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Papers on pp.2-118 were prepared for the Lawrence Barker Conferemce, Reeth, 10 September 2011 and were presented either as posters or lectures. The conference was organised to recognise Lawrence's contribution to the history and community of Swaledale.

LAWRENCE BARKER: AN APPRECIATION

Duncan Bythell

John Lawrence Barker - always 'Lawrence' to his friends and neighbours in Swaledale - was born on 3 July 1927 in the village of Healaugh, where his family has owned property for several generations: and, apart from his years of National Service, he has lived there ever since. He attended Reeth school, of which he was later to be a governor and trustee, until the age of fourteen. Family circumstances then required that he should seek gainful employment, and he found it as an apprentice mechanic at Grinton garage. Over the next thirty years, as the garage business grew, it relocated from Grinton to Reeth, and Lawrence became a partner in it. In 1972 he sold his interest in the garage and became a Warden for the Yorkshire Dales National Park, a position which he held until his retirement twenty years later. For Lawrence, this meant a change to truly congenial work. He was now able to play his part in conserving and improving the landscape, the wildlife, and the built environment which he had known and loved since childhood, whilst at the same time helping others, especially visitors, to understand and enjoy them.

Lawrence Barker is a living example of the truism that education is a lifelong process which often begins only after formal schooling has finished. Despite having left school at fourteen, by the time he began to work for the National Park Lawrence had become recognised, both locally and further afield, as the leading authority on the history of Swaledale in general, and of its lead mines in particular. How had this come about? Firstly, it happened because Lawrence belongs to Britain's long and honourable line of 'auto-didacts' - largely self-taught individuals with the enthusiasm and the dedication to go on finding out more and more about the subjects which interest and excite them until they become real experts. Secondly, it happened because the value of continuing education had been recognised in Swaledale since mid-Victorian times through literary institutes and village reading rooms, and because this tradition was carried forward in the twentieth century by the Workers' Educational Association and by Leeds University's Department of Extra-mural Studies. Lawrence was for many years an active member of the Reeth branch of the W.E.A., serving as its secretary, treasurer, and ultimately chairman. In particular, he was deeply involved in the long-running collaborative project which eventually produced Fieldhouse and Jennings's exemplary and authoritative 'History of Richmond and Swaledale' (1978). It was at a W.E.A. class that he met his wife Sheila, herself a history graduate and school-teacher, who shared his enthusiasm for local history. In celebrating Lawrence's own achievements, it is right and proper to acknowledge what Sheila has contributed over the years to a fruitful academic partnership.

Lawrence's interest in Swaledale's past was born of his early love of, and curiosity about, the things he saw around him as he explored the countryside: stone circles, old field patterns, abandoned farm buildings, and the still-present evidence, both above and below ground, of the once-important lead-mining industry. His interest was further enhanced by his pride in the role his ancestors had played in the dale's history. In the late seventeenth century, for example, brothers Robert and Adam Barker, migrants from Derbyshire, were partners with Lord Wharton and Philip Swale in the early exploitation of the Old Gang mines: in the course of the eighteenth century, no fewer than three Barkers practiced as doctors in the dale; whilst at the end of the nineteenth century, Lawrence's great-grandfather, John Barker of Reeth

SOME MATERIAL FROM THE LAWRENCE BARKER COLLECTION

Alan Mills

INTRODUCTION

Lawrence Barker's family have lived and worked in Swaledale for over 300 years. During this time they had a strong association with the local lead mining industry until its demise in the early years of the 20th century; Lawrence has continued the tradition through his strong interest in the history of lead mining in Swaledale and Arkengarthdale.

Over this period Lawrence and his ancestors collected much material of historical interest, particularly, but not limited to, that associated with the lead mining industry and including maps, plans, artefacts, documents and photos. It is the purpose of this paper to illustrate briefly the wealth of material which Lawrence has generously placed in the public domain. It is hoped that the illustrations shown here achieve this. Unless otherwise stated copies of these plates may be viewed at the Swaledale Museum, Reeth.

Figure 1. The last miner in Arkengarthdale, William 'Willem' Rayner Alderson Scott (1881 – 1976).

Willem Scott was born in Whaw, Arkengarthdale, 1881, into a lead mining family. William Scott's father, James, and his grandfather, Miles Scott, were both lead miners. In 1891 the family lived in the Faggergill/Seal Houses area of Arkengarthdale. Lead mining was in terminal decline at this time and it is no surprise to find that by 1901 William had moved, like many others, to the Durham coalfield. He was boarding with his uncle Thomas Scott and both were working as 'coal mine hewers' in Esh. By 1911 Willem had returned to Whaw with his young family and was working as a coal miner at the nearby Punchard Colliery.[1] In 1922 he leased the colliery at a rent of £5 per month. It continued working through the 1926 miners' strike but closed in 1927 and was abandoned in 1929.[2] He later farmed at School Master's Pasture, Hurst before retiring to Langthwaite where he died in 1976, aged 94.

[Photo ca. 1970 by Werner Kissling, ethnologist and photographer].

MINES, QUARRIES, BUILDING AND FUEL IN WENSLEYDALE AND SWALEDALE

Ian M. Spensley

Farming and mining had a considerable effect upon the distinctive pattern of settlement and agricultural scenery in Wensleydale, Swaledale and Arkengarthdale. While the lead industry largely satisfied a market far beyond the dales, it had a significant effect on the development of local villages. Both industries created a demand for fuel and materials for building and this paper explores their symbiosis.

As a farmer or farmer/miner, his family retained some right of access to organic fuel, timber and thatching material to repair their house. As that attachment was broken or loosened, for example by a family's specialisation in mining, their access to such materials was limited. As lead mining continued to expand competition for wood as fuel and timber for construction increased, particularly in Swaledale.

Following the Dissolution of the Monasteries (1536 to 1540) and the large scale sale of parts of the Honor of Richmond and Manor of Middleham in the early seventeenth century, the yeomen farmers benefited considerably. They were able to enclose their meadows and rebuild their humble homes in better style. Houses were increasingly roofed with the sandstone flags, instead of the traditional ling, (heather). Chimneys were added instead of the central hearth and coal could be burnt as well as peat without choking the family. Quarries were opened to supply more regular building stone and flags, lime for mortar created a demand for more fuel to burn limestone.

The population of the dales was far from isolated or insular but they were handicapped by the cost of transporting goods by packhorse. Some of these costs of inward carriage of grain and fuel may have been ameliorated by the outward trade of high value lead and cloth. The dales were however endowed with their own supplies of peat, coal and in parts of Wensleydale, timber.

ORGANIC FUEL

Prior to the expansion of lead mining and the rapid increase of the population of the dales in the sixteenth century, local supplies of domestic organic fuel were sufficient to meet demand. Wood and peat were the main fuels, ling (heather) and bracken was also used, even animal dung may have been burnt. Wood for burning was branch wood, underwood and gorse; timber from larger trees was preserved for construction. Peat was by far the greatest reserve of fuel and could to some extent be regenerated. There were strict rules of management of the 'peat pots', (places where peat was dug) particularly for the management of water and moss. Wood was the domestic fuel of choice for the elite, peat was the fuel of the labourer. In the upper dales it remained so into the nineteenth century, though it was often burnt along with local coal.

Figure 1. Pounders Vein, Faggergill lead mine, Arkengarthdale. From the 1790's an increasing amount of quarried stone was taken back under ground to arch many miles of horse levels.

Until the late sixteenth century smelting was done on bales. The earliest bales were little more than a bonfire on which the ore was placed. They were set against the prevailing wind, but as time progressed they developed into simple open-air furnaces, manually blown by bellows. From the 1570's the ore hearth was gradually introduced. This was far more efficient and ore hearths were placed in purpose built smelting mills. Their efficiency is demonstrated by this example from Derbyshire. The ratio of fuel to lead in bale smelting was about 24:1 while in an ore hearth it was 12:1.[1] This was a considerable cost saving but these early smelting mills had to be built near a good supply of wood because they burnt 'chop wood', which was branch-wood cut into short lengths and kiln dried. In the case of Swaledale and Wensleydale this was at the eastern end of the dales.

Wood was not only used underground for support, but it was also burnt underground as a means of mining hard rock, a method called 'fire-setting'. It was left to burn over night then the hot rock was doused with water, softening and cracking the rock, so it could be loosened with picks and wedges. There was an inevitable shortage of wood in Swaledale by the late sixteenth century. To ensure supplies for the mines, the Wharton family had protracted law suits with their tenants over the use of wood. The Crown had granted the Manor of Muker and half of the Manor of Healaugh to Lord Wharton in 1544 and the following is from 1616.[2]

> *'By the certificate the tenants may take the wood for house boot plough boot cart boot and fire boot. This is directly against all former usages for no tenant had any wood but by special gift and allowance of their lord or his officers and fire boot was never used in that place because there is plenty of turf and coal and if any man did take any wood he was punished for it. By this mean[s] of liberty of wood they may destroy all the lord's wood for he hath no wood for his mills and mines of lead and coal but such as grow upon the tenements in their occupations and thereby his lordship's damage may be greater than the profits of their rents and fines.'*

Much of Upper Wensleydale was equally bare of trees but the lower dale below Carperby was more wooded. The Crown survey of Middleham and Richmond Lordships in 1605 shows that Arkengarthdale and the south side of the Ure in Wensleydale was mainly open grazing, except for Raydale and Bishopdale, (this copy has later additions, post 1628).[3]

WOMEN AND MINING COMMUNITIES IN THE DALES

Janet Bishop

The near invisibility in records of women working at lead mines does not mean that women did not work there. We know from census returns in the nineteenth century that some women are recorded as working as ore dressers and ore washers but what we do not know is exactly how many women doing these jobs were unrecorded for a variety of reasons. It is extremely difficult to find references to women's work, in spite of the many books on lead mining, as it is to find illustrations of women ore dressers or washers.

Women have always worked, as have children, to produce a family wage, with all who could contributing in as many ways as they could to earn enough for the family to live on. So I take issue with Harley and Ingilby's statement that women must have received infinitesimal sums for their work and if any were the wives of lead miners their earnings cannot have been essential to their livelihood as the miners received good wages in those days, (eighteenth century).[1] Some lead miners earned good wages but some did not. Some miners would have used their money wisely, and some would have been profligate. When Arthur Young visited Swaledale in 1770, agricultural day-rates averaged out at 6s. to 7s. and lead miners earned a little more. *'If a man's wife and older children were able to obtain some casual employment - knitting, hay-making or washing lead-ore, this might bring the family income up to 9s. or 10s. a week'.*[2] Women's paid work always made a difference in a family, especially when as a dresser she would have been paid daily. When widowed, it was essential to earn a living.

Finding references to women working at the mines is difficult but several records quoted by Mike Gill and Les Tyson in their books on The Grinton Mines and The Arkengarthdale Mines show that women worked in a variety of ways in the eighteenth century. Women were paid to reclaim ore from deads and spoil heaps and what they reclaimed was measured by the horse load. In the late eighteenth century, about thirty men, women and children were employed below and above ground at the Grovebeck Mines, Grinton.[3] From an account of the lead produced at the How Mines, Grinton, from August 1758 to September 1759 and smelted at the How Smelting Mill, Jane Lonsdale earned 33 pieces from the Mill Slags: (this is in comparison to those men who worked underground, who are recorded as earning from 400 pieces for a senior at Whim Shaft, to men working the hushes who earned little more than Jane).[4] If women are referred to in these references, then there would have many other women whose records of work, if they existed, have been lost. One piece of evidence is an entry in the diary of the Rector of Wath, who visited lead mines in Arkengarthdale in September 1817 and noted, *'Saw some very handsome girls washing the lead'.*[5]

In the nineteenth century, the work done largely by women and smaller numbers of men and children was ore dressing and washing. Women did not work underground. When lead ore (bouse) came out of the mine, it was tipped into storage bays (bouse teams). It was then processed into pure ore, waste and mixed ore and rock. The subsequent processes relied on the fact that lead ore (galena) is heavier than the waste material and so will sink to the bottom when in water. The ore and rock were crushed into smaller pieces on a knockstone with a flat bucking hammer, dressing being done mostly by women. The crushed ore was then

ARCHAEOLOGICAL LANDSCAPES OF REETH MOOR

Tim Laurie

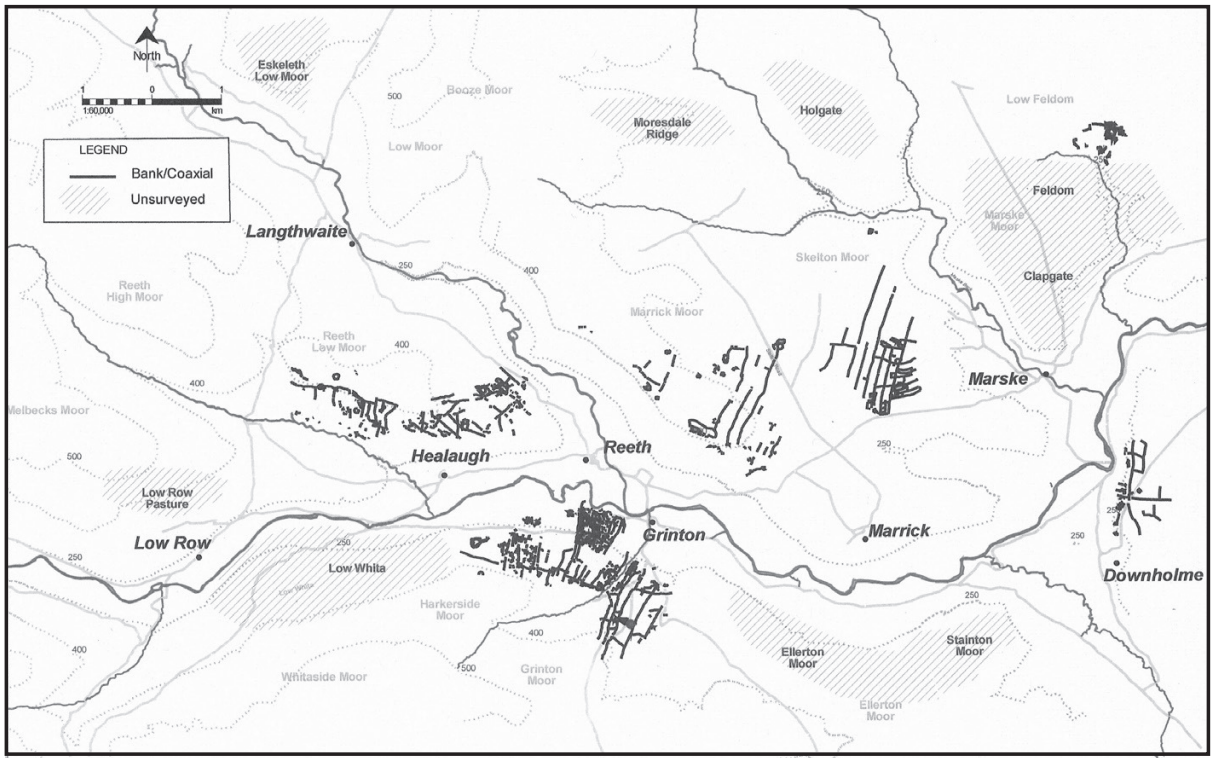

Figure 1. Swaledale early settlement [Crown Copyright. All rights reserved 100023740 (2010)].

The account provided below of the archaeological landscapes of Reeth High and Low Moors is a general account of the nature of the evidence which exists. The archaeological remains at any single location may be and usually are shrouded under thick heather. At any one time a proportion of the field remains will be visible where heather burning has recently exposed them. For this reason, it is not practical to direct the reader to any specific location since the remains may be invisible when the heather has re-grown. Very many separate visits to the moor by myself and many other field archaeologists over the course of almost 40 years were necessary to record the features depicted on the survey maps shown in Figures 1-3.

INTRODUCTION

The dry stone walled landscapes and the industrialised landscapes of the farmer-miners of Swaledale which are the special interest of Lawrence Barker, have long been admired. Only comparatively recently have the hidden landscapes, which exist beneath and beyond the upper limit of the stone walled pastures of the lower dale sides, been recognised and appreciated (see Figure 1). These hidden landscapes represent the lives, work and means of livelihood of past generations and are a palimpsest of sites of all periods which reflect aspects of the activities of the hunter-gatherer and early pastoralist communities who lived and gained their means of living across millennia, from the earliest Post-Glacial period through prehistoric time to the Native Roman, Medieval and recent time.

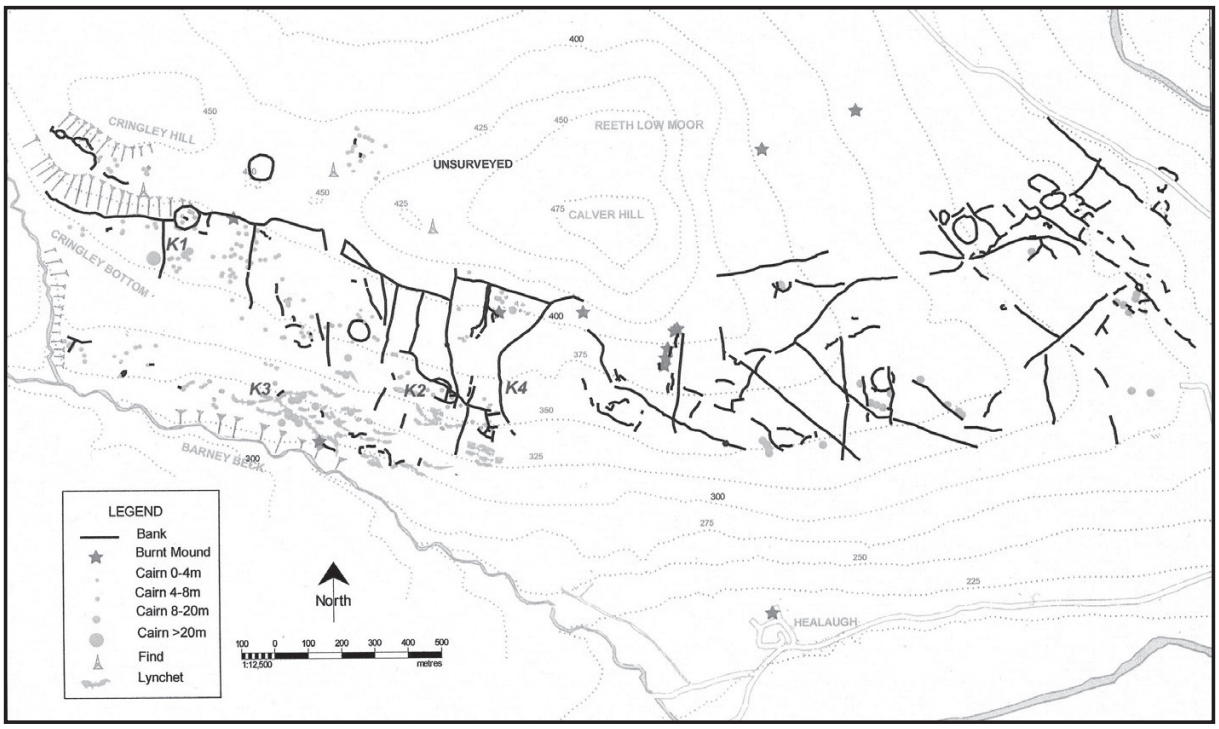

Figure 2. Reeth Low Moor - early settlement detail [Crown Copyright. All rights reserved 100023740 (2010)].

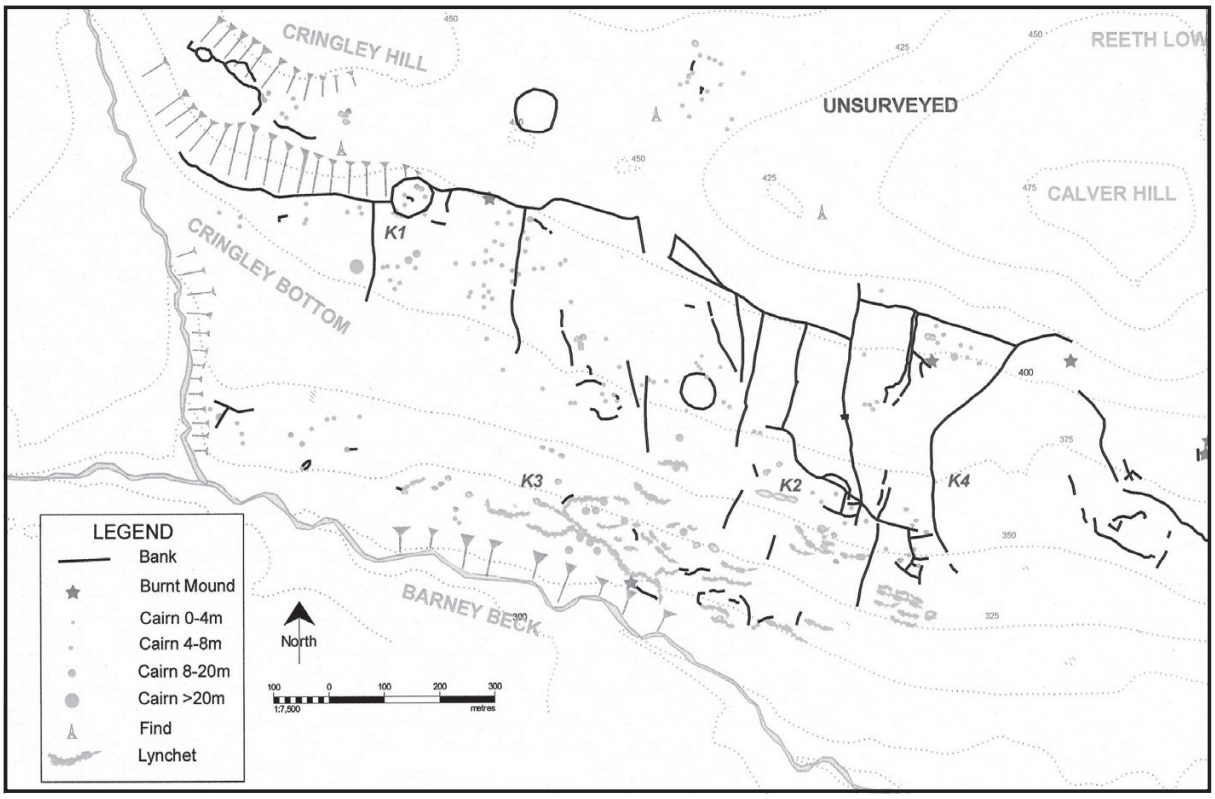

Figure 3. Reeeth Low Moor west (Calver Side) - early settlement detail [Crown Copyright. All rights reserved 100023740 (2010)].

These hidden landscapes have been recognised from the marvellous aerial photographs of Robert White and those taken, during the 1980's by his colleagues at the NYCC together

Figure 4. Reeth and Calver (right) from Reels Head.

with the field reconnaissance and survey during the last century by a number of field archaeologists, notably the late Edmund Cooper, David Hall and Robin Minnitt and from the late 1970's by the work of the Swaledale Ancient Land Boundaries (SWALB) Project directed by Professor Andrew Fleming and myself.

This earlier survey work was undertaken with the knowledge and support of local landowners and estate managers, including Lawrence Barker who took special interest in the survey work on Reeth Low Moor and who was our contact as Chairman of the Reeth Moor Committee.

The detailed surveys of the archaeological remains on Reeth Low Moor have been selectively discussed by Andrew Fleming.[1] More recently, the full extent of the earlier SWALB survey of the Low Moor has been made available together with further analysis of the prehistoric coaxial field systems on the Low Moor in the light of further fieldwork.[2]

This account will attempt to describe the archaeology in the form of a guided armchair walk which would commence at Reeth Market Place and traverse both Low and High Moors.

The structure and chronology of the field systems can best be understood from the archaeological reports. However, the fact of their existence can be appreciated by means of two traverses of the Low Moor, one across the higher slopes, the other, the return route, eastward at lower level just above or through the pastures on the lower dale sides.

I shall suggest that the walker or armchair observer chooses a path which would, on the outward section take him from Reeth to the open moor through Skelgate Lane. We shall pause at the top of the lane to consider the settlement there and the field systems on the eastern shoulder of Calver, Riddings Rigg and those extending across the eastern slopes of Black Hill (Figure 4).

The detailed archaeological survey of Calverside (Figure 3) can be regarded as the key to the structure of the field systems here. From Riddings Rigg (Figure 5) we shall continue on the track passing just below the uppermost, south facing slopes of Calver to pass above Five Intakes and Cleasby and across Cringley Hill to reach Foregill Gate.

A second recommended route to Cringley Hill would commence at the small Green at Healaugh and ascend to the Low Moor by the moor road to reach the open moor

MINING, QUARRYING AND AERIAL PHOTOGRAPHY IN THE YORKSHIRE DALES

Robert White

THE ORIGINS OF AERIAL PHOTOGRAPHY

The history of aerial photography goes back to the mid-nineteenth century when Félix Nadar, a French photographer, caricaturist, writer and balloonist patented the idea of using aerial photographs in mapmaking and surveying. Nadar made the first successful aerial photograph in 1858. During the Crimean War balloons were used for reconnaissance purposes but it was not until the First World War that photography from heavier-than-air aircraft became commonplace. During this conflict several million aerial photographs were taken of which some 150,000 survive in the Imperial War Museum. Many of these were near vertical images, taken with the camera pointing as vertically as possible to the ground.

In 1919 Aerofilms, one of the best known names in commercial aerial photography in the UK, was established. The company initially used hand-held plate cameras in open biplanes, taking photographs mainly for illustrative purposes but went on to pioneer various uses of aerial imagery. The Aerofilms archive, which incorporates the collections of two smaller companies, was acquired by English Heritage in 2007 in partnership with the Royal Commissions on the Ancient and Historical Monuments of Wales and Scotland and is currently being conserved. Some 18,000 images from this collection will be published on-line in 2011.

Between the two world wars, commercial air survey for mapping purposes was little used in Britain, probably because of the quality of the existing Ordnance Survey maps. O.G.S. Crawford, however, the Ordnance Survey's first Archaeology Officer had been a cameraman and observer during the First World War and was a major advocate of the value of aerial photography for archaeology. In 1923 he gave a lecture on ancient field systems in Wessex which was almost totally based on the evidence of aerial photographs. This subsequently formed the basis of an Ordnance Survey professional paper, Air Survey and Archaeology.[1] The major part of the aerial photographic collection Crawford accumulated, much of it via contacts in the RAF, was destroyed during the Second World War. This probably included the aerial photographs Arthur Raistrick had examined of the Grassington field system in 1932.[2,3] Raistrick was an honorary archaeology correspondent for the Ordnance Survey and was later involved in mapping the mining remains within this field system using aerial photographs (Figure 1).

VERTICAL IMAGERY AND ORTHOPHOTOS

As had happened twenty years earlier, the Second World War saw major advances in aerial reconnaissance, particularly the use of overlapping vertical photographs from cameras mounted beneath the aeroplane. These photographs, when viewed with the aid of a stereoscope, give a three-dimensional view which considerably aids interpretation. After the cessation of hostilities almost all of the United Kingdom was surveyed by

Figure 1 Grassington SD996657

A combination of shallow shaft and open rake working at Grassington Lea Green, overlying a well preserved Romano-British field system surviving as low earth and stone banks. The mound in the centre foreground is not the result of mineral working but a late Bronze Age burial cairn. Since this photograph was taken the grazing regime has changed: the land is now subject to much lighter grazing and the features are far less conspicuous. Raistrick commented on this field system in 1937 and in 1966 collaborated with the Ordnance Survey on an 1:2500 scale Air Machine Survey of the archaeology, identifying and annotating individual features on the survey plan (Aldsworth 1966).[4]

the aerial reconnaissance teams of the RAF. The surviving English images of this National Air Survey are now held by English Heritage at Swindon in the National Monuments Record (NMR). They are of various scales and unfortunately very variable in both condition and photographic quality. The flight paths were sometimes erratic and many images have extensive areas covered by cloud. At their best however they provide an excellent record of the Yorkshire Dales prior to the impact of the internal combustion engine and hydraulic power on the agricultural and moorland landscapes: for the lead industry, for example, they depict the landscape before the widespread post–war reprocessing of old spoil heaps for barytes and fluorspar, particularly by the Swaledale Mining Company who had a reprocessing plant at Old Gang lead smelt mill, later moved a few hundred metres upstream, and by the Dales Chemical Company on Grassington Moor.

Further vertical surveys of parts of the Yorkshire Dales were undertaken to assist in map revision by the Ordnance Survey but the most useful vertical surveys are the comprehensive county wide surveys undertaken for the West Riding of Yorkshire in 1968 and for the North Riding County Council in 1971/2 by Meridian Airmaps. A full set of the ca. 1:10,000 scale, 9″ by 9″, black and white contact prints covering the National Park is held as part of the Historic Environment Record (HER) of the Yorkshire Dales National Park Authority (YDNPA).

The National Park was surveyed again in 1980/1 by BKS Air Surveys and copies of

OUT OF COURT: THE BATTLE FOR BELDI HILL

Keith Sweetmore

INTRODUCTION

The Beldi Hill dispute has brought mixed reactions from Dales historians. Arthur Raistrick called it *'rather stupid'*,[1] *'a tedious and expensive law suit which gave rise to many queer scenes and capers by the rival miners'*.[2] In providing a very well written account, essential reading for any student of the case, Marie Hartley and Joan Ingilby refer disparagingly to *'sordid local quarrels'*.[3] Recent students of Dales history have viewed it more positively. Ralph Waggett of Richmond describes it as *'fascinating ... with a dramatis personae all full of interest'*,[4] and Lawrence Barker in his draft thesis on Beldi Hill identifies it as having *'considerable significance'* in local and national terms.[5]

For contemporaries it was a major issue of the day: *'What news of Beldi Hill?'* For more than four years the reports and rumours were in constant circulation, from the alehouses and markets of Swaledale, to the cockpits and taverns of Richmond and York, and even to the gambling clubs and coffee houses of London. When Richard Metcalfe and John Scott struck a rich vein of lead ore in May 1767, every interested party knew at once that trouble lay ahead - but few could have predicted how far-reaching the consequences would be, or how many lives would be affected.

At the heart of the case was a simple question. Here is a piece of ground, a mile east of Keld, containing a highly productive vein of lead ore. Does it lie within the pasture intakes belonging to Crackpot Hall Farm - or is it part of the common and waste ground of the manors of Healaugh and Muker? If it lay within the farm and had done so in 1738, it belonged to Thomas Smith, who had bought it in that year. If on the other hand it was part of the commons, it had been reserved from Smith's purchase and was property of the Earl of Pomfret.

After introducing the chief protagonists, this paper will examine some of the techniques used by the opposing parties to pursue their claims. To conclude, a brief assessment of the local significance of the dispute, and its effects on the local community, will be attempted.

THE EARL OF POMFRET

George Fermor, second Earl of Pomfret, had acquired ownership of mineral rights in Swaledale through his marriage to an heiress of the Wharton estate. Since his youth as Lord Lempster, he had been a spendthrift and a gambler. At the age of nineteen, he was recalled by his father from the Grand Tour: *' ... I cannot for my life conceive what you have done with all the money you have had ... I pray God that by your past follies and extravagances you may learn more judgement and experience for the future ...'*. In his twenties he was under strong paternal pressure to make an advantageous marriage, his father writing from the family seat at Easton Neston in Northamptonshire: *'*...(with)

the number of younger children that I have I cannot either in conscience or prudence come into any match with less than 20,000 pounds down with the lady, in which case I shall be ready to make a present settlement in proportion…'.[6]

Eventually, at the age of nearly 42, and having succeeded to the title of Earl of Pomfret, he married Anna Maria Draycott (formerly Delagard), who in addition to the Wharton inheritance, brought him the magnificent Sunbury Court, in Middlesex, today the headquarters of the Salvation Army. *'Her tonnage is become equal to her poundage'* was the verdict of Charles Townsend[7] and Lord Barrington commented: *'The Earl of Pomfret has at last taken that deep laden rich aquapulca Miss Draycott … you see what a middle-aged Lord of the Bedchamber can do'*.[8] A courtier like his father and mother and with an overwhelming belief in his own personal honour, Pomfret's other great weakness was a propensity for duelling. In itself far from unusual in the eighteenth century, this impulse was combined in Pomfret with a dangerous mental instability, ascribed by one modern scholar to syphilis.[9] As Lord Lempster he had appeared at the Old Bailey accused of the murder of a British army captain, Thomas Gray. An argument about a gaming debt had led to a duel with swords in Marylebone Fields. Lempster apologised to the court, was found guilty of the reduced charge of manslaughter and freed without punishment.[10] As far as we know, Pomfret killed no more opponents but he issued challenges in response to imagined slights on a regular basis, and a celebrated dispute with the Duke of Grafton in 1780 led to his imprisonment in the Tower of London. Following his release he was reported as *'… much disordered in his mind at times, and if his friends do not take great care will probably do more serious mischief'*.[11]

An unstable and sometimes violent character, Pomfret prosecuted the Beldi Hill dispute with great energy and persistence, encouraged by a supporting hierarchy of advisers, agents and workmen, who clearly influenced and encouraged him but were ultimately subject to his direct control. William Chaytor of Spennithorne, a member of the gentry classes, a lawyer and justice of the peace, was Pomfret's chief local adviser, as well as holding financial interests in the Pomfret mining operations. More active still was William I'Anson, a Leyburn attorney who devoted himself to the Pomfret cause for more than three years. His account for legal and other services in the Beldi Hill case ran to more than thirty pages, and survives at the National Archives. Chief mining agent was John Metcalfe of Dykeheads, who engaged miners and other workers on Pomfret's behalf. Pomfret visited Beldi Hill in person on at least two occasions, staying with I'Anson in Leyburn, and no doubt proving a handful. *'During the three weeks your lordship honoured me with your company at my house'*, wrote I'Anson, *'I could not do any one thing else'*.[12]

THOMAS SMITH

Thomas Smith was the son of a vicar of Brignal near Barnard Castle and he attended Richmond School before becoming a successful attorney at Gray's Inn in London. As a member of the Smith family of Easby near Richmond, he had relatives with extensive local knowledge of mining potential. In 1731 his uncle William Smith had been elected principal local agent for the Company of Mine Adventurers of England, a group of entrepreneurs which was active in searching for, mining and smelting lead

BALE SMELTING IN THE DALES

Richard Smith

INTRODUCTION

Lead mining and smelting has been part of the industrial activity of the northern Yorkshire Dales for at least 1,000 years. Our understanding of the industry has been gained very much from historical evidence researched by authorities such as Arthur Raistrick, Bernard Jennings and in later years Mike Gill, Les Tyson and many others. Where there have been few or no historical records, we have relied on archaeological evidence and this has been handicapped by several factors. Lead mining has not attracted the interest of professional archaeologists until recent years and many early features have been obscured or destroyed by subsequent activity. Because mining has generally been carried out in remote areas, there have have been fewer artefacts such as pottery or charcoal which enable dates to be established and until very recently the technical resources available to professional archaeologists have not been employed in investigations. Early lead smelting has suffered from similar limitations; in some respects the evidence has been even more ephemeral and difficult to identify; historical records have been even more sparse than those for mining.

The lead ore hearth was introduced into Yorkshire around the 1570's and from then on smelting mills started to appear. Initially these were fairly inexpensive structures but because money was involved in their construction and outfitting, we find increasing historical evidence of their existence. Before that lead ore was smelted on open fires or bales situated usually on the crests of hills and only passing mentions of this technology are available in historical records. The subject of this form of early lead smelting technology is not well understood and has been difficult to investigate.

It is, therefore, appropriate that at a conference arranged to recognise Lawrence Barker's contribution to archaeology and history in the Dales that a paper be presented on the subject of early lead smelting, because for over 20 years, Lawrence's papers on the bale sites of Swaledale have been one of the few contributions on this little-known subject in the whole of the UK.[1,2,3]

In 1927, Raistrick described a bale site at Winterings above Gunnerside which has been recorded in his personal notes at NY 942 003.[4] This was a collapsed circle of stones about 3m in diameter. Subsequent searches about 80 years later have failed to find the site, although this is not surprising given the growth of vegetation which has taken place in the area. Nevertheless, Raistrick's bale and its reconstruction have appeareared in most accounts of early smelting and for many years represented the only evidence of the technology which was used for smelting lead up until the time when the ore hearth was introduced and smelting mills started to be built.

In 1978 Lawrence Barker published the results of several years' work locating many of the bale sites in Swaledale which we know today.[1] This was followed in 1992 by a joint paper with Robert White listing yet more sites[2] and a paper describing bales

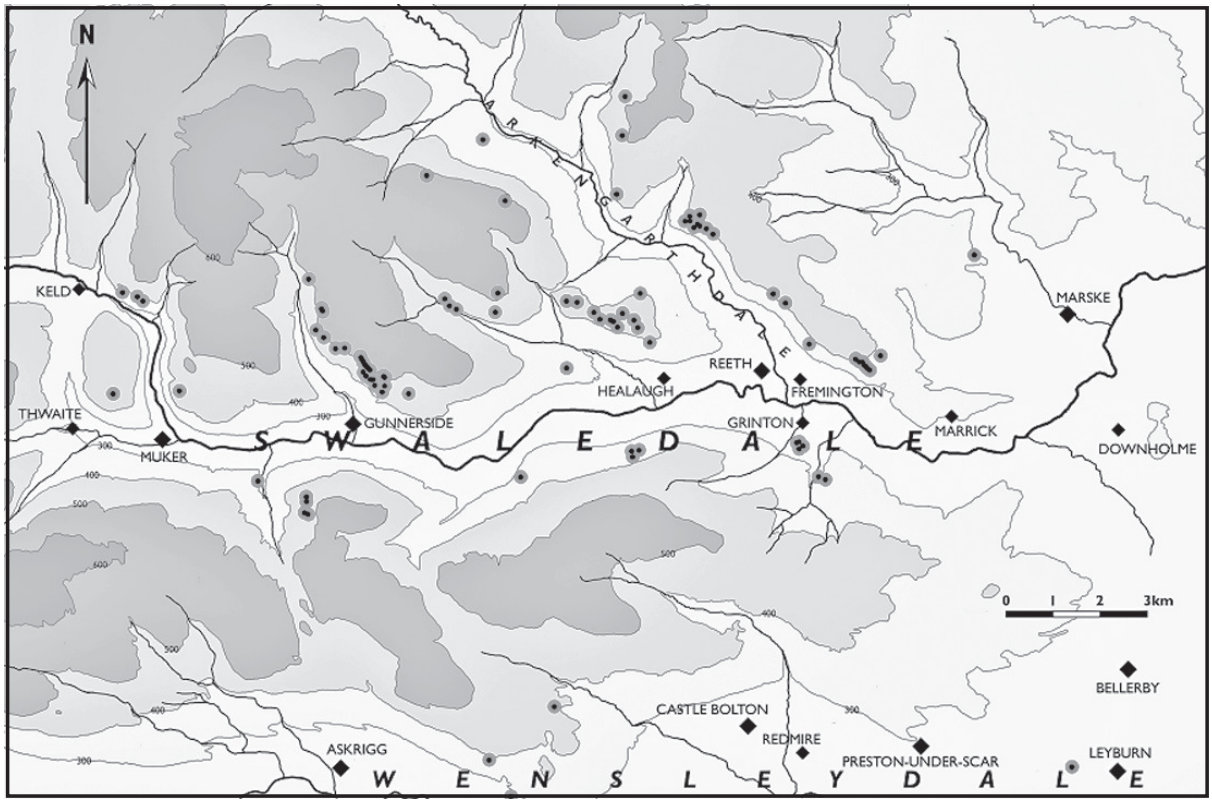

Figure 1. Early smelting sites in Arkengarthdale, Swaledale and Wensleydale.

at Downholme Moor and Thorpe Edge in the following year.[3] The 1978 paper also included a radiocarbon date of AD 1454 +/-15 for charcoal found at a large site on Calver Hill (NZ 00910 00020). The papers give the locations of the bale sites and describe their topographical situation as well as the smelting residues which can be found. This has been of inestimable value and inspiration to subsequent workers and has provided a firm foundation for some of the later studies on the Swaledale lead industry.

Since then, in 2001, Sam Murphy and Hugh Baldwin published the results of 15 years or so of field walking and physical studies on smelting residues.[5,6] Although published later than Lawrence's accounts much of this work took place at the same time and supported the earlier findings.

From then on, the subject of bale sites stimulated the interest of several investigators, mostly amateurs, and our understanding of early lead smelting sites has become somewhat clearer. Despite this, there are many gaps in our knowledge and many questions have been raised as a result of the later studies. The purpose of this presentation, therefore, is to outline some of the facts, myths and unknowns surrounding early lead smelting sites.

WHERE ARE BALE SITES TO BE FOUND?

Early accounts state that bales were situated on the edges of hills facing the prevailing wind which usually blew from the south-west.[7,8] From their dates, these accounts rely very much on oral tradition and both refer to Derbyshire. Figure 1 shows these

THE FUTURE OF MINING HISTORY IN SWALEDALE AND ARKENGARTHDALE

Mike Gill

I first met Lawrence in the early 1980s, when he was working for the National Park, and we argued (good naturedly). I forget what it was about, probably some young whipper-snapper having the effrontery to question the work of earlier writers on the area's mines. Nevertheless, since then he has helped me and other students of the history of Swaledale's mines. In my case he was prepared to allow free access to his collection of archives relating to the AD lessors. He was also prepared to discuss my conclusions, sometimes heatedly, which I've always valued. If it can survive the Lawrence test – it's looking good!

Lawrence's pioneering paper on 'Bale Hills in Swaledale and Arkengarthdale' showed, as early as 1978, that it was possible to achieve greater things by simply walking the fells and looking a little harder.[1] That still holds true, but we now also have tools like GPS, Google Earth and digital cameras which were not available then. This paper assesses what has been achieved so far and proposes some areas or themes which will repay closer examination.

The first generation of writers on mining history, led by Arthur Raistrick, Marie Hartley, Bob Clough and Bernard Jennings, produced a series of general histories of Dales mines and smelt mills.[2-5] The latter's thesis, though submitted in 1959 and sadly never published, was a major advance in our knowledge. They inspired others who took the study of mining history forward, in much greater detail. Lawrence wrote on the Beldi Hill Dispute, which Keith Sweetmore has discussed today and on a dispute over the ownership of Grinton Manor, a comprehensive study of which, by Tim Gates, will soon appear in Yorkshire Archaeological Society's Record Series.[6-10] Elizabeth Berry's book on Swaledale Wills is a useful source for the early period.[11]

Les Tyson has written on the Marrick, Arkengarthdale and Grinton areas.[12-14] He's currently working on the Tan Hill Coalfield and on the copper workings around Richmond and Middleton Tyas. Ian Spensley contributed to Les's Grinton volume and is currently writing up his study of Wensleydale.[15] My own book, on Swaledale's mines and smelt mills, had a broader coverage and owed much to Les and Ian's work, which they freely shared.[16] There's also a volume of Yorkshire mineral statistics, by myself and Roger Burt, which gives the known output from many Dales mines from the 17th or 18th centuries until they closed.[17] I also have an abiding interest in the Old Gang - Surrender area and am working on a monograph of that area. These monographs, together with several papers, appeared in the British Mining series and have done much to improve our understanding and correct earlier errors. Hopefully we have not added too many new ones in the process.

The National Park, through Robert White and Miles Johnson, continues to commission

detailed, archaeological surveys of mining, dressing and smelting sites as part of its management and conservation programme. Rob and Miles are also responsible for the local HER (Historic Environment Record) which carries details of many mining sites. Copies of the Yorkshire entries from the Northern Mine Research Society's National Mine Site Index are made available for use with the HER.

That strong corpus of work has allowed us to establish reliable chronologies of the changing ownership of the mines, those who worked them, when and how. Nevertheless, such knowledge brings an appreciation of what remains to be learnt, not all of which requires an especial knowledge of the subject. The rest of my paper examines how individuals might contribute to continuing that work.

By 1978 Lawrence had identified 35 bale sites in Swaledale and Arkengarthdale. He also had carbon from one of them C14 dated to c1580 - right at the end of that process's use. Bales continued to be found and so the topic was revisited by Richard Smith and Sam Murphy between 2001 and 2006. With funding from the NMRS they were able to get C14 dates for carbon residues from a number of sites. These dates fell within the first half of the last millennium and we still have nothing before that.[18-21] Smith also proposed a typology of lead-bale slags based on their physico-chemical properties. For anyone who enjoys walking the hills, there's little doubt that more bales can be added to the eighty or so now known. The next stage is to identify routes leading to bales and the mines which supplied the ore for them.

The last 25 years have seen our understanding of customary lead mining law undergo significant change. The orthodox belief was once that such laws were confined to Derbyshire, North Wales and the Mendip, with a late flowering at Grassington, where it was brought by Derbyshire miners. Work on mining landscapes showed that lines of closely spaced shafts, then called bell pits, were a common feature in all areas. These, it was realised, were the result of miners being confined by meers, which prevented them spreading spoil etc. outside a narrowly drawn quarter cord. This and several historical clues led me to propose in 1988 that customary mining law had been much more widely spread and of greater antiquity.[22] This was met with laughter but following Les Tyson's discovery, about a year later, of monastic mining laws used by Marrick Priory opinion has swung towards my view. Ian Spensley has also found 16th century references to Arkengarthdale in the National Archives, where the custom of the county in letting meers was:[23]

> *'When as any mine of lead is there found the two first meers of the said mine so found shall be taken to the only use and profit of your highness* (Henry VIII) *and the rest of the said mine so be equally divided among your highness tenants to enjoy four of them two meers of which meers among them so divided your highness ought to have fully whereof any manner cost or charge every 10th load and the charge the 10th load.'*

Even where the full customary laws had been suppressed, mineral owners continued to make grants in meers, as the following confirms: *'applied to John Harker, Lord Pomfret's field agent, to have their 10 meers set out, which was done and accordingly marked out by proper boundary marks'*.

THE MID-CUMBERLAND COALFIELD

Graham Brooks

This is the title used by the Victoria County History to describe the area of carboniferous strata running from the eastern end of the West Cumbria Coalfield in an arc around the north of the Lake District Fells to the east of Penrith.[1] The Westphalian strata, which contain the true coal measures of the West Cumberland Coalfield stop to the west of the area under consideration. There is an area of the higher Westphalian to the north of the area under consideration, but this is devoid of any coal seams. The geology of the area under consideration is based on rocks of the Namurian and Visean Carboniferous periods. The 1:50,000 solid geology map shows two coal seams as being present within each of these groups of rocks. The Namurian strata, contain the Little Limestone Coal and a further unnamed seam above it. The Visean strata contain two unnamed seams on either side of the Single Post Limestone.[2] The majority of the workings appear to have worked coals in the Little Limestone.

CALDBECK

The earliest documentary evidence for coal mining in the Caldbeck area specifically concerns the purchase of a number of manors in Cumberland in 1738 by the Duke of Somerset from the trustees of the forfeited estates of the Duke of Wharton. The Manor of Caldbeck contained a colliery, which was in the occupation of John Tye[3] and partners.[4]

A lease for 8 years, dated April 1742, has the colliery of Caldbeck covering the common ground or waste called Chalkhead lying in the Manor of Caldbeck Upton along with Ratten Row and Oldfield in the same manor. It also included inter-common lying in both the Manor of Caldbeck Upton and the Manor of Westward at a rent of £8 per annum. The lessees were Anthony Robinson of Sebergham, Thomas Robinson of Bromfield, John Marshall of Bolton all described as yeomen and Samual Chappelhow also of Bolton who was described as a collier.

On expiry of this lease in 1750 a new lease was signed with Joseph Railton,[5] Joshua Scott and Abraham Robinson all yeoman of Caldbeck and Thomas Head of Sebergham. This lease was for 7 years at a rent of £10 per annum. The lease also prevented them from opening more pits than was necessary for the winning of the coal at any one time and required them to leave sufficient pillars to support the roof. All shafts when finished with had to be filled in before new shafts could be sunk.[6]

A copy of an undated lease (but drawn up in the reign of George III therefore dating to after 1760) has the coalmines and lime kilns being leased to William Railton for an unspecified period. The lease entitled William to *'dig, raise, get and win the said coal'* and also *'convenient heaproom and groundroom to bank the coal and the waste'* from the collieries and limestone quarries. There was a right of way across the Earl's land with the right to construct *'waggonways'*, and also to erect *'engines water engines, engine houses, hovels and stables'*. There was also the right to erect

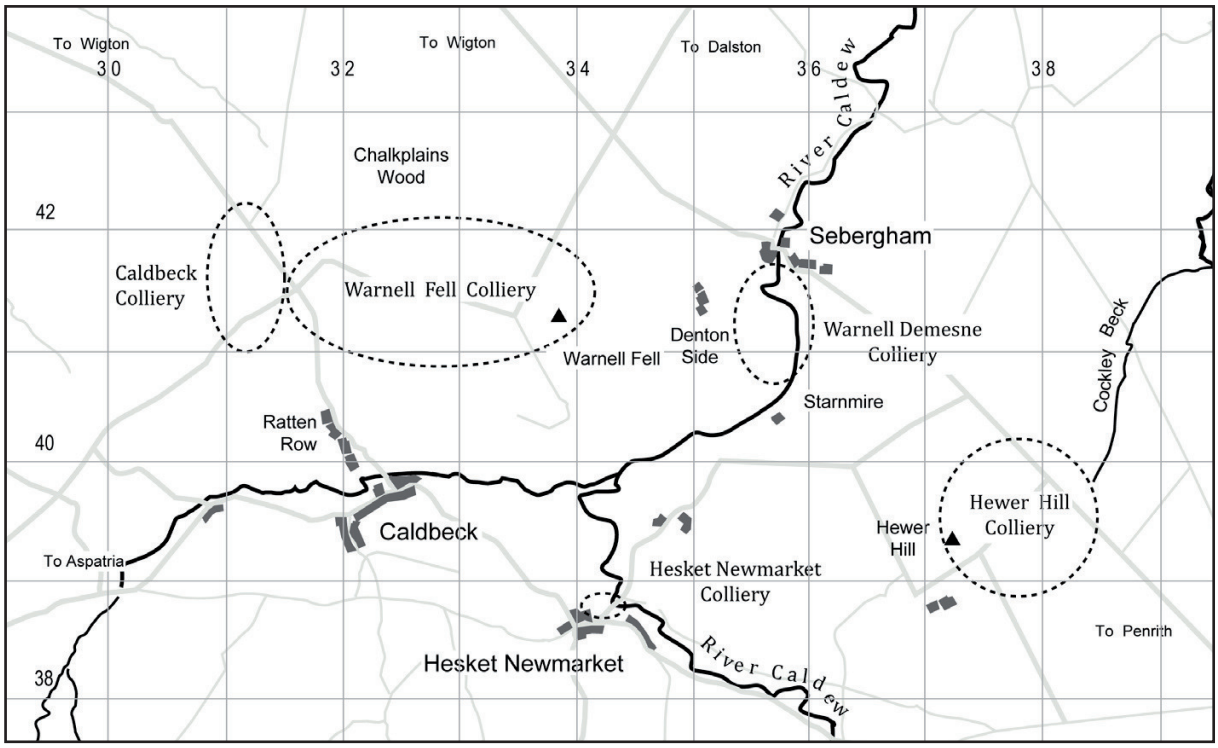

Figure 1. Area map of the western part of the Mid-Cumberland Coalfield, showing collieries at Caldbeck, Warnell Fell, Warnell Demesne, Hesket Newmarket and Hewer Hill.

one or more limekilns. All buildings erected were to be used only for the winning of the coal and limestone and no other use.

A report produced by John Barnes[7] in 1773 on all the Earl of Egremont collieries including Caldbeck, stated that the *'lease to Mr Railton will expire on Ladyday 1776'*. It described the colliery as being *'won to a depth of 43 fathoms by a level which had run together near the mouth but was being repaired'*. The seam was described as being 14 inches thick and having a fine freestone roof so that all the coal could be removed. There was about 15 acres to work by the winning and 50 acres to the dip. The viewer was, therefore, of the opinion that at the end of this lease the colliery would be in a situation to advance the rent considerably, especially as about 300yds from the present working face a dyke is met with. This turns east and west and casts the strata down to the north and throws in three other seams of coal about 10 inches thick; the lowest at 30 fathoms had been wrought by an old level, brought from the opposite side of the hill to which the water was lifted. This place was called Chalkhead Colliery in the Manor of Westward and was then drowned. Therefore it was in Lord Egremont's interest to let Caldbeck and Chalkhead Collieries together as a continuation of the Caldbeck Level through the dyke would allow access to Chalkhead.

They recorded the production of the colliery as six tons per day[8], the cost of production was 3s 10½d. per ton and the coal was selling for 5s per ton. This yielded a profit of £101 per annum on a calculated total production of 1,800 tons. Barnes calculated the cost of producing coal per Cumberland ton as shown in Table 1.[9]

THE DUNKER DOSSIER

R.M. Callender

INTRODUCTION

When Patrick Reeson and I completed the Baile an Or project in 2007 we realised not every stone was left unturned, but we were pleased when the Northern Mine Research Society published our account of the events surrounding the Scottish Gold Rush of 1869. Just as today's gold washers continue to find gold in the Suisgill and Kildonan Burns, local folklore continues to reveal tales worthy of investigation. From time to time, Mr Denis Farquhar of Frodsham, Cheshire, who had grown up in Helmsdale as a schoolboy, has shared some of these yarns with me.

Three years ago, Denis's information prompted me to make further enquiries concerning Mr John Dunker, whose activities in Sutherland's Strath of Kildonan had caused a stir within the local communities in 1880. Dunker made it known that he had a process for extracting gold from the rocks in the neighbourhood. Eleven years had passed since the gold rush and because most people in Helmsdale had participated in one way or another, it was not difficult for Mr Dunker's activities to capture their attention.

The initial circumstances were casual and free from sensation.

'… A LITTLE AGITATION'

In the middle of June 1880, William Ross reported to the Factor of the Duke of Sutherland that a man lodging at the Commercial Inn in Helmsdale was *'creating a little agitation regarding Gold digging'*. The man had examined parts of the Strath of Kildonan and the rumours claimed he could *'abstract gold from the hardest of stone'*.[1]

Ross lived in East Helmsdale and served as the local ground agent for the Duke of Sutherland's factor in Golspie, James Peacock. Ross's duty was to submit regular reports to the factor on a range of economic topics - the fishing, the property rentals, state of repairs and local births, marriages and deaths. Ross also received frequent chores from Peacock and it was quite in order for him to report the arrival of a stranger residing in the Commercial Inn. Peacock was not likely to ignore such news and soon found out the man was John Peter Dunker. At this stage, he asked the Reverend Dr James M. Joass for an opinion on the rumours. Joass was a well-known archaeologist and speculated *'it may be the limestone he is looking after - to work up … into Hydraulic cement'*.[2]

Peacock received Ross's next report on 27 June 1880. *'Mr Dunker has now erected a small furnace in a house on Dunrobin Street and is now smelting the rock that he selected from Torrish and other parts of the Strath'*, Ross said. *'I cannot yet say to what success the smelting has come to - but at present here nothing but talking of gold and creating a good deal of agitation among the people'*.[3]

Figure 1. An extract from a map of northeast Scotland drawn in 1851, showing Kinbrace and Kildonan in the Strath of Kildonan, Sutherland, which were the limits of Dunker's agreement with the Duke of Sutherland. Note that Kinbrace is 16 miles from Helmsdale (on the coast) and, even by today's standards, it is a long drive by a single track road. [Reproduced by permission of the National Library of Scotland.]

Dunker made an appointment to meet Peacock and soon this arrangement was common knowledge. In advance, Ross told the factor what he knew of the process: '*I hear daily so much about gold and cannot say the truth. I see that they first burn the rock and then breaks it with hammers to a small powder and then put it into small mugs or Pots and place it in the furnace and abstract the gold. It is said and I have seen the Gold a Penny Weight abstracted from Twelve ounces of the powdered Rock. This is Mr Dunker's statement … Mr Dunker has abstracted today again from four lbs of the dust thirteen Penny Weights of Gold'*.[4]

Prior to meeting Dunker, Peacock contacted the Duke's Commissioner, Sir Arnold Burrowes Kemball, who supervised the business of all the Sutherland estates from Stafford House, in Stafford. Peacock wanted the Commissioner's consent to allow Dunker *'to begin near Suisgill collecting material'*.[5] Whilst awaiting an answer, Peacock wrote a private letter to the manager of the British Linen Bank in Helmsdale. He was anxious to have information about Dunker's means but he also proposed a scheme whereby the manager, Mr J.J. Hills, would stipulate that Dunker had to make a bank deposit against surface damage during *'his proposed gold mining experiments'*.

Peacock intended to travel *'up the Strath of Kildonan with Mr Dunker'* and he informed Hills that he would appreciate *'a word or two'* when the train stopped at Helmsdale station. *'Does he appear to be paying his way and his work people promptly'*, he wished to know before agreeing anything with Dunker. Peacock expected he would *'return to Helmsdale by the train due at 2pm after which I hope to find you at home for a short time'*.[6] Hills replied promptly: *'I believe the party inquired about has at present sufficient funds to pay his work people. He appears to me to be indifferent to money or appearance so long as he can get something to experiment upon'*.[7]

GOLD MINING AT CONONISH, TYNDRUM, SCOTLAND

R.M. Callender

INTRODUCTION

In 1978, whilst serving as an advisor to Wanlockhead Museum Trust, I received a Kodak Bursary to document the remaining traces of the ancient lead mines of Scotland. My programme relied on G.V. Wilson's book, 'The lead, zinc, copper and nickel ores of Scotland', published in 1921.

Cononish, near Tyndrum in Stirlingshire featured on my list of locations and two visits were made to the lead mines during the project. The first time was at Easter 1978 (in weather described in my notes as *'snow, sleet, rain, mud, hail and wind !'*) but a more rewarding second visit took place the following year, in spite of a generous layer of snow on the high ground.

WILSON'S VIEW IN 1921

In dealing with what he termed the Tyndrum Mining District, Wilson claimed that lead veins were discovered by accident in 1741 by Sir Robert Clifton. In 1730, the Breadalbane Estate had granted Sir Robert a mining lease and between 1741 and 1745, he raised 1,697 tons of lead ore which went to a furnace near Loch Lomond by packhorse. Sir Robert backed the Jacobites and during the 1745 rebellion a quantity of his smelted lead was commandeered by the opposing Argyllshire Militia for making bullets.

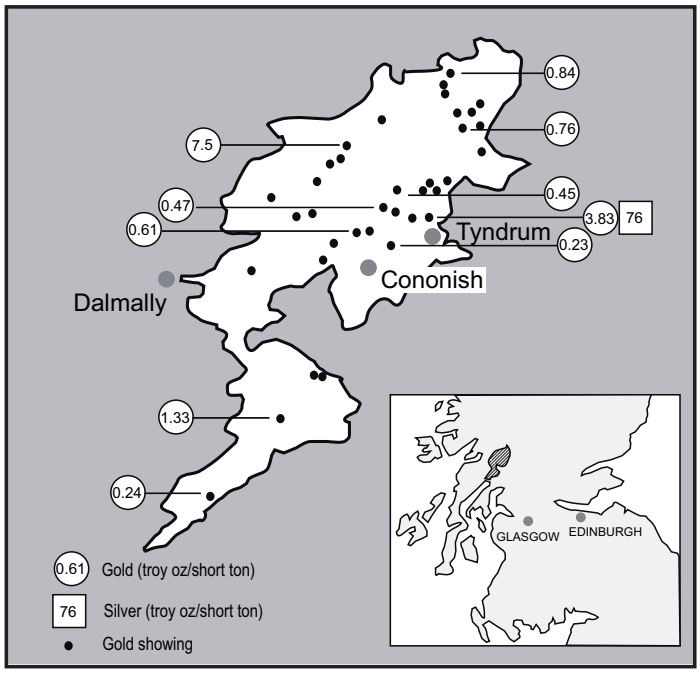

Figure 1. During 1989, Ennex International PLC undertook extensive surveys within its licence area and located widespread gold and silver mineralisation over an area of sixty square miles. [Reproduced from the annual report for 1989].

That same year (1745) the Mine Adventurers of England annexed the mines and over the next fifteen years, raised 2,000 tons of lead ore before assigning its rights to the Rippon Company, which extracted over 300 tons of ore in two years. They were succeeded by Richardson & Paton who raised a further 942 tons in six years, before the lease passed to the Scots Mining Company. The latter built a smelt mill just south of Tyndrum, which operated for eight hours a day and was capable of producing 8½ stones (54 kilograms) of lead per hour. Traces of the ruined buildings survive on the west side of the A85 Tyndrum to Glasgow road. Journals