Backbarrow Ironworks - Supplies

Charcoal

The availability of charcoal produced in the woodlands of this part of the country was one of the main reasons why blast furnaces were built here in the 1700s. Charcoal is a bulky yet fragile product which does not transport well, especially when it was carried in sacks by horse and cart over rough terrain. Lump charcoal was needed at the ironworks, not a sackful of dust.

Charcoal burning was an established industry in this area, not only supplying fuel for the bloomeries and forges of the early iron industry, but also for other industries such as gunpowder making. The woodland was managed to ensure a regular supply of poles – cut over the winter with the charcoal burns taking place in late summer and autumn. It has been estimated that 7 tons of coppice wood would be needed to make (reduce to) 1 ton of charcoal.

Demand from the furnaces was huge. In the period 1731-42, on average 1288 dozen sacks of charcoal were purchased by the Backbarrow Company per year. This was at the time of the 1711 furnace stack, before it was rebuilt and enlarged in the 1770s and later. Just imagine the number of cartloads that would be needed to transport the charcoal to the ironworks, and the effect that would have on the rudimentary transport network of the time. Interestingly, in this period at least, the Company always bought more than they used each year – presumably to ensure they always had a ready supply in store. (1). Water transport was used where possible – about 500 boatloads of charcoal were ferried down Windermere to feed the second blast of the furnace. (2)

It has been estimated that to meet this demand somewhere around 1000 acres of coppice woodland (1.5 square miles) would be needed to supply Backbarrow each year. This huge requirement was the biggest item of expenditure for the ironworks. For example, over the period 1772-1780, the cost of charcoal for the furnace as £22,964, much higher than the £7205 spent on iron ore. (1)

The arrival of the railway meant that supplies could be sourced from further afield. The (Barrow) Herald reported on 16th October 1897 that "charcoal is required in enormous quantities, and the bulk of it is brought to the works by rail from different parts of the country". At times it came from overseas, the same newspaper noting on 30th October 1869 that "a cargo of charcoal for Messrs Harrison Ainslie & Co. from Galway, per The Union, is now being discharged". (3)

As the size of the furnace grew, demand could outstrip supply. On 8th March 1920 the company placed an order with the Barrow News and Mail for 13 weekly insertions of this advert (4)


To Charcoal Burners.

WE ARE OPEN TO PURCHASE CHARCOAL IN ANY QUANTITY, DELIVERED AT OUR FURNACE AT BACKBARROW.

CASH ON DELIVERY.

BEST PRICES GIVEN.

Address all communications:—
THE SECRETARY,

CHARCOAL IRON Co., Ltd.,
BACKBARROW,
NEAR ULVERSTON.

Coppice wood charcoal was always preferred, but certainly by the early 1900s chemical charcoal produced in retorts was bought in from as far as Sweden. There were plans for a chemical charcoal works at Backbarrow in 1914 to guarantee supplies. (5)

Coke

After the switch from charcoal as the fuel for the furnace in the 1920s, coke was supplied by rail, with Backbarrow taking a small share of the tonnage transported daily from County Durham to the Cumbrian coast via Tebay and Arnside. The Company's MATERIALS IN book for 1933-37 records deliveries from Consett, Langley Park, Crook, Willington, and Brancepeth – all in Durham. (6)

Iron ore

Iron ore can take many forms, but Backbarrow was able to draw on the most productive of these – the haematite deposits of south-west Cumbria.

Red Earth (7) records a number of examples of mines that supplied the ironworks in the early years …

- Old Hills Mine (near Marton). Iron ore was carted from Old Hills to the furnace at Backbarrow between 1719 and 1724 by John Towers of Dalton, Yeoman, Robert Garner of Broughton, and Jona Fleming of Much Urswick
- Elliscales (near Dalton). The Backbarrow Company of William Rawlinson & Co. began mining operations at "Ennescales" in 1721, and that year raised 284 tons of ore which was carted to Pallas Nook (on the North Walney Channel) to be shipped to the furnace at Backbarrow
- Plumpton Mine (near Ulverston). A lease was taken from Bacon Morrit – the owner of the Plumpton Hall Estate - in 1744 by William Rawlinson of the Backbarrow Company to mine ore at Plumpton for 21 years at 1s6d per ton. No time was wasted in extracting the valued resources. In 1746 the mines yielded 900 tons of ore, by 1759 the amount had steadily increased to 1400 tons per year. From that date output decreased and by the time the lease expired in 1765 had dropped to 400 tons per year. (8)
- Stainton Mines (near Dalton). By 1736 the Backbarrow Company had a shareholding of two thirds, with Thos. Crossfield as manager. Between 1724 and 1745 the Backbarrow and Cunsey mined ore at Stainton, and also at Stone Closes to the north of Stainton

Once the ironworks had been taken over by the Harrison Ainslie Company in 1818, ore was delivered from the company's own mines at Lindal Moor and Pennington.

When the local mines closed, ore was obtained from sources much further afield. The Company's MATERIALS IN book for 1933-37 records ore from Florence Mine near Egremont in West Cumbria, (6) and, 30 years later, a plan of the ironworks in 1963 shows that the store then contained ore from Scandinavia and Morocco. (7)

The ore was prepared for the furnace firstly by crushing to small pieces, then heating by roasting and/or calcining. Strictly speaking there is a difference between the two processes, but writers often use the terms as interchangeable and the end result is the same – the ore is "improved" by evaporating water content, and modifying its chemical composition.

A description (10) of Leighton Furnace in 1740 (built by the Backbarrow Company in 1715) tells how "when the ore … is brought to the furnace, their first work is to burn it in a kiln" where "the mere drossy part is consumed and the other part rendered more soft and malleable". This process was most probably also being carried out at Backbarrow, although Fell relates that "in 1855 a shed was built adjoining the casting shed for drying ore by laying hot pigs in the ore". (11)

The manager Yacob Tornblad's letters to his employer in the early 1900s (12) suggest that he is planning a different approach – to the use the exhaust gases from the furnace to heat the ore …

- November 17th 1908. “Enclosed please find drawing of gas piping between furnace and dustcatcher for calcining kiln.”
- December 9th 1911. “Have you ordered that 4’0” iron tube from Rubery for our calcining kiln yet? It is most important we get this tube at once as we can not start the kiln without it as the ore we now get is very wet we want to have the kiln on”.

Scrap

An increasing amount of scrap (iron and steel) was delivered to the ironworks during the 20th century for use in the furnaces. The Materials Ordered book for 1919-21 (4) includes orders to Vickers Ltd, Barrow for “50 truckloads (8 tons each) turnings to be delivered this week and next, and to Geo Cohen & Co, Sheffield for “50 tons steel turnings delivered at the rate of 2 trucks per week”. By the time of the Purchase Book for Supplies (1958-68) (13) the suppliers listed include J H Binnell, Samuel Morgan, John Morgan, Thos Ward Ltd, I Wilson, Barrow Ironworks (pigs), Geo Cohen, Cox & Danks Ltd (Manchester), Barrow Steelworks, Harry Tootell (Blackburn), G Rollinson Ltd, Edward Fye (June 61 – chairs), Kendall & Hindle, H J Popperell & Co (chipped turnings), P Mulholland, and C C Cooper Ltd.

Limestone

The nearest place from which limestone is said to be quarried was at Fiddler Hall Woods on the back road from Staveley to Cartmel, roughly two miles from the furnace.

Much was taken from the quarries by the coast at Plumpton near Ulverston, or a little further north at Ashes Wood where there was “a small quarry yielding stone of an exceedingly fine grain or texture, locally called ‘Bloomery’, used at the furnaces of Newland and Backbarrow for smelting iron ore” (14). Although further away by road, the advantage these quarries had was their location by the estuary. The stone could be shipped to the tidal limit of the River Leven at Haverthwaite, only a short distance away from the ironworks to where it could be carted. Fell mentions Roudsea Wood and Chapel Island, similarly situated on the Leven Estuary, and also notes the use of cinders from old bloomery sites being used as a flux in the early years. (11)

The arrival of the railway meant that the stone could be sourced from further afield. For example, the MATERIALS IN book for 1933-37 notes deliveries from quarries at Sandside and Arnside. (6)

Limestone was used as a flux in the smelting process to separate out the impurities and non-metallic parts of the melt. Substitutes were used at times – Fell notes a delivery of lithomarge from County Antrim in Northern Ireland in 1876, (10), and an inventory of stock on 31st December 1911 lists 140 tons of lithomarge and 4 tons of fluorspar as well as 36 tons of limestone (12).

Miscellaneous

A wide range of items were needed for the successful operation of the works. For example, the Materials Ordered book (4) includes
May 12 - 2 dozen carrake shafts (*for the pig bed rakes*) from Croasdale, Haverthwaite
May 13 – 1 truck pig bed sand – Fisher, Barrow
May 14 – 24 pig bed patterns – Cairds (*Barrow*)
May 23 - 4 valve leathers – Townson, Brow Edge (*Backbarrow*)
May 29 – 1 dozen besoms – Askews, Finsthwaite
Aug 18 - oats and hay (*for the horse*) – Knowles of Newby Bridge

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Sources of information

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3. Accessed online at The British Newspaper Archive
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5. The history of Backbarrow Ironworks, by Peter Sandbach in The Mine Explorer Vol 7, 2022
6. Barrow Record Office BDB 2-5-24 (Materials In 1933/4)
7. The Red Earth Revisited, by Brian D Cubbon, Peter R Sandbach & Colin P Woollard, CATMHS 2021
8. The industrial archaeology of South Ulverston, by Rob Mckeever & Jack Layfield, 2004
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11. The early iron industry of Furness and District, by Alfred Fell, Frank Cass, 1908
12. Letters from Yakob Tornblad to Mr C E Ray of Harrison Ainslie (BDB2/3 at the Barrow Archive Centre)
13. Barrow Record Office BDB 5-2-38 (Purchase Book for Supplies and Overheads)
14. Geological fragments of Furness and Cartmel, by John Bolton, 1869

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Afterwords

February 2026. In the 'Annals of Cartmel' by James Stockdale, published in 1872, he mentions that bargemen carried lime up Windemere from 3 places on the Cartmel Peninsular. Although he doesn't say exactly when this was happening, it could presumably include the early years of the ironworks.

The places he identifies as sources of lime are "Fayriggs", likely to be Fair Rigg near Fiddler Hall near Staveley; Field Broughton, likely to the the quarry near the church; and Headhouse near High Newton. They all appear on the older OS maps.

Fair Rigg would be the nearest to Backbarrow, and downhill most of the way from the quarry to the ironworks!