



## How to find us



A lone survivor:  
a gooseberry bush  
in the abandoned  
gardens of Beulah  
Cottages. Photograph  
courtesy of David  
Dawson.

### West Somerset Mineral Railway

Visit [www.westsomersetmineralrailway.org.uk](http://www.westsomersetmineralrailway.org.uk) for further information about the Mineral Line, the Heritage Lottery funded project, a selection of images and educational material.



Large font versions of these leaflets are available to download from [www.westsomersetmineralrailway.org.uk](http://www.westsomersetmineralrailway.org.uk).



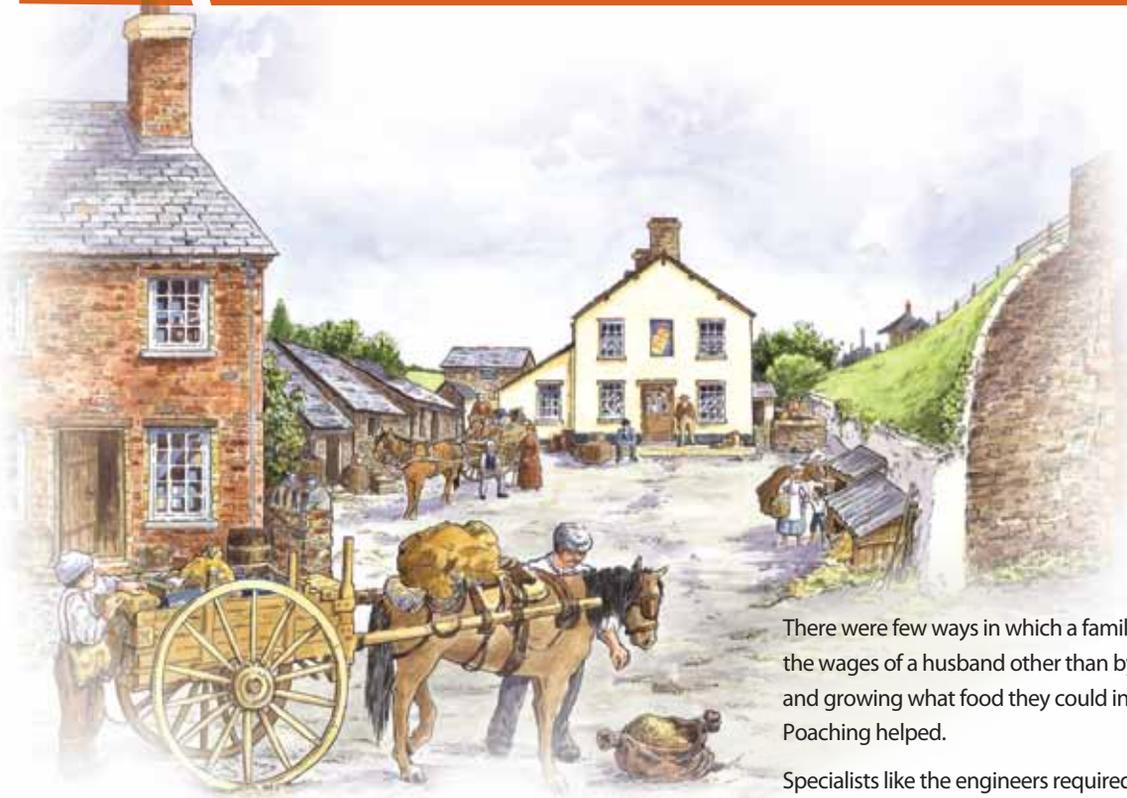
## Winning the iron ore



# West Somerset Mineral Railway

THE  
OLD  
MINERAL  
LINE

## Miners and others



In 1881 the Census returns show that out of a total of 194 miners, 64 lived at Brendon Hill, 19 at Gupworthy and the rest at various places near the mines. There were also 80 surface workers. There may have been a few children working to assist blacksmiths and the like, but there was little opportunity for women as the ore did not need dressing and they were forbidden to work underground.

There were few ways in which a family could find ways of adding to the wages of a husband other than by taking in a lodger, keeping a pig and growing what food they could in the small cottage gardens. Poaching helped.

Specialists like the engineers required to install and maintain pumping equipment were recruited from elsewhere but until the 1860s most miners were local former agricultural labourers attracted by the higher wages. During the 1860s they were joined by experienced miners from Cornwall driven to move by the recession in copper.

The Company provided housing. The largest settlement was developed around the head of the Incline at Brendon Hill. Most of the buildings here have now disappeared. Most prominent of the survivors is Beulah Chapel built in 1861 by the Bible Christians.

An artist's reconstruction of Brendon Hill Village. Drawing by Anne Leaver.

Cover image: Ore being trammed from Colton pits adit to a nearby stockpile in 1907. The gaffer stands by with his notebook. Photograph by Bert Hole, courtesy of Mike Jones.

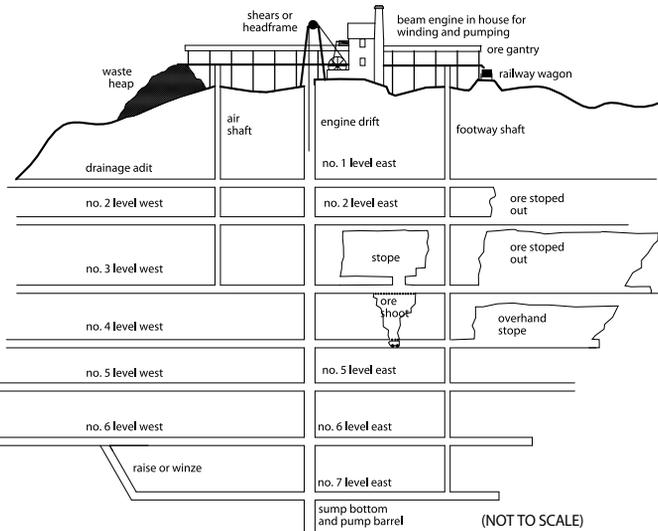
# West Somerset Mineral Railway

## The Brendon Hill iron mines

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Brendon Hill is the narrow eastern end of a belt of country rich in mineral lodes particularly of iron extending from Morte Bay in north Devon. They follow the structure of the country rock, mostly slates and sandstones, and dip at about 70°. Where these lodes reach the surface they were exploited by digging simple pits and opening out the workings underground. These 'bell-pits' were probably used across Exmoor to win iron ore since Roman times.

Individual lodes are highly fragmented which makes finding and mining them underground difficult and financially risky. The usual method of mining metal ores is by stoping. The lode is worked sideways and upwards so that the ore falls to a collecting area formed of stout timbers called stulls from where it can be fed into trams.



The levels are about 8-10 fathoms (48-60 feet) vertical distance apart. The engine drift slopes to the south at the same angle as the lode - about 55°-65°.

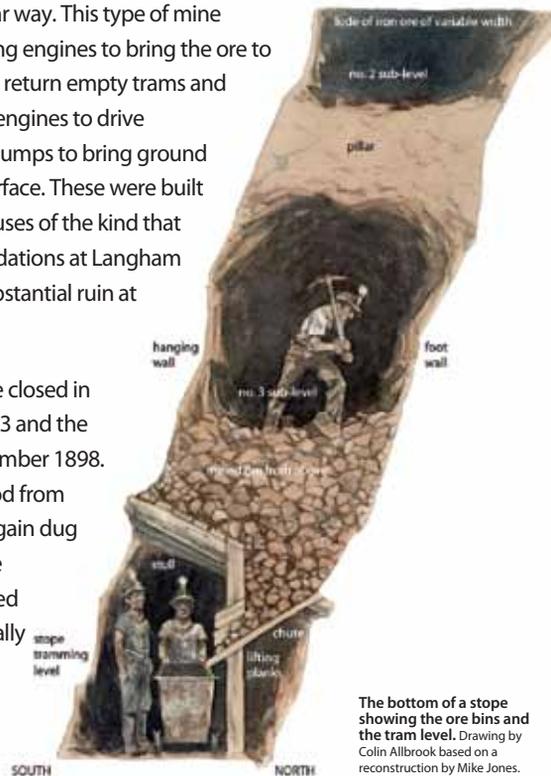
A typical Brendon Hill iron mine. Courtesy of Mike Jones.

### Finding the ore

The simplest way of finding lodes was to drive an adit in from the side of the hill as at Bearland. An adit is a tunnel, sloping slightly upwards to drain the water away, driven southward to pick up the lodes which hang almost like curtains across the path of the adit. Once found the lode will be worked by stoping and the adit serves to bring out the ore and drain the mine.

A second method was to drive shafts from the top of the hill as at Raleigh's Cross Mine and from these drive horizontal levels to find the lodes in a similar way. This type of mine required winding engines to bring the ore to the surface and return empty trams and massive beam engines to drive underground pumps to bring ground water to the surface. These were built into engine houses of the kind that survive as foundations at Langham Hill and as a substantial ruin at Burrow Farm.

The mines were closed in September 1883 and the railway in November 1898. For a brief period from 1907 ore was again dug and parts of the railway reopened but all were finally closed in 1910.



The bottom of a stope showing the ore bins and the tram level. Drawing by Colin Allbrook based on a reconstruction by Mike Jones.



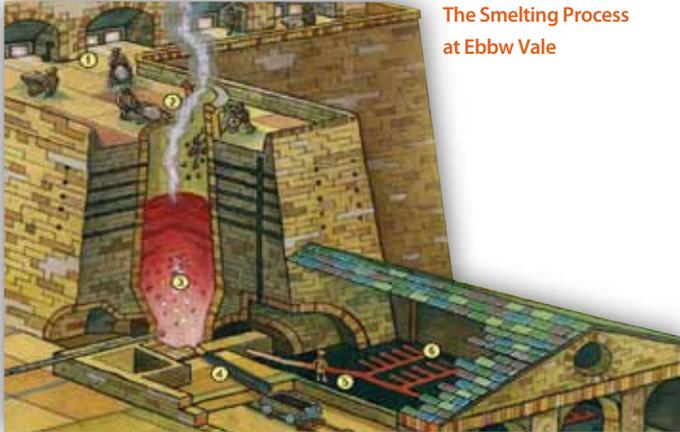
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## What happened to the ore?

There were no facilities for smelting iron on an industrial scale in west Somerset. The railway was built to take the ore down to Watchet so it could be shipped to Newport and taken by canal and rail to the furnaces at Ebbw Vale in south Wales.

The kind of iron ore won from Brendon Hill required the extra expense of roasting before it could be turned into iron. Its high carbonate content proved valuable in producing steel by the Bessemer process but once cheaper similar ore from Spain became available Brendon Hill could not compete on price.



The Smelting Process  
at Ebbw Vale

Illustration by Leo Davey.

- 1 Calcinating kilns were used to roast the iron ore. It was then stockpiled along with limestone for flux and coke for fuel.
- 2 Specific quantities of these materials were measured in the charging house and tipped into the furnace.
- 3 The contents grew incredibly hot as they settled in the furnace. At 1,500C it turned into a molten mass of iron and slag.
- 4 The floating slag on top was drained into wagons by knocking out a clay bung from the slag notch and taken to the tips.
- 5 After one last draining of slag the iron was tapped from a lower hole. The molten metal was guided into channels that were dug into the cast houses' sand floor. The molten metal branched into sows and pigs until it ceased to flow. Then, with fire clay, the tap hole was re-sealed.
- 6 When the pigs solidified they were dug out and the sand was prepared for the next tapping and a few hours later the furnace was ready to be tapped again.

### The people - Morgan Morgans

Born in 1816 in Carmarthenshire, Morgans was an experienced colliery manager by the time he came to the Brendons in 1858 to develop the mines. In 1859 he agreed to act as engineer to the West Somerset Mineral Railway. By the time he left in 1867 he had greatly improved mining practice and productivity, installed the winding machinery at the top of the Incline and supervised the construction of the railway along the Hill. Output of ore exceeded demand. He probably left frustrated at the Company's inability to sell the ore - over 80,000 tons were stock-piled.



Captain Morgans, c. 1865.  
Photograph courtesy of Mike Jones.

### Shops

For several years John Vickery's shop at the Bampton Road stores was the only purpose built shop at Brendon Hill. Some miners' wives, such

Blast furnaces at Victoria, Ebbw Vale. Photograph courtesy of Mike Jones.



A hidden heritage



as Jane Goss, who lived in one of the company cottages at Gupworthy described herself as a 'shopkeeper' in the 1881 census. Women like her evidently opened small 'huckster shops' in the front room of their cottages selling basic foodstuffs like flour and bacon.

### Accidents

Mining was a dangerous living. There were frequent accidents caused by incautious handling of black powder, the explosive used to break ore free from the lode. Falls down the underground shafts were usually fatal. Even someone as experienced a mine manager as David Richards died instantly together with a young miner, John Davey, on 9th May 1858. They had walked into a pocket of carbon dioxide whilst exploring a disused level at Raleigh's Cross mine.



Miner Mr Reed (far left) and other miners at Colton Pits, c. 1907.  
Photograph courtesy of Mike Jones.

### Key



Wheelchair accessible



Pushchair accessible



Toilets



Car parking



Watchet Market House Museum



Watchet Town Council



West Somerset Railway



Somerset County Council



Scheduled monument



Exmoor National Park Authority



Forestry Commission



Information point

**Watchet** - is the ideal starting point for exploring the West Somerset Mineral Railway. Discover the harbour town of Watchet, see where iron ore was loaded onto ships bound for south Wales, and visit the Market House Museum.



**The Watchet to Washford Trail** - walk along the former track bed of the West Somerset Mineral Railway. The trail is a stroll on the flat of approximately 2 miles (3.2 km).



**The Incline and Winding House** - is a spectacular piece of Victorian engineering which took four years to build. It opened in 1861 to lower wagons of iron ore down a 1 in 4 slope to the valley below, where it was transported by rail to Watchet. Enjoy magnificent views across the Brendons to Wales, and explore the conserved Winding House. The Incline: OL9 Grid reference ST 023 344.



### Langham Engine House and Bearland Ventilation Flue

**Chargot Woods** - is a peaceful place with a lively history. Forestry Commission trails will help you explore the industrial remains of a way of life that was difficult, dangerous, and short lived. The Langham Engine House trail is suitable for all abilities. Chargot Woods: OL9 Grid reference SS 975 355.



**Burrow Farm Engine House** - the remains of this Engine House were conserved by Exmoor National Park Authority in 1990. The Engine House is now on privately owned land, and there is a permitted footpath to the remains of the Engine House.

Please note that visitors are not permitted during April, and no dogs are allowed on site at any time of the year. This site can be reached through the public rights of way network. Parking is on the grass verge before Naked Boy Stone: OL9 Grid reference ST 015 344.