

Patrick Leahy's Maps of the Barony of Slieveardagh 1818 and of the Killenaule Coal District 1824

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Introduction

Two major maps and an associated report record the Killenaule or Slieveardagh coal area of County Tipperary early in its most intensive period of development during the mining boom of the 1820s. Produced by the surveyor and engineer Patrick Leahy (c.1780-1850), these documents comprise a very large manuscript map of the entire barony, or district, of Slieveardagh, made in 1818, and a manuscript map and report made during 1824-5 for an unnamed mining company interested in exploiting the coal-field. The maps have the particular interest that, as well as depicting the usual topographical detail, they display the distribution of coal pits, lime-kilns and some other features of geological interest.

Leahy was a contemporary of the great Richard Griffith, the producer of the first detailed geological map of Ireland,¹ and their careers had some overlap while both worked for the bogs commissioners of 1809-14. Griffith was one of the ten district bogs engineers, whereas Leahy was a surveyor assistant. Thereafter their paths diverged, with Leahy, though possessed with an inventive and enterprising outlook, lacking the connections and the good fortune that served Griffith so well. As the latter cemented his reputation, working as mining engineer for the Dublin Society and producing timely reports on the Leinster and Connacht coalfields, the former struggled. His Slieveardagh and Killenaule maps are good examples of his capacity for high-quality cartography, but as manuscripts both had limited circulation. Lacking verbal dexterity, Leahy lacked also the intellectual entrée afforded to Griffith. Nonetheless, as this article seeks to demonstrate, his recording of the Slieveardagh coalfield area has a claim to a place in the history of geological mapping in Ireland.

Patrick Leahy

Although much remains obscure, two recent studies facilitate a profiling of some key episodes in the life of Patrick Leahy (or 'Lahy') during the early nineteenth century. Dr Brendan O'Donoghue has celebrated the activities of several generations of the Leahy family,² while Dr William Nolan has described the Leahy involvement in the troublesome promotion by Sir Vere Hunt of the new 'town' of New Birmingham on the edge of Slieveardagh.³ Hunt, with a family base at Curragh Chase in County Limerick, also owned property at Glengoole in Slieveardagh and had founded his new settlement there about 1803. His diary and other records refer to several members of the Leahy family with a surveying background. Patrick, 'steady & deserving', had settled at Fennor just south of Urlingford after his marriage in 1805.⁴ Later he spent several years assisting the canal engineer Thomas Townshend.⁵ Their projects during 1809-11 included assignments from the Directors-General of Inland Navigation

and from the recently-established Bogs Commissioners. For the former, they explored potential routes for a canal between the River Barrow and the River Suir,⁶ with Leahy, as the surveyor, spending several days in the Slieveardagh area 'laying on the features of the Country, Towns &c on Map'. For the latter, with Leahy again acting as his surveyor, Townshend reported on the Brosna district, covering much of County Westmeath and the north-west part of King's County (Offaly).⁷ Leahy then travelled north with Townshend to the bogs district around Lough Neagh, working a lengthy spell there during 1811-12.⁸ After Townshend made an abrupt return to England, Leahy played a vital role in completing the Lough Neagh bogs report. Townshend took the unusual step of commending him by name 'for his exertions and abilities in the surveys'.⁹

In career terms, Leahy's work with Townshend was an important formative experience.¹⁰ On several occasions he cited their bogs experience as a reference, and on his coal district map of 1824, he described himself as 'Patrick Leahy C.E. Surveyor to the Commissioners for Draining and Improving the several Bogs, Loughs, and waste lands throughout Ireland'. He had also adverted to his bogs work a year earlier, when he had unsuccessfully written to the Chief Secretary's office seeking a position in government service as some sort of belated reward for his exceptional efforts on the Lough Neagh report.¹¹

Styling himself 'C.E.' (civil engineer) and, as 'engineer and land-surveyor', Leahy offered services in relation to drainage, irrigation, planting, sub-dividing and valuation.¹² Initially based in Thurles, he had moved to Clonmel by the early 1820s. His earlier commissions included a survey for at least one colliery proprietor,¹³ a map of the Thurles estate of the Earl of Llandaff (1819) and - a little later in 1828 - a survey and map of the 3339 acre Killenaule estate of Lawrence Waldon.¹⁴ However, land surveying was an intermittent activity, and Leahy augmented his income in other ways, including a shop selling groceries and whiskey in Thurles, and an involvement in the promotion of early railways. About 1830 he worked briefly on railway projects in England, returning to Ireland to undertake further mapping projects in Waterford city and in south Tipperary. His later career involved a fairly controversial spell as Cork county surveyor.¹⁵ In 1849 he emigrated to South Africa and died there the following year. When he commenced his first Slieveardagh map, however, he was still fresh from his bogs and canal work.

The Slieveardagh district - physical and human setting

Extending some 30km from the Urlingford - Kilcooly area in the north to the great isolated sandstone massif of Slievenamon (719 metres), the barony of Slieveardagh is a 36,500 ha district in the eastern part of south Tipperary (Figure 1). Its greatest extent from east to west is about 20km. A section in the north-west is part of the extensive limestone plain stretching across central Tipperary; it includes good land around the medieval monastic centre of Kilcooly, together with extensive areas of a distinctive chain of bogs extending some 40km from Roscrea to Cashel. A prominent escarpment defines the main physical feature of the barony, the Slieveardagh Hills, an upland area with an Upper Carboniferous geology of grits, shales and 'coal measures', a bit like the Castlecomer plateau to the immediate east. Rising to 333m at Renaghmore, 5km south-east of Kilcooly, the uplands are mostly between 180 and 300m in altitude and dip gently to the south-east. The main internal drainage is thus part of the River Nore catchment and is provided by the King's River and its principal tributary, the Munster. The area south of Mullinahone constitutes a further physical sub-unit

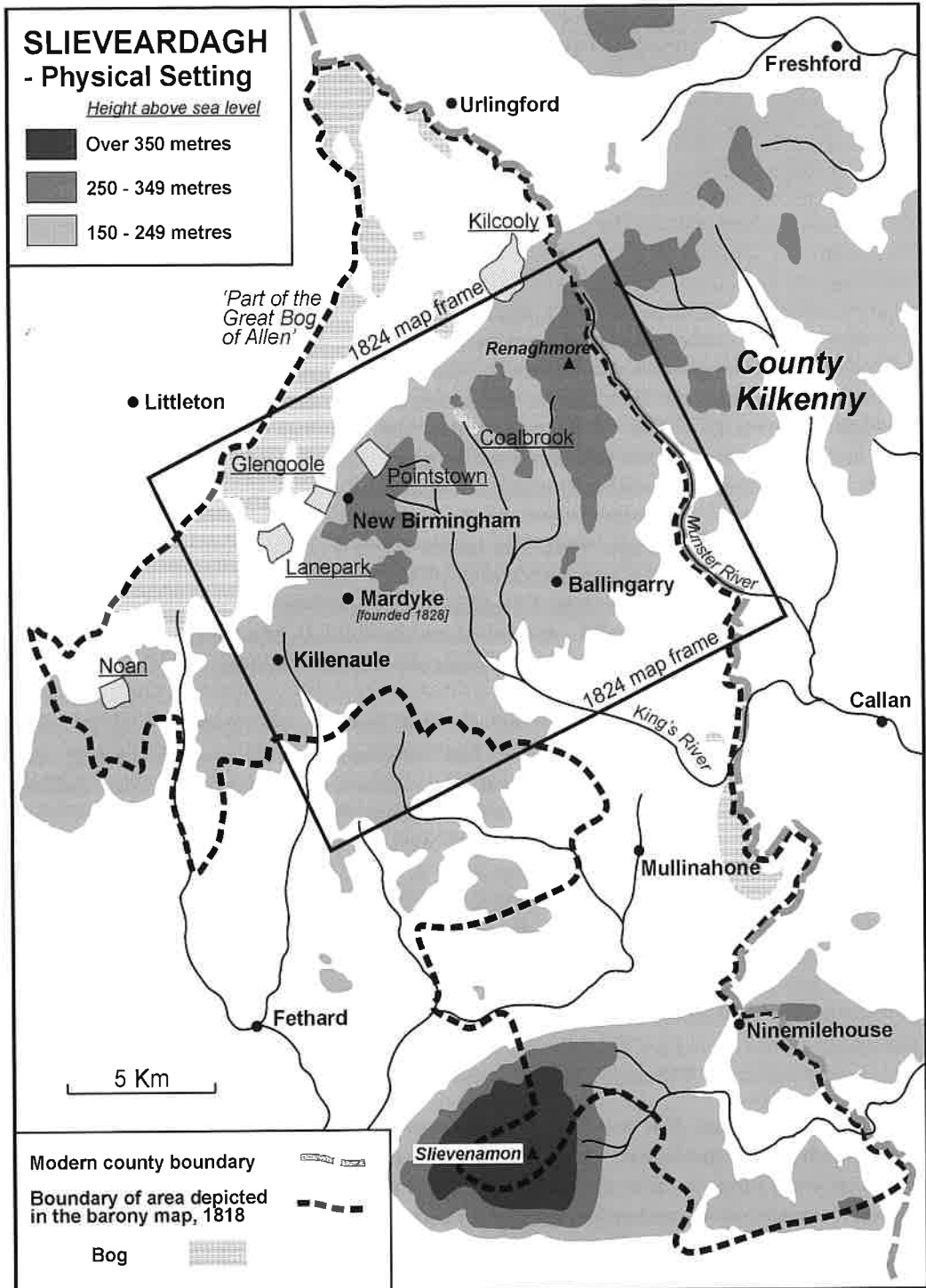


Figure 1. Slieveardagh. Principal physical features, names mentioned in the text, and areas covered by the 1818 and 1824 maps.

and drains to the River Suir. Dominated by Slievenamon, this district is physically distinct from the hills to the north, and formed the medieval territory of Compsey.

With a major Cistercian abbey at Kilcooly,¹⁶ and much of the hill area either directly or indirectly under the control of the Butler Ormond estate, most of Slieveardagh was evidently already widely settled by medieval times. The seventeenth century Civil Survey (1654-6)¹⁷ indicates an area divided into some forty estate blocks,¹⁸ with over twenty castles in various states of repair, and - depending on how terms like 'a few', 'many' and 'several' are interpreted - at least two hundred houses and cabins. A dozen mills and 'a good coalemeine for smithes' (at Coolequieill [Coolquill] in the parish of Croaghane) are also listed. Over the following century the most significant change was probably that New English families assumed ownership of extensive areas. William Nolan lists the Cromwellian military families of Långley at Coalbrook, Lane of Lanespark, Cooke at Poyntstown and the Goings at Ballyphilip.¹⁹ Also 'new' were the Barkers at Kilcooly and their near-neighbours and future patrons of the Leahys, the Hunts. A further exotic population came during the 1770s when Sir William Barker (1737-1818) of Kilcooly encouraged Palatines from County Limerick to settle and reclaim four upland townlands on his estate.²⁰

At the 1821 census, Slieveardagh had a population of 28,419, just under eighty persons per square kilometre. With only limited density variations among the thirteen parishes, the population was overwhelmingly rural. The largest towns in south Tipperary were then (as now) Clonmel (15,590) and Carrick-on-Suir (10,491). In Slieveardagh, only two places had more than one thousand inhabitants, Killenaule (1560) and Mullinahone (1108). The census lists just three other, much smaller, centres within the barony: Ninemilehouse (252) in the south, the upland village of Ballingarry (167) and the recently-founded, Vere Hunt-inspired, settlement of New Birmingham (293).

Dominated by small farms, the barony was also, crucially, a coal district. By the early nineteenth century, many small 'basset' pits had been opened in areas where the coal came close to the surface. In an era of great expectations that canal, and later railway, developments might unlock mining and manufacturing opportunities comparable to those already unfolding in Britain, these small pits were seen as indicating the potential of Slieveardagh. Like such other coal-bearing areas as neighbouring Castlecomer, the Arigna area of south Leitrim, and the Dungannon-Coalisland area of County Tyrone, the district became the scene for several ambitious, if highly speculative, development proposals.²¹ Some, like Vere Hunt's New Birmingham, achieved a physical expression. Others never went beyond discussion and a drawing board, among them some mining projects and several schemes for improving communications. The latter included the proposal for a Tipperary-Kilkenny canal (the subject of the survey by Townshend and Leahy in 1810-11) and, little more than a decade later, a proposal for a Killenaule-Clonmel railroad.

The grand jury and the making of a map of County Tipperary

Drawn from the landholders in the county, the grand jury (for whom Leahy made his 1818 map) raised funds to facilitate a limited range of necessary local functions, most notably the administration of law and order, and the making and maintenance of roads and bridges.²² As the demands of managing local communications increased, county maps proved to be valuable reference documents for these activities, and from the 1740s on, grand juries in various parts of Ireland began to encourage this type of cartography. A County Tipperary map, although proposed in the early 1750s, does not appear to have been produced.²³ By the

end of the century, however, a series of parliamentary measures supported the grand jury initiatives and allowed also for the making of separate barony maps.²⁴ During the late-1790s the Cork-based land surveyor, Neville Bath, made a survey and map of County Tipperary, for which he was paid £1500.²⁵ This map appears to have remained in manuscript, and it and all associated materials apparently passed into government hands in 1808, when the Chief Secretary, Sir Arthur Wellesley (later the duke of Wellington), authorised their purchase for £100.²⁶ When a listing of Irish county maps was made in 1816, the Bath map of Tipperary was dated to '1795 & 99' and was described as 'a trace on oil paper'; there had been no recent survey of the county.²⁷ Eight years later, and perhaps without much direct evidence in view of it presumably having been out of local circulation since its acquisition by the government, the Bath map was described as being so imperfect and inaccurate that it was never referred to.²⁸

With the utility of the Bath map limited by its possible defects and its unavailability, the grand jury appear to have contemplated the possibility of commissioning a new survey of the county. This initiative was apparently under active discussion in August 1813 when Patrick's relative, Michael Leahy, accosted Sir Vere Hunt at the Clonmel assizes 'looking for the survey of the county'. However, it was to Patrick that Hunt promised his vote in the event that the grand jury took action. The following spring, the grand jury advertised its interest in receiving proposals for a new survey that would produce a general county map at a scale of two inches to an Irish mile together with a set of barony maps on a scale of four inches to an Irish mile.²⁹ Tipperary was now among a diminishing number of counties that still lacked a good county map, in either manuscript or printed form,³⁰ yet any proposals that arose from this notice appear to have come to nothing. Almost a decade later, Patrick Leahy still held some hope that a county survey might be commissioned.³¹

A further ten years on, Leahy's interest in mapping County Tipperary resurfaced, although perhaps only rather briefly. Writing to the Chief Secretary's office from Clonmel in February 1834, he proposed that he should make a series of maps showing the police districts, and a separate series showing the baronies.³² The barony maps would be on a scale of two inches to a mile and would show

all roads, rivers, bridges, passages, bogs, loughs, hills & mountains, gentlemens seats, police barracks, military stations &c &c ... such police barracks [to] be washed with some one striking colour, say a red colour, to render them perfectly conspicuous and make the entire a military map

Perhaps not surprisingly, in view of the forthcoming coverage by the Ordnance Survey, these proposals were turned down. The correspondence does, however, include the comment from Leahy that 'no public map of this county has been ever published - a circumstance very much to be regretted in so extensive fertile, and prosperous a county'. Then follows the intriguing claim that Leahy had frequently been appealed to, because he had in his possession, 'executed principally from my own admeasurements, a very minute map' of the county divided into the various civil and ecclesiastical divisions. Not much else seems to be known about this map. Just possibly it was the copy of the seventeenth century William Petty map of the county with boundaries identifications that a year earlier Leahy had shown to the commissioners on municipal corporations.³³ Just possibly it was a framework that Leahy had doggedly hoped might develop into a fully-fledged county map. By the mid-1830s, however, county mapping was being superseded by the new era of countrywide mapping from the Ordnance Survey.

The case for a barony map of Slieveardagh

Curiously, neither of Leahy's applications to the Chief Secretary's office in 1823 and 1834 made reference to what may have been his most extensive, and perhaps also his most significant, mapping achievement in County Tipperary, his 1818 map of the barony of Slieveardagh. A map of Slieveardagh, an area with rising speculation about its coal resources, was arguably of greater priority than a map of the county at large. In his detailed report of 1814 on what he termed the Leinster coalfield, Richard Griffith had recognised the Killenaule district as a still little explored western extension.³⁴ Three years later, in November 1817, Griffith gave the district more specific attention with a report on the colliery owned by Charles Langley at Coalbrook.³⁵ The most enterprising of the landowners, Langley had already erected a steam engine and was reputed to be employing 150 men in 1814.³⁶ Now Griffith identified new seams of coal that could be exploited by deeper mining and better drainage of the workings. He outlined steps for more effective drainage, and the prospect that the Coalbrook colliery alone might contain coal to a value of £4,770,000 and culm (the lower grade shale with a heating potential) to the very precise value of £1,857,572. Langley was quite literally living on a fortune.

The Killenaule district was given further notice in May 1818 when (perhaps using Griffith's recent report to add to his own work) the mineralogist Thomas Weaver described it to a specialist audience in the course of an address to the Geological Society of London.³⁷ He made the rather negative comment that there was currently 'little doing' in any part of the district except on Langley's estate where there might be a reserve of over one million tons of coal and culm. Yet, even if activity was still limited, the landowners of Slieveardagh must by then have been well aware that their properties could soon be transformed. Griffith had indicated a need for improved communications to bring the coals to markets, and better roads might require presentments to the county grand jury. Such circumstances may have been the basis for the commissioning of a barony map independent of any county map and certainly help explain why the completed work featured a 'mineralogical reference' and a 'geological description'.

Leahy's map may consequently have been generated by a situation that was fairly specific to contemporary Slieveardagh. In contrast, most barony maps elsewhere in Ireland were produced as secondary items in more general county map projects.³⁸ So maps of at least eight baronies were made by the canal and mining engineer, David Aher, as part of his painstaking work for a map (apparently never completed) of County Kilkenny.³⁹ Aher was working in Kilkenny about the same time as Leahy in neighbouring Slieveardagh. As the biographer of the Leahys, Dr Brendan O'Donoghue, has remarked,⁴⁰ it is tempting to seek some connection between the two projects, but no supporting evidence has emerged.

The map of 1818 - general features

The Slieveardagh map is now preserved in the archives of the Geological Survey of Ireland (GSI). Exactly how it reached this repository is not known, but it is apparently not a recent acquisition. The GSI has, however, helped ensure its continued survival by undertaking its conservation. Drawn to a scale four inches to one Irish mile (1:20,160) - one in common usage for large-scale manuscript maps such as those prepared by the bogs engineers - the map has a frame height of 2130mm and a width of 1250mm, i.e. seven feet by four, and has been created by joining three large sheets. A scale bar shows a five mile

length in miles and perches, and gives a one mile length in furlongs and as eighty 'four pole chains'.⁴¹ Also shown is a compass rose with the 'magnetical meridian' (magnetic north) paralleling the side margin. On the mapped area, various colours are used, for hedges, parks and wooded demesnes (green), steep hill-slopes (black and grey brush strokes for the hachure symbols) and bog-land (pinkish brown), and for the boundaries of parishes (yellow) and the barony (pink).

The main title 'A map of/ the Barony of Slieveardagh/ From actual admeasurement' is followed by an extended elaboration (slashes indicate line breaks):

Showing all public, private and bye Roads, Rivers, Rivulets, and/ Bridges, Military Stations, Towns, Villages, Seats, Residences, Church/es, Glebe-Houses, Glebes with their exact boundaries and quantity where/ known; Antique Ruins of every description; Bogs, Moors, Mountains,/ Hills, Rising grounds, Valleys, and Steeps; The extent and bounda/ry of each Parish and Townland respectively, with the quantity of / Bog and Mountain in each; together with the proposed extensions / of Inland Navigation and the great Colliery situate in this Barony/ Surveyed for the/ Grand Jury of the County Tipperary/ By/ Patrick Leahy C.E./ 1818.



Plate 1. The 'Explanation', detail from Patrick Leahy's map of Slieveardagh 1818 (Reproduced with the permission of the Geological Survey of Ireland).

Two large panels provide more specific information. The 'Explanation' at the top centre offers extensive detail on the symbols and lettering conventions employed on the map (Plate I). 'Various handwritings' classify territorial units and places according to their perceived significance. Four types of buildings are shown in elevation: gentlemen's seats, castles and churches in ruin, and churches in repair. Other buildings and route-ways are placed into the category of 'Ichnography' [recte Ichnography, meaning representations as ground plans] and are shown by more stylised symbols: black rectangles for 'farm houses, farmers residences, and dwellings of the poor' (a single group), double lines for 'public roads, mail coach lines and cross roads', and dotted lines for 'private roads and by ways'. Distinctive symbols are also used for 'military stations for small detachments', lime kilns, stone walls, the projected Grand Canal extension that Leahy had surveyed, and the boundaries of parishes and townlands. Other features, explained as 'bogs, moors, mountains, hills, rising grounds, valleys and steepes' are all 'expressed by suitable colours and shades'. In other words, this is a map that draws from the so-called 'French' school to depict, as far as the scale permits, the major parameters of the landscape as if part of an aerial view.⁴²

Symbols are also included to indicate two further features of particular geological interest. Most notably and strikingly, bold black dots are used to denote the positions of the pits that form 'the great colliery of Slieveardagh'. Shown also, by a clear stippled line, is the key 'mineralogical division', namely the boundary between 'the limestone country and the Coal District'. It should be noted here that in his explanation, in the map title and in other places, Leahy uses the term 'colliery' both to imply the coal-field (his main usage) and an individual pit.

A second panel, at the bottom left, expands on the potential commercial interest of the local resources by offering a 'mineralogical reference' followed by a 'geological description'. The former relates specifically to the coal-bearing northern parts of the barony and features a list of 32 townlands under the headings of proprietor, quantity (area in Irish acres), location, and general observations relating to the past record of, and the prospects for, working coal and culm (see Appendix A). Culm is a type of carbon-rich shale that when crushed can act as a low-grade coal. If the practices of the Castlecomer area in neighbouring County Kilkenny were followed in Slieveardagh, culm being bulky and of low value, was mainly used close to the point of extraction, either as a domestic fuel or more extensively by burning with limestone to make fertiliser in local lime-kilns. William Tighe, in his *Statistical Survey* (1802, p.487) of Kilkenny, reproduces a description of the barony of Galmoy in which (under the heading 'Fuel of the Poor') the cheapest fire of all is described as 'culm pounded into dust, mixed with water, and rolled in their hands into balls, the size of a goose-egg'. Elsewhere (p.51) he states that burning lime is the principal use for culm.

Twenty-one different proprietors, some resident and some from outside the area, are listed. Those townlands where there had already been exploitation appear first, roughly in a south-west to north-east order commencing with the 'coal & culm of good quality and now working' in Ballinonty, the 319-acre property of William and Ambrose Going of Ballyphilip (where there was 'great quantities of coal and culm, part of a stratum of 5 feet coal'). This unit is followed by Lickfin, 580 acres, proprietor Fergus Langley, Esq., with 'coal & culm of superior quality and now working'. A very wide range of circumstances are identified. Eight townlands, to the south-east away from the surface coal, are given the comment 'doubtful whether coal or culm therein'. Others are described as 'not yet explored' or 'not much

worked'. Lisnabrock (to which is added in brackets 'now Coalbrook'), 817 acres of Charles Langley Esq. of Coalbrook, is 'a great coal & culm field now tolerably conducted', whereas the 616 acres of Glangoole (as it was spelt by Leahy), owned by Sir Obry [Aubrey] de Vere Hunt, is 'not working with advantage'. One of the most interesting comments is for the 580 acres of Boulancea owned by Edward Cooke Esq., of Kilkenny - it is described as 'a great coal & culm field, good quality, worked by the Tenants rendering a Third to the Landlord for his Royalty therein'. Revealed here is the dilemma faced by any landlord wishing to develop his assets: to choose from the options of becoming personally involved, coming to an arrangement with his tenants, or (especially where deeper mining was required) leasing his lands to a specialist mining entrepreneur.

Together with the absence of an immediate market of any size, management issues perhaps help explain why many of the townlands listed are described as having some coal or culm resources that were either badly worked or not yet explored. Among the less active proprietors was Chambré Ponsonby Barker Esq. of Kilcooly (2481 acres), with good quality, but little worked, coal and culm in the mountain parts of his estate. Others inactive included Lord Carrick, the proprietor of four townlands totalling over 800 acres, and John Dom. Byrne, formerly of Mullinahack, Dublin, who held Boullick and Gurteen (1800 acres), Colonel Pennefather of Newpark [near Cashel] who held Balingarry and Battaghbay (1903 acres), and Latouche of Harristown [Co. Kildare] who held Clonamicklan (1361 acres). Phaniel Cooke, Esqr, of Pointstown (1050 acres, now Poyntstown)) was another with 'a great coal & culm field in Ballinastick hill now very badly worked'. If anything, however, such negative descriptions underscored an argument that Slieveardagh was still greatly under-exploited and so with huge potential.

A more general 'geological description' followed the mineralogical reference [*place-name spellings as used by Leahy; other spellings modernised*]:

The Slieveardagh Mountains when viewed from the flat country on the North Side, present a steep ridge of Hill whose summits rise suddenly to an elevation of Five Hundred feet above the level of the lowlands, which are also Four Hundred and twenty feet above the level of High-Water mark in Dublin Bay; so the Colliery may be said to be situated Eight Hundred feet above the level of the Sea, Five Hundred and twenty two feet above the summit level of the Grand Canal, and Four Hundred and seventy eight feet above the summit level of the Royal Canal. These Mountains form a regular connected chain from Ballinonty near Killenaule to their entrance into the County Kilkenny; their general bearing being 20 degrees North of East or N70°E per Compass; parallel to which and a little South of their summits, the outgoing of one Coal stratum may be traced, from a string of Coal pits now opened through Ballinonty, Lickfin, Glangoole, Pointstown, Ballinastrick, Gurteen, and Graigamaun, beyond which no further searches have been yet made except a Danish excavation on the Hill of Kilbraugh, where the outgoing of this same vein is again recognisable in an open deep cut, which exhibits some beds of Anthracite, and manifests a continuation of this same coal vein thro' the Lands of White Hall and Rehenaghmore into the County Kilkenny. The dip of the Coal bed is rather uniform and regular, dipping generally with an angle of 30 or 40 Degrees under the Horizon and usually seated on an indurated Rock which is found parallel to the component Rock of these Mountains, whose Sections appearing along their steep sides and valleys on the North present their formation as seated on a Limestone Rock in its most perfect state. The Mountains on the South gently fall off and descend into a plain abundantly supplied with Limestone in secondary

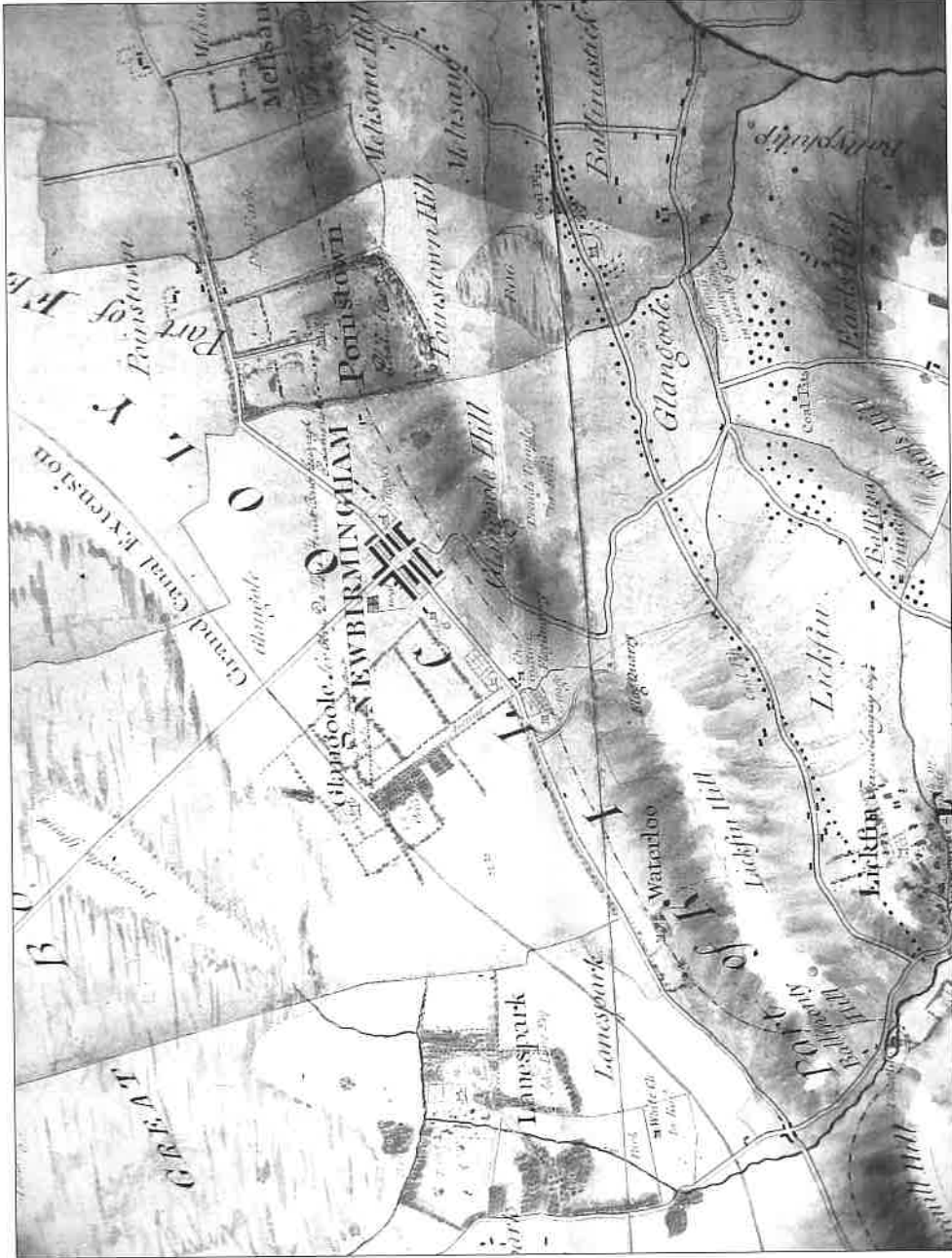


Plate 2. Detail, showing the New Birmingham area, from Patrick Leahy's map of the barony of Slieveardagh, 1818. (Reproduced with the permission of the Geological Survey of Ireland).

formations. From the application of Lime only, these Mountains which had been covered with Furze and Heath not more than thirty years ago, and presenting the most lonely, dreary and desolate aspects, are now converted to luxuriant meadows, sheep walks and gardens, and thickly stocked with Farmers, Cotters and Labourers.

This is the regional setting for the 'string of coal pits' that Leahy saw as tracing the course of 'one coal stratum' across parts of Slieveardagh. Besides the incidental comment about the recent reclamation of the southern mountains (presumably the slopes of Slievenamon), the altitude contrasts are indicated, the lowlands being placed at a height of four hundred feet, and the uplands at more than eight hundred feet, above sea level. Perhaps because they could be readily related to various canal surveys, these estimates are reasonably accurate, even though they precede the general height measurements of the Ordnance Survey by almost two decades.

The map of 1818 - content

Extensive general topographical information is scattered across the map. Nine parish names appear in prominent lettering. Two very recent house-name designations must be 'Wellington' north-west of Urlingford and 'Waterloo' north of Lickfin Hill. Also in the north-west, in a seemingly rather vague identification, the main bogland area is here designated as 'Part of the Great Bog of Allen'. Some roads get described as 'steep', 'new... of easy descent', 'condemned', 'old approaches'. The 'present mail coach road' and the 'old Dublin Road' are marked near Ninemilehouse in the far south. As indicated in the 'Explanation', flag symbols identify the small barracks at Mullinahone, Killenaule, New Birmingham and Urlingford. Cross and building symbols denote the Catholic chapels at these centres and also at Ballingarry and Gortnahoe. Perspective sketches of churches identify the places of worship of the established church, for example within the grounds of Kilcooly. Churches in ruins are also marked, for example 'White Ch in Rui[n]s' at Lanespark west of New Birmingham. A Methodist chapel, which may have been founded about 1790,⁴³ is indicated at the Palatine settlement at Bawnleigh. Demesnes, deer parks and orchards also appear, usually with considerable detail. A few features are recognised just once, for example the 'ice house' south of Kilcooly and a flour mill near Ballynonty.

Features of geological interest include the location of quarries, for example two 'flag quarries' near New Birmingham, 'Chelybate' (a spring, west of Ballingarry), and a steam engine and 'water engine in Rui[n]s' near Coalbrook. At least twenty lime-kilns are also shown, most of them close to streams or near the junction of the coal district and the limestone field.⁴⁴ William Tighe in his *Statistical Survey* of Kilkenny (1802, pp.440-441) described the building of kilns and the process of burning lime; he noted that Slieveardagh culm was used in the Kilkenny district of Callan and Knocktopher. On the 1818 map, however, the depiction of some two hundred pits is the most striking geological representation, producing a vivid impression of where the coal and culm resources had been exploited. One series of over a hundred pits extends in a narrow band for almost 8km (5 miles) close to what is now a minor road that runs north-east to south-west on the ridge high above what is now the R689. As the 'geological description' indicates, these pits mark where one of the main coal seams reaches or comes close to the surface. A second, less linear, concentration of around seventy pits lies between Earls Hill and Glengoole. Further, smaller scatters are found to the west near Coolquill (up to 20 pits) and to the east around Coalbrook and Newpark (both around 35 pits) and south of Bawnleigh (perhaps eight pits).

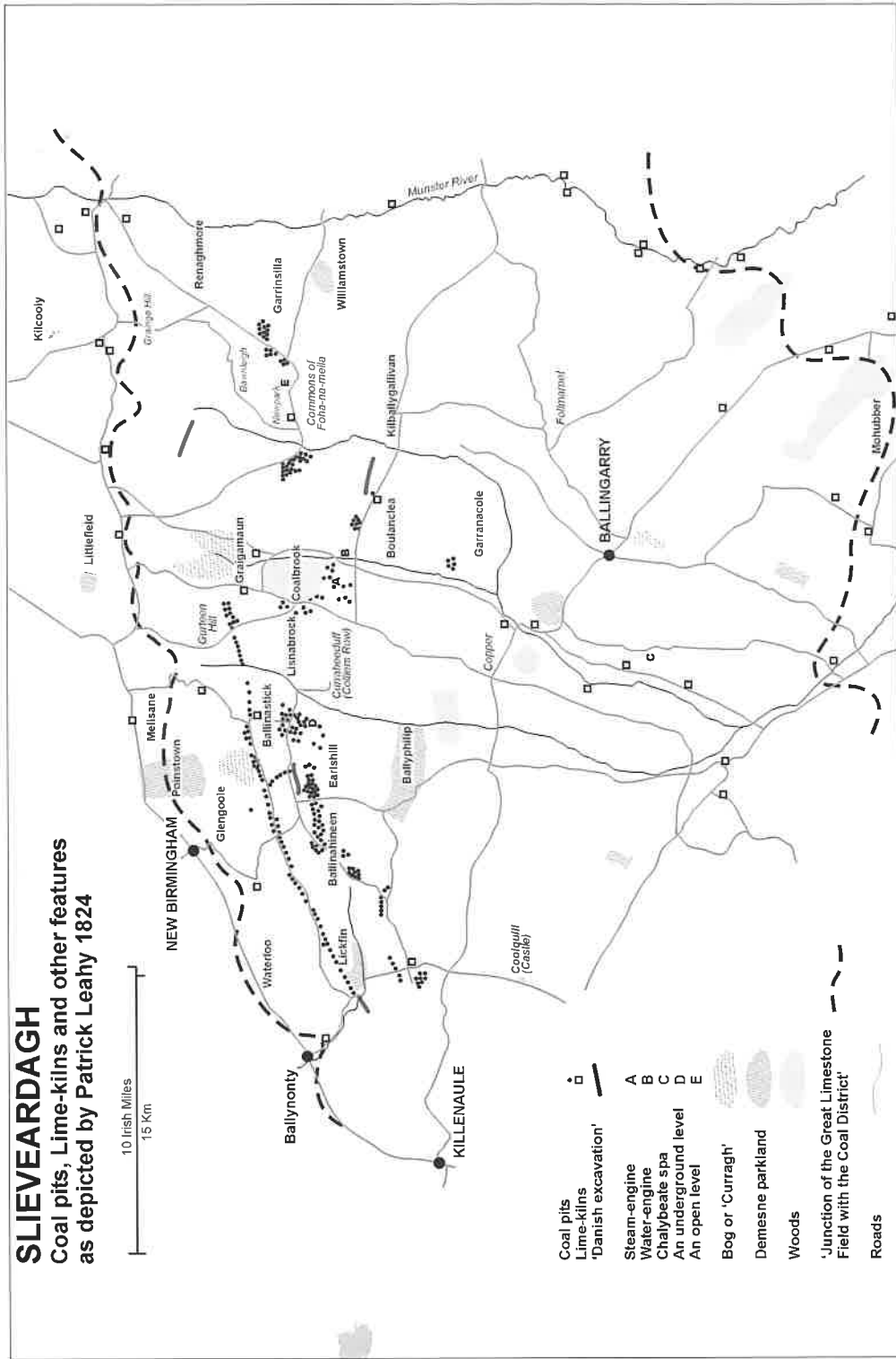


Figure 2. Slieveardagh 1824: Coal pits, lime-kilns and other features depicted by Patrick Leahy.

Across these areas also is a dispersal of buildings, many of them presumably the houses of farmer/miners. In a few places, there are signs of more organised settlements. The most striking is New Birmingham which is shown as a planned lay-out with about fifty houses. Another place with a planned appearance is the straight line of six buildings that is shown west of Coalbrook demesne. Unnamed in 1818, this site appears with three further buildings on the 1824 map and is identified as 'Curraheehduff alias Colliers Row'. To-day this area is known as 'the Acres' or more colloquially as 'd'Acres'.⁴⁵

Several sites across the map are noted for their historical associations. The 'Castle Ruins, the Ancient seat of Tighernan O Rourke King of Breiffne in the Year 1166' is identified at Inchorourk, close to the 'Wood of Inchorourk', on the bogland west of Urlingford. A 'Druids Temple in Ruins' is marked on Glengoole Hill overlooking New Birmingham. 'Forts' and 'Danish forts' are marked at several locations. 'Great Danish Excavation in search of Coal' at Glengoole presumably indicates that the tradition of exploiting the Slieveardagh coals is of considerable, if indeterminate, age.⁴⁶ On the 1824 map, three further 'Danish excavations', denoted by linear symbols that appear to indicate open trenching, are marked near Lickfin, at Kielbragh Hill, and at Bo[u]lanaclea east of Coalbrook.

The map of 1824

What has been described as a complex chemistry of economic forces and philanthropic impulse brought an investment boom in Ireland's mineral potential during 1824-25.⁴⁷ Four major companies were formed and sought suitable prospects for investment. The Hibernian Mining Company and the Mining Company of Ireland both explored the potential of the Slieveardagh collieries. As well as a copy of the Griffith report of 1817, the records of the former⁴⁸ contain a description, possibly also made by Griffith, of the collieries of Killenaule with particular reference to the estate of Edward Newenham. In the half-yearly reports of the latter,⁴⁹ starting with that issued in July 1825, regular accounts appear of the progress, and the difficulties (including delays in obtaining a steam engine and a resistant workforce), of developing the prospects in Slieveardagh. By mid-1825, mining leases had been agreed for the collieries associated with the Coolquill, Mardyke, Gurtinacy, Glengool and Ballygallivan estates, and the Coolquill venture was already being worked. In 1828, the company built a planned settlement of twenty-five houses at Mardyke near Lickfin.⁵⁰ By the early 1830s, up to ten steam engines were in operation, and the Mining Company of Ireland was reputed to employ nearly three thousand.⁵¹ The company link with Slieveardagh continued, in various expressions, until 1890.

Patrick Leahy became associated with the early stages of these developments by his preparation of a review of the prospects of the Killenaule/ Slieveardagh coalfield. His review is described as being 'the mining company's guide' to the locality, but the company involved is otherwise unnamed.⁵² The five-page hand-written report and an accompanying manuscript map are both now in the National Library of Ireland.⁵³ A subtitle explains that the latter was derived from the grand jury barony map, and that it is

'Embracing and extending Limestone Country/ And exhibiting the boundaries and extent of the several Properties in this Colliery, its/ Antient and Present Coal Works, with its Roads, Rivers, Bridges, Seats, Residences, Buildings,/ Ruins, Landmarks and Features; as also the Grand Canal Extension &c &c. '.

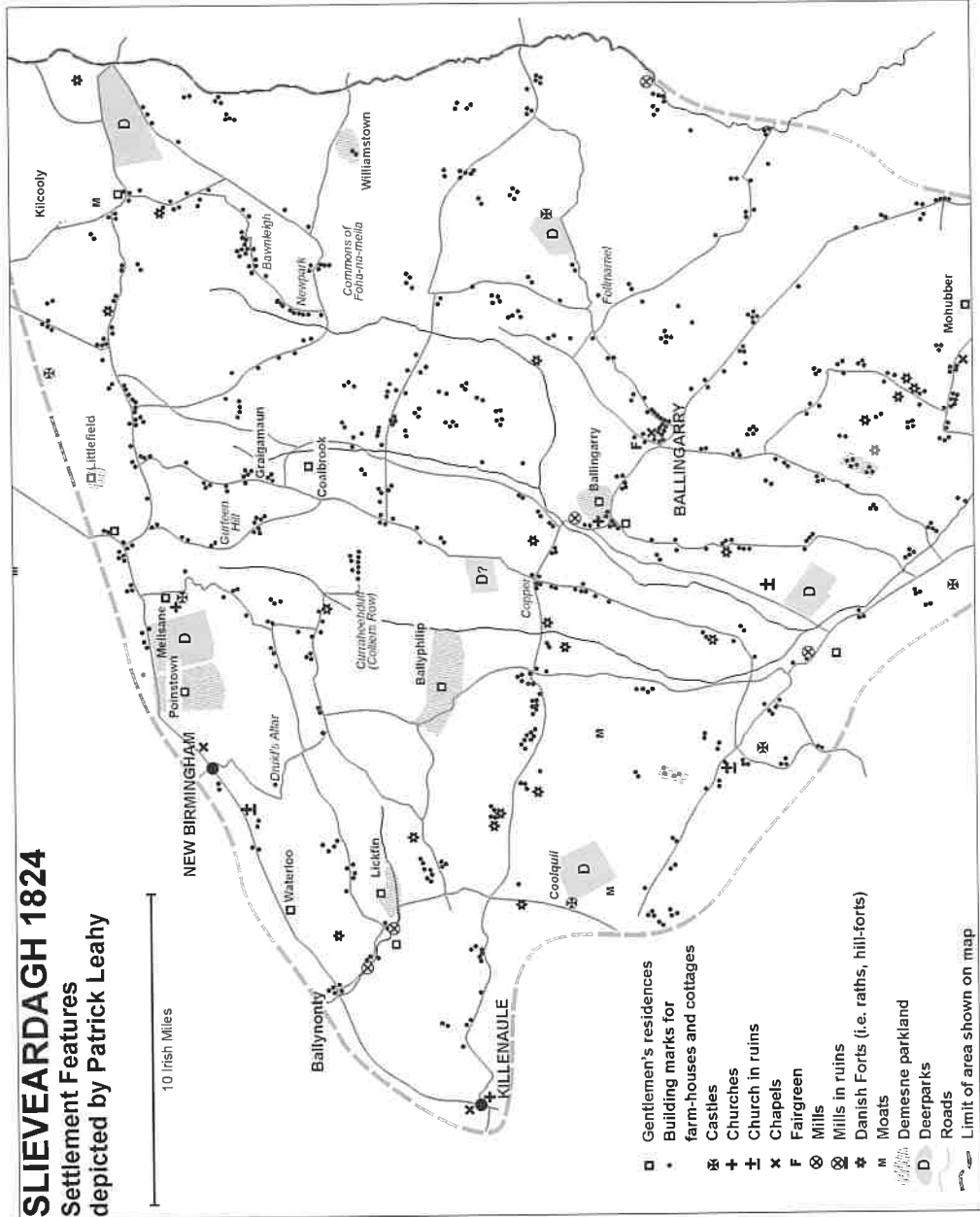


Figure 3. Slieveardagh in 1824. Settlement features depicted by Patrick Leahy. NLI 16.1.17

Compared to the barony map, there are place-name and other textual amendments, and the coverage is restricted to the coal district, extending from just north of New Birmingham and the scarp ridge to Mohubber and Harley Park about 6km north of Mullinahone. A stippled, yellow-bordered line, identifying the junction of 'great limestone field' with the coal district, girdles the main mapped area.

Inset on the map are several panels: a reference list, a scale panel, an explanation of symbols, and a commentary headed 'mineralogical observations'. The reference tabulates and locates 34 land units, listing their proprietors and where they reside. The scale (the same as in 1818, four inches to one Irish mile) is expressed in terms of perches, four pole chains and Irish miles. Another note describes the square grid that is lightly drawn across the map, explaining that each of squares represents 360 Irish acres, so facilitating area estimations.

The 'mineralogical observations' panel describes the setting of the coalfield and then comments briefly on its history

The ancient mode of working this Colliery was by open work, excavating the entire surface as is still perceptible in many parts, particularly Lickfin (k6), Glangoole (h 12) Kielbragh (e 22) and at Boulanclea (k 20) [Letters and numbers refer to the grid referencing system]. The present mode is by boring and underground, a work which is yet conducted extremely unskilful [sic].

The observations continue that the 'outgoing' of one 24-inch thick coal vein up to the surface may be traced from the train of coal pits from Lickfin to the bog at Graigamaun 'running [sic] North of East per compass 21 Degrees'. In the symbols explanation panel it is stated that the coal pits are 'laid down in their exact place'.

The 1824 map shows a total of around 290 pits in the Slieveardagh district (Figure 2). Also shown by symbol are 37 lime-kilns, most of them beside roads or rivers and at or near the junction with the limestone bedrock. As might be expected, the distribution of the pits and kilns follows closely the pattern shown in 1818. There is otherwise only limited evidence of other components of extractive activity: the 'flag quarry' near New Birmingham, 'an open level' near Bawnleigh, 'an underground level' at Earlshill, and four 'Danish excavations'. The steam engine and water engine (apparently in repair) at Coalbrook continue to be the only indications of the machinery that might be needed to meet the drainage challenges of deeper mining.

In addition, extensive detail is shown relating to features of human occupation. Besides the village-towns of Killenaule and New Birmingham, fourteen 'gentlemens residences', four castles, three churches, three chapels, three mills, an ice house and five deerparks are indicated (Figure 3). Twenty raths and hill-forts (as in 1818 described as 'Danish forts') and three moats, as well as three churches and two mills in ruins, and the 'druid's altar' on Glangoole hill represent former settlement activity. However, the most widespread feature of the map is the 670 small rectangular black building marks that denote the widespread scatter of small farm houses, cottages and, possibly, out-houses (the symbol explanation gives no indication that out-buildings are shown, but the lay-out of some sites suggests that what is shown in places may be a farmyard with dwelling plus two flanking out-houses). These buildings occur mostly either in isolation or as groups of two to four. In a few places they form larger groups as at Copper, or sometimes fairly linear features as in the Palatine area of Bawnleigh and Newpark (a locality later denoted on Ordnance Survey maps as 'Palatine

Street'), on the edge of Ballingarry and at the apparently-planned site of 'Curraheehduff alias Colliers Row'. The number and spread of the coal pits and these buildings highlight just how much Slieveardagh was a rural landscape of widespread, small-scale mining activity. The development of the coal-field had involved a series of individual proprietors, some with greater interest than others, and with a few undertaking - or allowing - more enterprising initiatives. The message from the memorandum was imbued with an optimism that - as with other coal districts across Ireland - the full potential of Slieveardagh had yet to be realised.

The memorandum

The coal-field is introduced with an outline of 'its structure, present extent and probable value'. An account is given of the past and present working of the coals, concluding with 'general observations on the comparative value of the several collieries, the state of circumstance of the proprietors, and instructions to a mining company where, and with whom the most beneficial and valuable purchases could be effected in these Collieries'.

The discussion is initiated with a physical description that expands on the geological comments in the 1818 map. Highlighting the contrast between the 'mountains' in which the coalfield is located and the flat 'limestone country' to the north, cross-reference is made to the depiction on the map of the junction between the two districts. As a tract of agricultural country with 'a great passion for liming land', the 700 square mile area further north is an important market that will 'sooner or later require lime and consequently ... a supply of culm'. Attention then shifts to the hill area and to the southerly dip of the 'mountain' and the slightly greater dip of the coal veins. Perhaps drawing from Griffith's 1817 report, three coal veins or beds are identified. The first, running from Lickfin at least as far as Foilacomán or Graigamaun, is stated to be 22 to 24 inches thick 'all pure coal and like quality with the Kilkenny'. As the 1818 map had already highlighted, it was denoted by 'a string of coal pits [that] have been sunk ... about 20 feet deep'. This vein was underlain by a second, stated to be found 32 yards under the first, which was 23 inches thick and 'far superior ... and has been scarcely touched as yet in any part of the Colliery'. A further vein, which was nine inches thick, lay some 22 yards under the second, but was in consequence of its depth of little value although not inferior in quality.

An attempt is then made to calculate the extent and potential value of the coalfield. The approach used again has a resonance with Griffith, except that the calculation is being applied to the entire coalfield, not an individual colliery. The surface extent is described and is calculated as 25½ square Irish miles. However, the southern part had not been much worked and its limits were unclear. To allow for this and for parts already worked, Leahy based his value reckonings on a coalfield area of fifteen square (presumably Irish) miles. The two main coal seams might, in Leahy's estimation, yield 2310 tons of coal per acre plus a further 3465 tons of culm. On this basis the value of coal and culm across one square mile (640 acres) might exceed four million pounds. As a result the fifteen square miles of coal and culm in the northern part of the district might have a value of over £60 million, a total which, if the third coal seam were added, might rise to a 'worth' of £77,172,480. No attempt was made to balance this impressive 'worth' with any estimate, no matter how tentative, of the cost of extraction. Leahy prefers to emphasise that his estimate is a minimum, as the coal area extends further east and west but has yet to be explored. In fact it might extend 24 miles in an east-west direction 'and consequently must be an inexhaustible source of wealth

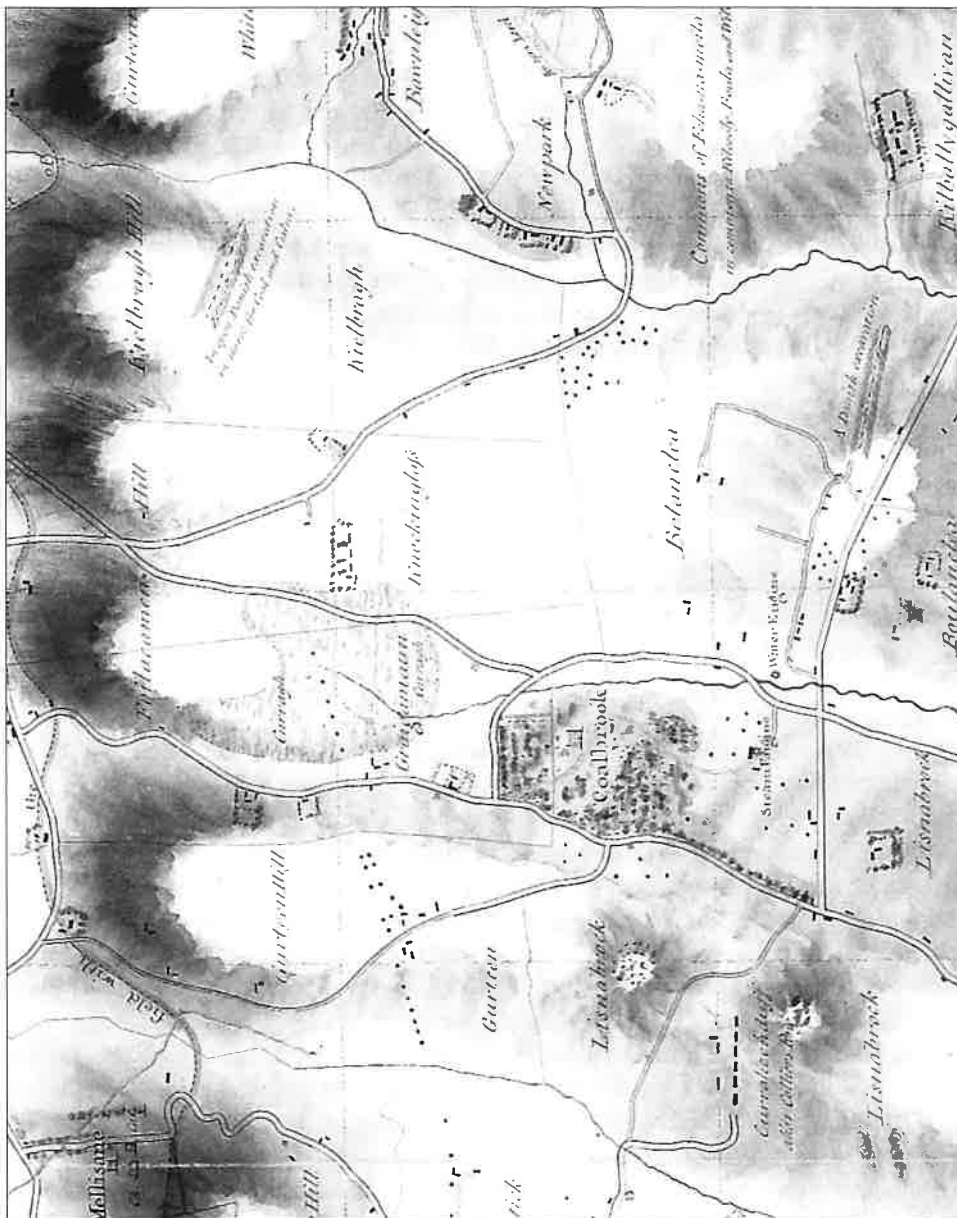


Plate 3. Part of Patrick Leahy's map of the Killenaule coal district, 1824, showing detail around Lisnabrock/ Coalbrook. (Source: National Library of Ireland, 16.I.7. Property of, and reproduced with permission of, Board of National Library of Ireland).

in such an agricultural country and in the vicinity of so many populous cities and towns'. The exploitation of the coal-field was facilitated by good road communications and would receive further impetus if the Suir Navigation were extended from Two Mile Bridge near Clonmel to Killenaule, an initiative that might be completed for £30,000.

An analysis of the characteristics of the individual collieries, existing and potential, is then attempted, the discussion being organised primarily by townland and proprietor, rotating clockwise from Killenaule. Thirteen 'collieries' are thus described, with brief remarks about each, with particular reference to the circumstances and willingness to sell of the proprietors. For example, Coalbrook or Lisnabrock is described as having 450 acres fine coal (Plate 3). Its proprietor, Charles Langley, who is identified as a gentleman much embarrassed as a result of 'family incumbrances', had built a fine house and suitable offices. He had also lately erected a steam engine of 14 Horse Power and worked his Colliery with more judgement than any other proprietor in the district. Further south, at Ballyphillip Earlishill and 'Ballwilkinson', there were 270 acres fine coal. Here the proprietor was Ambrose Going, who had 'acquired great properties from his colliery'. He had found basins six feet thick and had now completed a great underground level. However, he had no machinery and was 'working on the old system'. Leahy commented (as he had also in relation to Langley) that any purchase of land from this property would be difficult. Among the other notices, there is a remark on the 120 acres of Foha-na-mila Commons (near Newpark) which had 'many small huts'. Taken together, these commentaries provide invaluable, if sometimes rather uneven, detail on the development of the coal-field to 1824; they are reproduced in Appendix B. As the conclusion notes, their detail confirms that the main exploitation had been in the northern parts of the district and that the southern area, where the coals lay deeper, remained to be explored.

Later work by Leahy

Although, as already noted, he made a survey of the Killenaule estate, Leahy's later involvement with Slieveardagh, and indeed with geology, appears to have been quite limited. His main concerns came to focus on various types of engineering projects, among them a series of railway initiatives that were primarily promoted, not particularly effectively, by his sons. As far as geology was concerned, his career continued to contrast with that of his near-contemporary, Richard Griffith. Whereas Griffith benefited from a range of opportunities to build a national reputation as a geologist, an engineer and a capable organiser, much of Leahy's work appears to have been episodic. His 1818 Slieveardagh barony map was finished to a high standard. Yet, probably because it was a manuscript, its 'impact' appears to have been limited, and the main benefit accruing to Leahy may have been his 1824 mining company commission to report on the Killenaule/ Slieveardagh coalfield, a project that in turn produced another informative manuscript map as well as his memorandum with its highly optimistic estimate of the potential worth of the coal district.

Leahy's Tipperary maps therefore remained essentially stand-alone pieces, never feeding into the kind of career that Griffith managed to create. Perhaps for this reason Leahy's recording of the coal pits and mining features of Slieveardagh fails to command a notice in the most comprehensive account of the development of geological mapping in Ireland.⁵⁴ To judge from the scarcity of acknowledgements in later work, Leahy's initiative may never have become incorporated into the broader stream of geological knowledge. Or so it would seem,

except that such an explanation fails to account for the presence of the Slieveardagh barony map in the collection of the Geological Survey of Ireland. Before the story of Patrick Leahy and the Slieveardagh coalfield can be more fully evaluated, more information on the life history of his barony map (and indeed also on the history of his 1824 work on the Killenaule district) is desirable. If that map came into the Survey's possession soon after its foundation in 1845, then it should have been, at minimum, a feeder source of information for one of the principal centres of mainstream geology in Ireland. Perhaps Leahy's work has made more of a contribution than has yet been appreciated. This part of the story remains to be unravelled.⁵⁵ In the meantime, Patrick Leahy deserves recognition for his role in documenting the early nineteenth-century circumstances of the Slieveardagh coalfield.

Appendix A. The Mineralogical Reference of 1818

Showing the Townlands which lie within the Coal District, with such remarks annexed to each as may readily serve to point out the respective Lands now explored and working, their several quantities, and the names of the proprietors vested with their several Royalties. [*Placenames spelt as in original, other spellings modernised*].

Townlands	Proprietors	Quantity acres	Local situation	General Observations
Ballinonty	William and Ambrose Going Esq Ballyphilip	319	1½ miles east of Killenaule	Coal and culm of good quality and now working
Lickfin including Ballaughineen	Fergus Langley Esqr Lickfin	580	Adjoining the latter east	Coal & culm of superior quality and now working
Coolquill	...Gahan Esqr dec'd	681	Adjoining the latter south	Coal & culm good quality not much explored
Killnahone		265	1 Mile E of Killenaule	Coal & culm good quality near the surface
Crohane including Cashiel and Garrynoe(?)	Anthony G Loftus Esqr Clonmell	945	2 miles SE of Killenaule	Coal & culm by tradition supposed to exist here in extensive beds
Ballykeyran	Charles Langley Esqr	212	Adjoining Crohane north side	Not explored
Ballincurry	Lord Carrick	264	2 miles east of Killenaule	Not explored but supposed to have coal & culm
Gurtanesy	Lord Carricks	151	Extends from Coolquill to Copper village	Coal & culm of superior quality now very badly worked
Killaheen		278	Bounded by Ballyphilip	Not explored
Ballyphilip including Earls Hill	William and Ambrose Going Esq Ballyphilip	354	2¾ miles due east of Killenaule	Great quantities of coal & culm part a stratum of 5 feet coal
Glangoole	Sir Obry de Vere Hunt Bart Curragh Co Limerick	616	About NewBirmingham	Coal & culm good quality not working with advantage
Poinstown including Mellisane and Ballinastick	Phaniel Cooke Esqr	1050	Adjoining NewBirmingham E	A great Coal & Culm field, in Ballinastick Hill, now badly worked
Boullick & Gurteen	John Dom. Byrne Esqr. (Mullinahack Dublin formerly)	1800	East of Poinstown	Coal & Culm on Gurteen Hill very little worked
Clonamicklan, Graiganmaun Knockinglass Foilacasen and Kilebraugh	Latouche Esqr (Harristown)	1361	East side of Boullick	Much culm found but little coal - never explored much

Kilcooly Knockatoreen Whitehall Rehenaghmore Bawnleigh and Newpark	Cham B Ponsonby Barker Esq	2481	About Kilcooly House	Coal & culm in the mountain parts, good quality little worked
Garransillagh	William Butler Esqr	198	Adjoining Co Kilkenny	Coal & culm found little worked
Williamstown	Do Do	400	Adjoining Do	Coal & culm superior quality now not working
Kilballygallivan	Lord Carrick	218	Adjoining the Commons	Coal & cum in some places
Boulancea	Edward Cooke Esqr Kilkenny	580	East of Coalbrook and adjoining	A great Coal & culm field, good quality, worked by the Tenants rendering a Third to the Landlord for his Royalties therein
Garrinacole	Lloyd Esqr Lloydsboro Templemore		Adjoining Boulancea on the E	Some Coal or Culm found, not explored
Lisnabrock (now Coalbrook)	Charles Langley Esqr Coalbrook	817	4¼ miles East of Killenaule	A great Coal and Culm field, now tolerably conducted
Ballingarry and Ballaghboy	Col Pennefeather Newpark	1903	4 Miles East of Do	Coal & culm found not much worked
Farrinrory	Lloyd Esqr Lloydsboro	867	W of Ballingarry	No coal raised nor yet explored
Garrynagree	Lord Carrick	170	Between Williamstown and Farrinrory	No coal or culm found nor yet sufficiently explored
Boulacale	William Butler Esqr Williamstown	194	Adjoining the Co Kilkenny	Doubtful whether coal or culm therein
Gortfree	Stephen Moore, Esqr, Barn, Clonmell set to Robt Shaw Esqr	187	Adjoining the Co Kilkenny	Doubtful whether coal or culm therein
Kielmackevogue	Earl of Clonmell	168	Adjoining the Co Kilkenny	The like
Follmarnell	Walpole	200	East of Ballingarry	The like
Ballintaggart	Lord Desart	763	S.E. of Ballingarry	The like
Glengaul & Kilmatenuge		190	South of Ballingarry	The like
Shangarry (now Wilford)	Lady Barkers	232	1 Mile S of Ballingarry	The like
Gragagh		424	East of Shangarry	The like

Appendix B. Extract from the mining company memorandum on the Killenaule coal-field prepared by Patrick Leahy in May 1824. Section listing particular townlands/ 'collieries' [spelling and punctuation modernised].

.... I shall now treat of each Colliery in a connected order, beginning at Killenaule and passing in an easterly direction till we reach the County Kilkenny, from whence we shall course round by the south again to Killenaule.

Lickfin. Fergus Langley Esq, the proprietor. Contains 150 acres coal, is situated near Killenaule, strata 24 inches thick, comes up near the surface, and is equal to any coal in that Colliery. Was formerly worked by open work. Is traversed in every direction by good roads

and lies mostly low, not more than 250 to 300 feet above the Limestone plains. Mr Langley is a gentleman of embarrassed property, of fair and honourable character, and with whom a purchase could be effected for the fair value, even much under that, and is a resident upon his property or contiguous thereto.

Coolquill. 200 acres good coal, proprietors Mr Ponsonby and Mr Jacob in right of their wives, the only daughters of William Gahan, formerly of Coolquill and long dead. These gentlemen are not residents of that part of the country but I believe in Dublin. No better quantity of coal by account in the entire Colliery than in Coolquill. It lies deep, and I believe is a different vein to that in Lickfin, being south of Lickfin and therefore must be a different coal vein. The surface of the land lies lower than Lickfin, and consequently the operations were deterred (sic) formerly by water, and no mode nor machine ever executed to keep down the water. This Colliery fell into neglect upon the death of Mr Gahan who in his life time resided in the old castle of Coolquill.

Glengoole or Newbirmingham. 70 acres good coal. Sir Obey Hunt, Curragh. Co Limerick, proprietor. Comes up near the surface, has been little worked, the coal of good quality and was formerly worked by an open excavation of great depth and labour, which though conducted with great labour was yet laid out very skilful as it coursed?? with the coal vein began at the lowest level and worked forward in a westerly direction where a vale and rivulet served to carry off the waters towards Lisnabrook. This excavation is shown on the map at 11, 12. The proprietor will sell this Colliery for the value. [It] is traversed by two or three roads laid out and made in the lifetime of the late Sir Vere, his father, who was the founder of the present market town of New Birmingham. New Birmingham is built close to the foot of the mountains and on a limestone quarry of superior and tender quality and works nearly equal to the Kilkenny marble; it is capable of receiving a very fine polish. Convenient to this town and a little to the west, where the old church of Ballynalacken is situated, is a fine flag quarry which is yet very little known in point of value in that neighbourhood. The flags are blue, will rise and cleave to the thickness of 1½ inches to 2½ inches thick, and not inferior to the Co Carlow Flags.

Gurteen Hill. 80 acres good coal. John Dom Byrne, proprietor. Very little worked and lies high - this has been as yet but little worked.

Poinstown Mellisane and Ballinastick. 160 acres good coal. Phaniel Cook of Poinstown Esq., proprietor, is much embarrassed, and with whom it may be the advantage of the Company to purchase, unless his Collieries are otherwise under some conditional manner conveyed to the Courts for payment of his Debts. His property has been particularly surveyed and mapped by me and is a very considerable one. Some nucleus [?] of coals are to be found in basins on this Colliery several feet thick; in one place it is seven feet thick from whence great and valuable quantities of coal and culm had been raised.

Graiganaum and Boulancea. 350 acres of a fine coalfield. Edwd Cooke Esq Kilkenny the proprietor, who generally lets different parts of his Colliery for one-third of the real profit after deducting all expenses. Many enterprising persons has engaged with this Colliery.

There is yet the remains of water engines therein and had at all times very much attracted the notices of skilful persons. The coal lies low and much subject to water.

Coalbrook or Lisnabrock. 450 acres fine coal. Charles Langley Esq, Coalbrook, the proprietor, has been a gentleman much embarrassed notwithstanding his valuable Colliery, and which was occasioned from family incumbrances in addition to his having built a fine house and suitable offices. He has lately erected a steam engine of 14 Horse Power and works his Colliery with more judgement than any proprietor in that district. It will be difficult to effect a purchase here.

Ballyphilip Earlehill and Ballwilkinson??? 270 acres fine Coal. Ambrose Going Esq, Ballyphilip, the proprietor, has acquired great properties from his Colliery which is of immense value. He has found basins six feet thick which has enabled him to effect great purchases from Lord Doneraile, He has now completed a great underground level, has no machinery but working on the old system. It will be difficult to effect a purchase from Mr Going.

Garrane, alias Garranacole. 60 acres good coal. Mathew Jacob Esq., Mobarna, proprietor, with whom a purchase could be easily effected but is central in the coal district. Has every advantage as to roads.

Kilballygallivan. 70 acres. Lord Carrick's - good coal but inferior to the other Collieries. Has much culm. Lies low, and is central.

Foha-na-mila Commons. 120 acres. A commons, many small huts and the culm veins runs (sic) up to the surface. No coal has been sought for but great beds must lie under.

Renaghmore & Grainge hill. 100 acres not much explored. Cham. B P Barker Esq, Kilcooly, the [sic]. A Gentleman of great property, would sell his mine. Would not recommend for several years to encounter this colliery.

Williamstown and Garrinsilla. 400 acres very little explored. Wm Butler Esq, the proprietor, has under ground levels and with whom a purchase could be easily made. Lies well, and adjoins the Munster River of Co Kilkenny. The several coal veins to the east are said to traverse this property consisting of 777 acres in both lands.

Conclusion

Many collieries may hereafter be explored in the southern part of this district but, as no experiments has yet been tried or coals ascertained, I shall only say that in all probability the coal veins run deep under there, and until the northern parts are worked out few enquiries will be extended into the southern limits of this district.

Pat Leahy C.E.

Dublin 18th May 1824

Acknowledgements

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- ²Brendan O'Donoghue, *In search of fame and fortune: the Leahy family of engineers 1780-1888*, Dublin: Geography Publications, 2004.
- ³William Nolan, "'A Public Benefit': Sir Vere Hunt, Bart and the Town of New Birmingham, Co. Tipperary, 1800-1818", pp. 415-453 in H.B. Clarke, J. Prunty and M. Hennessy (eds) *Surveying Ireland's Past: Multidisciplinary essays in honour of Anngret Simms*, Dublin: Geography Publications, 2004. In 1813 Patrick Leahy was employed to make a plan for the proposed bridewell at New Birmingham (Nolan, p.435: Two years later Leahy was engaged with John Neville in laying out one of the streets of New Birmingham: (O'Donoghue, *In search of fame and fortune...*, p.15). Nolan (pp.428, 439, 443) also records a Thomas Leahy acting as a clerk for Vere Hunt in New Birmingham.
- ⁴Brendan O'Donoghue, *In search of fame and fortune ...* p. 5.
- ⁵On Townshend, see the article by David Brooke, pp. 712-714 in A.W. Skempton et al. (eds) *A biographical dictionary of civil engineers in Great Britain and Ireland, Volume 1: 1500-1830*. London, 2002.
- ⁶Minute books of the Directors-General of Inland Navigation, National Archives of Ireland, 1/5/1/10, esp. minute for 9.10.1809, and 1/5/1/13, esp. minute for 25.7.1812. (Dates quoted are correct, but it should be noted that there may be some confusion in the NAI index identifications).
- ⁷Report of Thomas Townshend on District of Bog No.6 (parts of Counties Westmeath and Offaly), with two maps. *Second report* of the Bogs commissioners, 1811, pp. 149-171.
- ⁸Payments by the Bogs commissioners to Leahy are recorded in the *First report* (p.14), *Second report* (p.30) and *Fourth report* (p. 19).
- ⁹Report of Thomas Townshend on the Lough Neagh district, *Third report* of the Bogs commissioners, 1814, pp. 153-166, esp. p. 162.
- ¹⁰Brendan O'Donoghue, *In search of fame and fortune ...* p. 12. O'Donoghue quotes Leahy as describing Townshend as his 'first encourager in life'.
- ¹¹National Archives of Ireland. Chief Secretary's Office reports 1823/6319, including the memorial of Patrick Leahy of Clonmel, 31 July 1823.
- ¹²*Clonmel Advertiser*, 1818.
- ¹³In the 1824 memorandum discussed here, Leahy indicates that he had surveyed and mapped the property of Phaniel Cooke of 'Poinstown'.
- ¹⁴According to Brendan O'Donoghue, *In search of fame and fortune ...* pp.18-20, the map does not survive. The associated rental book is recorded in NLI microfilm, Pos 8873.
- ¹⁵Brendan O'Donoghue, *The Irish county surveyors 1834-1944: a biographical dictionary*, Dublin: Four Courts Press, 2007, pp. 234-239.
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- ¹⁹Nolan, 'A Public Benefit' ..., p. 420.
- ²⁰W.G. Neely, *Kilcooley...*, pp.53-57, also p.III. The four townlands, Bawnlea, Knockatoreen, Newpark and Renaghmore, include the highest part of the Slieveardagh upland.
- ²¹For a recent general review on the exploitation of Irish coalfields, see Colin Rynne, *Industrial Ireland 1750-1930: an archaeology*, Cork: Collins Press, 2006, pp.81-97.
- ²²For a concise description of the grand jury system and a listing of the principal surviving records now in public

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- ²³Dublin Journal 5 June 1753. Cited in J.H. Andrews, *Plantation acres: an historical study of the Irish land surveyor*, Belfast: Ulster Historical Foundation, 1985, pp.340, 361.
- ²⁴J.H. Andrews, *Plantation acres...* p.349.
- ²⁵J.H. Andrews, 'A Cork cartographer's advertising campaign', *Journal of the Cork Historical and Archaeological Society*, 84, 1979, 112-118.
- ²⁶Wellington Papers, University of Southampton, WP/1/193/46, 54; also WP/1195/52, 56, all March 1808. At this time, the government also intended to £200 for Bath's map of County Cork and £100 for his work on Counties Limerick and Kilkenny.
- ²⁷British Library Add. 40612. 'Memorandum & description of the maps of the several counties in Ireland, particularly those in the QM Generals office' [1816].
- ²⁸Report of the select committee on the survey and valuation of Ireland, 1824, p.342. Also Andrews, *Plantation acres*, p.354.
- ²⁹*Clonmel Advertiser*, 23 April 1814. Thanks are due to Professor John Andrews for drawing attention to this notice, which was found by Mr. Michael Fennessy at Clonmel Museum.
- ³⁰J.H. Andrews, *Plantation acres...* pp. 350-1, indicates that at least 17 counties had produced reasonably large-scale printed surveys by 1814. By 1825 the total stood at 24. Some other counties such as Cavan and King's County had manuscript county maps.
- ³¹In National Archives of Ireland. Chief Secretary's Office Registered Papers (CSORP) 1823/6319, Leahy refers to a recommendation to the Grand Jury which he has been given (apparently from the 'Bogs Surveys') and which he has forwarded to the CSO. He asks for it to be returned 'in case the County should be surveyed at any further time'.
- ³²National Archives of Ireland, CSORP (Chief Secretary's Office Registered Papers) 1834/903. Letters from Leahy on 21 and 27 February 1834.
- ³³National Archives of Ireland, CSORP (Chief Secretary's Office Registered Papers) 1834/903. Letters from Leahy on 21 and 27 February 1834. Quoted in Brendan O'Donoghue, *In search of fame and fortune...* pp.42-43.
- ³⁴Richard Griffith, *Geological and mining report on the Leinster coal district*, Dublin, 1814.
- ³⁵National Library of Ireland, Ms 657. Records of the Hibernian Mining Company, including report of the colliery of Coalbrook in the County of Tipperary, part of the estate of Charles Langley Esq, by Ricd Griffith Civil Engineer [November 1817]. The report appears to have been made in response to a loan application to the Commissioners for the Issue of Money and of the Consolidated Fund for Ireland. This was a government body that offered loans for selected development projects. A pencil annotation to the version of the report in NLI 8146 (14) states 'H. Langley told me himself the Money never was granted'.
- ³⁶A. Atkinson, *The Irish Tourist...* Dublin, 1815, pp. 449-50. Quoted in William Nolan, 'A public benefit...', p.437.
- ³⁷Thomas Weaver, 'Memoir on the geological relations of the east of Ireland', *Transactions of the Geological Society of London*, 5, 1819, 117-304, especially 240-253. This article, which expands on the paper read to the society on 18 May 1818, was also circulated as a separate pamphlet.
- ³⁸Counties mentioned with separate baronial maps in the 1824 Spring-Rice commission on the valuation of Ireland were Armagh, Fermanagh, Kilkenny and Mayo. Examples of barony maps survive from Armagh, Kilkenny and Longford. In each of these cases the barony maps appear to have been produced with the county map.
- ³⁹John H. Andrews, 'David Aher and Hill Clements's map of County Kilkenny', pp.437-463 in William Nolan and Kevin Whelan (eds), *Kilkenny: history and society*, Dublin 1990.
- ⁴⁰Brendan O'Donoghue, *In search of fame and fortune ...* p.17.
- ⁴¹The 'four-pole chain', composed of 100 links and four Irish perches (28 yards) in length, was widely used by land surveyors during the eighteenth and early nineteenth centuries. See J.H. Andrews, *Plantation acres*, pp.297-299.
- ⁴²J.H. Andrews, 'The French school of Dublin land surveyors', *Irish Geography*, 5, 1967, 275-292.
- ⁴³W.G. Neely, *Kilcooley...*, pp. 98, 112.
- ⁴⁴For a general introduction to the operational role and historical significance of lime kilns, see Muiris O'Sullivan and Liam Downey, Lime Kilns, *Archaeology Ireland*, 19 (2), 2005, 18-22.
- ⁴⁵Thanks to Professor William Nolan for this information.
- ⁴⁶For a short discussion on the designation of forts and some other features shown on maps as 'Danish', see J.H.

Andrews, 'Mapping the past in the past: the cartographer as antiquarian in pre-Ordnance Survey Ireland', pp.31-63 in Colin Thomas (ed) *Rural landscapes and communities: essays presented to Desmond McCourt* (Blackrock: Irish Academic Press, 1986).

⁴⁷Des Cowman, The mining boom of 1824-25: Parts 1 and 2, *Journal of the Mining Heritage Trust of Ireland*, 1, 2001, 49-54, and 2, 2002, 29-34.

⁴⁸NLI Ms 657.

⁴⁹Mining Company of Ireland. Printed half-yearly reports, 1824 (preparatory committee) to 1840. Bound volume in NLI.

⁵⁰William Nolan, 'Patterns of living in County Tipperary from 1770 to 1850', pp.288-324 in William Nolan and T.G. McGrath (eds), *Tipperary: history and society*, Dublin: Geography Publications, 1985.

⁵¹NLI Ms 8146 (9). Notes on quarries and collieries.

⁵²NLI possesses a range of Hibernian Mining Company records (Ms 656-8) but nothing manuscript for the Mining Company of Ireland. Perhaps it is therefore more likely that the Leahy report and map is part of the Library's Hibernian Mining Company records.

⁵³National Library of Ireland, Maps 16. 1. 17. Nos 1,2.

⁵⁴Gordon L. Herries Davies, *Sheets of many colours: The mapping of Ireland's rocks 1750-1890*, Dublin: Royal Dublin Society, 1983.

⁵⁵One possibility, recently suggested by Professor John Andrews (personal communication to author, 22.2.08), is that the map was an early acquisition of the Ordnance Survey (established 1824) which is known to have acquired some pre-Ordnance Survey maps. The map may then have transferred about 1845 when Henry James, a Royal Engineer working with the Ordnance Survey, became the first director of the new Geological Survey of Ireland.