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

Sharron Schwartz and Martin Critchley

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 Cullentragh 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,* 23-86.

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 Raghnal 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.

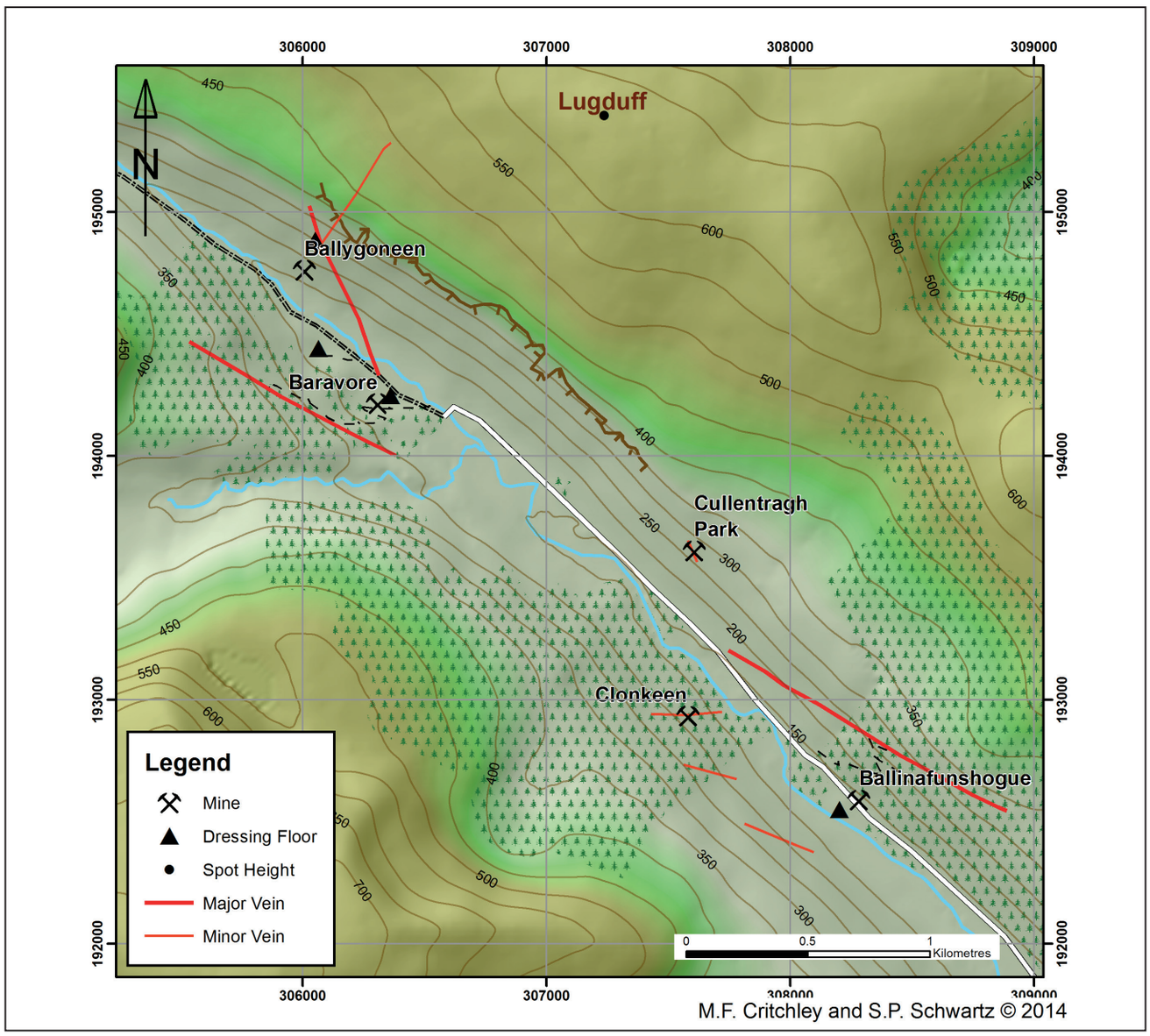
THE GENTLEMAN ADVENTURERS OF THE LEAD MINE COMPANY OF GLENMALUR

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 Glenmalure 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]

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

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 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.

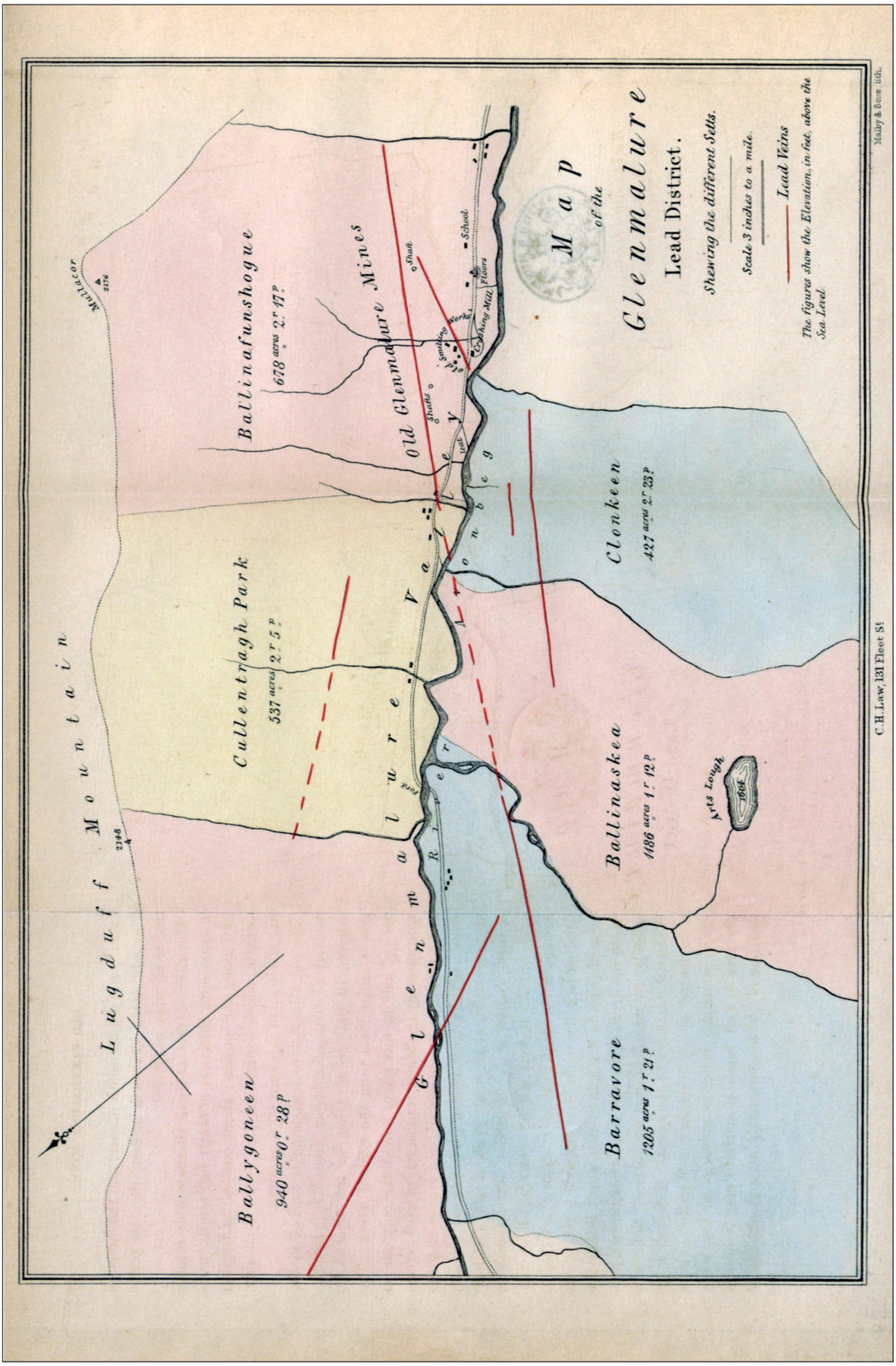


Fig. 1: Map of the townlands in the Glenmalure Valley showing the mines and main lodes, which accompanied the anonymous 'Mines of Wicklow', 1856

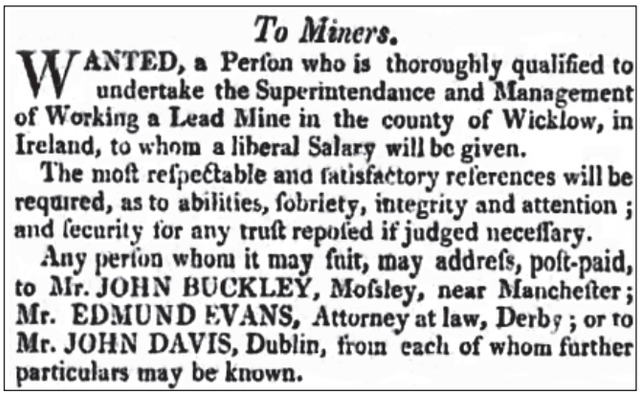
agents, stewards and workmen. Free rights of ingress, egress and regress to the mine sett of the workmen, horses, carts and other carriages to take, draw and carry away the ore and minerals or to supply the mine with materials were granted.

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 Glenmalure 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 Superintendance 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, Moſsley, 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 Glenmalure 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 Grangebeg[8] 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

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

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.

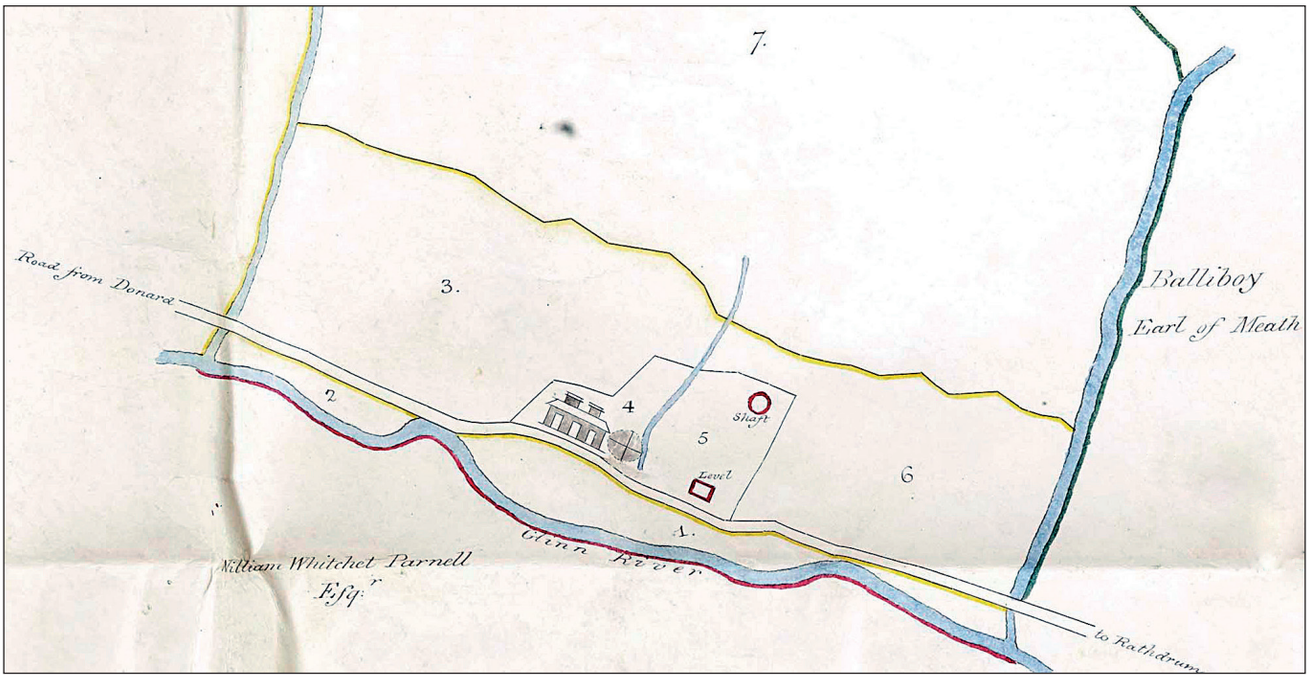


Fig. 4: ***Extract of part of the map of 'Balinafinchoge in the County of Wicklow the Estate of the Earl of Essex and Lord Henry Fitzgerald' drawn by John Logan of Dublin, 1828. The Indenture of Lease covered an area of 439 acres, 2 roods and 27 perches (Plantation Measure). 1 and 2, Meadow Ground at 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

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).

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.

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 Chritchly (Critchley), Edward Westby, Morley Saunders, Daniel Mills, William Parnell, Robert Reid, Louisa Reid, Charles Jones, Mary Davis and Sarah Davis.

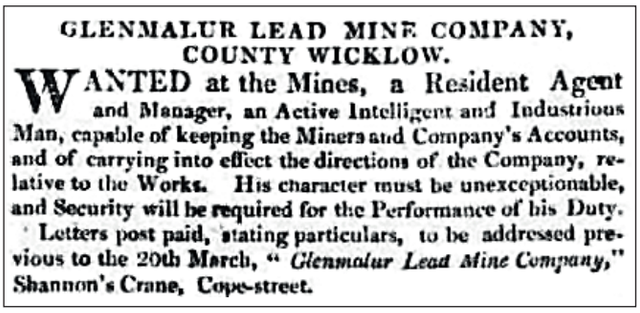
Daniel Mills held his share as he was the executor *de bonis non* of the estate of Thomas King of Kingston near Rathdrum who died in 1811 (Ireland Genealogy Projects).[11] William Parnell (1780-1821) acquired his share from his brother, Sir John Parnell, when he became the owner of *Avondale House* which 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 *Avondal*e should take the name of Hayes, or Parnell-Hayes.

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



GLENMALUR LEAD MINE COMPANY,
COUNTY WICKLOW.

WANTED at the Mines, a Resident Agent and Manager, an Active Intelligent and Industrious Man, capable of keeping the Miners and Company's Accounts, and of carrying into effect the directions of the Company, relative to the Works. His character must be unexceptionable, and Security will be required for the Performance of his Duty.

Letters post paid, stating particulars, to be addressed previous to the 20th March, "*Glenmalur Lead Mine Company*," Shannon's Crane, Cope-street.

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 Chritchly (who passed away in Bristol on 12 February 1826), Robert Francis Saunders (Morley's son), Elinor Jones (1772-1843, Charles's widow) and Catherine Chritchly (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 sluggs (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.

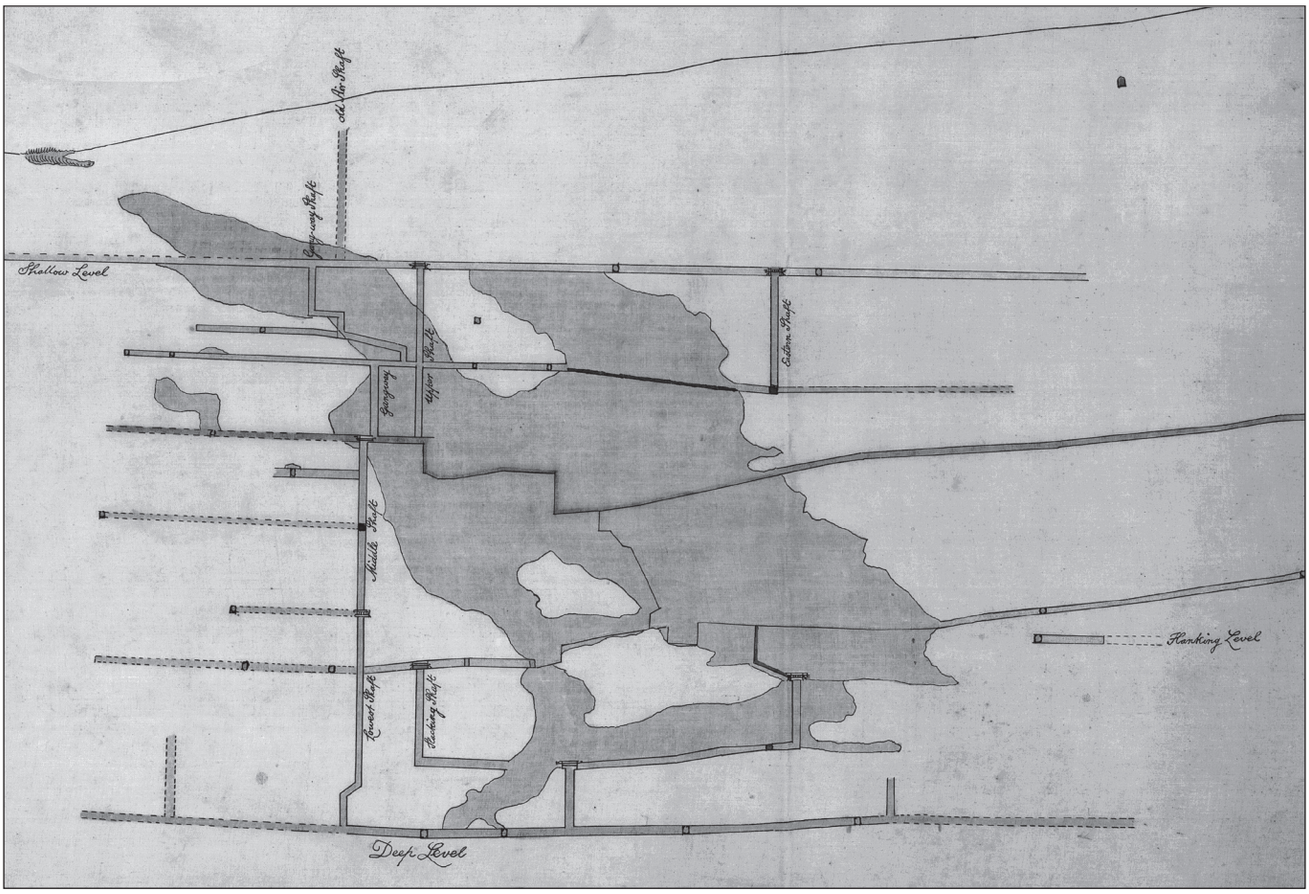


Fig. 9: ***Plan of the underground workings of the 'Ballynafinshoge Lead Mine in Glenmalur' drawn by Thomas Weaver in 1812. The mine was described in 1856 as 'a venture only worthy of the Middle Ages'. Weaver's plan gives an impression of the haphazard nature of the mine workings with their levels connected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

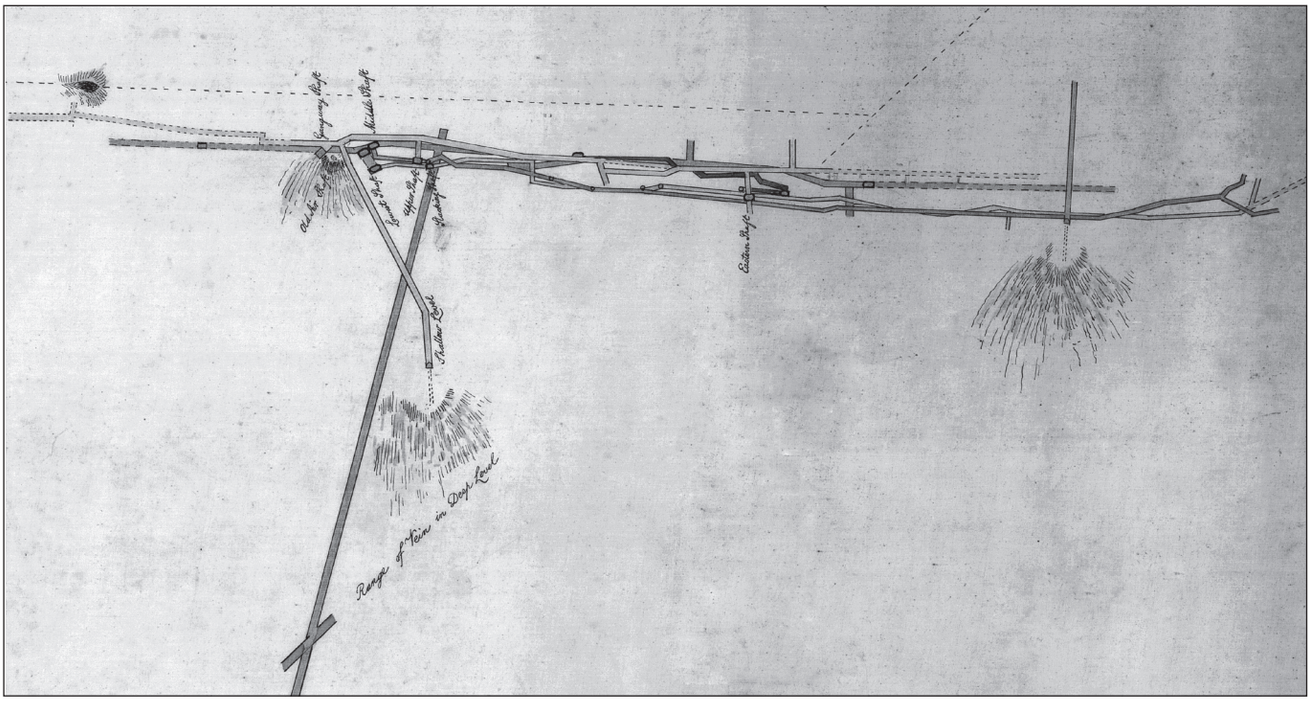


Fig. 10: ***Section of the underground workings of the 'Ballynafinshoge Lead Mine in Glenmalur' drawn by Thomas Weaver in 1812, showing that at that date, the mine had not been worked below the level of the Deep Adit. A criticism levelled at the mine was that it had not been worked in a 'minerlike' manner,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

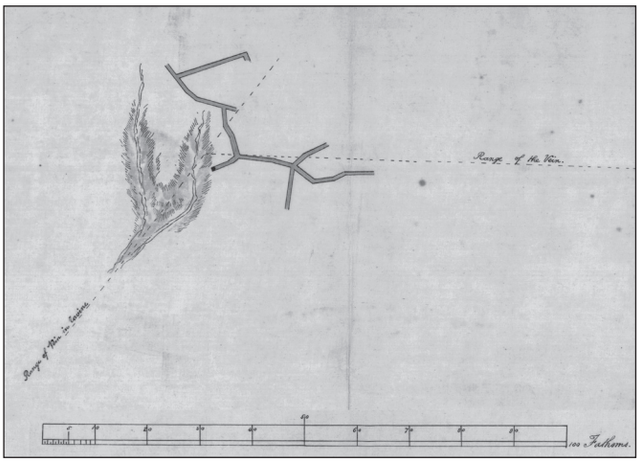


Fig. 11: ***Section depicting the Mill Brook workings of the 'Ballynafinshoge Lead Mine in Glenmalur' drawn by Thomas Weaver in 1812. By kind permission of the Geological Survey of Ireland***

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 Glenmalure 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-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 fathoms[20]. 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 metalled 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 20º 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 85º 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

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).

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).

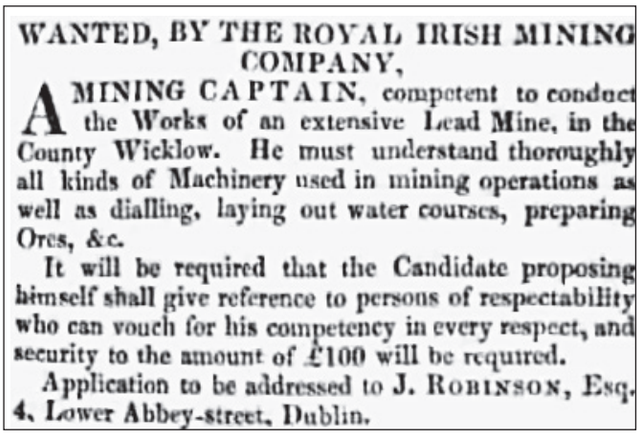
However, the RIMC's chief intention had been particularly directed toward the lead mines of Ireland, and, with a view to promote its interest, it had formed establishments on four which were active in 1824. Two of these mines, Tamlaght and Aughnamullen in the county of Monaghan, and Killiney, in the 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 earthernware 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 demanded 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). Griffith (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 (Griffith 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.



WANTED, BY THE ROYAL IRISH MINING COMPANY,

A MINING CAPTAIN, competent to conduct the Works of an extensive Lead Mine, in the County Wicklow. He must understand thoroughly all kinds of Machinery used in mining operations as well as dialling, laying out water courses, preparing Ores, &c.

It will be required that the Candidate proposing himself shall give reference to persons of respectability who can vouch for his competency in every respect, and security to the amount of £100 will be required.

Application to be addressed to J. ROBINSON, Esq. 4, Lower Abbey-street, Dublin.

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 engine[26] 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*l* 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 Janaury 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 Fottrell[30] 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 of 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 Letaigne (born 1805) were the sons of French immigrant physician, Benjamin Letaigne. 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

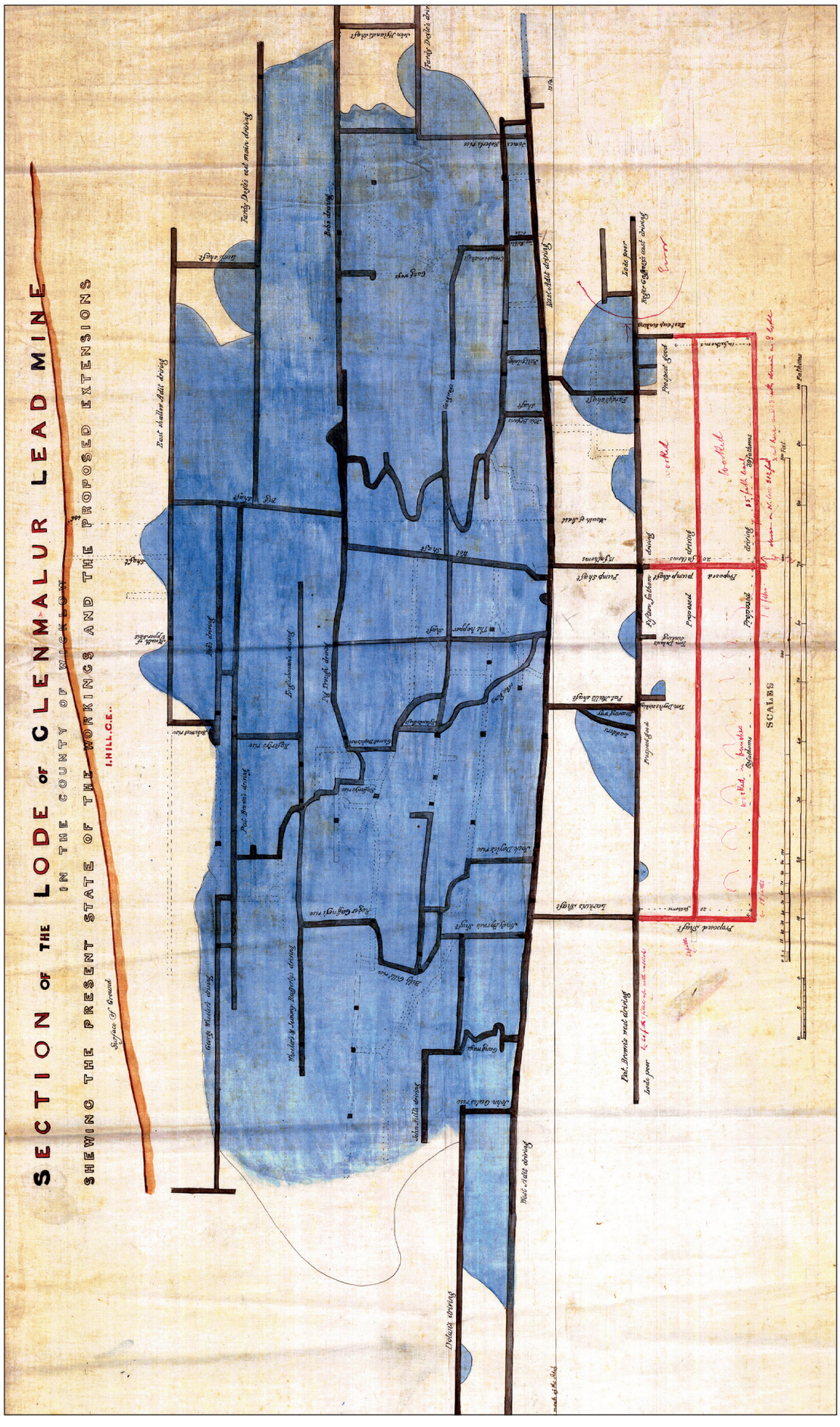


Fig. 14: ***Section of the lode of the Glenmalure Lead Mine by John Hill of Dundalk, drawn on 14th July 1841. Again, the ad hoc manner in which the mine had been developed is clearly illustrated by the maze of winzes and irregularly spaced levels. The section depicts the workings just four years after 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 ruinious 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 Cullentragh 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 on 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