

Summary of 1860s Weardale Information in “The Mining and Smelting Magazine”

“The Mining and Smelting Magazine” was published in London monthly from 3 Jan 1862 till 3 Mar 1865. Later issues may exist but they are not on-line on the internet.

This file summarises the information relevant to Weardale that was published in “The Mining and Smelting Magazine”. It includes some information about mining and some about iron-works, and particularly when blast furnaces were in use.

This information was published within monthly “Trade Reviews” and in some reports/papers. The full text of the Trade Reviews (for Durham) and details of the relevant reports/papers are in the document “Extracts of “The Mining and Smelting Magazine” concerning Weardale in 1860s” (filename Weardale_M&Smag_extracts). For more details than are in this summary, see the full texts.

Mining and Smelting Magazine, 3 May 1862, vol. 1, p.341

“Two of the principal [*iron*] firms are at present engaged in the execution of large orders for railway chairs for the South of France.”

[The 2 firms making rail chairs are not named, but it is known that in the 1850s rail chairs were made at Tow Law by Weardale Iron Co.

One of the firms is likely to be Messrs. Bolckow and Vaughan at Middlesboro’ because:

Grunner and Lan (see below) state (on 3 Jun 1863, vol. 3, p.331) that the better grades of Cleveland (Middlesboro’) pig-iron “are mostly converted, in the district itself, by second melting in a cupola, into railway chairs and pipes. One establishment alone, that of Messrs. Bolckow and Vaughan, makes as much as 100 tons of chairs per day”, which in 1860 sold at £4 per ton, compared to £2 10s 0d for no. 1 grade pig-metal.]

Mining and Smelting Magazine, 3 Dec 1862, vol. 2, p.367

Details are given of the prospectus of the “Brandon Walls Lead Mining Company”, which had just been issued. Includes “the lease being for 18 years, at a royalty of 1-12th for lead, and 6d. per ton for ironstone.”

[This suggests that the expectation was that Brandon Walls would produce some ironstone, presumably to be shipped to blast furnaces via the Rookhope railway.]

Mining and Smelting Magazine, 3 Jan 1863, vol. 3, p.46

Includes details of the **state of blast furnaces, taken on 1 Dec 1862**, as follows:

| Place and Owners | In blast | Out of blast | Total |
|-----------------------------------|----------|--------------|-------|
| Stanhope – Weardale Iron Company | - | 1 | 1 |
| Towlaw – Weardale Iron Company | 4 | 1 | 5 |
| Witton Park – Bolckow and Vaughan | 4 | - | 4 |

Mining and Smelting Magazine, 3 Mar 1863, vol. 3, p.170

State of blast furnaces on 4 Feb 1863:

No change in Weardale; Stanhope = 0 in, 1 out; Towlaw = 4 in, 1 out; Witton Park = 4 in, 0 out.

Mining and Smelting Magazine, 3 Jun 1863, vol. 3, p.321-335

Contains “The Iron Manufacture of the North of England. Districts of Cleveland, Durham, and Cumberland” by Gruner and Lan. This is abstracted from the “Annales des Mines, 6th series, vol. I, p.89. Gruner and Lan are two eminent French engineers, who were commissioned by the French Minister of Public works to report on all aspects of the iron industry in Great Britain. The report began to be published in France in 1861. This is the section of the report relevant to Durham. It includes:

[Interesting, but not relevant to Weardale: p.326-327 includes a very interesting account of how Eston ironstone mine (in Cleveland) is worked, with underground horizontal steam engines pulling endless wire ropes to haul waggons along large underground tramway headings to bring ore to the surface.]

Gruner and Lan visited the Cleveland, Durham and Cumberland districts in 1860 [p.325], and provide details of costs in 1860 [p.330], and quoted prices for June 1860 [p.330].

p.332 concerns the Durham (Newcastle) District and says “Between the Tyne and the Tees in Durham itself, there are three principal establishments; which, taking them from north to south, are:- the works of the

Derwent Iron Company, those of the Weardale Iron Company, and Witton Park, belonging to Messrs. Bolckow and Vaughan, the fortunate proprietors of the Eston iron mine."

p.334 says that Durham also includes 5 other works with 10 furnaces and another 16 furnaces on the left bank of the Tees which are counted as being in the Middlesboro' district.

p.333-334 (of vol.3, 3 Jun 1863) details the Weardale Iron Company (visited in 1860), as follows:

4. Of the Weardale Iron Company.—The Weardale Iron Company possesses four works, all very modern ones: five blast-furnaces at Towlaw near Weardale; one at Stanhope; and two at Ferry Hill, built in 1860. Lastly, a large forge of sixty-four puddling furnaces, built about 1853 at Tudhoe near Ferry Hill. The make at these works is quite special. The Weardale company treat in their furnaces at Towlaw the spathic ores and brown hematites of the Weardale, Allenhead, and Alston Moor table-lands, &c.* They have the monopoly of all the ores furnished by the lands of the Bishop of Durham. These ores are very manganiferous, without phosphorus, and almost without sulphur, and contain less than 1 per cent. of alumina. They also smelt the red ores and some Cleveland ore, but only as an accessory. It will be seen from this that the Towlaw pig is specially adapted for manufacture into wrought iron. It is white, lamellar,

* These ores are furnished by veins which, in the Carboniferous Limestone, occupy a zone of 20 miles in length by 4 or 5 in width. The average distance of the mines from the blast-furnaces is from 10 to 12 miles.

and easily refined. Its cost-price doubtless exceeds by about 20s. that of the ordinary Cleveland pig, but it can be refined for fine iron and thin plates, which are superior to the best irons of Staffordshire; and even in applying the Lowmoor method products are obtained in no respect inferior to those of that establishment. The Towlaw pig-metal is also puddled at Tudhoe for steel, and, at the time of our visit, a Bessemer apparatus was being erected, it having been proved at Sheffield itself, that it was capable of yielding by that method good cast-steel.

The Weardale company sell but little iron in pig. Almost all that they produce is converted into wrought iron at their fine forge at Tudhoe, one of the best appointed that we saw in England. About 30,000 tons of wrought iron per year can be produced there, and of late years, besides fine irons, superior rails for Russia have been manufactured at 8*l.* 10*s.* per ton.

p.334 (of vol.3, 3 Jun 1863) details the Witton Park works, as follows:

5. Of Witton Park.—The 'Witton Park works, in the valley of the Wear, above Bishop-Auckland, belong to Messrs. Bolckow and Vaughan. This establishment, erected since the discovery of the Cleveland ore, comprises four blast-furnaces and a large forge.* Lias ore exclusively is smelted there. Being situated 34 miles from the iron mines, the ore costs about 1*s.* less there than at Consett, and as the coke is almost the same price, the ordinary grey metal does not cost more than 2*l.* 6*s.*; which is a little less than at Middlesboro' but the carriage to the port is 3*s.* It is necessary therefore to refine the pig on the spot, which, besides, can be more advantageously done than at Middlesboro', owing to the vicinity of the coal mines.

*** The two forges belonging to Messrs. Bolckow and Vaughan, that of Middlesboro' and that of Witton Park, include together 150 puddling furnaces; they can turn out per year nearly 80,000 tons of wrought iron,**

Mining and Smelting Magazine, 3 Jun 1863, vol. 3, p.368

State of blast furnaces on 1 May 1863:

No change in Weardale; Stanhope = 0 in, 1 out; Towlaw = 4 in, 1 out; Witton Park = 4 in, 0 out.

Mining and Smelting Magazine, 3 Jul 1863, vol. 4, p.47

State of blast furnaces at beginning of June 1863:

No change in Weardale; Stanhope = 0 in, 1 out; Towlaw = 4 in, 1 out; Witton Park = 4 in, 0 out.

Mining and Smelting Magazine, 3 Aug 1863, vol. 4, p.112

State of blast furnaces on 1 Jul 1863:

No change in Weardale; Stanhope = 0 in, 1 out; Towlaw = 4 in, 1 out; Witton Park = 4 in, 0 out.

Mining and Smelting Magazine, 3 Oct 1863, vol. 4, p.223

Gives a summary of the paper "On the Weardale Iron Ores", given by Charles Attwood, at the Meeting of the British Association.

This concerns the formation of iron ores in Weardale. Weardale iron ores occur in "the two different forms of spathon or sparry carbonate, and of hydrated peroxides". Attwood observed that they "have certainly been all at first deposited as carbonates, and have passed into the state of oxides and of hydrates by the joint effects of atmospheric and aqueous action".

Mining and Smelting Magazine, 3 Oct 1863, vol. 4, p.239

State of blast furnaces on 1 Sep 1863:

No change in Weardale; Stanhope = 0 in, 1 out; Towlaw = 4 in, 1 out; Witton Park = 4 in, 0 out.

Mining and Smelting Magazine, 3 Nov 1863, vol. 4, p.269-284

Contains "Report on the Metallurgy of the District", a paper given by I L (Lowthian) Bell, T Sopwith, Dr (Thomas) Richardson and T Spencer, at the Meeting of the British Association. This paper includes sections on "The Manufacture of Iron in Connection with the Northumberland and Durham Coal-field", "Lead Metallurgy of the District", and "The Manufacture of Steel in Northumberland and Durham".

This paper was later published in 1864 (with slight rewording) in the book "The industrial resources of the district of the three northern rivers, the Tyne, Wear, and Tees, including the reports on the local manufactures, read before the British Association, in 1863". The book was edited by William George Armstrong, Isaac Lowthian Bell, John Taylor and Thomas Richardson. The 1st edition is dated 10 Feb 1864. The 2nd edition (with some added papers) is dated 11 Aug 1864. The book is on-line and can be downloaded from <https://archive.org/details/industrialresou00sciigoog>

The paper in the magazine includes:

[p.271] At the western edge of the Newcastle and Durham coalfield, some bands of ironstone are found above some coal seams. By 1863 most of these bands had been exhausted but **"a small quantity of ironstone continues to be extracted from a landsale colliery at Hedley, which is smelted at Wylam, and some is still worked by the Weardale Iron Company, near Tow Law."**

[p.271] At Weardale the mineral veins traversing the Mountain Limestone "contain so much carbonate and oxide of iron that furnaces have been erected at Tow Law, by Messrs. Attwood and Baring, for their reduction."

[p.273] "In 1840, Messrs. Bolckow and Vaughan, who had built a rolling-mill at Middlesboro' in 1840, **added, at Witton Park, in 1846, the process of smelting to their operations. They were induced to do so by an offer of ironstone to be supplied from the coal-field near Bishop Auckland. In these expectations, as had happened to their colleagues on the Tyne, they were disappointed, and like them, they had recourse to Whitby [where thick beds of ironstone were found]."**

[p.275] **"About this period [1844] Mr. Attwood, in concert with Messrs. Baring and Co., purchased a small furnace then recently erected at Stanhope by Mr. Rippon, and built five others at Tow Law [not completely accurate: he actually planned to build 6 at Tow Law, but ended up building 3 at first and 2 more later] for smelting the "rider ore" (carbonate and oxide) of the lead veins. There is no doubt that, owing to the extreme irregularity of this kind of material, immense labour and expense were at first incurred, and,**

as regards the quality of the produce, frequently with very unsatisfactory results. Better acquaintance, however, with the veins and their contents has enabled that firm to produce iron of a very high class – so good indeed as to closely resemble in composition and quality the celebrated German "Spiegeleisen". For bar-iron purposes it bears a high name, and has, like its prototype in Germany, been found well adapted for the manufacture of the finer kinds of steel."

[p.278] "The uniform practice in the whole district is to blow the furnaces with heated air."

[p.278] "In shape, the blast-furnaces present no novelty worthy of notice. The width of the boshes varies from 14' to 18', and the height from 42' to 55', in one case 75' having been reached with beneficial results."

[p.278] "The blast in the north of England is introduced generally by three or four twyers, at a pressure varying from 3 to 4 lbs. per square inch, and at a temperature of about from 600° to 700° Fahr. The production of a furnace is from 200 to 220 tons weekly, although more than this quantity has been frequently obtained."

[p.280] There are extensive lead mines in "the mining district of Weardale, in the upper part of the valley of the River Wear, and its tributary valleys of Burnhope, Kilhope, Wellhope, Ireshope, Rookhope, &c."

[p.281] In lead mines "the general use of levels or galleries large enough to admit of horses travelling in them, is said to have introduced into the lead mining districts by Sir Walter Calonby Blackett about one hundred and twenty years ago [1740], but the example was not, as I believe, followed for many years by other mine owners. Cast-iron rails, instead of wood, were first used in Nrent Force Level."

[p.284] Concerning steel manufacture. "The Bessemer process of making steel has also been introduced into the district, at Tudhoe, near Ferryhill, but with what success the writer is not able to say. The operation, as is generally known, consists of blowing atmospheric air through a mass of melted cast-iron until the carbon and the whole of the impurities of the iron are burnt out of it."

Mining and Smelting Magazine, 3 Nov 1863, vol. 4, p.304

"It is reported that new works for making steel are to be built at Tow Law, by Mr. Charles Atwood."

[These works were planned to be built at Tow Law, using the cast steel process patented by Attwood in 1862, but Baring Brothers did not support this, so Attwood built separate new works at Wolsingham, as reported on 3 June 1864.]

Mining and Smelting Magazine, 3 Feb 1864, vol. 5, p.106

State of blast furnaces on 1 Jan 1864:

No change in Weardale; Stanhope = 0 in, 1 out; Towlaw = 4 in, 1 out; Witton Park = 4 in, 0 out.

Mining and Smelting Magazine, 3 Apr 1864, vol. 5, p.236

State of blast furnaces on 1 Mar 1864:

5th furnace at Towlaw now in blast; Stanhope = 0 in, 1 out; Towlaw = 5 in, 0 out; Witton Park = 4 in, 0 out.

Mining and Smelting Magazine, 3 May 1864, vol. 5, p.295

State of blast furnaces on 15 Apr 1864:

Furnace at Stanhope now in blast, all Weardale furnaces now in blast; Stanhope = 1 in, 0 out; Towlaw = 5 in, 0 out; Witton Park = 4 in, 0 out.

Mining and Smelting Magazine, 3 Jun 1864, vol. 5, p.353

State of blast furnaces on 1 May 1864:

No change in Weardale, all in blast; Stanhope = 1 in, 0 out; Towlaw = 5 in, 0 out; Witton Park = 4 in, 0 out.

"The steel works which Mr. Charles Attwood and partners have erected in the neighbourhood of Tow Law have been opened, and it is said that cast steel will be manufactured there by a process discovered by Mr. Attwood, at a much reduced cost."

"A prospectus has been issued of the Harehope Gill Lead Mining and Smelting Company, ... with the object of purchasing the plant and the residue of 17 years of the lease of a mining estate of about 900 acres at Weardale, Durham. ..."

[This is the opening of the Stanners Close steel works at Wolsingham, built by Attwood who set up Stanners Close Steel Company, independent of Weardale Iron Company. On 23 July 1863 Weardale Iron Company had become The Weardale Iron & Coal Company Limited, which probably reduced Attwood's influence and led to his building the new works to exploit his patent at Wolsingham, not at Tow Law as planned earlier and reported on 3 Nov 1863.]

Mining and Smelting Magazine, 3 Sep 1864, vol. 6, p.167

State of blast furnaces on 5 Aug 1864:

No change in Weardale, all in blast; Stanhope = 1 in, 0 out; Towlaw = 5 in, 0 out; Witton Park = 4 in, 0 out.

"Another important purchase of iron and coal works has just been completed, through Messrs. Chadwick, Adamson, M'Kenna, and Co., of London and Manchester, the agreement having been signed for the transfer to a company to be called *Bolckow, Vaughan, & Co., limited, of the works and property of Messrs. Bolckow and Vaughan*, at Middlesborough, Witton Park, Eston, White Lee, Woodifield, Shildon, West Auckland, and other places in Yorkshire and Durham, at which establishments more than 9,000 persons are employed. The whole of the properties and stock are taken by valuation, and the estimated total purchase-money will be about £1,500,000. ... A deposit of £20,000 has been paid, and a further sum of £230,000 will be provided in January next, when possession will be given to the new company. ..."

Mining and Smelting Magazine, 3 Nov 1864, vol. 6, p.298-299

"At Witton Park the trade for plates and rails is reported never to have been better, and the masters have large orders on their books."

State of blast furnaces on 14 Oct 1864:

No change in Weardale, all in blast; Stanhope = 1 in, 0 out; Towlaw = 5 in, 0 out; Witton Park = 4 in, 0 out.

Mining and Smelting Magazine, 3 Dec 1864, vol. 6, p.361

State of blast furnaces on 19 Nov 1864:

No change in Weardale, all in blast; Stanhope = 1 in, 0 out; Towlaw = 5 in, 0 out; Witton Park = 4 in, 0 out.

Mining and Smelting Magazine, 3 Feb 1865, vol. 7, p.117-118

A summary is given of the annual report of the Cleveland iron trade, produced by Messrs. Stephenson & Co. in Jan 1865 for year 1864. **"The demand for manufactured iron was good at the beginning of the year [Jan 1864], but, owing to stagnant state of the iron shipbuilding trade, and from other causes, it has greatly diminished, and prices consequently are low, and barely remunerative. The labour question has assumed a very grave aspect, and unless the workmen consent to a reasonable reduction in their wages, the manufacturers must, in self-defence bring their works to a stand."**

State of blast furnaces at end of 1864 (from Messrs. Stephenson & Co. report):

2 furnaces at Tow Law and 1 at Stanhope now out of blast; Stanhope = 0 in, 1 out; Tow Law = 3 in, 2 out; Witton Park = 4 in, 0 out.

[This is quite surprising, since on 19 Nov 1864 and on 3 Feb 1865 all Weardale furnaces were in blast. But it was probably temporary stoppages due to low prices.]

Mining and Smelting Magazine, 3 Mar 1865, vol. 7, p.186-187

"The iron trade of this district has been rather dull and unsettled; but prospects are stated to be somewhat brighter. On February 18th, notices were posted up at nearly all the iron-works, that unless the men now on strike in North Staffordshire go in by the 11th of March, all the puddlers in Great Britain will be locked out. Some dissatisfaction has been shown by the men with regard to the reduction in prices, but not to an extent to excite apprehensions of a protracted strike."

State of blast furnaces on 3 Feb 1865:

All Weardale furnaces in blast; Stanhope = 1 in, 0 out; Towlaw = 5 in, 0 out; Witton Park = 4 in, 0 out.

The "Mining and Smelting Magazine" of 3 Mar 1865 is the last one on-line on the internet. It is unknown whether the magazine was issued in Apr 1865 and later, although the March 1865 issue called for advertisements for insertion in the April 1865 issue to be provided to the publisher before noon on Sat April 1st 1865.