

GRIN HILL, BUXTON A MAJOR DERBYSHIRE LIMESTONE QUARRY

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I: INTRODUCTION

Limestone has been exploited by man from at least the third millennium B.C. A particularly hard substance it has been used in the Peak District since the Bronze Age in the construction of barrows and stone circles and throughout the medieval period as the mortar and raw material for fortifications, houses, barns and stone walls. Since the late sixteenth century there has been an increasing demand for lime for agricultural improvement, and both lime and limestone in the traditional industries of glass, iron, paper and soap production, and in tanning. The Industrial Revolution increased demand and introduced many new uses, particularly in the bleaching and chemical industries. A major but often unappreciated use for lime (and elsewhere chalk) was in mortar; despite the fact that 'Portland' cement was patented in 1824 it did not come into general use, due to imperfections in the process, until the 1850s.¹ An appraisal of limestone as a fundamental building block of the Industrial Revolution has been made by the present author.²

The quarrying of all rock types (coal excepted) has received scant attention from archaeologists and historians. Despite such works by Jean Lindsay³ and J.P. Polak⁴ on the slate and millstone industries, and Michael Trueman⁵ on the Langcliffe limestone quarry, David Crossley has recently written that:-

There is no extensive literature on the archaeology of quarrying, a topic with considerable potential. Quarries were an important aspect of many local economies, providing full or part-time employment.⁶

With regard to the limestone industry of Derbyshire there are two early and very general works by Lesley Jackson and Phillip Boden⁷ relating to the north-west of the county, and a very full account by Messrs. Marshall, Palmer and Neaverson on, 'The history and archaeology of the Calke Abbey lime-yards'.⁸ The present article considers the Grin Quarry in Buxton where very high grade lime and limestone were produced and distributed both locally, and into Staffordshire, Cheshire, Manchester and South Lancashire. It briefly documents the history of lime and limestone production at Grin until its final closure in 1972, and stresses its eighteenth century eminence, when it influenced the developing turnpike network and became one of, if not the, most important quarry in North Derbyshire.

Grin Hill probably derives its name from the former hamlet of Buxton-le-Grene (then separate from Buxton and first recorded in 1262) situated around the entrance to Pooles Cavern (i.e. Grene or Green Hill). Formerly located in Hartington Parish, Grin Hill and part of Stanley Moor comprised that part of the ancient Hartington Common lying on limestone (see below). The hill now forms two country parks, belonging to the Buxton Civic Association and the Derbyshire County Council, and so is publicly accessible. Formed of the very pure Bee Low limestone (D1 beds), containing in excess of 98.5% calcium carbonate, it is considered to be of Category 1 quality. When it is considered that the limestones of Cauldon Low (North Staffs-Category 2), Prestatyn (North Wales — Category 2-3), and Clitheroe (North Lancs. — Category

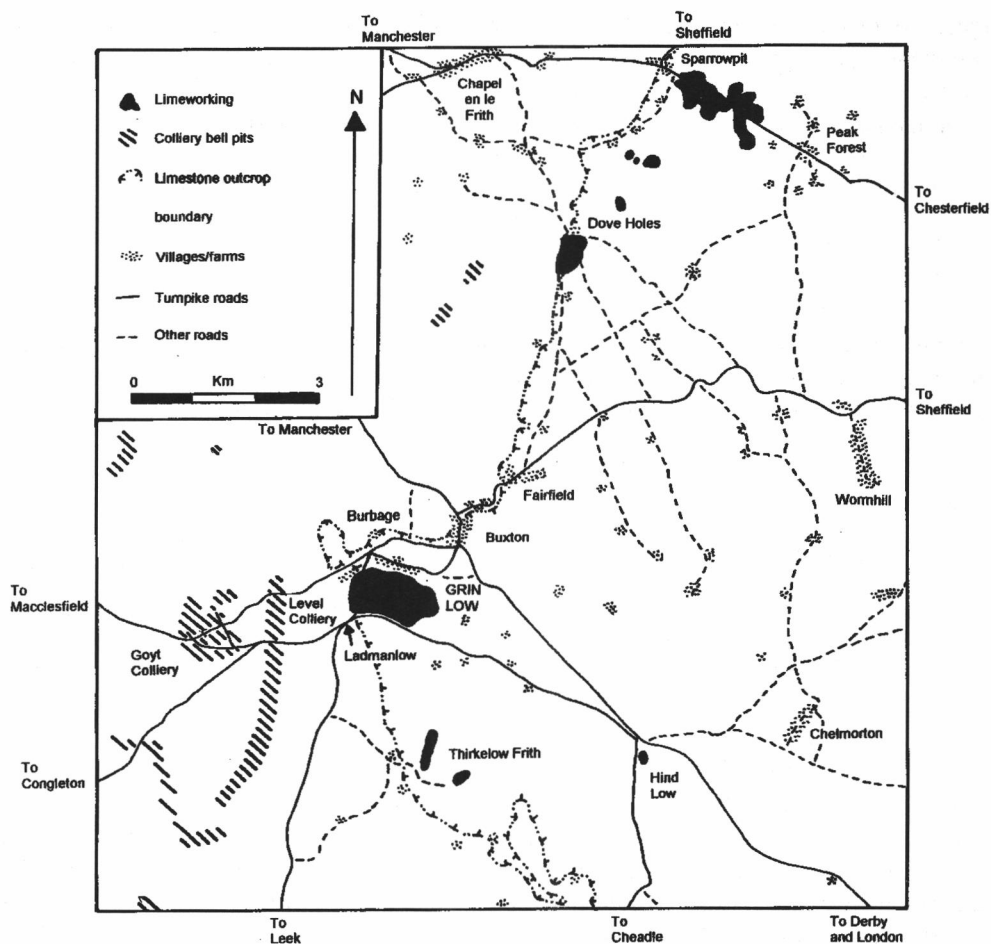


Fig 1. Buxton and district in about 1800

4) are inferior to that produced at Grin⁹ it can be understood why North-West Derbyshire came to dominate the limestone trade in North-West England. A further factor in the pre-eminence of Grin over other local limestone quarries was its proximity to a detached part of the Cheshire coalfield located on Axe Edge and Goyts Moss within two miles of the kilns. While the coal was of an inferior quality, it was an important local resource and mined extensively from the seventeenth century until 1919.¹⁰

II: THE ORIGINS OF LIMEBURNING

Notwithstanding the very early use of limestone to build a Bronze Age barrow (Grin Low¹¹) on the summit of the Hill the earliest known reference to limeburning occurs in the mid-seventeenth century with a very firm indication that it was already a long-established practice.

In 1662 the third earl of Devonshire purchased the Manor of Hartington, with all its various

rights and royalties, for the sum of £20,000. Due to a dispute with a Mr Dickenson (see below) these rights and royalties were examined at great length by Mr B. Filmer. His opinion, expressed in correspondence, regarding the right to burn lime was as follows:

The present Duke of Devonshire & his Ancestors have ever since the purchase, held and enjoyed a Coal Mine near a place called Buxton within the sd. Manor, which they let to a Tenant, together with Several Lime Kilns on the Commons & Wastes there, with Liberty to make other Kilns, & get stone & burn & make Lime to sell, for which they have hitherto been paid a considerable Rent.

Ever since the Purchase, & for *time out of mind before*, it has been the Constant Custom, that no Freeholder Tenant or Inhabitant within the Manor should get Limestone & make Lime, but for their own use within the Manor, ...¹²

From the above it can clearly be seen that an ancient and well established industry had been created both for domestic use and for commerce. A Hartington rental of 1698 gives details of the rents for the coal mines and lime kilns; these extracts are given in Table 1.

Mr Cornelius Dale Bayliff

Mr Wm. Brock	£5 5s 0d
Mr Wm. Brock for Lime Kilns & Cole Mines	£12 0s 0d
Mr Wm. Brock more	£7 0s 0d
Mr Wm. Brock, Francis Norton & Jackson for Thatch March	£8 0s 0d

SOURCE: Chatsworth L/96/12.

Note: Thatch Marsh is on Axe Edge where one of the coal mines was situated.

Table 1: Hartington rental for 1698

The Brock family were tenants until 1789 although very little is known about them. Limeburning is inextricably linked to the development of these coal mines but as a brief outline of them has already been published¹³ only passing reference will be made in this account.

Valuable though the 1698 rental is it does not specify the exact location of the kilns nor is the extent of the Hartington Common delineated where 'from time out of mind' the Common right existed to 'get limestone and make lime'. A document dated '9 August to 5 September 1751' gives, 'An Account then taken of the Buts and bounds of a part of *the* Common in the Parish of Hartington ... wherein Lieth 3 Cole Mines' It then rehearses these 'Buts and bounds' (on and around Axe Edge which is formed of Carboniferous grits and shales) before delineating a further part of the Common situated on the limestones:

Allso the Buts and Bounds of a part of the said Common afforesaid Caled Grin beginning at Wash Brook from thence on the southside of some Inclosures Held by ... so to a place Caled Fern Hows and so on to Countors Clif from thence on by the Inclosures to Turn Clif from thence Northwardly to Wash brook.¹⁴

This description includes Grin Hill and that part of the adjoining Stanley Moor situated on the limestones. Although it does not directly preclude any common rights on any other commons or wastes in the manor it does clearly indicate the eminence of '*the* Common' centred on Axe Edge and Grin. Bishop Nicolson of Carlisle visited Buxton in 1704. Part of his diary entry for 18 October records:

The Town of Buxton is a small chapelry in the parish of Bakewell, eight miles off; and Pool's Hole is in the parish of Hartington; but the Hill, under which it is, is call'd Buxton-Greene; which is cover'd with Lime Kilns, and furnishes the hither parts of Cheshire with that commodity.¹⁵

This reference is particularly important at this date because it indicates that Grin had been

producing lime for a long period ('is cover'd with Lime Kilns') and again affirms its early eminence as a centre for lime burning. It also clearly demonstrates that a trade in lime has been established with the 'hither parts of Cheshire' with implications for the mode of carriage.

Until the mid-eighteenth century lime and coal was carried along the many local packhorse ways such as the 'Jaggers Gate' to Macclesfield in 1600.¹⁶ Even as late as 1795 John Aikin recorded that lime was being carried 'on the backs of small Welsh horses' from Chapel-en-le-Frith to Mottram (Ches.), and that, 'The country round Buxton is celebrated for lime of a strong quality...It is sent chiefly on the backs of small horses to considerable distances.'¹⁷ The advent of turnpikes facilitated the easier transport of lime and it is notable that in the 1724 Manchester to Buxton Act no tolls were levied on its carriage or that of coal.¹⁸ Tolls were levied on the Macclesfield (1759) and Leek (1765) roads on which coal and lime were principal commodities. During the latter part of the eighteenth century their respective trustees were in active dispute with one another over access to the kilns at Grin.¹⁹

III: EIGHTEENTH CENTURY PROMINENCE

The use of lime in agriculture reflects the interest taken in agrarian improvement in the sixteenth century. Anthony Fitzherbert, the outstanding (and local) agricultural writer, stated in 1523 that, '... an other maner of mendynge of erable lande is to make it, marl it, lyme it and dunge it'.²⁰ William Camden²¹ noted the use of lime in the Dove Valley in 1586 and by the mid-sixteenth century limeburning was taking place in many parts of the Peak District. Within the High Peak and Wirksworth Hundreds there are some 45 recorded 'Limekiln Crofts', 'Lime Pieces' and other variants, and some 49 'Kiln Fields' or similar dating from the seventeenth century.²² Early concentrations of kilns were to be found on the extensive commons and wastes as a 'General Survey of the Manor of High Peak' revealed in 1650:

All those Quarries of Pits of Lymestone lyeing in ye Dovehole neare Chapell Frith within the waste grounds of the Manor aforesaid for the burning whereof there are at present fourteen kilns at work or thereabouts the kilns being set up ordinarily and taken down again by the people thereabouts at their pleasure without any licence in that behalf butt if the benefit of digging and burning of Lymestone there might be quietly enjoyed by one single person as tenant to the state whose right we conceive it is wee value the same to be worth £7 per annum.²³

This survey also records ten kilns at Bradwell. Clearly the existence of such a large number of kilns on the wastes indicates not only some common right but a great demand for lime to improve the fields and pastures of the manor.

The parallels with Grin are obvious but for much of the eighteenth century agricultural production remained small-scale and dispersed. However, rising demand, because of enclosure and expanding industry, led to the production of 'landsale' or retail lime. Landsale lime was produced either as an agricultural by-product or, more commonly, by purpose-built kilns which were usually located close to turnpike roads and had convenient access to fuel supplies. These kilns were generally of the continuous type and were increasingly built in masonry. They evolved into larger complexes which gradually eliminated the need for many smaller, less efficient kilns; a list of these was prepared by John Farey²⁴ in 1813. In the mid-eighteenth century the most important were those at Ashover, Bradwell, Buxton (Grin), Calver, Dove Holes, Peak Forest and Stoney Middleton. All had large reserves of pure limestone and ready access to the turnpike network, since transport was a key factor in assembling the raw materials and exporting the lime and limestone. Landsale kilns, therefore, marked an early step towards centralised production, improved organisation and increased commercialisation.

Reference has already been made to the trade in lime in 1704 to the 'hitherto parts of Cheshire'. By 1734 the scope of the trade had extended considerably. Dr. Thomas Short described Grin Hill as:

... a Mountain of easy ascent, consisting chiefly of Limestone, which with a coarse Coal got near, is burnt and carried into Cheshire, Lancashire, and the Neighbourhood both for Building and manuring of Land.²⁵

Aikin in 1795 states that, 'much [lime] is disposed of in the Northern part of the county and also in Cheshire and Lancashire'. He specifically refers to the Derbyshire trade to Ashton, Oldham, Prestwich and Royton (Lancs.).²⁶ Lime was used extensively in agriculture, in the building of mills and tens of thousands of houses and extensively in industry. The extent of the trade has been demonstrated by the present author.²⁷

For almost all of the century the kilns at Grin were let to the Brock family who also leased the neighbouring coal mines. The length of their involvement and the geographic extent of the trade enabled them to build up a wide network of business contacts. A valuation of 1766²⁸ provides useful information on production methods and an important statement about the seasonality of the trade:

All the limekilns that are worked to pay 7s per man for 7 months in the year and to get the stone 4 yards deep from the surface and to lay all the rhoubish where the stone has been got and not on any fresh land.	} £21 0s 0d
Suppose 60 men to work at the Lime Kilns	
	£150 0s 0d

[Note at the end of the valuation]

Mr Brock proposes by his agent to work eight kilns and employ five men at each.

It is interesting to note the scale of the industry at Grin and also that Mr Brock employed an agent, presumably to manage the works whilst he sought outlets for the lime. Correspondence from Edward Brock (1 Dec. 1739), and from James Brock (26 Dec. 1763, 25 Jan. 1776 & 3 Mar. 1776) give mailing addresses as Stockport, Kedleston Inn and Buxton(2).²⁹ In 1776 Brock (presumably James) petitioned for, and was given, a house (at Edge End) to let by the Devonshire estate.³⁰ Before this date it is not known where the family resided but it should be noted that Brock is not a local name. In a 'Representation of Hardship'³¹ submitted to the Duke, Brock stated his sources of income. From this it is clear that his main income was from the coal mines and that he sub-let the kilns; in the period 1767-72 the combined land and kiln rent was £37 10s 0d.

The Brocks however were not the only ones burning lime on Grin for retail. In 1738 John Dickenson (Manchester merchant and Lord of the Manor of Taxal, Cheshire) purchased:

... a small Freehold at Buxton lying within the Manor contiguous to his Grace's Lime Kilns; & has erected Lime Kilns on the sd. Freehold so purchased by him, & got Limestone, & brings Coals from his Estate ...to burn them into Lime, and sells great quantities of Lime into Cheshire & Lancashire, much to the Prejudice of his Grace & his Tenant of the Lime Kilns³²

As a merchant Dickenson would be acquainted with the Manchester lime trade and no doubt wished to share in its profits. His coal mines were on Castids Common (west of the river on Goyts Moss) near Taxal, in Cheshire, and not Staffordshire as the document states. They straddled the Macclesfield turnpike and their presence was probably a significant factor in his involvement with the lime trade. From evidence cited below it is believed that he had four kilns at Grin.

The Brocks were furious as they believed that they had the sole right to retail lime from Grin. The Duke's agent Robert Sherrard sought the opinion of Mr B. Filmer about the Duke's and the

Commoner's rights. Filmer replied:

The Custom, & Usage that no Freeholder, Tenant or Inhabitant should get Limestone & make Lime in the Manor but for his own use, must be understood, as I apprehend only of Limestone taken out of the Lord's own Demesne...and the several Presentments at the Lord's Court must have the same Construction; so that I conceive Mr Dickenson may not withstanding this Custom dig Limestone in his own Freehold & make Lime & sell it, & that the Custom as here stated will not extend to his case.³³

In a letter to Brock, dated 1 December 1739, Sherrard encloses a copy of Filmer's opinion and advises him, '... you should keep this Opinion a Secret for if it Should be Publickly known our Freeholders within the Manor may do the same.'³⁴

Dickenson, and/or his son (also called John) continued to produce lime but the Brocks did not forget the incident. From a series of apparently incomplete documents³⁵ it appears that in 1763, Dickenson's 'small' freehold (quarried since 1738) had become exhausted of stone. He applied to the Duke to quarry stone from the Common to supply his kilns; not surprisingly the Brocks, remembering the earlier incident, vigorously opposed this. It would seem that the Duke declined for in 1764 Dickenson attempted to purchase another freehold plot, adjoining his own, in which to obtain stone. Brock obviously urged the Duke to acquire it but the younger Mrs Dickenson wrote to the agent, Mr Barker, on 10 January 1764, advising him of a verbal understanding between the Duke and her father. After indirectly referring to the 1739 incident she wrote, '... after I married Mr D. his Grace mentioned the affair to my Father himself; said there should be no more disputes, for the future; & that he would — Mr D. any service in his Power.' Rather passionately she expressed her opinion of Brock and his control over the lime trade:

Mr Brock I find (tho he has already got a handsome fortune by his Coals) cannot be content that others should get bread out of their own Property. If he can crush us, he may indeed have it in his power to oppress the whole Country by raising the price of Lime...The great advantage he reaps from the liberty of getting Limestone upon the Waste, will always give him the superiority over us; as his Kilns will lye better for sale³⁶

The Duke did not attempt to acquire to purchase the freehold and Mrs Dickenson wrote to thank his agent on 11 March 1764.³⁷ Her earlier letter indicates that the Dickenson kilns were inconveniently situated and that Brock's kilns 'lye better for sale'. The suggestion is that Dickenson's kilns lay on the east side of the hill being farthest away from the coal and the road network, and indeed there are four large kilns of contemporary date inside the ancient enclosures at this point.

Rather curiously, after thanking the Duke for not intervening in the purchase of the freehold she asks the agent if the Duke would be interested in acquiring the Dickenson's coal mines which were in the course of being sold. The reasons for this are far from clear but, due to a dispute over the ownership of the mineral rights, the Duke declined. John Dickenson, the younger, died in 1793 and his estates were sold.³⁸ Presumably the Duke acquired his Grin freeholds as none of Dickenson's successors to his main estates can be traced in the Hartington Enclosure Award of 1801.

Complementing the 1766 valuation referred to above, is evidence given by Charles Roe, industrialist, of Macclesfield to a House of Commons committee, also in 1766, considering a proposed Macclesfield Canal Bill. Roe expressed the opinion that from the twelve kilns at Buxton and four at Peak Forest which were producing 174,720 horse-loads of lime annually, some 120,000 would be carried by the proposed canal at a saving of 3d per load.³⁹ This is of great interest as it indicates that there were four more kilns at Buxton (i.e. Grin) than the eight being worked by Brock shown in the 1766 valuation. Presumably the four belonged to Dickenson. It

also indicates the scale of production (discussed below) and the very large proportion being carried into Cheshire and South Lancashire which could have been carried by the proposed canal.

Before discussing production statistics it is necessary to consider the weight and nature of a horse load. Whilst the term originates with the use of packhorses there is tentative evidence that even with carts this measure was still used. John Farey, writing in 1817,⁴⁰ stated that a horse-load of lime comprised three bushels generally and two and a half level bushels at Marple Bridge (i.e. on the Peak Forest Canal). Bushels are dry volume measures and so a bushel of quicklime weighs 48 pounds and a bushel of hydrated lime weighs 70 pounds. It is not certain in which form the lime was carried; it is believed that it was partly air 'slaked' due to outside storage. All the calculations used in this article are based on an assumed carriage of quick lime; if this assumption is incorrect then there may be up to a thirty per cent increase in the weights quoted. Using a three bushel measure and a bushel weight of 48 pounds then a horse-load is calculated to weigh 144 pounds; on this basis 100 loads weighed 6.43 tons.

The valuation and the House of Commons evidence, both dated 1766, combine to reveal the true scale of the lime trade. The valuation shows that the kilns (or rather Brock's kilns) were let for seven months in the year. The House of Commons evidence reveals that, together with the four kilns at Peak Forest, some 174,720 horse-loads of lime (11,235 tons) were being produced annually. Assuming that all of the kilns worked for seven months in the year, then this involved an extraordinary 5,824 pack-horse movements, or equivalent carts, per six day week in a thirty week year. This traffic was dispersed throughout North-West Derbyshire and into Cheshire, Lancashire and Staffordshire.

This enormous trade was a major factor in the promotion of turnpikes. The first in Derbyshire, authorised under an Act of 1724,⁴¹ was part of a larger scheme to improve the road from London to Manchester; it included sections from Loughborough to Brassington and Buxton to Manchester. With a preponderance of Manchester textile manufacturers as trustees it is clear that its prime objective was to improve communications with the principal textile market, then located in London. However, no tolls were levied on the carriage of lime until 1730 which is perhaps surprising considering the volume being carried. It may suggest the influence of the Manchester lime merchants wishing to keep their unit costs to a minimum. This practice was not normal; T.S.Ashton noted that whilst many turnpikes had a provision to carry lime toll free this applied to local agricultural use and not for industry.⁴² On the other hand coal and lime were the principal traffics on the Leek (1765) and Macclesfield (1759) roads. There was a great dispute between their respective trustees over access into Grin and toll-bars were specically sited at Green Lane, Grin End and Ladmanlow to maximise revenues on movements to and from the kilns.⁴³ Toll-bar receipts for the period 1780-1820 are given below:

	1780	1785	1790	1795	1815	1820
Green Lane	} £292	} £297	} £361	} £319	} £301	} £251
Grin End						
Ladmanlow						

Source A. F.Roberts, Turnpike roads around Buxton, (Buxton, 1992), p197.

Table 2: Toll-bar receipts, 1780-1820.

The decline post-1790 is discussed in the following section. Comparison may be made with figures of £177, £242 and £250 from the Buxton toll-bar on the Derby to Manchester Road in 1822-23 to 1824-25 (the London traffic usually went via Leek at this date). More specifically

the Leek Trust turnpiked the short Ladmanlow to Brierlow and the Ladmanlow to Ravenslow (Goyts Moss) roads under an Act of 1773 for the carriage of coal and lime. The expansion of the lime trade brought investment into the developing turnpike system. Improvements in transport also facilitated expansion in trades unrelated to it and so brought great benefits to the overall economy of North- West Derbyshire.

Writing in 1789 James Pilkington⁴⁴ described much larger production; he recorded eight kilns, served by five men each, producing 120 horse loads daily. Whether Dickenson's production was not recorded or whether he had ceased for some reason is unknown. It was a period of intense local demand with the erection of the Crescent and other building works in Buxton. Even if there were only eight kilns in operation the level of production is even greater. Assuming a six day week, thirty week year as before, Pilkington's estimate would yield some 172,800 horse-loads (11,000 tons) per annum, which is almost equal to the total Buxton and Peak Forest output of 1766 with sixteen kilns in production. To achieve this level of activity there can be no doubt that the much taller (still earthen) kilns at the top the hill on the east side were in use. That lime was still being produced on this side is attested by the establishing of another toll-bar by the Leek Trust at the Buxton end of Green Lane⁴⁵ in 1785. This was to prevent prevent toll avoidance along Green Lane (the Leek turnpike). With possible production by Dickenson and a longer working season then the total production from Grin may have been much higher.

Here then is evidence for larger kilns, exploitation of more land and the better distribution of lime through a more extensive and efficient turnpike system. With allowance for exaggeration by Pilkington and by Roe in his evidence to the House of Commons committee, these are remarkable production figures and portray Grin at its zenith.

IV: THE RETIREMENT OF MRS BROCK

The retirement of Mrs Brock in 1789, from both the kilns and the coal mines, had a remarkable effect on the lime trade. In a minor way it caused the Duke of Devonshire to manage the kilns directly for a period and occasion the production of estate accounts for lime production and sales at Grin. More importantly, the withdrawal of the Brocks from the lime trade, after nearly a century, marked a high point in activity at Grin. A steady decline began which was not reversed until the kilns were let to a limited liability company in 1857. These themes are discussed further in the following sections.

The most far-reaching effect appears to have resulted from the vacuum created by the withdrawal of the Brocks. The facts are far from clear but there is strong circumstantial evidence to suggest that their Lancashire business was taken over by Thomas Gisborne of Whaley Bridge. Certainly from 1790 (the first year of ducal accounts) there is no trade from Grin into Lancashire.

The Gisbornes were minor gentry who received arms in 1741.⁴⁶ In the following year John Gisborne purchased the Hallsteads estate in Dove Holes and commenced lime burning.⁴⁷ His son Thomas developed the family's industrial interests with coal mines at Whaley Bridge and other limekilns at Harpur Hill. He was an M.P. for several constituencies during 1830-52 and a director of the Manchester, Buxton, Matlock and Midland Junction Railway. More importantly he was a Manchester lime dealer and had links with the Manchester lime trade.⁴⁸ His son, Thomas Guy, was less interested in these activities and the estate was eventually broken up.

By the end of the century canals had become established as mass carriers of bulk materials. Demand for lime and limestone was increasing as industrialisation gathered momentum, and just as the Bridgewater and Ashton canals had reduced the cost of coal in Manchester it was believed that a similar venture to the Peak District would reduce the cost of lime and limestone. An Act

was secured for the 'Peak Forest Canal' to run from the Ashton Canal at Dukinfield to Buxworth, with a short branch to Whaley Bridge; it opened in 1796. Beyond the canal a tramway was built to connect it with the limestone quarries around Dove Holes. A study of the shareholders⁴⁹ indicates that the majority were either local landowners, cotton manufacturers, or both. Apart from Samuel Oldknow of Marple, who became a limeburner, there were no known limeburners or dealers. However, representing the Manchester lime dealers in talks with the shareholders was Thomas Gisborne.⁵⁰

It would therefore appear that upon the retirement of Mrs Brock in 1789, Gisborne secured the Lancashire trade to his (and perhaps others) kilns at Dove Holes. When the canal was promoted in 1793 it would have been projected towards the main focus of the lime trade at that time which was Dove Holes. The building of the canal marked a major transformation in the industry as limeburning became concentrated along its banks. Stone was brought down from Dove Holes from quarries belonging to Gisborne and others, to Buxworth and other locations to be burnt by coal from the Whaley Bridge collieries, the largest of which was owned by Gisborne.

Of wider note is the fact that carriage by canal enabled the pure Peak District limestone to eclipse that from Clitheroe in the Rochdale area, eclipse Welsh stone on the Bridgewater estates in West Lancashire, and allow it to be carried extensively into Merseyside.

V: MANAGEMENT BY THE DUKE

Following the retirement of Mrs Brock the coalmines and limekilns were directly operated by the Devonshire estate. The collieries were managed by Thomas Wild from 1790-92 and thereafter for a long period by George Dickens.⁵¹ Initially the kilns were let to Wild who paid £40 for eight in 1789 and 1790. In 1791 William Wainwright was employed by the estate to manage them for an initial salary of £26 per annum. During 1798 he was declared insolvent and the Duke's agent, Joseph Fletcher, managed them himself from 14 March until 31 May; Wainwright left with the sum of £53 7s 8d owing to the estate. For the remainder of the year and for the years 1799-1802 the kilns were let to James Clowes for £300 per annum. This was a massive increase even allowing for the fact that Wainwright had built two new kilns in 1797 (it is not known whether these are additional ones or whether two older or defective ones were extinguished). At this date the production of lime at Grin was still substantial even though the Lancashire trade had been lost (see below). The year 1803 saw a return to direct management, and the year 1805 was the most profitable for the Duke when 124,383 horseloads of lime were burned in five kilns and sold for a profit of £477 17s 6d. Thereafter a gradual, but not uninterrupted, decline in profits set in, reaching a nadir in 1817 with a loss of £5 8s 1d: this was also the last ever year of direct ducal control. The managers for the intervening years were James Clowes (1803-06), Matthew Holland (1807-09), William Wainwright, again (1810-13), and Robert Bagshawe (1814-17). Bagshawe continued at the kilns as the first new tenant in 1818. The sources for the above and for remainder of this section are, except where otherwise stated, the Chatsworth 'T' series accounts.

Of great significance during this period was the Hartington Inclosure Award executed in 1807.⁵² Under the terms of the Award the Duke of Devonshire received plot number 28 on plan II; this was 'Grin and Nesta' estimated at 267 acres. The significance of the name 'Nesta' is not known nor does it occur on any other known document. This inclosure coincided with the development of Buxton as an inland spa by the fifth Duke and it is interesting to note that the following two decades witnessed widespread tree planting on Grin, Corbar, Burbage Edge and

		Scores	Loads	Loads	Price per Score	£	s	d
1805	Old Spy Kiln	}	1632.12	32,652	4s 1½d	336	14	5
Nov 13th	Paid Wm. Bennett Geo Heathcote and Co. for Burning Lime to this Day							
Do	New Spy Kiln	}	1620.14	32,414	4s 0½d	327	10	3½
	Paid Solomon Wheeldon and Co. for Burning Lime to this Day							
Do	Cotton Shop Kiln	}	1217.5	24,345	3s 7d	218	1	9½
	Paid Thos Wheeldon Joseph Johnson and Co. for Burning Lime to this Day							
Do	Red Bull Kiln	}	1147.7	22,947	4s 1½d	236	12	9½
	Paid Jno Wheeldon D. Nadin and Co. for Burning Lime to this Day							
Do	Boson Hole Kiln	}	607.3	12,025	4s 4d	130	5	5
	Paid Thos Wardle and Co. for Burning Lime to this Day							
			<u>6219.3</u>	<u>124,383</u>		<u>1249</u>	<u>4</u>	<u>8½</u>

Source: Chatsworth T4 accounts

Table 3: Cash paid to sundry persons for burning lime upon Grin from 1st January to 31st December 1805

elsewhere. Clearly the lime tips on the Buxton side of the hill were considered to be inappropriate and in need of landscaping; the effect on lime production being its removal to the west side of the hill.

Full accounts exist for the whole of the period of direct management, but in addition, for the year 1805, there exists in full, the subsidiary accounts. These clearly indicate that there were five kilns in operation and these produced 124,383 loads of lime. The kilns had distinctive names, 'Old Spy', 'New Spy', 'Cotton Shop', 'Red Bull' and 'Boson Hole', and were sub-let to five teams of limeburners. Production figures and payments for burning the lime are given in Table 3. Additional expenditure can be seen in the reproduction of the estate account for the year which is representative of other years under ducal control. Included under 'repairing tools' is the Blacksmiths account for making and repairing 'Boring hammers', 'Crows', 'Nogers', 'Wedges', and other sundry items; for example on 5 August he repaired 42 Nogers for 3s 6d, 54 Wedges for 4s 6d, 1 Boring hammer for 4d, 3 Crows for 3d, and 1 iron wisket for 8d. His name was Robert Nall and he received £45 3s from James Clews for his year's work. Total sales for the year are given in Table 4; these figures are precised from the original accounts which give in great detail the name of each purchaser and the amount purchased. During the year 86,567 loads were sold into Cheshire, 28,567 loads into Derbyshire, and 9,249 loads into Staffordshire;

<i>Cheshire</i>	308 Customers
	56,609 loads at 1½d per load
	6,697 loads at 6d per load
	23,261 loads at 7d per load
	Amount due £1,199 13s 6½d
	Amount paid £1,189 0s 4½d
	Arrears £10 13s 2d

Note: At the 1½d rate there was an average of 204 loads per customer.
Ten customers purchased in excess of 1,000 loads each.

<i>Derbyshire</i>	71 Customers
	4,078 loads at 1½d per load
	13,345 loads at 6d per load
	11,144 loads at 7d per load
	Amount due £684 2s 11d
	Amount paid £668 2s 11d
	Arrears £16 0s 0d

Note: At the 1½d rate there was an average of 194 loads per customer.
Robert Wain purchased 2,053 loads at 1½d. Jonathan Hoyle purchased 7,862 loads at 6d.
The relatively small amount of the cheapest lime sold is probably due to the alternative local field kiln supplies.

<i>Staffordshire</i>	123 Customers
	1,096 loads at 1½d per load
	2 loads at 6d per load
	8,151 loads at 7d per load
	Amount due £244 12s 9d
	Amount paid £242 9s 7d
	Arrears £2 3s 2d

Note: At the 1½d rate there was an average of 110 loads per customer.

	<i>Loads</i>			<i>Cash Due</i>								
	1½d	6d	7d	1½d			6d			7d		
Cheshire	56,609	6,697	23,261	£353	16s	1½d	£167	8s	6d	£678	8s	11d
Derbyshire	4,078	13,345	11,144	£25	9s	9d	£333	12s	6d	£325	0s	8d
Staffordshire	1,096	2	8,151	£6	17s	0d	1s	0d		£237	14s	9d
	61,783	20,044	42,556	£386	2s	10½d	£501	2s	0d	£1,241	4s	4d
Total loads:	124,383 loads			Total Cash due: £2,128 9s 2½d								

Total tonnage: 7,997

Source: 'An account of Lime sold by James Clowes from Grin into Cheshire, Derbyshire and Staffordshire 1st January to 31st December, 1805. Chatsworth, T4 accounts.

Table 4: An Abstract of Sales from Grin Quarry — 1805

none was sold into Lancashire. The reason for such a small amount sold into Derbyshire would be the existence of large numbers of agricultural kilns on the limestone plateau of the Peak District.

Details of rents, profits and production figures for the period 1789 to 1817, when the kilns were mainly under ducal control, are given in Table 6. When considering these they should be

Year	Lime			Coal			Baths			Rents		
1791	£140	6s	11d	—	—	—	£779	19s	9d	£4,074	14s	5d
1792	£176	10s	4d	£343	12s	11d	£822	7s	3½d	£4,235	13s	11d
1793	£253	0s	0d	£598	5s	8d	£732	6s	1d	£4,176	16s	11d
1794	£299	8s	10d	£418	15s	11¾d	£663	0s	0d	£4,026	16s	11d
1795	£237	2s	1½d	£652	10s	10½d	£704	0s	0d	£4,148	16s	11d
1796	£303	10s	0d	£581	2s	7d	£779	0s	0d	£4,440	16s	11d
1797	£206	13s	11d	£643	15s	8d	£767	0s	0d	£4,281	16s	11d
1798	£300	0s	0d*	£662	12s	9s	£795	11s	8d	£4,320	16s	8d

* Rent Source: Chatsworth T series accounts

Table 5: Buxton Estate revenues 1791-1798

Year	Occupant	Kilns	Rent	Production (Loads)	Estate Lime Profits
1788	Mrs Brock	?8	YES	—	—
1789	T. Wild	8	£40	172,800	—
1790	T. Wild	8	£40	—	—
1791	W. Wainwright	—	—	—	£140 6s 11d
1792	W. Wainwright	—	—	—	£176 10s 5d
1793	W. Wainwright	—	—	—	£255 0s 0d
1794	W. Wainwright	—	—	114,138	£299 8s 10d
1795	W. Wainwright	—	—	100,886	£237 2s 2d
1796	W. Wainwright	—	—	105,060	£303 14s 5d
1797	W. Wainwright	—	—	101,359	£206 13s 11d
1798 (to 13 Mar)*	W. Wainwright	—	—	13,897	Monies owing
1798 (from 1 June)	J. Clowes	—	£300	—	—
1799	J. Clowes	—	£300	—	—
1800	J. Clowes	—	£300	—	—
1801	J. Clowes	—	£300	—	—
1802	J. Clowes	—	£300	—	—
1803	J. Clowes	—	—	115,394	£416 15s 2d
1804	J. Clowes	—	—	112,798	£140 2s 0d
1805	J. Clowes	5	—	124,383	£477 17s 6d
1806	J. Clowes	—	—	118,897	£223 11s 4d
1807	M. Holland	—	—	90,506	£265 10s 6d
1808	W. Wainwright	—	—	94,828	£245 3s 11d
1809	W. Wainwright	—	—	89,049	£291 3s 9d
1810	W. Wainwright	—	—	90,270	£374 6s 0d
1811	W. Wainwright	—	—	89,182	£200 7s 7d
1812	W. Wainwright	—	—	77,240	£127 16s 2d
1813	W. Wainwright	—	—	87,785	£295 11s 11d
1814	R. Bagshawe	—	—	83,678	£207 4s 0d
1815	R. Bagshawe	—	—	84,318	£118 12s 0d
1816	R. Bagshawe	—	—	67,137	£29 12s 0d
1817	R. Bagshawe	—	—	66,951	—£5 8s 1d
1818**	R. Bagshawe	3	£75	—	—

* Following Wainwrights insolvency the kilns were managed for a short period directly by the Duke's agent, Joseph Fletcher.

** First year of renewed letting. Included for comparative purposes.

Source : Chatsworth, T series accounts. Loads for 1789 are calculated from, J. Pilkington *A view of the present state of Derbyshire*, (London, 1789), Vol 2, p292.

Table 6: Abstract of lime accounts, 1788-1818.

put in the context of other estate revenues. Table 5 gives these for the period 1791-98 where it can be seen that the income from lime was a small part of the ducal revenues in Buxton.

Of interest in 1811 was a request by Samuel Oldknow of Marple for land at Grin, presumably for limeburning. Phillip Heacock, the Duke's agent at Buxton, advises him that there is none available but suggests he writes to the Tideswell agent.⁵³

VI: GRIN IN DECLINE

With the retirement of Mrs Brock Grin lost the Lancashire trade and gradually fell into decline. From a peak in 1789 when Pilkington recorded production of 172,800 horseloads (11,000 tons) the trade fell to 100,886 loads in 1795. After a revival when production climbed to 124,383 loads in 1805, it slumped to 66,951 in 1817 when the Grin lime trade made a loss of £5 8s 1d. Fluctuations due to the Napoleonic Wars and the establishment of other limeworks, such as Cauldon Low in Staffordshire, obviously had some effect, but it seems clear that the major influence was the expanding lime trade along the Peak Forest Canal. Further evidence of the decline can be seen in the toll-bar receipts from the Green Lane, Grin End and Ladmanlow bars (see Table 2) which controlled the exits from Grin. In 1813 John Farey recorded that, 'the Lime is mild and good, of a light grey colour, and is fetched from great distances into Cheshire and Staffordshire, as well as northward in this County, to less distances.'⁵⁴

After 1817 the Devonshire estate clearly considered that the direct management of the limeworks was no longer worthwhile; in 1818 three kilns were leased to Robert Bagshawe for £25 each. This further demonstrates the decline at Grin with a reduced number of kilns and a reduction in their value from £50-£60 each in 1798-1802. Perhaps as a further indication of the problems of lime sales, Bagshawe left after one year. From 1819 to 1826 the tenant was Edward Vernon who leased either three or four kilns for £25 each.⁵⁵

In 1826 the coalmines were leased to Thomas Boothman of Manchester. He leased the limekilns from 1827 and, together with his son John William Boothman, operated both concerns until the latter's retirement in 1857. Thomas Boothman resided at various times in the Ancoats and Islington areas of Manchester. He was a coal dealer with mines at New Mills, Whaley Bridge and at Standish near Wigan, active in Derbyshire leadmines and a sleeping partner in a weaving mill. He was also a member of the Royal Manchester Institute.⁵⁶ His other major limeburning concern was at Buxworth but he also sold hydraulic lime from Astbury (Cheshire) at his Piccadilly (Manchester) warehouse. In a letter dated 16 January 1827 Phillip Heacock advises Boothman:

I have not been able before this day to obtain the particulars of Edw. Vernon's claim in regard to the Grin Lime Kilns. Perhaps you will be surprised to hear that it exceeds £170. I requested Jos. Vernon to say to his father that I would either pay him £100 on his relinquishing the Kilns, or refer the question in regard to arbitration. It is about the usual time for engaging the workmen for the present year, and on that account I urged him to [?give] me an immediate answer. He told me that the profit of the Kilns last year would amount to £200 & that his father wishes very much to retain them & that that profit had arisen in consequence of the improved quality of the Coal'.⁵⁷

The nature of the dispute with Vernon is unknown but its resolution led to Boothman leasing four kilns for £25 each. As with Vernon he appears to have leased three for the same amount right up to 1856. Reference to engaging workmen indicates that limeburning was continuing on a seasonal basis; this is probably not the norm for the wider industry at this date but a further indicator of stagnation at Grin. However, profits of £200 suggest that trade may have been reviving.

Of particular interest is the reference to the improved coal. As has been said above the local coal was of very poor quality and it may be a factor in the decline of Grin that the Dove Holes stone, burnt with better Whaley Bridge coal in mixed feed kilns, produced lime with less fuel ash contamination than that from Grin, and was in greater demand for industrial use. By 1860 Whaley Bridge coal was being carried to Grin by the Cromford and High Peak Railway (CHPR) to mix with the local coal and so it may be at this pre-CHPR date that Vernon was arranging for such to be supplied by carters.

The CHPR was opened in 1830-31 to link the Cromford canal to the Peak Forest Canal at Whaley Bridge; it ran along the Hindlow ridge to the west of Buxton and made a connection with the Goyt Colliery. As such it was well placed to promote the further expansion of the limestone industry and export its products into the Manchester region. The advantages were obvious; the Duke's agent wrote in 1831 to the engineer, Mr Jessop:

I have hitherto understood that there would be a great advantage in sending lime by the Railway ... either to Whaley Bridge or any other place on the line of the canal between that place and Manchester⁵⁸

Plans and estimates were drawn up for a branch railway into Grin from the wharf at Ladmanlow in 1830⁵⁹ but this was not built until 1857. Despite the opportunity that the CHPR presented, limeburning at Grin remained low-key. Some stone was however transhipped along the new railway; surprisingly in 1832 the Grin and Harpur Hill quarries were supplying John Clayton's Marple limeworks.⁶⁰

In contrast to Grin the limestone deposits at Harpur Hill were actively exploited, the first major kilns being erected in 1835. The land here was principally owned by the Earl of Newburgh and Thomas Gisborne of Whaley Bridge.

From 1827 to 1839 and in 1842 Boothman was still renting three kilns at £25 each; his son, John William, was renting the same in 1851 and 1855-56.⁶¹ It would therefore seem that for the whole period 1827 to 1856 there were only three kilns producing lime on Grin although it is very probable that these were of greater capacity than the earlier ones. It should also be noted that these were probably not the same three kilns but different ones built as stone reserves were exploited and earlier kilns deteriorated. As the kilns were not directly managed by the estate there are few records of their business activity. In 1855 J. W. Boothman rented 52 acres of land and property in Burbage and on Grin for £27 5s 6d; this included the land on which the kilns stood.⁶² An indication of production costs can be found printed in the *Buxton Herald* of 29 March 1905 when an elderly resident provided two dated 'pay sheets' from Boothman for the 'Old Spy' kiln:

The Old Spy Lime Kiln, Grin.	
74 scores at 4s per score for the four weeks ending 8 October 1853	£15 5s 0d
Horse and cart at 4.25d per score	£1 14s 5d
Mr Bagshaw, carter, at 4.25 per score	£1 14s 5d
Wm. Norton and Son feeding the kiln at 9d per score	£2 19s 1d
Joseph & John Renshaw, picking at 6d per score	£1 19s 5d
Pit, three men finding own tools and powder at 1s 10d per score	£7 7s 7d

Presuming a score to be twenty loads, as it was in the period 1789-1817 when full estate accounts are available, then thirteen four-weekly production figures based on the 74 score above would yield 19,240 loads per annum. The correspondent also gives similar information for a further four-week period ending 16 June 1855; this time based on 110 scores the annual production would have been 28,600 loads. Assuming that the other two kilns produced similar amounts then the annual production would have been in the range 57,000 to 86,000 loads.

However, these figures must be treated with circumspection for although there is little reason to doubt their authenticity it is not known how representative they are as averages. Of note is the name of the kiln which is identical to one operating in 1805 (see above), and in the second pay sheet the fact that William Norton was assisted to feed the kiln by two daughters. The lower production range figure is a modest one and may reflect Grin in stagnation. The higher figure is later and may possibly be due to earlier criticism of Boothman's scale of operation by the Duke's agent (see below). The loss of the Lancashire trade was a major blow to the Grin lime enterprise but it would appear from the following quote that Boothman was not keen to generate new markets. Production was so low that in 1852 the Duke's agent commissioned a Mr Stephen Eddy to report on the state of his coalmines and limeworks. In his report Eddy concludes:

The lessee is not now, nor does it appear that he has for many years past been raising anything like a significant quantity [of coal] to yield a profit upon the sales and his own consumption, and I much doubt if he would continue to hold possession of these Works if he had not some other object in view than that of direct profit from the Collieries — that object I believe to be a monopoly of the Lime Trade. It is well known that in addition to the Dukes Lime Kilns in the vicinity of these Collieries, Mr Boothman has very extensive limeworks at Bugsworth, and that he is sending considerable quantities of Lime from these works to Manchester, where it is sold as 'Buxton Lime', for which alone the Dukes works have long been celebrated, and which always commands a high price in Manchester. It is doubtless much more to his interest to push the sale of the Bugsworth Lime than that from Buxton, and hence the trifling amount of business done at the latter place, and the fact of his continuing to hold possession of and to work the Collieries in order to prevent other parties who might be disposed to work the Lime Rock and Kilns intensively⁶³

The fame and knowledge of Grin even in this period of depression, was such that in August 1842 a group of Chartist activists travelled to Buxton and, '... stopped the Gin [sic] lime works'.⁶⁴

VII: COMPANY MANAGEMENT

In 1831 the C.H.P.R. was opened to provide communication between the textile districts of Lancashire, Derbyshire and the East Midlands. By 1850 however the expanding railway network permitted this inter-regional link to be made without the inconvenient transshipment of goods at Cromford and Whaley Bridge. Having lost this important traffic the C.H.P.R. sought to increase its revenue by making physical improvements to the railway and attempting to generate additional lineside traffics such as minerals. Accordingly a Bill was placed before Parliament in 1855 to effect such improvements and to acquire the Harpur Hill limeworks to provide additional traffic.⁶⁵ When this latter clause was rejected by the House of Lords four of the directors, Messrs P. Arkwright, R. Broome, H. A. Hubbersty and F. Wright, formed the separate, but parallel, 'Buxton Lime Company' (B.L.Co.) which operated the Harpur Hill works. The impact on traffic flows can be seen in an inventory of C.H.P.R. rolling stock in 1856 when out of 155 wagons some 45 were specifically called 'Harpur Hill lime wagons'.⁶⁶ Robert Broome arranged for the Company offices, a warehouse and stables to be built at Whaley Bridge.

On 11 April 1857 John William Boothman placed the following advertisement in the *Buxton Advertiser*:

Grin Lime Works, Buxton

J.W.Boothman begs to inform his friends and customers for lime that he has retired from the business of LIMEBURNER at the above works in favour of the Buxton Lime Company.

J.W.Boothman in retiring tenders his thanks to his late customers for past favours, and has great pleasure in recommending his successors.

The BUXTON LIME COMPANY

Since taking to the above works, have considerably extended them, and so increased the facilities for loading carts, that their customers will no longer have to wait, but will be enabled to load at once.

The Buxton Lime Company's terms will be as under:

6s 6d per ton cash on delivery

6s 8d per ton one months credit

Customers who wish to have ledger accounts with the Buxton Lime Company must make application in writing, addressed to the principal offices, Whaley Bridge, Stockport.

The improvements were swift and dramatic. For the first time a direct rail link was made into the limeworks from Ladmanlow. This coincided with a further connection to the main rail network at Whaley Bridge in August 1857⁶⁷ sponsored by the C.H.P.R. An issue of who paid for the Grin extension was resolved in late 1856 when it was agreed to lend 1,600 yards of old rails for the proposed branch. The C.H.P.R. also sold them some small wagons and the superfluous Bunsall incline engine for £25 for use in a limestone crushing machine.⁶⁸ Negotiations ensued between the two companies and eventually the C.H.P.R. agreed to a reduction in tonnage dues provided these amounted to £1,000 per annum and the B.L.Co. built one or more kilns to compete with those of Dove Holes. Carriage of coal to Ladmanlow was also cut provided it was for limeburning and a special reduction was allowed on lime carried to the Manchester gas works. The B.L.Co. responded by increasing the number of kilns to five in 1857, six in 1858, seven in 1859, ten in 1860, and eleven by 1866. These were let at £20 per annum.⁶⁹ By 1880 these eleven are depicted on the first 25 inch O.S. map as two banks of four and six and one individual kiln. By 1861 the B.L.C. had capital of £52,000 and employed 290 men. Its lime was mainly sent northwards to Liverpool, St.Helens and other stations; of the traffic carried forward by the London & North Western Railway, amounting to 64,000 tons, some 18,000 tons went to St. Helens.⁷⁰

According to Hodgkins, 'Although the capital outlay on the Buxton Lime Company was relatively low (a tenth of that of the C.H.P.R. according to Wright) prosperity did not follow and no dividend was paid on the limeworks before 1862.⁷¹ In 1882 the Company renewed their lease for a further 21 years; the lessees being named as James Charles Arkwright, John Thomas Arkwright, Henry Alfred Hubbersty, Alfred Cantrell Hubbersty and John Osmaston. They leased the land (111 acres), three cottages and other buildings, the quarry and pits, eleven lime-kilns and the branch railway from Ladmanlow, for £360 per annum. In addition the lessees also had to pay a 3.5d per ton royalty for good stone or lime in excess of 48,000 tons, plus 1d per ton for small or refuse stone. For this they enjoyed, 'Full liberty and licence and authority to burn the stone so gotten as aforesaid and erect such additional limekilns upon the said land.'⁷²

VIII: THE GEOGRAPHY OF THE LIMESWORKS

Whilst there was likely to be early limeburning activity any- where on the Common, there are the substantial remains of 130 earthen kilns on Grin Hill spilling down as far as the infant River Wye behind Anncroft Road in Burbage. A dispute over the avoidance of tolls (see section III above) in 1785 indicates that lime was being carried off the east side of the Hill at this late date. Their tips can be seen (before the trees were planted) in a print of Buxton made by the geologist William Martin in 1796.⁷³ John Farey described these tips in 1813:-

In burning the 4th lime rock at Grin Hill south west of Buxton enormous heaps of refuse lime called Lime-ashes have been accumulated and left covering many acres of ground,...almost entirely covered by the Ash-heaps of former and present Lime-kilns.⁷⁴

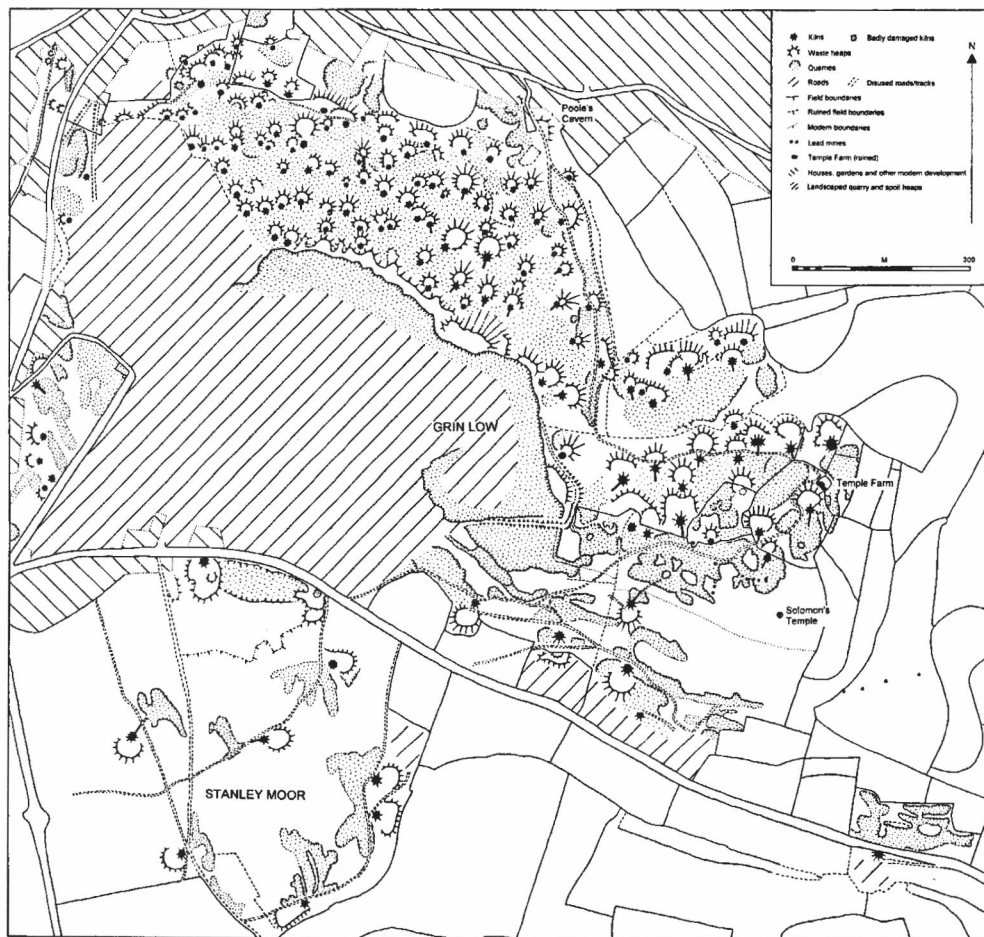


Fig 2 Sketch survey of the surviving limekilns on Grin Low and Stanley Moor

In 1766 there were twelve kilns on Grin, eight of which were worked by the Brock family. The other four it is believed were situated in a small close and owned by Dickenson. On the north east end of the hill there are four kilns in an ancient enclosure. In 1789 only eight are recorded but it is not known whether the Dickenson's were still producing lime or whether a move had been made to fewer and larger (perhaps running) kilns. A recent survey of the Hill by Dr John Barnatt (Fig 2), has revealed that the kilns increase in size as they ascend the hill and also in an arc from the north-east corner, around the south end and across to Stanley Moor. Their tips spill over smaller ones and their quarries below. At the very top of the Hill on the Buxton side and below the present Temple are eight kilns, three of which would seem to have passed out of use before c 1807 when an enclosure wall was built through them. By 1805 there were only five kilns in operation but as the hillside was soon afterwards planted to mask the workings from the developing spa then it would seem likely that these kilns would be soon extinguished.

Over the hill were four medium-sized kilns adjacent to the road (three of which were destroyed by reclamation) and three existing massive earthen running kilns which may be their

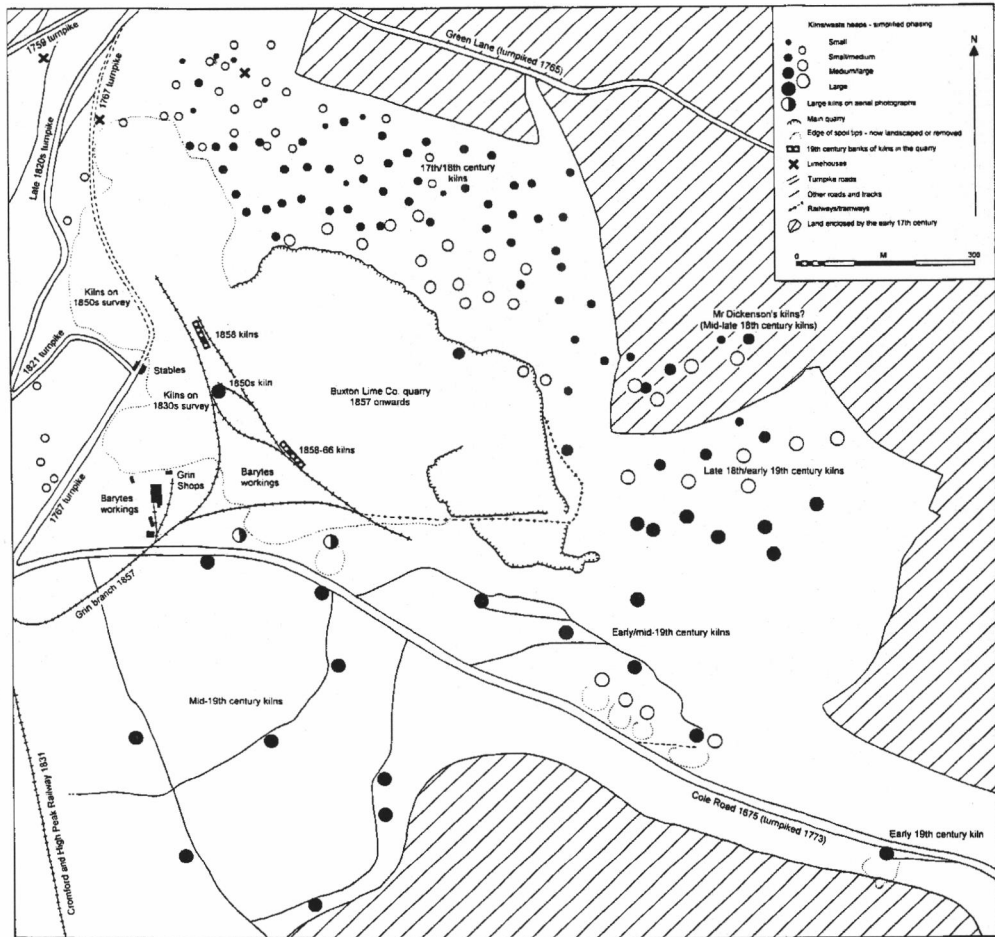


Fig 3 Schematic interpretation of known features associated with limeburning on Grin Low and Stanley Moor

successors. The accounts for the period 1818-28 show either three or four kilns, and thereafter only three. A survey by John Coke in 1835 indicates four kilns to the south-west of Grin Hill. Due to the small scale of the map no great weight can be attached to it as evidence but it is worth noting that close to the three large earthen kilns noted above is another very large single kiln with its quarry across the 'Cole Road' to the south east. As with Dickenson's kilns this would seem to be another independent kiln and as such is recorded separately from those on 'Grin Hill' by Farey in his list of sale-kilns in 1813:

Buxton, S, at Ferney-Bottom, from the 4th Limestone.⁷⁵

Messrs Hind and Ruff's County map of 1837 places the kilns at the northern end of the Hill, and the first one inch O.S. map of 1840 shows kilns in the above two situations and below the present Temple to the east. This offers the alternative theory that there were three separate areas of working with one active kiln in use at one time in each. These kilns would be separately rebuilt as required, thus maintaining the working practice so evident with the earlier kilns on the east side.



Plate 1 Small (intermittent) 'pudding pie' kiln in Grin Woods. Probably early to mid 18th C in date. There are approximately 100 of these in the woods. Kiln on left, tip on right. (Author's Collection)



Plate 2 Large (running) 'pudding pie' kiln on Grin Hill. The kiln is approx 30ft high and the grirstone lining can just be seen. Marked 'D' on Fig 2 it probably dates from c1807-37. (Author's Collection)



Plate 3 Limehouse in Burbage, inhabited until the 1860s. (Author's Collection)



Plate 3 Masonry kilns at Grin, built 1858-66 (marked 'H' on Fig 2). The steel 'cans' were added at an unknown date, but possibly 1905. (Author's Collection)

A Hartington terrier of 1855 indicates that the kilns were at the northern end adjacent to Stables Lane. The reason for the concentration at this point is unknown; they were marginally nearer to the coal supplies in this new location. Perhaps when situated at the south-west end they were unacceptable to the fashionable visitors who were encouraged to walk up from Buxton to the Temple, which was originally built in the late 1830s.

In the Buxton Museum and Art Gallery there is an unpublished paper by S. Le Chevalier entitled, 'The historical development of limeburning and waste deposition on Grin Low, Derbyshire' (February 1977). Whilst containing some useful information it essentially draws upon secondary sources and so the postulated chronology of activity ignores such primary information that would give it more substance. Its strength lies in the fact that the author appraised the hillside before it was landscaped.

Sometime after 1837 limeburning moved to the north end of the Hill and probably Stanley Moor. This was before the large quarry was opened. It would seem, that during the last years of the Boothmans' tenancy their three kilns were at the north end of the Hill close to Stables Lane and now landscaped. With the advent of the B.L.Co. a single new kiln seems to have been built in 1857 making the total up to four. A bank of four kilns appears to have been built in 1858 as six kilns were let at £20 each with the probability that two of the older ones were abandoned. A further bank of six kilns had been built by 1866 and with rent being paid for eleven kilns it would seem that Boothmans' remaining kiln had also been abandoned. No further kilns were ever built at Grin. A network of tramway lines fanned out into the big new quarry and towards the tips which grew enormously from the 1880s with a reduced agricultural demand for the low grade lime. A railway line, still visible, around the south end of the big new quarry was built after 1880 and abandoned before 1921; its purpose is unknown. Adjoining Stables Lane were the stables and workshops for the new quarry complex, and alongside the branch line from Ladmanlow were wagon repair shops. Across the old 'Cole Road' (turnpiked in 1773) a number of houses were built for quarry employees.

IX: DESCRIPTION OF THE LIMESWORKS

On Wednesday 4 August 1880 members of the Cheshire and Derbyshire branch of the Institute of Mining, Civil and Mechanical Engineers visited the works belonging to the Buxton Lime Company. Director, Mr H. A. Hubbersty, reported this visit in the Institute's *Journal*,⁷⁶ part of which is quoted below:

... They expressed astonishment at first sight of the enormous heaps of debris from the kilns; it was explained, however, that these were in a great measure to the poor quality of the coal which is used for burning the lime.

In appearance this coal resembles shale, with very thin streaks of pure coal in it. In burning it leaves a very large percentage of red ash; this, and the underburnt stones and small pieces of lime which are not saleable, cause the accumulation referred to The coal is obtained from collieries, at Burbage and Whaley Bridge, which are worked by the Lime Company.

The visitors first inspected the large Crushing Mill at Grin, made by Galloway and Sons, of Manchester, and consisting of three pairs of rolls driven at varying speeds by a 50-horse single cylinder engine fitted with friction gearing, to prevent accidents in case of uncrushable material getting into the rolls. The mill is capable of crushing 180 tons of stone per day, the largest size being about 1 inch thick, which is sent to the chemical works for the manufacture of what is known as 'black ash', and 'salt cake'; the next size is sent away for garden walks and asphaltting purposes; and the finest, which is like fine sand, is also used at chemical works.

After completing their inspection of the above, the visitors were next shown the process of Lime-burning, commencing at the finished lime, and seeing the manner in which the lime is picked

out of the mixture as it is shovelled from the eye of the kiln; each man having two boys who select all the saleable lime and put it into one barrow to go into the truck, leaving the refuse to be taken to a large tip wagon, and by it to the debris heap referred to before.

The Kilns are about 45 feet in height, open at the top, and about 15 feet in diameter at the widest part. It is just below this point that the greatest heat is, estimated to be about 2,000 degrees.

They are lined with a stone obtained in the neighbourhood, which is so suitable that some of the kilns have not been put out for more than ten years; the chief repairs being at the top, where they are sometimes hot to redness, and then almost cold; and, being exposed to rain, the stones break frequently, and necessitate continuous repair.

The Lime-stone is put in at the top, out of tramway wagons holding one ton each, in layers of about 7 tons; no stones of more than 60lbs. weight or less than 2lbs. are allowed to be put in; the stone is carefully levelled, and then a layer of the coal previously mentioned is put on, of which it takes 12cwt to make 1 ton of best lime.

Each kiln is capable of turning out about 12 tons of lime per day, the annual output of the Company being 100,000 tons.

After the kilns an inspection of the Quarries was made, the visitors following the line of tramways — down which the stone is brought from the quarries in the above mentioned wagons, in gangs of six or seven, by one horse in charge of a youth to the faces of the rock, where the quarrymen were busily engaged in the several processes of drilling, breaking up the stone, loading the wagons and removing the soil or clay which lies between each two beds of stone of an average thickness of 18 inches.

There are five different beds of stone being worked in these quarries, the system of quarrying being to undermine the rock faces (some of which are over fifty feet high) from the clay bed to a height of twelve feet, or sufficiently high to enable the men to get to a 'back joint', which is then followed until only a pillar remains supporting the mass: several shots are then fired in this, and the block - sometimes upwards of 3,000 tons - falls, and in falling breaks itself up. It is then in convenient sized pieces, requiring little more than blasting before being broken by hammers and loaded up for the kilns.

All the drilling is done by octagonal steel jumper drills about 6 inches long and 1.125 inch diameter. The hammers used weigh on an average 26lbs. each, but have very thin and elastic handles, made from the toughest ash - these taking all the 'jarr' from the hands. A large quantity of powder, upwards of 14 tons per annum, is used in the quarries of the Company.

In considering the above it should be noted that the Company also operated the Harpur Hill limeworks. After 1872 there was a tremendous increase in demand for 'chemical' limestone from the Peak District, following the introduction into Cheshire of the 'Solvay' method of alkali production from Belgium.

X: MINERAL WORKINGS

As well as limestone quarrying there has also been small scale extraction of lead and its associated gangue mineral barytes, locally termed 'caulk'.

Lead mining took place along the valley of the River Wye in Burbage, in and around Ladmanlow, on Grin Hill, Stanley Moor and also in the Carboniferous grits on Axe Edge. Thomas Short described the mineworkings as early as 1734.⁷⁷ He also recorded that there was also 'Spar Ore and Cauke Ore, the last is much the richest'. On 6 September 1779 the Hartington barmaster, Thomas Roberts, 'gave' to Mr Jas. Brock:

... an old vein called Doghole Vein with seventeen Meers of Ground ranging Southwardly from a Place called Gate lying to the Sawrake. Also gave four Meers of Ground Takers Eastwardly from Chance Possessions. Also gave a Vein called Ladmorelow foot with Eight Meers of Ground ranging West from the Saw Rake. Also gave five Meers of Ground Takers ranging Northwardly from Zachary Possessions. Also gave an old Vein called Sawrake with Twenty seven Meers of Ground

ranging Southeastwardly from Doghole Vein. Also gave an old Vein called Bolepitrake with Twenty Meers of Ground ranging West from the Saw rake. Also gave an old Vein called Rushy gutter Vein with Twenty Meers of Ground ranging Westwardly from the Saw rake.⁷⁸

By September 1801 a similar parcel of grants was given by the barmaster to Mr Henry Millward. Interestingly the veins are identified in relation to a 'sough level'.⁷⁹ This sough was either the 'Gate Sough' or an unnamed level from [Upper] Otter Hole towards Ladmanlow. J. H. Rieuwerts, referring to the former, stated that it, 'Probably drained the closely associated Chance Veins, Saw Rake and small veins on Grin Common and the lower slopes of Ladmanlow'.⁸⁰ These veins were still being worked in the period 1835-41 and are very briefly described by Nellie Kirkham⁸¹ along with the names of some of the miners. Of particular note are references to Grin End, a mine adjoining the Ladmanlow toll bar and the 'Solomons Temple mine'.

Associated with the lead was mining for Barytes or 'caulk' in the area alongside the branch railway from Ladmanlow. Short's reference to it's extraction in 1734 has been given above and it is very likely that it was produced by the lead-miners. An example of the scale of activity can be seen below:

Buxton Estate Accounts (extract) 1863.⁸²

Received of Buxton Lime Company as follows viz:

One years dues on Cawk raised in Hartington Upper Quarter to 31 December 1863 viz:

1,769 tons 5cwt. large at 2s 6d	£221 3s 2d
616 tons 0cwt. small at 1s 0d	£30 16s 7d
151 tons 15cwt. washings at 3d	£1 17s 11d
	£253 17s 8d

Two interesting events are associated with these workings. The first is the entombment of Benjamin Bonsall and John Bagshaw, due to a collapse of the workings, for five days in c1843,⁸³ and the disappearance of the well-known Dr Hannah's horse into a previously sealed shaft in Stables Lane in January 1901.⁸⁴

The author has not researched either the lead or barytes workings in any detail but has included them to demonstrate the range of industrial activity on Grin Hill.

XI: MASTERS AND MEN

It is not the purpose of this article to describe at length the Company directors or the quarrymen but it would be wrong to ignore them.

Of the directors of the Buxton Lime Company the Arkwrights, Peter Wright and John Osmaston are well known in Derbyshire industrial circles. The Hubberstys were sons of Philip Hubbersty of Wirksworth, solicitor for the C.H.P.R. Henry Alfred Hubbersty was the driving force and general manager of the Company, and by the end of the century was the most influential man in the Buxton lime trade. He lived at Burbage Hall which was also the Company's offices until their removal to The Quadrant in Buxton in c1905-07. From an earlier period Robert Broome was the secretary based at the then offices in Whaley Bridge. He became chairman of the Buxton Local Board in 1864 and founded a number of local charities; he lived at Burbage House.

From directory sources the lesser tiers of management can be gleaned with a manager (Robert Raynor in 1857), an overseer (William Srigley in 1870) and a foreman (Robert Todd in 1895). During c1855-62 Srigley had mined coal at Bunsall before losing a lawsuit with the Company over coal rights. After the trial Broome recognised his abilities and offered him the position at Grin.⁸⁵

<i>Class</i>	<i>Grin Shops</i>	<i>Grin Quarry</i>	<i>Harpur Hill</i>
Foreman	£9 15s 0d	30s 0d	30s 0d
Clerk	25s 0d	—	—
Blacksmith	4s 8d	—	4s 3d
Strikers	3s 6d	—	3s 6d
Engineer	5s 10d	—	—
Saddler	5s 8d	—	—
Joiner	3s 6d-4s 6d	—	3s 4d-4s 3d
Masons	—	—	4s 0d-5s 4d
Carters	3s 6d-3s 8d	—	—
Waggoners	—	2s 6d-3s 4d	2s 4d-3s 10d
Lime inspector	—	3s 10d	—
Quarrymen	—	7½d-8d*	7¼d-8d*
ditto (breaking only)	—	4d*	4¾d*
Burners	—	2¾d*	—
Pickers	—	—	6½d*
Stackers	—	—	6½d*
Bullhead knockers	—	3s 8d	—
Fillers up and poppers	—	—	4¾d*
Ash Waggoner	—	3s 6d	—
Engine Driver	4s 8d	4s 0d-4s 8d	3s 9d
Stokers	—	—	—
Truck —	—	3s 6d	—
Rope runners	—	3s 10d	—
Weighers	—	3s 0d-3s 4d	3s 0d-4s 2d
Platelayers	—	3s 8d-4s 0d	3s 6d-3s 7d
Coal fillers	—	—	—
Dirt tipper	—	3s 0d-3s 4d	3s 2d-3s 6d
Horsekeeper	—	3s 4d	3s 10d
		plus cottage	
Sheetmaker	—	3s 6d	—
Crusher feeder	—	—	—
Baring per yard	—	7½d-9d	—

Note: All rates weekly except the foreman of Grin Shops who was paid quarterly and those marked * which it is assumed are day rates.

Source: Derbyshire Record Office, I.C.I. Collection, D2667.

Table 7: *Scale of Wages — May 1905.*

Information regarding quarry operatives is sparse. Census data can be misleading as the distinction between a (lime) stone ‘getter’ and a (sand) stone ‘getter’ is not always made nor that between ‘labourers’. The census officer was not required to record places of employment and the situation is confused by the large numbers who traditionally walked great distances to work in the quarries. In the village of Burbage (adjacent to Grin) the 1861 Census⁸⁶ records only eleven operatives directly attributable to the lime trade, whereas in January 1861 Mr H. A. Hubbersty entertained 230 employees (Grin and Harpur Hill) to a New Year feast.⁸⁷ Needless to say the work was back-breaking, tedious, exposed to the elements and dangerous. Although no early statistics exist there was a regular flow of accident reports once the local press became established. One example must suffice. In July 1896 the ‘Buxton Herald’ recorded the death of

Samuel Norton, a labourer at Grin, due to a fall of ash.’⁸⁸ The dangerous nature of the work is also reflected in the creation of the ‘Grin Sick Fund’ to which the Buxton Limes Firm Co. contributed the sum of £10 in 1895.⁸⁹

The variety of trades and other people employed and their rates of pay are given in Table 7. The working week comprised 53 hours being in the ‘Summer’ at Grin Shops:

Monday:	7.00-9.00,	9.30-1.00,	2.00-5.30
Tuesday to Friday:	6.30-9.00,	9.30-1.00,	2.00-5.30
Saturday:	6.30-9.00,	9.30-1.00.	

The ‘Winter’ period was the six weeks either side of Christmas when different times were worked due to the reduced daylight.

The Company also owned or leased 74 cottages, with an annual rental of £5 10s 0d in 1873, which it let to its employees, and one house with a rent of £40 occupied by Mr Hubbersty.⁹⁰ By c1904-05 it had 70 in the Burbage area alone.⁹¹ These were mainly in the Grin Old Row (20), Grin New Row (6), and Lime Terrace (11) at Ladmanlow, and in Green Lane (10).

XII: THE LIMEHOUSES

The limehouses which covered the slopes of Grin Hill, and other limeburning locations, were an unusual and perhaps unique form of habitation. A simple but very poor form of housing for quarrymen, they were created by hollowing out ancient lime-ash tips which had become hard through carbonation. The French traveller Faujas de St Fond described the occupants of the Grin limehouses in 1784:

I looked in vain for the habitations of so many labourers and their numerous families without being able to see so much as one cottage when I at length discerned that the whole tribe, like so many moles, had formed their residences underground. This comparison is strictly just; not one individual of them lodged in a house or even in the hollow of a rock ... I felt much pleasure in visiting the residences of these troglodytes.⁹²

Due to increased standards of sanitation the limehouses had by the mid-nineteenth century become a social disgrace. By this time there were still three in Burbage and the names of their occupants can be traced in the 1841 and 1851 censuses. In his account of the limehouses, Frank Morgan recorded the dimensions of one of these homes as being a single room of 14ft x 7ft x 5ft 6in.⁹³ During the time of Mr Wilmot’s agency to the Duke of Devonshire, he had the occupants re-housed in three new cottages in Burbage. In July 1863 a limehouse collapsed at Dove Holes killing four people but no such incident has been recorded at Grin.⁹⁴

XIII: THE BUXTON LIME FIRMS COMPANY

A major feature of the Grin complex in later years was the enormous white tips which dominated the village of Burbage. Their accretion was accelerated from the 1870s when a decline in agriculture discouraged farmers from taking away the lime-ashes at low cost. By the early 1890s recession was also affecting industry and so to stabilise prices a number of trade associations and amalgamations were formed. The local lime trade was no exception and in an attempt to weather this recession Mr H. A. Hubbersty persuaded thirteen out of the seventeen local lime companies to amalgamate to form the ‘Buxton Lime Firms Company’ (B.L.F.Co.) in 1891.⁹⁵ Management of the individual plants was usually undertaken by their former proprietors.

Two of these companies were ‘The Old Buxton Lime Co.’ (O.B.L.Co.), and ‘The Buxton Lime Co.’ Jackson notes that the former comprised the Harpur Hill works and the latter comprised Grin and Whaley Bridge.⁹⁶ He is clearly in error here for the B.L.F.Co. minutes and

accounts clearly refer to Grin, Harpur Hill and Whaley Bridge as being formerly part of the O.B.L.Co. The composition of this new 'Buxton Lime Co.' and its relationship to its near namesake is unclear. Why the B.L.Co. (referred to in section VII above) became 'Old' is not known either but what is important to this account is the fact that the Grin limeworks came to the B.L.F.Co. from the O.B.L.Co. and was managed within that named unit of the new company.

The B.L.F.Co. issued 40,000 ten pound shares to acquire a nominal capital of £400,000. These had been fully subscribed by 1892 when the former proprietors of the O.B.L.Co. had purchased 9,242 shares.⁹⁷ This was greatly in excess of any of the other constituent companies and this is perhaps hardly surprising when it is considered that Hubbersty was the driving force for the amalgamation. It also reflects the eminence of the O.B.L.Co. and this is further indicated by the value of their assets at the time of merger in July 1891. The purchase of, '...Freehold estates and Leasehold properties, Goodwill, Stock in trade, Stores, Fixed and Rolling Plant, Machinery etc', was £153,848 7s 1d.⁹⁸ A pencil note in the ledger states that the 'stocks' amounted to 4,253 tons. This figure for the O.B.L.Co. was again far in excess of the other companies; the next highest figure (£67,175) was paid to the former proprietors of, 'The Great Rocks Lime and Limestone Co.' Of note is the fact that Grin was one of the leasehold properties.

The 'Old Buxton Works' revenue accounts give very full details of sales and production costs for the early 1890's. Unfortunately they do not separate sales for Grin and Harpur Hill. The combined figures are given in Table 8.

<i>Half year ended</i>	<i>Lime sales (tons)</i>	<i>Limestone and other sales (tons)</i>	<i>Joint receipts</i>	<i>'Old Buxton' profits (inc. coal)</i>
Dec 1891	38,484	16,795	£30,299	£4,369
June 1892	33,836	16,108	£25,042	£3,304
Dec 1892	38,529	19,267	£28,269	£5,429
June 1893	38,117	19,836	£27,949	£3,189
Dec 1893	36,547	16,729	£26,535	£3,890
June 1894	33,053	21,240	£26,103	£3,239

Source: 'The Old Buxton Works', revenue accounts, Derbyshire Record Office, I.C.I. Colln., D2667.

Table 8: Lime and limestone sales for Grin and Harpur Hill, 1891-94.

The wages for both limeworks (excluding Grin Shops) for the half year ended December 1893 amounted to £6,574.

A number of commercial decisions slanted the emphasis at Grin towards lime production. The B.L.F.Co. minute books⁹⁹ record:

25. 06. 1903: Report on Grin noted — decision not to extend screening and crushing.

31. 08. 1905: Chemical lime only, as far as possible to be produced at Grin with a view to keeping the new kilns in full work.

[Note: No new kilns are known from this time. It is believed that the above refers to the placing of steel 'cans' on top of the existing kilns (see below)].

30. 11. 1905: Lime mill to be restored and rebuilt in fireproof material.

In 1905, from eleven kilns, some 26,740 tons of lime was produced from 57,631 tons of stone and 11,394 tons of coal. Over the year the average consumption figures for stone and coal per ton of lime produced were 42.67 and 8.53 cwts. respectively. Comparable figures for the same year at the Harpur Hill 'New' kilns were 41.2 and 6.53 cwts.¹⁰⁰ Coal consumption at the

<i>Grin</i>	<i>H.Hill</i>	<i>H.Hill</i> <i>'New' kilns</i>	<i>'Hoffman'</i>	<i>Hindlow</i>	<i>Bugsworth</i>
26,740	19,125	13,933	26,525	24,736	6,318

Source: B.L.F.Co., 'High Peak Works' notebook. Derbyshire Record Office, I.C.I. Colln., D2667.

Table 9: Selected lime production figures — 1905.

innovative 'Hoffman' kiln, also at Harpur Hill, was 7.06 cwts. Selected lime production figures for the year are given in Table 9.

From this it can clearly be seen that Grin was one of the major lime-producing units in the group and, by virtue of the eminent role of the B.L.F.Co., also in the district. The coal consumption figures however indicate that the kilns at Grin (over 40 years old in 1905) were gradually losing out to the newer, more fuel-efficient kiln elsewhere. At an unknown date tall steel 'cans' or cylinders were placed on top of the kilns to improve the pre-heating of the stone, and thus the fuel efficiency. This required the stone and coal to be raised on hoists to feed the kilns. These improvements may constitute the 'new kilns' reference in the minutes quoted above. The small role of Buxworth may be noted as the canal traffic receded but it should be further noted that most of the Canal traffic at this time emanated from S.Taylor and Co. of Dove Holes and not from the B.L.F.Co.

The accent on lime production at Grin can be further seen in a note of quarrying and crushing costs in 1914 given in Table 10.

<i>Quarry</i>	<i>Quarrying</i>		<i>Crushing</i>	
	<i>Stone quarried</i> <i>(tons)</i>	<i>Cost</i> <i>(£)</i>	<i>Stone crushed</i> <i>(tons)</i>	<i>Cost</i> <i>(£)</i>
Grin	44,363	4,332	3,862	206
Harpur stone	74,863	4,258	73,980	1,394
Ashwood Dale	13,556	871	13,337	464
Cow Dale	104,283	7,903	85,291	1,892
East Buxton	67,469	4,765	55,924	858
Millers Dale	56,390	4,599	54,872	2,413
Long Sidings	136,736	9,755	111,214	2,356
Small Dale	95,212	7,847	88,748	2,756
Peak Dale	97,897	6,980	95,109	1,512
	<u>700,769</u>	<u>51,310</u>	<u>582,337</u>	<u>13,851</u>

Source: 'Quarry costs — 1914'. Derbyshire Record Office, I.C.I. Colln., D2667.

Table 10: Quarrying and crushing costs — 1914.

The motive power in the limeworks were the horses whose presence is still recorded in the name Stables Lane which runs from Ladmanlow. It is not known how many there were before the introduction of steam power but in June 1906 there were twelve. Horse power came to an end in March 1907 when all but one ('Mettle', a 'black' horse aged eight) were either sold (six) to a man called Nadin (one other, aged nineteen was given to him), transferred to other quarries (one), or destroyed (two). The twelfth was loaned to W. Wainwright of Peak Dale. One of those sold was 'Fan', a 'bay' aged twenty-one, who was a former pit-pony in the collieries.¹⁰¹

It is not known either when steam engines, as a form of motive power, were introduced at Grin. However, in June 1892 the B.L.F.Co. paid twenty pounds for a 'Loco shed', and paid one hundred pounds for laying rails (presumably to carry the additional weight of a locomotive in

the limeworks).¹⁰² As this is immediate upon the formation of the B.L.F.Co. it may be conjectured that from 1857 until this date all of the major shunting duties and transfer of wagons to Ladmanlow had been undertaken by a C.H.P.R. (closely allied to the B.L.Co.) locomotive. With the formation of the new Company the London and North Western Railway (which had absorbed the C.H.P.R. in 1887) may not have been keen to continue the arrangement. In December 1919 a 'Grin loco' was purchased for £2,300.¹⁰³

In February 1905 a twelve horsepower stationary Robey engine was installed to haul two hundred wagons of stone up from numbers three and four 'lifts' in the quarry up to the kilns and sixty wagons of dirt to the tips daily. It had two cylinders (12in x 8in) and worked at a steam pressure of 75p.s.i. A new boiler was supplied in September 1907 (No.26856/1907). Altogether, there were four boilers at Grin, the Robey, the locomotive, and boilers at the crusher and in the wagon shops. The latter measured 30ft x 7ft 6 in, had a surface heating area of 900 sq. feet and a boiler pressure of 103p.s.i. It had a chimney 53 feet high.

Much of the 'chemical' stone was supplied to Messrs. Brunner Mond at their alkali works in Cheshire. During the First World War they became increasingly concerned about their limestone supplies and in 1918 acquired a controlling interest in the B.L.F.Co. In 1926 Brunner Mond and three other firms combined to form the 'Imperial Chemical Company' but by this time they had disposed of Grin.

The last major available production figures occur in 1920 and again show Grin in decline. Out of thirteen limeworks quoted in the 'Trading Accounts' only three (including Buxworth) have a smaller lime output than Grin. Extracts for lime, stone and refuse sales are given in Table 11.

It may have been that the continued use of the old kilns at Grin was becoming commercially unviable but it seems probable that the cause of the decline was due purposeful run-down prior to the termination of the lease. Figures for 1921 give production figures of 25 tons for refuse and 11 tons for stone; there was no lime production. In 1922, the last year of the lease, there was no production at Grin at all.¹⁰⁴

<i>Quarry</i>	<i>Lime sales</i>	<i>Stone sales</i>	<i>Refuse sales</i>
Grin	7,555 tons	13,184 tons	1,244 tons
Harpur	2,178 tons	34,929 tons	2,729 tons
Dove Holes*	16,357 tons		
Buxton South*		85,521 tons	
Buxton Central*			3,324 tons

* Note: Largest producer of commodity.

Source: Trading Accounts', Derbyshire Record Office, I.C.I. Colln., D2667.

Table 11: B.L.F.Co. Trading Accounts — 1920 (extracts).

XIV: THE CLAY CROSS COMPANY

In a definite policy move the B.L.F.Co. relinquished all its quarries leased from the Duke of Devonshire in 1922.¹⁰⁵ This had major ramifications for the local lime industry as a number of senior B.L.F.Co. management officers took the opportunity to establish themselves as quarry owners, and the I.C.I. Ltd. (successor to the B.L.F.Co.) ultimately developed Tunstead as a major freehold quarry from 1929.

In line with this policy the B.L.F.Co. left Grin in 1922 and in 1923 the lease was then taken by the Clay Cross Company.¹⁰⁶ Disagreement over the transfer of plant and equipment led to arbitration by Messrs. Eddon and Lockwood. They awarded the sum of £3,657 to the B.L.F.Co.

for, '... machinery etc taken over by the Duke of Devonshire',¹⁰⁷ less the sum of £2,915 for dilapidations. This latter figure clearly indicates the out-dated nature of the quarry infrastructure. The Clay Cross Co. purchased plant and machinery from the B.L.F.Co. for £785.¹⁰⁸

Unfortunately little is known about this period of operation and the author has been unable to view any records belonging to the Clay Cross Co. In a sesquicentenary publication of the Company's history Stanley Chapman briefly records the acquisition of Grin:

A lease was taken of a third limestone quarry at Grin, near Buxton, in 1923, which with Ambergate and Ashover, produced 300,000 tons a year. Half of this was burned, and the Clay Cross Co. now claimed to be the second largest lime burners in the country.¹⁰⁹

Monsieur S. Le Chevalier recorded the demise of lime burning as follows:

It was a very old quarry with almost obsolete plant that found itself trying to meet the demands of the Second World War. The open top kilns were kept burning but had to be damped down at night as a precaution against enemy air raids. Meanwhile technical advances were being made, keeping pace with the demands of the War. I.C.I. concentrated on their most productive units and pushed ahead with their new quarry at Tunstead. Other firms also mechanised their quarries and plant to maintain output in the face of dwindling manpower. After the War the Grin works found strong competition in the modern quarries and finally closed its doors to the world of lime burning in 1952. Following the closure much of the old plant was dismantled and the railway removed as far as Hindlow.¹¹⁰

It would be unfair and unsubstantiated to say that the Clay Cross Co. did not invest in, or develop, the quarry and limeworks in any way, but, in the absence of documentation to the contrary, it does appear that they worked the out-dated plant for as long as possible, and when investment was unavoidable they declined to make the improvements. Alternatively, the quarry may have reached its workable limits or, some thirty years later, their lease may have expired. Lime-burning therefore finished in 1952 but that was not the end of quarrying activity at Grin.

XV: THE FINAL YEARS

Following the nationalisation of the coal industry and Governmental policy to increase production of that commodity Grin quarry was used in the 1950s to stockpile coal. After this it lay idle until it was re-opened as a roadstone quarry in mid-1967 by a new 'Buxton Lime Company', a subsidiary of 'Harry A. Coeff Ltd.'. The impetus for this renewed activity came from the major road and motorway building programme then in progress. In September 1970 Grin was acquired by 'Limmer Quarries Ltd' who increased output to approximately 300,000 tonnes per annum of dry stone. This generated about 10,000 tonnes of waste limestone and clay which bedevilled the workings in these last years. 'Limmer Holdings' were absorbed by the 'Tarmac Group' in December 1971 who closed the quarry for good in January 1972¹¹¹ following local pressure.

XVI: POSTSCRIPT

Grin Hill is as busy as ever but not now from quarrying and limeburning. The woods on the north-east side were acquired from the Duke of Devonshire in April 1970 and turned into the Buxton Country Park centred upon Pooles Cavern. The quarry and the remainder of the hill were acquired by the Derbyshire County Council who landscaped the enormous white lime tips in 1979-80. There is no doubt that, in landscape terms, this has been a great improvement but it is unfortunate to note that the large masonry kilns, built in 1858-1866, were demolished, together with much else of archaeological interest. Quite imaginatively the quarry floor has been

transformed into a large caravan site which is not visible except from the quarry edge. On 23 March 1989 the whole Grin complex, including the County Council country park and caravan site, was formally opened by Councillor S. Mellors.

Surmounting the hill is Grin Low Tower, traditionally believed to have been built by the sixth Duke of Devonshire to provide work for local unemployed men. It soon became a focal point for tourists and it remains ever popular with the many visitors who use both country parks. Erected in the late 1830s¹¹² on land then leased for grazing by Solomon Mycock, landlord of the Cheshire Cheese Inn, Buxton, it became more popularly known as 'Solomon's Temple'. Built of unmortared limestone and in a very exposed position it eventually fell down and was re-built in its present form by public subscription in 1896. The tower is built upon a Bronze Age burial mound and prior to its re-building this barrow was excavated by local archaeologist Micah Salt in 1894.¹¹³ It contained one primary interment and a number of secondary ones. Among a wide variety of grave goods were a small, highly decorated, food vessel and a crushed Romano-British urn. Almost a hundred years later the Tower again became unsafe and was repaired by Messrs. G. D. Rodgers (contractors) in 1987; the cost being defrayed by public subscription and a grant from the Countryside Commission.

XVII: CONCLUSION

Grin Hill has been a focal point for man for at least 3,500 years and its limestone resource has been used intermittently ever since for building purposes. When the purity of this resource became fully appreciated is unknown but by 1704 it was being carried into Cheshire and by 1734 into Lancashire. Limeburning since 'time out of mind' in 1662 puts this activity back probably three generations and possibly four. No further estimate of early use can be made without additional evidence. Claims have been made locally that its lime was used in the Roman baths in Buxton but there is no evidence for this.

With so little research, either historical or archaeological, having been undertaken into quarrying it is difficult to make any comparisons. The major Derbyshire work to date is that by Messrs. Marshall, Palmer and Neaverson on the Calke Abbey lime-yards.¹¹⁴ Here large amounts of lime were produced from some 85 acres of earthen kilns. In the period 1810-15 they estimate that some 15,000 tons of stone were being quarried annually which, if it was all being burned would produce approximately 6,600 tons of lime based on their own conversion figures.¹¹⁵ Using the load conversion figures outlined in section III this approximates to 103,000 loads and so makes the Ticknall lime production slightly ahead of Grin for a similar period. However, it has been demonstrated that Grin was in decline at this time. One reason for the expansion of the Ticknall industry was the enclosure, improvement, and subsequent industrial development of the Ashby Wolds. Grin expanded similarly but served the much wider area of Cheshire and Lancashire and the burgeoning industries of Manchester and Liverpool. Messrs. Marshall et al make the point that at Ticknall there is, '... one of the largest concentrations of intermittent lime-kilns in Britain, some dating back to the eighteenth century.'¹¹⁶ Whilst the importance of this complex has been duly recognised that at Grin has not been so and neither has it received a full archaeological assessment.

Comparable with Grin were the lime workings to the west of Peak Forest village (SK17: 102.796), again producing from large earthen kilns. In 1793 (before the opening of the Peak Forest Canal) there were seven kilns in operation. In 1807, with the Canal in use, and from an unknown number of kilns Edward White produced 134,806 loads;¹¹⁷ far in excess of Grin. Peak Forest was one of over seventy landsale quarries which Farey recorded in Derbyshire in 1813.¹¹⁸

Ashover, Crich and Stoney Middleton are but three which must also have been major producers.

Without substantial further research into other landsale kiln complexes few strong conclusions can be made. In considering the important role of limestone in the Industrial Revolution, and the distribution of lime throughout North-West England, the present author has demonstrated the importance of the Buxton and district supplies, and that it eclipsed the use of limestone from Clitheroe and North Wales.¹¹⁹ Considering also the early important role of Grin and the wide export of its lime there can be little doubt that during the eighteenth century at least, Grin was one of the most important sources of limestone, not only in Derbyshire but also for Cheshire and Central Southern Lancashire.

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