

SMELTING MILLS IN THE UPPER DOVE VALLEY

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ABSTRACT: As well as the well known smelting works at Ecton, Whiston and Froghall, there were a number of small mills processing copper, lead and zinc ores in the Upper Dove Valley. These operated spasmodically in the late-seventeenth and eighteenth centuries. The known history of these smelting mills is summarised and brought up to date.

The River Dove forms the boundary between Staffordshire and Derbyshire, from its source near Buxton to where it joins the River Trent near Burton upon Trent. The upper part of the river, north of Mayfield, is one of Britain's most scenic areas, with large parts of it owned by the National Trust. Its beauty has been recognised over the centuries, while the millions who visit it every year regard it as a completely unspoilt part of rural England, but in fact even here there has been industrial activity.

The surrounding limestone hills of the Peak District have for centuries had a prosperous mining industry, extracting the lead ore galena, the zinc ore, calamine, (used in brassmaking) and copper ores (mainly from the Ecton Mines in the Manifold Valley, a tributary of the Dove). Most lead smelting was done further north, particularly nearer to the sources of fuel to the northeast of the limestone area. Although some copper smelting took place at the Ecton Mines, most of it was smelted at Whiston in the Churnet Valley. Nevertheless there were some small-scale operations in the Dove Valley — two of them in the heart of Dove Dale itself. This short note records their history and also updates what has already appeared in print.

These mills are considered from north to south

GREENLOWFIELD LEAD SMELTING MILL

A lead smelting mill had been started some time before October 1739 at Greenlowfield or 'Regis End' in the parish of Alstonfield, when it was agreed to finish the mill, its dam, floodgates and watercourses. Details of the leases and the personalities involved have already been given (Robey 1970). After some difficulties the mill had been completed for the 'smelting and running of lead ore' by July 1741.

Shortly afterwards it was described as having two hearths, with 'Mill Pools, dams, floodgates, wheels, Bellows and other Utensils and Implants'. The lead ore probably came from Ecton, as those involved in the mill also had shares in the mines there, or possibly from the Bincliffe Mines further down the Manifold Valley. Of the mill's subsequent history nothing is known, although it probably had ceased smelting by 1760.

The location of this mill has been uncertain, but it is now thought to be Lode Mill, just north of Mill Dale (the name may well be a corruption of Lead Mill), as a nearby field (although on the Derbyshire side of the river) is known as Greenlow.

MILL DALE CALAMINE MILL

The only references to this mill appear in a ledger of the Cheadle Brass and Copper Company. This ledger is in private hands in Cheadle, but the author has a copy of the notes made from it by the late Herbert Chester. It covers the period 1730-64, and seems primarily to be accounts for calamine.

As zinc metal was so difficult to extract from its ores, the early methods of making brass (a copper and zinc alloy) involved heating copper metal with calamine (Smithsonite or zinc carbonate) and charcoal in a crucible. The charcoal reduced the calamine to zinc which immediately alloyed with the copper granules. This was also known as the cementation process.

Before use the calamine had to be cleaned, ground to a powder (usually with a vertical edge-crushing millstone) and roasted for about 6 hours. This converted the zinc carbonate to zinc oxide and removed excess moisture. This reduced its weight by 35% or up to 50% if the ore was wet, so it also eased transport costs. After roasting the calamine became lumpy and had to be ground again before being sent in sacks to the brass works. It was these initial processes of roasting and grinding that were done at Mill Dale, so it was not strictly a smelting mill (even though it is referred to as such in one instance), rather it was a roasting and grinding mill. Although horse power was often used to crush the ore, presumably at Mill Dale water power was used to turn the grinding stones.

The earliest reference to Mill Dale is in 1750 when almost 13 tons of coal was delivered to the "Cally House at Milldale". There were also "Ex[penses] pd for building the Calcining Furnace, Materials £11 . 18 . 2", which presumably refers to Mill Dale. By the end of the year calamine was being sent to the mill from Croom (? Chrome Hill) and Parkhouse Hill near Longnor in Upper Dovedale, Biggin and from further afield in the Peak District, such as Sheldon near Bakewell.

By early 1751 there were expenses at "building Calcining Furnace at Milldale" and for "the Mason at Alstonfield ... for his building the Cally Furnace". The latter reference confirms that it was the Mill Dale in the Dove Valley and not any other dale with a similar name (such as Millers Dale near Tideswell, which was called Miln Dale in the eighteenth century).

The roasted calamine was sent from the Mill Dale furnaces to the Cheadle Company's brass works at Old Spout and New Spout (now known as Brookhouses) near Cheadle (Morton 1983).

Soon the Thorswood Mine on the Weaver Hills became a major source of raw calamine, with ore being sent from there in 1751-2, 1759-60 and 1764 (Robey & Porter 1971). Calamine also came from mines at Tideswell, Monyash, Youlgreave, and Castleton. There was even a "Journey to Llanymynech in Shropshire to see about Callamine there".

In 1752 12cwt of calamine "for Druggists" was produced. This was, presumably, purer than the usual grade and ground finer to make into calamine lotion.

The latest date at which the Mill Dale furnaces are specifically mentioned is 1759, after which time it is not known if the mill continued working. It is likely that after a promising start the

output from the Thorswood Mine did not live up to expectations, and so there were no local sources of ore of any consequence. The Cheadle Company are likely to have concentrated their efforts at their Bonsall calamine mill, which operated from the 1750s to about 1830 and was closer to the mines of the Matlock/Cromford/Winster area where calamine was also an important mineral in addition to the galena usually produced.

By the nineteenth century the site was used for grinding colours for paint (calamine could also be used to make a whitish zinc-based paint) using locally mined iron ores. Today there is just a small building which houses a National Trust information office, together with a later millstone in the remains of the wheelrace. A photograph survives which shows a mill building on the opposite (Derbyshire) side of the river, but as the wheelrace is on the Staffordshire side the site is not easily explained and more investigation is necessary.

ELLASTONE

There was a copper smelting mill at Ellastone in the late seventeenth century, and although the reader is referred to an earlier article for fuller details (Robey 1969), a map of the nearby Calwich Estate has recently come to light which shows the exact location.

The mill was built, or modified from an existing building, in 1660-1 and was owned by Sir Richard Fleetwood, who owned Calwich Hall and Wooton Lodge. He had a long interest in lead and copper mines, and although there are only a few scattered references he worked the Burgoyne royalty at Ecton in the Manifold Valley (ie. the Clayton Mine, not the main Ecton Copper Mine which was owned by the Dukes of Devonshire).

In 1665 the Ellastone mill was let to a Mr Mumma; this is almost certainly Jacob Mumma, a "Dutchman" who had a brass wire mill at Esher in Surrey. He was an important, although enigmatic, figure in the copper and brass industry at that time.

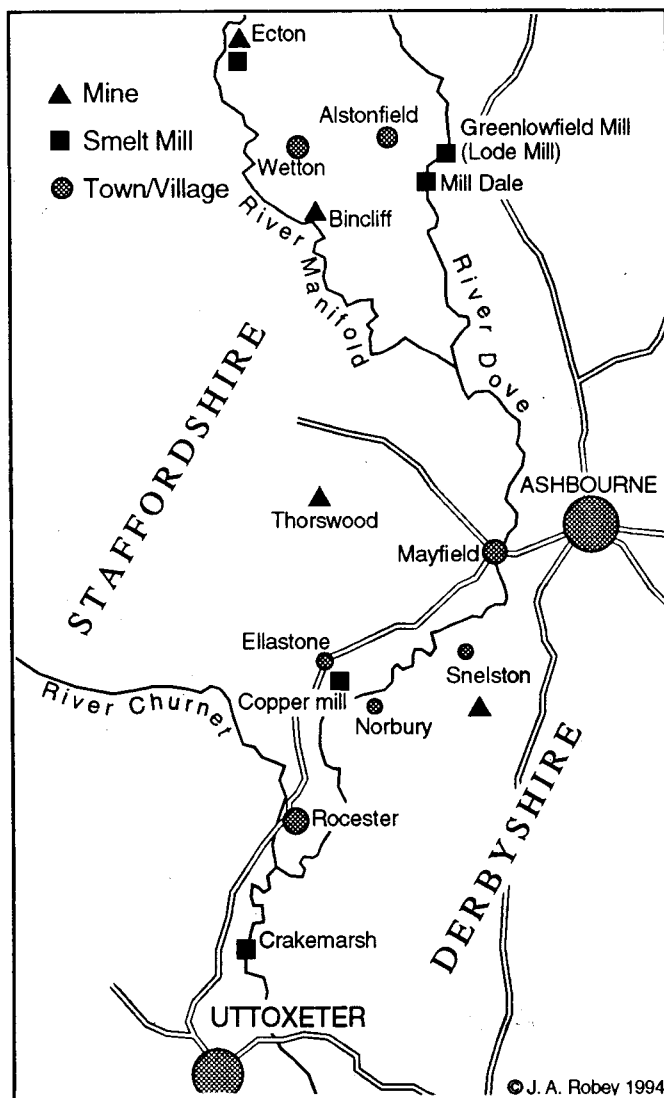
In 1660 £8 7s was paid for "Leather and hides for bellows", but when Dr Robert Plot visited the area 20 years later he reported that the copper from Ecton had been:

"Smelted at Ellastone not far off [it is actually 9 miles away in a direct line, and much further by road], where they had mills, etc., for the purpose; but all was out of order before I came thither, and the famous wooden bellows that had no leather about them carried away to Snelston in Derby-shire".

Plot includes an engraving of these bellows, described as "Designe of a foreigne Engine". As the original bellows *did* use leather (see above) this innovative design had probably been introduced by Jacob Mumma when he took over in 1665.

Ellastone was not an obvious choice of site for copper smelting if the main source of the ore was from Ecton. It was close to supplies of wood for fuel and it was, of course, close to Fleetwood's estate, but if ore from Snelston only 2 miles away was smelted there, or if Fleetwood had a financial interest in the Snelston mines, then this would have made the siting of the mill more understandable. There was a small copper mine near Fleetwood's Wooton Lodge so ore may also have come from there.

The location of the mill can now be pinpointed from a map of the Calwich estate from the 1730s (Staffordshire Record Office D3730/1). This shows the 'Copper Mills' with buildings and a waterwheel, approximately halfway between the corn mill on Dove Street (both fed by a stream flowing into the Dove) and the bridge over the river leading to Norbury, where there was



another corn mill. A neighbouring small field is shown on the map as 'The roasting-house piece'. There are now no traces of the copper mill apart from a stone bridge, which today serves no purpose apart from being a field access, but it may have once been associated with the copper mill.

CRAKEMARSH

A copper works of some sort existed at what is probably Crakemarsh, between Uttoxeter and Rocester. The only reference to it is given in the diaries of Celia Fiennes, who travelled round Britain in the late seventeenth century (Morris 1949, Robey 1974). In 1697 her journey took her through Ashbourne, where she mentioned copper mines, presumably those near Snelston on the Derbyshire side of the River Dove. Then:

"... just before we came to Uchater [still the local pronunciation of Uttoxeter] we pass by a very exact House and Gardens of one Mr Cotten a Justice of Peace, its brick and coyn'd with stone [ie with stone quoins at the corners] ... but it stands in a low moorish ground; to show this worlds goods is not perfect but has its fould as well as faire side, and with all its conveniency's must labour under some difficultyes, we pass thro' a deep and long water just by, but the bottom was hard gravell, this supply's several mills which are used for their preparing the metal they take out of the mines, I had a piece of Copper given me by one of the Managers of them".

The editor of the journal assumed that Mr Cotten was Charles Cotton the poet, and the house was Beresford Hall. This must be incorrect for not only was Beresford Hall near Hartington, 8 miles north of Ashbourne, while Celia Fiennes was clearly south of Ashbourne, but Charles Cotton had been dead for 10 years and the hall had been sold out of his family. What does fit the description is Crakemarsh Hall, owned by a Mr Cotton unrelated to the poet. Not only is this close to the road along which she travelled, but there was indeed a ford across the Dove here. (The present derelict building is a later Georgian building and not the one that Celia Fiennes saw). The implication is that the ore came from the Snelston Mines. This mill appears not to be the smelting mill at Ellastone which had closed down more than 10 years before, but its exact location is not known and no further other references are known.

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