

# The Butterley Gangroad Project

## Butterley Limestone and Lime Works at Crich

### Output and Profitability

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Version 1.0

- 1 -

# INDEX

1. Introduction

2. Output from the Crich limestone works 1802/03 and 1813/14

3. Output from the Crich limestone works 1902 to 1913

4. Profitability of the Crich limestone works

Figure 1	-	Output for the years 1802/03 and 1813/14.
Figure 2	-	Output from the Crich limestone works 1902-1913
Figure 3	-	Annual profit for early years and 10 year profit from 1830 onwards
Figure 4	-	1840s annual profit
Figure 5	-	Total costs and labour/coal costs in 1860s & 1870s
Figure 6	-	Sales, costs and profit for the 1860s and 1870s
Figure 7	-	Output and Sales for the period 1902 to 1913
Figure 8	-	Total costs, sales and profit for 1902-1913
Figure 9	-	Sales, profit, labour and coal costs for the final years

## 1. Introduction

A review of the Butterley Company archives held at the Derbyshire Record Office has been undertaken by the project research sub-group to collate information on the Butterley quarries at Crich, the Butterley gangroad and the Butterley lime kilns at Bullbridge (the Crich limestone works). The works were operational from 1793 to 1933 and this short paper provides summary information on the output and profitability of the works during specific periods between these two dates.

The information found in the archives to date has been very limited and the output information (limestone quarried) only relates to the years 1802/03, 1813/04 and 1902 to 1913. The profitability information found in the archives provides better coverage for the period 1830 to closure.

## 2. Output from the Crich Limestone works 1802/03 and 1813/14.

In 1796 Benjamin Outram had agreed with John Chilton for the latter to be responsible for getting limestone at the Crich quarry and the agreement specified sufficient labour was to be put in place to get 100 tons of limestone per day<sup>i</sup>. The only accounts in the archives for the works in the early years relate to the years April 1802 to March 1803 and April 1813 to March 1814<sup>ii</sup>.

Figure 1 shows the output from the works during these two periods. There was a significant increase in the stone being quarried when the two sets of accounts are compared. Based on a six day working week, an average of 140 tons of limestone were being quarried each day in 1814 and this quantity of limestone was presumably transported on the railway each day to the Amber Wharf at Bullbridge.

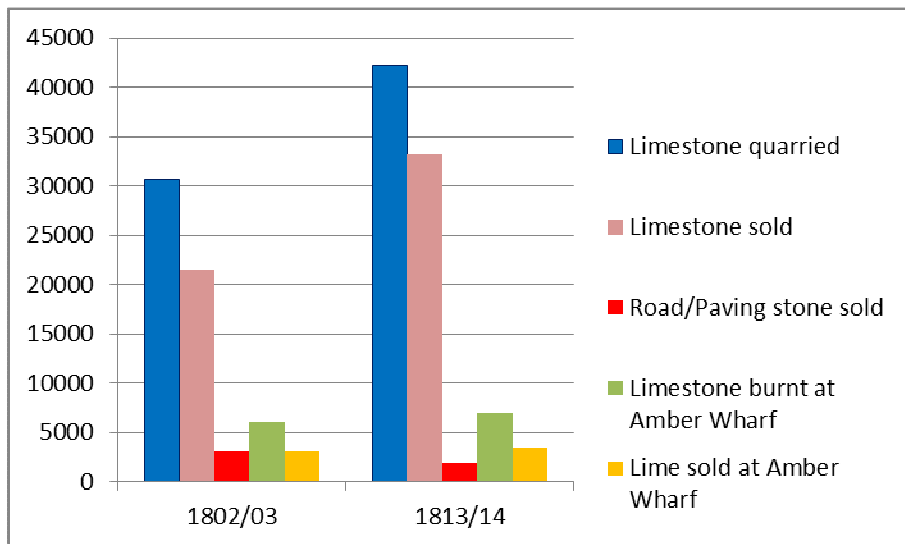


Figure 1 - Output (tons) from the works for the years 1802/03 and 1813/14.

### 3. Output from the Crich limestone works 1902-1913.

In 1893 a new manager was appointed at the Crich limestone works (J P Hamilton) and he, with the board's approval, improved the productivity of the operation by investing in new plant (locomotives, kilns and machinery) and opening up the old Warner quarry to be worked in parallel with the Hilts quarry. By the turn of the century most of the improvements had been implemented and the annual reports for the works for the period 1902-1913<sup>iii</sup> detailed the output from both the quarry and the lime works. The 1902 report confirmed the barring work had been completed and 1.5 million tons of limestone had been exposed.

In 1900, Dale Quarry at Wirksworth was purchased by the company and was managed in conjunction with the works at Crich. Figure 2 represents the output from the Crich works only as in the reports Dale Quarry outputs were shown separately.

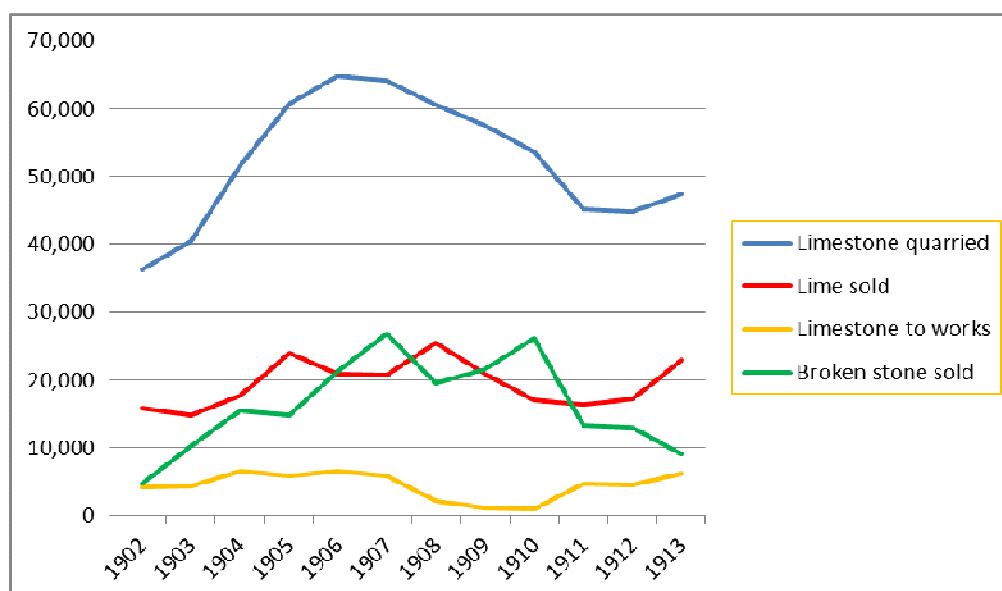


Figure 2 - Output (tons) from the Crich limestone works 1902-1913

Taking into account both works at Crich and Wirksworth the limestone quarried peaked at just over 100,000 tons per annum. When the output peaked at the Crich quarries, an average of 200 tons of limestone per day would have transported on the railway from the quarries to Bullbridge.

The quantity of limestone quarried in the first half of the period increased significantly as a result of the old quarry being re-opened and new faces being opened at Hilts quarry following additional leases having been put in place as part of the improvements. However from 1906 the trend reversed and output fell over the next five years before stabilising at around 45,000 tons per annum in the years leading up to the start of WW1 in 1914.

Towards the end of the period output at Dale Quarry was increased by 25% to around 40,000 tons per annum to compensate for some of the lost output at the Crich

works. No output figures have been found in the archives for the period from 1913 to the closure of the works in 1933.

#### 4. Profitability of the Crich limestone works

The summary profit figures for the Crich limestone works have been found in the archives for the period 1830 to 1933<sup>iv</sup> and the two sets of early accounts for the years 1802/03 and 1813/14<sup>v</sup> did include a profit figure albeit these accounts were basic given the date they were prepared.

Figure 3 shows the annual profit taken from the early accounts (1802/03 and 1813/14 - red columns) and the profit for each 10 year period from 1830 to closure (blue columns). In the two early years the profit was £749 and £1258 compared to a profit of £5,182 in the 10 years, 1830 to 1839.

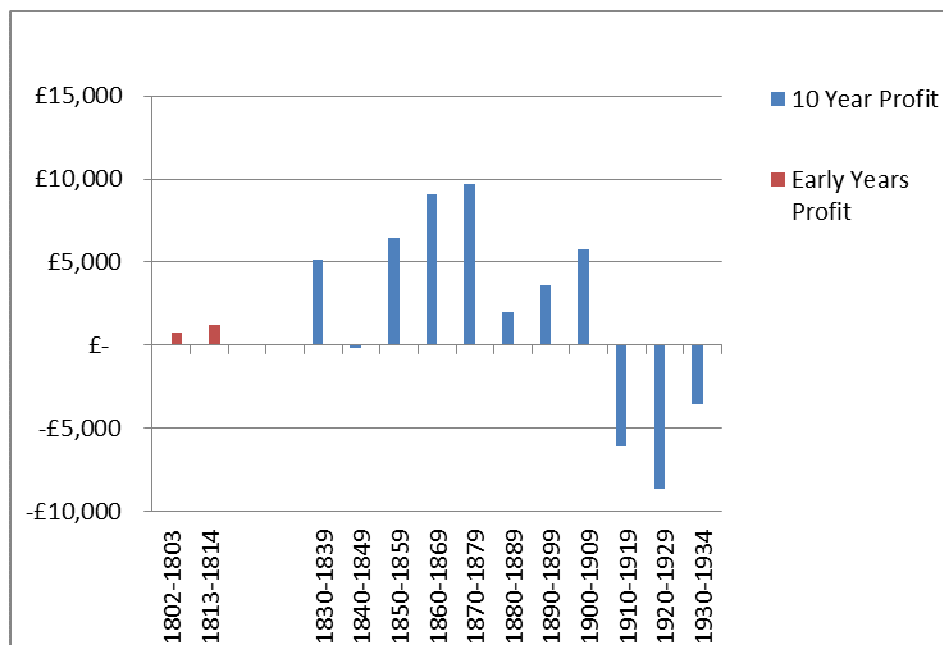


Figure 3 - Annual profit (£) for two early years and 10 year profit from 1830 onwards

The profit for the 1840s shows a significant dip compared to the previous decade and the annual profit for this 10 year period is shown in Figure 4. In the first four years of the decade a profit was made in three of the four years but for next five years losses were incurred followed by a return to profit in 1849. From 1844 onwards changes were made to the gangroad including the realignment between the Hat Factory and Fritchley and building the extension branch

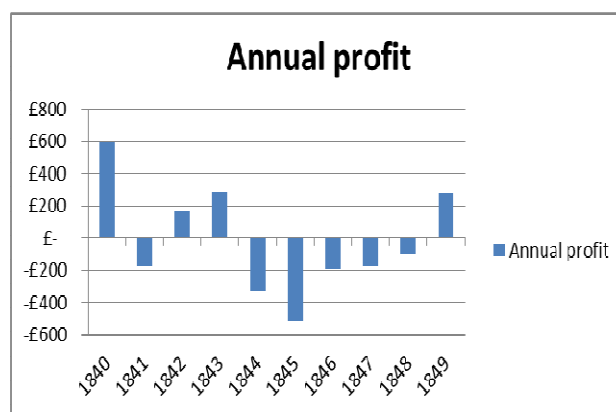


Figure 4 - 1840s annual profit

line to Hilts quarry. These changes to the line, coupled with the issues leading to transferring the quarry operation to Hilts quarry, contributed to the financial losses.

The works continued to remain in profit throughout the 1850s when the Warner quarry was closed and further changes were made to modernise the line with possibly the introduction of steam locomotives to the line. From 1860-1880 stability returned to the works and the profits peaked during this period. A more detailed analysis of the accounts for this 20 year period shows the works operated on an annual cost base of around £7,100<sup>vi</sup> of which 65% comprised two major elements - labour and coal for burning the limestone. Figure 5 shows the annual total costs for the works and the individual and combined costs for the labour and coal elements.

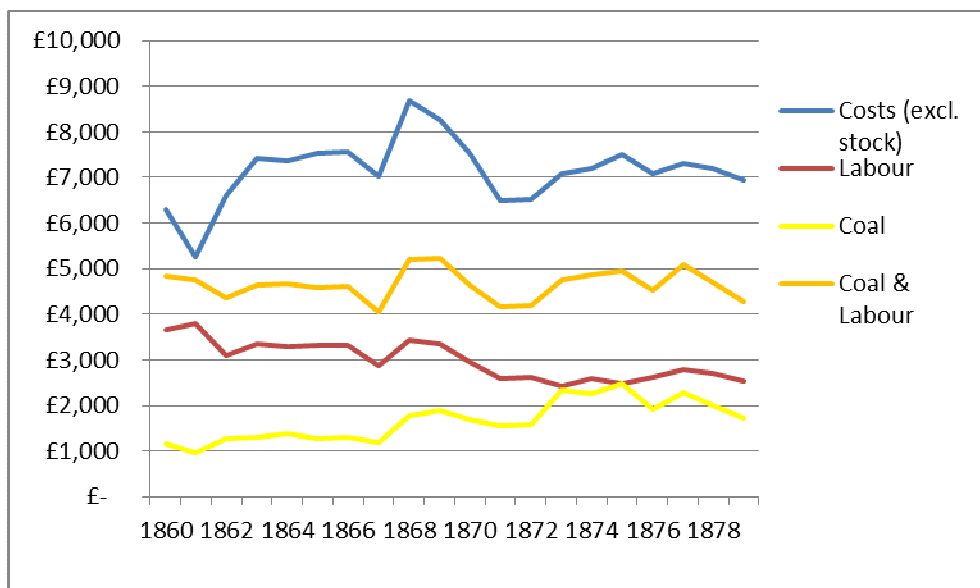


Figure 5 - Total annual costs and labour/coal costs in 1860s & 1870s

The profitability of the works for the 1860s and 1870s is shown in Figure 6.

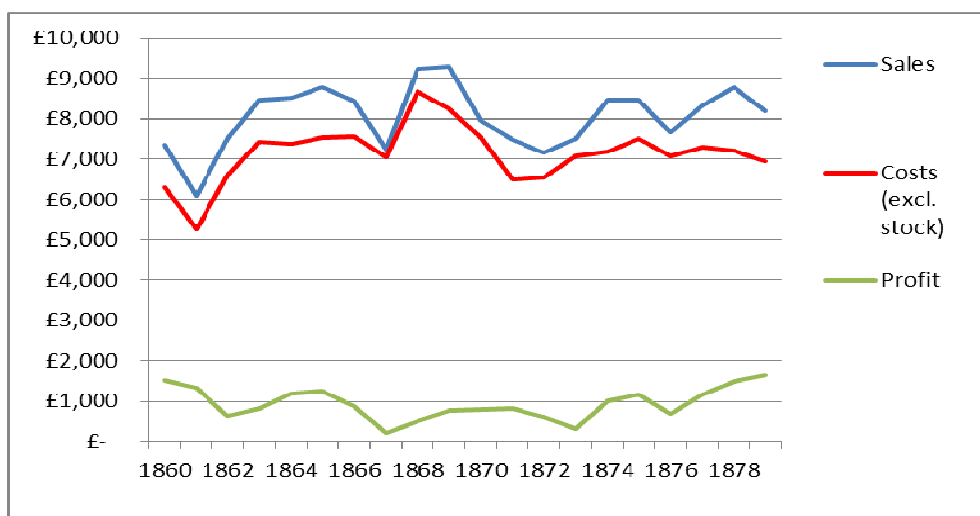


Figure 6 - Sales, costs and profit for the 1860s and 1870s

As stated in Section 3, major investment was made in the works between 1894 and 1900. New locomotives were purchased to work the full length of the line, the height of the kilns was increased and new plant was purchased. Additional land at Hilts quarry was leased to open new quarry faces and the Warner quarry was re-opened and a contract was awarded to Bott Lewis Jones to remove 100,000 cubic yards of earth to expose the limestone. By 1913 the total capital expenditure in the 20 years from 1894 was £36,178 made up of £22,516 on the lime works and quarries and £13,662 on baring the limestone.

The injection of this capital had a positive result on the output from the quarries for the five years from 1902 to 1907 and on the corresponding sales figures. However output fell from 1907 onwards before stabilising again in the years immediately preceding the start of WW1. The sales figures for the same period show a similar trend albeit peak sales figures (1908) were achieved when output was in the early stages of decline. Figure 7 shows the output and sales achieved in the 12 years following completion of the improvements to the works.

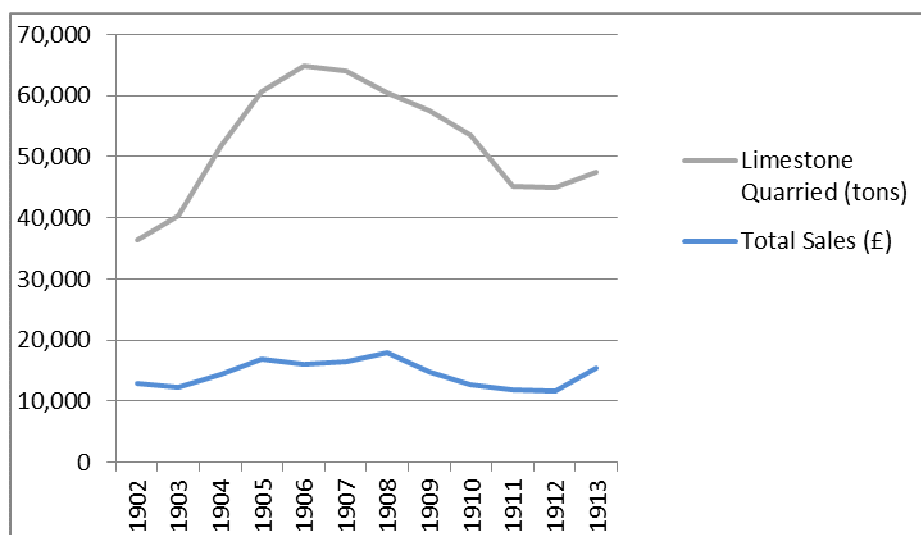


Figure 7 - Output and Sales for the period 1902 to 1913.

In this period profitability varied with peak profit being achieved in the first half of the period followed by successive years of losses in the second half. Figure 8 shows the total costs, combined coal and labour costs, sales and profit figures for 1902 to 1913<sup>vii</sup>. The combined labour and coal costs accounted for around 50% of the total costs which was a smaller percentage compared to that recorded in the 1860s and 1870s. This may have been caused by two factors:-

- The capital costs incurred by the improvements to the works was depreciated on the P&L accounts; and
- The cost of baring the limestone had been put into a suspense account and was being paid for by a levy of 6d per ton on all stone quarried<sup>viii</sup>.

The accounts for this period included entries for depreciation and royalties totalling £1200 in 1905 and increasing to £1500 in 1907 and beyond<sup>ix</sup>.

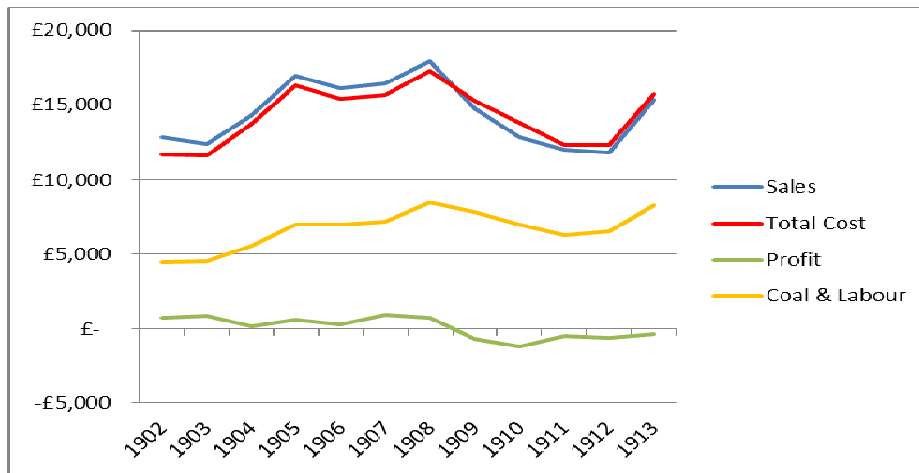


Figure 8 - Total costs, sales and profit for 1902-1913

The limestone works incurred losses throughout the war years and into the start of the 1920s. The demand for lime at this time was low and the lime works were shut down in 1921 for a year and the men re-deployed to the quarry for baring the limestone. Later in the 1920s the general strike of 1926 had an impact on the works as a result of coal, and maybe labour, being in very short supply. Figure 9 clearly shows the dip in sales and costs in both 1921 and 1926 but labour costs not reducing on the same scale. The works returned to profit in 1927 but by this time limestone reserves at the quarry had been reduced to a low level to only sustain operations for a further five years. From 1929 onwards the works were in decline and the Butterley Company closed the works down in 1933.

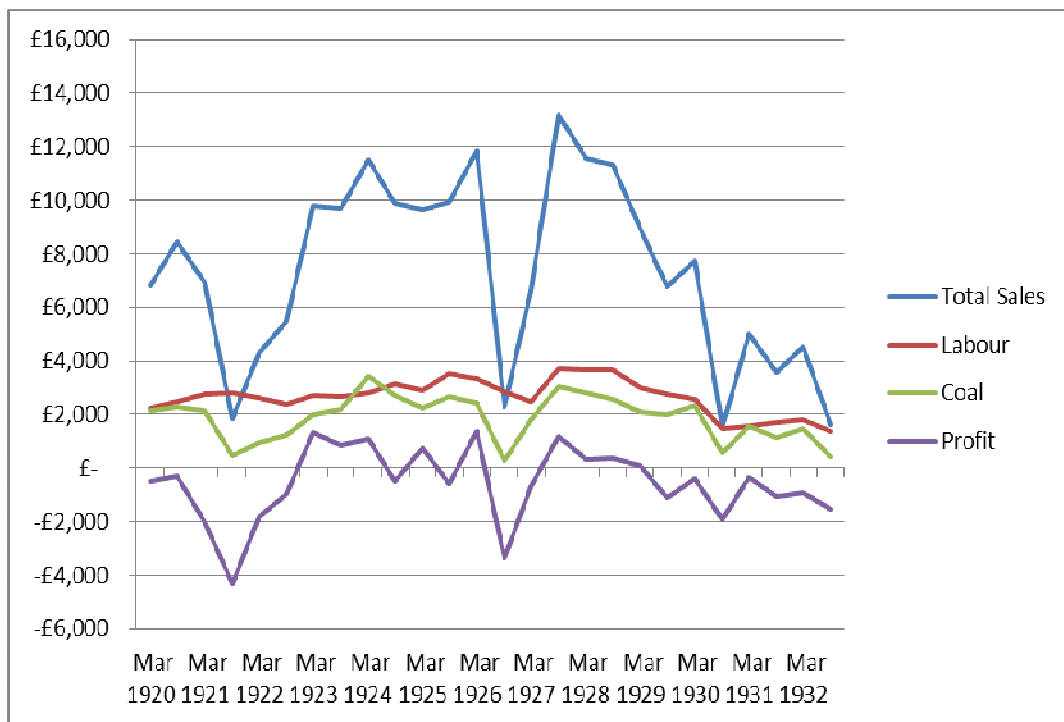


Figure 9 - Sales, profit, labour and coal costs for the final years



## Notes

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- i Derbyshire Records Office – Butterley Company Letter Book D5974/3/1
- ii Derbyshire Record Office – Butterley Company Accounts D503/35/5 & D5974/4/1
- iii Derbyshire Record Office – Butterley Company Managing Directors Reports D503/14/2
- iv Derbyshire Record Office – Butterley Company 10 year profits D503/27/2
- v Derbyshire Record Office – Butterley Company Accounts D503/35/5 & D5974/4/1
- vi Derbyshire Record Office – Butterley Company Private Ledgers D503/29/3-6
- vii Derbyshire Record Office – Butterley Company Private Ledgers D503/29/9-11
- viii Derbyshire Record Office – Butterley Company Managing Directors Reports D503/14/1
- ix Derbyshire Record Office – Butterley Company Accounts D503/37/2