

Chatsworth and Buxton: *built on copper!*

Visitors to the Peak District marvel at the splendour of Chatsworth House and the elegance of the Crescents at Buxton — but how many will know that the fourth Duke of Devonshire financed these wonders with the revenue from a single copper mine? Steve Brown reports.

VISITORS to the beautiful - and tranquil - upper Manifold Valley today would scarcely believe that the green and verdant hillsides of Ecton were once the scene of industrial activity on a huge scale, both above and below ground. The discerning might notice pock marks and shafts on the hillsides or spoil heaps hidden in the woodlands but all is peaceful now. Yet this was the site of the Peak District's only copper mine and an industrial enterprise of great local and national significance.

Recognising this, in 2008 the National Trust purchased just over 21 acres of land from the estate of the former owner of the Ecton Mine which included buildings of national importance to the UK's industrial heritage and set about, with the assistance of the Ecton Mines Educational Trust, developing the area's massive potential for

understanding the processes of ore extraction and metal production from pre-history to the post medieval period and for the interpretation of the same to both professionals and the public.

Ecton Mine is one of only two English sites where there is evidence of mining pre-history, the other being at Alderley Edge in Cheshire. Evidence discovered at the mine only recently clearly demonstrates the mining of ore there in the Bronze Age. Worked extensively from the 17th century, it was also home to some of the most innovative mining technology in history and its rich veins of ore were meeting about 50 per cent of the UK's demand for copper in the 1780s when the mine was at its most productive and providing employment for some 400 workers. The copper was largely used in brass and as a sheath for the wooden hulls of ships. Previously



The man who made a fortune from copper: William Cavendish, the 4th Duke of Devonshire.

worked on a lease by two companies of "adventurers", the fourth Duke of Devonshire saw the potential for large revenues when a massive pipe deposit, rich in ore, was discovered in 1760 and chose to work the mines with "in-house" labour at great profit until the 1820s. At its peak in



The wooded entrance to the National Trust's Ecton Hill site.



The Powder House at Ecton, where the explosive were stored.



The entrance to the Ecton Deep Level tunnel.



1786, the mine produced over 4,000 tonnes of copper ore at a profit to the Duke of £40,000 per annum - the equivalent of £6 million today! However, in the late 1780s, the ore began to run out so the Duke decided to return to leasing out the mineral rights to others. Mining continued with varying degrees of success through the 19th century, finally ceasing in about 1891. The mine itself, the mineral rights and the associated land was eventually purchased in the 1950s by the late Geoff Cox, a mining engineer, who recognised the historical significance

of the site and wanted to preserve it for the benefit of others. After Geoff's death, the Ecton Mines Educational Trust was established in 2005 as per his wishes and now owns Salts Level, the adjacent upper dressing floors for the minerals, the adjacent field studies centre and the mineral rights for Ecton Hill.

The mine at Ecton lies within a complex area of distorted limestone rock containing a source of copper ore which is unusual in the Peak District, being normally associated with lead mining. The main

ore at Ecton is chalcopyrite (CuFeS_2) and the main ore body ran in an irregular vertical "pipe" about 90 feet wide east to west. The mine became synonymous with innovation; it saw the first use of gunpowder (black powder) in mining in 1665; in 1767 an underground canal was in use below the Apes Tor level, where boats took ore to the shaft bottom, from where it was taken to the surface for dressing.

Women and children worked on the dressing floors: Women used hammers to break up the ore into small pieces and boys then barrowed the ore to a shed where young girls sorted it into three different grades. It was then beaten down further into finer grades, then taken to the 'buddles' - large artificial



The Engine House high on Ecton Hill is a reminder of the area's rich industrial history.

ponds - where it was mixed with water and poured down a sloping surface to separate out the denser ores from the rock residues. Evidence of these dressing floors and 'buddles' still remain today on the site among the trees above the valley road and they are classified as 'Scheduled Monuments'. As the mining became deeper to follow the

"It saw the first use of gunpowder in mining in 1665"



A view of some of the mine's old buildings and spoil heaps taken around 1905-7, also showing Ecton Church, which may have been built for the men working on the Manifold Valley Railway, which opened in 1904. Courtesy of Staffordshire Museum Service.

ore, the need to pump water out of the mine became ever greater and an underground water pumping engine housed within a vast man-made cavern was built in 1783, raising water up to Ecton Sough. The Deep Ecton pipe was eventually worked to a depth of 330 metres (1,090 feet) below the ridge top. By then, something far more powerful than the horse gin at the top of the shaft was required to wind the ore up from the depths. Thus, in 1788 a steam-powered winding engine of the latest type built by Boulton and Watt from Birmingham was installed in an engine house (now thought to be the oldest mine winding engine house in the world) at the top of the main shaft. Students at the Field Study Centre can now inspect for themselves copies of the original technical drawings for the engine to see how it was set up within the engine house (the original drawings are within the Boulton archive at Birmingham Museum). This engine lifted ore from Ecton Deep Level but also raised enough water from the depths to supply its own needs! The winding rope alone weighed

one tonne so a balance rope was added and this eventually had a separate shaft provided after an accident in which the balance weight fell down the main shaft, fortunately without causing any injury. An innovative system of dials indicating depths was connected to the engine, enabling the operator to judge when a load of ore from the depths had reached a spot in the main shaft where it could be unloaded into a level to be taken out of the mine. The mine workings eventually reached 400 metres (1,300 feet) below the surface but the ore deposits were very much smaller by then.

After the National Trust acquired the land at Ecton Hill in 2008 a management plan for the site was developed and is now being followed through. As well as its industrial heritage, the site contains woodland and mixed grassland including some fine plants like wild thyme, fragrant orchid and mountain pansy. A schedule of work was drawn up to repair the engine house and the powder house and, with the help of a

grant from Natural England, roof repairs, structural work and site improvements were carried out last summer. This year, work will be carried out on the interior of the engine house which, at one time, had a tall chimney reminiscent of the engine houses above the Cornish tin mines but this collapsed when the engine house fell into disuse and while its remains are obvious there are no plans to return it to its original glory. The small powder house was constructed to store explosives used in the mine; thick walls and a light roof ensured that any unfortunate explosion would be directed upwards rather than outwards!

Paul Mortimer, the National Trust's Projects Officer in the White Peak area, said they planned to provide a small number of interpretation boards on the site plus a "listening post" within the engine house so that visitors

can learn more about its fascinating history.

The National Trust is also now running "Ecton Overground And Underground" tours, taking visitors across the hill before venturing into the depths of Salts Level to see what remains of the workings underground. After the heavy metal gates guarding the underground entrance have been swung open, parties can be taken some 100 metres into the hillside along a tunnel leading to the main shaft and ore pipe workings where

miners toiled with pick and shovel by candlelight to hew the precious ore from the depths.

The tunnels into the mine through

unproductive rock were cut by the miners for a "bargain" - the price per fathom of stone worked agreed with the mine owners. Often the outlines of the chisel strokes made by the miners can be seen on the walls and the roofs of the tunnels they made. Veins of minerals can still be seen sparkling in the beams of head torches. The deepest of the hewn caverns is now flooded to a depth of over 1,000 feet, a scarcely believable feat given the tools available and the working conditions the miners endured.

Editor's Note: The National Trust is running two such tours this year and hopes to run more in 2014: all relevant safety equipment is provided but visitors should ensure that they themselves have adequate clothing and footwear for both parts of the tour. Details of the tours and how to book can be found on the National Trust events website at www.nationaltrust.org.uk/white-peak/.

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■ Buxton's stunning Crescent – built with the profits from the Ecton copper mine.

