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“Lead Miners” Earnings in 19th Century Allendale”

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(To some extent preliminary – please don’t quote without author’s consent)

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Abstract

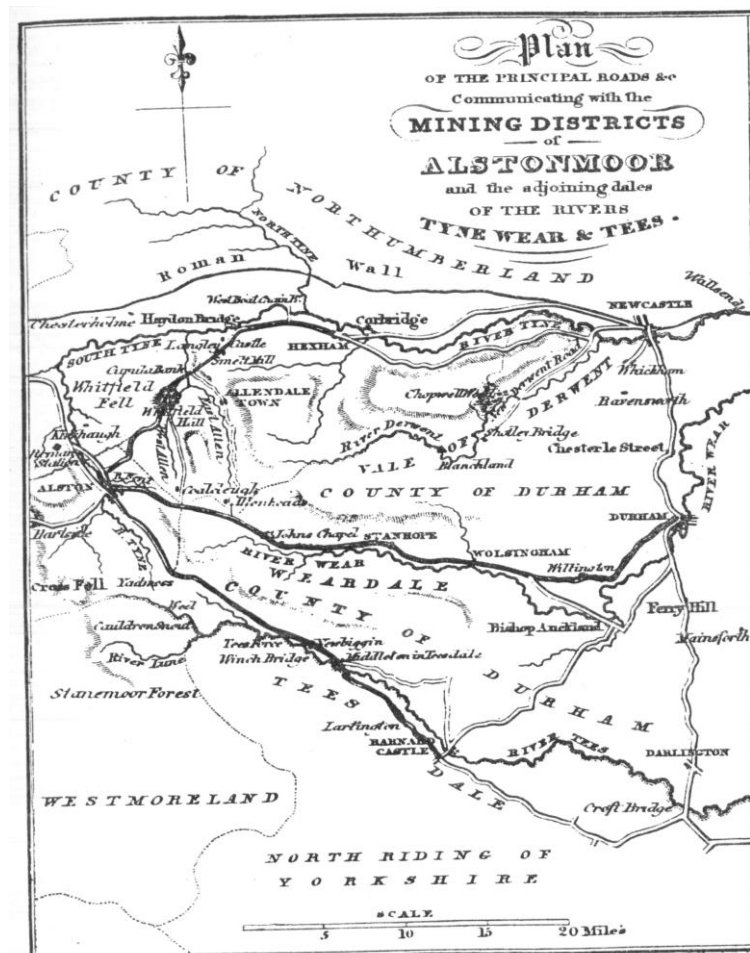
This paper uses the records of the Beaumont/Blackett lead mining concerns in Allendale to examine the earnings for lead miners in the early 1860’s. The paper matches two parts of the historical record, the Bargain books and the quarterly financial accounts, to give a more complete picture of the earnings of this group of workers than has previously been done. The paper also examines aspects of the setting of the rates in the bargains by the mine owner’s agents.

¹ I would like to acknowledge the help of staff at both the Northumberland and Durham Record offices, and also at the Mining Institute in Newcastle upon Tyne. Particular thanks go to Mrs Liz Bregazzi at the Durham Record Office. I would also like to acknowledge the hospitality of the Department of Economics and Finance at the University of Durham. Contact:- Tim Barmby, Dept of Economics, Business School, University of Aberdeen, Old Aberdeen Scotland AB24 3QY, tim.barmby@abdn.ac.uk

I Introduction

Lead mining was an important industry in the Northern Pennines all through the 18th century and for most of the 19th, Burt (1984) analyses the industry in different parts of the country, Wales, Derbyshire, and Northumberland, Honeyman (1982) also looks at aspects lead mining in Derbyshire, while Hunt (1970) and Raistrick and Jennings (1965) concentrate more on the Northern Pennines. Numerous aspects of the way the industry was organised are of interest to the economic historian. This paper focuses on one of these, namely the form of the contract between the miners and the mine owners and asks whether more can't be deduced from existing historical records in terms of giving a clearer picture of individual worker's earnings than has so far been achieved.

Figure 1 Map of Alston Moor and Allendale



Source Thomas Sopwith "An Account of the Mining Districts of Alston Moor, Weardale and Teesdale

II Bingtale, Fathomtale and other contracts

The main form of lead mining contract in the Northern Pennines was the Bingtale contract. This was essentially a piece rate contract. Groups of miners, often 4 or 6, would make a bargain with the mine owners to dig in a particular part of the mine, for a particular period of time. In Allendale during at the time this paper considers this period was a quarter. The contract would specify a particular price to be paid to the miners for each bing of ore raised and dressed. A bing was 8 cwt (hundredweight), or 0.4 of a ton. Dressing was the process by which waste material would be separated from ore so that the ore would be ready for smelting. The miners would be responsible themselves for paying for this to be done.

There were other types of contracts used in the work in the mines, Fathomtale contracts were bargains made for digging a particular distance, for instance in driving a level, in which the gang might encounter ore, but where the purpose was to gain access to sources of ore and to make drainage for the mine, the contract would quote a particular rate per distance. Sometimes the bargains would be types of hybrid contracts which would give a separate rate for distance and for ore raised.

Hunt (1970) and Raistrick and Jennings (1965) give some discussion of these contract types and suggest that there was some movement from Bingtale to Fathomtale over the evolution of the industry, and this was due to the objective of trying to make workers earnings less variable. This issue of the variability of earnings and also due to the fact that the contracts were settled intermittently seems to have been behind the practice of making advances to workers. Hunt (1970) reports that in the mid to late 19th century the Beaumont/Blackett company would advance 40s (£2) to each worker each month.

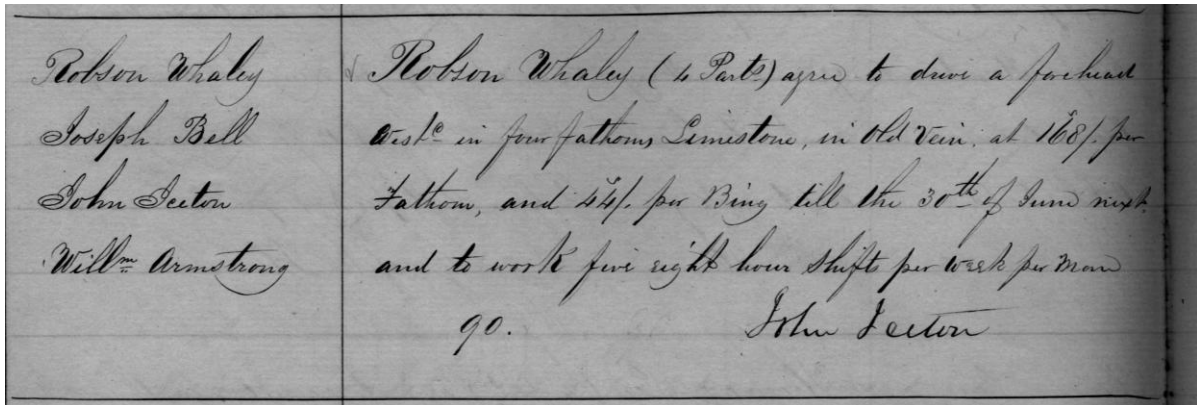
The piece rate nature of both Bingtale and Fathomtale contracts, are likely to do with the monitoring problem for underground working, especially as the payment for many of the more easily observable tasks were made on wage contracts, or Daytale work in the parlance of the time and place.

Occasionally workers would contract to be paid on the amount of lead actually smelted from the ore raised, these types of contracts were called Tontale contracts.

III The Historical Records pertaining to these contracts

Bingdale contracts would be recorded in Bargain (or sometimes letting or setting) books, and looked like:-

Figure 2: A Bargain from the Allenheads mine in 1861 (Northumberland Record Office Document NRO/672/E/2A/10) Reproduced with permission of Viscount Allendale



This record was made on March the 30th 1861 and shows that Robson Whaley and 3 other miners, Joseph Bell, John Seaton and William Armstrong contracted to drive a “forehead” west in “four fathoms limestone” in Old Vein in Allenheads Lead mine at 168/- per fathom until the 30th of June. The contract also specifies that they will be paid 44/- per bing of ore raised. It also specifies the days and hours they would work.

The number of miners in each gang was very often an even number, this is likely to do with the technology of the mining at this time, though odd numbers are not unknown. Half partners are also occasionally seen and this is where miners would take their sons down the mine. Although Robson Whatley was the first named member of this gang of workers and his name appears in the financial accounts as being in receipt of the gang’s earnings, note that John Seaton signs the bargain. This give added support to the assumption that these 4 men are equal partners in the venture and that the proceeds from such would be equally split.

IV Earnings of Miners

The discussion of earnings found in Hunt (1970) and Raistrick and Jennings (1965) suggest that it is very difficult to form an accurate picture of the earnings of individual workers. Hunt (1970) p 73 observes

“The accounts of the Blakett/Beaumont mines give only some indication of the miners’ general prosperity; there are no specific figures for annual earnings. The surviving accounts are the general accounts of the costs and production at each mine. No wage books or their equivalents survive. Thus it is recorded that ‘ _____ and partners’ raised so much ore at such and such a price during a quarter, but that the partnership’s expenses – washing, drawing, candles, etc. – are not recorded, and the same partnership may appear elsewhere in the accounts for specific dead work or days’ labour performed. It is thus hopeless to attempt to work out from these figures the actual year’s earnings of an individual partnership.”

One of the primary purposes of this paper is to argue that this might be too pessimistic an outlook and that we might well be able to form some view of not just individual partnership’s earnings but the earnings of individual miners themselves. To start the discussion on this Figure 3 gives a segment of the Beaumont/Blakett accounts for the June quarter of 1861 recording specifically payments made for ore raised under Bingtale contracts for Old Vein in the Allenheads mine under the contract in Figure 2. As Hunt observed above there is clear information on the physical amount of ore raised, the rate of pay and the amount paid out. So Robson Whaley and his gang received £24/15s for the 11 bings 2 cwt of ore which he and his partnership raised.

Figure 3a Segment of the Beaumont/Blakett accounts for the June quarter of 1861 (NRO/672/E/3A/5) Showing Bingtale payments to Robson Whaley as detailed in the contract in Figure 2 Reproduced with permission of Viscount Allendale

<i>Allenheads Bingtale Ore.</i>			<i>Bings</i>	<i>cwt</i>	<i>Bings</i>	<i>cwt</i>	<i>Rate</i>			
<i>1</i>	<i>Robson Whaley</i>	<i>Old Vein</i>	<i>11</i>	<i>2</i>			<i>24/</i>	<i>24</i>	<i>15</i>	<i>.</i>
<i>2</i>	<i>John Liddle</i>	<i>do.</i>	<i>10</i>	<i>4</i>			<i>24/</i>	<i>23</i>	<i>2</i>	<i>.</i>
<i>3</i>	<i>Christ. Philipson</i>	<i>do.</i>	<i>7</i>	<i>.</i>			<i>24/</i>	<i>10</i>	<i>10</i>	<i>.</i>
<i>4</i>	<i>do.</i>	<i>do.</i>	<i>18</i>	<i>6</i>			<i>24/</i>	<i>97</i>	<i>10</i>	<i>.</i>
<i>5</i>	<i>John Dodd</i>	<i>do.</i>	<i>18</i>	<i>.</i>	<i>95</i>	<i>4</i>	<i>24/</i>	<i>39</i>	<i>12</i>	<i>.</i>
		<i>Carried forward</i>			<i>95</i>	<i>4</i>		<i>195</i>	<i>9</i>	<i>.</i>

Note that Christopher Philipson appears twice in these accounts. This is not because his gang had two bargains but rather he is being paid for output from the first quarter of this year. Bingtale work was only paid every 6 months, and the first and second quarter bargain will only appear in the accounts as two separate items when the price of the bargain changed, as it did here for Philipson's gang from 30/- to 40/-. The other amounts are the joint amounts for the two quarters, so for example the bargain rate for Whaley's gang was 44/- in both quarters, and they raised 11 bings 2 cwts over the two quarters.

In the same accounts the amount paid for the fathomtale part of Whatley's contract can be found

Figure 3b Fathomtale earnings made to Robson Whaley in the second quarter of 1861 (NRO/672/E/3A/5) Reproduced with permission of Viscount Allendale

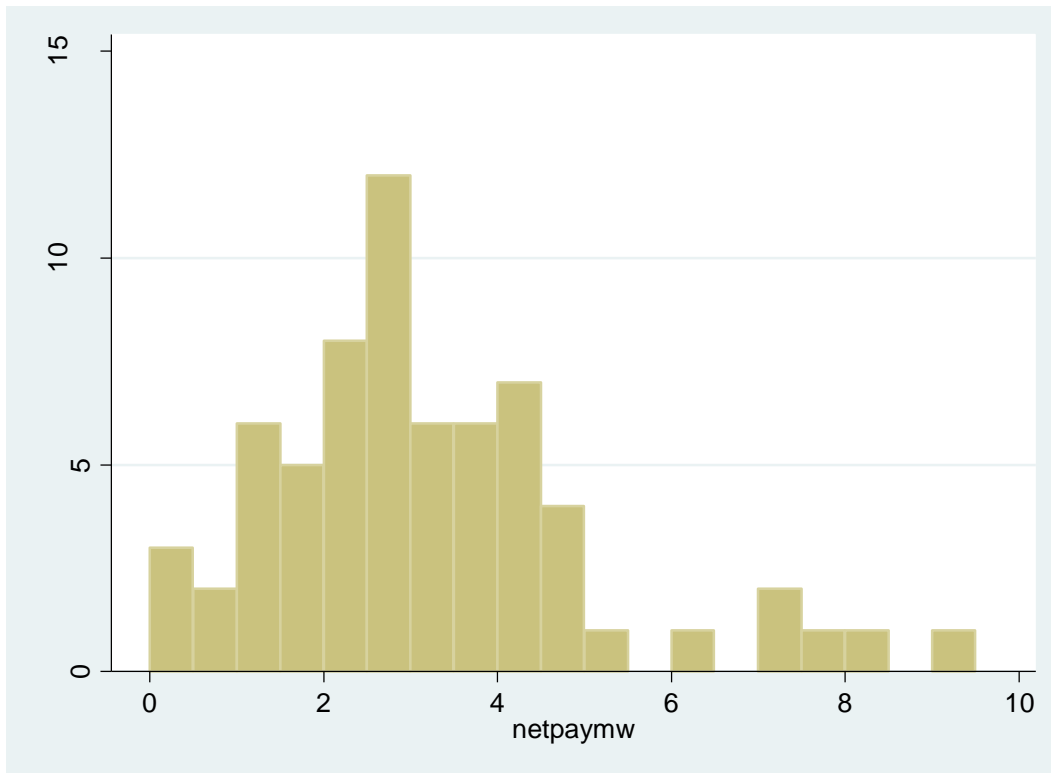
No.	Do.	Running Leads	No.	Contract	£	s	d
2	Robson Whaley	Driving Water in New St. Limestone, Old Vein		5-160/-	42		

The first objective of the paper is to try and use these historical records to deduce some aspects of the pay of these workers. The histogram below gives the distribution of monthly earnings of 230 miners who workers in 66 gangs in Allendale in the first two quarters of 1861. Adjustment has been made for dressing and other costs in the following way, Jennings (1959) reports the monetary costs of deductions from miners' pay for the first 5 months of working Friarfold vein off St Francis level in A. D. Company's mine in Swaledale in 1878², on the assumption that the quantity of candles used, and the cost of tools will be a function of the number in the gang, the costs of drawing and washing will be a function of the number of bings of ore raised and the cost of dynamite will be a function of the number of niners in the gang and the amount of ore raised, regressions are computed to predict the deductions for miners in Allendale these deductions are then taken out of the gross amount received by the miners gang. These regressions are reported in Appendix 1

² Although the period which the deductions are observed is later than the earnings period for Allendale, this will if anything overstate these costs

The histogram reported in Figure 4 gives some interesting indications; while the mean earnings is roughly comparable with previous work. It does seem that a small number of gangs are achieving reasonably high earnings for the period.

Figure 4 Net pay per month of Allendale Lead Miners for first 2 quarters of 1861



To get an idea of how these earnings compare to general wage levels at this time Phelps-Brown and Hopkins (1981) report a craftsman’s daily wage of 56d, which would give a monthly earnings of £4/13/4. Feinstein (1981) would put a coal miners earnings in the early 1860’s at around £4. Lead miners were not well paid on average, but it does appear that there was significant variability both for workers within a these two quarters

V Were the bargain rates successfully set to equalise mean earnings ?

Both Hunt (1970) and Raistrick and Jennings (1965) suggest that bargain rates were set relative to the difficulty of the working, so that miners working on a difficult vein might not produce as much weight of ore but would end up, on average at least, earning the same. This idea can potentially be tested with this data. If the bargain rate could be set so as to exactly equalise earnings then we would have

$$\frac{\text{Bings x Bargain rate}}{\text{Number in Gang}} = \text{Constant} \Rightarrow \ln\left(\frac{\text{Bings}}{\text{Number in Gang}}\right) = \ln(\text{Constant}) - \ln(\text{Bargainrate})$$

A regression of (natural log of) mean bing per worker, MBW, on (natural log of) the bargain rate, BR, should give an estimated coefficient of -1. Performing this regression gives

$$\begin{aligned} \text{Ln}(\text{MBW}) &= 9.4134 - 2.02216\ln(\text{BR}) & N &= 66 \\ &(0.4371) & R^2 &= 0.25 \end{aligned}$$

The coefficient on bargain rate is significantly more negative than -1. It appears that the bargains with higher rates per bing would produce lower earnings for the miners. This result requires more research to establish the correct way to interpret the finding as the bargains were of course freely entered into on both sides. In the Northern Pennines, either the mine agents would propose a rate for a particular section of the mine. The bargains would very accurately describe the area of work, terms such as “*between William’s sump to Henry’s rise*” will be seen indicating a clear internal map of the mine and way of describing locations. Sometimes the head of partnership would propose a bargain, which the mine agents would consider.

There is little evidence on the workings of these negotiations; around setting day you will see most bargains start up on the quarter day, but sometimes bargains will be a dated a day or so later. If the bargains are offered by the agents we may deduce that these were bargains whose rates were not set high enough to attract takers but that the firm still wanted to proceed with, if these offer came from the worker side these would be rates that the agents considered too high, and after a thinking it over the miners still thought it worth their while, even at a lower rate but beyond this little else, I think, can be said.

VI Some concluding thoughts

The research reported here is to some extent preliminary and work is ongoing to refine it. These preliminary findings, I think, are suggestive of two things.

Firstly, the historical records, and the linking of the initial bargains with the subsequent payments, is sufficiently rich to enable the researcher to construct quite detailed information for individual miners over time. It is certainly the case that carefully matching of the written bargains with the subsequent payments could be done for quite extensive periods of time especially in this latter part of the 19C. The present literature is rather ambivalent regarding the variability of payments under Bingle contracts, ascribing its persistence to the inherent dispositions of workers towards risk, and emphasising their downside when workers ended up in debt to the miner owners. It seems at least plausible that a contract which persisted for more than 200 years is likely to have offered at least some benefit to both sides. The available data can, I believe, support a more thorough examination of performance of the contracts and supplement the view already current. A more extensive study would cast light on whether some workers were able to use their skill and knowledge to generate persistently higher earnings for themselves.

Secondly, the assertion in the literature that the mine agents successfully set bargain rates to equalise earnings doesn't seem to receive much support from the data analysed here, the extension of the dataset suggested would allow a more authoritative statement on this point.

Appendix 1: Regressions of the costs of candles, dynamite, drawing, washing and tools for the first five months of mining at St Francis Level 1878. N=22, data from Table 3 Chapter X, p 280. B Jennings (1959)

Variable (mean - £)	Constant	Number ('t')	Bings ('t')	R ²
Candles (0.98)	0.1198	0.1267 (1.42)		0.09
Dynamite (3.9)	-1.2175	0.2327 (0.74)	0.1743 (2.97)	0.62
Drawing (2.99)	0.8354		0.1067 (6.28)	0.66
Washing (2.05)	0.0268		0.0997 (51.66)	0.99
Tools (0.14)	0.0787	0.0093 (0.47)		0.01

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