Coal produced about half as a house coal, while the inferior went for lime burning.

Ironstone in the form of large nodules was found in the coal measures, mainly in the shale above the Great, Three Quarter and Four Foot Coals. It also occurred as a black shale between the Three Quarter and Smith Coals and as a black band in the roof of the Gutter Coal. In the latter case, it was from 6-20" thick. In 1850, the ironstone was collected and smelted in a furnace at the Knowbury Works, while nearby at Cornbrook was an old furnace.

The coalfield was intersected by several large faults, making the working difficult and irregular. It was stated that the average cost of extraction was 7s 6d per ton. Over the coalfield, the Great Coal had been extensively worked in the past and was exhausted. Considerable areas of the Three Quarter Coal remained but it was very thin, making extraction uneconomic. Of the Smith and Four Foot Coals, a limited area remained to work but, because of the poor records of mining, the extent was unknown. It was suggested that the whole of these seams could be worked from a colliery known as the Green Pits, probably producing 6,000 tons for the next 10 years.

The future of the coalfield depended on the Gutter Coal, with considerable areas still to work. Recent exploration had produced evidence of poor quality coal in the seam, in the Lower Gutter Pits the coal had been so poor and faulted that it was abandoned. It was believed that, by working to the dip, superior coals would be found. In the event, the seam would supply considerable amounts for some years to come. Mr Dobson suggested that the sinking of the Moor Edge Pits should be completed, making about 20 acres workable. During the sinking, large quantities of water had stopped operations, since then natural drainage had improved the situation but it was still viewed as a major undertaking. A tramroad of 800 yards would be needed to deliver coals to the turnpike road (Ludlow to Kidderminster). Another suggestion was to drive a cross measures drift from the Penny Pits to the Lower Gutter Pits to prove the seam and open the workings.

Mr Dobson believed that, with enough capital and energy, the coalworks could be made profitable and suggested that a responsible person should be found to work them. He objected most strongly to the use of day wages at Knowbury since he had never met colliers on such low wages or so many hands employed. His estimates were based on the use of contract or piecework labour. He suggested that a suitable tenant should be found to take on the mines but, knowing that it might take some time, he suggested that the landlords continue working the Green and Lower Gutter Pits. To keep the Green Pits open would require repairs to the pumping engine at Knowbury, namely a boiler and the fitting of a wooden king post with iron straps to lift the ends of the wooden beam. Fortunately, a second hand boiler lay near the Green Pits and was for sale.

The Whitton Court water level drained the Dumplings Pits about 800 yards away and the Tinkler's Pits about 200 yards farther away. In places, however, it had been crushed down to 7-8" wide. If a level was driven from Tinkler's Pits to the engine, a distance of 170 yards, the area could be explored and the drainage improved. While these operations were being undertaken, about 50 tons of coal per week would be raised. When the Smith Coal near Green Pits was reached, output would rise to 100 tons per week.

Mr Dobson estimated that a cost of £151 10s was necessary for the repair of the Whitton Court level and the pumping engine, to permit the landlords to continue working the coal mines. Added to this was a weekly cost of about £12 for the suggested explorations plus supervision during the period of about a month to 6 weeks that the operations would take.

At the time, the cost of working the collieries was put as follows :-

1847	Gutter Pits	4,967 tons 10 cwts
1848		4,775 tons 17 cwts
1849		4,695 tons 4 cwts
1850		2,387 tons 14 cwts
Total		16,826 tons 5 cwts = £5,522 9s

Average cost per ton of coal = 6s 7d.

1847	Upper Gutter Pits	3,553 tons 16 cwts
1848		4,453 tons 14 cwts
1849		4,376 tons 6 cwts
1850		6,752 tons 2 cwts
Total		19,135 tons 18 cwts = £6,083 3s 9d

Average cost per ton of coal = 6s 4¼d

1847	New Pit	6,230 tons 12 cwts
1848		3,447 tons 19 cwts
1849		196 tons 4 cwts
Total		9,874 tons 15 cwts = £3,378 15s 3d

Average cost per ton of coal = 6s 10d

1849	New Level Pit	1,522 tons 18 cwts
1850		1,903 tons 18 cwts
Total		3,426 tons 16 cwts = £1,606 14s 2d

Average cost per ton of coal = 9s 4d

1847	Green Pit	3,266 tons 9 cwts
1848		4,197 tons 6 cwts
1849		2,130 tons 2 cwts
1850		374 tons 9 cwts
Total		9,968 tons 6 cwts = £4,199 5s 8d

Average cost per ton of coal = 8s 5d

Average cost per ton of coal for the coalfield = 7s 6d.

Already existing at Knowbury was a single blast furnace, making good quality pig iron at a cost of £3 15s per ton. When bar iron was produced, the cost rose to £6 18s per ton plus transport, making about £8 per ton or twice the cost of some Scots iron then sold, Mr Dobson stated that no prudent man would invest his capital in these works with a view to manufacturing iron when hampered by such transport costs. He in effect suggested the closure of the iron making plant. As other sources state that the furnace ceased working in 1851, it appears that Mr Dobson's advice was acted upon.

Then, on December 31st 1866, John and William Pearson, bothers, coalmasters and brickmakers of Stourbridge, Worcestershire, signed a lease with George Grimston, Earl of Craven, to mine coal on the Clee Hills. The brothers were already engaged in working collieries at several locations in the South Staffs Coalfield and had the necessary knowledge and capital for the enterprise. They leased 2,900 acres of land, covering almost the whole of the high portion of the Clee Hills. A covenant of the lease required them to erect a blast furnace before September 29th 1867 near Cleobury Mortimer. In the event, this was never done. Pearson Brothers set to work with a will, sinking pits, working coal and introducing steam winding engines to the mines. Probably many of the mounds of pit waste to be seen beside the Ludlow road on the Clee Hills date from this period.

During 1870-71, the Pearsons paid £1,320 4s 9d towards the operation of these collieries and are said to have made a profit of 15% on the capital expended. They became involved in collieries at Rowley Regis, South Staffordshire and the Clee Hills were neglected. One report suggests that they visited the mines about once a year, leaving the day to day operations to a local manager who was left to his own devices. During 1872, the Pearson brothers entered into negotiations with Thomas Thompson for him to purchase the remaining years of their lease and form a limited company to work the collieries. Following an agreement of terms and with the Earl's approval, this was done. On January 21st 1873, the Pearsons assigned their interest in the Cornbrook and Knowbury Collieries to Thomas Thompson, junior.

The Clee Hills Colliery Company was formed in November 1872 with the following subscribers :-

A H Miller	Alexandra Villa, Epsom
Thomas Thompson, junior	Palmerston Buildings, E.C.
W H Harrison	Harley St, Cavendish Square
F H Fabran	Shakespeare Rd, Herne Hill
S A Cobbett	Mitcham
W B Cobb	62 Cornhill
Joseph Talmanson	62 Cornhill.

They went ahead to form the company with the following people named as directors :-

Edmund Harrison	114 Harley St, W.
Samuel Saunders	Conservative Club, S.W.
Major P W Sydenham Ross	United Services Club, S.W.
Captain John Kitto	Llandidloes
Thomas Thompson, junior	Palmerston Buildings, E.C. (vendor).

Thomas Thompson was happy to sell the lease to the company at a price of £30,000. This was to paid as £12,000 cash and £18,000 in shares of the new company.

The Clee Hills Colliery Company consisted of 40,000 shares of £1 each. The purpose of the company was the working and sale of the output of the coal mines and other minerals under certain lands called Cornbrook and Knowbury in the parishes of Cainham, Bitterley, Coreley and Cleobury Mortimer. The property was leasehold and very extensive, having an area of over 2,000 acres covering the whole of the high portion of the Clee Hills. A branch of the Shrewsbury & Hereford Joint Railway, forming a junction with the main line (L & NW & GW) at Ludlow, had its upper terminus on the Cornbrook estate. An extension of this branch right up to the pits had already been surveyed and marked out on the ground, under instructions from Lord Craven.

John Brunton, civil engineer, visited the mines to produce a report for the company and estimated the probable annual profits as follows :-

150,000 tons of coal at 2s 6d per ton		£18,750
15,000 tons of Dhu-stone at 1s 6d per ton	£1,125	
8,000 tons of ironstone at 5s per ton		£2,000
3,300 tons of lime at 1s 6d per ton		£250
Profit on bricks		£1,000
Profit on coke		£750
Total =	£23,875	

On March 19th 1873, a shareholders meeting was held in the company's office in Bishopsgate, London with Thomas Thompson in the chair. A directors' report noted that 22,000 shares in the company had been offered and taken up by the public. Two major problems had caused concern, the appointment of a capable Manager to superintend operations and the disaffection of the local men. They had appointed Mr W Bertram, who had supplied most satisfactory testimonials, at the end of January. Up to the meeting, he had proved to be capable of dealing with the men with tact and firmness and the regularity of the pay had worked wonders. The

output of coal had varied considerably but, with the mines in a poor state and improvements being undertaken, this gave no indication of future output. It was hoped that the construction of a railway up to the pits would be commenced in a few weeks, making the transport of large quantities of coal at a reduced cost a reality.

Bertram then gave his report on operations since January. He started by mentioning the unsettled state of the colliers and their past poor treatment, paid irregularly and employed on time-wages instead of the use of piece-work. They were now working with greater interest and improving the roads underground. The No.6 Pit had been fitted with a cage and both pits were winding coal at the time. Instead of 20 tons per day, they were now getting 100-150 tons. The cost of transport from the pits to the railway at Bitterley was a problem but the new line would improve the situation.

At No.1 and No.2 Pits on Cornbrook, they were putting in a steam engine to wind from each pit at the same time. They would need to sink a new pit of about 60 yards depth and place an engine between it and the Pole Pit to wind from both. A cage had been put into the Pole Pit and they expected to raise the Four Foot Coal from this shaft. The Chapel House Pit was also winding coal from the Four Foot seam. He was also unhappy with the size of some shafts, wanting them all to be 12ft in diameter. Bertram wanted the construction of the railway pushed on with all speed and believed they could produce from the existing 5 pits about 1,000 tons per day. With such a positive report, probably helped by a good meal and drink, the shareholders must have left the meeting looking forward to profits.

From this report, it is evident that each colliery consisted of two pits with a cage in each pit, worked by a steam winder very much in the South Staffordshire tradition. At the time Craven, Pole, New, Pool and No.6 or Gutter Vein were each being worked from two pits. Bertram made promises but failed to produce results and was replaced within a couple of months. A Mr Cooper was recommended by some of the largest shareholders in the concern and had some excellent references, so he was appointed Mines Manager. Both men concentrated operations along the outcrop of the Great Coal seam, moving from place to place and frittering away the company's capital without producing results. Because of the isolated nature of the coalfield, the control of mining was very much left in the hands of the resident Manager. He was expected to raise and sell the coal, keep the colliers content but most of all produce the expected profits. The prospectus had suggested that profits were made by the Pearsons with their distant methods of management, therefore with improved methods the new company should have made larger profits. The reality was proving to be different and, sometime in 1874, the second Manager was sacked.

The directors were desperate to find a new Manager who could be trusted to run the collieries on the Clee Hills in a proper way. Most of all he had to produce profits to keep the increasingly vocal shareholders at bay. Sitting as a director was the obvious person in John Kitto. He was asked to take over the concern but refused on the grounds of being more familiar with lead mines. At the "urgent entreaties" of his fellow directors, Kitto agreed but required a salary of £300 per annum out of which he would pay his brother Frank to be the resident Manager. He also required time to study the situation and make changes. Brother Frank was brought over from the Isle of Man and settled into a house on the Clee Hills, while John proceeded to reduce the stores bill and, by stages, bring down the colliers' wages. By October 1874, coal was produced from the No.1 and Church Pits and was said to be the best on the estate. Under the Kitto brothers, the cost of timber was said to have been reduced by three quarters. The colliers were still kept well supplied with timber, instead of having to stop for the lack of props in the

workings as in former times. So, by late 1874, the Clee Hills collieries were producing large quantities of coal under an efficient management team and the shareholders patiently waited for their dividends.

Early in January 1875, however, the directors sent circulars to the shareholders canvassing for funds to improve operations and increase the output. Several shareholders wrote letters to the mining press asking if a local "friend" would visit the mines and supply information on activities. They complained about the high price of coal and yet no profits, blamed the directors and the Kitto brothers for "defective management". Late in January, a "friend" wrote to the Mining Journal about his visit to the mines. He poked his nose into everything and asked questions when he had a chance, as most people he saw were busy, and he felt pleased with operations.

An ordinary and extraordinary AGM were held at the colliery on January 22nd 1875, when much was made of the past problems of the company. The directors claimed to have been deceived by the promises of William Bertram as to the output from the collieries. They went on to request additional funds from the shareholders to continue the company and conducted parties round the mines. Following a meal and drinks, the meeting seems to have passed off with promises of increased funds and happy shareholders. Tomorrow is always a better day!

Nothing further, however, is recorded until a letter appeared in the Mining Journal on June 24th 1876, when a shareholder wrote to ask if the company was still working or wound up. He had received notice for the meeting of January 22nd 1875, then silence for 17 months. He suggested that such a long period without a shareholders meeting was, at best, improper if not illegal. This brought a letter from another shareholder on July 1st 1876, who complained along similar lines. Nothing appeared from the company and no further reports have been found.

The Clee Hills Coal Company is recorded in the Mineral Statistics as operating the mines until 1878, then is replaced by the Cornbrook & Knowbury Coal & Stone Company who worked the collieries into the 1880s.

Acknowledgment

I would like to thank the staff of the Central Libraries, Birmingham for their help and kindness over several years.

References

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