



THE SILVER-LEAD MINES OF GLENMALURE, COUNTY WICKLOW: A HISTORY AND AN ARCHAEOLOGICAL SURVEY OF EXTANT REMAINS

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Abstract: The aim of this paper is to bring to life the under-researched and largely unwritten history of the mining industry in this glen and to offer an interpretation of its extant mining remains. It incorporates the results of survey data conducted under the aegis of the *Metal Links: Forging Communities Together* Interreg 4A project and new documentary material drawn from a future publication (Schwartz and Critchley, forthcoming). The most important lead producer lay in the townland of Ballinafunshoge (with variant spellings) more commonly known as the Glenmalur(e) Mine, some 9.5 km from Rathdrum and 30 km from the port of Wicklow. Smaller concerns included Bar(r)avore, Ballygoneen, Clonkeen and Cullentrath Park. The mining industry has left indelible marks in the landscape of the glen in the shape of spoil heaps, shafts, adits, leats channels, and two nationally significant crusher houses. *Journal of the Mining Heritage Trust of Ireland* 14, 2014, 23-85.

INTRODUCTION

The wild and remote glaciated valley of Glenmalure is fabled in the annals of Irish history as a hotbed of resistance to English, then British rule. It was the stronghold of the Gabhail Raghnaid branch of the O'Byrne clan at Ballinacor and the site of the 1580 Battle of Glenmalure, which took place during the Second Desmond Rebellion, a reaction to the encroaching Anglicisation of, and central government interference in, Gaelic society, as well as the defence of Catholicism against the heretic Tudor Queen, Elizabeth I. An English force was completely routed attempting to take Ballinacor, home of the rebel chieftain Fiach MacHugh O'Byrne, suffering the English army's worst defeat in Ireland. Two centuries later, the valley once more found itself in the eye of the storm of the 1798 Irish Rebellion, when bands of rebels used their intimate knowledge of its rugged terrain to evade capture and to frustrate British and Loyalist forces for five long years. Yet there is much more to Glenmalure than just its military past, a hidden history and heritage every bit as captivating, for this rugged glen was also home to a number of silver-lead mines, including the oldest currently documented in County Wicklow.

THE GENTLEMAN ADVENTURERS OF THE LEAD MINE COMPANY OF GLENMALUR

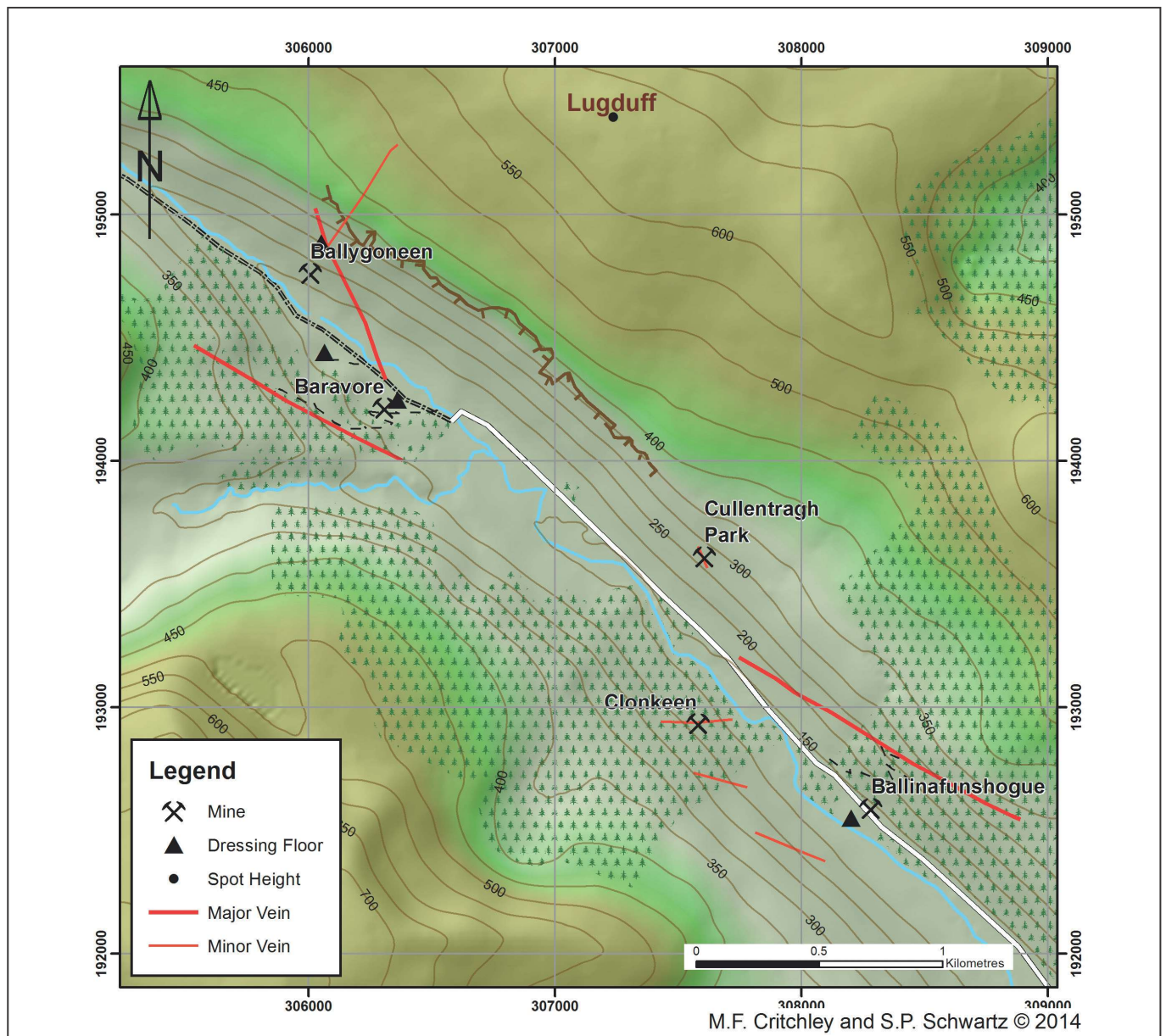
Cole (1922, 113) asserts that the mines in Glenmalure existed before those in Glendasan, Stewart (1800, 122) noting that 'Glenmullar' was working in 1800 and Fraser (1801, 18) states that it was the only lead mine in Wicklow around the turn of the nineteenth century. The mine (in the townland of Ballinafunshoge) was discovered in about 1726 by some men employed by John Hayes of Ballinaclash, the grandfather of

Colonel Samuel Hayes of *Avondale*, who were working a mine on the opposite side of the valley (where a lode passes through the townlands of Ballinaskea and Clonkeen). However, the mine was largely neglected until 1783, when an English gentleman named John Fox conducted some successful experiments. In a letter dated 16th August that year to Earl Fitzwilliam, from whom he had recently obtained a lease to work the Ballygahan Mine in Avoca (NLI Powerscourt Papers), Fox describes the prospects of the lead mine as being still 'very flattering', (SCA, WWM); a company was thereafter formed to more thoroughly exploit it (Wilson 1786, 280).

The Times carried the story of the opening of the mine in 'Glenmolaur' by 'Colonel Hayes and Westby, Mr King and some other public spirited gentlemen of Wicklow', noting that its richness 'must prove a valuable and interesting object to the kingdom in general, and there is every reason to think it contains an inexhaustible body of lead ore'. The report further stated that '... thirty tons had been raised on the bank of so rich a quality, that fifteen ounces of the ore produces twelve ounces of pure lead with an extraordinary quantity of silver' (TT 1786). Two years later it was reported in a London newspaper that, 'the lead mine on Lord Malden's estate in the County of Wicklow, near that of Colonel Hayes, is now worked in the most judicious and successful manner (W 1788).¹ According to Wakefield (1812, 134), the mine was being worked by a partnership of seven, the majority of them Wicklow gentlemen, among whom the craze for mining was then rampant.

The mine lay on the Essex Estate and the first lease that we have been able to locate (HRO, Muniments of the Earls of

¹ Viscount Malden is used as the courtesy title by the heir apparent to the Earldom of Essex.



Map. 1: The valley of Glenmalur showing the location of the main lodes, mines and dressing floors

Essex, *et seq.*) is dated 26 October 1801 which was for 21 years, between George Capel-Coningsby, 5th Earl of Essex (1757–1839), Lord Henry FitzGerald (1761–1829)², and his wife Charlotte, late Charlotte Boyle (1769–1831), of the one part, and Sir John Parnell of the City of Dublin, Baronet (of His Majesty's Privy Council); Edward Westby of High Park; Morley Saunders of Saunders Grove; Abraham Chritchley [Critchley and variants] of Ballyboy; Thomas King of Kingstown; John Chritchley of Derrybawn; James Chritchley the younger of Ballyboy, all of the County of Wicklow and John Davis of Great St George's Street, City of Dublin, of the other part. The Earl of Essex held 5/6ths of the lease and Baroness de Ros, 1/6th.³

2 Lord Henry FitzGerald was the fourth son of the 1st Duke of Leinster and the Duchess of Leinster (née Lady Emily Lennox). His son, Henry William FitzGerald-de Ros, 22nd Baron de Ros (1793–1839), also opened the Tullyratty lead mine near Strangford Lough around 1829 (see Schwartz and Critchley 2013).

3 She was the daughter of Sir Charles Hanbury Williams and Lady Frances

The lease covered an area of 439 acres, 2 roods and 27 perches (Plantation Measure) and entitled the seven partners to search for 'all mines veins groves pits beds rakes rowes and holes' of copper, tin, iron ore and lead ore and all other metal, mineral substances and mineral waters. It related to mines already opened and discovered, as well as those that might be found and worked in the future. The partners were granted power to search for mineral lodes and to open and fully develop the mine at the surface and underground by making levels, soughs, sinking shafts, cutting leats, constructing buddles, erecting engines and other machinery. They were also entitled to maintain and continue any smelting house and bingsters [ore hoppers], workshops, mills, pumps, gins and other buildings, and to build dwelling houses or cabins for their

Coningsby of Hampton Court, Herefordshire. Their daughter, Frances Williams, married William Anne Holles Capell, 4th Earl of Essex. Their son, George Capel-Coningsby, 5th Earl of Essex, assumed the additional surname of Coningsby on succeeding to the estates of his great-aunt, the Countess Coningsby.

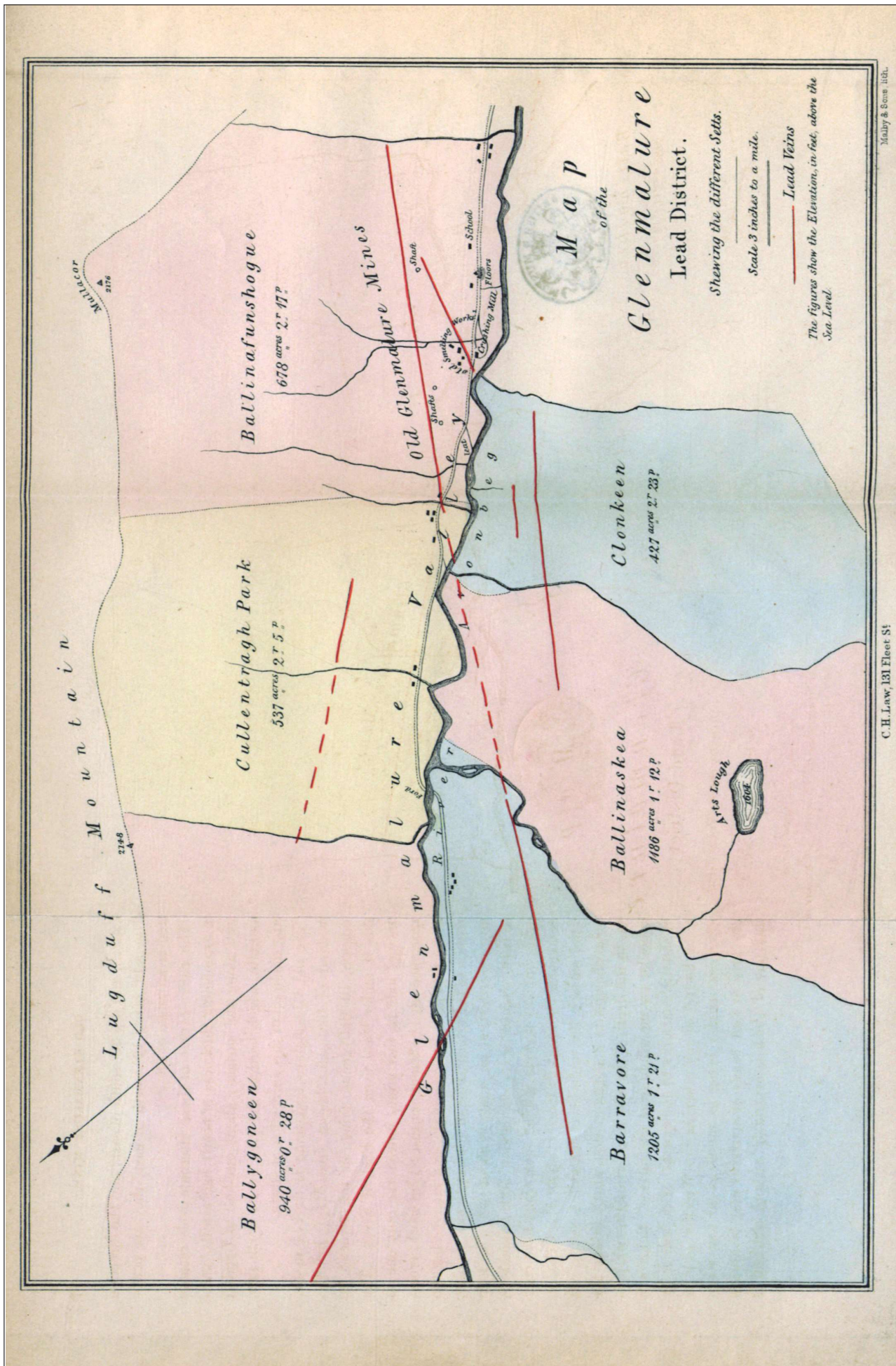


Fig. 1: Map of the townlands in the Glenmalure Valley showing the mines and main lodes, which accompanied the anonymous 'Mines of Wicklow', 1856

agents, stewards and workmen. Free rights of ingress, egress and regress to the mine sett of the workmen, horses, carts and other carriages to take, draw and carry away the ore and minerals or to supply the mine with materials were granted.

Essex was to receive, free of all taxes, rates and other charges, £1 15s for each ton of lead ore and a royalty of one-eighth of the produce of any other ore, such as copper or tin. This had to be well dressed and made merchantable and fit for smelting, and the Lord's Dish was to be calculated immediately after each 'weighing off' at the mine's dressing floors, seven day's notice of which was to be given to Essex and FitzGerald so that they or their agents could attend to determine that all was being conducted properly. The lease also stipulated that one, or some, of the partners had to be present at each weighing off to ensure it was done correctly and to see that Essex's royalty was paid within three months of the extraction of the ore.

The lease further stipulated that any shafts or pits that were abandoned or fell into disuse had to be filled and levelled within one month of their becoming useless, except those that were timbered, which had to be kept open and in good order as Essex and FitzGerald were entitled to take the timber as they were the freeholders. The partners also had to pay for any damage or trespass to the Lords of the Soil or their tenants and agree to allow the mine workings to be viewed, dialled and measured to ensure that the mines were being conducted in a fair manner.

A clause stating that the mine had to be worked constantly, regularly and without interruption (except for Sundays) with a sufficient number of able workmen 'unless hindered by Civil War or other public calamity' suggests that the workings had been adversely affected during the Irish Rebellion of 1798. Indeed, that year the Lead Mine Company of Glenmalur had made a claim to the government for the sum of £315 14s 5d for losses sustained during the fighting to the Smelting House and for the theft of iron, steel and timber from the mine. They were granted £310 14s and 5d (Find My Past, 1798 Claimants). This lease probably represents the re-commencement of mining after sufficient calm had been restored in Glenmalur following the upheaval of the Rebellion. If the terms of the lease were broken in any way, the freeholders would exercise the right to re-enter the property and to immediately expel the Agent, servants and workmen. Of interest is the wording used in the lease, including mention to 'veins' 'groves' 'rakes' 'soughs' and 'bingsteads', which were closely associated with the Derbyshire lead mining district (see Rieuwerts 1998). It appears therefore that the Glenmalur adventurers had established a connection with this English lead mining district, exemplified again in 1803 when they placed an advertisement in the *Derby Mercury* (Fig. 2.) seeking a person 'thoroughly qualified to undertake the Superintendence and Management of Working a Lead Mine in the County of Wicklow in Ireland', to whom a liberal salary would be given (DM 1803).

The partners were all Protestants, mainly drawn from Wicklow's Anglo-Irish landed dynasties and lesser gentry, many of whom played a significant role in local and/or national politics and were prominent Loyalists during the Rebellion. Sir John Parnell, 2nd Baronet (1744-1801), whose

To Miners.

WANTED, a Person who is thoroughly qualified to undertake the Superintendence and Management of Working a Lead Mine in the county of Wicklow, in Ireland, to whom a liberal Salary will be given.

The most respectable and satisfactory references will be required, as to abilities, sobriety, integrity and attention ; and security for any trust reposed if judged necessary.

Any person whom it may suit, may address, post-paid, to Mr. JOHN BUCKLEY, Mofsley, near Manchester ; Mr. EDMUND EVANS, Attorney at law, Derby ; or to Mr. JOHN DAVIS, Dublin, from each of whom further particulars may be known.

Fig. 2: In 1803, the Lead Mine Company of Glenmalur placed an advertisement in English newspaper, *The Derby Mercury*, seeking a qualified Mine Captain. John Davis of Dublin was one of the original seven gentlemen adventurers

family migrated from Congleton, Cheshire, in the seventeenth century, was a Member of Parliament for Queen's County [Laois], Commissioner of Revenue (1780), Chancellor of the Exchequer (1787) and Lord of the Treasury (1793). He inherited *Avondale House* from his first cousin, Samuel Hayes, MP, barrister, amateur architect and dendrologist, who died without issue in 1795, and who had been a shareholder in mining concerns in both Glenmalur and Avoca (McCracken 1968). Hayes was one of the original gentlemen adventurers in the Lead Mine Company of Glenmalur and from whom Parnell obtained his interest in the concern.

Sir John most certainly had an interest in mining, having inherited mineralised land in the townlands of Ballinaskea and Clonkeen on the opposite side of the Avonbeg River from the Glenmalur Mine, as well as land in Ballymurtagh, Avoca, contiguous to the rich copper mines then being worked by the Associated Irish Mining Company. He was also involved in the Bangor and Newton Mining Company, working the Whitespots lead deposit in County Down (Schwartz and Critchley 2013, 32). He enjoyed a colourful political career, and was witness to some of the most momentous events in Irish history. During the crisis of 1780-82, when France joined the Americans in support of their Revolutionary War, London called for volunteers to join militias to defend Ireland against the threat of invasion from France (since regular British forces had been dispatched to North America). Parnell commanded one such corps of Irish Volunteers, who, after 1782, used their newly powerful position to force the Crown to grant the landed Ascendancy self-rule and a more independent parliament.⁴ After the admission of Catholics to the parliamentary franchise in 1793, Parnell was gradually drawn into sympathy with them and came to see complete emancipation as inevitable.

The prospect of further reform had inspired a small group of Protestant liberals in Belfast to found the Society of United

4 The Irish Patriot Party, led by Henry Grattan, pushed for greater enfranchisement and in 1793 parliament passed laws allowing Catholics with some property to vote, but they could neither be elected nor appointed as state officials.



Fig. 3: *The Right Honorable Sir John Parnell, (1744-1801) 2nd Bart, by Pompeo Batoni, 1869/70 on display at Castle Ward House. © National Trust Images*

Irishmen in 1791, an organisation which crossed the religious divide.⁵ The Society espoused policies of further democratic reforms and Catholic emancipation, which the Irish parliament had little intention of granting. The outbreak of war with France following the proclamation of the Republic and the execution of Louis XVI in 1793, forced the Society of United Irishmen underground and toward armed insurrection with French aid, their avowed intent to 'break the connection with England'. The organisation spread throughout Ireland and had at least 200,000 members by 1797. The Establishment responded to widespread disorder by launching a counter-campaign of martial law from 2 March 1798 and Loyalists across Ireland organised in support of the government. During the chaos unleashed during the subsequent rising that became known as the Irish Rebellion, Glenmalure found itself centre stage as disgruntled rebels fought a bloody rural guerrilla war with the British military and Loyalist forces.

Parnell was deeply apprehensive about the loyalty of the local miners during this period, some of whom he believed to have been indoctrinated with the subversive sentiments of the United Irishmen (Power 2003, 55). He and his fellow partners in the Glenmalur Mine must have been alarmed upon learning that the rebels were procuring regular quantities of gunpowder from another mine, Cronebane, in Avoca (Crocker 1838, 175) and it seems certain that mining at Glenmalure would have been suspended during this period. Post Rebellion, Parnell

declared himself staunchly opposed to the Act of Union between the two kingdoms of Great Britain and Ireland, an idea which had been resurrected due to the alarm caused by a French landing in County Mayo during the Rebellion and the fear that Ireland could be used as a base for attacks on Britain. Parnell did not long survive the Irish parliament which became defunct when the Irish Act of Union came into being in 1801, or indeed the Glenmalure indenture he had so recently signed, dying suddenly and unexpectedly in London in early December 1801 (O'Brien 1898, 7-11).

The Critchleys were a well established and wealthy family of the Wicklow yeomanry some of whom, resident in Ballyboy townland, lived closest to Glenmalure and consequently probably visited the mine the most frequently to ensure that it was being operated in a manner that complied with the terms of the lease. Being prominent Loyalists, they suffered greatly during the Rebellion. Abraham was a repeated target, he and his family managing to repel a rebel attack on their house at Ballyboy on 25 March 1798. Even with the very vocal support given by the County Magistrate, nothing could prevent the 'beautiful seats' of Derrybawn and Ballyboy, the properties of James and Abraham Critchley respectively, from being 'totally burned and destroyed by a large body of rebels' under General Holt that July (FLJ 1798).⁶ James Critchley the younger, who became a prominent magistrate, actually shot one of his own herds named Timmon for some unassigned reason during the Rebellion, while James Toomey of Carriglineen, his coachman, 'was discarded for greasing Critchley's guns when the insurgents attacked the house [Derrybawn] looking for firearms'. Sutton, of Ballinakill, a carpenter at Derrybawn, shot two of these intruders (Cullen 1998, 65-66).

Abraham (1760-1806) and John Critchley claimed just over four thousand pounds compensation from the government for the loss of the house, furniture and cattle at Ballyboy (Nolan 1994, 680) and received just under £4,000 of the amount claimed (Find My Past). James Critchley the landowner at Derrybawn, seems to have encountered some difficulty in securing compensation for his losses and this delayed the building of the road from Glenmalure to Laragh in 1806. Wright (1827, 110) informs us that Richard Bookey 'later erected a very handsome house, near the old site of Mr. Critchley's, and not far from the bridge over the Glendalough river'.⁷ It is no coincidence to discover that James Critchley married Richard's daughter and heiress, Catherine Bookey of Grangebeg⁸ and the couple moved to Grangebeg House, situated in the foothills of the Wicklow Mountains on the county border between Kildare and Wicklow. Critchley was listed as a Captain of the Yeomanry Corps in 1804 (Great

⁶ James Critchley the Younger, burnt out of Derrybawn House, seems to have been resident in Ballyboy townland when the 1801 lease was signed. He was most certainly related to both John and Abraham Critchley, and appears to have acquired their shares in the mines upon their deaths (see below).

⁷ Critchley's house stood close to the bridge over the Glendalough River. This later became known as Bookey's Bridge. The current Derrybawn House was that built by Bookey.

⁸ A tablet inside Rathdrum Church of Ireland records that she died on 20th September 1835, and that she was the widow of James Critchley and heiress of Richard Bookey of Grangebeg.

⁵ The membership comprised Roman Catholics, Presbyterians, Methodists, other Protestant dissenters' groups, and some from the Protestant Ascendancy.



Fig. 4: Extract of part of the map of 'Balinacfinchoge in the County of Wicklow the Estate of the Earl of Essex and Lord Henry Fitzgerald' drawn by John Logan of Dublin, 1828. The Indenture of Lease covered an area of 439 acres, 2 roods and 27 perches (Plantation Measure). 1 and 2, Meadow Ground at Bottom of Smelting House; 3 and 6, The Dry Rocky Pasture; 4 and 5, The Smelting House, Water Course, Great Level and Shaft that communicates to ditto including the ground occupied and injured by Mine Works; 7, near 3/4ths of which is Moor and Bog, the remainder pasture. Note the stylised waterwheel adjacent to Mill Brook that powered the smelting works. By kind permission of Hertfordshire Record Office

Britain War Office 1804, 92)⁹ and repeatedly served as High Sheriff of the counties of Wicklow and Kildare. Although he was a man of extensive possessions, he was 'still better known for integrity, liberality and correctness in all the walks and commerce of life' (Jones 1820, xiv).

Edward Westby (1755-1838) was the younger brother of prominent Whig, Nicholas Westby, who enjoyed the support of Whig grandee, the 4th Earl Fitzwilliam (1748-1833), and had represented Wicklow in several parliaments. Edward became a barrister and after his brother Nicholas's death in 1800, inherited the extensive demesne of High Park (near Hackettstown), the mansion of which had been burned out during the Rebellion. He had it rebuilt and, like his brother, served as High Sheriff of County Wicklow, in 1807 (Burke 1836, 119).

Hailing from a family of Yorkshire extraction, Morley Saunders (1738-1825) of Saunders Grove near Baltinglass, was High Sheriff of County Wicklow in 1788 and gained notoriety for the part he played in the 1798 Rebellion. He had mustered the Saunders Grove yeoman infantry to protect Anglo-Irish interests and had captured 36 suspected rebels whom he had subsequently incarcerated in the Market House in Dunlavin. On Market Day, the captured men were paraded from their place of internment to the Fair Green where they were gunned down by a party of Ancient Britons (Lawlor

1998, 94). Although not executed on the orders of Saunders, the popular ballad, *Dunlavin Green*, lays the blame for the atrocity firmly at his door (for more see Cullen 1996, 349).¹⁰ Not as black as he was painted, Saunders tried to protect the family of rebel leader, Michael Dwyer, from reprisals in 1801 and initiated contacts with him in 1802 leading to his eventual surrender in 1804. He was listed as a Captain of the Yeomanry Corps for Imaal and Saunders Grove in 1804.

Throughout his life he harboured parliamentary aspirations, but was frustrated in his efforts to become an M.P. by the 4th Earl Fitzwilliam, who effectively controlled the political scene in County Wicklow, and who also failed to support his son, Robert Francis's, candidature (Thorne 1986, 702). In 1800, Donald Stewart, itinerant mineralogist of the Dublin Society, was instructed to carry out a mining survey of Saunders Grove, and Saunders's interest in mining is further demonstrated by his membership from 1819-23 of the Royal Dublin Society's chemistry and mineralogy committee. He died at Saunders Grove aged 87.

Thomas King, a spirited local magistrate, was a close

¹⁰ *Bad luck to you, Saunders, may bad luck never you shun!
That the widow's curse may melt you like the snow in the sun.
The cries of the orphans whose murmurs you cannot screen
For the murder of their dear fathers on Dunlavin Green.*

*Some of our boys to the hills they are going away,
Some of them are shot and some of them going to sea.
Micky Dwyer in the mountains to Saunders he owes a spleen
For his loyal brothers who were shot on Dunlavin Green.*

⁹ In June 1821 he wrote a letter to Dublin Castle detailing outrages committed across several baronies of counties Kildare, Wicklow and Carlow (NA—Chief Secretary's Office Registered Papers).

confederate of Samuel Hayes, one of the early partners in the Glenmalur Mine. Following his friend's death in 1795, King, an ardent Loyalist, erected a memorial and eulogy to his 'brother-in-arms' in the Rathdrum Church of Ireland where the pair served as Churchwardens. King had a keen interest in mining and had been authorised by the Crown to work the gold mines in the vicinity of Croghan Kinsella with Thomas Weaver and Abraham Mills, Directors of the Associated Irish Mining Company, which ran the copper mines in Avoca (Weaver 1819; Smyth 1853, 401). The trio laboured constantly from August 1796 to February 1811, only ceasing work between May 1798 and September 1800, when quashing the Irish Rebellion became the first order of government business, during which time the gold workings were ransacked (Alborn 2011, 365). Indeed, King played a central role in creating a Loyalist party in Wicklow during the early to mid-1790s and actively pursued and arrested members of the United Irishmen during the Rebellion (Cullen, 1994, 431). Following the Rebellion, he continued in his post as Captain of the Rathdrum Corps of Yeomanry (Great Britain War Office 1804, 112).

John Davis was a cabinet maker and auctioneer of St George's Street in Dublin in the years 1779-1813. A descendant of John Davis of Murphystown who founded a prominent Protestant landed dynasty in the seventeenth century (Guinness 2012), he had married into a wealthy merchant family from Wicklow named Jones, about which more below.

Details about the working of the mine before and under the 1801 lease are sketchy, but we do know that the partners commenced working the mine via an internal shaft on the level of Shallow Adit and had been much hampered by a great body of water. Consequently, a deep adit was being developed in the autumn of 1795 in order to drain the workings and to provide a method to 'expeditiously convey the ore to the roadside'. The ore raised, smelted on site and sold to plumbers in the metropolis (Dublin) had apparently 'more than amply repaid the money they [the partners] had advanced' (SNL 1795) and this new adit was expected to intersect the workings within two months (by December 1795). Wakefield notes that the seven partners expended £1,000 in the driving of what became known as Deep Adit (Wakefield 1812, 134), marked on Weaver's 1812 plan as 'The Great Level'. The relative richness of the mine and its economic importance is highlighted by the fact that in 1751 owners of mines and collieries were empowered to make roads connecting their mines with the nearest canal. Various Acts of Parliament were passed incorporating mining companies and in 1792, the Associated Irish Mining Company was granted powers to open and improve Arklow Harbour and to form a canal from there to the Meetings Bridge in Avoca in order to serve the copper mines in the valley and also to extend the canal towards the Kilkenny coalfields and the Glenmalur Mines (GL, Act 1792). The canal was, however, never constructed.

In May 1820, a new indenture of lease was drawn up between George Capel-Coningsby, 5th Earl of Essex, Lord Henry FitzGerald, and his wife Charlotte, Baroness de Ros, this time naming ten partners. The area covered in the lease remained the same (439 acres, 2 roods and 27 perches), and was granted for a term of 31 years from 1 March 1820 at a rent of £75 per

annum, which the partners were instructed to pay in quarterly disbursements on dates set out in the lease. Essex was to receive £1 13s 4d for every 5/6th of a ton of lead ore and Baroness de Ros was to receive £15 6s 8d per annum. The lease reiterated most of the terms of the 1801 indenture as regards development at the mine's surface and underground. One stipulation in the new indenture was that the interest in the company could only be passed on to children or near kin by will of testament. The partners were James Critchley (Critchley), Edward Westby, Morley Saunders, Daniel Mills, William Parnell, Robert Reid, Louisa Reid, Charles Jones, Mary Davis and Sarah Davis.

Daniel Mills held his share as he was the executor *de bonis non* of the estate of Thomas King of Kingston near Rathdrum who died in 1811 (Ireland Genealogy Projects).¹¹ William Parnell (1780-1821) acquired his share from his brother, Sir John Parnell, when he became the owner of *Avondale House* which was bequeathed to him in 1801 on his brother's death. William, who adopted the Hayes name in accordance with the will of Colonel Hayes,¹² served as Deputy Lieutenant of County Wicklow in 1817 and again in 1819-20. No supporter of the Union, he displayed considerable sympathies towards the persecuted Catholic population and, after years of patiently waiting for the support of the 4th Earl Fitzwilliam, served as Whig MP for Wicklow in 1817-21. In 1810, he had married Frances, the daughter of Hugh Howard, brother of William Howard, Earl of Wicklow, which undoubtedly strengthened his interest in mining, for the Howards resided at Castle Howard near the rich copper mines in East Avoca (Power 2003, 55).¹³ He probably also shared a mutual interest in mining with his neighbour, Thomas Mills-King of *Kingston House*, the son of Daniel Mills King who, as we have seen, was also involved with the lead mine at Glenmalure. Indeed, Parnell actively sought out sources of lead and silver on his estate (see below).

Robert Reid, M.D., M.I.R.A., was a physician and subscriber to the British Association for the Advancement of Science and also served as the physician to the House of Industry in Dublin. He married Louisa Carter in Dublin in 1818. She was the administratrix of the late Richard Carter of the City of Dublin who served as Secretary to the Commissioners for Relief of Suffering Loyalists (Stewart 1800, 115). The Jones's and the Davis's were related by marriage, Mary and Sarah being the daughters of Charles Jones (1766-1828), a general goods purveyor of Killincarrig near Delgany. Sarah Davis of Cloragh, County Dublin, had married James Moore Davis, a printer and gentleman 16 years her senior, the heir to a farm at Murphystown near Dublin, in 1790. She was widowed ten

11 Daniel Mills, a medical doctor who served as High Sheriff of County Wicklow in 1816, (and who died in September 1818) had taken the name 'Mills King' after his inheritance in 1811. It seems his son, Daniel Mills, then acquired the share.

12 The will of Colonel Hayes contained two curious provisions: one, that the estate of *Avondale* should always pass to a younger member of the family (it being considered, no doubt, that the older members would be sufficiently provided for out of the ancestral estates in the counties of Armagh and Queen's) and two, that the owners of *Avondale* should take the name of Hayes, or Parnell-Hayes.

13 Parnell's wife died at *Avondale* in August 1814 aged 21 (Urban 1814, 297).

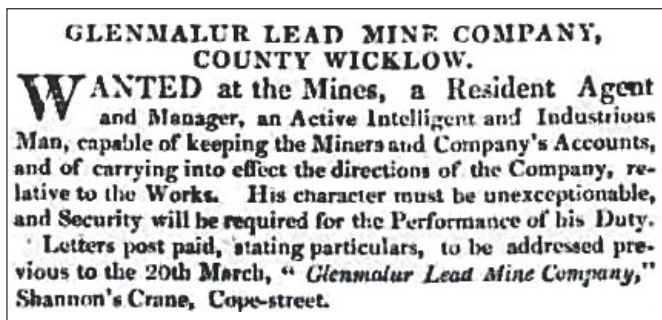


Fig. 5: Advertisement by the company in the *Dublin Evening Post* 22 February 1823, for a Resident Agent

years later. Sarah's elder sister, Mary, a widow of Eden Park, married James Moore's elder brother, John, aged just 15 in 1785 (Guinness 2012). Fifteen years her senior, he was one of the original gentleman adventurers in the Glenmalur Mine and had died in about 1813.

By 1828, the list of partners had changed slightly, numbering 11 rather than 10. Morley Saunders and Charles Jones were dead, as was James Critchly (who passed away in Bristol on 12 February 1826), Robert Francis Saunders (Morley's son), Elinor Jones (1772-1843, Charles's widow) and Catherine Critchly (née Bookey, James's widow), now holding their shares.¹⁴ William Parnell had also passed away at the relatively young age of 41, and his share had been transferred to the executors of his estate: his father in law Hugh Howard of Bushy Park, the fourth son of Ralph Howard, 1st Viscount Wicklow and Granville Leveson Proby, 3rd Earl of Carysfort (1782-1868), the third and youngest son of John Proby, 1st Earl of Carysfort, and his first wife Elizabeth (née Osbourne). Proby had married Isabella Howard, Hugh's second daughter, in 1818, hence he was related to both the Parnell's and the Howard's through marriage.

James Critchley, whom it was reported held three eighths in the mine having acquired these from his kinsmen, John and Abraham Critchley and was thus probably the majority shareholder in the concern, had left debts on his death which resulted in these shares being put up for auction by virtue of writs of *fieri facias* by the Wicklow County Sheriff in March 1826. Interestingly, the auction notice states that there were but eight shares in the whole and the other shareholders were of the first rank and respectability, most of them resident in the county [Wicklow]. Moreover, the works were constantly superintended and all capital speculation avoided by the fact that the Agent was himself a shareholder and Acting Manager of the Works through whose hands all money transactions occurred, and who settled the accounts and made the annual dividends. Which partner this was is not clear, but it might suggest that the advertisement placed in the *Dublin Evening Post* in 1823 (Fig. 5) had failed to find a suitable candidate.

Geologist, Richard Griffith, giving evidence to the Select Committee on the Survey and Valuation of Ireland in 1824, stated that although several other mines had been worked at different times 'but never with any spirit', there were then

only two lead mines in operation in the Wicklow district, one of which was Glenmalur. The other was at Ballycorus near the Scalp, which was, strictly speaking, in the County of Dublin (Report from the Select Committee 1824, 55). He further notes in his report on the metallic mines of Leinster, published in 1828, that Glenmalur had been worked 'by the present company for thirty years [since 1798] with various success, but a considerable profit has been cleared, even in the least productive years' (Griffith 1828, 15-16).

THE GLENMALUR SMELTING HOUSE

The smelting house at Glenmalure was probably opened in about 1786 by the Lead Mine Company of Glenmalur, and is mentioned in the memoirs of prominent Wexford rebel, Miles Byrne (1780-1862):

There were several houses on each side of it [Glenmalure], where our men got the means of cooking the mutton which they had in abundance, as the hills... were covered with flocks of sheep. They also got timber to make pike handles in the rafters of the smelting house belonging to the lead mines, to replace those that were broken or lost during the night marches; so that in a few days we were tolerably well armed with pikes.

Quite what the Loyalist partners of the Lead Mine Company of Glenmalur would have made of this theft from their property and Byrne's assertion (Byrne 1907, 220) that his men assembled at dusk near the smelting house in preparation for another night campaign can be imagined! This theft by the rebels resulted in the company making a claim to the government for their losses in 1798 as outlined above. The smelting house is plotted on a plan from a survey conducted in 1803 (Fig. 4), depicted as a high, single storey structure with three large doorways facing the road, a hipped roof (which we know to have been of slate due to the presence of fragments on site) above which stood two large stone chimneys.

The works were sited about 500 metres northwest of the mine workings at the foot of a small ravine (dubbed by locals the 'Mill Brook'). This contained a steady flow of water which Weaver (1819, 148) states turned the wheel in the 'upper smelting house' noting, 'the ore is smelted in a simple and cheap manner in small blast furnaces [also known as ore hearths], with the aid of turf, lime, and a small proportion of the purest blind coal [anthracite] that can be procured; and being reduced at a single operation, the lead obtained is of an excellent quality, fit for every purpose of the plumber' (Weaver 1819, 205). According to him, the works processed about 300-400 tons of galena yearly. Cast into pig ingots marked with the name of the company, the lead was taken to Dublin for sale, where in 1807 three people were arrested for attempting to sell stolen ingots belonging to the company to a plumber named Binns (DEP 1807). The complex of buildings depicted on the 1838 First Edition 6-inch OS Map would have included an ore house, a peat store, a weighing house and probably a residence nearby for the smelters. The blacksmiths

¹⁴ Charles Jones had died, aged 62, in July 1828, just a couple of months before the indenture was signed.

forge and a mill (see below) were sited on the opposite side of the road and parallel to it, with the smithy being located closest to Mill Brook.

Dublin Chemist, Michael Donovan (see below), visited the Glenmalure smelting works, probably in the late 1820s, to conduct an experiment on the relative merits of smelting ores in different types of furnace, presenting a paper to the Royal Irish Academy on his findings (Donovan 1848, 136-147).¹⁵ He offers a description of an ore hearth such as was in use at Glenmalure (there were many regional variations, see Willies 1990, 5), which resembled a low blacksmith's hearth with a blast provided by a water powered bellows coming in from the rear:

... a few blocks of cast iron placed upon a bed of masonry, in such a manner as to include a square shallow well, in which is contained the burning fuel, consisting, according to circumstances, of wood, charcoal, common coal, coke or turf, or all of these. A double bellows, of considerable size, worked by a waterwheel or by manual labour, assisted by a heavy swinging pendulum, is made to blow a stream of air towards the centre of the fire, and being there obstructed by a burning sod of turf, placed for that purpose, the air is driven in all directions through the fuel; and thus is established an equal heat, as well as an equal blast, to carry off the sulphureous (sic) vapours through the chimney which surmounts the hearth.¹⁶

A hood or arch over the hearth conducted the fumes up the chimney. During the smelting, small amounts of lime were occasionally thrown on to coagulate the slag. The molten lead trickled down into a well which, when full, became a running sump, overflowing down a gutter made in an inclined plane called an apron and thence into a cast iron pot placed beneath and kept heated by a small fire. The dross was skimmed off the top of the molten lead with a ladle pierced with small holes, then the liquid lead was ladled into a pig mould, cooled and then weighed.

After the charge had been smelted, the fire was drawn out onto the apron and the slags, when visible, were picked out as soon as possible and the fire returned to its place with more fuel and the process repeated.¹⁷ Donovan notes that when sufficient slags had been collected they were 'melted with more lime in another furnace, called the slag-hearth'. The metal procured from the second smelt was a harder, or 'slag lead', which bore a somewhat lower price than that obtained from the first smelt which was known as 'soft' or 'ore lead'. He also states that the success of the smelt relied on the skill of the smelter who had



Fig. 6: *This building is believed to have been the 'mill for grinding ore' seen here converted into a private dwelling. Note the window in the wall facing the camera which has been infilled. The stone chimney, offset to the rear, is built in the same style as those of the smelting house across the road (see Fig. 19) and possibly served a small blast furnace. The leat for the mill's waterwheel can be seen running parallel to the road on the right. Photograph by Joshua H. Hargrave, published 1895. Image courtesy of the National Library of Ireland, Dublin*

to ensure that the blast of air delivered into the centre of the furnace permeated the burning fuel in all parts without overheating the furnace (because this would vaporise the lead causing it to be lost to the atmosphere). Each ore hearth was worked by two smelters (usually working an eight hour shift) who could process up to 5,376 lbs (2.4 tonnes) of ore a day (Donovan 1847-1850, 139).

From Donovan we learn that Glenmalure had two blast furnaces: one for the first smelt and one for the slags, so improvement to the smelting process had obviously been made since Weaver made his observations sometime before 1819. At the time of Donovan's visit, there was no provision for the treatment of the second slags, which, at some of the larger works with which he was familiar, were ground in a crushing mill and washed in water (buddled) to allow the lighter wastes to be rejected from the remaining lead which was then re-smelted in another furnace, a process that Willies (1990, 23) notes was undertaken at many contemporaneous Derbyshire smelting works. However, it appears this might have been introduced at Glenmalure at a later date, perhaps even on Donovan's recommendation, because the 6-inch OS map of 1838 notes a 'mill for grinding ore' on the opposite (south west) side of the road. Sited away from the main smelting complex, it was built here to avail of the water power from a pre-existing leat contouring round a small knoll

¹⁵ His paper must refer to a visit which took place years earlier, for the works were closed in the mid-1830s.

¹⁶ Sulphurous fumes issue for a short time only when the fire has been roused and opened – the period when the molten leads begins to run. At some blast furnace works, in order to improve the removal of sulphur, a previous preparative desulphuration process was undertaken in a small furnace.

¹⁷ The slags that resulted from the smelting process consisted of un-burnt ore, partially oxidised or reduced ore, gangue (waste non-metallic minerals) and globules of metallic lead trapped in the vesicles (pores) or on the surface.



Shown here are a blast furnace (Fig. 7. Top) and the weighing of pig ingots of lead (Fig. 8. bottom), at the Leadhills Mine, South Lanarkshire, owned by the 3rd Earl of Hopetoun, who commissioned Scottish artist, David Allan, to produce a set of four paintings in the 1780s, of which these are the third and fourth. The processes Allan depicts are probably similar to those which would have been in use at the contemporaneous Glenmalure Smelting House. Both images accepted by HM Government in lieu of inheritance tax and allocated to the National Galleries of Scotland, 2008

towards the mine's dressing floors. It also had the added advantage of being sited close to the area where the rejected slags had been dumped and which would therefore have been nearby for re-processing (Fig. 6).¹⁸

The Glenmalure furnaces were fuelled by coal and coke (brought in from the Port of Wicklow) and turf that was cut on Mullacor Mountain above the works; the zig-zag trackway leading from the works up onto the open hillside can be seen on historic OS maps. Two types of galena were raised at Glenmalure: a steel grained, hard kind obtained from a very hard quartz which was very refractory in the furnace; the other, either plumose or cubical in its fracture, was softer and more easily reducible to the metallic state. Donovan noted how these ores had to be well mixed to ensure a successful smelt.

However, blast furnaces had their detractors, critics noting that they 'saved coal but wasted lead', more of which was lost to the atmosphere as a sulphuret of lead and as a metallic substance, than in the reverberatory furnace with longer horizontal flues that allowed the fumes to condense and the deposits in the flues to be periodically collected. Moreover, in a blast furnace, the temperature dropped significantly when the fire was raked out onto the apron to remove the slags and the furnace therefore took time to heat up again, thus lengthening the smelting process. Indeed, blast furnaces had been largely superseded by reverberatory furnaces in some of the most important lead producing regions of neighbouring Britain such as Flintshire by the early to-mid-nineteenth century.

The reverberatory furnace isolated the mineral being smelted from contact with the fuel, but not from contact with the hot combustion gases, and worked best with bituminous coal. The firebox was separated from the ore by a partition and covered with a domed roof, the angle of which reflected the hot air into the reaction chamber where the ore liquefied and flowed with ease out of a tapping hole into an iron pot. This type of furnace received no air blast, up draught being provided by tall chimneys which also served to divert the toxic fumes upwards and away from the workers. Unlike the blast furnace, the reverberatory furnace could be placed in operation and cooled down in a short time. Usually only a single charge in the range of 12 to 21 cwt (roughly 600-1,000 kg) was smelted and drawn off, after which the furnace was opened, recharged, and started again without much lessening of temperature.

However, as Donovan explained, reverberatory furnaces did not always answer best in remote areas where the cost of the carriage of fuel was considerable and a steady supply of ore

was not always guaranteed. In areas such as Alston Moor in Cumberland (Cumbria), parts of the Northern Pennines and also at Leadhills in Scotland (see Figs. 7 and 8), the blast furnace still had a place, as too at Glenmalure. Here, an abundant supply of black turf, which was capable of affording an intense heat, was obtainable on Mullacor Mountain close by. As the blast furnace consumed much less coal than a reverberatory one, significant expense was saved by not having to purchase large amounts of coal which had to be imported to, and then transported inland from, the Port of Wicklow. Moreover, if the ore was exported long distance, or out of the island, its transport, insurance and warehousing had to be taken into account. In addition, a blast furnace works could be constructed much more cheaply than a reverberatory works and took up far less space.

Glenmalure galena contained, on average, about 68 per cent lead and was much esteemed on account of its purity, being unusually free of antimony (Griffith 1828, 16-17). Donovan's estimated costs of smelting one ton of ore (about 1,000 kilos) on the spot and exporting the lead to market in Ireland at the time when the mine was in brisk production at the beginning of the nineteenth century, are depicted in Table 1. This produced 12cwt. 3qrs. 8lbs. of pig-lead (just over 609 kg); the carriage of this lead to Dublin cost 12s. 8d, making the final price after transport £7 14s 11d. In Dublin it was sold for £9 12s 4d, leaving a profit of £1 17s 5d per ton of ore.

	£	s	d
Cutting out the ore from the rock, per ton	3	17	6
Royalty (as it should have been)	1	10	0
Dressing	0	16	0
Smelting by the blast hearth	0	17	3
	7	1	3

Table 1. Estimated cost of producing and processing one ton of lead ore

Had the same consignment of ore been exported across the Irish Sea to Dee-Bank (Flintshire), Donovan argues that the additional charge of carriage to Wicklow, storage, freight, insurance, two commissions and an assay, would have increased the cost of producing lead metal to £7 6s 4d, while the price of pig lead at Dee-Bank was but £8 17 6d; the profit would therefore be £1 11s 2d, leaving a balance in favour of smelting the ore locally by the blast-hearth of 6s 3d per ton of ore, or an increased profit of nearly 17 per cent.

In his work of 1812, Wakefield also mentions the smelting works, the ore hearths each worked by an immense pair of bellows:

... the lead is run into pieces like cast-iron, called bars, each of which weighs one cwt. About 180 are made each week, and the labourers receive for smelting crop ore 10s, for tale (sic) 12s and for slugs (sic) or refuse 13s. Washing [dressing] the ore costs from £2 6s to £4

¹⁸ According to locals, the smelting slags were dumped on the opposite side of the road from the smelter in an area that was dubbed 'Smelting House Bog'. It could be that the Royal Irish Mining Company decided to re-process the second slags in order to extract the remaining lead during the late-1820s, early-1830s, when the price of the metal was very low and there would have been a rationale for treating these to boost profits. There is a distinct lack of slag on the site today which points towards most of having been re-processed. The idea that this mill might have been used to grind the ores raised from the mine seems unlikely, as the mine's dressing floor lay directly opposite the Deep Adit some 500 metres away.

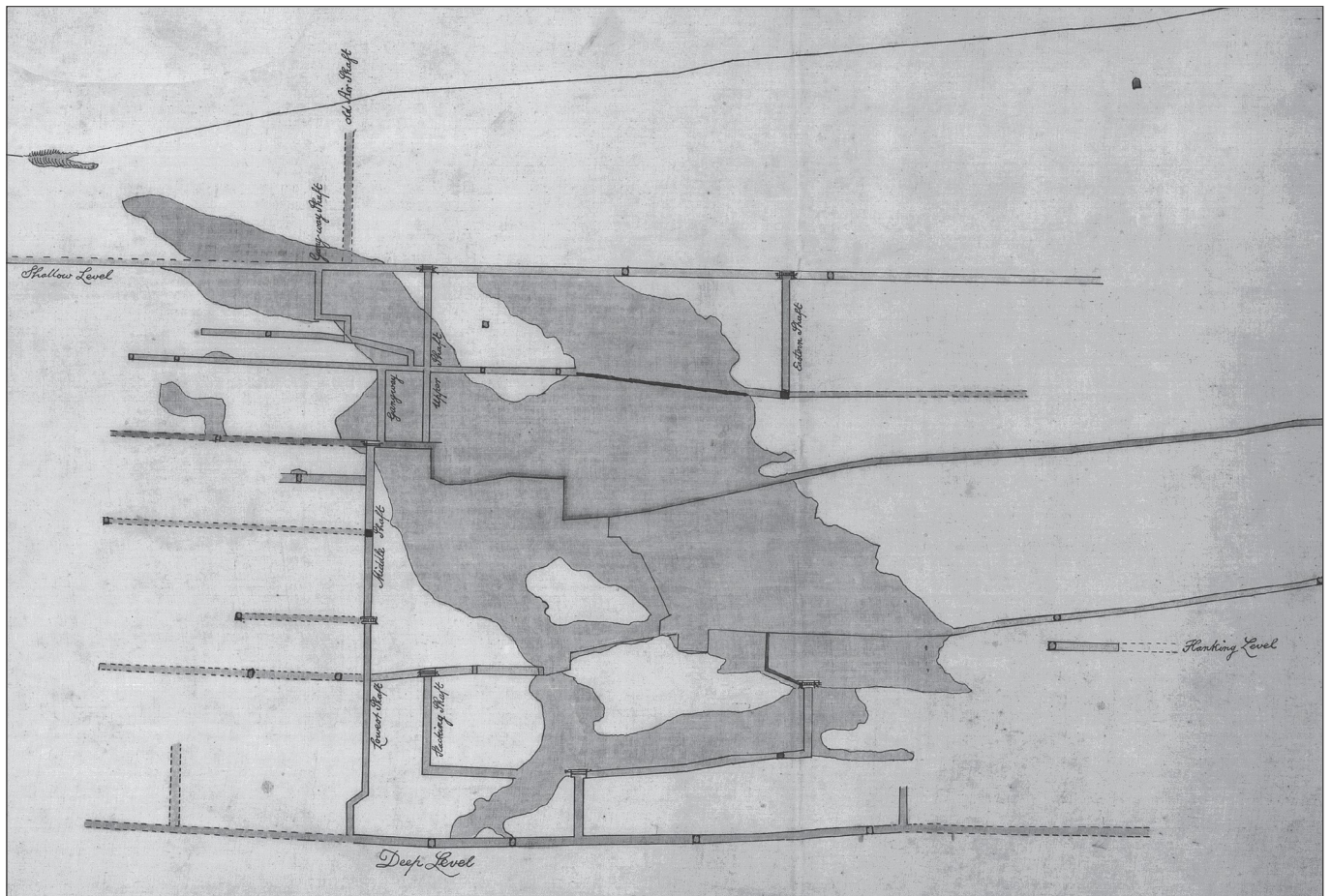


Fig. 9: Plan of the underground workings of the 'Ballynafinshoge Lead Mine in Glenmalur' drawn by Thomas Weaver in 1812. The mine was described in 1856 as 'a venture only worthy of the Middle Ages'. Weaver's plan gives an impression of the haphazard nature of the mine workings with their levels connected by numerous crooked winzes. Plan by kind permission of the Geological Survey of Ireland

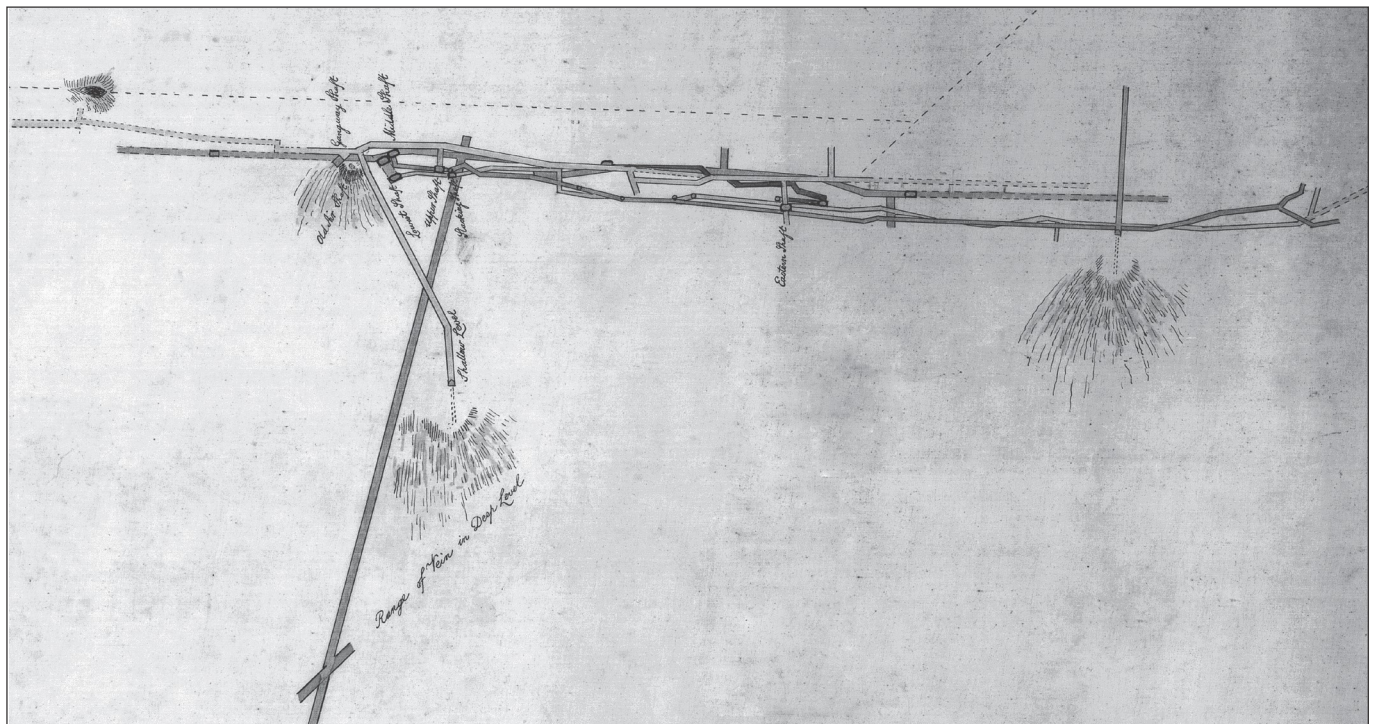


Fig. 10: Section of the underground workings of the 'Ballynafinshoge Lead Mine in Glenmalur' drawn by Thomas Weaver in 1812, showing that at that date, the mine had not been worked below the level of the Deep Adit. A criticism levelled at the mine was that it had not been worked in a 'minerlike' manner, with no regular shaft for drainage or hoisting. Section by kind permission of the Geological Survey of Ireland

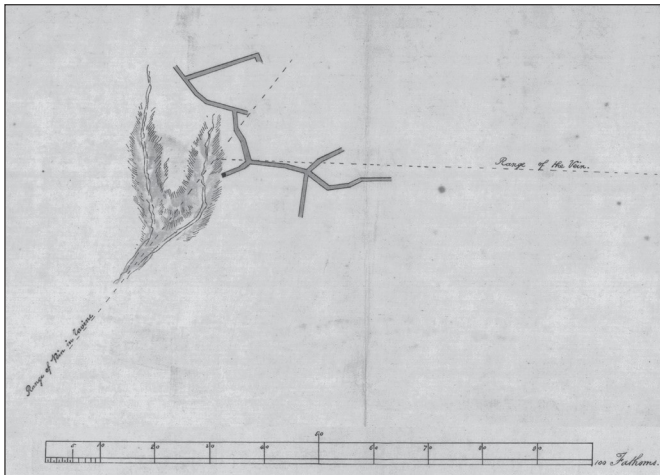


Fig. 11: Section depicting the Mill Brook workings of the 'Ballynafinshoge Lead Mine in Glenmalur' drawn by Thomas Weaver in 1812. By kind permission of the Geological Survey of Ireland

10s per ton. The carriage to Dublin is 20d per cwt.¹⁹

Fitton (1811) notes that the sales of lead, from ore raised and smelted at the Glenmalur works amounted, in the year ending 31 December 1811, to no less than £9,819 16s 2d Irish currency. The weight of the metal sold was 6,680 cwts 2 qrs.

Interestingly, the Lead Mine Company of Glenmalur did consider modernising their smelting works in 1825, because an advertisement appeared in the *Freemans Journal* alerting builders that plans and estimates would be received for erecting an 'Air Furnace at the Glenmalur Lead Mines, for the purpose of smelting ore'. The charge was not to exceed 16 cwt (about 800 kilos) and particulars could be obtained from Doctor [Robert] Reid, 16 Belvedere Place [Dublin] (FJ 1825), who, as we have seen, was one of the company's partners. An air furnace is a reverberatory type, but as there is, as yet, no archaeological evidence to support this kind of furnace ever having been built in this location. It appears the plans were dropped, possibly because the Lead Mine Company of Glenmalur was soon to sub-let its lease to another company.

'THE OLD ROCK MINE': A VENTURE 'ONLY WORTHY OF THE MIDDLE AGES'

Although the blast hearth was appropriate to a mountainous valley far from the coast and the smelting side of the enterprise was seemingly being managed in the most economical manner by the Lead Mine Company of Glenmalur, the same cannot be said of the mining which drew considerable criticism from a variety of observers. The Ballinafunshoge Lode on the north-

¹⁹ Wakefield's description must be treated with caution. He erroneously places the smelting works in Glendalough and incorrectly states that the water that issued from the Great Adit was used to turn a waterwheel at the smelting works where there were 'three smelting houses'. He further records that the works smelted 10 cwt. of ore each day. His assertion that 180 bars of lead were produced each week cannot be correct, as 10 cwt. of ore might be expected to yield 6 cwt. or so of lead per day, giving a total of only 36 cwt. of pig lead in a 6 day week (or 36 bars if each bar weighed one cwt. as he claims).

eastern side of the glen was by far the largest of any other in the Wicklow Uplands, Wright (1822, 97-8) noting how it had been traced to a distance of 400 fathoms²⁰. Upon it the Old Rock Mine (BNL 1860) had been opened, unwatered by the Deep Level or Adit driven in 1795 to intersect the lode through solid rock for a length of 140 fathoms from a point a little above the Avonbeg River, its portal being level with the metallated road to the Glen of Imaal (the Stony Road) that passes through the glen (Griffith 1828, 15). The extent of the works was about 160 fathoms: one hundred on the right and sixty on the left of the adit level with an annual production estimated at about four hundred tons of galena, which yielded, on average, 68 per cent of lead.

Weaver also shows several other levels on his map of 1812, including 'Stream Adit' situated just above where the Mill Brook bifurcates (see Fig 11); the level was driven into the bank above the right hand branch of the brook and had '... been worked five or six fathoms in length, and twice as much in depth, but the operations were not attended with advantage' (Weaver 1812, 206).

Ballinafunshoge seems to have attracted curious visitors from near and far (see Wright 1822; Leigh and Son 1835, 343) from an early period, some of whom published informative and evocative descriptions of their foray into the workings - documentary evidence for an early form of mining tourism. Wright was one of these and he notes:

... the visiter [sic] to these awful chambers in the bowels of the mountain can consequently be conveyed with great facility in one of the ore wagons, which runs on a railed way, until he reaches the intersection of the wings with the adit level; turning to the right he may range along galleries, infinite in number, without any inconvenience, except that of soiling his dress; this he ought to be provided for, by borrowing a miner's jacket before entrance. In this way, a very extraordinary and interesting object, the interior of a mine, may be easily and securely visited.

Griffith (1828, 15-16) informs us of the geology of these 'infinite galleries', stating that white lead ore, both massive and crystallised, was met with, together with hornblende, copper, iron pyrites and spar in a matrix of quartz and occasionally within sulphate of barytes. He further adds that the general direction of the lode was 20° west of north and east of south and from the surface and for about 30 fathoms downwards, it inclined towards the south-west at an angle of 85° from the horizon, and beneath that point it formed a gentle curve, and inclined in an opposite direction towards the north-east, at the same angle.

He remarks that the lode was on average 15 feet thick, and, excepting where there were bunches or great masses of ore, it was divided with some degree of regularity into five parts. Commencing from the north, a 'soft slaty vein' was met with containing much talc and three feet thick, followed by a vein

²⁰ One fathom is equal to 6 ft or approximately 1.8 metres.

of white quartz from one to two feet thick that usually contained ore and which was termed the 'north string' by the miners. Next came 'a soft talcy matter similar to the first, around three feet thick', then a second vein of quartz two feet thick called the 'south string' in which the chief part of the ore had been found. Beyond that was 'a third vein of soft talcy matter which extended to the south wall'.

The Lead Mine Company of Glenmalur had discovered two great bunches of ore, one to the west and the other to the east of the adit level; that to the east was uncommonly productive and frequently the forebreast of the workings presented a solid mass of ore from ten to twelve feet in breadth and from 30-40 feet in height. However, the ore that inclined to the eastward gradually diminished in quantity as the working approached the Deep Level, beneath which Griffith stated no trials of consequence had yet been made. He also notes that 'the western bunch had been discovered and worked within the last ten years; it descended in the form of a pipe, quite perpendicularly from the surface to the deep level, where the workings have been discontinued for the present'. He also remarks that in other parts of the lode to the north and south of the bunches, considerable bodies of ore had been raised from the south string, and some had occasionally been encountered in the north string. 'The greatest length of the workings is 180 fathoms from north to south, of which 73 fathoms are to the north, and 107 to the south of the Adit'.

It appeared that the majority of the men employed at the mine were probably drawn from the immediate locality and surrounding counties, for in 1825, when a fall of ground trapped two 'Englishmen' who were re-timbering one of the old levels in the Luganure Mine belonging to the Mining Company of Ireland, men 'from the neighbouring mine of Glenmalure', rushed across the mountains to help in the 33 hour long task of clearing the blockage. The Glenmalure miners, described as Irishmen, refused remuneration for their help and courage (MC 1825). However, Griffith tellingly states of Glenmalure, 'this mine has never been conducted with the spirit which it deserves. If sinkings to a considerable depth were made beneath the adit level, I have no doubt of a successful result' (Griffith 1828, 17).

The anonymous author of *The Mines of Wicklow* (1856, 18-19) was less guarded in his opinion of the mine, writing almost 30 years later:

This fine old mine, which has now been at work for considerably upwards of a century, has been sunk to a considerable depth below adit, but in such an unskilful and unminerlike manner as to have brought it almost entirely to an end. There is no regular shaft, but a series of winzes of all shapes; and the method of drainage and raising stuff (the latter is performed by hand-tackle, through three or four different winzes, entailing about half-a-dozen re-fillings and wheelings in handbarrows,) is only worthy of the middle ages. A vein of gold could not be profitably worked in such a manner. This is very unfortunate; for there cannot be a second opinion as to the intrinsic value of the old Glenmalure mine.

From this damning description we can deduce that the operators had, in essence, picked the eyes out of the Old Rock Mine in their search for ore, forgoing any form of systematic development and opening of ground in their eagerness to turn a profit. This was not unique to Glenmalure and was an all too common feature of numerous late-eighteenth early-nineteenth century mining ventures.

THE ROYAL IRISH MINING COMPANY

As no workings below adit level are depicted on Weaver's 1812 map, or mentioned by Griffith in 1828, this means they had been started by the Royal Irish Mining Company (RIMC) which got its hands on the lease in 1828. This company had been set up by an Act of Parliament (5 George IV, c. clvii) (PA 1824) during the London Stock Market boom of 1824-25 as a concern with a capital of £400,000 in 16,000 shares of £25 each (English 1826). The passage of their Bill through the House of Commons was not straightforward, as evidenced during a debate at its second reading on 6 May 1824, for it contained, according to William Huskisson, MP for Liverpool and President of the Board of Trade, '... some of the most extraordinary provisions he had ever heard of'.

Objectionable clauses obviously had to be removed before the Bill was passed, for, as Huskisson commented, 'You may form yourselves into what companies you please; but if you apply for powers, those powers must be limited as in all other cases; you may sue and be sued like all other individuals', continuing, 'In fact, there would otherwise be no fairness. He should, therefore, oppose all bills containing such clauses' (MC 1824). The bill was read for a third time and finally passed on 11 June 1824 (TT 1824). The bill contained a clause that no proprietor of the company would be liable beyond the amount of his shares, thus removing the dread of personal responsibility beyond the amount subscribed, but another clause in the Bill was to come back to haunt the Directors as we shall see below.

Patronised by '... some of the greatest Landed Proprietors in the Country, among whom are Noblemen and Gentlemen, whose names are recited in the Act, they cannot but feel great confidence under such patronage and with such powers' (English 1826, 55)²¹ the RIMC's first Chairman was John McMahon, Esq.. The Directors, all based in Ireland, were John Clancy; Michael Donovan (the Dublin chemist who described the Glenmalure smelting works); Dr Duigan; Patrick Fottrell; Victor Hervieu; Philip Malloy; Patrick Nolan; Major James Palmer;²² Cusack Roney (1810-1868);²³ George Stapleton;²⁴ Francis Tardy and Patrick Woods. The Secretary was Thomas Taylor.

21 The names of the Patrons were: the Earls of Meath, Charlemont and Roden; the Marquis of Sligo; Sir Capel Molyneux, Bart; Sir Thomas Esmonde, Bart; the Right Honourable George Knox and the Dean of St. Patrick's.

22 He was the inspector-general of Irish prisons from 1823-45.

23 Later knighted, Roney was heavily involved in railway engineering projects in Ireland, Britain and overseas. He spent much of his life in London and was the author of *Rambles on Railways* (1868).

24 Possibly the prominent Irish stuccodore and builder.

Imbued with a desire to ensure employment for the poor peasantry, for there was 'no vice inherent in the Irish peasant that made him turbulent, but want of employment and subsequent poverty' (DEM 1824), the company stated its intention to set out modestly (English 1824, 55):

But as gigantic projects, in the infancy of any Company must ever be liable to mistakes, and sometimes to great losses, the Directors have determined that the commencement of their operations shall be on such a scale as not to endanger any considerable portion of their Capital; but yet to an extent sufficient to prove, that great advantages may be derived from Mining in Ireland. They have therefore secured such Mines, as from the known value of their products, their contiguity to Canals and Navigable Rivers, are best calculated to be worked with success.

As with their rivals, the Mining Company of Ireland and the Hibernian Mining Company, both of which had a head start over the RIMC, the company began an ardent search for minerals throughout the country, one of their engineers apparently discovering a copper deposit at Parkbawn near Gorey in Wexford in the autumn of 1824 (MP 1824). By June 1825 they were reported to have been working the coal mine of Carrickmacross on the estate of Mr. E.J. Shirley in County Monaghan (MP 1825) and they also held the royalty of Curran in the coal field near Dungannon, where they were busy sinking a shaft to reach a bed of coal (English 1826, 111). Gypsum was discovered at Carrickmacross, which Shirley permitted the RIMC to freely use to finance the exploration of coal, but the venture was unsuccessful and the company left the Shirley Estate in 1828 after the failure of the coal prospects there (McDermott 2009). During 1825, the company was also busy inspecting a number of slate mines in County Tipperary (Donnell 1826).

However, the RIMC's chief intention had been particularly directed toward the lead mines of Ireland, and, with a view to promote its interest, it had formed establishments on four which were active in 1824. Two of these mines, Tamlaght and Aughnamullen in the county of Monaghan, and Killiney, in the county of Dublin, six miles from the city, had already been productive (English 1826, 110). The lead mine at Tamlaght was reported to have been wrought to considerable advantage, and the extent of the vein had been traced for upwards of half a mile. The ore sold for £20 per ton on the spot, 'being in use for glazing earthenware extensively manufactured near Dungannon' (see Schwartz and Critchley 2011, 61, for more on the lead mines in this area). The mine lay in the estate of the See of Clogher and it was trumpeted that there was little doubt that it would bear competition 'with the greater number of the celebrated mines of Flintshire' (English 1824, 111).

The 'very valuable lead mine of Killiney and Rochestown' near Dublin (MC 1825) produced ore that allegedly yielded 80 per cent metal, and it was reported that during the course of its being opened it, 'furnished nearly one ton of lead each day for the last fortnight'. It was stated to have 'more than twenty-fold paid the charge of working it', as it required little labour, lay but a few feet from the surface ground on a declivity, and

demanding no machinery for unwatering. 'If it should continue in its present highly-favourable appearance (and of this the practical miners entertain no doubt), it must in itself prove sufficient to yield an abundant profit for the entire capital of the company, besides defraying all cost of management' (English 1826, 111). In 1825, it was noted that the company's success there was not more promising than it was at Tamlaght and Lara in Monaghan (DMR 1825). Griffiths (1828, 17) provides further evidence for the fate of this undertaking. He notes that within the last three years (from c1824/25) the RIMC had worked two lead veins on the eastern declivity of the Killiney Hills and raised a considerable amount of ore from shallow shafts and a driving towards the seashore on the southern vein, before the works were abandoned due to the lode becoming irregular and poor at depth.

In 1826 the company had taken possession of a silver mine near Killalee (the Derry Mines) at an annual rent of £500 (DMR 1826) and was working Ballysteen on the borders of the Shannon (Co. Limerick), the seat of Col. Westropp, reportedly 'with considerable success' (Fitzgerald and McGregor 1826, 401). But their plans to work Silvermines in Tipperary were, however, tellingly abandoned, the mines thought to have required too much capital expenditure to bring into production (DMR 1826); it seems Ballysteen was also abandoned. Taylor (1838, 385) notes that one of the oldest mines in Ireland, the Milltown lead mine in the barony of Tulla, County Clare, was started by the RIMC around the same time. But after partially clearing out some old workings and driving a level for a short distance into the north side of the mine, they abandoned the speculation after raising only 11 tons of ore. Lewis also records that a small lead mine had been tried at Cootehill in County Cavan, which was another of the RIMC's short-lived undertakings (Lewis 1836, 315).

Griffiths writes of a more ambitious venture entered into by the RIMC: Wheal Church, close to the Grand Canal in County Kildare.²⁵ Galena had been discovered in Mr. Stephens's limestone quarry at Wheatfield and a mine was opened by the company close by and to the west of it. An engine shaft worked by a horse whim was sunk to a depth of 15 fathoms and two levels were driven on the main vein connected by winzes. The company had cut a two mile long watercourse from Bishop's Court to the mine to power a 14 feet waterwheel for pumping the workings (Griffiths 1828, 27-29), presumably to replace the horse whim depicted in a plan by M. Healy dated 1826 (Cowman 2002, 30). Like their other ventures, this too seems to have been an unsuccessful enterprise. In 1827 it was noted that just £17,000 had been paid to the RIMC by shareholders, with another £383,000 liable to be called (English 1827) suggesting a distinct lack of subscribers. This gave the company a limited working capital for operating mines across Ireland and it had made a call of 10 shillings per share in 1827 (LG 1827). Their track record up to the year in which they acquired the Old Rock Mine, otherwise known as

²⁵ Note the use of the Cornish prefix 'Wheal' which means 'mine working'. By adopting a term widely used in one of the most important mining districts of Britain, it could be that the company wished to puff up the importance of the working to attract investment, or alternatively, it might indicate some actual Cornish involvement in the venture.

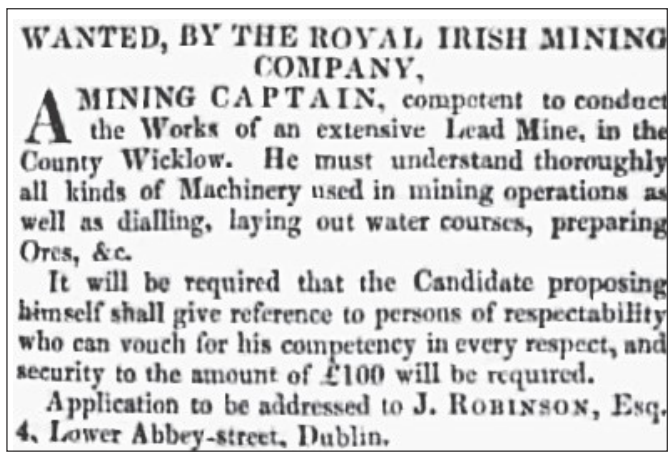


Fig. 12. Advertisement in a Chester newspaper, 1828. Lying on the River Dee, Chester was close to Flintshire and Denbighshire, Wales, where there were many lead mines

the Glenmalure Mine, in 1828 was therefore hardly inspiring.

On the 9 September of that year the RIMC agreed the terms of sub-leasing the Glenmalur Mine with the partners of the Lead Mine Company of Glenmalur (HRO, Muniments of the Earls of Essex, *et seq.*). With the consent of the landowners, Essex and de Ros, the RIMC agreed to pay a sum of £6,000 to the company's partners to acquire the remainder of the 31 year lease and for rights to all the mining equipment, machinery and buildings on the mine. The partners also received a transfer of 500 shares in the RIMC (valued at £254 3s 4d). The indenture was signed on behalf of the RIMC by Major James Palmer [Milltown County Dublin]; Michael Donovan; Cusack Roney; Joseph Ferguson [Oatlands, Abbeyleix, Queen's County] and George Studdert [J.P., Clonderlaw, Knock, County Clare], who were named as Company Directors, who agreed 'for the time being' to keep the present number of persons at the mine at work and to abide by all the terms and agreements the lessors had entered into with the landowners as set out in the 1820 and 1828 indentures of lease.

'We understand that the extensive and valuable mines of Glenmalur [sic] are again about to be worked on the great scale which their magnitude and wealth would warrant', sounded the *Dublin Evening Mail*, '... having become the property of the Royal Irish Mining Company. This company is one of the largest joint-stock establishments, which adopted prudence and economy for its basis, and which retains, unimpaired, its ample capital, and consequently its means of being beneficial to the country' (DEM 1828). The RIMC wasted no time in placing an advertisement (Fig. 12) in a prominent northwest of England newspaper for a Mining Captain competent to conduct the works of an extensive lead mine in County Wicklow (CC 1828) or of making another call on its shareholders for 10 shilling per share (LG 1828).

A sense of what that Mine Captain would have faced on his arrival in Glenmalure is provided by German traveller, Hermann Fürst von Pückler-Muskau who was touring the area in August 1828 (Tour in England, Ireland and France):

The valley of Glenmalure has a character of desolate sublimity, which harmonized perfectly with the weather. In the midst stands a deserted and already decaying barrack, which looks like a haunted castle;—neither tree nor bush is to be seen, and the sides of the mountains are covered with loose stones. The valley has only subterranean inhabitants, and their life produces death. Here are great lead-works, whose unwholesome exhalations are traced on the pallid faces of the workmen. I dressed myself in a black slop, and was driven into one of the entrances,—a gloomy and terrific journey. The passages were cold as ice; pitch-darkness reigned in them, and a cutting wind loaded with a death-like smell blew in our faces. Minute drops fell with a hollow sound from the low roof, which bent us nearly double; and the jolting of the car, which a man dragged slowly over the rugged bottom, completed the picture of horrors. The delicate state of my chest did not permit me to remain long here, and I gave up all further researches, glad 'once more to see the rosy light'.

Within six months of taking over the mine, the company had reportedly run a new level into the hill through solid rock and had also erected a powerful pressure engine²⁶ to aid in pumping the lower levels of the mine and were said to be working the mines very extensively (WC 1829).

However, not long after their acquisition of the mine, the RIMC faced a crisis caused by the price of pig lead which had fallen from over £27 per fodder in 1825, to around £17 per fodder in 1828; it continued to slump, to just over £13 per fodder in 1830 (Burt 1984, 305). The development of the free trade movement in the 1820s had resulted in a reduction of the duty payable on imported lead ore to Britain. With the lead mines of south eastern Spain beginning to boom following Ferdinand VII's 1825 decree, effectively opening the country to Spanish and foreign adventurers, this had resulted in a depreciation in the value of British lead (Burt 1984, 226, 253). This in turn drove many domestic lead producers to petition parliament for relief, including the owners of mines in Durham, Northumberland, Cumberland (CG 1828) and Cardiganshire (MC 1828). The board of the Mining Company of Ireland did likewise in June 1828 and in the same month the RIMC petitioned the House of Commons on the importation of lead and lead ore (JHC 1828, 463). They remarked that:

... when their company was formed and until after they had expended much money in opening their works, the price of good lead ore was 20/ per ton; that the same quality now can be obtained for nine, and that this decline is attributable to the uncontrolled importation of Lead Ore into these Kingdoms, as well as to the supply of Foreign markets by Spanish lead smelted by British coal, the obvious effect of which is, to paralyze

26 This was probably sited underground at the top of Pump Shaft and would have required water to have been piped down from the surface. Smythe (1853, 361) notes the ill-chosen position of the adit and shaft in respect to each other and states that this resulted in the apparatus for raising water and minerals being very disadvantageously applied and therefore costly.

domestic industry, to deprive numbers of the labouring class from employment and to render unavailing the efforts of those patriotic individuals who have contributed their exertions and wealth to the welfare of a Country in which the enormous sum of 150,000l had been expended within the last four years on Mining operations, and in a great measure (owing to the causes here complained of), expended in vain. The Petitioners beg leave to state that they have been actually compelled to relinquish the working of seven Mines, on which much money had been expended by them, and to sacrifice the product obtained, on account of the impossibility of competing with a Foreign market; and that they continue their exertions as a Mining Company only in the hope that the House will in its wisdom adopt some measure calculated to serve the Mining interests of these Kingdoms; and they more anxiously await the decision of the House, as at the present instant the fate of one of the most valuable Lead Mines in the Kingdom depends thereon.

The valuable lead mine referred to was, undoubtedly, the Old Rock Mine, Glenmalure. The government eventually capitulated, introducing an additional duty of 15s per ton on foreign lead ores on 1 December 1828. Although the price of lead would certainly have had a bearing on the fate of many of the mines worked by the company, there is also reason to believe that with a limited working capital and some dubious acquisitions, the RIMC was the architect of its own misfortune.

In 1829 it was rocked by a scandal over shares. John McMahon, the Chairman of the Board of Directors, filed a lawsuit in the Court of Chancery alleging that the company had given George Upton, a shareholder and Dublin apothecary, certificates for 241 shares that remained on hand and undisposed of. Upton was directed by the Board of Directors to sell these shares on their behalf, and was to receive the customary rate of commission for his endeavours. He, however, sold and disposed of the shares at a considerable premium and then refused to account for the monies he had received. The RIMC brought the case to court in order to retrieve the money from Upton, less the commission. However, the judge found in favour of Upton, stating that the company was merely a partnership, not a corporation, and therefore to suit for an account in which the company was interested, all the partners would have to have been parties. The way in which the company's Act had been set up meant that it was only possible for the company to sue or be sued by third parties, there was no mechanism for the shareholders to sue each other. Hamstrung by the clauses adopted within its own Bill, the Board was thus powerless to prevent Upton making off with a tidy profit (LJ 1829).

The company's woes continued as the introduction of the additional duty on foreign imports of lead ore made little difference on the ground, the price remaining '... so low that few mines in the Kingdom can be worked profitably', causing rival company, the MCI, to reduce its labour force and cease any major development during 1830 (MCI Reports). The continuing depressed state of the lead market led to the RIMC petitioning the House of Commons again in 1830 (British

History Online). They claimed that since their incorporation in 1824, a sum of £30,000 had been expended on their mining works:

... employment has been given by the Company during the last six years to a great number of persons; that, owing to the current depreciation in the value of lead, it has been found necessary to dismiss a number of the miners; and that further reduction of the works, if not a total abandonment, must take place, if some remedy be not devised by the House, either by granting a bounty on the export of Lead, or by such other means as may seem fit.

The House ordered the Petition to 'lie upon the table' (be offered up for consideration) but nothing was done to protect the domestic market from foreign imports of lead as the forces of *laissez faire* won out. Indeed, in 1843 the import duty on lead was again lowered and was finally abolished in 1845 (Burt 1984, 235). Larger companies like the MCI, despite the loss of the Kildrum lead mine in County Donegal which was surrendered by the company in 1832, were able to ride out the financial storm until the price of lead began to show the first signs of recovery in 1834-5. The MCI had diverse interests in mining across Ireland, including copper mines in County Waterford and collieries in County Tipperary, the profits from which they could use to offset their loss making lead mines at Luganure in County Wicklow (MCI Reports).

But not so the RIMC, which was stated to have been in anything but a flourishing state in 1830 (DEPC 1830) and whose shares could not be sold for six pence each in 1834 (WM 1834). Despite improvements at their mines including the erection of stamping mills to facilitate the quicker and cheaper throughput of ore (DEPC 1832), the fate of their Glenmalure venture can be ascertained in a report by a man calling himself 'Adventurer', entitled 'County of Wicklow Mining Districts', dated September 1835: '... the mine produced a very large amount formerly; but latterly it has not been productive to any extent; the concern belongs to the Royal Irish Mine Company'. The RIMC were also working the Ballygahan Mine in Avoca (on lands belonging to Viscount Powerscourt) which Lewis (1837) states was re-commenced by the company in 1833 with the intention of working it on a larger scale. 'This is a small concern... in connection with the Royal Irish Mining Company', read 'Adventurer's' report, 'the only machinery, a waterwheel used for drawing up the ore, and a wheel on the river bank below the road, working a few stamp heads' (MJ 1835).

In fact, 'Adventurer's' published comments were slightly out of date, because in the spring of 1835, after working it for just seven years, the Royal Irish Mining Company had placed the Glenmalure Mine up for sale. At this time it was employing, on average, a mere 20-30 men and producing 180-200 tons of ore per annum at £15 per ton (MP 1852). In May of 1836, a special meeting of the shareholders was called to consider a proposal to sell the mines (LG 1836). By now the company's fate was obvious; the only published record of a dividend was in January 1837, when registered holders of shares were given a £1 3s per share, perhaps from the capital raised through the

sale of the Glenmalure and Ballygahan Mines (LG 1837).

In the spring of 1839 the company was making calls to the tune of 10 shillings per share (LG 1839) and had commenced upon a downward trajectory which would ultimately see it dissolved after around 16 years in operation, its management tainted with accusations of 'jobbing and deception' (MJ 1838). The RIMC was wound up prior to the autumn of 1840 and the Act 5th Geo 4 creating it was purchased by Mr Maguire of Nenagh who was successfully working lead mines in the vicinity of the Shannon between Tipperary and Limerick, and had formed the New Royal Irish Mining Company under the provisions of that enactment (NG 1840; WC 1840). The final dividend of the capital stock of the old RIMC, fourteen pence on each share presented, was paid out in February 1842 (LG 1842; FJ 1842).

Interestingly, the Glenmalure Mine had been advertised for sale along with a half-share in the Ballygahan Copper Mine in Avoca (LM 1835). The Glenmalure lease covered the same area set out in 1820 which included extensive turbary, an Agent's house, shop, miners' and smelting houses, forge, an abundant supply of water, with all the machinery, consisting of stamping mills, pumps, washing floors, waterwheels, and every requisite for extensive mine operations. The advertisement added that the mines were most extensively opened and now in full work. Upwards of £10,000 had been expended in opening the ground, the ore was of high assay and the character of the mine was well known from the reports of Messrs. Weaver and Griffith. Moreover, the purchaser also had the benefit of the Act 5 Geo. 4 establishing the Royal Irish Mining Company (eventually purchased by Maguire of Nenagh), which was, in the light of the Upton debacle, rather overstated to have been 'the most beneficial Act of Parliament ever obtained by any Mining Company'.

THE HODGSON YEARS

The Old Rock or Glenmalure Mine was purchased by Henry Hodgson (1796-1878) of *Wood Vale*, a wheeler dealer who had established himself in copper mining in Avoca.²⁷ He was an Englishman born in the Whitehaven area of Cumberland (now Cumbria) according to his descendants (pers. comm), but of his formative years and education, nothing can yet be verified with any certainty, although he must have come from a well connected family possessed of considerable means. We do know that as a young man he operated as a trader, dealer, chapman and mining engineer and soon made a name for

himself. In May 1822 the Hibernian Mining Company of Avoca leased the Ballymurtagh mines to Hodgson and Cheyne Brady, for 31 years at a rent of £40 per annum and a royalty share of 1/12 (NLI Hibernian Mining Papers, Lease Brady and Hodgson). Both men were described as being of Ballycorus and, we suspect, were possibly related through marriage.²⁸

At Ballycorus was a lead mine working two lodes of galena dubbed 'Mount Peru', presumably on account of its richness. A smelting works had been set up to process its ores and it was being run by a private company with which Brady and Hodgson could conceivably have been associated. The mine and smelting works was sold to the Mining Company of Ireland in 1824 (Griffith 1828, 11-12). Soon after he signed the Ballymurtagh lease, Hodgson appears to have moved to the Vale of Avoca to reside, for on 31 August 1822, he married, by license, Ann Theresa Elizabeth Bullock at the Church of St Luke, Chelsea, London and was described as of the Parish of Castlemacadam, County of Wickow (DWR 1822).

Ann was the daughter of William Bullock, a prominent Victorian explorer, naturalist, antiquarian and the proprietor of the *Egyptian Hall*, Piccadilly. Bullock had visited the newly independent Republic of Mexico in 1822 with his son, William junior, and had acquired the rights to mine for silver at the Del Bada or Milan Mine at Temascaltepec, about ninety miles south-west of Mexico City in 1823. He later formed the Mexican Mining Company with three other English gentlemen to work the concern. However, it appears that he knew very little about metalliferous mining and during a visit to his daughter Ann and son in law Henry Hodgson at their home, *Wood Vale*, in the townland of Ballanagh, Castlemacadam, in 1825, he probably turned to his young son in law for advice about the type of equipment required for his mining venture in Mexico (Costeloe 2006, 300-301). He might even have marshalled his help to select some suitable Wicklow mineworkers who migrated to work at Temascaltepec.²⁹

In October 1824, Hodgson had entered into partnership with Nicholas Kempston (of *The Meetings*, Woodenbridge) who paid £1,600 and a further £500 to improve the Ballymurtagh mines, and was granted a full fourth part share in the concern (NLI Hibernian Mining Papers, Hibernian Mine Company lease to Henry Hodgson). In November of 1826, another partner was admitted: Joseph William Wright of Granby Row, Dublin. The three partners soon realised that Ballymurtagh needed to be worked with an increased capital and in January

27 In 1856 (Anonymous 1856, 54), it was noted that at the time Hodgson secured Ballymurtagh (which we can definitively state was in the year 1822) Ballygahan Mine belonged to other parties who, 'together from the absence of all energy and mining knowledge' had caused it to fail. It is further alleged that Hodgson then acquired Ballygahan before he disposed of the Ballymurtagh Mine to the Wicklow Copper Mining Company (ie., in 1827). However, it appears that this was not the case, as the mine was reportedly idle (Lewis 1837) until the RIMC attempted to resurrect it in 1833. As they held just a one half share in the mine, it is reasonable to assume that Hodgson was the lessee of the other half, and it would make good business sense to therefore purchase the half share advertised by the RIMC in 1835. What is absolutely certain is that the assertion made by Cowman (2011, 27), that Henry Hodgson and Cheyne Brady had started mining Ballygahan in c1791 is incorrect. Hodgson was not born until 1796.

28 It is likely that Cheyne Brady who leased the Ballymurtagh Mine with Hodgson was the son of Nicholas William Brady (born in 1734 to Thomas Brady and Eleanor Cheyne). If so, his brother would have been Francis Tempest Brady who married Charlotte Hodgson of Castle Dawson, Co. Antrim, and who had three sons and eight daughters, including Maziere Brady (born 1796), who was conveyed and assigned the Ballymurtagh Copper Mines when the Wicklow Copper Mining Company was set up by Hodgson in 1827.

29 Bullock's party consisting of ten miners, some of them with their wives, and a single woman named Mary O'Brien, arrived at Veracruz, Mexico, on 13 December 1825. A Mexican newspaper (AG 1825) gives the names of the men as: John Millon, Richard Wright, Matthew Ykilliam, Thomas Brown, Valentin Brennan, W. Bryan, H. Oberto, G. Sanders, David Brown and Annan William. The spelling of some of the names is obviously incorrect. Bullock's silver mine was a total failure and the fates of these Irish migrants remains unknown.

1827 they dissolved their partnership. In February of that year, Hodgson travelled to London for the purpose of extending the capital embarked in Ballymurtagh by means of increasing the number of shares. George Lackington, William Bullock's nephew who owned a successful publishing and bookselling business who had bought the *Egyptian Hall* from his uncle, met Hodgson while he was in London, writing to Bullock that he had dined with him and found his son in law to be '... a very well behaved and well informed young man' (Costeloe 2006).

In March of 1827, Hodgson, Kempston and Wright entered into an indenture with the Hibernian Mining Company setting up the Wicklow Copper Mining Company (NLI Hibernian Mining Papers, Deed of Association between Hodgson, Kempston *et al.*). It was agreed that 6,000 debentures to the value of £5 each would be issued, 3,600 of which would be retained by them, the mines and premises to be conveyed to, and become vested in, Hodgson, Kempston and Wright as well as David Charles Roose and Richard Wright who were trustees. The mines and premises were then conveyed and assigned to Maziere Brady and William Armstrong. Hodgson acquired 2,700 debentures, while Kempston and Wright received 450 each.

But it seems Hodgson overstretched himself financially, being made bankrupt in 1831 (DMA 1831) which appears to have forced him out of the Wicklow Copper Mining Company; in 1835, about 600 of his shares in Ballymurtagh had to be sold by auction (DMA 1835). His bankruptcy however, seems to have galvanised his determination to acquire the old Ballygahan Mine, the U-shaped sett of which surrounded that of Ballymurtagh, and in 1833 he formed a partnership with the RIMC in order to work it. This enterprise was short lived and the partnership was dissolved on 21 December 1836 due to the RIMC's slow downward spiral into dissolution, necessitating the sale of their interests in both Ballygahan and Glenmalure.

The loss of his interests in the rich Ballymurtagh Mine had doubtless been a body blow to Hodgson, and the purchase of the remaining half share in Ballygahan from the RIMC was probably his primary objective, rather than the Glenmalure Mine (PBG 1837). However, the price of lead was beginning to show the first signs of recovery in the mineral market and the monopolisation of the Sicilian sulphur trade by the King of Naples in 1838 stimulated the mining of low grade pyritic ore deposits across Europe, so that the Avoca mines rapidly become Britain's largest supplier of 'sulphur'. The canny Hodgson had bought both mines at a most auspicious time.

Hodgson's bankruptcy proceedings probably slowed the sale and conveyance of the mines, resulting in the fact that a new Indenture of Lease for the Glenmalure Mine was not drawn up until 1 July 1837 (HRO, Muniments of the Earls of Essex, *et seq.*). This was made between William Lunell Guinness, John Lentaigne, Joseph Lentaigne, Patrick Fottrell³⁰ and George

Studdert, Esquires, Directors and representatives of the Royal Irish Mining Company on the one part; Henry Hodgson of *Woodvale* (sic), gentleman, of the second part and the Earl of Essex, Lord Henry FitzGerald and the Baroness de Ros on the third part. Hodgson agreed to pay £3,500 in total: £2,500 of this sum for the purchase of the residue of the 31 year lease of 1820 in which Essex and de Ros permitted Critchley *et al.*, to sublease the mine to the RIMC.

This included all the lands and premises, mining machinery, implements and utensils at Glenmalure. Hodgson had paid £1,750 up front to secure the RIMC's agreement to release and forever discharge their interest in the residue of the 1820 Ballinafunshoge lease and for the sale of all the machinery, implements, houses, buildings and stores on the mine sett. He also paid £1,000 for the mining machinery, implements and utensils in, and upon, the Ballygahan and Wood Mines in the Parish of Castlemacadam and also for the purchase of the RIMC's interest in any renewal of the lease of Ballygahan, the other half of which he already held. Hodgson thus became the sole lessee of the mines of Ballygahan and Glenmalure, both of which he operated as private companies.

In Glenmalure, Hodgson had acquired an antiquated mine so ransacked by its former proprietors (Smythe 1853, 361) it would have cost a small fortune to rehabilitate. Judging by the comments made by the anonymous author of *The Mines of Wicklow*, published in 1856, the mine saw little improvement during his ownership of it. It appears that Hodgson closed the smelting works, as Lewis states that the ore was by then 'merely washed and exported' to the Deeside smelting works in Flintshire. The average annual produce of the mine during the seven years it was worked by the RIMC was noted to have been about 300 tons of galena with a metallic content of 75 per cent (Lewis 1837, 495), although as we have seen above, production had tailed off towards the end of their ownership due to the depressed state of the lead market.

Glenmalure was then the only mine at work in the valley, and a hint at the environmental impact the mine had made was provided by a group of students from Dublin who were staying at *Wiseman's Inn* (now the *Glenmalure Lodge*). They noted that while their breakfast was being prepared '...we bathed in a pretty pool in the stream behind the house, for the waters of the Avonbeg which flow before it are somewhat tainted with the drainings of the lead mines; these have given a melancholy appearance to the river, for all its golden sands look quite blue in consequence' (Anonymous 1836, 326).

Inglis notes in his *Journey Throughout Ireland* in 1834 that the Wicklow mines directly employed over 2,000 people, observing how task work and consequent high wages had attracted many from a distance. He concluded that the active

³⁰ William Lunell Guinness (1779-1842), was the fifth son of Arthur Guinness, founder of the Guinness brewery in Dublin in 1759, and was a partner in the company. John (1803-1886) and Joseph Lentaigne (born 1805) were the sons of French immigrant physician, Benjamin Lentaigne. John, who trained as a

Barrister-at-Law served as Privy Counsellor for Ireland from 1803 to 1886, Justice of the Peace and Deputy Lieutenant for County Monaghan, and High Sheriff of Monaghan for 1844-45. He was Inspector-General of Prisons in Ireland from 1854 to 1877 and Commissioner of National Education. He was invested a C.B. and made a Knight of the Order of Pius IX. Joseph became a Jesuit priest and migrated to Melbourne, Australia, in 1865. He was one of the first Irish Jesuits in Australia. Patrick Fottrell appears to have been a solicitor.



Fig. 13: Sited almost opposite the public house in Glenmalure, is the former Military Barracks at Drumgoff (centre right) which was converted into a 'Miners' Shop', a boarding house for the workforce of the Glenmalure Mine in the 1830s

working of the mines had materially improved the condition of the peasantry, as the number of absolutely unemployed poor had fallen. But he also remarked '... the miners are a drunken and improvident race. One who had earned thirty shillings the past week, came into the inn while I was there; and I heard him regretting that it was impossible for him to drink the whole of this sum' (Inglis 1835, 34). Miners arrested for being drunk and disorderly were not uncommon events, especially when it was customary to split their monthly tribute earnings in public houses and shebeens. John Yorke of Glenmalure was arrested by Constable Benjamin Henderson on the public road at Ballinacoola near Glenealy on 15 November 1853. Hauled before the Petty Sessions Court, he was fined 4s 6d with 6d costs (Find My Past, Petty Sessions).

Despite their better wages, some mineworkers were living in shockingly primitive cabins, little better than those of agricultural labourers. Hodgson took over the semi-derelict former Military Barracks at Drumgoff (Fig. 13) which Lewis claims had been turned into a residence for the workforce by the RIMC (Lewis 1837, 495) and to further address the lack of suitable living quarters for his mineworkers, the 'extensive remains' of the old smelting works (Fig. 19) had also been altered into workmen's residences (Anonymous 1856, 19).

Hodgson also waived the rent payable on the small parcel of land where a school house had been built with contributions from the mineworkers in 1836 for the benefit of their children

who had no access to education. Constructed of cob and thatch with quarters for a teacher, it was sited just a stone's throw from the mine's Deep Adit. By 1839, when the school applied to be included in the National School System, there were 50 boys and 20 girls, all Catholics, enrolled on the register. Described as being in 'a very wild situation, in the heart of the mountains' and 'nothing more than four walls and a roof [with] neither floor or ceiling' (HMSO 1870, 37) the school was open six days each week. A point of interest was that the normal school day which ran from 9 am to 4 pm with a one hour dinner break, continued from 6-9 pm to accommodate those of school age who worked in the mines during the day. Hodgson was clearly driven by a strong sense of philanthropy, and he and his wife, Ann, were noted for their benevolence to the mineworkers and the wider community in Avoca during the Great Famine.

In 1837, Binns provides the first report of the mine under its new ownership, stating that 'an English gentleman of the name of Hodgson was the proprietor of the extensive lead mines in Glenmalure, where upwards of 140 hands were frequently employed'. The level then extended 250 fathoms and the shaft was 90 feet [just over 27 metres] below the adit level (Binns 1837, 202), which demonstrates the limited amount of work undertaken by the RIMC in the seven years that they held the lease. However, employment seems to have fallen off drastically during the four years after Binns's report, a parliamentary commission of 1838 stating that the mine was

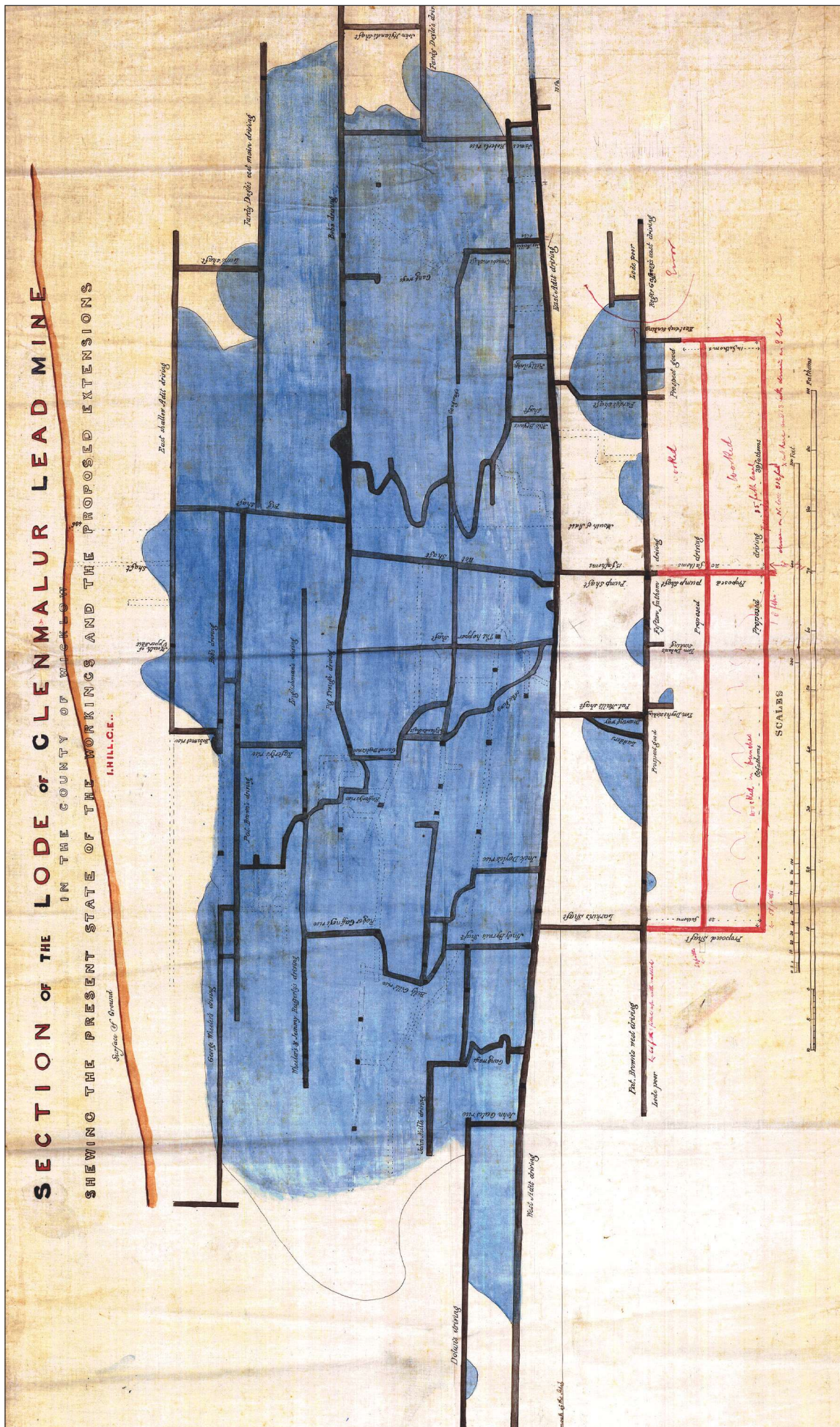


Fig. 14: Section of the lode of the Glenmalure Lead Mine by John Hill of Dundalk, drawn on 14th July 1841. Again, the ad hoc manner in which the mine had been developed is clearly illustrated by the maze of winzes and irregularly spaced levels. The section depicts the workings just four years after Hodgson took on the mine and shows the extensions proposed by him under the fifteen fathom driving which had been executed by the Royal Irish Mining Company. The annotations in red ink appear to have been added at a later date and show the extent of the work carried on by Hodgson after he took out the 1843 lease. The nomenclature on the section is invaluable from a social history point of view, as it names some of the men who worked in the mine and hints at the movement of mineworkers within the Wicklow mining districts. By kind permission of the Geological Survey of Ireland

then employing 20-30 men (Sessional Papers 1838, 68). In April of 1841 Frederick Roper, collecting evidence for the *Childrens' Employment Commission*, interviewed Hodgson at Ballygahan (BPP 1842, 856-858). He informed him that he was also the lessee of Glenmalure Lead Mine but there was 'very little doing there now', which Roper confirmed during a visit to the mine:

I have visited the lead-mines at Glenmalur, belonging to Mr. Henry Hodgson of Avoca, and found there were only 30 people employed there, and no children whatever. Indeed, this mine I am informed is now in a bad state, has been many years worked, and requires a large outlay of capital to make it productive and profitable. The agent told me the men were not earning much more than their subsistence and stores. Their subsistence, as it is termed, is the sum allowed them by the proprietor for their living, until their next contract is finished, when the balance is paid to them. Here the subsistence is 10d a-day; and the agent said the men were not earning on an average more than 6s or 7s a-week; he also told me that they had upwards of 300 fathoms of wagon-way, to bring the ore to the surface, along the levels. There is a national school close by, the school-house for which was built by the miners.

On a section drawn by John Hill of Dundalk in July 1841 (Fig. 14) which details the below adit workings Hodgson intended to develop, the shambolic nature of the maze of mine workings interconnected by crooked winzes are clearly depicted. This section amply demonstrates the problems faced by Hodgson who had taken on a mine that had been plundered by its former proprietors. However, this section is invaluable from a human perspective as many of the drives, shafts and winzes are named. Thus we have evocative nomenclature such as 'Pig Trough Driving', and another that throws light on the fact that immigrant miners from Britain, possibly Derbyshire, had at some point been employed at Glenmalure: 'Englishman's Driving'.

But named too are some of the hundreds of men, many from Wicklow, who toiled in this mine over the century it had been at work: Garret Doyle's Rise; Bob's West Rise; Lewis's Shaft; Fardy Doyle's East End Main Driving; Larkin's Shaft; John Gates's Rise; John Hyland's Shaft; James Roberts's Rise; Jas (James) Neill's Shaft; Tom Doyle's Sinking; Tom Delan's Sinking; Wheeler and Jemmy [James] Rafferty's Driving; Pat Brown's Driving; George Wheeler's Driving; John Mills's Driving; Andy Byrne's Shaft, Billy Gill's Rise, Dolan's Driving and Mic [Michael] Byrne's Rise. A number of these surnames (Hyland, 'Neal', Roberts, Byrne and Larkin), appear on Griffith's Valuation for Ballinafunshoge in 1854. However, some of the men are likely to have formerly worked at the copper mines in Avoca, betrayed by the naming of a 'Cronebawn Shaft' on the plan. Undoubtedly, there was a constant churning of skilled mineworkers between the mines in the Vale of Avoca and those in the Wicklow Uplands, as several of the gentlemen adventurers of Glenmalure had strong connections with mining in Avoca.

Moreover, mineworkers were accustomed to move around as

they sought the best wages and conditions as the relative fortunes of the different mining enterprises throughout the county waxed and waned over the years. Certainly the name of Fardy Doyle stands out. He was a highly skilled miner, the head of a tribute pare and employed by the Associated Irish Mining Company at Cronebane from 1795 until at least 1800 (NLI MSS). Also noted as working at Cronebane in 1800 was the head of another pare, Garret Doyle, who might well be the same man who lent his name to a rise in the Glenmalure Mine. The later Hodgson connection with Avoca almost certainly continued this early pattern, as he would undoubtedly have switched his workforce between Glenmalure and Ballygahan when necessary.

On 1 May 1843, Hodgson surrendered the remainder of the 1837 lease acquired from the RIMC and took out a new lease for 21 years from Arthur Algernon, Earl of Essex, and William Lennox Lacelles, Baron de Ros (HRO, Muniments of the Earls of Essex, *et seq.*). However, by the mid-1850s the focus of Hodgson's attention was increasingly westwards. He had bought the Merlin Park Estate in County Galway in the Irish Encumbered Estates Court in 1853 and had begun working lead mines near Oughterard and was planning to work the Merlin Park marble quarries (MJ 1853). He did retain an interest in Ballygahan, Avoca, a source of great wealth, James Redmond, the Parish Priest of Arklow noting in 1859 that, 'Mr. Henry Hodgson, an English gentleman, is conferring a great blessing on this town and neighbourhood, by employing hundreds in raising, drawing and shipping ore' (WNL 1859).

Although Hodgson appeared to have had numerous privately operated mining companies across Ireland, these were small to medium scale concerns which he could work cheaply utilising water or horse power, or via adits. He avoided, where possible, costly stationary steam engines and investment in state of the art dressing floors and his biggest project was probably the construction of the eight mile long mineral tramway connecting his Ballygahan Mine to the Port of Arklow in the aftermath of the famine, which he sold in 1859 (Duffy 2003; Waldron *et al.* 2004). Indeed, Smythe writes scathingly of the Glenmalure Mine in 1853, stating that it was in such a ruinous condition that it was impossible to approach either of the 'ends' or the extremities of the workings (Smythe 1853, 361), and for this state of affairs, Hodgson must bear some blame.

The Glenmalure lease that Hodgson had taken out in 1843 expired in 1864. It appears that he then remained in possession of the mine as a tenant from year to year at the same money, royalties and rent (DEM 1867). His mine manager at that time was H. Robinson. However, in 1866 Hodgson faced an ejectment order from the landowners, the Earl of Essex and Lord de Ros, at the Wicklow Spring Assizes. He defended his case in the Court of Common Pleas with a couple named Bridget and Patrick Rafferty who lived on four acres of land near the smelting house that included a house and wheel sited between the road and the Avonbeg River. They were labourers who had been resident there since the days of James Critchley and claimed to have taken out a title of adverse possession prior to 1820 and also again in 1843. They averred that they had never acknowledged the title of Essex or de Ros and had never paid any rent. The judge found in favour of Hodgson

and the Raffertys, which prompted a demand for a retrial by the Mineral Lords who claimed that false evidence had been presented to the court (DEM 1867). This court case obviously had a bearing on activity at Glenmalure, for the *Mineral Statistics* note no production from the mine after 1864 when 100 tons were raised and it is listed as having ceased production in 1869-73.

Additional light is thrown on this period of the mine's history by William George Strype, C.E. (1847-1898), an engineer born in Liverpool, who served his apprenticeship in Drogheda where his father was working at an engineering company. Upon qualification, Strype was posted to Bombay to assist in the harbour works, and upon returning to Ireland, set up his own engineering practice in Dublin, acting as engineer to the Wicklow Harbour Commissioners and the Arklow Harbour Commissioners. By 1883, he was Managing Director of the Dublin and Wicklow Manure Company which had its works on the Murrough in Wicklow Town. He frequently gave evidence before parliamentary commissions and in July 1885 was called before the Select Committee on Industries in Ireland (House of Commons Papers 1885, 700-701).

Questioned about the past and present situation of Wicklow's lead mining industry, he stated that he had been anxious to open up 'a mine that had a great reputation' in the adjoining valley to the Churches Valley (Glendalough). He related how this valley (Glenmalure) had 'a large lead-mining works carried on there about twenty-five years ago ... worked by a gentleman [Hodgson] who was also conducting operations on the sulphur mines near the town of Avoca'. According to Strype, when the lease was about to expire (in 1864), he 'allowed the property to get into a dilapidated state ... for the purposes of getting a renewal of his lease upon more moderate rent. The Lords became acquainted with this and they refused to give him a lease'. Strype claims that as a consequence, the mining operations eventually ground to a halt:

The Lords continued to work the wheels and appliances, but by degrees these became dilapidated; and after some four or five years from the time he ceased operation, the whole thing collapsed, and it is now one great ruin. I endeavoured to open that mine again, and to get concessions from the Lords, getting some assistance from them in the way of abatement of royalty and free rent for a short time. After carrying on negotiations for some two years I failed altogether to get them to give any terms that could be satisfactory.

Strype claims that from that time, which the Cancelled Land Books (VO, Dublin) inform us was 1866, the Glenmalure Mine remained unwrought.

CLONKEEN, 'CANABALOGUE' CORRASILLAGH AND CULLENTRAGH PARK

Mining activity on a lode that runs through the townlands of Clonkeen and Ballinaskea was noted as early as the 1720s, when a lead mine was being worked by John Hayes of

Ballinaclash (Wilson 1786, 280). Unsuccessful trials had also been carried out in the late eighteenth century on a quartz vein on the southern side of the Avonbeg 'from one and a half to two feet wide... ranging nearly parallel to the valley' (Weaver 1819, 206-7; Stewart 1800, 122). It seems that around the mid-1830s, arrangements were in progress to open another mine on the south side of the glen (Lewis, 1837). This might refer to the activities of the Mining Company of Ireland (MCI) which held an agreement for working 'Clonekeen' and had expended the sum of £5 in 1835 on what must have amounted to a trial.

The MCI also held 'Cannamalogue Mountain' (sited on the high ground at the very far reaches of Glenmalure) where, over the course of two years (1832-34), they conducted what must surely have been mere surface trenching in a search for lode outcrops, possibly following quartz veins exposed in stream beds that can be seen close to the Stony Road over the mountains to the Glen of Imaal. During the second half of 1832 they spent 8s 1d; further exploration in the spring and summer of 1833 was made at a total cost of £1 4s 1d with 8s and 1d expended in 1834. However, 'Clonekeen lead mine' and 'Canabalogue', were both surrendered by the company in 1838 as a cost saving measure (MCI Reports, 1855). Henry Hodgson later brought 1043 acres of land on Camenabologue, no doubt in the hope of conducting successful trials for lead ore, but he seems to have failed to open any mines.

According to the anonymous author of *The Mines of Wicklow*, three veins, all of which contained considerable barite of good quality, were opened on the opposite side of the valley to Cullentrath Park sometime before 1856 and a considerable quantity of this mineral raised and shipped, but probably not in sufficient quantity to repay the cost of working, as the mines were then suspended. These lodes were situated in the townlands of Clonkeen and Ballinaskea, in the latter of which Griffith notes a lead and zinc mine by the name of Corrasillagh had been opened before 1854 (Morris 2001, 37). One of the lodes in Clonkeen contained 'sparry iron and micaceous iron in connection with galena and blende [zinc], which was noted to be a very unusual assemblage of minerals (Anonymous 1856, 20). The veins presented very promising indications of lead and this attracted the attention of a 'Wicklow mining engineer' named Bonnby (FJ 1861 *et seq.*).

This is a clearly a misspelling of the surname Boundy, for one Martin Boundy, an independent and fiery tempered mining engineer born to Cornish parents in Tavistock, Devon, in about 1824, was known to have been active in County Wicklow at this time, having discovered copper on the estate of the Parnell Family at Avondale (MacBride 1992, 214-5; Lings 2011, 22). Boundy claimed to have entered into an agreement with John Henry Parnell of *Avondale House* for two leases, dated 1 July 1858, of lands in Glenmalure (in the townlands of Ballinaskea and Clonkeen). These leases stipulated that he and his workmen should be free to enter the land in order to make excavations to search for minerals. Boundy was to have possession of the lands for two years, undertaking to pay a royalty to Parnell of 1/10th of the value of the produce of minerals brought to the surface and that if the searches should prove abortive in nature, all works and



Fig. 15: Charles Stewart Parnell who spent many fruitless hours searching for lead on his estate in Glenmalure

excavations would be made good. It was also agreed that Boundy would have a lease for 31 years from the 1 July 1858, provided he applied for it within two years of the date of the agreement, at a rent of £20 per year, which rent was to merge into the royalty rent if the amount of the produce of the mines should exceed £20 per annum.

Boundy, noted as resident in Baravore, was summoned to the Petty Sessions Court in mid-March 1858 for the non-payment of the wages of labourer, Thomas Crofton, one of the men who was undoubtedly aiding him in his search for minerals in Glenmalure and who claimed he was owed £1 18s for his work. Despite Captain Peter Hooper, a fellow Cornishman and the Agent of a nearby mine (see below), standing as a witness for Boundy, the court found in favour of Crofton, and ordered the Cornishman to pay his wages, plus one shilling and sixpence costs (Find My Past, Petty Sessions).

John Henry Parnell, however, died suddenly in 1859 aged just 48 at the Gresham Hotel in Dublin (Power 2003, 57) and the Avondale Estate passed to his second son, Charles Stewart Parnell (1846-1891), who, at 13 years old, was still a minor. Sir Ralph Howard, John Parnell's uncle in law, and Robert Johnson, were appointed trustees and guardians of his children. Boundy had indeed made searches in both townlands and, 'from the opinion of skilled persons he had no doubt that the mining operations would prove remunerative'. Moreover, he had gone so far as to form an association with persons of capital to assist him in working the mines.

However, to his surprise he found that when he attempted to

enter into the 31 year lease as promised by John Parnell, the trustees claimed to know nothing of any such arrangements, nor were they parties to them. They alleged that Boundy had in fact assigned his interest in the matter to the Mining Company of Ireland (MCI) and that John Henry Parnell, during his lifetime, was not desirous of having the mines worked. The case went to the Rolls Court in the autumn of 1861 where the judge directed the case to stand for legal evidence of the alleged assignment of Boundy's interest to the MCI. Although he could not be classed as a mining entrepreneur *per se*, it seems strange that Howard and Johnson should allege John Parnell's disinterest in having mines on his lands worked, for he had gone out of his way to visit a silver mine being operated by an English mining company while in Mexico in the mid-1830s and had permitted mining on his lands in Glenmalure sometime during the 1840s. Moreover, it was well known that he was encumbered financially with the Avondale Estate and in financial straits due to his purchase of an estate in County Cavan.

Clonkeen is noted as suspended in the *Mineral Statistics* from 1862-4, confirming that Boundy was unsuccessful in his court battle with the Parnell Estate. Indeed, he had returned to Britain and in 1861 was engaged in iron mining in the northwest corner of the Lake District, Cumberland (Hewer 1998, 21). Clonkeen is listed in the *Mineral Statistics* as a subdivision of Glenmalure from 1865-1873 which seems to suggest that Hodgson managed to get his hands on the mineral lease, but it is not known whether any work was done there during this time. After Hodgson's death, Charles Stewart Parnell seems to have taken an interest in 'the old mines that were worked a generation ago', and was particularly keen to discover whether any of the mineral veins in the disused mines ran across the mountains on his estate (these trial mines are detailed in Power 2003, 58-59).

The *Mineral Statistics* list a lead mine managed by Charles Stewart Parnell named Avondale from 1874 until 1887, employing anywhere from six to a dozen men. But no mineral returns are recorded and this mine near The Meetings, in the Vale of Avoca, amounted to a failure. In 1881 Parnell wrote of two separate tests he had conducted on a dark stone which had been taken from an old mine which he believed contained a good deal of silver: 'In fact the whole lode consists of this (the miners are working it in the North Level). I cannot say how many ounces there will be to the ton until I get it assayed, but if there should be six or eight ounces to the ton it ought to pay to work' (O'Shea, 1914, Vol. 1, 187).

Although this mine probably refers to one in the Avoca Valley, Charles Stewart, in the company of his brother, John Howard, spent many fruitless hours in 1887 searching for a lode of lead in Glenmalure that one of his tenants claims his father had discovered whilst driving cattle across the mountain some years before. Parnell had grand plans to develop the mineral resources of the Avoca Valley and the Wicklow Uplands, which, echoing the ambitious canal plan of 1792, included a scheme to get the Dublin, Wicklow and Wexford Railway, in conjunction with the Great Southern Railway, to build a line from the Meeting of the Waters right through Glenmalure to the Kilkenny coalfields 'tapping the lead and iron mines on

their way' (Parnell 1916, 284-5). However, apart from his brief reference to the discovery of silver bearing ore in an old mine being worked in 1881, it is unclear whether any new discoveries were made, or mines opened, on the lodes known to have passed through the townlands of Clonkeen or Ballinaskea on his Avondale estate. Upon Parnell's death in 1891, his brother, John Howard, inherited the heavily mortgaged Avondale Estate, which he sold in 1899.

Cullentragh Park, the neighbouring townland to Ballinafunshoge, is similarly listed in the *Mineral Statistics* as a subdivision of Glenmalure from 1865-1873, indicating that Hodgson might have obtained a lease from the Earl of Meath to work the lode which outcropped high on the mountainside. Sometime before 1853, a shaft had been sunk and a level driven in to intersect a lode running N 23° W that was from one to two feet wide, bearing crystals of galena in a quartz matrix and a coarse grained granite from an inch to a foot wide on its north wall. In one or two places, small pockets of ore had been discovered and some lead ore raised, but the mine was abandoned when the lode was cut off by a cross fault and lost to view (Smyth 1853, 362). The anonymous author of *The Mines of Wicklow* stated that up to the point already explored, 'it can scarcely be considered as favourable for lead', but, because the lode was regular in size and direction, he thought that there was 'every probability of its becoming productive in a more congenial stratum' (Anonymous 1856, 20).

In 1871, however, the *Mineral Statistics* note that the mine was in the ownership of the Mining Company of Ireland (MCI), yet curiously still listed as a subdivision of the by now defunct Glenmalure. The MCI might have acquired the lease of Cullentragh Park from Lord Meath at the same time as it secured the lease to mine in the neighbouring townland of Ballynagoneen. This came about as the result of a rumour that reached the board that the old Ballynagoneen Mine was to be resumed by an English consortium who were trying to poach tributers from their Luganure Mines, about which more below (FJ 1871).

'MINERS' WIVES WILL LEAD LADIES' LIVES': THE BARAVORE MINING COMPANY

The fame of Ballinafunshogue in the late eighteenth and early nineteenth century undoubtedly helped to create the impression that Glenmalure was richly stored with lead ore. Indeed, the name of the valley was mistakenly translated from the Irish as 'the glen of much ore' in numerous nineteenth century books (for example, see Anonymous, *The Mines of Wicklow*, 1856).³¹ By the 1840s it was attracting the interest of prospectors and Smyth (1853, 362) mentions that a significant trial had been carried on since 1846 on a lode in the townland of Baravore [also spelt Barravore] coursing E.S.E. and bearing galena with zinc blende, copper pyrites, black oxide and carbonate of copper.

An indenture of lease dated 27 July 1849 throws more light on the early history of this mining operation. This was made between Rachel Harrison, widow, and Alicia R. Harrison, spinster, of the one part, and Thomas Sandes, Charles Oddie and William Griffith of the other part, for a term of 62 years, at a Royalty Rent of 1/16th or £20 per annum in lieu thereof. The Harrisons were of Irish extraction, Rachel A. Harrison, a widow and native of Cork (c1776-1864), and her spinster daughter, Dublin-born Alicia Rachel (1797-1890).³² By 1851, the Harrisons and their servants were resident at 9 Marlborough Street, Bath, Somerset, and noted as having income from lands in Ireland. As Peter Byrne was noted as the landowner at Baravore in Griffith's Valuation, it seems that the Harrisons probably owned the mineral rights.

Charles Oddie, a Liverpoolian (born c1807), was an accountant and merchant who married London born Emilia Lacy at St John's Anglican Church, Buenos Aires, Argentina, in 1829. He was involved in shipping and was resident at Everton in 1851 before moving to Cambridge Terrace, Hyde Park, London.³³ Thomas Sandes we believe to have been a prominent solicitor from Sallowglen, near Tarbert, County Kerry,³⁴ but of the background of William Griffith, who appears to have attracted a great deal of controversy during his time in the glen and who became the Mine Captain at the Baravore Mine, little can be stated with any certainty.

Prior to his arrival in Glenmalure, he had inspected the estate of Thomas Phillips, Esq., at Clanmore, County Mayo. Described as '... a mining engineer of considerable experience in South Wales and Ireland', he reportedly discovered coal seams estimated at £100,000 on this estate (N 1851). In 1851, he claimed that he had been engaged in practical mining since approximately 1816 and had worked in England, Wales and Ireland (DEM 1851). He would therefore have been middle aged when he took up his Captaincy at Baravore. His extensive use of Cornish mining terminology hints at him being a possible native of Cornwall. But if he was Welsh, he had certainly enjoyed a considerable degree of contact with men from this region of Britain, most likely in Wales.³⁵

On 17 October 1849, a deed of partnership was entered into between Charles Oddie, William Griffith and William Leach, a merchant from Aigburth, a suburb of Liverpool, to work the

32 She died on 27 January 1890 at the Cotleigh Rectory, Honiton, Devon, the residence of her nephew and the sole executor to her estate, the Reverend John Hawker. She could hardly be described as wealthy at her death: her estate was valued at £54 0s 7d. Principal Probate Registry. Calendar of the Grants of Probate and Letters of Administration made in the Probate Registries of the High Court of Justice in England. London, England.

33 Their only child, Emelia Mary, was born in Argentina in about 1830.

34 Born in 1802, son of Thomas William Sandes and Margaret Chute. In 1839 he married Elizabeth, daughter of Francis Bernard Chute of Rathanny, and died without issue in 1874.

35 Griffith is a surname found in both Cornwall and Wales. His mine reports include terms widely used in Cornish mining districts, including 'lode' (as opposed to vein); 'caunter' (a lode that diverges at a considerable angle from the direction of other lodes in its vicinity); 'kind' (as of the nature of the ground); 'killas' (clay slate); 'stent' (extent or limits of a pitch or bargain) and 'spar' (quartz) as well as describing himself as a 'Captain' rather than as a manager.

31 The Irish is *Gleann Molúra*, which translates to Malowra's Glen.

Baravore lead mine (FJ 1854). Leach and Oddie advanced a sum of £2,000 for the purpose of carrying on the works and Griffith was to act as the superintendent, for which he was to receive £200 per annum in wages. Subject to the £2,000 advanced by Oddie and Leach, and the £200 salary received by Griffith, the three parties were to be joint partners, each holding one third of the shares.

A further indenture signed on 14 October 1851 by the three confirmed their joint proprietorship of the Baravore Mining Company. However, the initial capital advanced by Oddie and Leach in 1849 had been found insufficient and Griffith had repeatedly petitioned them for additional sums of money. During this time, a forge, office, stores and a Mine Captain's house were constructed, plus eighteen new cottages to accommodate the mineworkers, as it was difficult to attract labour into such a remote part of the Wicklow Uplands without providing adequate housing. Inevitably, the cost quickly escalated until the sums advanced amounted to no less than £10,600.

However, just weeks after signing the indenture reconfirming their joint proprietorship of the company, Oddie and Leach were refusing to advance any more capital and calling by notice on Griffith to dissolve the partnership and sell the mines. For such a *volte-face* to occur, they had obviously received some sudden and unexpected news of significant wrongdoing by Griffith in order for them to suspect him of making false representations to them about how the monies they advanced had been spent and even began to believe the mines might be valueless. Remarkably, over 160 years later the oral history of the glen points to his probable profligacy: 'Miners' wives will lead ladies' lives when Captain Griffith is in Baravore!' (pers. com, O'Toole, 2014). Griffith, however, refused to surrender the partnership and the relationship between the three rapidly soured.

An agreement was reached on 28 October 1851 whereby the trio resolved that, as from the 1st day of October instant, William Griffith should cease to manage the concern and that 'no bills of exchange whatsoever should be drawn, accepted or endorsed by the said William Griffith, in the name, or on behalf of the said concern'. All bills of exchange related to debts owed by the company were only to be drawn, accepted or endorsed by Oddie and Leach (DG 1851). London newspaper, the *Daily News*, also reported that the partnership of W. Leach, C. Oddie and W. Griffith, Baravore Mining Company, Wicklow, was dissolved so far as regards W. Griffith (DN 1851).

Intriguingly, only a few weeks later, an advertisement appeared in the *Freeman's Journal* advising of the sale of 32-64ths of the interest of a Partner in a lead mine in County Wicklow. This notice claimed that all the mine required to make it profitable and valuable was capital, as it was proven that a lode which ran through it had been worked by a nearby mine [Glenmalure] that had paid large and profitable returns for many years. Prospective capitalists were advised that terms and particulars could be obtained from Captain William Griffith, Baravore Mine, Rathdrum, Co. Wicklow, 'who is authorised and empowered to treat and dispose of same' (FJ

1851). It seems that Griffith was trying to sell half of his interest as a partner in the Baravore Mining Company. Whether he was legally entitled to do so is open to question, and, by stating himself to have been the Captain of the Baravore Mine, he certainly seems to be flouting the resolution arrived at with Oddie and Leach just weeks earlier.

The following month another advertisement appeared, this time in the *Dublin Evening Mail*, in which Griffith appealed to 'the nobility and gentry of Ireland desirous to ascertain what mineral production are in their estates', as he had '... some spare time and would be glad to be employed in examining and reporting their probable productions and prospects'. He noted that he was experienced in practical mining for 35 years, his charges were moderate in order to encourage industry and extend employment and that references would be readily given if required. Tellingly, he signed himself as the Mining Captain of the Baravore Mine (DEM 1851).

Time on his hands indeed, as he had just been relieved of his position as the Baravore Mine Captain! But he stubbornly refused to relinquish the partnership and, starved of capital, the mine was suspended after producing only 40 tons of ore (MJ 1853). Things turned increasingly acrimonious between the three men, forcing Leach and Oddie to bring the case to court to get the partnership legally dissolved in April of 1854. During the court proceedings, Griffith argued that he was not legally required to find any part of the working capital of the mine and that he had committed no act by which the partnership could be forfeited in any way. He also challenged Leach and Oddie's allegation that the mines were valueless, but to the contrary, insisted that they were of great value if properly worked and he believed that they were at that time in a fit position to yield a remunerative profit, if his fellow partners would continue to advance capital.

The judge found in favour of the petitioners, Oddie and Leach, stating that there was a clear case for a dissolution and sale which could be held at once (FJ 1854). An embittered Griffith did not take this verdict lying down and brought a case of his own against his former partners which was heard the following summer before the Lord Chief Justice and a special jury in Dublin. Griffith claimed that on Friday 5th December 1851, his house in Baravore (the Mine Manager's House)³⁶ had been broken into by the servants of Leach and Oddie and a quantity of household furniture illegally seized and carried away. Consequently, he was claiming £50 damages and also compensation for his services as manager of the Baravore Mine. The defendants strongly denied Griffith's accusation and disputed his rights to the property. They stated that he had ceased to be their Manager, yet still retained possession of the house [as confirmed on Griffith's Valuation of 1854], although their money had paid for the building and for the furniture. A set-off was also put in by Leach and Oddie, showing that

36 Griffith's Valuation records that William Griffith was also renting a house, office and land, in other words, a smallholding, from landowner, Peter Byrne, which was situated near the ford at Baravore. The site today is marked by some ruinous masonry walls. He probably lived there following the debacle over the Mine Manager's House, even though he is still recorded as its occupier on Griffith's Valuation.

Griffith owed them £206. The jury found in favour of Griffith and ordered Leach and Oddie to pay him £20 (FJ 1855).

By now the victorious Griffith and a group of adventurers were working another mine across the valley. Subject to the decretal Order made in the matter of Leach and Oddie versus Griffith, tried on 24 April 1854, the interests of the lease dated 27 July 1849 with the rights to mines in the townland of Baravore, plus all the buildings erected and roads thereon, were sold at the Chambers of W. Brooke, Inn's Quay, Dublin, on 5th November 1855, to the highest bidder (LE 1855). It appears that Oddie was the purchaser, buying out his partner William Leach, and, finally rid of Griffith, he thereafter tried to resuscitate the enterprise. On 1st November 1858, The Baravore Mining Company was incorporated as a limited liability company with a capital of £20,000 in an attempt to attract shareholders to secure enough capital to thoroughly revive the mine (BPP 1859, 55). The plan, however, failed and the company was placed into liquidation on 29 July 1859 and struck off the Companies Register that year.

GRIFFITH'S NEW VENTURE: THE BALLYGONEEN MINING COMPANY

After being sacked as the Mine Captain of Baravore Mine and his partners' attempts in 1851 to dissolve their partnership, William Griffith had turned his attention to the development of another lead bearing lode across the Avonbeg River on the opposite side of the valley, in the townland of Ballynagoneen. A lease was obtained from the Earl of Meath to work this lode and the Ballygoneen Mining Company was set up in about 1852 as a concern in 12,000 shares. Chief among the English and Irish adventurers who came together to work the mine was Sir Cusack Patrick Roney, who had maintained an interest in the mining industry since serving as a Director of the Royal Irish Mining Company that operated Glenmalure. Interested in industry, he was the Secretary for the 1853 Great Exhibition in Dublin and in 1856, became a shareholder in the Shamrock Mine, Herne in the Rhur (Schmidt-Rutsch 2004, 7).

A meeting of the original proprietors was held at the Nag's Head Court in Grace Street, Dublin, in January 1853, where those assembled heard the favourable reports of Messrs Plant and Williams who had just returned from a visit to the mines. They reported that the lode traversed a mountain 170 fathoms in height and had been cut in the three upper adit levels, the uppermost of which had a back of 70 fathoms. Two deeper adits were being driven which were expected to cut the main lode in about two months. The dressing operations were about to commence and regular sales of ore were shortly anticipated, specimens of which could be seen at the company's office (MJ 1853).

In April 1853, Griffith reported that the Deep, or No. 1 Adit had been driven for a distance of 34 fathoms through hard solid granite, and he expected to cut the lode by driving 10 fathoms further, but due to the nature of the ground, anticipated that this would take from three to four months to accomplish. The No. 2 Adit had been driven about 15 fathoms and he predicted cutting the lode about 10 fathoms further in, and,

with the ground being more favourable, foresaw cutting it earlier than in the Deep Adit. In Adit No. 3, the men were driving on the lode and the present end looked promising; Griffith expected to cut the Great Cross Lode in a few fathoms driving, stating, 'I have no doubt, both the lodes will prove productive'. He had commenced rising from this adit to No. 4, for the purpose of ventilation, the distance between the two levels being 12 fathoms.

The lode in No 4 Adit end also presented a very favourable appearance, and in a short time Griffith expected to be under the ore ground in No 5 Adit, where he confidently predicted it would be richer than in the level above. The men were rising and sinking between Adits 4 and 5 and had about 3 more fathoms to hole. The lode in No. 5 or Shallow Adit had considerably improved within the last week and was fully three feet wide and worth upwards of £30 per fathom. Griffith explained that as the mountain rose very rapidly on the run of the lode, 'we shall, in the course of time, have backs to the extent of 100 fms.; and as this level is 100 fms. above the Deep Adit, it follows that we shall have 200 fms. of backs above the adit level, the whole of which we expect will prove considerably more productive than the Shallow Adit is at present'. About 20 tons of lead ore had been raised to the surface and preparations were being made to dress it in order to send a cargo to market forthwith (MJ 1853).

The following month, it was noted that an enormous slab of galena 'measuring in length 8 ft, breadth 4½ ft' was raised from the Ballygoneen Mine. This was intended for the Great Exhibition in Dublin '... entire, but could not be got out of the level' and was consequently obliged to be broken into several pieces, 'fragments of which from 4-5 cwts then lay on the bank, some of which would be transmitted to the exhibition' (MJ 1853). In mid-July 1853, Griffith reported that the lode had been cut in the Deep Adit and was very favourable for driving on, and he expected shortly to enter the ore-ground. No. 2 was not yet into the lode and in the rise from No. 3 to No. 4, the lode was producing from 1-1½ tons of lead per fathom, and the end in No 3. about ½ ton per fathom. The end in No. 4 was within 8 fathoms of the bunch of ore that had been encountered in No. 5 and was 'orey and promising'. However, work in No. 5 had been temporarily suspended until a rise had been completed on account of bad air. With about 50 tons of ore already at the surface, rudimentary dressing areas had been constructed at Nos. 4 and 5, and preparations were being made to create another at No. 3. These were, however, intended to be of a temporary nature, as the long term plan was to convey all the ore through the Deep Adit, which was being driven large enough to admit of a tram-road and mules.

Purpose built dressing floors were also being planned and to this end, a waterwheel, crusher and stamps had been ordered from the St Austell Foundry in Cornwall and which were expected at the mine the following month (i.e., August 1853).³⁷ Once the new dressing equipment was erected,

³⁷ The St Austell Foundry was then operated by John Hodge (c1816-1855) who had taken sole control of it in 1843. This foundry produced a variety of mining plant including high pressure steam engines up to 80-inch cylinder



Fig. 16: Miner single jacking at the forehead of a level in the Ballygoneen Mine. The vein running diagonally across the rock face was comprised of pure white foliated mica. It was an unusual spectacle in a mine that drew numerous tourists

Griffith then intended to set to work on the backs in some of the levels where solid lead a foot thick had been encountered (MJ 1853). However, whether or not this machinery arrived from Cornwall or was ever erected is unclear, for there are no obvious archaeological traces of leats, buildings or a waterwheel pit at the Ballygoneen mine site and the Cancelled Land Books (VO Dublin) make no mention to any other building in the Ballynagoneen townland except one farmhouse, the ruins of which may be seen on the opposite side of the river to the present An Oige Hostel.³⁸

The following January, Griffith's report noted that Levels 3 and 4 were improving, the rise from No. 4 to 5 Level was holed and the men could now work in comfort through every department of the mine. He also reported that '... Another tribute pitch has been set in No. 5 backs, at 3/ 10s. per ton for dressed ore, and a stent³⁹ of 2 fms. has been set to drive in No. 5 level end, which we are pressing forward, as it opens fresh backs for tribute; the ground is very kind and congenial for lead in this end. All the tribute bargains for the present month

in size, for numerous Cornish mines but also supplied the export market, including Australia. Hodge died in 1855 and the works, comprising Higher and Lower Foundry, were sold the following year, the latter being brought by the redoubtable William West (1801-1879) who already ran the St Blazey Foundry (Barton 1969, 159-61).

38 It could be that the crusher house built on the opposite side of the river in the Barravore townland was used to crush ores from Ballygoneen Mine, see below.

39 'Stent' or 'stint', is a term used in Cornish mining districts, meaning the extent or limits of a pitch or bargain.

are doing well'. A reminder of how brutally cold the winters can be in the Wicklow Uplands, particularly at this remotest of lead mines sited high in the valley cliffs, is acknowledged by Griffith who reported '... the snow having disappeared, we are again busily engaged in dressing lead, and shall soon have another 10 tons to send to Wicklow, beside the parcel of 10 tons now under tender, and warehoused there, ready for shipment (MJ 1854). A call of 1s per share was made 'to meet the expenses of the mine from the 31st December last' (MC 1854). The following month, Griffith notes that a fine rib of lead was being worked in the end of No. 4 and the lode in Level 5 was bigger and larger and opening good tribute ground.

The dressing was proceeding regularly and 10 tons were ready for sampling (MJ 1854). Indeed in February 1854, the mine sold its first sampling of lead ore by tender, consisting of 10 tons, to Messrs. Sims, Wilyams and Co. at £14 8s 6d free on board at Wicklow (DN 1854). However, the problems of mining in the Wicklow Uplands was again exemplified in early March; the ore dressing was being retarded by a lack of water, with just 10 tons dressed and awaiting sampling, but Griffith hoped to have another 10 tons completed by the end of that month. A further 30 tons were 'on the bank' awaiting dressing 'and will be got ready faster when we have a better supply of water, which is not now abundant' (MJ 1854).

In late April, Griffith reported the discovery of a channel running parallel with their present levels and under what was considered to be the footwall of the lode. The new lode was fully 10 feet wide, mixed with lead and of a different character

from the main lode. Griffith anticipated that this would prove to be the richest part of the mine and had commenced cross-cutting through the footwall to prove it. A few days later, in No. 3 level, 13 fathoms under No. 4 level, the lode was finally cut in several places and was producing good lead (MJ 1854). In early May (MJ 1854) Griffith confirms the discovery of the Ballymanus Caunter Lode: 'It has come in through the leading wall, at an oblique angle with our lode, which is nearly north and south; but the caunter runs nearly north-east where it forms a junction with our lode.

I think that it cannot be less than 10 feet wide; it is richly blotched with lead, and as far as we have driven upon it, it maintains the same character. This opens a new mine for us, which will be of immense value, for it takes into a very heavy cover in the mountain. No. 5 level will soon bring us to the other great caunter lode coming in through the hanging side, and I have no doubt that in our progress, we shall meet with other lodes in this great mountain, equally valuable.

A fortnight later he reported:

We are driving on the Ballymanus lode, and find that it is improving; as we leave the junction the killas is lessening, and from the present appearances I think that in 3 or 4 fms. driving it will be all worked out, and spar and lead will come in; this will prove of great value, there being upwards of 20 fms. of backs on this lode, and the like in the caunter, which I now take to be the same lode, and only heaved a little out of course by the junction.

Two pitches had been set in the caunter lode in No. 4 Adit which were doing well and Griffith planned to set another the following day (MJ 1854). He also stated that a very good tribute pitch was being worked over No. 4 and 5 levels, and the ends in both, which had been poor, were improving. In No. 3 Level, the lode had split up and after following what appeared to be the best branch of it, Griffith had decided to commence a cross cut through the hanging wall to prove it. At that time there were six bargains on tutwork, at the average of £4 10s. per fathom; four on tribute, at the average of £5 per fathom, and 13 dressers. Ten tons of ore had been sent down to Wicklow for shipment, 10 tons were dressed and from 20-30 undressed were at the surface of the mine (MJ 1854).

At the half yearly meeting of the company in July 1854, a balance of £440 3s 9d against the adventurers upon the previous months' workings to June were presented and a further call of 1s per share was made. Griffith reported that on the 18th of July, 20 tons of lead were sent down to Wicklow, 10 more tons were to follow in the next fortnight and another 30 tons of ore was at the surface in the course of dressing (MJ 1854). On 26th July, 14½ tons of lead ore were sold at £13 per ton 'free on board at Wicklow' (DN 1854).

By now the mine was attracting attention as being 'most vigorously and profitably worked under the auspices of an enterprising English company and producing ores of rich quantity in considerable abundance'. Indeed, in an echo of the

Lonely Planet travel guides of today, interested tourists, especially those of a scientific bent, were informed in a guide to Ireland of 1854 that 'Mr. Barker, No. 1, Eden-Quay, Dublin, will furnish tickets to view the mines, on application, and courteously afford every information' (Bryce 1854, 49).

However, in the autumn of 1854, Griffith placed a notice in the *Freeman's Journal*, advertising his services as a Mining Captain who was willing to 'inspect, report and survey any mines or mineral property in Ireland and would take the Directorship or Management of any mines of which he may consider the success certain' (FJ, 1854). Not only had he fallen foul of his former partners in the Baravore Mine, it appears that he had made enemies among the local mineworkers, only the previous summer bringing a court case against Matthew Hourigan, a miner of Baravore⁴⁰, whom he claimed was conspiring, with some unnamed persons, to take his life or to do him some injury. James Farrell, Bridget Bryne and John Holt appeared as character witnesses for Griffith, described as a 'gentleman', at the Petty Court Sessions, where Hourigan was bound over to keep the peace for one year on a security of £10 and one security in £5. The charge of conspiracy to kill was, however, dismissed (Find My Past, Petty Sessions).

But Griffith found himself on the wrong side of the law in April of 1854, when he got into a heated altercation with publican, John Carroll, at his premises which happened to be a cottage owned by the Baravore Mining Company near the junction of the Stony Road and the Mine Road to the New Crusher House. Here, Griffith was accused of drawing his pistol and pointing it at Carroll's head which saw him summoned to the Petty Sessions Court⁴¹. It seems this lively public house was the scene of several drunken brawls, for only two days later, another miner, Patrick McLennon, was accused of assault there and hauled before the same court (Find My Past, Petty Sessions). In the wake of the incident at the public house and his bruising court defeat that April regarding the dissolution of the Baravore partnership, upon learning of the imminent arrival of an Assistant Mine Agent at Ballygoneen, Griffith surely sensed his days in Glenmalure were numbered, hence his autumn advertisement in the *Freeman's Journal*.

The Assistant Agent was Captain Peter Hooper, born at St Erth near Hayle in Cornwall in 1820, the son of Henry Hooper and Jane Freethy. He married Ann 'Nanny' Courtis in January 1841 at Perranuthnoe and the couple set up home in Goldsithney where he was working as a copper miner at one of the mines in the mineralised belt which runs east from Marazion on the coast, towards Goldsithney and St Hilary. The family remained there until about 1852 when they moved up to Cardiganshire, Wales, where Peter took up the position of Mine Captain at the Nanteos lead mine, Cwmrheidol, which had been worked during the late-1840s by John Taylor (WB 1853).⁴² In 1855 Nanteos merged with another mine –

40 Hourigan is not a name associated with Wicklow, but ramified most strongly in Limerick and Tipperary in the 1800s; likewise McLennon, most common in Co. Down. The Glenmalure mines drew labour from near and far.

41 Unfortunately, the Petty Sessions book is too damaged to see what, if any punishment, was imposed on Griffith.

42 1851 Census for Cornwall: HO107; Piece: 1918; Folio: 19; Page: 1. A

Penrhiw - which might have precipitated Hooper's departure, for at about this time he migrated to Wicklow to take up his post at Ballygoneen.

Yet, at the beginning of 1855, share-dealer, John R. Pike of Threadneedle Street, London, was advertising the sale of the whole or any part of 100 shares in the Ballygoneen Mine (DN 1855). Perhaps some shareholders were trying to off-load their shares, for by March of that year we learn from a report of the meeting of the adventurers that the accounts of the previous eight months' working to February inclusive showed a loss of £413 17s 3d. Assets were noted as £133 13s; liabilities as £357 14s and the balance against the mine as £224 1s. A call of 6d per 12,000th share was made payable immediately to discharge the mine's current liabilities and a further call of 6d per share payable by the 5th April, to provide for the future requirements of the mine (DN 1855). Reports about its progress had ceased in the *Mining Journal* by the autumn of 1854 (suggesting that Griffith, who had submitted the reports fairly regularly, had perhaps left his post as Mine Agent) with the last mention of the mine in the press coming in January 1856 (MC 1856).

The *Mineral Statistics* report just 20 tons of ore sold in 1854 (realising 14.50 tons of lead and 65 ozs of silver), but this is clearly an underestimation. The *Royal Cornwall Gazette* (RCG 1854) lists sales of ore at Wicklow between February and April which amount to 34.5 tons and another consignment of ore in July (RCG 1854), the weight of which was not recorded, but noted by the *Daily News* (DN 1854) as being 20 tons. The buyers were usually Sims, Willyams and Co. at Wicklow. Nothing is listed of ore sales in 1855, but 10 tons more were weighed ready for sale in January 1856, so we may confidently ascertain that the mine continued to produce ore throughout 1855 but that the information was not lodged with the *Mineral Statistics*, an all too common problem for small Irish lead mines as we have demonstrated with respect to mines elsewhere in the country (Schwartz and Critchley 2012).

By the late 1850s, the adventurers realised that they had insufficient finance to continue to develop Ballygoneen and, with the concern never having paid a dividend, their patience had worn thin. Precisely when the mine closed is unclear. It was certainly still in operation when tragedy struck Captain Hooper's family in 1857. His first born son, Peter, died aged 15 a few days before Christmas and is interred at the Ballinatone Church of Ireland graveyard just before the entrance to the glen where the family erected a memorial to him.⁴³

However, a hint as to the company's fate is indicated by the sudden departure of several miners on 10th August 1858, who left their employment before the expiration of their contract and contrary to the terms of their agreements. Captain Hooper,

described as the Agent of the mine, took these miners, named as Joseph Cownley, Philip Harney, John Toomey, James Teeley, John Doyle, James Connor and James Crofton all of Baravore, and John Hyland of Ballinafunshoge, to the Petty Sessions Court. They were ordered to work out the remainder of their contracts, subject to the arbitration of Captains Whelan and Harvey (possibly men in positions under Hooper at the mine) as to the amount of remuneration and costs (Find My Past, Petty Sessions). Interestingly, Captain Martin Boundy of Baravore, who was then conducting trials on mineral lodes in the townlands of Clonkeen and Ballinaskea on the Parnell Estate, was called as a witness. Were the miners who jumped ship from the floundering Ballygoneen hoping to find work with Boundy?

Soon after this debacle which surely signalled the final death throes of the company, Captain Hooper and his family returned to Goldsithney where another son, Peter, was born in mid-December 1858. Hooper was then working as a copper miner, but the declining fortunes of the Cornish copper mining industry probably convinced him to once more consider emigration. As two of his sisters and their families had migrated to South Australia in 1849⁴⁴ (SAR 1849) in 1863, Peter, his wife, two daughters and infant son, Peter, followed them, sailing from Plymouth to Port Adelaide as government immigrants per the barque *Adamant* (SAR 1863). On arrival in the colony in September, Hooper applied for, and was given, the post of Mine Captain with the newly set up Adelaide Mining Company to manage a gold mine at Blackwood (SAR 1863). After that appointment he took charge of the Talisker lead mine on the Fleurieu Peninsula with Cornishman, Captain W.H. Price, before quitting mining to become a hotelier at Second Valley. He died aged 72 at Hyde Park, Adelaide, on 31 Mar 1892 (SAR 1892).

As we have seen above, the Ballygoneen Mine attracted the attention of some people from England in the early 1870s. A rumour reached the board of the Mining Company of Ireland (MCI) that those Englishmen were making inquiries as to whether they could entice some of the company's miners to work for them. This greatly alarmed the MCI, suffering as it was from a shortage of labour caused by the migration of many of its most skilled tributers. Using its economic and financial muscle, the MCI quickly obtained a lease from Lord Meath to explore this small mine which had been 'partially tried by some adventurers many years ago, but who had not sufficient capital to thoroughly explore it'. A sum of £87 was expended by the MCI (FJ 1871) on unsuccessful mine searches. It was estimated that it would have cost between £800-900 to go far enough in to properly explore the workings, and consequently a notice of surrender had been given (FJ 1873), which signalled the end of the chapter of mining at Ballygoneen.

daughter, Laura Maria, was born in Cwmrheidol on 3 November 1853.

⁴³ The inscription on the headstone reads: 'Sacred to the memory of Peter Hooper (son of Captain Peter and Ann Hooper of Goldsithney Cornwall) who honourably held the position of Assistant Agent for three years in the Ballyganeen Mines, Glenmalur. Born January the 11th 1842. Departed this life December the 22nd 1857'.

⁴⁴ Elizabeth Gartrell and Jane Sampson with their husbands, both miners named John, per the *William Money*.

A NEW BEGINNING: THE BARRAVORE SILVER-LEAD MINING COMPANY LTD.

By September 1859, a new company had risen phoenix-like from the ashes of the Baravore Mining Company: the Barravore Silver-Lead Mining Company Ltd., incorporated in 1858 and set up with a capital of £6,500 in shares of £1 each with a deposit of 10s per share. Nine people signed the memorandum of association, receiving 900 shares between them. Oddie, who resided in England and ‘being unacquainted with mining operations and unwilling to expend capital sufficient to develop the resources of the mines’, had agreed to transfer his entire interest in the lease covering 1,200 square acres granted for 62 years from 1849 at a royalty of 1/16th, receiving £500 and 2,000 shares (MJ 1859). This included the improvements and assets of the Baravore Mining Company, listed as a Manager’s house and offices, workshop and forge with tools complete, eighteen labourers’ cottages recently erected, waterwheel and crushing machinery, with all the mining implements now on the premises, together with about 8 tons of lead ore currently on the surface (IT 1860 *et seq.*). It was estimated that the erection of the same buildings on the property would cost at least £1,500, the plant a further £160, and the overall value could not be less than £3,000 (MJ 1859).

The Barravore Silver-Lead Mining Company Ltd. had been promoted by the Mineral Exploring Company (MEC) which was set up in about 1858 (and registered on 17 October 1859) ‘to counter the widespread ignorance of Irish mineral resources propagated by English mining engineers’ (Schwartz and Critchley 2013, 60). The Baravore concern was inflated by references to the famous Ballinafunshoge (or Glenmalure) Lode that was believed to pass through the mineral sett and its proximity to the rich Luganure Mines, the lodes of which were thought to run parallel to that at Baravore. It was further stated that the old Baravore Mining Company had commenced operations at three different points and which, ‘so far as he [Oddie] proceeded, proved satisfactory’. Moreover, the presence of an endless supply of water power and the cost of carriage to Wicklow of the ore at 10 shillings per ton, made this an attractive proposition for would be shareholders. The MEC received 1,000 free shares for its efforts and the working capital of the new company was £3,000, half of which it was thought would suffice (MJ 1859).

Oddie, who by 1860 was an occasional visitor to the valley, having taken the lease of the Mine Manager’s house (VO, Dublin), the former residence of the now departed William Griffith, became one of four English directors. No doubt he had learnt from bitter past experience that he needed to keep a closer eye on the mine’s affairs. However, the MEC’s fingerprints were all over the new company, for its four Irish directors - Edmond Henry Casey; Samuel Crampton; Thomas Percival Swan and Thomas Johnston - were also directors of the MEC (FJ 1859). At the first general meeting of the proprietors in January 1860, two of the English based directors stepped down as they were unable to make the board meetings in Dublin, one of whom was replaced by William Greene of the MEC and the company’s Dublin solicitor was Alexander McNeale, who worked for the MEC in the same capacity.

The shares were taken up by private partners by September 1859, after the mine had been inspected that summer by the company’s Consulting Engineer, Captain James Skimming of Castleblayney, an Englishman who had migrated from Derbyshire in the early 1840s to captain the Coolartra lead mine in County Monaghan (Schwartz and Critchley 2012, 64-65). In order to avoid unnecessary time and expense which would probably have exhausted the shareholders’ patience, Skimming judged it best to make a direct attack on the lode both horizontally and in depth into more settled and mineralised ground. From him we learn more about the true state of affairs of the underground works of the former proprietary, which were:

... chiefly of an abortive character, being confined to driving long adit cross cuts through hard granite. Two of the most expensive of these adits have not been carried in to cut the lode, but as they are situated to the east of the present or any former workings, and in a new part of the sett, we intend, at some future period of working, to take advantage of what has already been done, and prove the lode at this point.

Skimming further reveals that Adit No. 6 [Shallow Adit] was the only work of relative value from a mining point of view that had been undertaken by the former company. This level, driven in near the top of the hill so as to be ‘comparatively speaking only a surface adit’, was extended some 40 or 50 fathoms on the course of the lode. It had discovered, and passed through, several healthy looking shoots of ore. One of Skimming’s chief objectives was to push this level westwards where the hill rose and the lode rapidly gained cover. The result had been a regular improvement in the lode and in the back of this level in unexplored ground which had been opened by the new company, a stope, named Gregory’s, was, according to the Mine Agent, producing the best ore ever seen in the mine. The mineral bearing part of the lode in this end was from three to four feet wide, comprised of a strong quartz intermixed with ore throughout with a regular contact wall coming in on the foot side, the like of which had not been seen in the mine before. Skimming had given instructions to push this end with six men.

Another of Skimmings’s objectives was to drive a level from a winze or sump sunk by the previous operators 10 fathoms [just over 18 metres] under No. 6. According to him, ‘this winze is near the point where the cross-cut intersects the lode, and consequently to the east of all the bunches of ore passed through in the adit’. This winze had been sunk in ground that was near surface, and Skimming had observed that the granite in contact with the lode, when close to the surface, became soft and in a decomposed state. This meant that, in consequence, the crystallisation of the quartz, the ore bearing matrix, was not present and the lode became poor [probably oxidised to lead carbonate that had been dissolved]. Skimming therefore thought it wise to deepen this winze: ‘To penetrate these bunches 10 fathoms deeper, and to take advantage of this winze for doing so, appeared to me to be a proper mining course’. According to Skimming, ‘this level had occasionally shewn traces, and occasionally yielded some saving work for lead, but we have as yet some distance to drive west, previous

to getting under the ore ground. We push the end with six men, day and night’.

Skimming also reported that another prime objective (irrespective of stocking operations), was the commencement of the sinking of a sump shaft at the bottom of No. 6, directly under Gregory’s Stope, in the ore ground that had recently been passed through. ‘The men have been cutting out room for some days, and the sinking, ere this, has commenced’. Skimming planned to carry the sump sufficiently large enough to permit of mechanical arrangements should this contingency be required to work the mine at greater depth. He also described how he planned to utilise the immense water power passing through the glen and that a powerful waterwheel, 32 feet in diameter and 3 feet 6 inches in breast, was being erected.⁴⁵ A leat had been cut ‘to bring in and command a never-failing supply of water’ in order to maximise the power and performance of the waterwheel and he proposed ‘to drain and work the best parts of the lode, from No. 6 to the level of the valley – say 30 or 40 fathoms’. With this objective he hoped to prove ‘... the value and character of the lode in depth which would warrant the commencement and carrying out of a new arterial drainage, from which to discharge the water and the ore to that depth, then the same mechanical power would be again available for another drainage 50 fathoms under the bed of the river’.

Attached to this waterwheel was crushing machinery, then being erected, and new dressing floors on the most approved principle were in the course of being laid down. A large pile of ore, the produce of the stopes for the previous four months, lay at the surface awaiting the completion of the crusher and floors. Skimming anticipated having the whole machinery complete by spring and the mine making returns of ore ‘certainly during the present half-year’. The staff, consisting of the Agent, carpenter and blacksmith, together with two masons engaged in building the wheel pit and crushing house, all resided on the mine in the village of cottages built by the old Baravore Mining Company and which were rented to the mineworkers, netting the company £50 per annum in the shape of rent. Skimming noted how the buildings on the site, consisting of the Agent’s house, stores, carpenters and smiths’ shops, office and the eighteen miners’ cottages, were a great acquisition on the property, although they were in need of some repair, which was ongoing.

⁴⁵ The diameter of the waterwheel at the New Crusher House quoted in the *Irish Times* appears to be a misprint and cannot possibly be correct, for the length of the waterwheel casement, the holes for its timber frame and the location of the drive shaft aperture suggests a wheel no larger than 22 feet. It is also strange that the company went to the expense of purchasing a new rolls crusher and waterwheel which were accommodated at a purposely built new crusher house, when it stated in 1859 that Oddie had transferred his entire interest in the lease including crushing machinery and a waterwheel, which must refer to the machinery at the old crusher house. There might be a rationale for building a new crusher house close to the Deep Adit which Skimming was developing as the main haulage way and also at a spot where a more reliable flow of water (from a nearby natural reservoir) could be procured. But it begs the question as to why the company did not simply move the existing rolls crusher (and wheel) from the old crusher house to this spot? Unless of course the head difference at the New Crusher House’s location was too great to utilise the old wheel and the company wished to install a multiple rolls crusher, hence the building’s unusual interior form (see below).

The mason employed by the company to oversee the construction of the crusher house and new dressing floors was Mr Edgar, and he was afterwards employed by the Castleward Mining Company in County Down in the same capacity, having been recommended by some of the men involved in the MEC (Schwartz and Critchley 2013). Things appeared to be going well at the mine as indicated by the first monthly pay sheet of the company which showed that the value of the ore raised exceeded expenditure (MJ 1859). In November 1859 it was reported that the monthly expenditure was £200 in wages alone, with work progressing favourably on the erection of the waterwheel to work the stamps and crushers and a large amount of ore was being dressed at the surface (MJ 1859).

However, at the half yearly directors’ meeting in July of 1860, Skimming explained that progress on getting the dressing floors completed had been ‘much retarded by the unusual severity of the weather and wet spring’ but by July 1860 they were operational. Ten tons of ore had been dressed and a further 10 tons was soon expected to be ready, enabling the directors to take this to market. He also reiterated his intention to develop the mine at depth by the use of mechanical power supplied by the new waterwheel and informed the meeting that the ore had been assayed by Professor Galway, who found that one ton of it contained 16 cwt 0 qr 19 lbs and 6 oz 10 d 16 grains of silver (FJ 1860).

However, by the autumn of 1860 it had become apparent that Skimming’s development plans for the mine did not meet with universal approbation. John Staunton of Kingstown, one of the company’s directors, a position he also held with the Castleward United Mining Company in County Down and, ‘on whose opinion in mining matters much reliance [was] placed’, compiled a report in early October 1860 that called into question the wisdom of the work being undertaken (FJ 1861). Consequently, later that month Staunton and a deputation from England, including the original promoters and two other fellow directors, visited the mine. They conducted a thorough examination of the works, and, estimating the quantity of lead then produced, arrived at the conclusion that the deep sinking [the adit by the new crusher house] then in operation should be suspended, it not having been found remunerative and that another course of operation should be pursued.

The directors, however, persevered with Skimming’s recommendations for upwards of two months, then decided to call in Evan Hopkins, a well respected Welshman who was the consulting engineer to the Castleward United Mining Company (Schwartz and Critchley 2013, 63-64). Acting on Hopkins’ report, a temporary reduction in the establishment was made which would remain in place until the next company meeting. Worryingly, of the original real capital of £3,500, only about £600 remained which was quite insufficient to carry on the works (MJ 1861).

Ominously, the first half yearly meeting was called in January 1861, but so few shareholders turned up that it was impossible to form a quorum and the meeting was adjourned until the following day (FJ 1861). At this meeting it was announced that the amount of capital left, a mere one seventh of the

original sum, meant that it was impossible to continue the works even on a small scale, until the next half general yearly meeting. Therefore, the directors stated that they were compelled to recommend that out of this sum, the existing liabilities of the company be discharged and the works suspended, unless the proprietary were of the opinion that further trials should be made. This course of action would have required additional capital, which they suggested could be raised by forming the company anew and by the issue of new shares. To offer some incentive if this plan was acted upon, the present proprietors would receive in the proportion of one new share for every two of the old stock. Tellingly, the directors held, amongst themselves, 4,600 shares and the general public, 1,880.

Although at pains to point out that they had undertaken their duties free of charge, it is difficult not to conclude that the directors associated with both the MEC and the Barravore Silver-Lead Mining Company were out to feather their own nests. When the question arose of making a call to keep the mine open, they were not at all keen to part with 2s 6d per share (MJ 1861). The way in which they kept most of the shares to themselves (and were therefore at liberty to sell these on the market), but at the same time put up a ridiculously small amount of capital to develop a mine which they expected to furnish them with large amounts of lead ore almost immediately, displays both cupidity and stupidity, an all too common occurrence among nineteenth century mining companies. History was to repeat itself, for they seemingly paid scant attention to the fact that a lack of capital had caused the failure of the mine under Oddie *et al.*. Suffice to say, the MEC was not a success and neither were any of the mines it promoted, including Baravore.

A special general meeting of the company was called in early February to discuss its future prospects (FJ 1861). The directors reported that they had done all in their power to develop the character of their mine with the small amount of capital at their disposal and had no doubt as regards its wealth and richness. It had been inspected by an English gentleman, 'a first-rate and acknowledged authority on mining matters, and he declared his conviction that the metal was there in abundance and that the works were even now approaching the tale [sic] of a rich lode or stratum of ore':

But unhappily the primary mistake of the company consisted in their having commenced their undertaking with a capital so wretchedly small and insufficient, whereas four times the sum would be scarcely equal to the requirements demanded by such a concern for the proper commencement of the works the purchase of machinery and plant, the leasing of the ground, &c.

The accounts showed that the debts due to the company were £124 4s 5d; liabilities, £286 10s, and expenditure since the last statement £187 15s 7d, making a total of £598 10s. The balance of capital from the last published statement was £638 9s 8d, debts due to the company amounted to £175 and the probable amount to be realised by the sale of machinery and plant was estimated at £217. This gave a total of £1,030 9s 8d, leaving a balance in favour of the shareholders of £431 9s 8d.

**BARRAVORE SILVER LEAD MINING COMPANY,
LIMITED.**

TO BE SOLD BY AUCTION, by order
of the Liquidators of the above Company, on **MONDAY**, the 10th of June, 1861, at Eleven o'Clock in the forenoon, **AT THE BARRAVORE MINES, in the Valley of Glenmalure, in the County of Wicklow, by CHARLES BENNETT, Auctioneer, 6, Upper Ormond-quay, all the right title, and interest of the said company in and to the said Mine, as demised by indenture of lease, bearing date the 27th July, 1849, made between Rachel Harrison, Widow, and Alicia Harrison, Spinster, of the one part, and Thomas Sandes, Charles Oddie, and William Griffiths, of the other part, for a term of 62 years, at a Royalty Rent of 1-16 or £20 per annum, in lieu thereof; and also all the valuable MACHINERY, pumps, crushing mill, new water wheel, galvanised iron for roofing, mrtal rails, trucks, tools, and plant; subject to the conditions of sale, copies of which may be had on application at the Office of the Liquidators, 33, Upper Sackville-street; or of**
MR. BENNETT, the Auctioneer,
6, Upper Ormond-quay, Dublin.

Note—These Mines are situated about nine miles from the Railway Station at Rathdrum, on the opposite side of the valley from the Glenmalure Lead Mines, one of the most profitable mines in Ireland.

Fig. 17: Auction advertisement in the *Freeman's Journal* 6 June 1861, of the machinery and residue of the lease of the Barravore Silver Lead Mining Company

Nothing was mentioned about any stocks or sales of lead and there are no production figures for Baravore listed in the *Mineral Statistics*.

It transpired that some of the original shareholders had taken shares in the company allegedly in return for large advances of capital 'out of their own pockets' to keep the concern going, but had then disposed of these shares on the market (presumably at inflated prices). One of the shareholders present at the meeting alleged that he was duped into the recent purchase of 100 shares placed on the market by one of the company directors and strongly objected to this malpractice, as that director must have known that the company, 'was on the eve of dissolution'. This drew a strong rebuttal from the Chairman, John Chambers, who stated that he had never parted with a single share.

At the meeting, the company took the inevitable decision to dissolve and wind up, the *Freeman's Journal* remarking that the 'undertaking appears to have eventuated in an almost total loss' (FJ 1861). During its lifetime, the mine had made continual one pound calls per share (there were 75 shareholders recorded at its last company return) amounting to £3,225 2s 6d (BPP 1864, 244). The residue of the 1849 lease, plant and machinery were advertised to be sold by auction in June 1861 (FJ 1861), thus bringing to a close the history of a disastrously managed mine which probably produced less than 60 tons of lead during its entire lifetime.

Charles Oddie's continued leasehold of the Mine Manager's house for some six years after the company's collapse suggests that he perhaps harboured aspirations to revive the mine's fortunes after Henry Hodgson bought the sett in 1861. Irreconcilable differences had by now arisen between Hodgson and the Mineral Lords of Ballinafunshoge, and, realising the writing was on the wall for his continued involvement with the

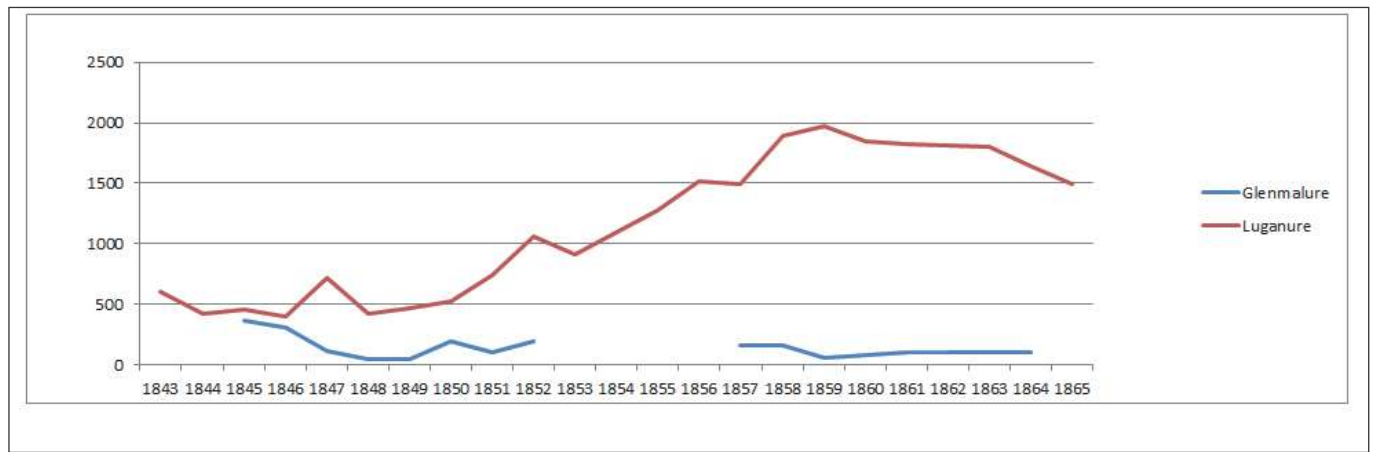


Fig. 18: Ore figures for the Glenmalure Mine from the annual Mineral Statistics. In its heyday in the late-eighteenth-early-nineteenth century, the mine is alleged to have regularly produced over 300 tons per annum, but the 367 tons recorded in 1845 was never exceeded thereafter. Production from the Luganure Mines by comparison dwarfs that of Glenmalure

Glenmalure Mine, he acquired the Baravore sett possibly intending to re-focus his efforts there. But the *Mineral Statistics* record no production from Baravore and it seems unlikely that he did anything of importance on the mine. His association with it ended in 1874.

DECLINE AND DISPERSAL

The Glenmalure Mine never returned to the golden years of the eighteenth century in terms of tonnage figures which did not surpass the 367 tons recorded in 1845 and the *Mineral Statistics* record that no ore was raised in the years 1853-56 (see Fig. 18). Mine closures and decline resulted in employment levels falling dramatically. In 1863, a letter to the Poor Law Commissioners asking them to consider the propriety of having a dispensary for Glenmalure was considered at a meeting of the Rathdrum Union. An argument was made for a resident doctor in the valley, as the poor of the neighbourhood had to travel to Rathdrum for their medical needs.

Heated exchanges between several of the commissioners ensued as some felt that a dispensary was totally unnecessary: ‘... when the mines were working and that district much more thickly populated then it is at present, there was not a single word about a dispensary’ (WNL 1863). The resolution for a dispensary was at first carried, but such was the opposition to it that at a specially convened meeting, the decision to grant it was rescinded. Those present were informed that only about 20 people were then employed in the mines of Glenmalure, when in living memory there had been about 300 working in the industry there. Since the question of a dispensary had never before arisen, it was thought unfair to saddle the current ratepayers with the cost of an unnecessary building and resident doctor (WNL 1863).

The rise and fall of mining and the consequent effects of this on population levels is exemplified by the decennial statistics for the townland of Baravore at the far end of the glen. In 1841 a population of 30 people living in just 4 houses (all farms or smallholdings) was recorded there (BPP 1852, 10). By 1851, following the discovery of lead and the construction of a

number of cottages and other buildings by the Baravore Mining Company, 33 houses were recorded and 278 people, representing a population rise of over 900 per cent.⁴⁶ None of the housing in the townland was unoccupied, there were no first class houses (nine rooms and upward with windows) and just six second class houses (a house having from five to nine rooms and windows) which would have included the Mine Captain’s house (no longer extant).⁴⁷

The majority of the housing, eighteen dwellings, fell into category three. Such dwellings were supposedly those with two to four rooms constructed of mud but with windows. However, the classification of housing was also dependent on the number of families dwelling within a given property. At least some of the eighteen buildings in category three must have been the stone walled and slate roofed mineworkers’

⁴⁶ Thirty six male visitors and 10 female visitors formed part of this figure. This gives an average of about five people per household. Griffith’s Valuation (1854) gives the names of the householders renting dwellings from the Baravore Mining Company as: William Griffith; James Kirwan; John Byrne; Hugh Byrne; John Walsh; James Hamilton; Mary Teely; Thomas Byrne; John Petty; James Sinnott; Michael Conran; John Hyland; John Carroll (publican); Judith Byrne; James Byrne; Patrick Donnelly; Bridget Byrne and John Malayter (presumably an in-migrant, as the name is not Irish but associated particularly with Central Europe (Austria and Hungary), suggesting that he was most likely engaged in a highly skilled job). One cottage was vacant, as was the forge. The rateable value for the cottages was between 10-15s, with Captain Griffith’s house set at £5; that of Hyland £3 15s and the house and offices (a public house) of Carroll, £4. As the Baravore Mine was suspended at the time of Griffith’s Valuation, it is highly likely that mineworkers occupying the cottages would have been working at the Ballygoneen Mine across the river, as there was no housing of any kind in that townland except for one farm house, home to a single family. This was sited on the other side of the river almost opposite the An Óige Hostel. The ruins of at least one cottage set amid small, stone walled plots further down the valley in this townland pre-dates the 1838 First Edition 6-inch OS Map.

⁴⁷ This, which also accommodated the Count House, was built between the river and the road almost equidistant between the two crusher houses. It is not to be confused with An Óige Hostel which Morris suggests was the Mine Captain’s house (Morris 2008, 33). The hostel was formerly an isolated two bedroom cottage built as a hunting lodge in 1903 and owned by W.B. Yeats’s *femme fatale*, Maude Gonne McBride, from 1919. It was the setting for J.M. Synge’s play, *Shadow of a Gunman*. In 1955 it was bequeathed by the then owner, Dr Kathleen Lynn, to An Óige. The Mine Captain’s house/office was demolished in the mid-twentieth century by the forestry department.

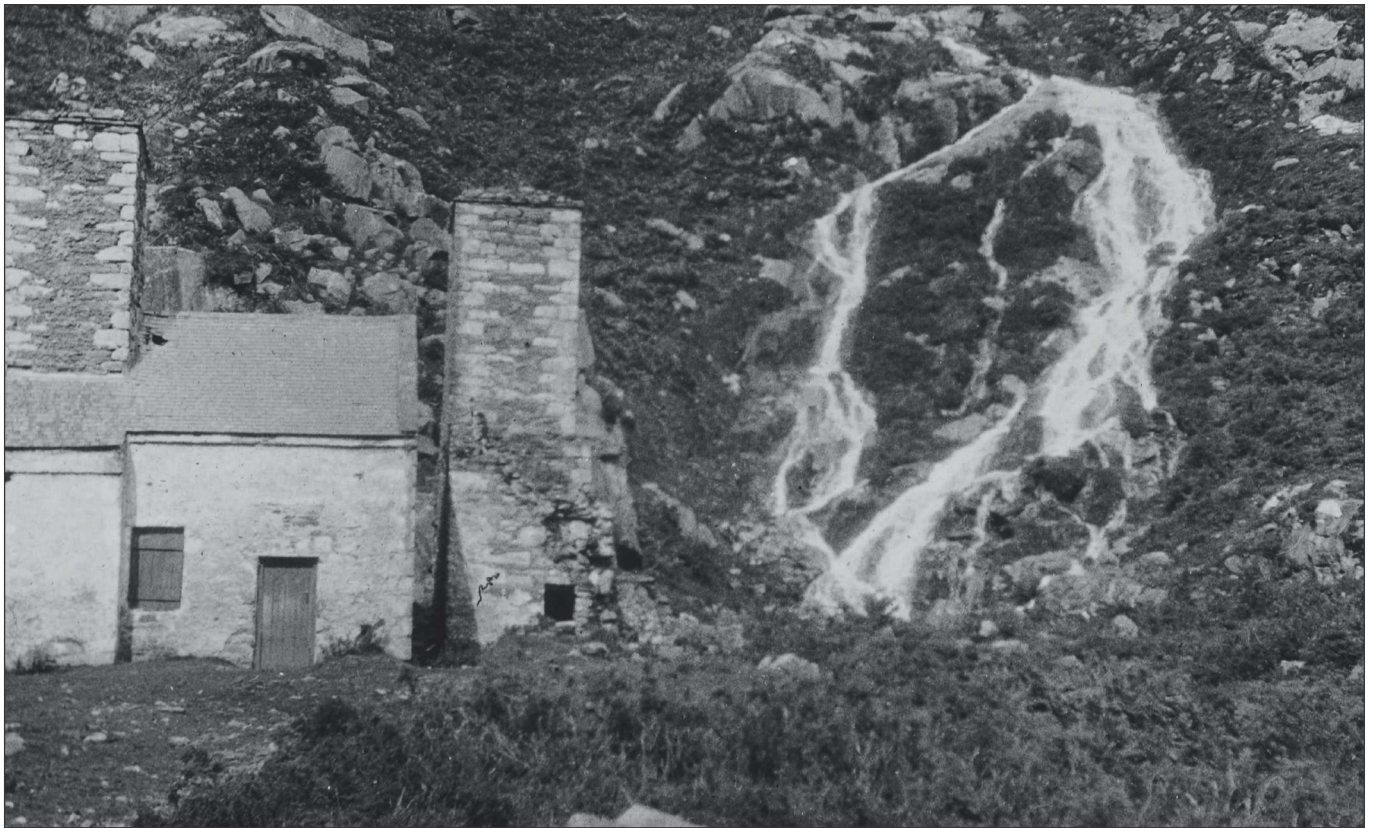


Fig. 19: *Following their closure after Hodgson bought the mine in 1835, the smelting works had been converted into miners' cottages. One of a stereo pair, this image shows the partially destroyed cottage (right) of a Glenmalure miner named Byrne, who tragically lost several of his children in the catastrophic floods of the spring of 1867 that tore down through the ravine (right) turning Mill Brook into a torrent akin to the Powerscourt Waterfall, destroying all but the sturdy chimney that formerly served a blast hearth. Photograph by Joshua H. Hargrave, published 1895. Image courtesy of the National Library of Ireland, Dublin*

cottages with windows built by the Baravore Mining Company and that almost certainly offered a better standard of housing than class four. Nine class four dwellings were listed: one roomed mud cabins with earthen floors and no windows, wretched hovels constructed on the roadside or on waste ground. These were probably occupied by 'strollers', attracted to the valley in search of casual work in the mines. From the census we learn that eight families occupied the six second class houses; 33 families the 18 third class houses and 12 families the nine fourth class cabins (BPP 1856, 186).

Living conditions for the mineworkers would therefore have been quite poor, characterised by cramped and overcrowded conditions, with more than one family cohabiting some of the company's cottages and the squalid cabins. By 1861 the number of houses had fallen to 22 and the population had declined to 103. A decade later, after mining had totally ceased, 19 houses were noted and just 27 people. The published census report noted that the decrease in population 'was owing to the cessation of mining operations'. By 1881, of 16 houses, just three were occupied and there were only 17 people living in Baravore (10 males and 7 females) and these were all likely to have been agriculturists (BPP 1863, 348).

The same picture was repeated in Ballinafunshoge, where many of the mineworkers lived in cottages and cabins close to the road, clustered particularly on the townland boundaries

with Cullentragh Park and Ballyboy. A group of buildings depicted opposite the waterfall at East Stick included a two storey residence for the resident Mine Agent.⁴⁸ In 1841 in the townland of Ballinafunshoge, 26 houses were occupied by 88 people; in 1851 the number of houses had fallen to 21 but the number of people had risen to 136, reflecting a temporary improvement in the fortunes of the Glenmalure Mine. However, by 1861 there were just 11 houses accommodating 51 people (27 males and 24 females), and one house was uninhabited, mirroring the gradual decline of the Glenmalure Mine (BPP 1863).

Ballinafunshoge was badly affected by flooding in the Wicklow Uplands in the spring of 1867. On Saturday 23 March, deep snow had thawed rapidly due to heavy rains causing a slight mountain stream running 'precipitously down a height of some 800 feet' to become swollen by the sudden overflow from an assumed upland lake, into a torrent resembling the Powerscourt Waterfall:

... a range of stoutly-built miners' houses stood right under the gorge where the water came down. One was taken and the others left. The public road was covered in an instant, and a forge and three smaller cottages were overwhelmed' (LM 1867).

⁴⁸ Most of the mineworkers' housing in Glenmalure has vanished.

A mass of mountain debris including boulders many tons in weight with thousands of tons of earth was carried along in the deluge that smashed through this cottage, the home of a miner named Byrne, leaving nothing standing but the chimney, the hearth and a few articles of humble furniture. His wife and five of his children were swept away in the flood. Two of the children drowned, one of his daughters was so injured that her life was despaired of and another was miraculously found floating in its cot in a distant stream (LDSM 1867).

An eyewitness related how he stood upon the bank where the public road had been swept away by the mountain burst, watching the melancholy search for the body of Byrne's remaining missing child, commenting how he hoped that an appeal to the Lord of the Soil, the Earl of Essex, for the bereaved and afflicted family would not prove a fruitless one. It appears the calamity occurred at the foot of Mill Brook. The old smelting house had been converted into miners' dwellings and the forge mentioned was sited directly opposite on the other side of the road. 'We left the grand though gloomy Glenmalure this evening as the shadows were thickening and as the heavy clouds were breaking up', wrote the eyewitness, 'giving promise of the passing away of a severe spring, which will be long remembered in the County of Wicklow as a sad, severe and fatal one'.⁴⁹

By the late 1860s, there was no deep lode mining going on in the valley, Dickinson, HM Inspector of Mines, noting in 1874 that the Glenmalure Mine was discontinued (Reports of Inspectors of Mines 1875). Henry Hodgson, by then an old man and not in the best of health, had been in no mood to take on Essex and de Ros for a renewal of the Glenmalure lease at more favourable terms and he died aged 82 in 1878 at Ballyraine, Avoca. An attempt by Strype to resurrect the mine had failed and the population began to dwindle, reflected in the fact that funding was withdrawn from the National School in 1875 as there were just 14 boys and 12 girls on the roll. It closed later that year.⁵⁰ Those living in the valley with no access to land and wholly dependent on the mines for their livelihood, had been forced to move away. Some were lucky to find work in the Luganure Mines or at the Avoca 'sulphur' mines, but many took ship for mining areas in England, the USA and Australia.

This is exemplified by the family of miner, Michael Kennedy and his wife, Mary (née Dunne). One Michael Kennedy is recorded renting a house and garden in Ballinafunshoge on Griffith's Valuation of 1854. They had at least two sons, both of whom left Glenmalure when the mines went into decline.

49 Also killed were a woman and her two children named Smith, who lived at Lough Dan (at the settlement of Inchavore), who were swept away and drowned in a sudden avalanche of snow and water, and further fatalities were recorded at Aughrim and Blessington. Much property, including the bridge at Newbridge (Avoca), was wholly or partially destroyed. The public damage was estimated at about £10,000.

50 By 1838 when the school applied to be included in the National School System, there were 50 boys and 20 girls enrolled on the register. From its high point in the mid-1850s, when it had almost 80 children on the register causing it to be enlarged and given a new slate roof, the number of pupils began to fall as Baravore and Ballygoneen Mines closed and Glenmalure entered a terminal decline.

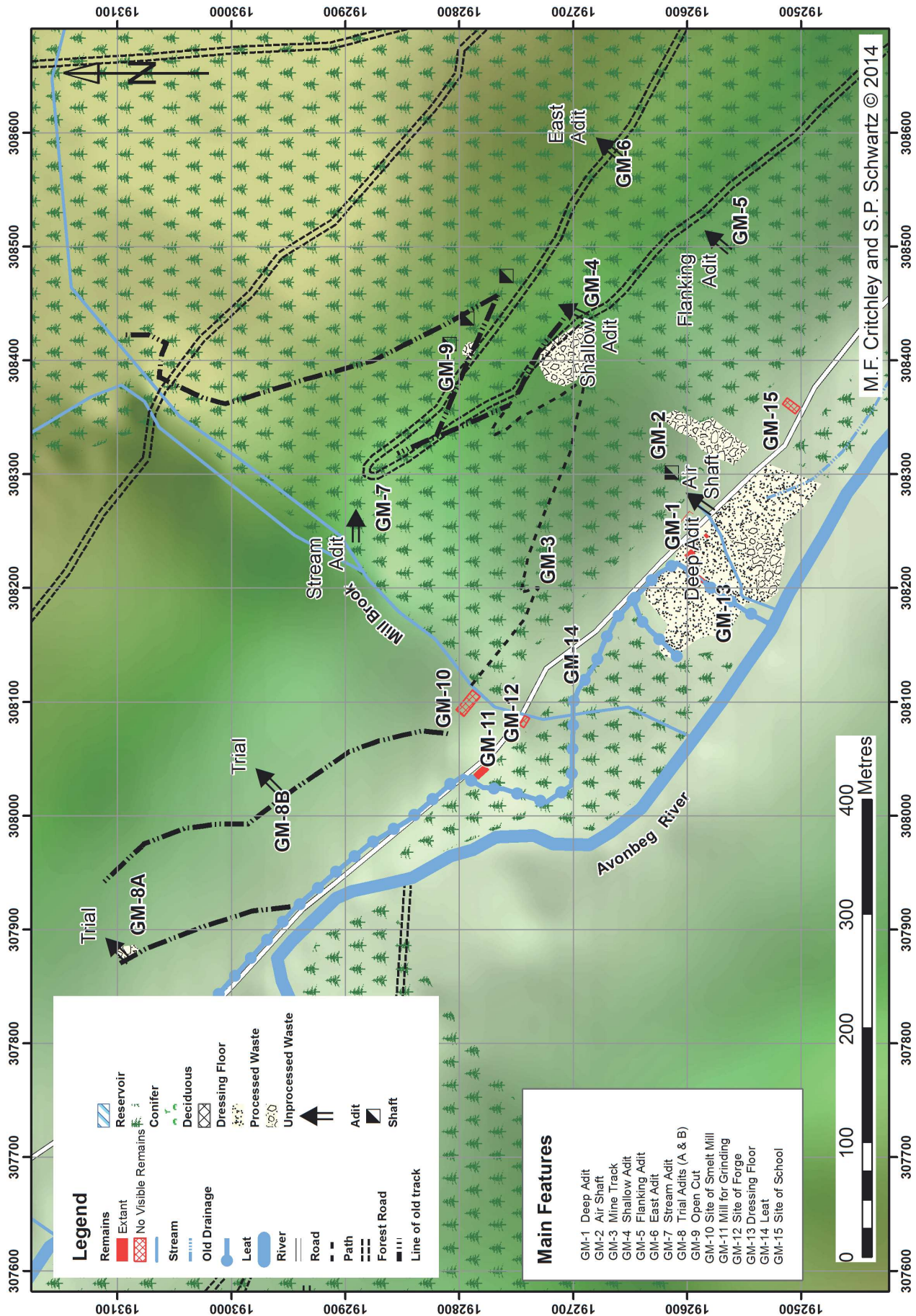
Matthew was born in 1819. He married Mary Byrne of Gorey, County Wexford, in 1843, but in about 1869 he took his wife and five children across the Atlantic to Dover, Morris County, New Jersey, an iron mining area with a significant Irish community. Here he obtained a job as a mine labourer, but died aged 51 in 1871. One of his sons, Michael, born in Glenmalure in 1850, married Caroline Bray of St Blazey, Cornwall. He had probably cut his teeth in the lead mines of his native glen with his father and grandfather and found work at the Dickerson Mine as a stationary engineer.⁵¹

Matthew's younger brother, Patrick, born in 1821, married Mary McDonnell in 1842. Of their nine children, the last was born in Glendalough in 1861, so it is possible that he had taken a job with the Mining Company of Ireland at their Luganure Mines. In the mid-1860s, like many other local mineworkers, he migrated to Cleator Moor, an iron and coal mining community on the edge of the English Lake District dubbed 'Little Ireland' due to its large Irish population (MacRaild 1998). He died there aged 49 in 1870. Other men migrated to the gold fields of Victoria Australia, including Patrick Hyland. He and his wife left Glenmalure around the end of 1854 for Melbourne, where they spent several months and where their eldest son was born. They then moved on to McIvor (renamed Heathcote, sited some 47 km from Bendigo), where gold had been discovered in 1852 and which had attracted over 40,000 diggers (MTRA 1909), many of them Irish.

By 1890, the Wynnes, a family of Welsh descent who had settled in Sligo in the late seventeenth century, had acquired several lead mines in the Wicklow Uplands, including Glenmalure, which had languished unwrought since 1866. Albert Augustus Wynne (1833-1922) and his cousin and brother in law, Wyndham Henry Wynne (1840-1910), were mining engineers who had spent many years managing lead, zinc and silver mining ventures in Niederfischbach bei Kirchen in the present day German state of Rhineland-Palatinate, as Directors of the West Prussian Mining Company Ltd. and the Silberhütte Supply Company Ltd.. The Wynnes also had interests in mining concerns in North Africa and North America and had purchased the Luganure Mines from the Mining Company of Ireland in 1890 (Schwartz and Critchley 2013, 7; 26).

Besides continuing deep lode mining, they were attracted by the possibility of extracting lead and zinc from the large waste dumps of the Luganure mines. It is likely that they had the same plans for the dumps at Glenmalure, rather than any actual deep lode mining, as the mine had been abandoned for 25 years and was described as a ruin by Strype back in 1885, so the cost of rehabilitating it would have been phenomenal. However, some unfortunate financial losses in the Big Snowshoe Mine in Montana, USA, (SR 1899) in the early twentieth century curtailed their plans somewhat and it appears they then focussed the bulk of their energy and finances on the Luganure Mines.

51 1870 US census: Randolph, Morris, New Jersey; Roll: 988; Page: 12A; Enumeration District: 75; 1880; Census Place: Randolph, Morris, New Jersey; Roll: 793; 1920; Census Place: Dover, Morris, New Jersey; Roll: T625_1060; Page: 22A; Enumeration District: 12; Image: 421.



Map 2: Overview of the Glenmalur(e) Mine Site

To all intents and purposes, mining had ceased by the turn of the twentieth century in Glenmalure and any ore obtained by the Wynnes from the spoil heaps there in the 1890s is aggregated in the *Mineral Statistics* under the Luganure Mines.

AN INVENTORY AND INTERPRETATION OF DISCRETE INDUSTRIAL FEATURES

Glenmalure has an interesting suite of industrial heritage features, some of which are arguably of national significance and are included in County Wicklow's Record of Protected Structures (RPS), albeit it in a rather vague and ad hoc manner. However, there is still considerable ignorance as to what many of the features and monuments actually are, with *Wikipedia* describing the two crusher houses as 'ruined forts in the forest' (*Wikipedia*). Furthermore, forestry activity over many decades has degraded and badly damaged some of the archaeology and what remains is threatened by the elements, rampant vegetation growth and benign neglect. It is hoped that the discrete descriptions of the various monuments and industrial archaeological features described below will draw attention to the fact that these are vital heritage assets and will help to inform future policies governing the historic mining landscape in Glenmalure.

As part of the INTERREG 4A *Metal Links: Forging Communities Together* project, the authors were contracted to undertake a visual inspection of the extant remains of the valley's lead mines, to photograph and record important individual monuments and to survey all features of industrial archaeological importance. These data were then compiled into a GIS. The survey work was undertaken during 2013 and 2014 using a Trimble GeoXT hand held GPS unit, a South 355R Total Station and detailed tape measurements and drawings in the field to a standard commensurate with English Heritage (2006) Level III.

GLENMALUR(E) (BALLINAFUNSHOGE) MINE

Deep Adit Portal GM-1

Driven in 1795 and also known as The Great Level, this runs for about 250 metres into the mine and would have accommodated a tramway for the conveyance of ore from the workings to the dressing floors that were sited opposite. The adit's lobby has been largely erased and the portal has collapsed, but the site of the adit is betrayed by an outflow of ochreous water emerging from dense vegetation.

Glenmalure Adit Channel BF-13F

The adit water, now characterised by an ochreous discharge, flows in a culvert under the road and into a stone-lined channel. It now flows across the site to the north west of the spoil heaps, but formerly ran in a south easterly direction in a culvert beneath the spoil heaps before emerging several metres from an old track way leading to a ford in the Avonbeg River. It crossed this trackway and then ran parallel to the river, emptying into a marshy flood plain beyond.

Air Shaft GM-2

Obscured by gorse and brambles amid a stand of Scots Pine is a small un-collared circular shaft, its rocky walls lined with moss. As it is on the line of the Deep Adit, it was driven to intersect this for ventilation purposes. It is blocked several metres from the surface by debris.

Mine Road GM-3

Running from the site of the former smelting house, this road ascends the steep-sided valley giving access to shafts, open cuts and eventually the open mountainside of Mullacor where peat for the smelting works was formerly cut. A branch from it leads to Shallow Adit. Granite boulders line the sides of the road which has a crudely metalled surface and a ditch to one side. Fragments of revetment walling survive, particularly on the hairpin bends. The upper part of the mine road has been badly damaged by a forestry track which cuts right through it and consequently much of the upper section is thickly vegetated and inaccessible, although parts of it have been included in a hill walkers' track.

Shallow Adit GM-4

Driven in the late 1700s, the distinct adit lobby, cut back into the hill, is sited just off a very overgrown and disused section of the Mine Road and right above a forestry track which has cut through part of the spoil heap from it. The adit is open with water issuing from it. It goes into the hillside in a northerly direction before terminating in a collapse where it meets the lode. The presence of old timberwork in the collapse betrays the fact that this was historically bad and running ground.

East Adit GM-6

Of eighteenth century in derivation (and depicted on Weaver's 1812 Map), this trial adit driven in to prove the lode, is sited in a bank above a forestry track and marked by a vegetated cutting issuing ochreous water. Its portal appears to be open.

Flanking Adit GM-5

Of eighteenth century in derivation (and depicted on Weaver's 1812 Map), this trial adit driven to prove the lode is sited almost directly below East Adit. It has, however, not been located due to dense vegetation cover and land slippage.

Stream Adit GM-7

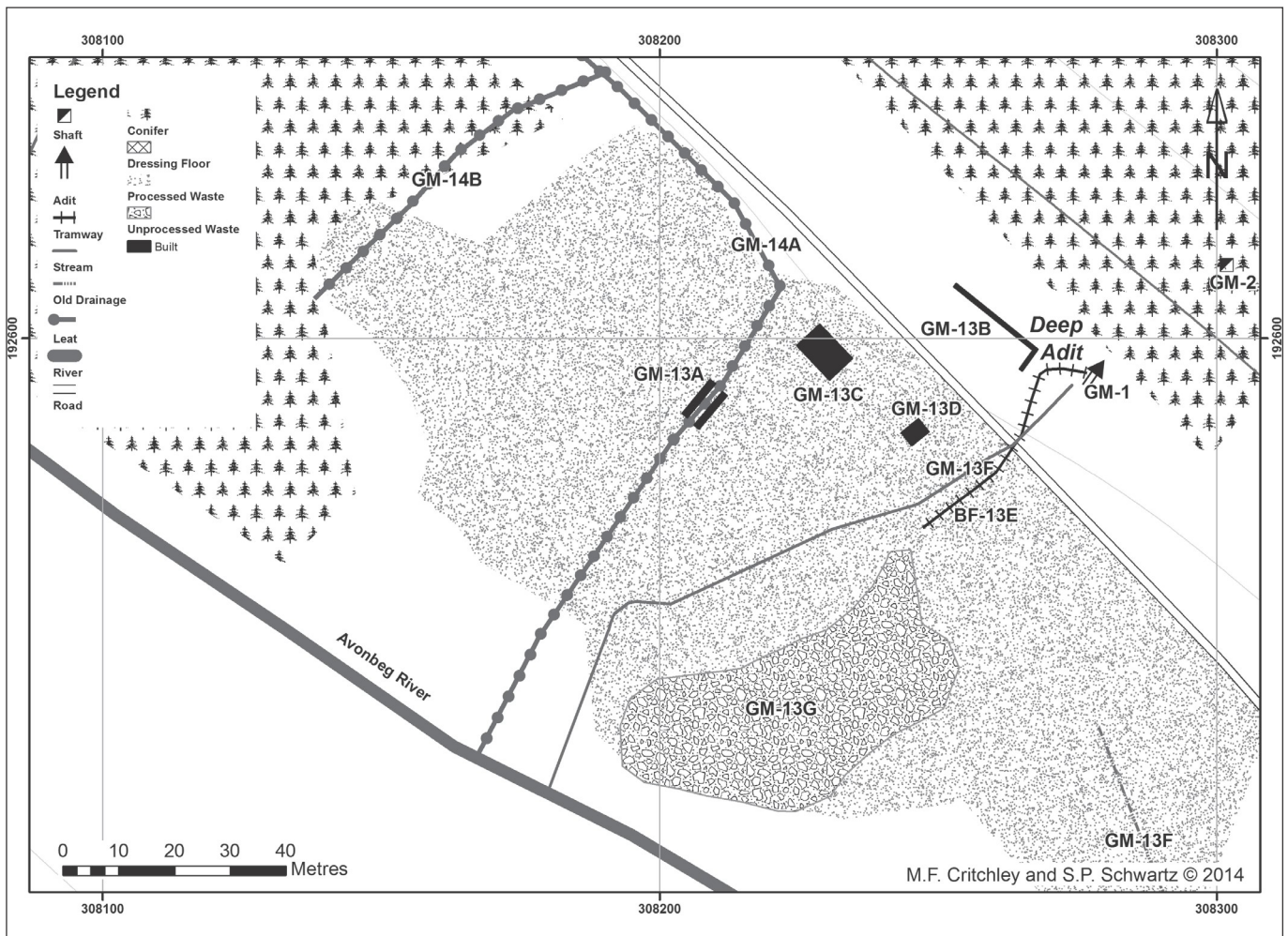
Of eighteenth century in derivation (and depicted on Weaver's 1812 Map), this adit was driven into the bank of the easterly of two streams feeding Mill Brook, to intersect the Ballinafunshogue Lode. Its adit portal has collapsed, any lobby erased (probably by flooding events) and it is therefore difficult to say with any certainty where it was located.

Trial Adit 1 GM-8A

Located in dense vegetation and described as a shaft on OS mapping, this level is marked on Weaver's Map of 1812 and is undoubtedly another trial adit, driven in for 35 metres to intersect the Ballinafunshogue Lode, after which another 16 metres drive to the south east ends in a forehead.

Trial Adit 1 GM-8B

Described as a shaft on OS mapping, and betrayed by a pile of



Map 3: The Glenmalure Dressing Floors

spoil, this trial adit has been driven into the hillside along the strike of the lode to prove it. The heavily vegetated portal is open and issuing some water. A trackway, now choked with gorse and virtually impassable, runs to it from the Smelting House.

Open Cut GM-9

Depicted on Weaver's 1812 map, and now heavily vegetated and choked with fallen tree trunks and vegetation, this open cut with an unnamed shaft in the bottom of it probably represents the earliest attempts to work the Ballinafunshoge Lode where it outcropped at surface. A significant pile of fine un-vegetated spoil to the southwest of the open cut comes from the unnamed shaft. During inspection of the open cut in spring 2014 by the authors, they observed considerable slippage of ground at the bottom of it, suggesting that the shaft might be collapsing. Consequently, the site should be considered unstable and dangerous.

Smelting House GM-10

The smelt mill complex and to the north west, a building that was most likely an office with a square field in front, are marked as roofed structures on the 6-inch OS Map of 1908-9. Today, the only visible remains of this once large complex is a fragment of masonry walling built into the slope of a bank which might have formed part of a yard or storage area at the rear of the mill. The site was levelled and landscaped almost

two decades ago to create a picnic and camping area with a small car park.

Mill for Grinding Ore GM-11

Sited in this location to avail of the passing leat which powered a waterwheel operating crushing/grinding apparatus inside, a fragment of masonry wall less than a metre high which formed the rear wall of the mill building is all that remains of this structure. Lumps of slag containing vesicles and lead globules have been found in the area known as 'Smelting House Bog' close by. The mill is not shown on the 6-inch OS Map of 1908-9.

Blacksmith's Forge GM-12

This building, formerly sited to the south east of the mill for grinding ore and on the course of the Mill Brook which probably turned a waterwheel to power its bellows, was overwhelmed and badly damaged in the catastrophic floods of 1867. The forge is not shown on the 6-inch OS Map of 1908-9 and not even a footprint is now visible.

Dressing Floors GM-13

The former dressing floors sited opposite the Great Adit, a large, flat un-vegetated area situated between the banks of the Avonbeg River and the Stony Road from Rathdrum to the Glen of Imaal, have been largely despoiled by the activities of motorbike scramblers, quad-bikers and off road vehicles



Fig. 20: Leat channel that conveyed water to the Glenmalure Mine dressing floors contouring round the back of a small knoll before meeting Mill Brook

whose tyres have cut up the ground damaging and/or destroying both surface and subsurface archaeology. The site has also fallen victim to periodic fly tipping. The huge dumps of spoil to the south east indicate that the main processing area lay to the south west. Indeed, the presence of sand and slimes at the far end of this area suggests that this is where the fines were treated by buddling, marking the final stages of the dressing process and the probable extent of the floors. The foundations of a wall running along the top of the site parallel to the current road probably demarcated the north western extent of the dressing floors before the Stony Road was widened and tarred in the early twentieth century.

Spoil Heaps GM-13G

Considerable amounts of development spoil from the workings and unwanted mineral such as sphalerite and low grade lodestuff (halvans) from the primary dressing area, were dumped at the north eastern side of the dressing floors. A significant amount of spoil has been removed over the years, leaving the much reduced spoil heap present today.

The site has been badly damaged by scrambling, quad biking and 4X4 usage which has disturbed the stratigraphy of the remaining dumps, destroying vital contextual information about the ore body and the methods of working it throughout the mine's history. Additionally, the dumps and the wider dressing area are heavily contaminated with toxic heavy metals (EPA Report); the continual disturbance of the spoil heaps by the tyres of off road vehicles and bikes is causing erosion and increased mobility of contaminants into the surrounding soil horizons and the Avonbeg River.

Leat GM-14

Well preserved in places, this leat runs for approximately 820 metres from a take off point in the Avonbeg River (destroyed by flooding and changes in the river's course). It flows broadly in a south easterly direction where it powered a waterwheel at the mill for grinding ore, before joining Mill Brook, which was deliberately diverted from its original course down to the Avonbeg River, to run towards the mine's

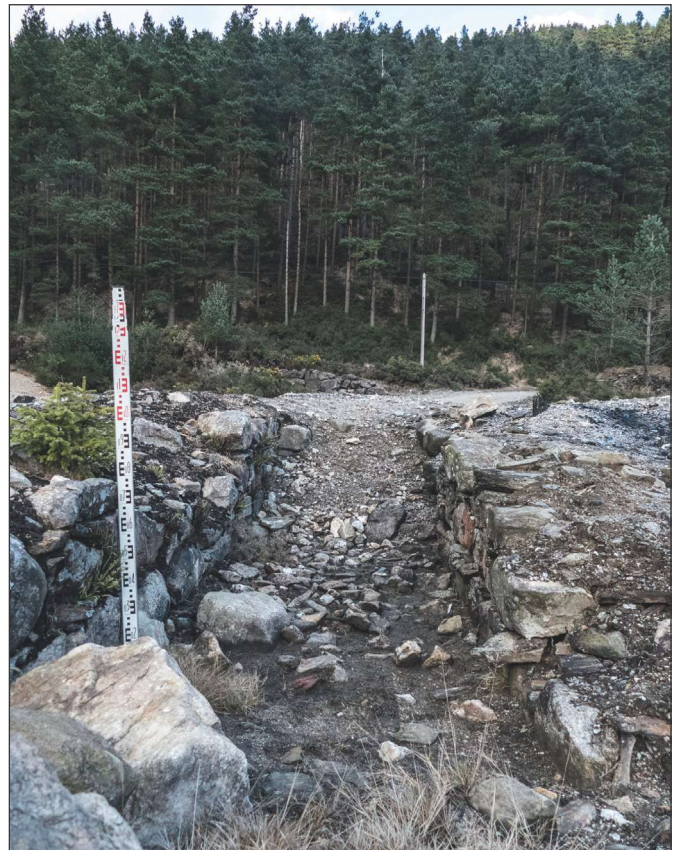


Fig. 21: Waterwheel pit at the Glenmalure Mine, thought to have accommodated a breastshot wheel of approximately 30 feet diameter

dressing floors. The combined water from both sources would have provided a substantial head of water to power the machinery there. The route of the leat can be traced from the point after it crosses, and then runs parallel to, the Stony Road along an earthen embankment where it is at least 1.5 metres deep and approximately 1.5 metres wide. It then passes under the road to flow past the south western side of the mill for grinding ore, the waterwheel pit of which is in-filled and no longer visible, afterwards contouring round the back of a knoll before meeting Mill Brook.

The leat then runs along an earthen embankment below the modern road. Apart from a breach in the embankment where Mill Brook has burst through to resume its original course, the leat is well defined in this area, with an average width of approximately 1.7 metres, with a bank height of 0.8 – 2.5 metres. The leat then becomes ill-defined as it approaches the dressing floors, obscured by over-tipping, but before this point the spot height of the leat channel is 3.5 metres above the extant masonry of the wheel pit. A spillway (GM-14B) is encountered just before the leat enters the dressing floors, which allowed the water to be diverted when required. As the leat waters entered the dressing floors they were conveyed via an elevated timber launder which ran along the top of the floors parallel to the Stony Road, before making an almost 90° south westerly turn towards a waterwheel.

Waterwheel Pit GM-13A

The most discernible feature on the dressing floors is a

waterwheel pit constructed of random schist and moorstone. The internal width of the pit is 1.4 metres (four feet), but the length is difficult to determine (currently in the region of six metres), as the south west end facing the river is buried or has been destroyed. The maximum current depth of the pit is approximately one metre, but it would originally have been much deeper than this, being in-filled with spoil and masonry debris from the fallen walling above.

Traces of grease drips on the interior walling might approximate to the location of the waterwheel's axis, some five metres from the back (north east) wall of the pit, thus giving the wheel a possible diameter of 30 feet (about 9 metres). A comparison of the spot heights of the leat channel where discernible near the dressing floors and the top of the extant masonry of the wheel pit, indicates a leat water head of approximately 3.5 metres. Allowing for the loss of some of the masonry walling of the wheel pit and the timber frame and axle bearing, the above measurement indicates a upper breastshot wheel configuration, if a wheel of 30 feet diameter was installed.

Due to the absence of any substantial masonry foundations contiguous to the pit which one would associate with a crushing house, we surmise therefore that this wheel powered a battery of stamps, possibly located on the north western side of the pit, which would have been required on a mine where the galena was bound up in hard quartz. The presence of a wooden post, a metal pin and an iron bar sticking up out of the ground on the south eastern side of the pit, would suggest that some machinery, possibly jiggling hutches, was previously installed here.

Vandalism to the south east masonry walling of the waterwheel pit has resulted in the removal of at least two large rectangular blocks bearing circular holes in relation to bolts that secured the wooden frame of the waterwheel which were still in situ in 2007, but have since been robbed from the site. The tailrace, which ran in a straight line down through the dressing floors to the Avonbeg River, is no longer visible, being filled with spoil, although a slight linear depression can just be discerned.

Shed for Cleaning Ore GM-13B

A fragment of walling constructed of moorstone and schist is all that remains of a building described as a 'shed for clearing ore' on the 1838 First Edition OS-Map. It lies close to the Great Adit portal, the main haulage way, and was probably the site where the lodestuff was tipped to be washed, and then possibly sorted to undergo a primary manual reduction in an open sided roofed structure. The extant masonry is grease splattered, suggesting some form of dressing machinery was sited within it. A wooden box launder emerging from the bank behind the shed on the north western side possibly conveyed water for washing the ore.

The 6-inch OS Map of 1908-9 shows a rectangular building above the shed for cleaning ore which must have been built during the Hodgson years as it does not appear on the first edition 6-inch OS map of 1838. No obvious trace of it can be found on the ground due to dense vegetation.

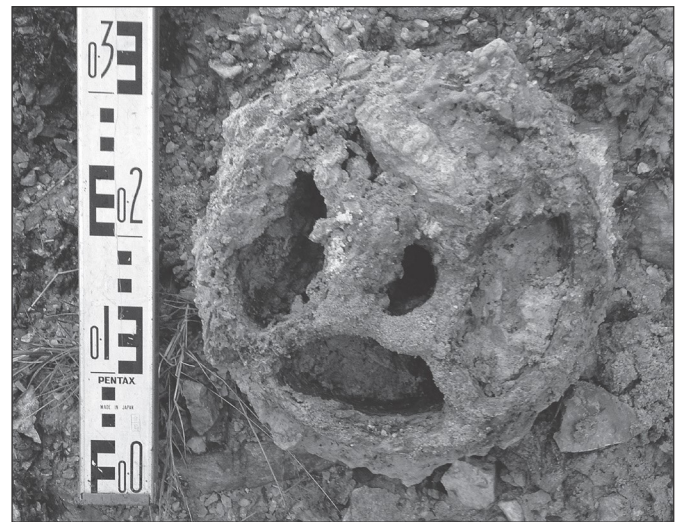


Fig. 22: Cast iron tram wheel discovered on the mine spoil heaps at the Glenmalure Mine

Tramway Embankment GM-13E

Running parallel to and above the adit channel is a line of granite masonry which seems to be the revetment walling for a tramway which aligns with the adit portal. This would have been used to convey waste material from the workings to the mine spoil heaps. A spur probably led off the tramway near the end of the adit lobby to convey lodestuff above the shed for cleaning ore. The stumps of two timber posts which accommodated this tramway can be seen to the south east of the masonry foundations of the shed for cleaning ore. A cast iron chair for securing the rail was found near the line of the tramway and a cast iron wagon wheel (Fig. 22) on the spoil heap.

Building Foundations GM-13C

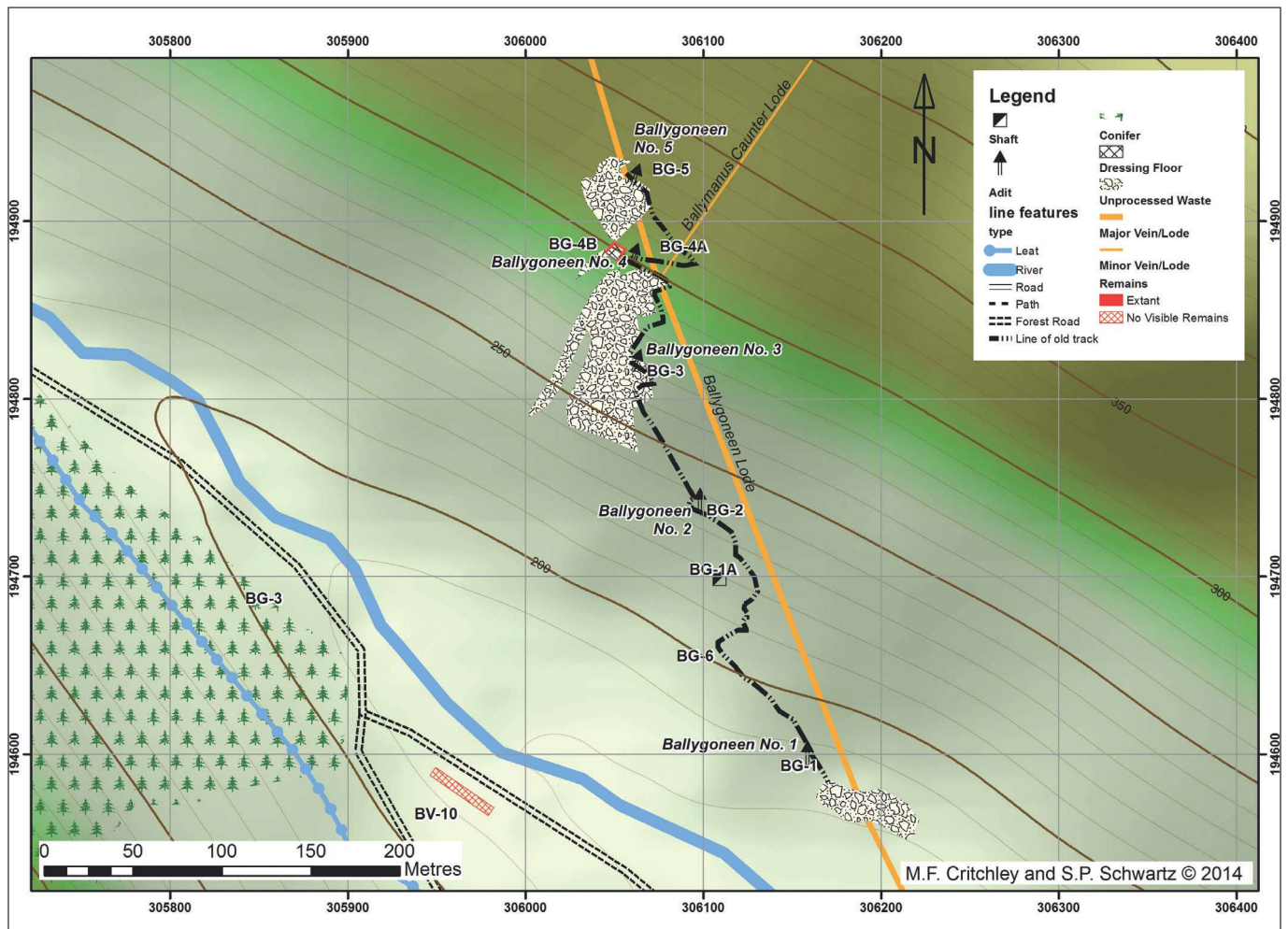
Located to the south east of the waterwheel pit in a vegetated area parallel to the Stony Road is the footprint of a stone building measuring 7m x 7m. Fragments of pinkish-grey slate indicate that the roof was tiled. The most likely use for this building was a materials store where the equipment and tools used on the dressing floors (hammers, shovels, rakes, sieves) plus other mining sundries such as grease, would have been kept under lock and key.

Building Foundations GM-13D

The foundations of a rectangular stone structure, some 3m x 3m is of indeterminate use. Fragments of pinkish-grey slate indicate that the roof was tiled. A large, rectangular granite block with two hemispherical depressions found here could be a bucking anvil, or knocking stone, the hollows formed by the action of bucking irons (flat headed square hammers) used to manually reduce the orestuff.

National School House GM-15

Built of cob and thatch in 1836 with a separate building accommodating a school teacher, these became private dwellings, in 1881 leased by Julia McDonnell, after they ceased to function as a school after funding was withdrawn in 1875. They are still marked, albeit unroofed, on the 6-inch OS Map of 1908-9, but today only the faint footprint of the building situated in a boggy hollow can be discerned.



Map 4: The Ballygoneen Mine Site



Fig. 23: The Ballygoneen Mine, sited high in the cliffs at the head of Glenmalure seen here from the Stony Road that runs through the valley from Rathdrum over the Wicklow Mountains to the Glen of Imaal. Three of the mine's five levels are betrayed by spoil heaps. Adit Four (centre) has a well-defined crude dressing area sited close to its portal



Fig. 24 left and Fig. 25 right, depict the small dressing floor constructed of random moorstone boulders close to the entrance of Adit Four. Built on the orders of Captain Griffith in 1853, this, and another less well-defined dressing floor at Shallow Adit, were meant to be only a temporary measure before purpose built dressing floors were constructed at Deep Adit. The lodestuff was washed, sorted and crudely reduced at this small dressing area before being transported to the valley floor. The 'V'-shaped notch in the wall of Fig. 24 is where a picking grate was likely positioned, fed by water from the adit. One can only imagine how brutal it would have been to work in such an elevated, exposed place

BALLYGONEEN

Deep Adit (Adit One) BG-1

Developed as the main haulage way for the mine, a large finger dump of fine gravelly material partially covered by grass and gorse, leads away from the adit portal and lobby, both of which have collapsed. There are no obvious signs of dressing floors built in the vicinity of this adit, where one would expect them to have been constructed.

Shaft BG-1A

Sunk on lode for ventilation purposes, the collar has collapsed leaving a circular depression in-filled with rocks and vegetation. Quantities of granite rock dumped when the shaft was being developed can be seen down-slope, including rocks bearing triangular drill marks.

Adit 2 BG-2

Very little spoil is associated with this adit, the lobby and portal of which have collapsed. A boggy area in front of the collapse betrays the fact that water is percolating through the collapse.

Adit 3 BG-3

A large spoil heap, clearly visible from some distance, can be seen below the collapsed portal and lobby of this adit.

Adit 4 BG-4A

A large spoil heap, clearly visible from some distance, can be seen below the collapsed portal and lobby of this adit. Water is percolating through the large moorstone boulders of the collapsed portal.

A temporary dressing floor (**BG-4B**) was created here in 1853

to process the ore prior to purpose built dressing floors being constructed. Of coursed-moorstone measuring approximately 7m x 9m, the open fronted dressing area is set into the ground to the west of a platform leading away from the adit portal. Here the ore would have been roughly sorted and ragged. A 'V'-shaped slot in the eastern wall below this platform (Fig. 24) might indicate where a picking grate was situated, presumably fed by water from the adit. A ramp leads down from the platform to the dressing floor where the spalling, cobbing and riddling of ore took place. The floor is covered in grass but is likely to be cobbled underneath. Quantities of dressing refuse (mostly quartz) can be seen to the south and west of the dressing floor. This is the best preserved of two such makeshift dressing areas at Ballygoneen Mine. It is currently unlisted but should ideally be included in County Wicklow's Record of Protected Structures.

Shallow Adit (Adit 5) BG-5

A large spoil heap, visible for some distance, can be seen below the collapsed portal of this adit. The eroded lobby is just about visible. A flat area has been cut into the slope of the hill as a temporary dressing platform to the west of the adit portal, but it is not as well engineered or clearly defined as that at Adit 4.

Mine Track BG-6

A rough track from Deep Adit zigzags its way up the mountainside to Adit 5. It cannot be termed a road, as it is not as distinct or well engineered as those serving the Glenmalure or Baravore Mines. Formed by clearing the moorstone boulders to one side, this track would have been used by the miners to access the mines' portals and presumably by mules transporting materials up to the workings and the dressed ore down to the valley floor before the development of Deep Adit.

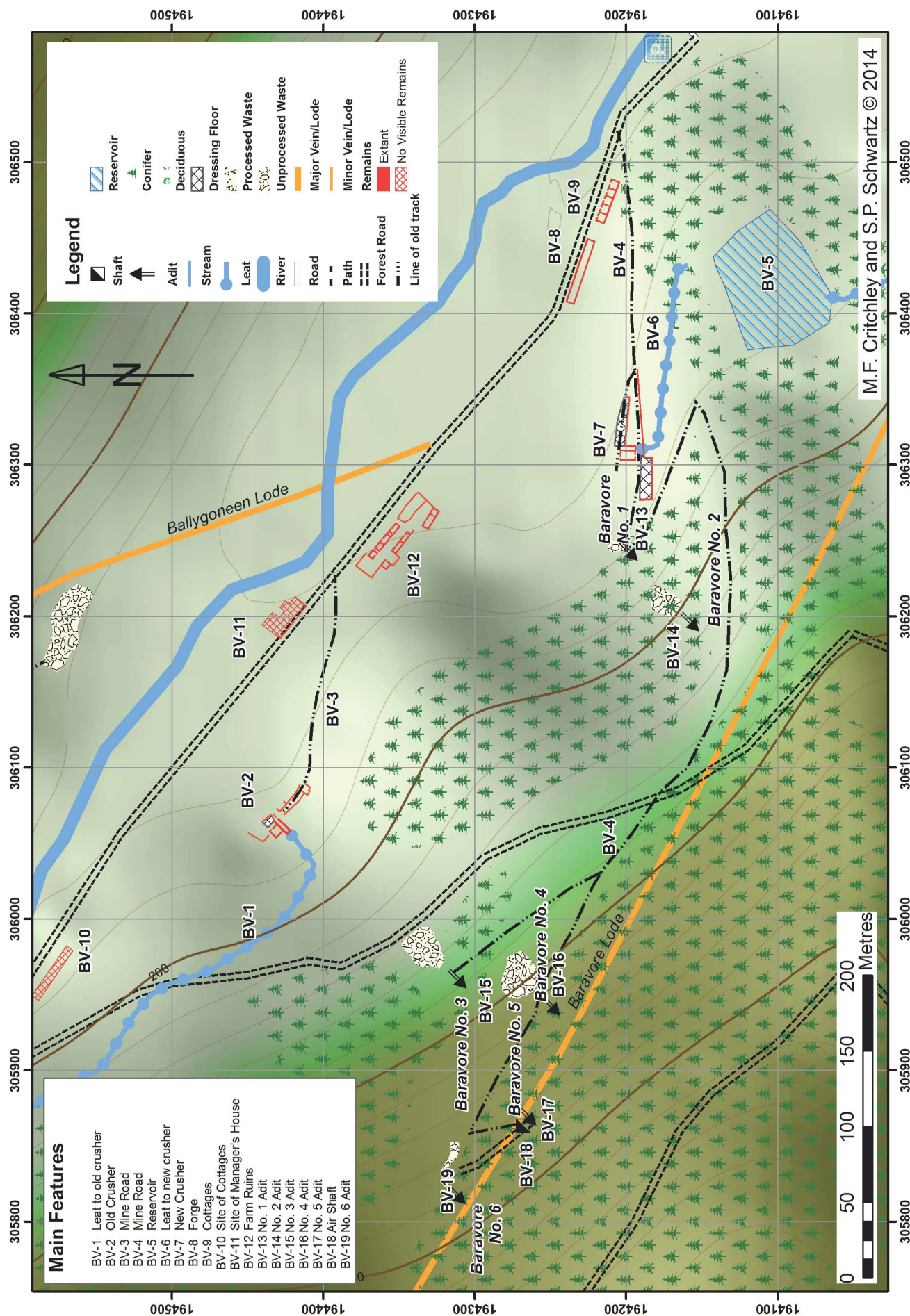
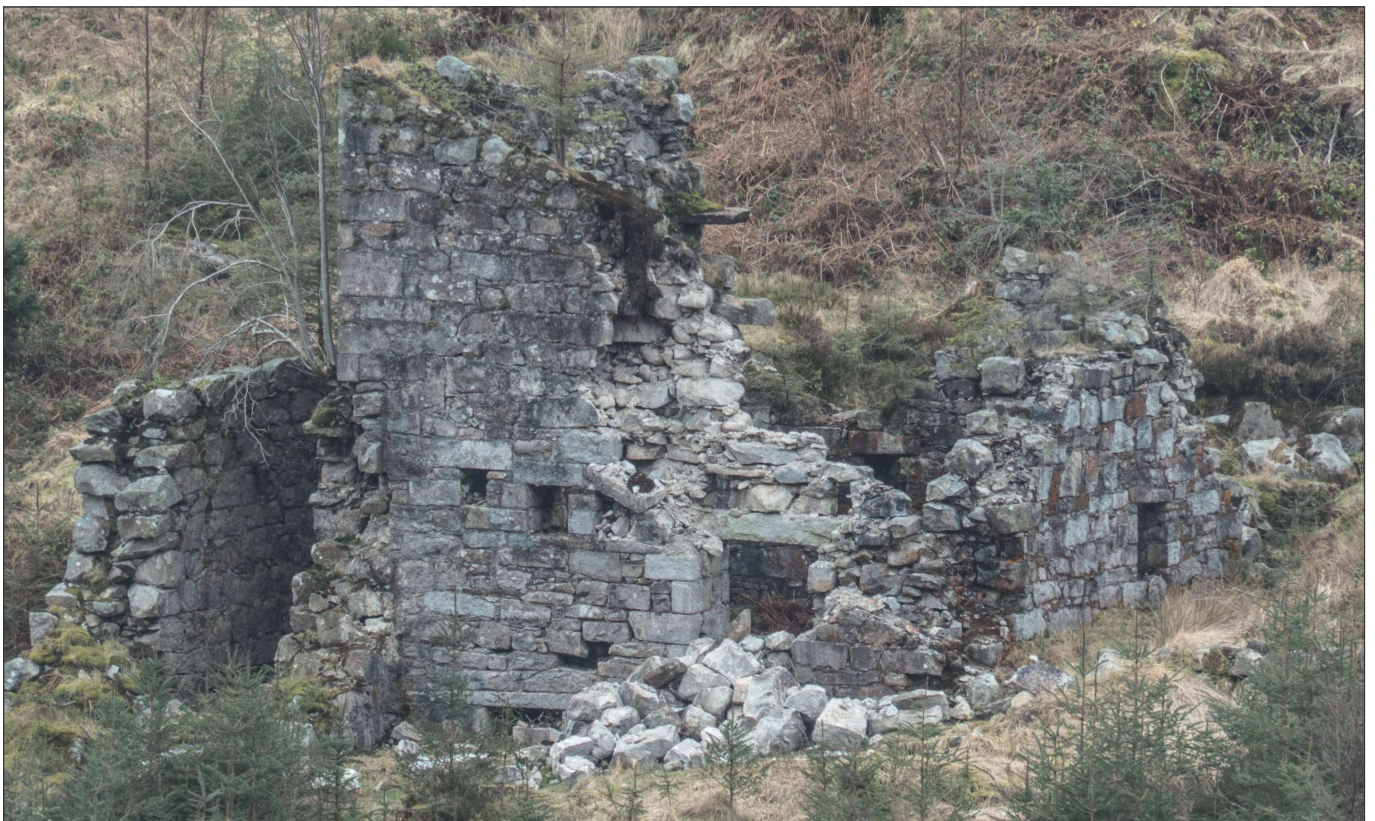




Fig. 26: *The Old Crusher House and waterwheel casement for a single set of Cornish rolls at Baravore Mine, pictured in March 2008 before part of its front wall collapsed in late winter, 2013 (see Fig. 27 below). This mid-nineteenth century building, listed in the Record of Protected Structures for County Wicklow, is the finest industrial monument of its type in Ireland. Its preservation is a matter of urgency*



BARAVORE MINE

Leat to Old Crusher House BV-1

This ran in a south-easterly direction for well over 600 metres from a take off point in the Avonbeg River, before turning sharply north as the ground drops steeply above the crusher house where the water was conveyed in a timber launder to discharge onto an overshot wheel. The leat was formerly quite visible and undamaged (see Chester and Burns 2001, 70-71) apart from a section cut through by a forestry road and another where the leat waters were conveyed over a small gully in a timber launder supported on stone pillars. However, the leat has been all but destroyed by heavy earth moving machinery associated with clear felling around a decade ago; the remaining fragments are choked with tree debris and vegetation and are barely visible. No obvious dam or take off point for the leat could be identified on the Avonbeg River, as these have probably been swept away by past flooding events.

Old Crusher House BV-2A

Based on documentary evidence, we estimate that this building, 6.9m x 7.35m was probably constructed in 1851 to house a single Cornish rolls crusher. Its design is very similar to that at the Hero dressing floor at Glendasan constructed in 1837. Built into the slope of the hill, this two storied building had a slate roof sloping down from its south eastern wall. The walls are 90cm (3ft) thick and all external elevations are of roughly dressed and coursed moorstone bonded in a pale lime mortar with dressed granite lintels and quoins to the elevation

returns. There is no trace of internal rendering.

The waterwheel casement (**BV-2B**) of random moorstone boulders with walls 1.30m thick, 3.5m in height, 10.9m in length and 1.4m in width, is built onto the south east crusher house wall through which the axle for the waterwheel passed. All but the very front of the casement is intact (which was probably destroyed taking the wheel out); there is some rubble and vegetation debris at the bottom of the recessed section which is at least 1m deep. Fragments of plaster on the internal walls suggest it was rendered. Its dimensions indicate that it could have accommodated an overshot wheel up to a maximum of 36ft (11m) in diameter and 4ft (1m) wide. Overshot wheels are ideal for head differences of three metres or more (such as would have been encountered at Glenmalure) as they are efficient energy converters for their size and speed.

The south eastern wall of the waterwheel casement has a rectangular recess 70cm W x 200cm L x 20cm D built into its exterior which could have housed a timber support related to a stamps battery run off the waterwheel, but no archaeological evidence has yet been found to indicate that stamps were erected on the south eastern side of the crusher house. Below this recess is a cut granite stone 130cm x 90cm with two circular holes set 64cm apart and a crudely cut rectangular groove which acted as an axle bearing plate and which has fallen from the wall above. Metal bolts or fixing pins passed through the holes in this axle bearing plate and down through the wall, emerging in two 'crow-holes' that align with another

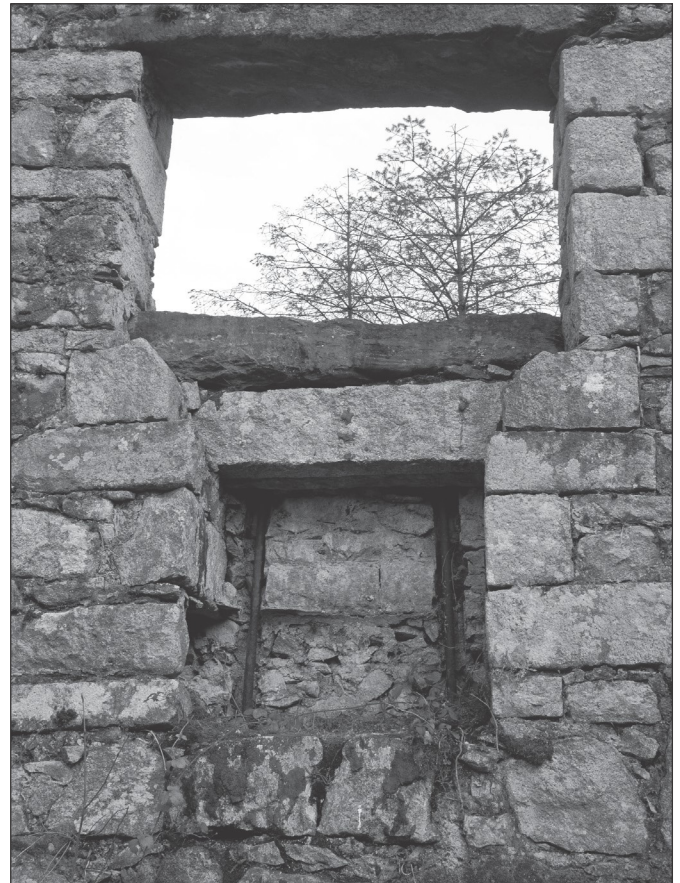


Fig. 28 (left): The axle mounting plate with two protruding 'bolts'. These run the length of the crusher house wall as depicted in Fig. 29 (right) and emerge in two 'crow holes' at the base of the waterwheel casement (Fig. 30)



Fig. 30: View inside a 'crow-hole' at the bottom of the waterwheel casement. Used during the installation of the machinery, 'crow-holes' were vital access points for attaching a plate and fixing cotter on the end an iron bolt that secured an item of machinery above. Only the plate is depicted here

pair in the opposite wall (see below). Besides this parallel pair of 'crow-holes' are a series of five further pairs in each wall. 'Crow-holes' were access points for attaching a plate and fixing cotter on the end of the iron bolts that secured items of machinery or the heavy wooden frame of the waterwheel. During manufacture, a slot was cut towards the lower end of each bolt shaft. An iron or steel wedge (a 'cotter') was driven through this slot below a fixing, or stop, plate. During the installation of the machinery or waterwheel frame, the plate and cotter prevented the bolt end from being pulled out of the pocket and provided a secure fixing, with the fixing nut being tightened at the top end of the bolt.

The waterwheel axle and drive shaft passed through a rectangular aperture 110cm x 160cm in the south eastern wall of the crusher house. A cut granite bedstone approximately 100cm x 30cm sitting partly on top of the 1.30m thick wall of the waterwheel casement and partly inside the recessed aperture contains two well preserved iron bolts 64cm apart with visible threads protruding within a rectangular groove into which a metal axle bearing was set. Inside the crusher house these holding down bolts are visible running the length of a square recess, 100cm x 105cm, set directly below the rectangular drive shaft aperture and separated from it by a granite lintel (Fig. 29). The bolts disappear into the masonry below. The ends of these bolts emerge in two 'crow-holes' in the bottom of the south eastern wall of the crusher house (see Fig. 30). Directly opposite and parallel to these two 'crow-holes' are the identical pair described above, minus any bolt



Fig. 31: Interior rear wall of the crusher house showing joist pockets for support timbers relating to (L-R) the Raff-wheel; the Cornish rolls (parallel larger apertures); the trommel and axle bearing. These joist pockets are repeated in the front wall of the crusher house

ends, plates or fixing cotters.

The interior square recess was probably engineered to house a lower gear wheel to operate the drive shaft for the rolls crusher and the Raff-wheel. The use of a separate gear to drive these might have been to change the rotational speed of the rolls from that of the waterwheel and/or to provide a means to engage/disengage the rolls and Raff-wheel from the waterwheel. The quoin stones directly below the axle bedstone and to the left and right of the lintel in the top course of masonry of the square recess have been deliberately angled to accommodate the upper gear wheel on the waterwheel shaft (see Fig. 29). There are significant grease splatters on the walling below the drive shaft aperture which has dripped off the axle and gear wheel, and traces of grease can also be seen on both the interior north western and south western walls, probably in relation to the Raff-wheel.

The upper section of the rear (south western) wall has collapsed (damaged perhaps when the crusher was removed), but would have contained a doorway. This gave access to the upper storey where the ore was shovelled into a hopper set into the wooden floor that fed two cast iron rolls, which we will call A and B, and where the upper part of the Raff-wheel protruded through the floorboards. The Raff-wheel had buckets on the face turned towards the crusher which conveyed fragments of ore too big to pass through the perforated plate of an inclined trommel sited below. As the wheel revolved it tipped these fragments into a sloping apron which fed them back into the ore hopper to be re-crushed.

The bottom section of the damaged north western wall has the only surviving evidence of fenestration in the shape of a square window of tapered recess design, which would have illuminated the lower storey containing the rolls, trommel and waterwheel drive shaft running SE to NW across the length of the room. The end of the shaft of roll A was coupled to the main drive shaft which carried the Raff-wheel; the other end had a cog-wheel which geared into a similar one on the shaft of roll B and so drove it. The trommel was driven from the shaft of roll A by means of a bevel gearing. The lower storey was accessed via a doorway in the north east wall. Forster (1821, 358) notes that a small amount of water was run over crushing rolls in the North Pennines of England to prevent them from overheating and the small rectangular aperture at the bottom of the north east wall of the building could be a drain for such cooling water.

Chester and Burns (2001, 71) provide an interpretation of the layout of the machinery based on the extant archaeology. They conclude that weighted levers for providing tension to the rolls crusher protruded through two large square apertures in the front of the house. We, however, disagree with this interpretation. These two holes have identical apertures at the back of the house just below the openings for a series of floor joists, suggesting that two large parallel baulks of wood ran the length of the interior to support the rolls crusher. Moreover, three other holes can be seen in the rear wall of the building (Fig. 31). They relate respectively to the wooden support frame for the Raff-wheel (left) which has a corresponding hole at the front of the house and the trommel and axle bearing

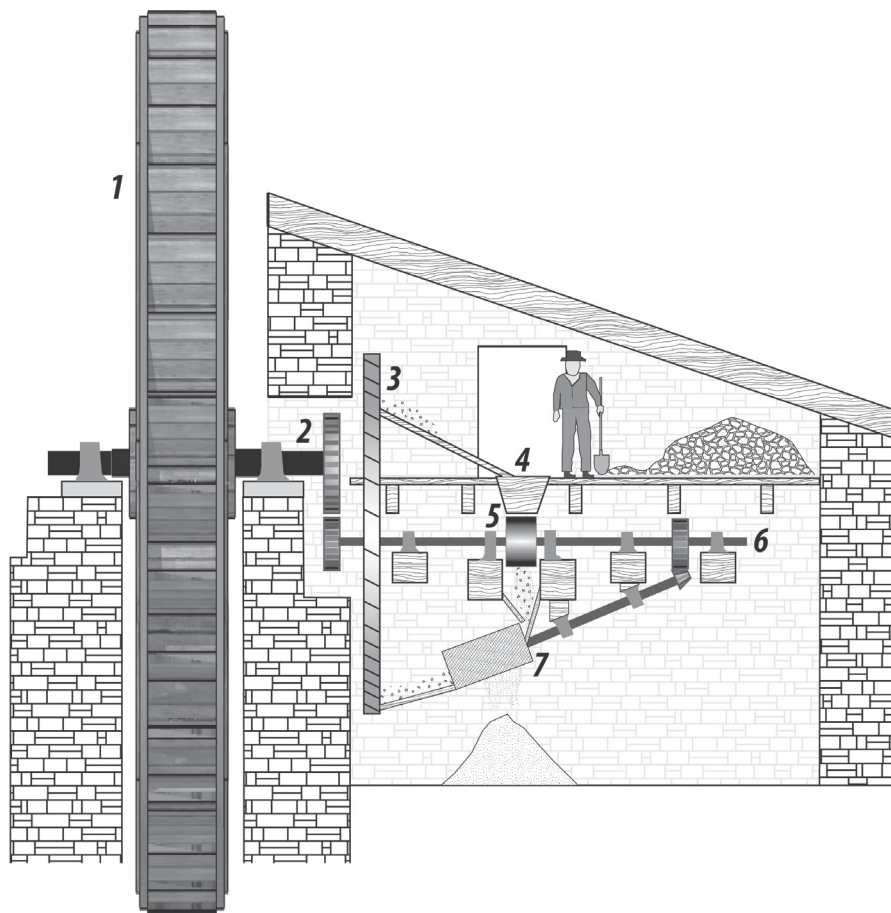
(right) which did not continue through the entire thickness of the front wall (see Fig. 27).

We have concluded that the weights for the rolls' levers did not protrude outside the building as claimed by Chester and Burns, but were suspended inside the rear of the building. This was not uncommon, see for example the crusher house at the Old Providence Mine near Ketterwell, Yorkshire (Woodall 1991, 22). Figure 32 represents a diagrammatic representation of the dressing machinery contained within the Old Crusher House based on its extant archaeological and architectural features.

It has been suggested (EPA report) that this crusher house and its attendant dressing floor was a central processing site for both Baravore and Ballygoneen Mines, the latter of which lay across the valley on the other side of the Avonbeg River. Griffith's Valuation (1854) records a crusher house in the ownership of the Baravore Mining Company, on land owned by Peter Byrne, so the building had been erected by then. We speculate that it was probably constructed around the same time as the other buildings on the mine, in the very early 1850s. Six years later, the waterwheel and crushing machinery belonging to the defunct Baravore Mining Company was transferred to the Barravore Silver-Lead Mining Company Ltd. (IT 1860).

Interestingly, in 1853 a waterwheel, crusher and stamps had been ordered from the St Austell Foundry in Cornwall by the Ballygoneen Mining Company (MJ 1853). This consignment of machinery would have arrived in August 1853. As yet, we have found no obvious archaeological evidence at the surface of the Ballygoneen Mine for buildings or foundations related to the installation of any or all of this machinery; no lead providing water to power a wheel and no remains of dressing floors. Additionally, there is no indication in the Cancelled Land Books (VO Dublin) of any buildings or industrial structures related to the mine ever having been constructed in the Ballynagoneen townland. However, it seems unlikely that the St Austell manufactured machinery was erected at Baravore, as the companies leasing the two mine setts were different, as were the mineral lords. Moreover, by 1853 the Baravore Mine was suspended due to the acrimonious collapse of the partnership of Leach, Oddie and Griffith. No documentary reference has yet been found to suggest that an agreement was reached between the two companies whereby Ballygoneen ore was crushed and concentrated at the Baravore dressing floor, but this cannot be ruled out.

The clear felling of the forestry in the vicinity of the Old Crusher House around a decade ago has caused considerable mischief, as conifer saplings and a dense tangle of brambles and other vegetation have grown up very rapidly and are beginning to obscure and damage the archaeology. A field visit by the authors in December 2014 revealed that the previously planted flat area between the crusher house and the track has been replanted with conifer saplings. This is a very regrettable action by Coillte, as these trees will eventually grow to a height that will obscure the monument and destroy the visible integrity of the site. The area in front of the New Crusher House has been similarly replanted.



M.F. Critchley 2014

Fig. 32: Conjectural diagram of the layout of the machinery in the Old Crusher House based on archaeological and architectural evidence. 1: Waterwheel; 2: axle and gear wheels; 3: Raff-wheel; 4: ore hopper; 5: crushing rolls; 6: drive shaft; 7: trommel. The weighted levers to the rear are not depicted

Water ingress into the stonework of the front wall of the building, which was already in a parlous condition, increased following the removal of the conifers that once conferred some protection from the elements. This, coupled with two consecutive hard winters during which ice formed in the interstices of the masonry, caused the largely unsupported lintel over the doorway in the north western wall to collapse bringing down a large section of its outer masonry in the spring of 2013. The remaining wall is now structurally unsafe and further collapses are to be expected. An additional threat to the structural integrity of the building emanates from water running down the hillside which passes through the rear (south western) wall washing out the remaining lime mortar and degrading the load bearing stonework. This comes from an ill considered drain built by Coillte to conduct water away from the forestry track above the site. A tree growing out of the wall above the waterwheel casement is also weakening and degrading the stonework.

The remains of crusher houses are rare in Ireland, and this one, dating to the mid-nineteenth century, retains a significant number of its architectural features, allowing an interpretation of the machinery contained within. It is undoubtedly the finest example of a water powered single Cornish rolls crusher

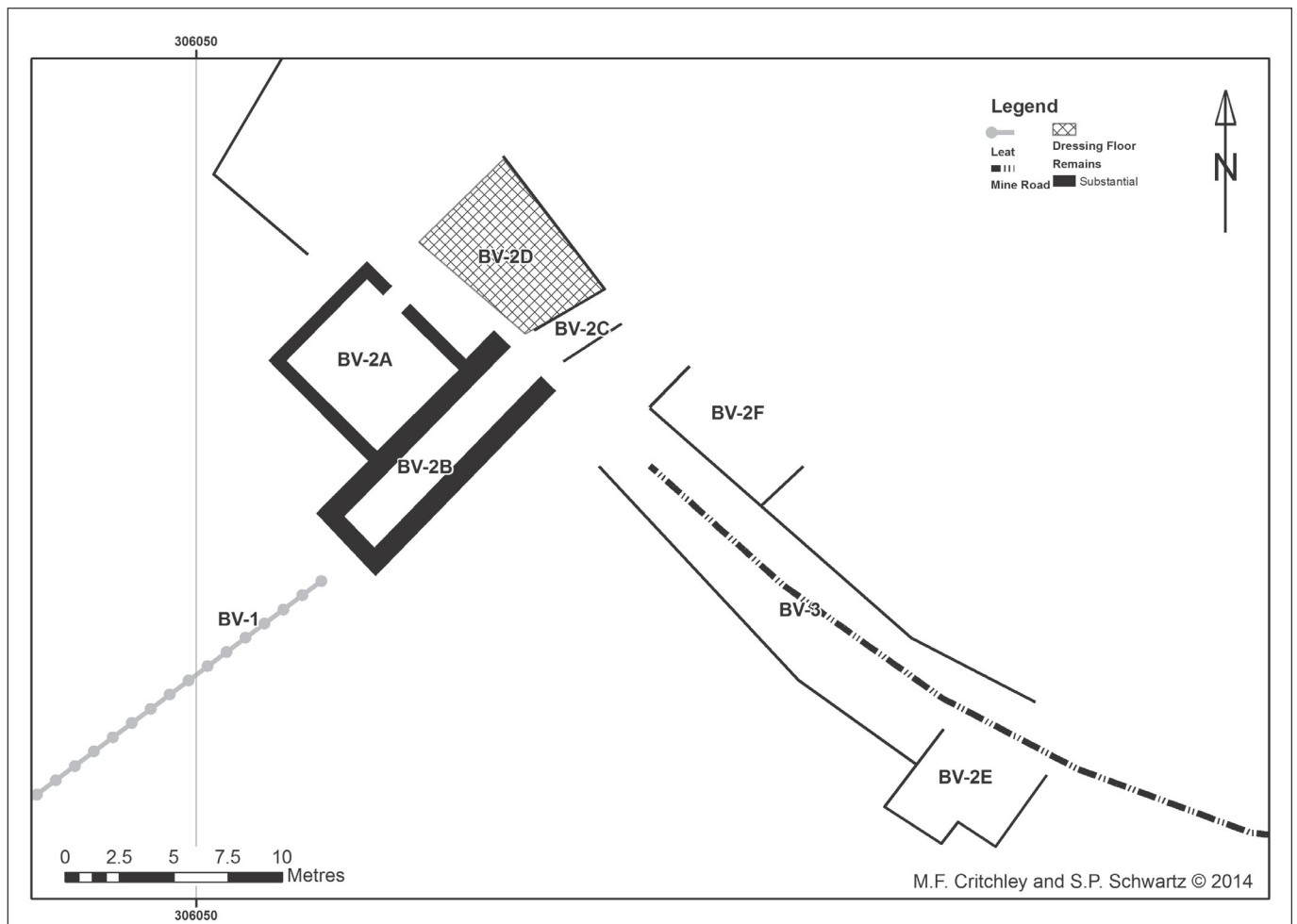
house in Ireland and is therefore of national significance. Its preservation is of the utmost urgency. The curtilage surrounding this important monument should be cleared of conifers and other trees to prevent future damage to the monument and the loss of its visual integrity.

Mine Road to Old Crusher House BV-3

Lined by moorstone boulders and raised above the surrounding bog with revetment walling of moorstone up to a metre high in places, the road is clearly defined from its junction with the Stony Road opposite the former Mine Manager's house and stores (BV-11) which were demolished in the mid-twentieth century. The road choked with conifer saplings and other vegetation as to be impenetrable as it contours round the hillside towards the crusher house. Its course can be seen again clearly after it passes a small open fronted building where it runs up to the crusher house atop a well defined section of revetment walling. Still visible are the remains of a pile of partially dressed lead ore, placed at the end of the road, probably to be removed when the mine was abandoned.

Dressing floors BV-2D

A rectangular platform atop a revetment wall built of moorstone is sited in front of the Old Crusher House. Leading away from



Map 6: Baravore Dressing Floors, Old Crusher House Site

the platform on the north western side is an area, now boggy and overgrown, bounded by a crude moorstone wall weathered to less than a metre high. At the opposite (north eastern) end of the platform, a metre deep tail race (**BV-2C**), constructed of granite blocks, conducts water away from the waterwheel casement towards the lower levels of the dressing floor which have not survived. The deposition of bog makes it impossible to determine without an archaeological dig, whether this platform is cobbled. Any trace of a primary dressing floor above the crusher (on the south western side) has been almost certainly obliterated by forestry activities. The presence of quantities of fine quartz gravel suggests that an area on the platform below the south east wall of the crusher house was possibly reserved for jigging purposes. The lack of any significant spoil (gravel and sands) in the vicinity of this dressing floor area, indicates that not much ore was ever processed here.

Building BV-2E

Built alongside the mine road with sloping walls of random moorstone weathered to around one metre in height is a small rectangular building. Its function is unclear, but given that it is sited alongside the mine road, it might have served as an ore store.

Lower Dressing Area BV-2F

Directly below the mine road, and built up against its

revetment wall, is an area bounded on either end by crude sloping walls of random moorstone which was undoubtedly associated with ore dressing. However, any evidence of buddling activities in this area has been lost due to the planting and subsequent clear felling of the area by Coillte.

Baravore Mine Road BV-4

This clearly defined track runs behind the extant remains of a row of cottages, constructed along the line of the Stony Road, towards the New Crusher House. After approximately 150m, the road bifurcates, with the lower track providing access to the dressing floors below the crusher house, and the upper track passing across the dressing area to the rear of the crusher house towards Deep Adit, where it makes a hair pin bend to zigzag up the hillside serving Adits, 4, 5 and Shallow Adit (No. 6). Branches off the road run downhill to access the portals of Adit 2 and Adit 3, the former of which is almost impossible to trace on the ground.

Since the clear felling, many sections of the road are barely visible and all but impassable, choked with vegetation and hidden by bog. The best preserved section, albeit very muddy, is that used by hill-walkers which runs behind the crusher house uphill to a point where it is bisected by a new forestry road. A dense thicket of rhododendron alongside the road to the east and just before the crusher house should be removed as this could potentially colonise the curtilage of the New



Fig. 33: The New Crusher House at the Baravore Mine, a well-constructed building erected in 1859-60 to accommodate what we believe to have been a multiple rolls crusher and is the finest extant example of a such a crusher house in Ireland. Yet, despite its solid appearance, urgent conservation work is required to ensure it does not suffer a similar fate as the Old Crusher House, the front wall of which experienced a significant collapse in the spring of 2013

Crusher House and threaten the monument itself if it continues to grow unchecked.

Reservoir and Leats BV-5 and BV-6

The reservoir, commenced in 1859 to provide a constant supply of water to the New Crusher House, is accessible on its western side by cutting down from the zigzag mine road 70 metres after the first hairpin bend. Roughly square in shape and formed from a natural depression in retreat moraine, it is quite marshy and can clearly be seen from the hillside on the opposite side of the valley. Chester and Burns (2001, 70 *et seq.*) report the discovery of a granite masonry outflow and stone lined sluice for the leat leading to the crusher house some 120m to the south west and the inflow leat at the rear of the reservoir taken from the Fraughan Rock Glen some 213 metres to the south east. They also report a 40ft (12m) breach in the wall in its eastern end. This was apparently done deliberately in the mid-twentieth century by the local community to prevent anyone from drowning in the reservoir. Chester and Burns estimate the reservoir to be in the region of 300ft (91m) diameter with a head of 8-10ft (2.4-3m) above the leat, making it capable of holding more than 10 million litres (four million gallons).

As the leat approaches the rear of the New Crusher House, it turns 90 degrees north and enters a stone lined channel approximately one metre wide. This probably served to accommodate a change in elevation between the leat and the timber launder conveying the water across the mine road to the top of the wheel. A notch in the masonry wall marks the point where the timber launder joined the channel.

New Crusher House BV-7A

The two storey New Crusher House built in 1859-1860 is a well constructed substantial building erected into the slope of the hillside with an elevation of 11.1m to the roof apex at the front and 5.2m at the rear; it originally had a pitched slate roof (no longer extant). The walls are 90cm (3ft) thick and all external elevations are of roughly dressed and coursed local moorstone bonded in a pale lime mortar with dressed granite lintels and quoins to the elevation returns. There is no trace of internal rendering. A doorway at the front (offset towards the west side wall) leads into the lower storey and a second doorway is located in the rear wall of the house, flush with the level of the second floor which was used to bring ore into the building from the nearby dressing area. Fenestration includes two windows on the second storey, one in the west wing wall



Fig. 34: *Eastern wall of the New Crusher House. Note the discharging arch built above the square aperture which accommodated the drive shaft that transferred power from the waterwheel to operate the crushing rolls inside the building*



Fig. 35: *The rear of the crusher house featuring the doorway into the upper storey where the ore was fed into a hopper. Note the joist pocket in the eastern wall at the level of the rear doorway that probably held a timber supporting either the waterwheel frame or a launder bringing water onto the wheel*

and another directly below the front gable. The letter 'B' has been inscribed into a dressed granite block in the exterior gable wall above the rear door and probably refers to the name of the townland from which the Barravore Silver and Lead Mining Company, which erected the building, took its name.

The building was sited with two main objectives in mind: firstly, to take advantage of a natural dam in the retreat moraine on the nearby hillside which could be modified to bring in 'a never failing supply of water' (IT 1860) to power a waterwheel; secondly, it was constructed close to the portal of the Deep Adit which was being driven to intersect the workings with the intention of using it to convey all the ore out of the mine close to where it would be washed and crushed. Another consideration having a direct bearing on the form and structure of the house, is the type of crushing apparatus it was intended to accommodate.

A waterwheel casement (**BV-7B**) of randomly coursed moorstone built onto the east side of the crusher house has been partially damaged, probably when the waterwheel was removed. Two square pockets 0.5m x 0.5m set approximately 6.2m apart in the lower eastern wall of the crusher house appear to have been constructed to accommodate substantial timbers, part of the frame required to bear the weight of the waterwheel. A notable feature of both square pockets is the presence of a small circular hole in the upper interior face of the stone work. These locating holes were presumably used to secure the timbers upon insertion.

A square aperture (60cm x 60cm) in the east wall of the crusher house, not central but offset to the rear, leads from the waterwheel casement and marks the axis of the waterwheel (and drive shaft into the house). The aperture does not retain signs of a bearing for the axle drive shaft, which indicates this was most likely accommodated on the external timber frame. The cement lined interior of the drive shaft aperture is angled downwards on both sides to throw off water. Its centre is five metres from the rear wall of the casement, indicating that the maximum diameter the waterwheel could be is 7.3m (24ft). However, the post holes near to the front and rear of the casement used to secure the timber framework of the wheel would have restricted the diameter to a maximum of 6.2m (20 feet). The width of the casement suggests a wheel with the maximum width of 6 feet (1.8m). However, the available width would have been reduced by the side timbers of the frame and an allowance for clearance, making it more likely to have accommodated a wheel with a width of 3-4 feet. A contemporary newspaper report (IT 1860) states that the wheel was 32ft diameter and 3½ft width (approximately one metre), but field evidence suggests that the dimensions of the wheel have clearly been misreported.

For this wheel to have been of the breastshot type, the water would have had to have arrived below the top of the wheel which is clearly not the case here, meaning that the wheel was overshot. There is a joist pocket in the east wall of the building at the same height as the rear doorway (Fig. 35) which possibly relates to the top of the frame for the waterwheel or support for the timber launder bringing water onto the wheel. The height of the wheel is now only a little above the height of the

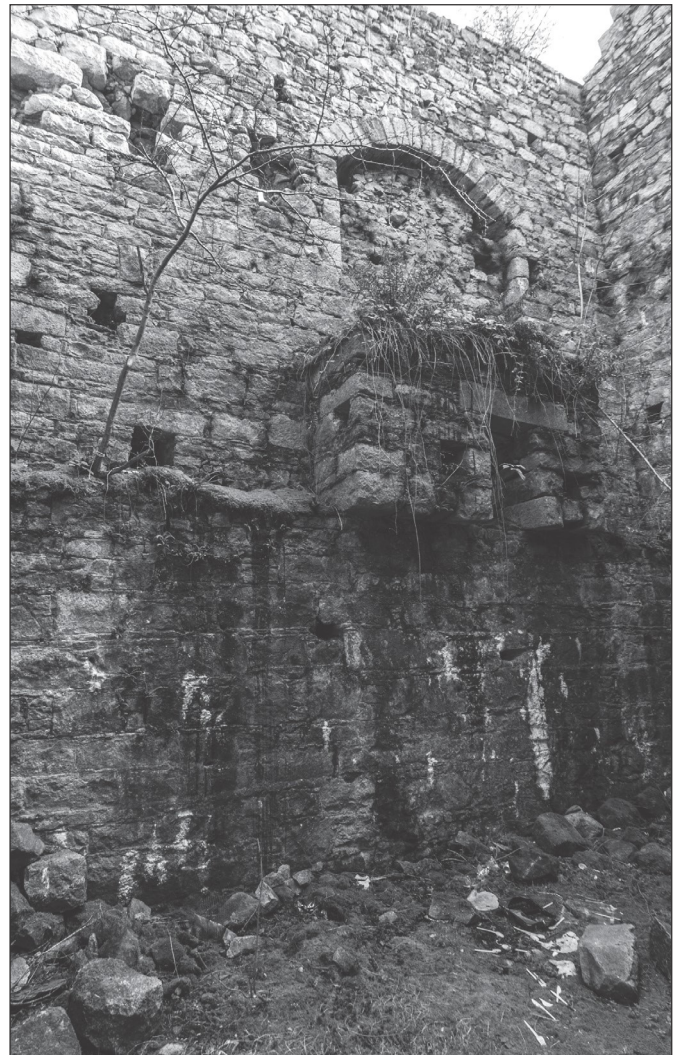


Fig. 36: Interior of the New Crusher House depicting its eastern wall with the recessed ledge atop which is constructed a substantial granite cantilevered plinth with three 'crow holes' and a drive shaft opening. Note also the recess above the plinth which has necessitated the construction of a discharge arch to relieve and/or to distribute the weight of the wall above

road passing the rear of the house, but the ground elevation has changed significantly in this area, being now almost two metres higher than it was when the crusher was operational. There is no trace of the tail race which has most likely been obscured or obliterated by past forestation.

The interior of the New Crusher House (Fig. 36) is unusual on several counts. Firstly, there is no evidence of large timber beam holes or pockets running at right angles to the waterwheel drive shaft (front to rear) as seen in the old crusher house. Timbers might be expected in this orientation to support the rolls, elevator (Raff) wheel and trommel. Instead, there are three sets of timber post holes set in the east and west wing walls (running parallel to the waterwheel drive shaft axis) and two sets in the rear and front walls. The upper beam pockets (seven on each side wall) are just below the level of the rear doorway (6.3m above the ground floor level) and supported the floor joists for the upper (second) storey.

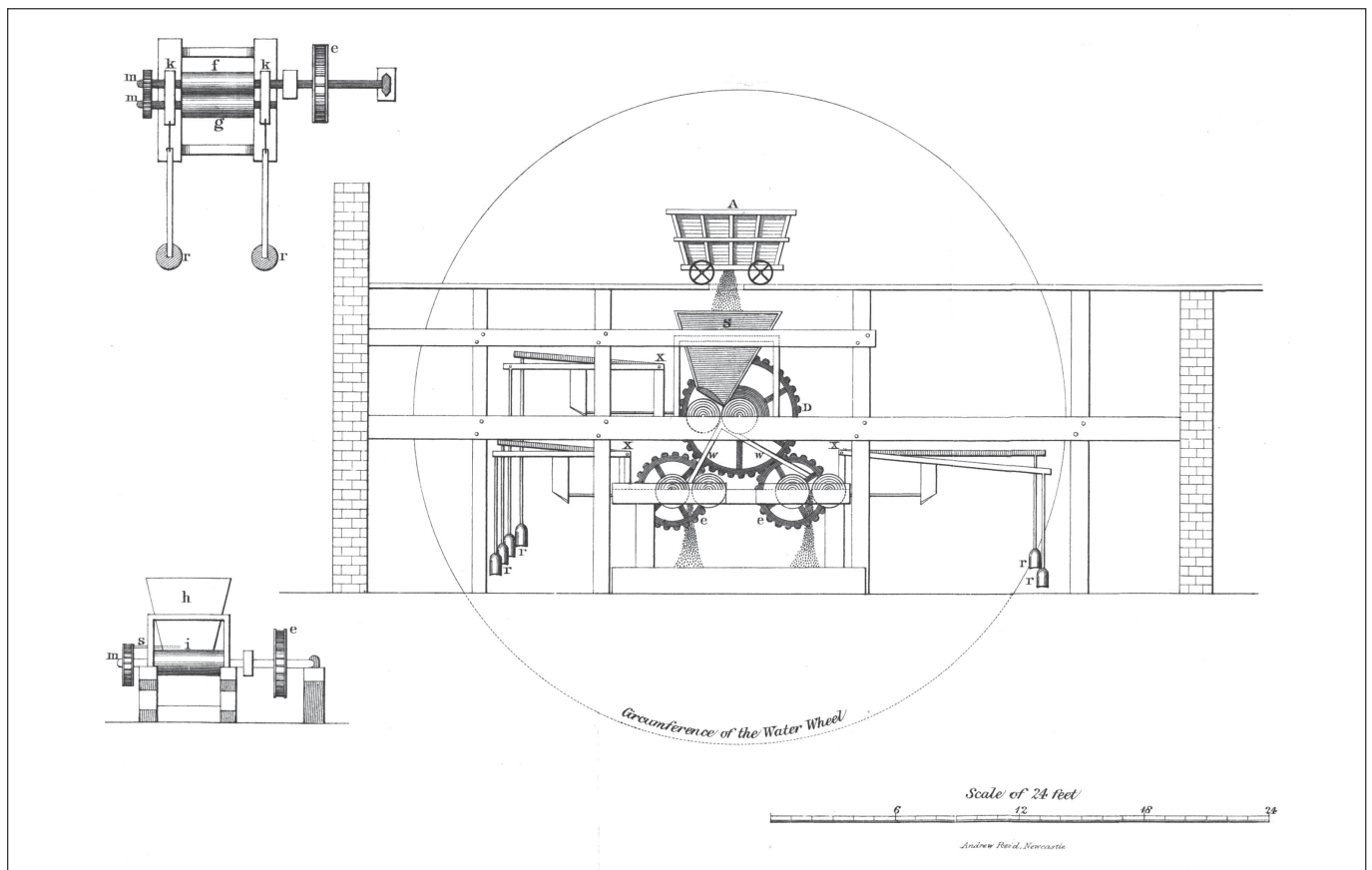


Fig. 37: Diagram of a set of multiple rolls crushers such as were in use at many lead mines in the North Pennine Orefield. Taken from Forster (1821)

The second set of post holes are on all four walls, about 4.1m above the present floor level. There are three holes on the front wall with three corresponding holes on the back wall and two holes on each side wall. Timbers inserted in these holes would have crossed in a lattice arrangement with halved joints where the front to rear timbers overlapped the side to side timbers. The third set of post holes are 2.6m above the ground floor level and consist of three holes on the front and rear walls but only 3 holes on the west wall and none on the east wheel side wall (although the front timber on the east may have rested on the recessed ledge – see below). Like the second set of timbers, this third set may have crossed in a lattice fashion using halving joints but there would be a rectangular void running longitudinally in front of the waterwheel axle opening as the east-west side timbers only appear to have gone halfway across the house from the west to the central longitudinal timber. There is one large post hole also at the elevation on the east wall near to the front of the house which might correspond with the hole on the west wall but they are of greatly different hole sizes.

The second curious feature of the interior is a recessed ledge running the length of the east wall (Fig. 36). Offset to the rear of the recess is a cantilevered plinth 2.9m long and 1.5m high constructed of random local moorstone and cut granite lintels. This plinth accommodates the drive shaft aperture, a rectangular slot which is not in a central alignment (being offset to the right), the top of which is constructed of seven large cut horizontal granite blocks placed parallel to each

other, the interior one forming a distinctive lintel above the drive shaft aperture. Two square ‘crow holes’ are set at uneven positions in the masonry at either side of the drive shaft aperture, as described above and a third ‘crow hole’ on the door side of the plinth. There are grease drips on the doorwards side of the plinth (left when facing the plinth) which suggests machinery (or gearing) was installed on top of the plinth at this point. Directly above the plinth is an arched recess approximately 6 inches deep (15.5cm), 2.6m high and 2.4m wide, deliberately engineered perhaps to accommodate a gear-wheel of some description, although how this was secured and what it might have meshed with is puzzling. Due to the thinness of the wall, a discharging arch has been incorporated into the masonry directly above the recess to relieve and/or to distribute the weight of the masonry above.

The layout of the crushing apparatus that was installed inside this house is difficult to interpret and made far more complicated by the presence of a number of holes in the masonry walling. Some of these relate to pockets for timbers, while others are clearly putlog holes which held the scaffolding in place when the building was being constructed. Due to the high vertical elevation of the house with its lofty lower chamber, we hypothesise that this building might have housed multiple rolls arranged vertically with sifters below. Indeed, a report in the *Mining Journal* in 1859 mentions the erection of the waterwheel at this mine to work the ‘crushers’.

Such multiple rolls were quite common on the lead mines of



Fig. 38: *Opening in the rear interior wall of the crusher house which appears to be a blocked up doorway, the masonry infill of which has failed*

the North Pennine orefield (see Fig. 37) from the early nineteenth century, where Forster (1821, 356-358) describes an arrangement consisting of a pair of fluted rolls which fed two further sets of rolls lower down, with mechanical sifters underneath which graded the ore into fractions, the whole being held in a wooden or metal framework. The cantilevered plinth could therefore have performed the function of supporting the top set of rolls and part of the metal or wooden framework for the entire crushing apparatus. The weights providing tension to the rollers were suspended inside the building on short levers, as there are no obvious apertures for such weighted levers running through the walls of the crusher house to the exterior.

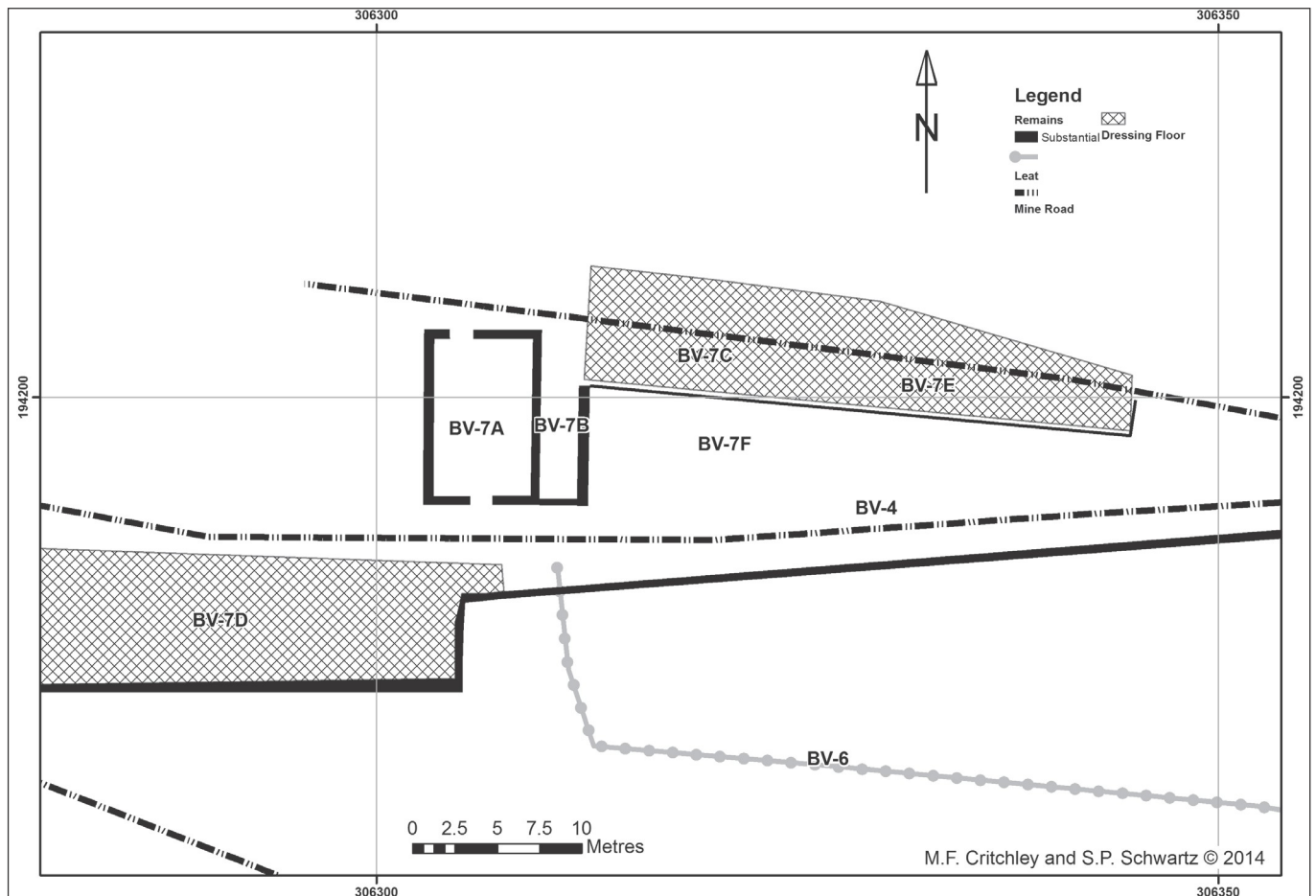
The arrangement of the post holes in the walls at 2.6m and 4.1m suggests some form of square set wooden frame. The timbers at 4.1m are the same elevation as the top of the plinth and could have been associated with the primary rolls crusher. This crusher may have been driven via a cog wheel located on the front (left side) of the plinth where we observe the grease splatters. A secondary rolls crusher or crushers may have been located at the elevation of the timbers at the 2.6m level. In single rolls crusher arrangements there is normally a trommel and Raff-wheel to separate oversized material from the crusher and recycle this to the top storey of the building for a second pass through the crusher. This arrangement appears to have been uncommon in the case of multiple rolls crushers,

where bucket elevators or ‘Jacob’s ladders’ (Phillips and Darlington 1857, 123) were utilised (Burt 1982, 23). Indeed, the inferred arrangement of the drive shaft to the primary rolls would have precluded a Raff-wheel on the waterwheel side of the building.

The third curious feature of the interior is an opening in the rear wall (now partially collapsed and spilling a quantity of soil (see Fig. 38). As the rear of the house is built into the hillside, it is difficult to see what purpose this opening served. Close inspection however, indicates that this was formerly much wider, a doorway with a dressed granite lintel which has been in-filled with granite masonry. This seems to suggest that the design of the crusher house either changed during, or immediately after, its construction, or after mining operations had ceased when the crusher building might have been reused by the farmer renting it.⁵² The presence of this doorway appears to indicate that a gap formerly existed at the rear of the house to provide access to it.⁵³ Soil has at some point been pushed into this void, possibly for safety reasons by the forestry department during the mid-twentieth century. The soil

⁵² In 1883-85, farmer, Matthew Graham, was leasing the building from another local farmer, Pierce Harney, who had purchased the building from the Hodgson Estate.

⁵³ A timber ramp would have been used to convey ore into the top storey of the crusher house from the washing floors.



Map 7: Baravore Dressing Floors, New Crusher House

placed pressure on the masonry infill of the doorway which was not keyed into the surrounding walling, causing it to eventually fail, leaving a distinct depression in the ground below the doorway into the top storey of the building.

Chester and Burns (2001) suggest that no machinery was ever installed in this house, but highly visible grease drips on the east interior wall and down the front of the cantilevered plinth suggest otherwise, as does the documentary evidence which notes that the dressing floors were completed and in use in the summer of 1860 when 10 tons of ore was dressed.

The New Crusher House is arguably the finest extant example of its kind on a metalliferous mine in Ireland and on a par with some of the best examples in Britain. From the exterior, the building looks to be in good overall condition. But this is deceptive. Both interior granite lintels in the upper storey have been robbed out, presumably when the floor was still intact. Over time, a quantity of masonry has fallen from the inner face of the wall above the (north) gable end window in particular, seriously weakening its structural integrity and the internal masonry above the other (west) window is also missing to the roof line. Additionally, the tops of the walls at the former roof level have been colonised by conifer saplings whose roots will severely damage the building wall fabric by causing increased water ingress to weaken the mortar and stonework.

The New Crusher House requires urgent remedial works if it is not to suffer the same fate as the Old Crusher House which experienced a partial collapse in the spring of 2013.

Probable Stamps Site BV-7C

An 1859 report in the *Mining Journal* notes that ‘the erection of the waterwheel to work the stamps and crushers was progressing favourably’ (MJ 1859). On the eastern side of the crusher house beyond the waterwheel casement is a raised platform (BV-7F) atop a wall 2.2m metres high built of randomly coursed moorstone that runs for 32 metres parallel and below an old mine track serving the crusher house. The wall forms the back of an area (BV-7C and BV-7E) on the same level as the crusher house which is thought was reserved for dressing operations, and precisely where one would expect a stamps’ battery to have been located, powered by the waterwheel.

Often stamps are driven by an arrangement of clutch and gears directly from a waterwheel drive shaft. However, at the New Crusher House, the axis of the waterwheel is at the level of the raised platform which means that the stamps could not have been sited on top of the platform. Instead it is hypothesised that the stamps barrel was either driven from a ring gear on the waterwheel or via bevel gears from the axis of the waterwheel. The platform was most likely to have been used to drop fragments of lodestuff disseminated in very hard quartz or chats from the jiggling hutchers down discharge boards to the

stamp grates below.

Primary Dressing Floors BV-7D

A well defined rectangular platform can be seen at the rear of the New Crusher House. The mine road (BV-4) passed along the front of this area, the rear of which has been cut into the hillside with a purpose built revetment wall holding back the top and sub soil (there has been a partial collapse of this at its centre). It is highly likely that ore bins abutted the wall, probably separated by wooden partitions, where the washing of the newly raised lodestuff was undertaken.

The relatively small surface area of this dressing floor compared to the primary dressing floors at the Glendalough and Glendasan Mines, lends weight to the fact that a multiple rolls system was possibly installed in the crusher house. This system eliminated the preliminary ore breaking with hammers and consequent grading operations on large cobbled areas, as was common practice on Welsh and Cornish mines (including the Mining Company of Ireland's Cornish-run Luganure Mines), as it allowed the lodestuff to be processed direct from the washing floor (Burt 1982, 23).

Dressing Floors BV-7C and BV-7E

Beginning at the front end of the eastern wall of the waterwheel casement is a 2.2m high wall of random moorstone that runs for 32 meters eastwards forming the back wall of a slightly recessed area we believe to have been reserved for dressing operations, most likely stamping, jigging and possibly buddling. A track leading from the mine road runs along the front of this recessed area and passes the front of the crusher house before terminating. The lack of any significant spoil (gravel, sands and slimes) in the vicinity of this dressing area indicates that not much ore was ever processed here.

Miners' Cottages BV-10

According to Griffith's Valuation, a row of twelve cottages formerly stood here and were undoubtedly among the eighteen built by the Baravore Mining Company in 1850-51, as they do not appear on the 1838 First Edition 6-Inch OS Map. The Cancelled Land Books (VO Dublin) note that most of these were in ruins in the early 1880s and they were not valued thereafter. There is now little evidence of the cottages on the ground. We speculate that stone from them was robbed when a cottage, (now An Óige Hostel), was built opposite in 1903.

Group of Cottages BV-2

The footprints of a cluster of buildings depicted on the First Edition OS Map (1838) sited close to the Stony Road include some of the four houses listed on the 1841 Census return for the townland of Baravore, home to 30 people (BPP 1852, 10). Chester and Burns (2001, 73) suggested that these were possibly miners' cottages. However, Griffith's Valuation and the Cancelled Land Books (VO, Dublin) confirm that these were clearly of agricultural derivation, the house, offices (sheds) and land of farmer, Pierce Harney, and are not directly related to the mining industry.

Mine Captain's House and Stores BV-11

Formerly sited above the bank of the Avonbeg River and now denoted only by fragments of cobbled floor (probably in

relation to a former courtyard), the Cancelled Land Books (VO Dublin) note that the house was vacant for a spell in the mid-1880s before being bought by a local farmer (Pierce Harney). Both buildings were demolished by the Forestry Department before the mid-twentieth century. Fragments of brick and slate may be seen embedded in the Stony Road in this vicinity.

Workshop, Forge and Dwelling BV-8

A long range of buildings built of random moorstone parallel to the Stony Road do not appear on the 1838 First Edition 6-Inch OS Map, so it can be confidently assumed that these were built by the Baravore Mining Company in 1850-51. The fragments of masonry walling have been eroded to less than a metre, while some of the foundations have been buried by debris thrown up out of a nearby drainage ditch which runs parallel to the buildings, making interpretation very difficult. Griffith's Valuation informs us that these buildings included an office (probably meaning a workshop), a forge and one dwelling (occupied by John Malayter).

Where discernible, the footprint of this range of buildings suggests that there were three rectangular rooms at the north westerly end of varying sizes, and two very small, almost square, rooms at the south eastern end of the buildings. Two of the rooms have what appear to be small storage areas at the rear. Besides accommodating the forge, this complex was probably where the carpenter's shop was sited. The Cancelled Land Books (VO Dublin) notes that most of these were in ruins in the early 1880s and they were not valued thereafter.

Miners' Cottages BV-9

A terrace of buildings, all of which are roughly 25m² with entrances fronting on to the Stony Road and constructed at the junction of this with the mine road running up past the New Crusher House, are undoubtedly among the eighteen cottages built by the Baravore Mining company in 1850-51, as they do not appear on the 1838 First Edition 6-Inch OS Map. One of these was a public house, occupied by John Carroll, publican.

Built of random moorstone, most of the extant walling has been eroded to less than a metre and parts of the walling facing the Stony Road have been buried under debris thrown out of the above mentioned drainage ditch. Fragments of slate in the vicinity demonstrate that these cottages had tiled roofs. They probably also had a window in the wall facing the mine road. There are no obvious signs of chimney breasts or fireplaces. Six cottages originally stood here, yet the footprint of only five are now visible. The Cancelled Land Books (VO Dublin) notes that most of these were in ruins in the early 1880s and they were not valued thereafter.

Deep Adit (No. 1) BV-13

Deep Adit was apparently commenced by the Baravore Mining Company, driven to intersect the Baravore Lode, but was chiefly of an abortive nature and highly costly, due to the hard nature of the granite. Driving was continued by the Baravore Silver-Lead Mining Company between 1859-60 towards Adit 6 (Shallow Adit) for use as an arterial drainage and haulage way. A small, partially vegetated dump is associated with it, betraying the fact that it was not a success

and was discontinued before it intersected the Baravore Lode. There is a distinct lobby and the adit portal is open through which a small amount of water is issuing.

Chester and Burns (2001, 70-1) surveyed Deep Adit in 1997 which they determined ran for a distance of 152.5m before ending in a forehead. Three levels were recorded off it, the longest of which running NW for 100 metres appears to have been an attempt to intersect the Baravore Lode. The remaining two closest to the entrance are trial cross cuts driven to prove the lode and are between 10-15 metres in length.

Adit No. 2 BV-14

Like Deep Adit, Adit No. 2 was commenced by the Baravore Mining Company but failed to intersect the Baravore Lode and had proven to be an expensive undertaking due to the hard and barren nature of the granite. Its development was continued by the Baravore Silver-Lead Mining Company between 1859-60 after which work on it was suspended due to spiralling costs and failure to locate the Baravore Lode. A partially vegetated spoil heap is sited right below the portal. Adit No. 2 is now very difficult to access as the track leading to it is completely overgrown with immature conifers and briars. The entrance lobby is choked with vegetation but is open with some water using from it. Chester and Burns (2001, 71-2) surveyed this adit in 1998 and discovered that it runs for a distance of 127.4m before ending at a forehead. Two small drives to the NW were probably made to test the lode. The miners driving this adit undoubtedly suffered from bad air, as a wooden ventilation pipe was discovered inside it (see Chester and Burns 2001, 74, for an illustration of the ventilation pipe).

Adit No. 3 BV-15

Sited on the hillside almost directly above the Old Crusher House, this adit is characterised by a large, unvegetated spoil heap sited right on an old field boundary shown on OS mapping (the walling described by Chester and Burns (2001, 75) which they erroneously suggested could indicate the presence of ore bins). The spoil heap has been partially truncated by a new forestry road rendering it quite unstable and the wooden supports for a tramway used to tip the spoil can be seen issuing through the surface. Due to its proximity to the new forestry road, a lot of material containing visible specimens of galena has been removed for road re-surfacing throughout the area. The entrance portal has collapsed and is now choked by large boulders through which water is issuing.

Adit No. 4 BV-16

Situated close to the mine road leading up to Shallow Adit, Adit No. 4 has a large heap of partially vegetated spoil and a well defined lobby into which a large tree trunk has fallen. The portal is open and water is issuing from it. It was partially surveyed by Chester and Burns in 1998 (2001, 72, 74). Driven in a SW direction for over 20 metres a forehead is reached where the level makes a 90 degree turn to the NW, after which it is driven on lode.

Deep water is encountered from inside the portal up to a collapse some 15m from the forehead. After the collapse, the level becomes drier and an intersecting shaft with remains of

wooden staging with 3-inch piping attached to it is encountered over 60 metres from the forehead. The presence of this pipe, together with the fact that shaft ascends to the surface close to Adit 5, indicates that it was sunk from surface for ventilation purposes. The shaft, set into the floor of the adit (taking up the entire width of it) continues downward for around 20m where it connects with Adit No. 3.

Martin Critchley abseiled down the shaft about 10 years ago and encountered a pile of debris at the bottom of it which had blocked access to Adit No. 3 in a NW direction. In the SW direction leading towards the collapsed portal of Adit No. 3, the water had backed up and was flooded to roof level. Adit No. 4 continues beyond the shaft where a Cousin Jack ore chute is encountered, denoting the presence of stoping in workings above it. Not far from this chute is a collapse preventing further exploration.

Adit No. 5 BV-17

The lobby of this suspected adit, probably little more than a trial, is choked by conifers and fallen trees and its portal has vanished.

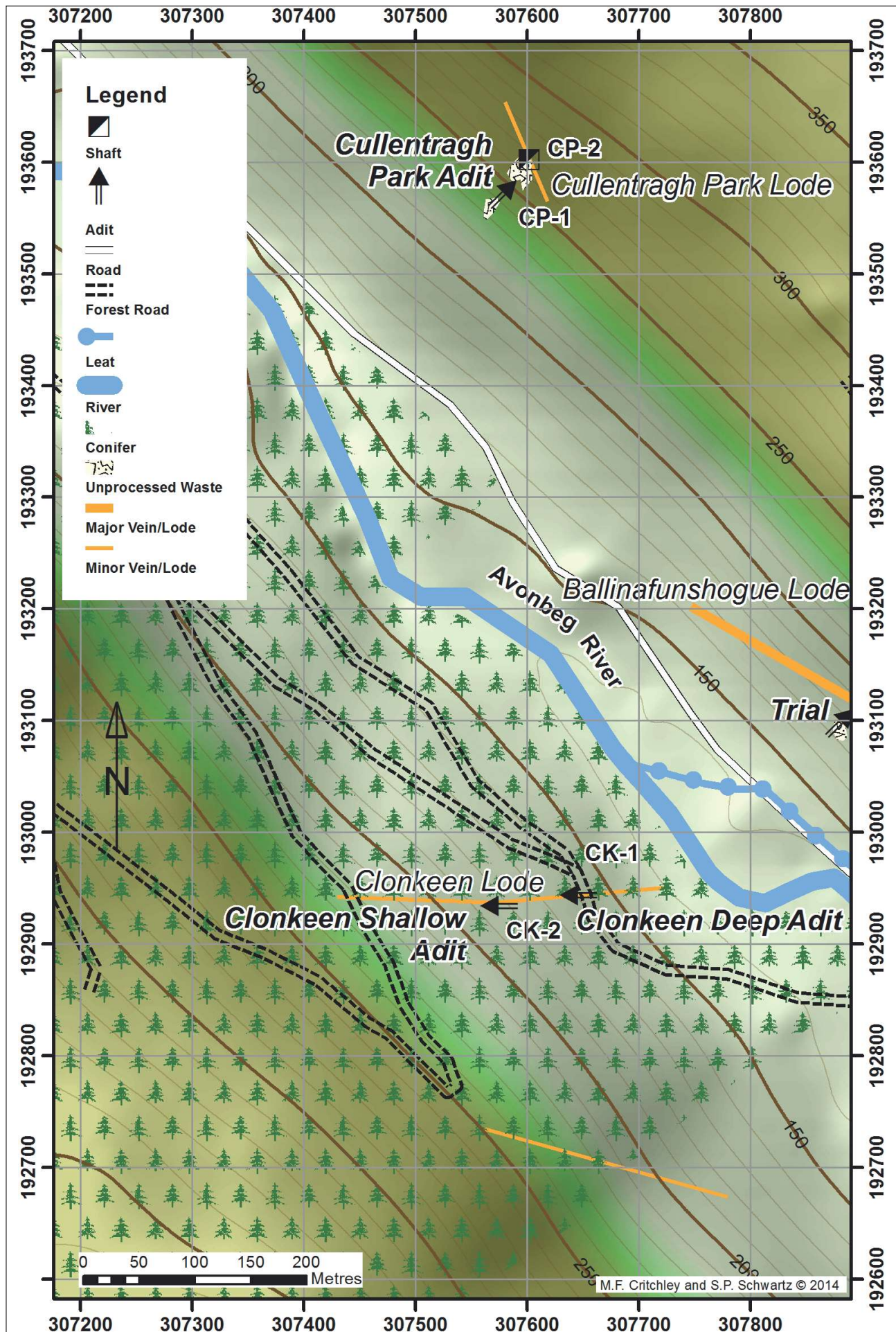
Air Shaft BV-18

This shaft which intersects Adit No. 4 and terminates in Adit No. 3, contains a ventilation pipe and emerges at the surface near Adit No. 5. It is impossible to locate its collar on the ground as the area is choked with clear felling debris, immature conifers and dense vegetation.

Shallow Adit (No. 6) BV-19

This adit commenced by the Baravore Mining Company was the only one that proved to be of any real value and was where the company raised the majority of their 40 tons of lead ore. It had been driven in on the course of the Baravore Lode to almost 90 metres and intercepted several shoots of ore. A 10 fathom (just over 18m) deep winze was sunk in the floor of a stope where a cross-cut intersects the lode. The Baravore Silver-Lead Mining Company then deepened this winze and drove westwards from it. This company also drove Shallow Adit westwards opening up Gregory's Stope, where a well defined footwall was reported and the mineral bearing part of the lode was from three to four feet wide, comprised of a strong quartz intermixed with ore.

The lobby and adit portal which is open and issuing water, is situated at the back of a level, now boggy area, at the end of the mine road. A small building constructed of moorstone boulders with a fireplace, eroded to a height of less than a metre and being slowly engulfed by immature conifer trees, is sited where the mine road enters the flat area. Shown on historic mapping, it probably functioned as a miners' dry and/or materials' store. A large, well vegetated spoil heap containing specimens of galena and sphalerite can be seen below the flat platform which might have been used for some rudimentary dressing. Exploration of Shallow Adit confirms the documentary descriptions of the work undertaken there, with a large stoped out area encountered where the cross-cut intersects the Baravore Lode. A small drive in the far eastern wall was presumably undertaken to test for a parallel lode. A winze in the SE end of this stope connects to a lower level of



Map. 8: Clonkeen and Cullentrath Park Mines



Fig. 39: Clonkeen Shallow Adit

stopping. The main adit continues in a NW direction for around 24 metres to a collapse.

CLONKEEN

Deep Adit CK-1

Not far from a forestry track, a moss covered lobby cut back into the slope of the hillside leads to the adit portal which is open, but due to debris in the lobby blocking the egress of water, is flooded to its top several metres in.

Shallow Adit CK-2

Hidden in dense forestry approximately 72 metres uphill from Deep Adit is a large pile of moss covered spoil containing significant amounts of quartz close to an historic track that probably formerly served this mine. A well-defined lobby is sited at the rear of a level area which gives access to a short level (Fig. 39) driven on lode which terminates in a forehead after approximately 15 metres. A short drive off to the left of the main level leads to a rectangular vertical shaft approximately 150 feet (just over 45 metres) deep which it is believed connects to the Shallow Adit. A short drive less than 3 metres long to the right of the shaft ends in another forehead.

CULLENTRAGH PARK

Adit CP-1

Obscured by thick gorse, the lobby of the level is formed by giant moorstone boulders. The portal has collapsed but there

is some water issuing from it. This level is about 30 metres long and intersects the shaft above. Below the level is the largest of two spoil heaps at the mine, derived from material discarded from the level, which contains good specimens of sphalerite and some galena.

To the south east of the level is a flat rectangular area built above a crude moorstone revetment wall with a roughly built granite wall at the rear. Now choked with gorse, this likely functioned as a rudimentary dressing area and quantities of discarded quartz fragments litter the slopes below it. There are no obvious track ways up to the mine.

Shaft CP-2

Still open and leading down to some small workings on lode which have run in and are unstable according to Martin Critchley who abseiled down the shaft in about 2005, this un-collared shaft is choked with vegetation and fenced for safety purposes. Below is a partially vegetated spoil heap derived from material drawn up from the shaft.

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