

BRITISH MINING No.93

MEMOIRS

2012



Editor: Richard Smith



ISSN 0308-2199

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COAL MINING AT SAMSON COLLIERY, OLDBURY IN THE NINETEENTH CENTURY

Nigel A. Chapman

William Morgan gentleman of Rowley Regis owned a small estate known as the Portway Farm at Newbury Lane in the parish of Oldbury. The Portway Farm was situated on a hillside above the Titford Valley with collieries and canals much in view. He had not sold the coal under the farm but retained the agricultural nature of the farm. Mr Morgan employed in the late 1850's John Southam, a local mining engineer and coal master to open negotiations with Messrs. Hunt who were working the adjacent coal seams from their colliery. Hunts were to drive a heading through the estate to prove the coal but not to work it for £40 *'for the trouble and expense of driving'*. About 1860, being an old man, William Morgan made his will, leaving the estate to his niece Sarah Travers of Stamford Hill Middlesex. Miss Travers seems to have enjoyed travelling the world and probably saw the estate as a source of income to further her travels.

She appears to have ordered a survey of the estate and mines employing Joseph Fellows of Walsall Mining Engineer to carry out the work. He soon found that Messrs. Hunt of the adjoining Brades Colliery had not only driven the suggested heading but had commenced to work the Portway coal. In 1860 Messrs Hunt had purchased some of Messrs. Bennitt and Taylor's mines on the opposite side of the Portway Farm. To access this coal required the completion of the heading through the Portway Farm. To add insult to injury, Hunt's had also extracted over 2 acres of Thick Coal under Portway Farm. After lengthy negotiations Messrs. Hunt were judged to have raised 3,960 tons of Portway coal and were forced to mortgage the Brades estate to raise the £1,529 10s 0d required to be paid for this trespass.

Having had the coal under Portway proved by Hunts, Miss Travers now offered the coal to other coal masters who were mining near to the estate. Messrs. Haines and Davis of the Newbury Lane Colliery were working the Thick Coal adjacent to Portway and were interested in the 37 acres 2 perches of virgin Thick Coal offered. By an indenture of 13 January 1863 Messrs. Haines and Davis were to work the minerals under Portway Farm down to and including the White Ironstone. They were to pay £1,000 per annum to work a minimum area of 2 acres for a term of 25 years and were required to *sink a pair of shafts on the farm to prove the measures leased*. At this point Mr. Davis refuses to sign the lease while Mr. Haines was happy to sign and work the mines. Mr. Davis went his own way and the partnership of Haines and Davis was dissolved. Mr. Haines put his colliers to driving a heading from the Newbury Lane shafts into the Portway coal. Mr Fellows on 22 June 1863 reported to Miss Travers, *'That Haines is driving levels in Portway and winding the coal up his shafts, which he has no right to*. Fellows also notes *He should deepen the Newbury shafts to get Portway coal. Haines was entitled to drive levels from the existing shafts to prove the coal. Then to sink new shafts to wind the coal from'*. Haines found objections to creating a

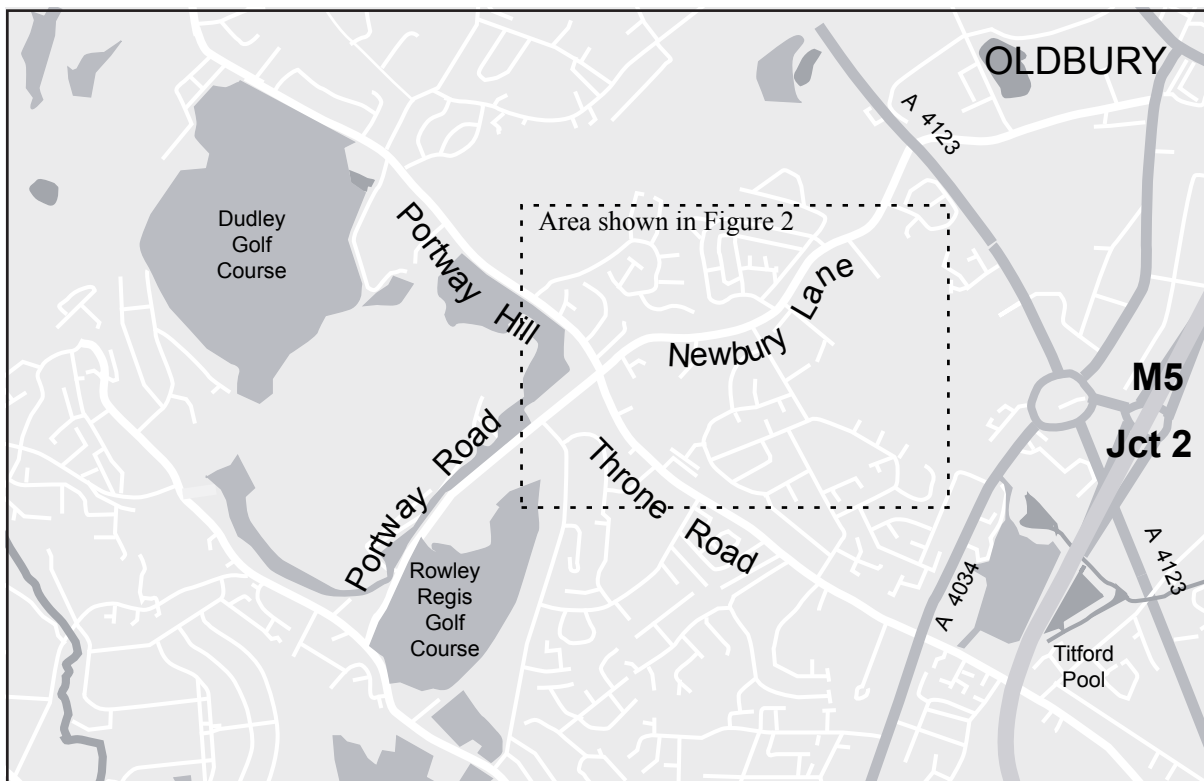


Figure 1. Location map of the Portway Farm estate.

new colliery, claiming to be able to wind from existing shafts and to send the coal by an existing tramroad to the Birmingham Canal basin at Titford. Gradually it became apparent that Haines had overreached himself and by October 1863 he disappeared from the scene. Joseph Fellows suggested negotiating with Messrs. Hunt as the only adjacent company likely to be able to extract the coal. He was still talking of sinking a new pair of shafts and noted that the canal was 1,200 yards away.

It took until March 1865 for Miss Travers to find another coal master, Samuel Nicklin, prepared to take on the Portway coal. He had taken over the Newberry Lane Colliery from Haines and was extracting the coal and sending it down the inclined tramroad to the Birmingham Canal. Styled ‘gentleman of Rowley Regis’, Samuel Nicklin was to take 37 acres, 19 perches of Thick Coal under Portway Farm from 25 December 1864 for a term of 21 years. He was to pay a minimum royalty of £1,000 per annum or £500 per acre worked or not. A surface rent of £3 per acre was chargeable or £5 per acre for land used for depositing spoil from any adjoining mines. Nicklin managed not only to extract the coal by means of the underground roadway already driven by Haines but also to avoid sinking new shafts.

Samuel Nicklin made his will on 18 April 1867 and died within a few days, leaving his coal mines to his nephew, the Rev. William Auden of Church Broughton, Derbyshire. It then transpired that while working the Portway coal, in the best traditions of the Black Country, Nicklin had failed to sign the Mining Lease!

About this period while not mentioned in the papers, two new shafts were sunk on Miss

19TH CENTURY PHOTOGRAPHY AT WALSALL WOOD COLLIERY

John Goodchild and Ron Callender

INTRODUCTION



Figure 1. The obverse side of a typical stereocard from the John Goodchild Collection. The number 1785 is imprinted, along with a caption, 'A man (?) roadway in a coal pit. Note the slight difference in exposure caused by the two lenses of the camera.

The extensive John Goodchild Collection at Wakefield houses a valuable archive of original documents, printed material, plans and illustrations relating to the development of the coalfields of the West Riding of Yorkshire. The earliest document dates from the 14th century. In addition, the collection holds material relating to other aspects of Yorkshire, as well as material from elsewhere but having a relevance to the county.

This last category includes twenty-six pairs of stereoscopic cards, which were purchased from a one-time second-hand bookshop in Barnsley. When viewed in a special optical device, each pair of images blends so as to create a very acceptable 3-dimensional image.

The photographs were taken at Walsall Wood Colliery in Staffordshire and feature different aspects of the workings of a middle-sized colliery, which was served by the Midland and L & NW Railways. Of the twenty-six stereocards, nineteen are of underground scenes and 21 carry reference numbers from 1766 to 1793 and often incorporate printed titles. Some of these photographs have also been used to illustrate the book, 'Coal Mining in Walsall', which B. Collins wrote in 1994. (There is a copy of the book in the John Goodchild Collection.) A selection of the pictures also appears in the third edition of 'The Colliery Manager's Handbook' by C. Pamely, published in 1896 and speculation suggests this was the reason for undertaking the ambitious photography.

THE DOLAUCOTHI ROMAN DRAINAGE WHEEL

Stefan W Meier

The most important evidence of Roman mining at Dolaucothi is a fragment of a wooden drainage wheel. The military and political situation in the 1st century AD and comparisons with similar drainage wheels from other mines, should give a plausible interpretation of the C-14-dating of the drainage wheel fragment and therefore supply reliable confirmation of Roman mining.

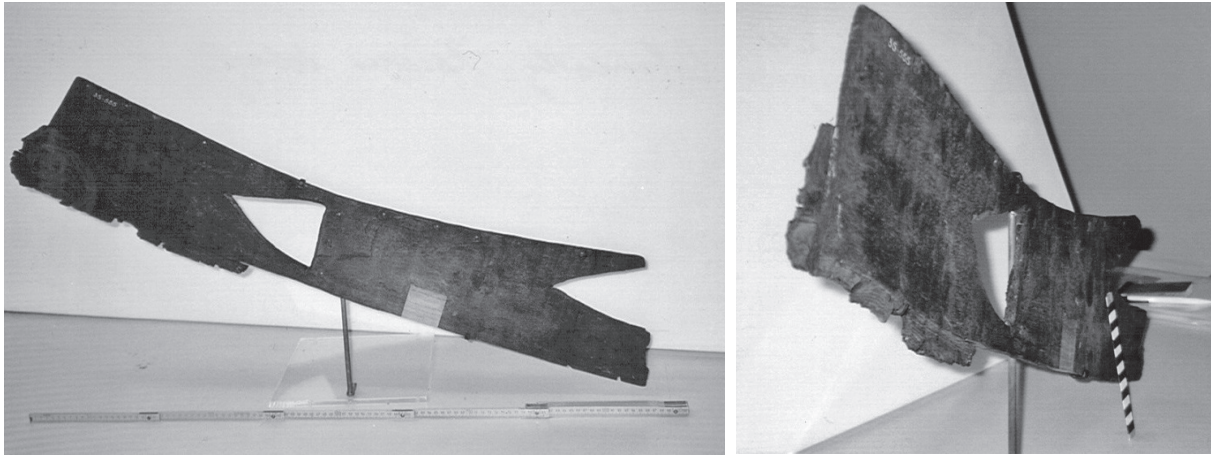


Figure 1 (left). Rim of the Roman drainage wheel, National Museum Cardiff, Object 35-555 and Figure 2 (right). Detail of the rim [photographs by S.W. Meier, 2011].

The mining site is situated in a hilly part of South West Wales, partly covered with woodland at 3° 56' 57"W/52° 02' 41"N (SN 6634 4032). Approximately 1 km NW is Pumsaint, on the A482 Llanwrda-Lampeter road. In the 1st millennium BC, at the latest, gold was exploited at Dolaucothi in open pit-mining. The Romans, on their arrival, were able to continue with mining and intensify it, possibly under military surveillance. After the troops departed gold was probably exploited by local mining leaseholders.^{1,2} Thereafter, mining at Dolaucothi took place between the 12 to 20th centuries with lengthy intervals of inactivity. During the 1930s gold mining was taken up yet again with the last attempt ending 1943.² In AD 48 Roman legionaries reached the Welsh borders for the first time. However, in the mountainous wilderness the Romans met with serious resistance which resulted in three larger-scale military campaigns (between AD 47 and AD 78) involving fairly big losses until the local tribes were conquered, especially by the generals Sextus Julius Frontinus (AD 76) and Julius Agricola (AD 78). The Romanising of the Welsh people was generally restricted to the ones of the south border regions³ and additional forts, connected by roads, were built for the legionaries and auxiliaries. A Roman road passed the village of Pumsaint,⁴ a village situated on the same spot where a Roman fort had once been erected. The site of the fort was possibly named Luentinum, a name which appeared on the maps of Ptolemaeus.⁵ Based on these details there is a strong indication that Luentinum and Pumsaint are identical. The Roman fort and the neighbouring mine

HALTCLIFFE LEAD SMELTING MILL, CUMBRIA

Richard Smith and Sam Murphy

Immediately east of the crossing of Carrock Beck with the unclassified road between Mungrisdale and Hesket Newmarket lie two large shallow pits with a series of leats. About 300 metres to the east is a large flat area with a widespread scatter of metallurgical slags. Although there is almost no masonry exposed, there are a number of humps in the ground, which are all that remains of Haltcliffe lead smelting mill, undoubtedly the largest and most important of the mills in the Caldbeck area. The mill has a reasonably well documented and interesting archival history and has been used as a textile mill both before and between the times when it was used for lead smelting.

HISTORY

In 1794, William Roe of Liverpool took up a mining lease of the Caldbeck Fells, although most of his activity seems to have focussed on Driggeth and Carrock End. He seems to have become very friendly with Peter Denys and the two families entertained each other and there is a clear measure of respect and camaraderie in their later correspondence. Perhaps they felt a common spirit as they were both businessmen who owed their status and wealth to their commercial activities and not to an aristocratic pedigree. Denys tried to interest Roe into taking a half share in the Blakethwaite mines in Yorkshire but without success.¹

The mill is first mentioned as being surrendered to Roe for a rent of 2d by Joseph Monkhouse on 12 October 1792 and was converted from a fulling mill to a smelt mill some time after that. Towards the end of 1798, Roe wrote to his mining agent, John Davies about acquiring additional land on Caldbeck Common² and that year a new enclosure of 300 yards was purchased for £1 for a dwelling house and factory.³ This took place after the end of Roe's mining activity on the Fells at Christmas 1796, although smelting of duty ore and mining on Hasel of Dalemains property continued for a short time afterwards. The new factory was a cotton carding mill and was run by John Davies for about three years. During this time he carried out some work for Denys as a mining agent at Caldbeck but in February 1802, a group of gentlemen from Carlisle declined a lease for the Fells and some enquiries about working old waste heaps do not seem to have been taken up. In 1802 he was offered a job in Swaledale as a lead mining and smelting agent for Peter Denys which he accepted and moved to Yorkshire for an annual salary of £50.¹

Davies' subsequent actions then caused the utmost confusion which was not to materialise for another twelve years. His version of events was that he sold the old fulling mill to Joseph Monkhouse of Hesket Newmarket and that he allowed him the use of the furnace house during the time when the mine was not being worked. In return, Monkhouse promised to keep the buildings in good repair and to return the furnace house should the need arise.⁴ The arrangements were conducted without formal or written agreements. All went well until Lowry, Richardson and partners working under the name of the Caldbeck Lead Company took up a lease for the Fells. After sending

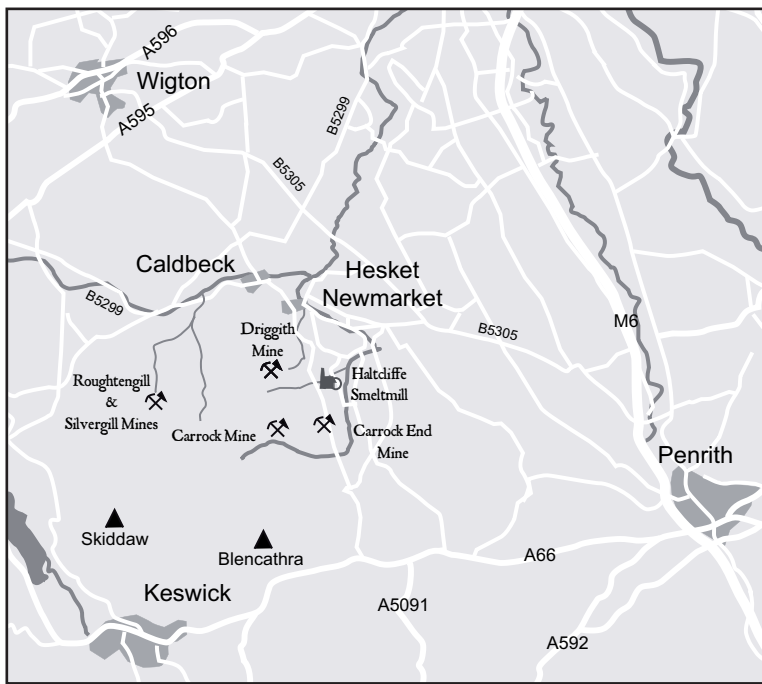


Figure 1. Location map of Haltcliffe smelting mill and associated mines.

ores to Liverpool and Swansea for a short time, they decided to build a new smelting mill and refinery at Haltcliffe.

By May of 1814 the upright chimney and roasting furnace had been finished, the horizontal flue, ore hearths and bellows were nearing completion and by June the first seven pigs of lead had been produced.^{5,6} Smelting yields were consistently poor throughout the year of 1814 and on 29 August 1814, the local steward, Johnathan Ivinson, reported that they had made and refined a 30lb slab of silver from the smelted lead.

He also mentioned that the lessees would be having a meeting on Wednesday the first of September to buy Joseph Monkhouse's right to the smelting mill. By the end of November the mining company came to a decision and bought the furnace house and fulling mill from Monkhouse for £300 with a further £110 towards the cost of the new smelting house which he had built.⁷ When Monkhouse was unable to produce a legal title deed for the property the deal fell through and he then served the lessees with a notice to quit.⁸ Monkhouse then went to the law court at Cockermouth to assert his rights where he is described by Ivinson as '*Cramin the Steward and Part of the Juery with ther Dinners. I was Informing the Rest about the Furnace house....Monkhouse has Don Every thing that meat drink money and Intrest would Do to Extend his Rights at the Smeltnill but to no Purpose*'.⁹ The jury found that he only had rights over the fulling mill, now converted to a smeltnill. Nevertheless, Monkhouse stood firm and refused the company admission to the furnace house.

At this point Bensons, a firm of Cockermouth solicitors, were put on to the problem at the express instruction of Peter Denys and one of their lawyers, Nathaniel Nicholson, prepared a declaration of ejection.¹⁰ John Davies was also instructed to go from Yorkshire to Caldbeck and obtain possession as soon as possible.¹¹ Monkhouse's lawyers agreed with Nicholson that he would give up any claim on the buildings at the mill with the exception of the old fulling mill. This would be sold to Mr Lowry of the mining company for £170 and that Monkhouse would pay for the costs of the ejection proceedings.^{12, 13} Ivinson reported that he had finally obtained Monkhouse's written agreement together with the keys to the furnace house.¹⁴

The matter does not appear to have finished there because in January 1816, Ivinson reported '*I Bleve Walton and Monkhouse will be Both in a Great house neer the Pig*

WILLIAM STEWART AND THE LUNDHILL COLLIERY

John Goodchild

LAWYER, FINANCIER AND MAN OF PUBLIC AFFAIRS

William Stewart was an excellent example of the nineteenth century 'rags to riches' phenomenon. From (almost) rags he rose to be co-owner of one of the largest collieries in the West Riding of Yorkshire, chairman of a major bank, a highly successful lawyer, Clerk to the Guardians of the Wakefield Poor Law Union and his firm had the offices of the Deputy Steward of the Manor of Wakefield and clerk to the Wakefield Gas Company, the Borough Market Company, the Streets' Commissioners, the Governors of the Grammar School and of several charities at various periods. His portrait in oils (by Sir W.B. Richmond R.A., 1842-1921) hangs in the offices of the modern successors to his practice, Chalker, Mosby & Hick.

Something of Stewart's background can be learned from his obituary in the (Tory) Wakefield Herald, from an application by Stewart himself for insurance on his own life in 1839, when he was in his mid-thirties and from other contemporary newspaper references. He was born in Wakefield in November 1805 and was baptised at the parish church there in February 1806. His father was described later as being 'not a man of any extensive means', a cabinet maker and upholsterer, who from 1817 was also an auctioneer in a modest way of business. The father died in 1847, having three sons of whom William was the youngest. William was educated at Wakefield Grammar School under the great Dr Naylor – a memorial window was later erected by Stewart in Wakefield Church to the memory of his early vicar and schoolmaster. He was subsequently articled to John Stringer, a minor lawyer of nearby Horbury, qualifying as a lawyer in 1830; he then became managing clerk to W.B. Beckett, an attorney in a large practice in the rich agricultural area centered on Thorne. However, when his old master Stringer died, Stewart bought his Horbury practice in 1832 and carried on his business from there until 1848. He purchased a pew in Horbury Church in 1831 for twelve guineas and later one in the north gallery of Wakefield Parish Church (now a cathedral) for £26 in 1852. He was appointed to the new but part-time office of Registrar of Births, Marriages and Deaths for the Alverthorpe district on the establishment of the Wakefield Poor Law Union in 1837 and in 1842 he was successful in his application for appointment as Clerk to the Wakefield Poor Law Union Guardians and was Union Registrar. He was later Clerk to the Union Assessment Committee and Clerk to the Wakefield Union Rural Sanitary Authority, established in 1872 and important as being the means of providing water, sewerage and public health facilities in the wide rural area of the Union around Wakefield. He was Clerk to the Wakefield Guardians from September 1842 until September 1874 and was succeeded in that office by one of his clerks, John Roberts. In the late 1830s Stewart described himself as being 5 feet 4 inches in height, weighing ten to eleven stones and '*appearance cheerful and healthy*'. His later boasted ability as a young man to live on sixpence a day (two and a half new pence) seems to have done him little harm.

Stewart advantageously married the daughter of Henry Lumb, another successful

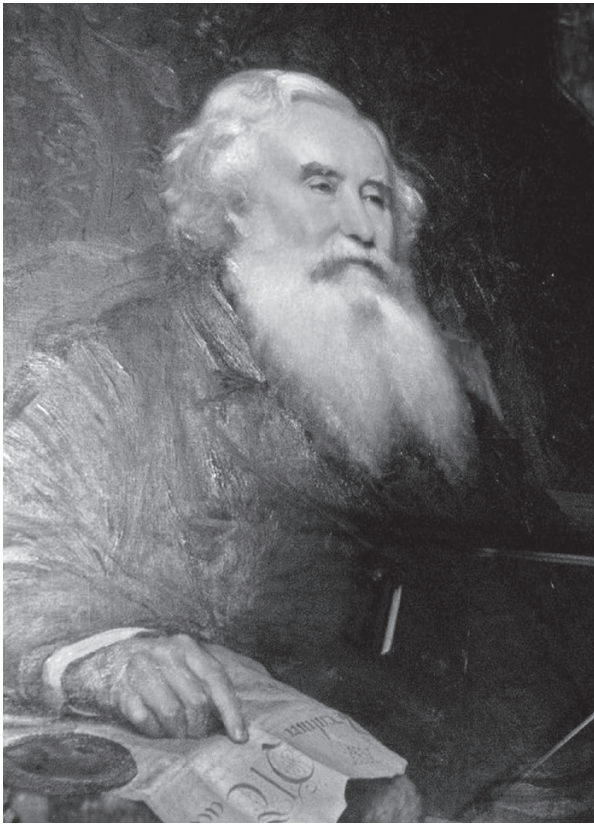


Figure 1. William Stewart, a portrait in oils.

Wakefield lawyer and in 1848 entered into partnership with his father-in-law and brothers-in-law Robert John and Frederick under the name of Lumb, Sons and Stewart. The partnership was dissolved in 1855 and he practised on his own account until 1864 when his son William Henry, who qualified that year, joined him under the name of Stewart and Son. Meanwhile, part of Stewart's profits had been invested in local well-established public service companies which paid good dividends. In 1847 or 1848 he became a director of the Wakefield Water Works Company and in 1855 a director of the local Gas Light Company. He later served as a non-elected Wakefield Borough Alderman (one of the few) from 1879 until 1883.

In 1853 Stewart became a director of the Wakefield and Barnsley Union Bank which provided access to financial resources. The bank was founded in 1832 as one of the new

joint stock banks and was the junior of the two Wakefield banks in existence at the time; its Wakefield business operated from premises in Westgate in which Stewart's law firm was later housed. He purchased fifty-five, £5 shares in the bank in November 1853 for £495 and they grew enormously in value. He rose to become the chairman of the board of directors and his face is carved in stone above the central door of the new bank premises built in Westgate in the late 1870s. He was presented with a silver trowel on the laying of the bank's foundation stone and also on the laying of the foundation stone for the new St Catherine's Church at Belle Vue on the outskirts of Wakefield.

During the 'railway mania' of 1845-6, Stewart invested in railway shares and was active in the concerns of the Leeds, Wakefield & Midland Junction line, one of the many abortive schemes of the period. Later in life he paid the large sum of £15,200 for a one-third interest in Cradock's growing ropeworks in Wakefield, which was ultimately to become a part of British Ropes; he eventually invested £25,000 until he sold out in 1879. His considerable wealth was evident in that he lent £21,000 and later another £21,000 to his partner in the Lundhill Colliery who was associated with the large Wakefield firm of soap manufacturers, Hodgson and Simpson. He lent George Craik, the owner of Barnsley Colliery, linen bleacher and railway wagon manufacturer the sum of £3,500.

Mrs Stewart was a Lumb and her grandfather, father and brothers were all lawyers and had been locally influential as Deputy Stewards of the great Manor of Wakefield since at

THE ARSENIC INDUSTRY AT BOTALLACK MINE, CORNWALL AND ITS ARCHAEOLOGY: A STORY OF EARLY 20TH CENTURY ADAPTIVE RE-USE

Peter Joseph

INTRODUCTION

Although the St Just mining district is dotted with an assortment of equipment for the roasting of tin and arsenical ores, in the form of furnaces and calciners (see Figure 1), only at three locations, Botallack Mine, Levant Mine and Pendeen Consols, was arsenical soot known to have been collected. At all other places the furnaces appear only to have been used to roast tin concentrate prior to further processing. The aim of this manuscript is to give an outline history of arsenic production at Botallack Mine and descriptions of the technology employed and the remains on site.

Botallack is one of the well-known coastal mines of the St Just district at the very western end of Cornwall (Figure 1). Despite its fame however, the commencement of mining here is not known. Tin streaming, possibly with underground mining, was recorded in West Penwith in the fourth century BC;¹ while the actual locations are not known, several contemporary occupation sites, some associated with tin and/or pewter production, occur in the area (such as Chûn Castle to the east and Kenidjack Castle to the west. A number of stream works are recorded during Tudor times¹ while the village of Botallack was described in the late 16th century as: ‘...a little hamlet on the coaste of the Irishe Sea, much visited with tanners, where they lodge and feede, being nere theyre mynes’.²

The mine was working in the late 18th century³ while an advertisement in 1813 stated that it had produced over £100,000 of ore over the previous twenty years.⁴ The first pumping engine was erected on the Crowns rocks no later than 1819, and perhaps even earlier.^{5,6} The mine seems to have worked uninterruptedly from 1721 until 1895, closing in the last great tin depression of the nineteenth century and worked again, with little result, from 1906 to 1914.⁷ Diamond drilling was carried out in the area between Geevor and Botallack mines after 1968⁸ resulting in the re-opening of Allen’s Shaft by Geevor Tin Mines Ltd in 1980 and some exploratory work was carried out; however work ceased the following year through financial problems. Geevor closed in 1986 following the dramatic collapse in world tin prices and the prospect of any further work at Botallack now seems remote.

CORNISH ARSENIC PRODUCTION

The commonest ore of arsenic in Southwest England is arsenopyrite (FeAsS), usually referred to in contemporary accounts as arsenical pyrites, mispickel or mundic (although the latter was sometimes a mixture of arsenopyrite and pyrite). The mineral is absent from streamworks because of natural oxidation by air and water (and the mineral is fragile compared with cassiterite) but could occur in great quantities in fresh underground deposits. Arsenic was regarded as a contaminant when found; tin ore was either roasted to oxidise and remove the impurities or the arsenic minerals were manually

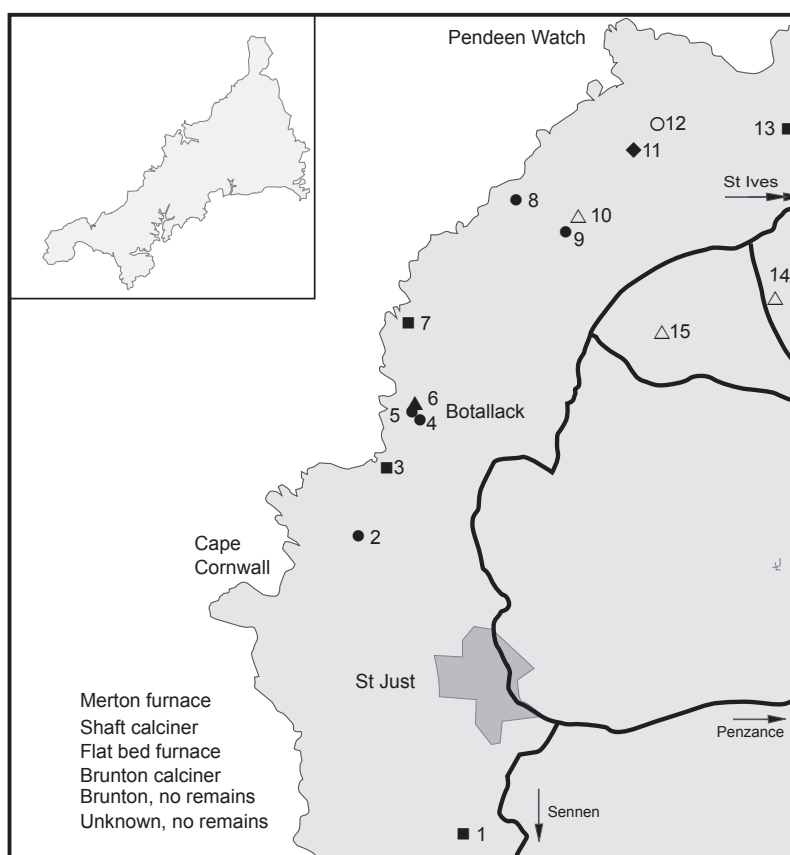


Figure 1. Locations and types of calciner in the St Just mining district. 1. Wheal Kelynack, 2. Kenidjack, 3. Wheal Edward, 4-6. Botallack, 7. Wheal Cock, 8. Levant, 9-10. Geevor, 11. North Boscawell Mine. 12. Pendeen Consols. 13. Rose Valley. 14. Wheal Hearle. 15. Wheal Bal.

sorted from the other ores and sent to the waste dumps. Copper and arsenic ores were separated visually as the ores have different colours.

Production of arsenic in Southwest England ranged from the early 1800s to the 1930s (note that the word arsenic, in this context, does not refer to the element but arsenic trioxide, As_2O_3). The semi-metal was used for an astonishing array of uses: pigments (red, yellow and green), decolourant for glass, arsenical soaps used by taxidermists, mordants for the fabrics industry, sheep dip, lead shot manufacture and in the enamel industry.⁹ However one of the major uses of arsenic was as a pesticide, used to counter the Colorado Beetle and the Boll Weevil, both rampant in the United States. For these markets, many mines

in Cornwall and Devon turned to arsenic production and it is accurate to state that this supported many of those mines for some years. Arsenic production was not universally adopted however and was only significant for a comparatively small number of mines. Between 1845 and 1913 the production of arsenic and arsenical pyrites was worth £1,763,235.¹⁰ Of this, over 78% came from just seven mines and of these the three largest produced nearly two-thirds of the total. The principal example of this is Devon Great Consols (just west of Tavistock) which, during the period 1844-1900, produced 540 tons of arsenopyrite and 70,800 tons of crude arsenic, while two other mines within this group of mines produced 982 tons of arsenic.¹¹

A number of arsenic works in Cornwall existed independently of the mines; that is, they bought arsenic ore or crude arsenic oxide from the mines but were not directly associated with them.¹² The Carnon Valley works near Truro was set up in 1812 and by 1851 another three works had been established in the area. Within a few years the works at Roseworthy, just west of Camborne, was established. By the 1870s other works had been established at Hayle in west Cornwall and around the River Tamar to the east. Foreign imports provided competition that the Cornish works could not rival and the majority of them closed around the end of the nineteenth century. By

MINES, TRIALS AND LODES OF THE GLANDYFI TRACT, CEREDIGION, WALES

David M.D. James

INTRODUCTION

Over most of the Central Wales Orefield the great majority of the lodes are oriented broadly ENE-WSW and extend laterally over considerable distances although economic mineralisation is not continuous along their length.^{1,2} However in the far NW of the orefield many smaller mines, and numerous trials, notably those around Talybont, lie in or adjacent to an extensive fault belt oriented SSW-NNE (Figure 1) which locally

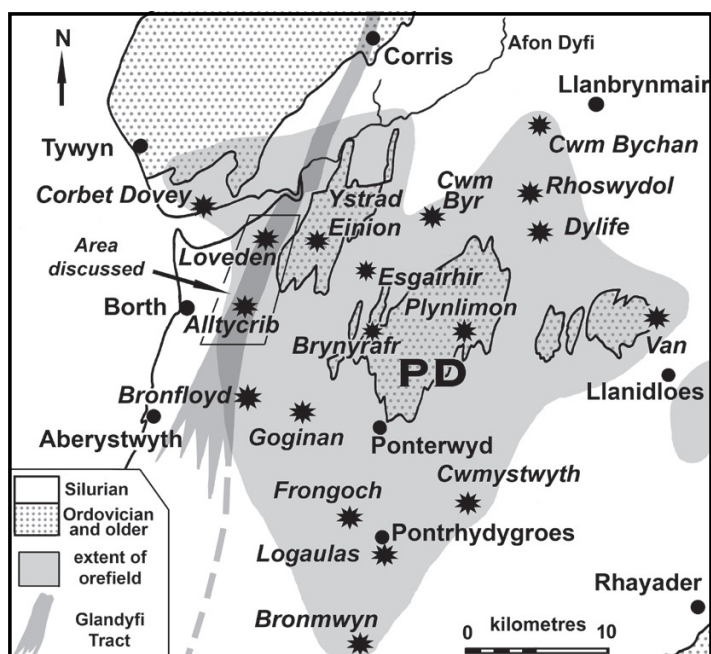


Figure 1. Location map for the Glandyfi Tract within the Central Wales Orefield. PD indicates the Plynlimon Dome.

contains relatively impersistent subsidiary NW-SE, E-W/ENE-WSW and ESE-WNW lodes. The belt has been termed the Glandyfi Tract by the British Geological Survey (BGS)³ and its development S of Afon Dyfi is extensively mineralised between the mines at Loveden and Alltycrib (Figure 2). By contrast with the remainder of the orefield the belt was not very productive. This results largely from the complexity of the fault systems and limited extents of ore bodies, some of the best production coming from small, rich and steep 'pipes' near the intersections of lodes of differing orientations or the intersections of lodes with a regional joint system which strikes broadly ESE-WNW perpendicular

to fold axes (a-c joints). Recorded post-1845 production of lead concentrates totals about 4,135 tons^{2,4}; earlier production could well be similar or a little larger as several sites were active in the eighteenth century and some are of great antiquity.⁵ However the returns were very poor for the effort expended and probably totalled barely 2% of that for the entire orefield.

Although outlines of mining activity⁴ and geological setting³ exist for mines within and immediately adjacent to the Glandyfi Tract, there is as yet no detailed documentation of the lode geometry, the existing maps^{1,2,6} being of small scale and in many cases mutually inconsistent. This paper seeks to redress this deficiency. Notes on site condition and accessibility are also given. Spelling of mine names follows that in the Mining Journal, i.e. usage when active: these names are easily recognised in other sources which make minor changes of lettering and hyphenation.

STRUCTURE, STRATIGRAPHY AND MINERALISATION

In the area to be discussed the Glandyfi Tract lies between the Tre'r ddol Fault and the Glandyfi Fault (Figure 2); on a regional scale it is the central element within the Llangranog Lineament, a zone of relative structural complexity ca 8 km wide across which fold facing and cleavage attitude change from NW-facing in the NW to SE-facing in the SE.^{3,7} The lineament is the surface expression of deep-seated faulting which runs through Western Wales from Corris towards Llangranog and the coast SW

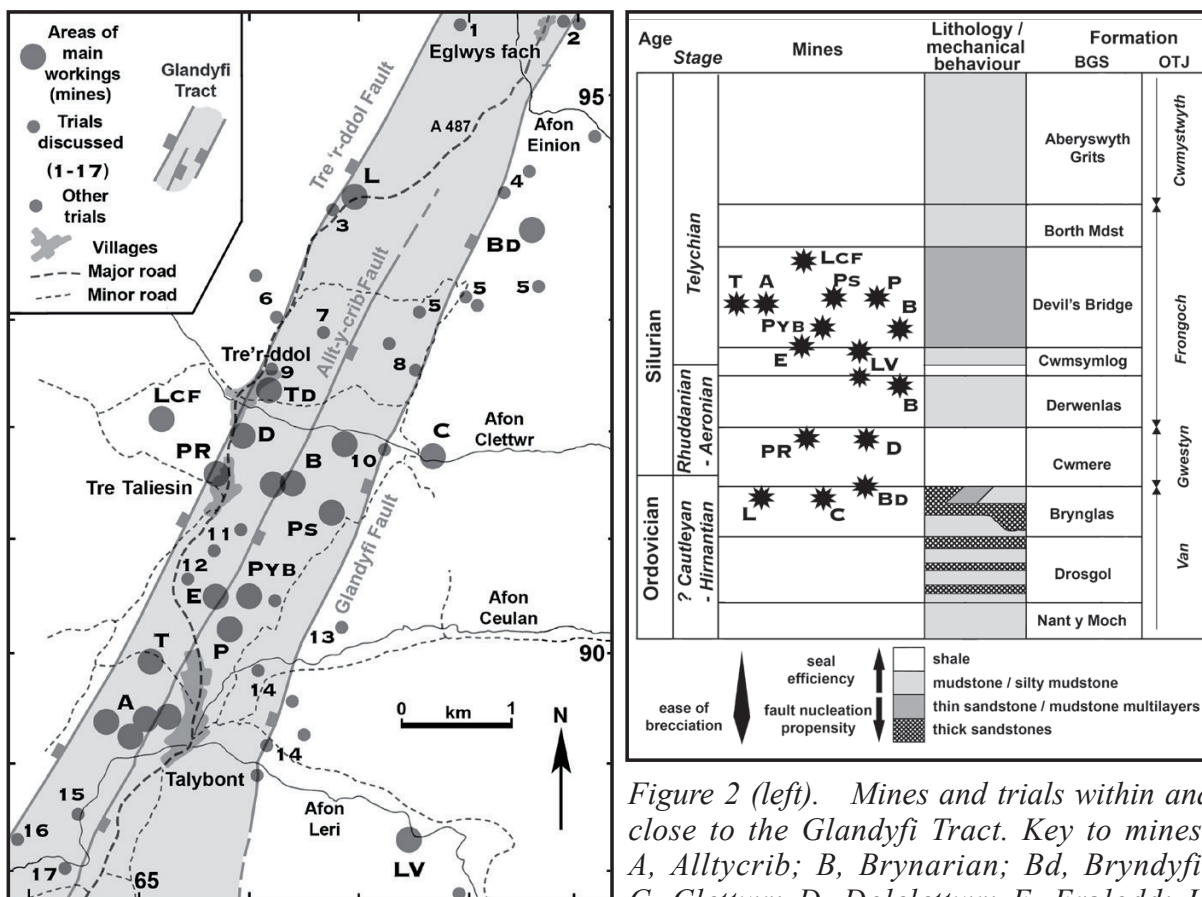


Figure 2 (left). Mines and trials within and close to the Glandyfi Tract. Key to mines: A, Alltycrib; B, Brynarian; Bd, Bryndyfi; C, Clettwr; D, Dolclettwr; E, Erglodd; L, Loveden; Lcf, Llancynfelyn; LV, Leri Valley; P, Penpontbren, Ps, Pensarn; Pyb, Penybanc; PR, Pwll Roman, T, Tanyrallt; Td, Tre'r ddol. Key trials are numbered, see text. Only the main rivers are shown.

Figure 3 (right). Stratigraphic setting of the mines within and close to the Glandyfi Tract. The tract does not expose strata below the Brynglas Formation or above the Borth Mudstone Formation in the area studied. Terminology is that of the British Geological Survey³ (BGS) and O.T. Jones² (OTJ). Key to mines as Figure 2; note that Brynarian lies in the Devil's Bridge Formation E of the Alltycrib Fault and in the Derwenlas Formation to the W.

of Cardigan.^{7,8,9} It was active with downthrow to the NW during late Ordovician-early Silurian sedimentation¹⁰ and its fold/fault geometry records transpressive Acadian (late Early Devonian) deformation followed by later extension (in part at least of Mesozoic age) of the cover above this step in the basement.⁷ The component faults become difficult to map within the ductile Borth Mudstone Formation S of Talybont to just W of the Elgar and Penycefn mines (SN 662 860 and 655 856 respectively) and may die out stratigraphically upwards; not being recognisable further S around the major mine

FURTHER NOTES ON NORTH PENNINE IRON ORE MINES

Graham Brooks

Fairbairn and Robertson in 2001¹ described the development of iron ore mining in the Alston Moor area in the 1830s to 1850s. They mainly concentrated on the mines on Park Fell and around the town of Alston as well as those associated with the lead mines in the area. Whilst Smith and Murphy mentioned a number of the iron ore mines in their book few details were given.² Further research has brought to light further information on some of these and other iron ore deposits in the area that have been worked or tried.

HORSE EDGE VEIN

This vein is listed in a letter dated February 1860 from Joseph Michell Paull, Moor Master for Greenwich Hospital, to the Derwent and Consett Iron Co. Ltd as being of



Figure 1, Horse Edge iron workings.

3 or 4 good veins but no work had been carried out there at the time. The vein was open cut for umber around 1886 and was leased by the Alston United Mining Association who also worked it for lead. It was worked again in 1917/18³ by the Alston Prospecting Syndicate during the First World War. The trial was carried out over 400yds. of the vein by up to five NW trending trenches, and shafts, with tunnelling and crosscutting from the bottom of the shafts. A pair of shafts were put down in one place on the cheek of the vein to find its width.⁴ By 1940

the workings were reported to have partially collapsed. The ore was described as cavernous limonite averaging 30-35ft wide with 6ft of overburden. It is possible the Amos Treloar did further prospecting there in Spring 1941.⁵ Dunham estimated the deposit to be over 70,000 tons at an iron content of 28-66%

The site today stretches from NY 691 452 to NY 690 450 and consist of a series of shaft mounds and a number of either collapsed open workings or collapsed adits.

CROGLIN FELL

When the manor of Croglin was sold in 1738 William Dean was renting an ironstone quarry in the manor.⁶ There is no evidence today for an ironstone quarry.

LOO GILL HARTSIDE

A limonitised limestone was worked for umber in the region where the old cart road crossed the gill.⁵