



*‘There and
back again’*

The story of a Waterwheel

Paul Tucker

January 2024



21328 Gawn's Water Wheel



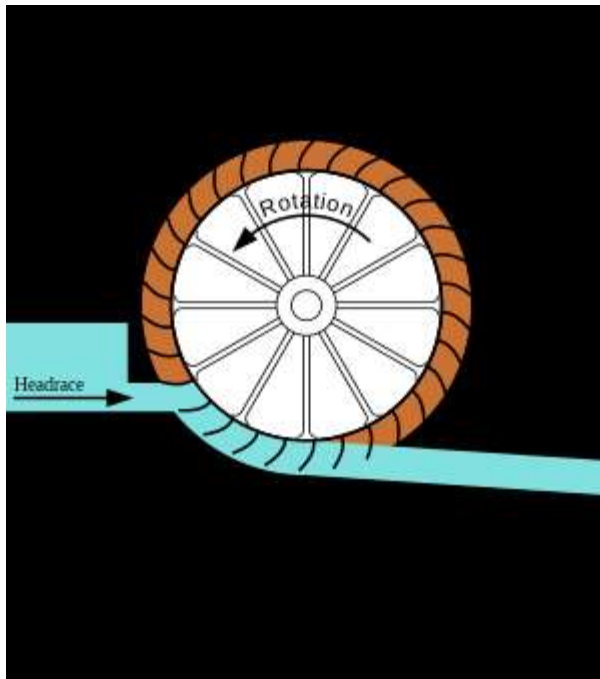
HOW DID THIS PROJECT START?

- In 2023, while visiting our daughter who lives in the Isle of Man, I heard about the Snaefell Mine Disaster.
- When the mine closed, its Waterwheel was sent to a clay pit on Bodmin Moor.
- My interest in Industrial Archeology was aroused and I wanted to know more!
- This is what I know so far

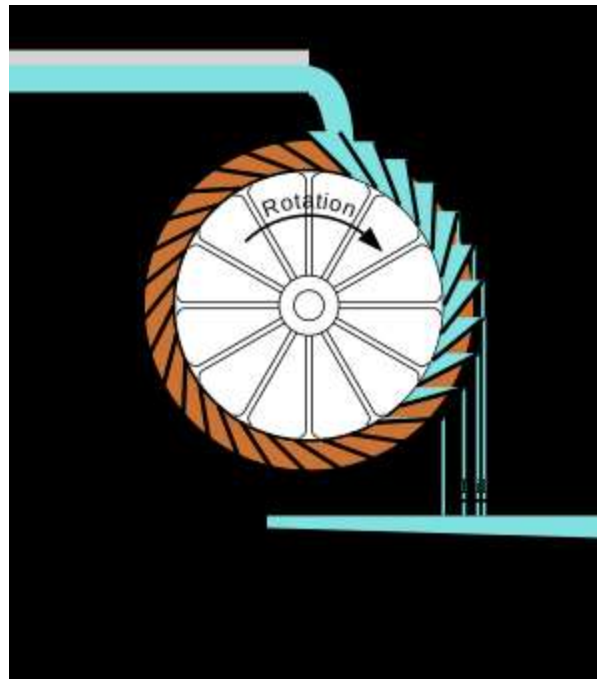
But first: WHAT IS A WATERWHEEL?

- A machine for converting the energy of flowing water into useful forms of power.
- Often used in a Watermill to grind corn.
- A Waterwheel consists of a wheel with a number of 'buckets' arranged on the outside rim to catch water.
- In commercial use well into the 20th century, but not in common use now.

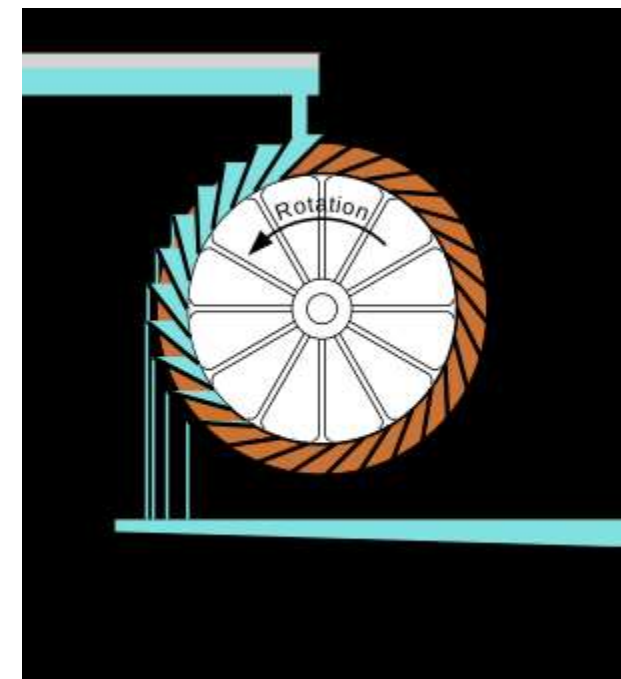
TYPES OF WATER WHEEL



Breastshot



Overshot



Backshot

There and back again, the story of a waterwheel

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Isle of Man

- The story starts in the Isle of Man.
- Then moves to Cornwall.
- Finally, back to the Isle of Man.



- There are also Welsh connections.



Cornwall





**Snaefell Mine
Isle of Man**

45 years

**Blisland
Cornwall**

40 years

Disuse

26 y

Wales

27 y

**Laxey
IOM**

21 y

1865

1910

1950

1976

2003

2024

SNAEFELL MINE WATERWHEEL – TIMELINE



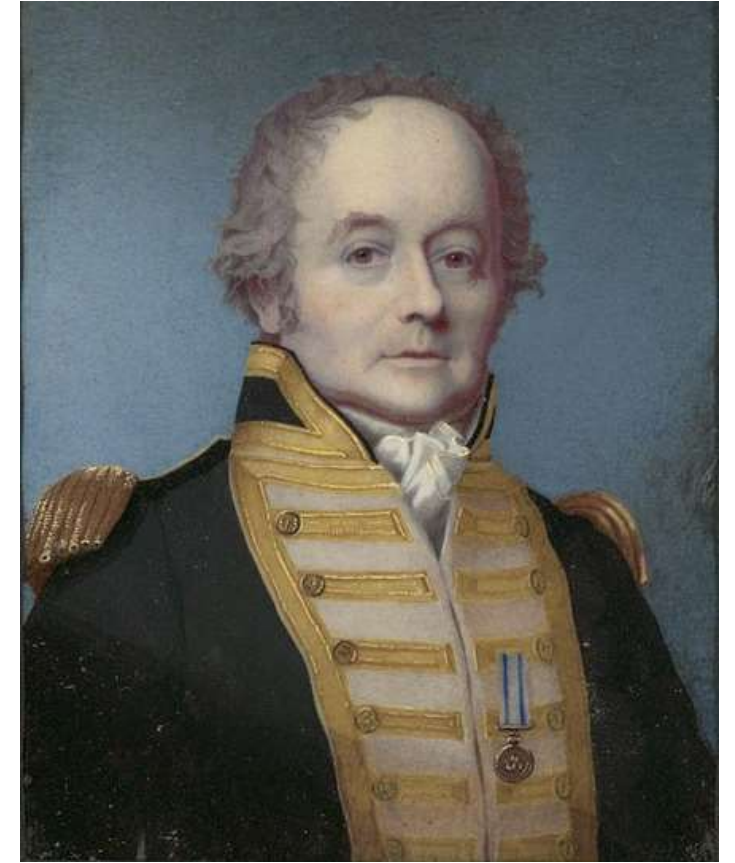
ISLE OF MAN

- In the Irish Sea between England and Ireland.
- Ancient Kingdom, not part of the UK.
- Self-governing British Crown Dependency Head of state Charles III, Lord of Man.
- Represented by a Lieutenant Governor.



ISLE OF MAN – Connection to St Tudy

- William Bligh was born on 9 September 1754.
- Ancestral home: Tinten Manor in St Tudy.
- He became a Vice-Admiral in the Royal Navy and a colonial administrator.
- He married Elizabeth Betham from the Isle of Man on 4 February 1781.
- Best known for the mutiny on HMS Bounty which occurred in 1789.





MINING IN THE ISLE OF MAN

- Mining for metals on the Isle of Man began in the Bronze Age.
- By the mid-19th century, the Isle of Man was one of the leading Lead producing districts in Britain
- More Zinc was produced from the Island's mines than all the other mines in Britain combined.
- Snaefell Mine is situated at the eastern foot of Snaefell Mountain.
- Originally a portion of the Laxey Mine and ran parallel with the Great Laxey lodes.

There and back again, the story of a waterwheel

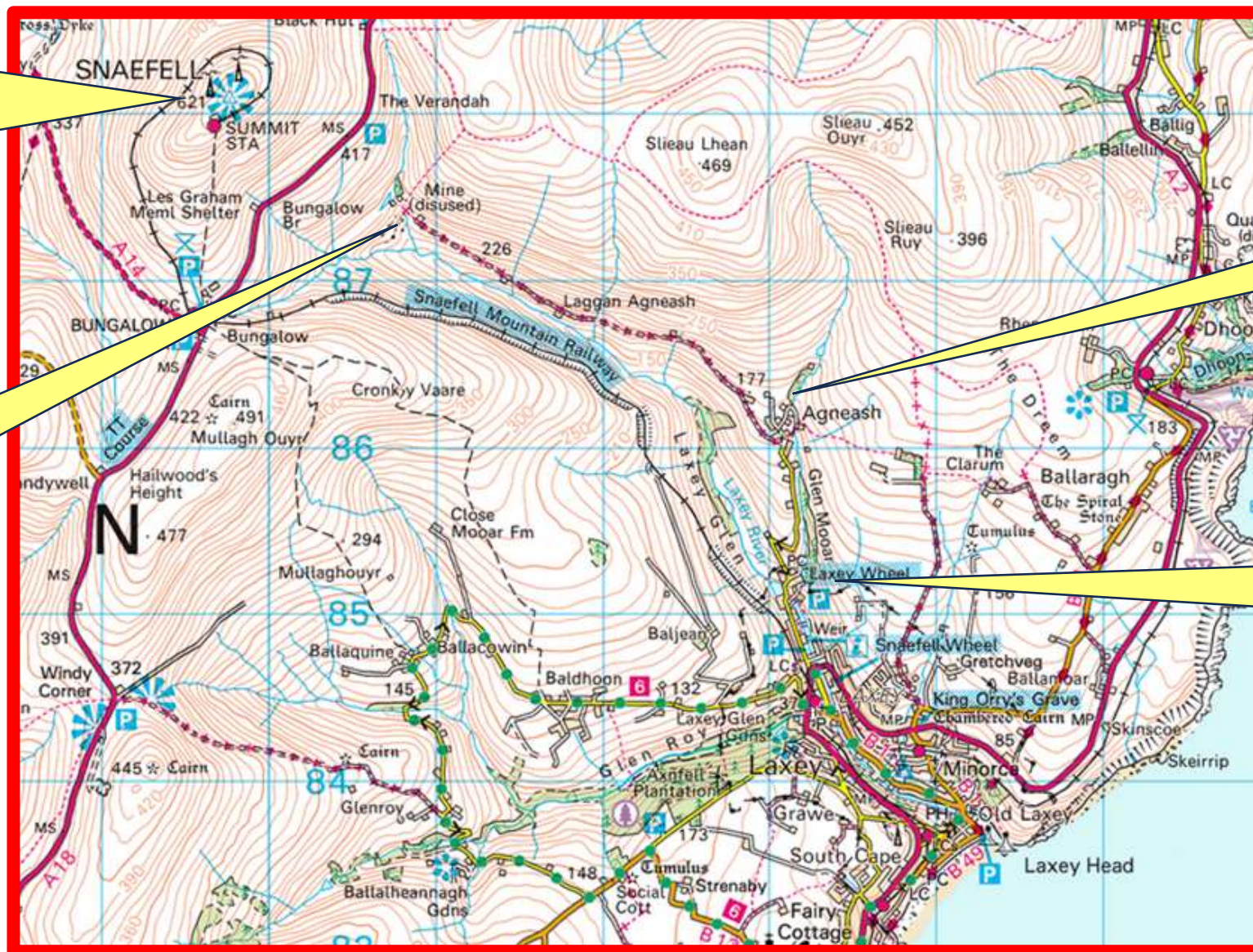


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Snaefell
Mountain
Summit

Snaefell
Mine

**THE LAXEY
MINING
DISTRICT**



Agneash

Laxey
Mine

THE LAXEY WHEEL

- Largest surviving original working waterwheel in world.
- 72 ft 6 in diameter.
- Built in 1854 to pump water from the Laxey Mine.
- Named "Lady Isabella" after the wife of IOM Lieutenant Governor Charles Hope.
- Maintained by Manx National Heritage.



THE LAXEY MINE

Connection to Cornwall

- Mining Engineer Richard Rowe was the Laxeey Mine Captain and came from Cornwall.
- Photograph mid 19th century.





THE SNEAFELL MINE

1856 to 1908

- Produced mainly Zinc.
- The mine had a main shaft which followed the dip of the vein.
- To pump out water a 50 feet diameter Waterwheel ordered from Leigh and Gilbert at the Howarden Iron Works.



1865
Howarden Iron Works,
Bagillt, Flintshire,
North Wales

HOWARDEN IRON WORKS BAGILLT

Estuary of River Dee

Howarden Iron Works,
Bagillt, Wales

(No information on Works so far)





1865

Delivery from

Howarden Iron Works, North Wales

to

Snaefell Mine, Isle of Man

There and back again, the story of a waterwheel



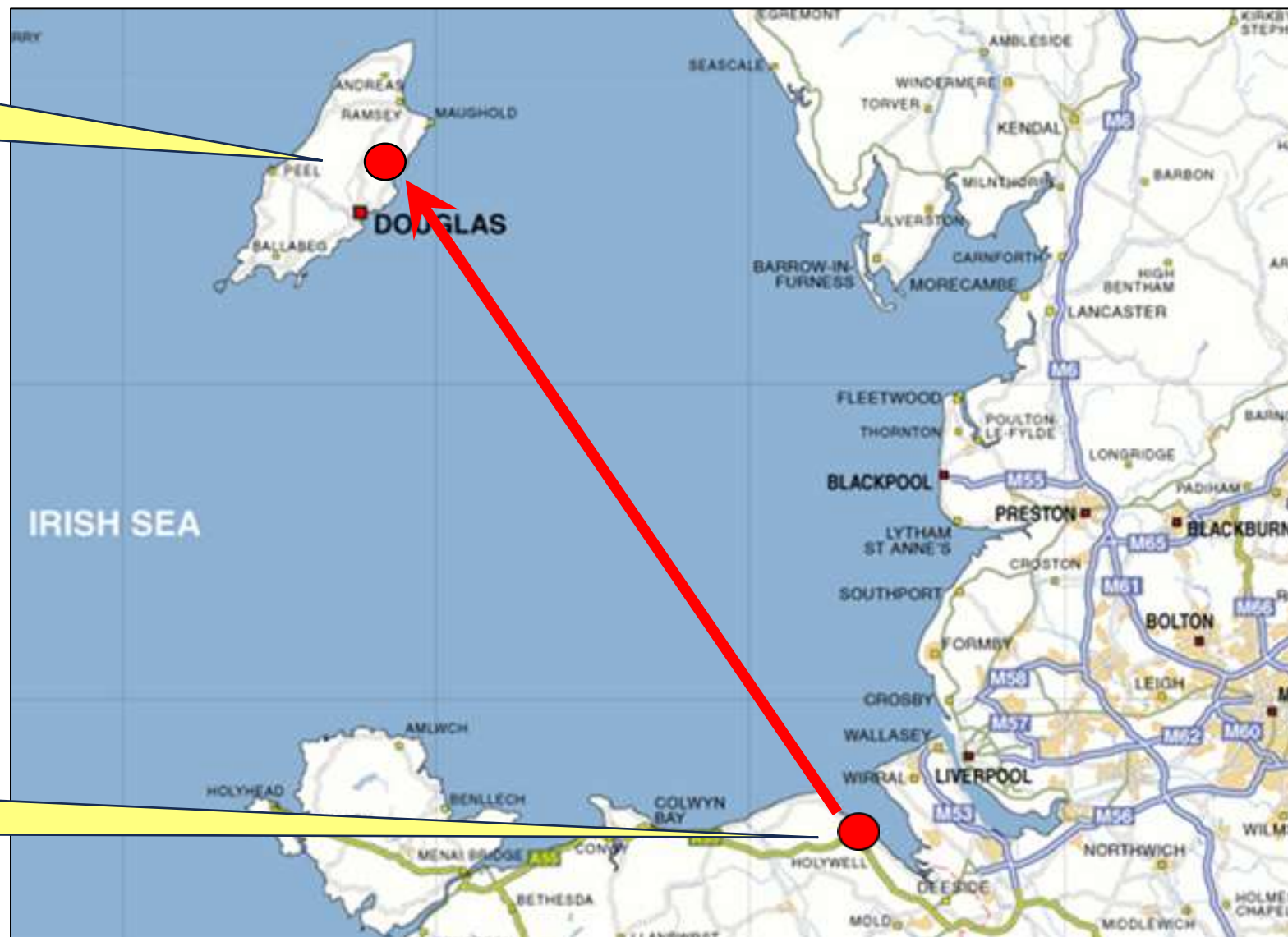
17

1865

Isle of Man

**BAGILLT, FLINTSHIRE,
NORTH WALES
TO
SNAEFELL, ISLE OF
MAN
(88 miles)**

Bagillt





1865 to 1910

**Snaefell Mine
Isle of Man**

The mine is in the distance here!

2023

- The hamlet of Agnish on the way to Snaefell Mine
- Snaefell Mountain is behind lost in the mist!





THE SNAEFELL MINE

- The Snaefell Mine was a Zinc mine 1,188 ft deep.
- Main shaft followed the dip of the vein and had 3 compartments:
 1. Ladderway.
 2. Winding ore.
 3. Water pump and the compressed air pipes.
- The ore was wound up in a wooden 'kibble'.
- It is remembered as the scene of the Isle of Man's worst mining disaster in 1897.

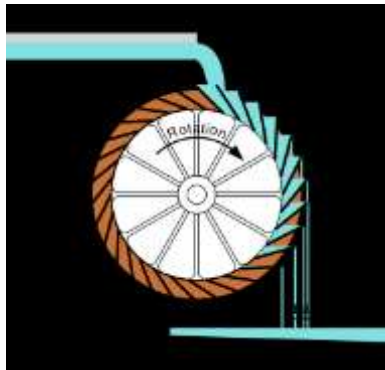
There and back again, the story of a waterwheel



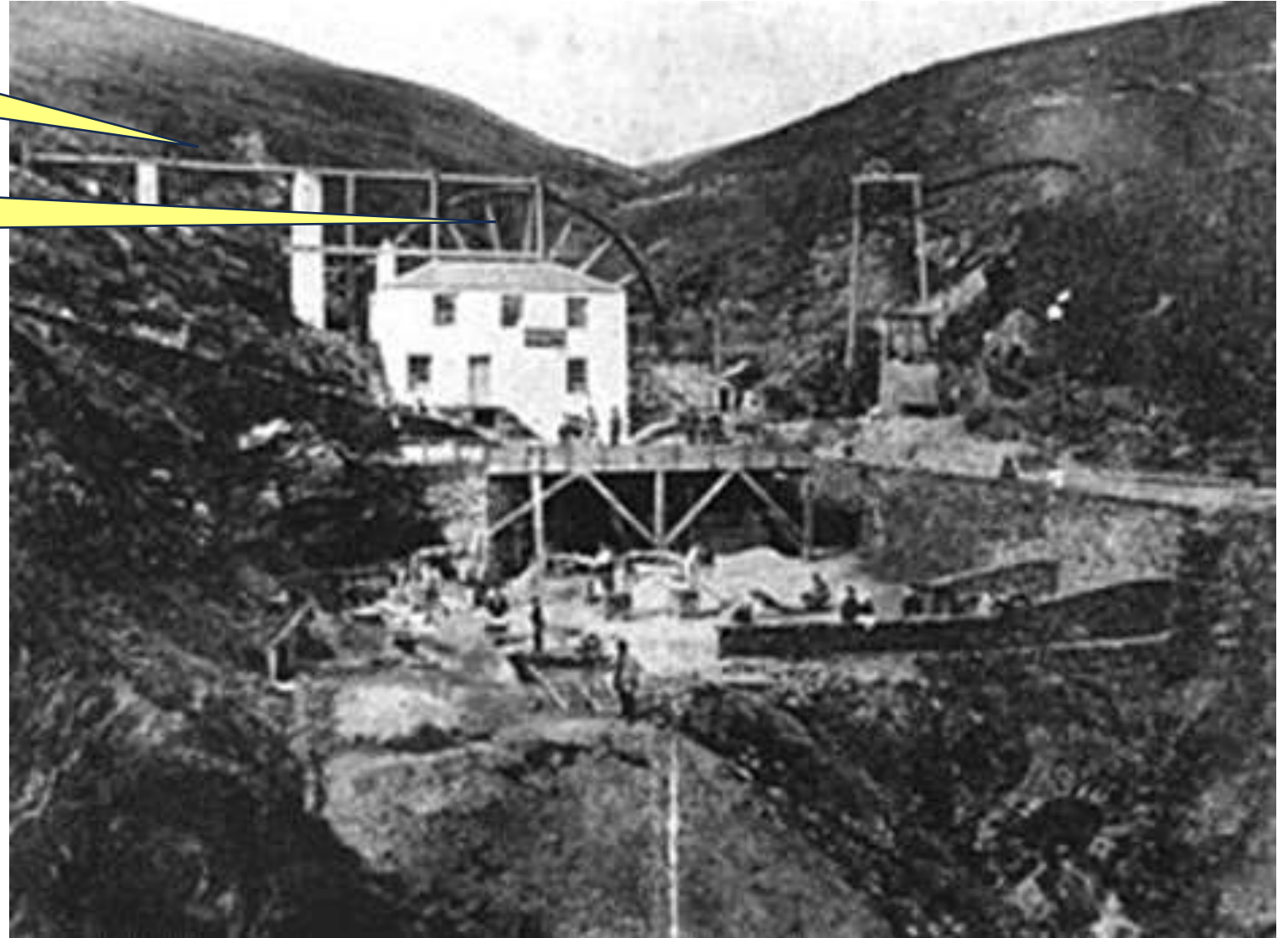
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Water supply

Waterwheel



SNAEFELL MINE
1900





1897 MINING DISASTER

- Miners finished their shift on 8 May 1897, but a candle was still burning and set fire to a pit prop which started a fire in the shaft.
- The fire burned while there was Oxygen and then produced Carbon Monoxide filling the lower mine.
- 34 miners descended the mine on 10 May, using the ladders lashed against the side of the shaft.
- When they reached the lower mine they encountered poisonous fumes, had breathing difficulties, and began to climb up the shaft.



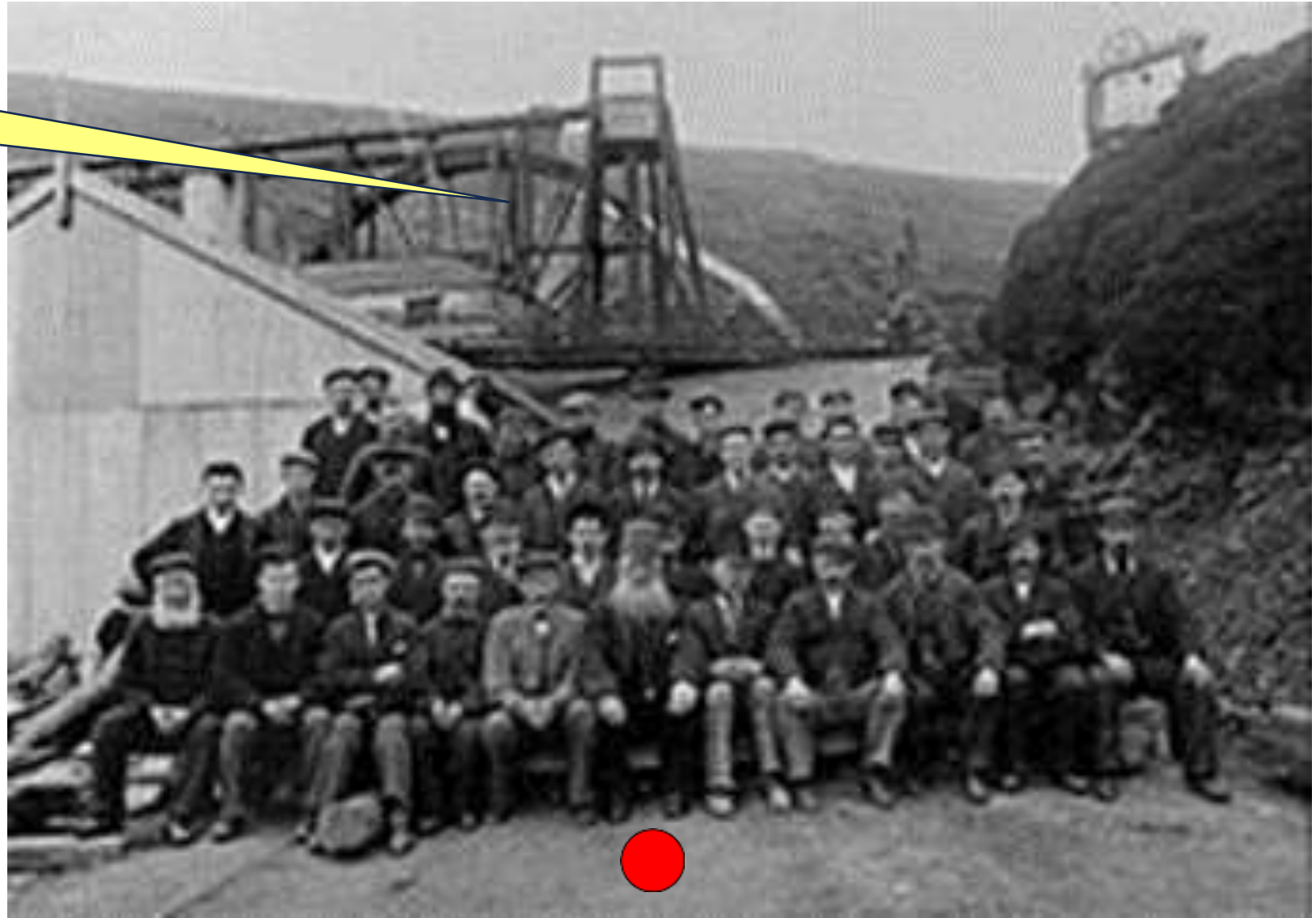
- Some got out without too much difficulty, but others arrived at the surface in a state of near collapse.
- It soon became apparent that a large number of the miners who had made the descent were unable to return.
- A rescue party was quickly assembled but were beaten back by the fumes.
- 40 miners from the Laxey Mine arrived together with a doctor, but it was several hours before it was deemed safe to enter the mine.
- 19 miners died in this disaster.

1897

MINERS AT THE SNAEFELL MINE

- Miners pictured after the disaster.
- Captain Kewley pictured front centre. ●

Wheel





- Following the disaster mining resumed, but the yield from the mine continued to decline.
- Following a rock fall in the shaft in 1908 it was decided that the clearance of the debris would be uneconomical, and the mine was closed.
- The Waterwheel was in place until 1919.
- In 1955 it was thought that re-processing the spoil from the mine could extract a further yield of ore.
- The venture was an initial success, but production ceased July 1958.

ALL THAT IS LEFT OF THE SNAEFELL MINE

**Mine closed 1908
Site Closed 1958**





1910

Move from Snaefell Mine

to

Durfold China Clay Pit,

Cornwall

‘Gawns Wheel’

There and back again, the story of a waterwheel

1910

**ISLE OF MAN
TO
BLISLAND
(278 miles)**

Isle of Man

Blisland

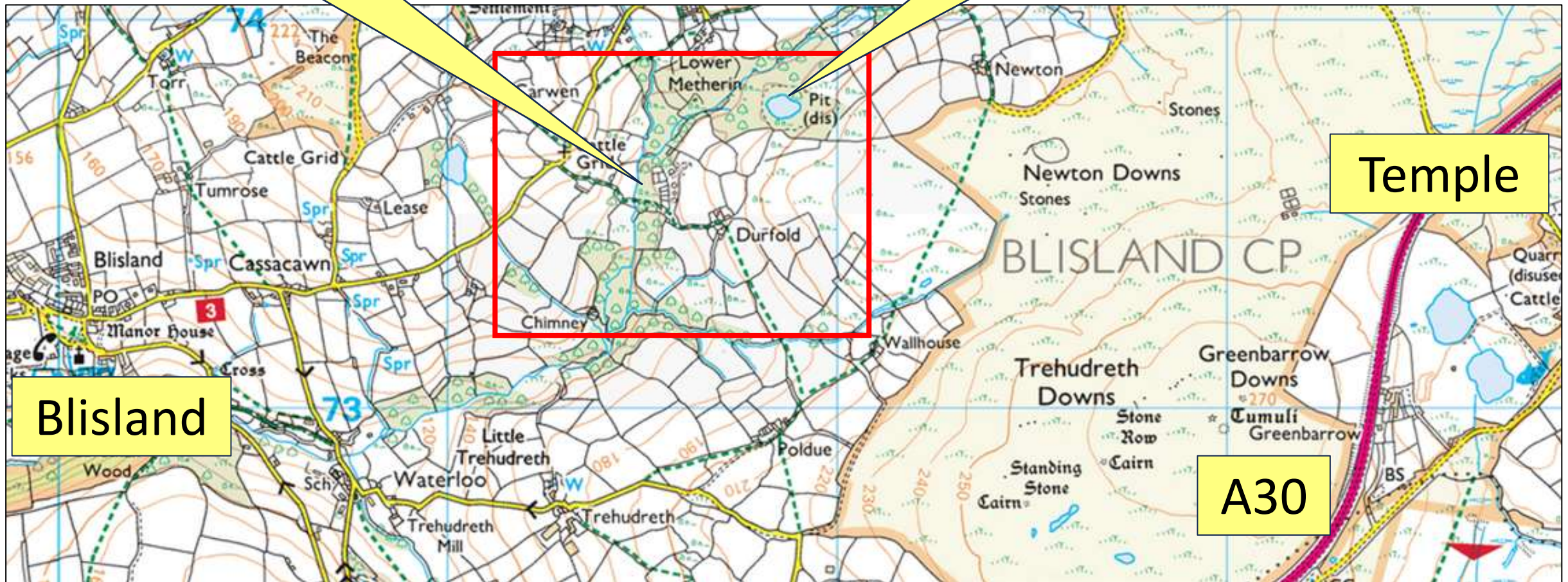


There and back again, the story of a waterwheel

Gawns Wheel

Today

Durfold Pit



Temple

Blisland

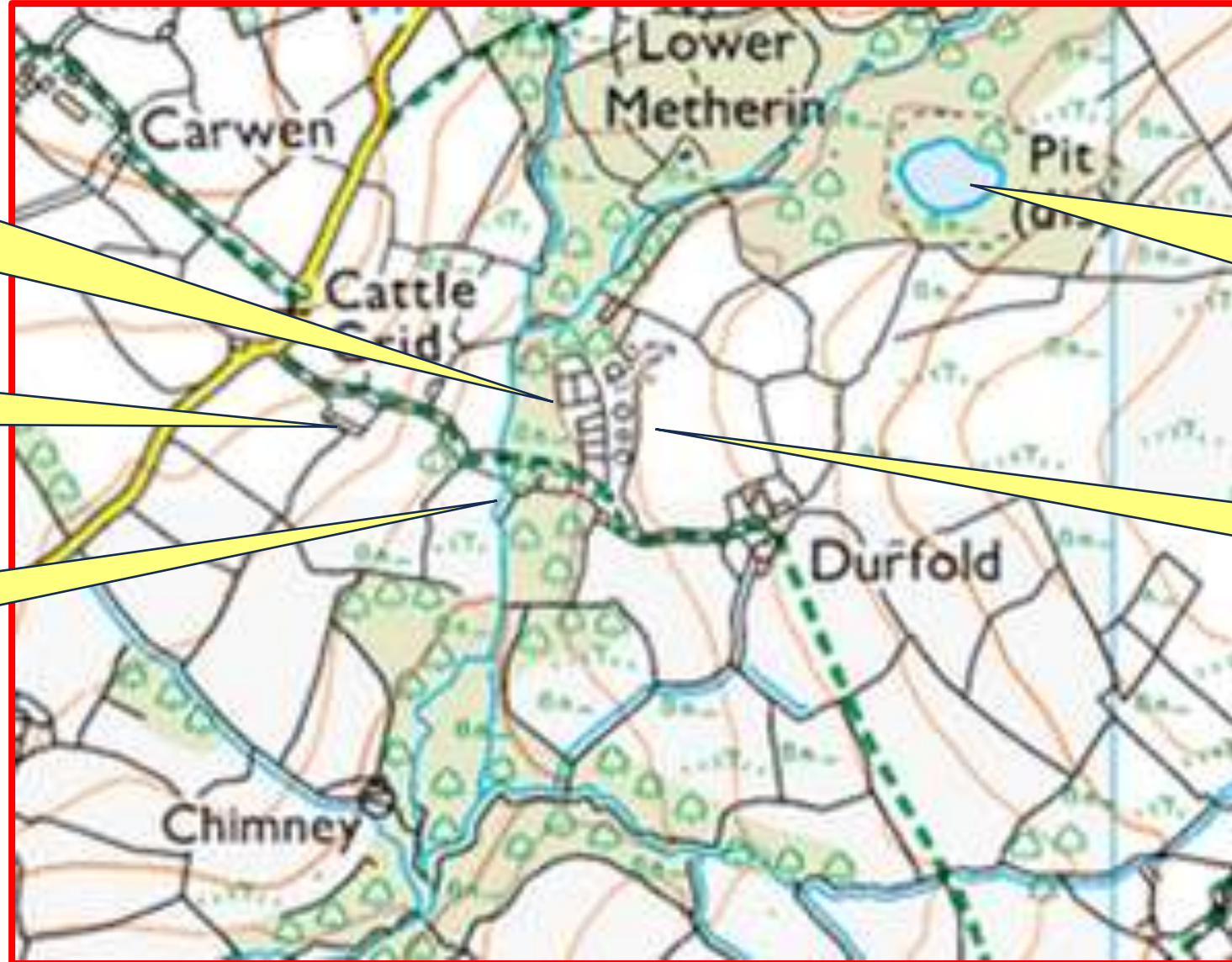
A30

Gawns Wheel
& Drys

Gawns Lodge

Stream

Enlarged



Durfold
Pit

Drys

CHINA CLAY

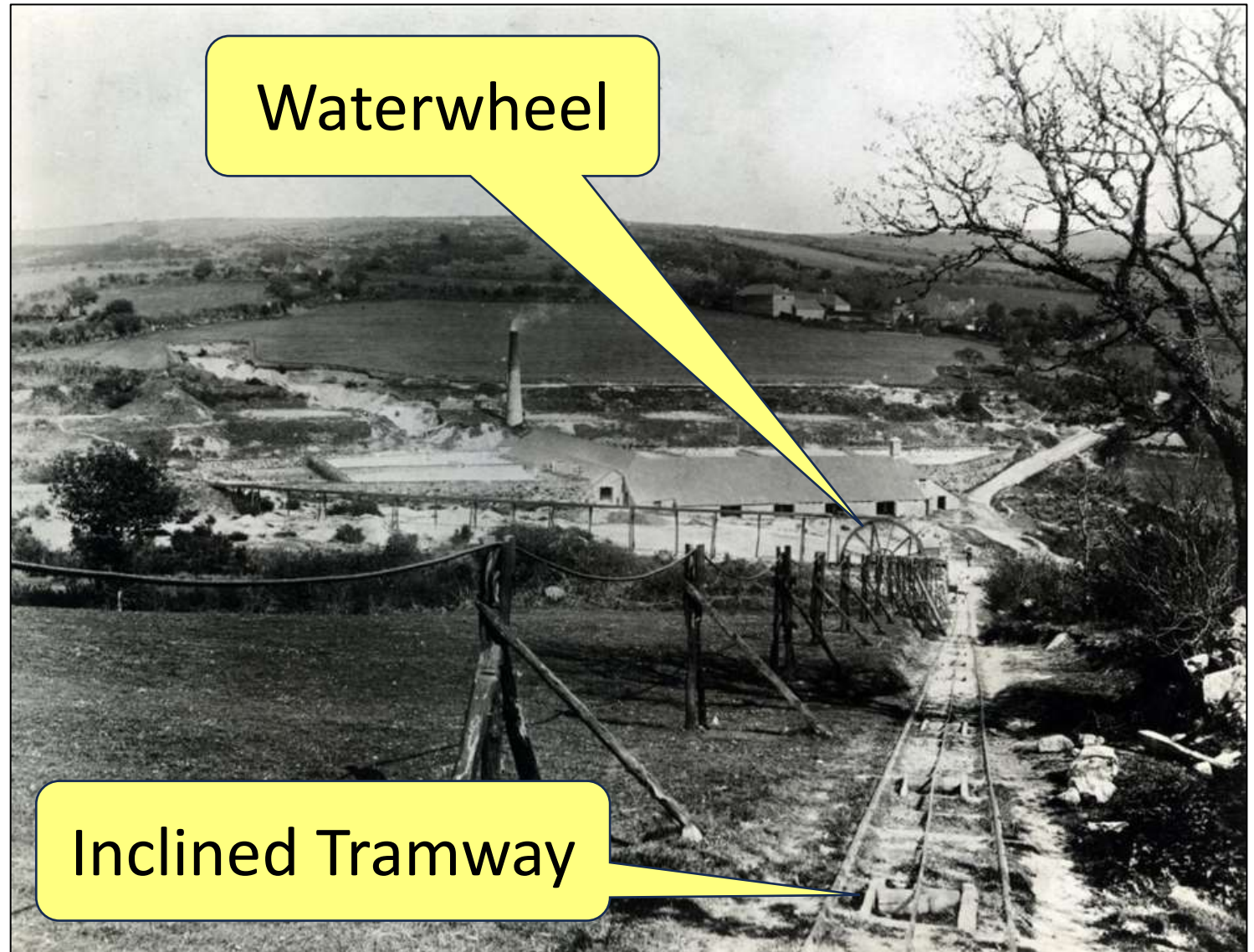
- Formally known as Kaolin and latterly China Clay.
- Soft white substance was first discovered at Tregonning Hill near Helston by chemist William Cookworthy in the mid eighteenth century.
- The clay is to be found largely in granite rich areas for which Cornwall is renowned.
- This product has many uses, but most notable is its use in the manufacture of fine porcelain.

DURFOLD CHINA CLAY WORKS

- Works consist of a single pit, northeast of Durfold Farm.
- The deposit was first worked around 1860.
- In 1866, 400 tons of China Clay were exported from Blisland.
- Pit now flooded.
- Drys in the valley between Gawns and Durford now derelict.
- Incline Tramway powered by a Waterwheel from valley up to road to Blisland.

DURFOLD DRYS

- A Waterwheel in Durfold Valley.
- From the top of the Incline Tramway.
- **The Waterwheel shown is not the Snaefell Waterwheel.**
(More research required)



DURFOLD DRYS

- Durfold Valley Waterwheel and Incline Tramway.
- **The Waterwheel shown is not the Snaefell Waterwheel.** (This one looks smaller and has less spokes)

Enlarged

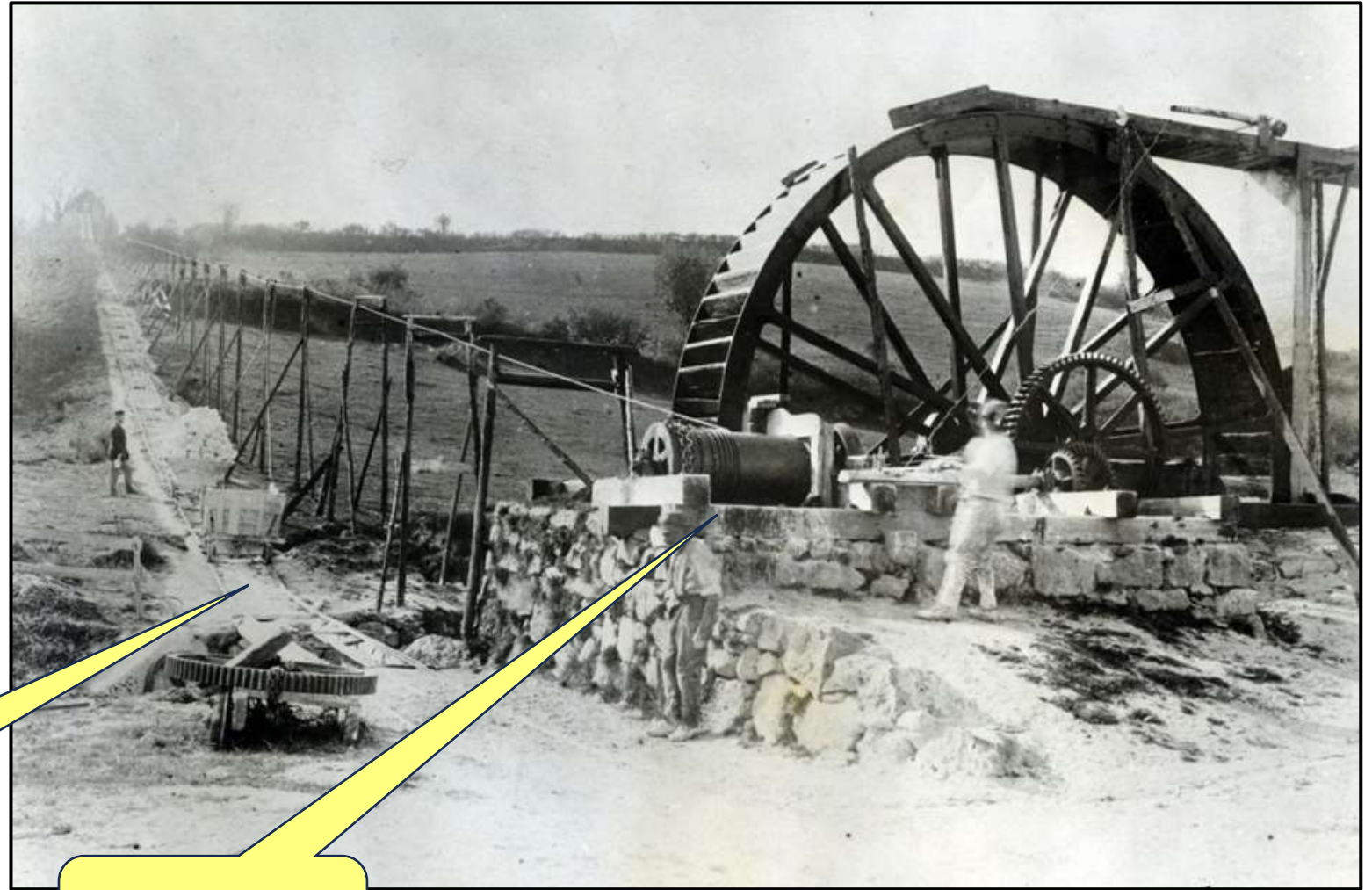


DURFOLD VALLEY

- A Waterwheel and winder beside the incline tramway in Durfold Valley
- Two wagons of clay are ready to pull to the top

Incline Tramway

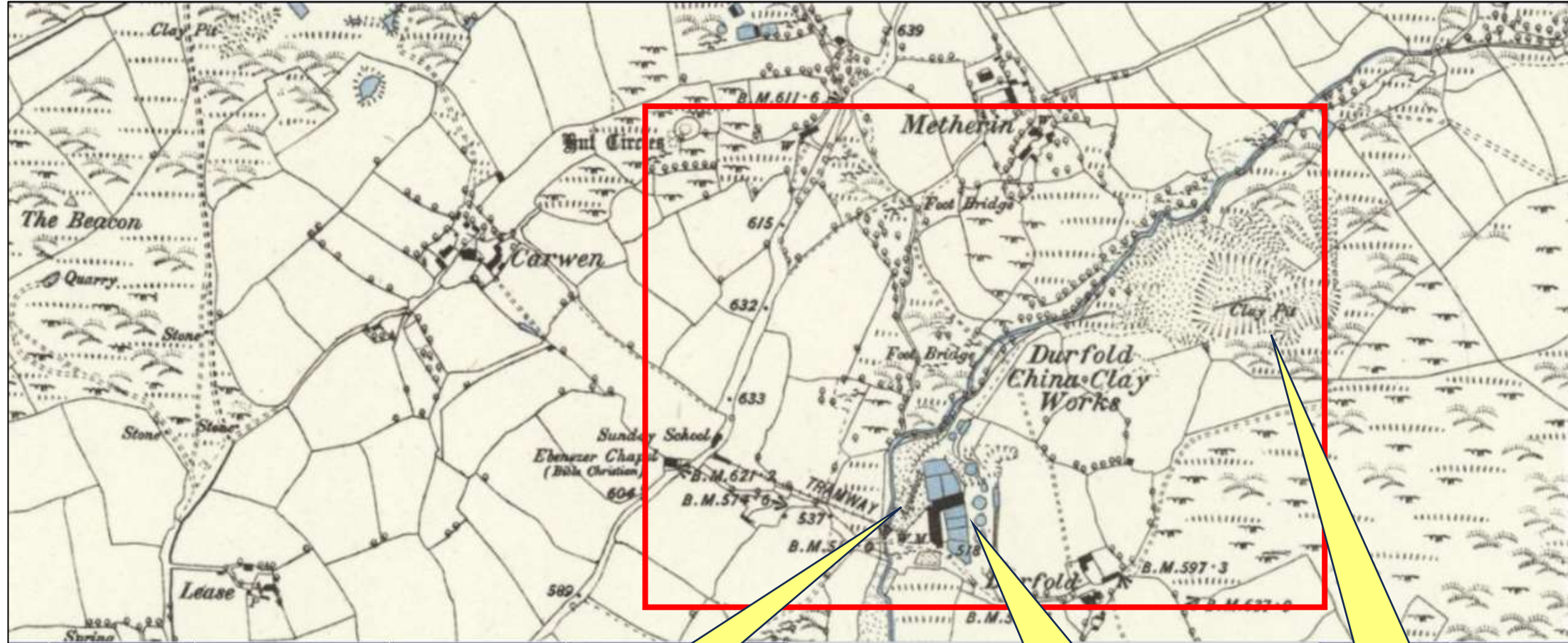
Winder



Not the Snaefell Waterwheel

There and back again, the story of a waterwheel

1888
Map



Gawns
Wheel

Drys

Clay Pit

There and back again, the story of a waterwheel

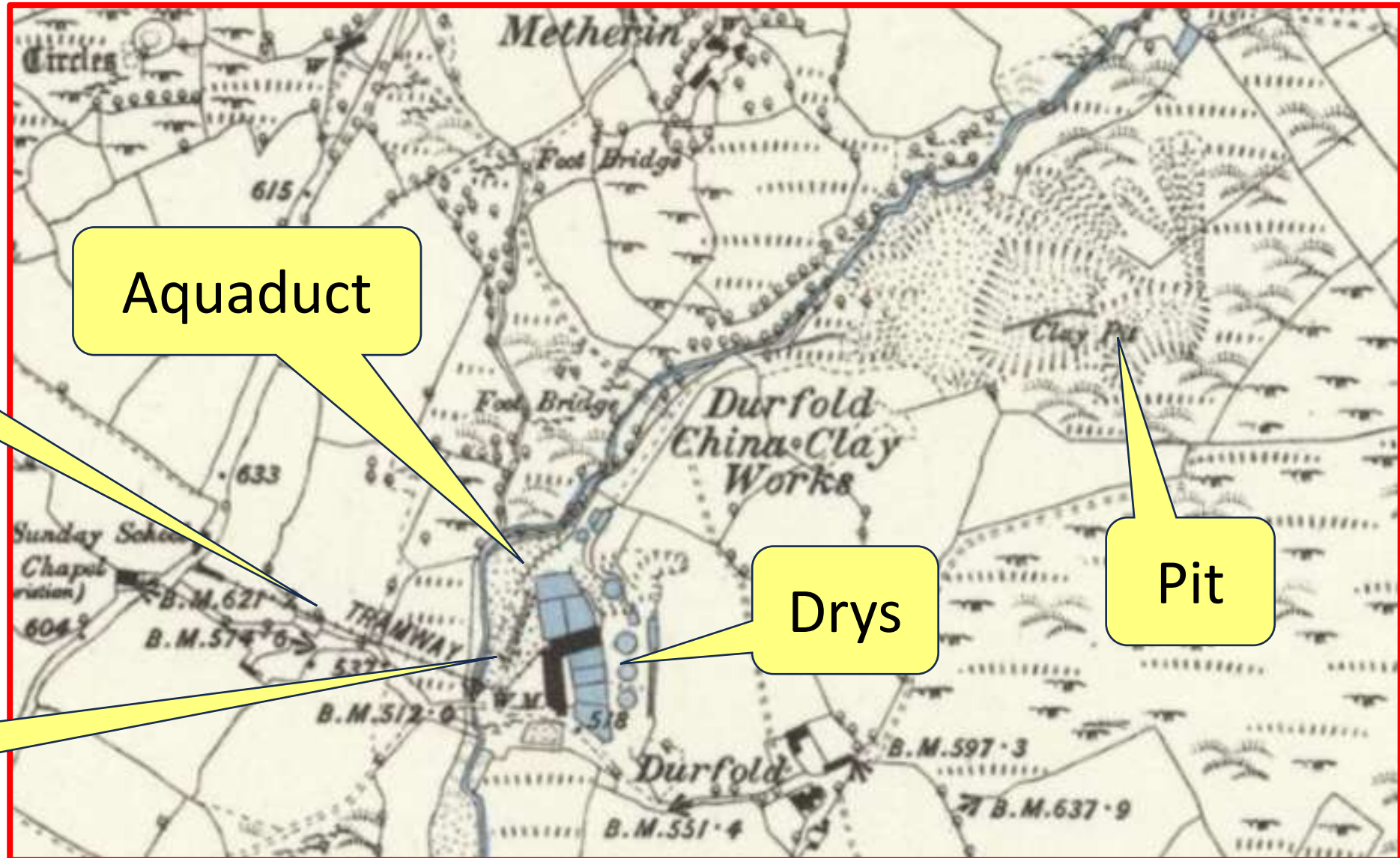
1888

Inclined
Tramway

Aquaduct

Enlarged

Waterwheel

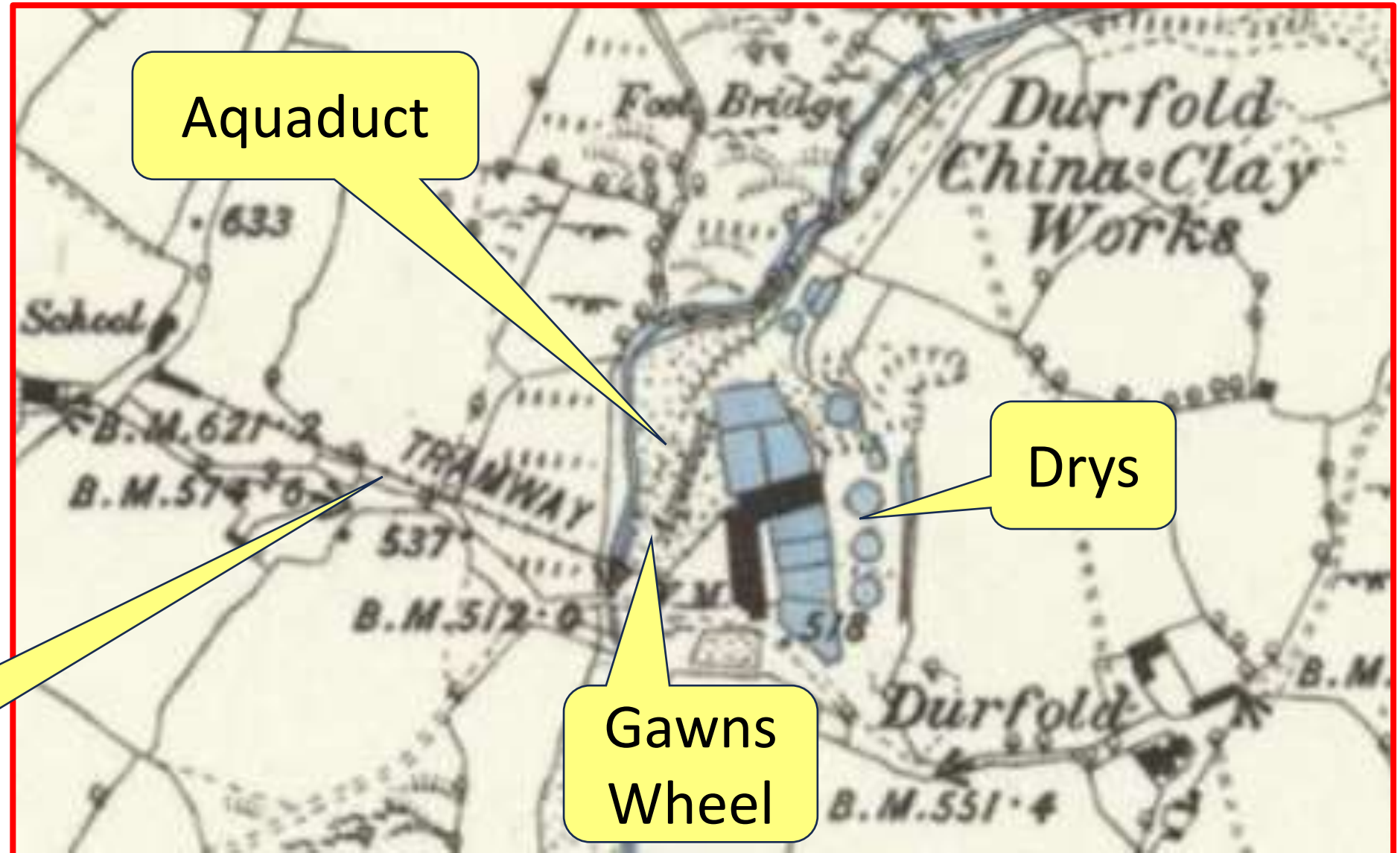


Drys

Pit

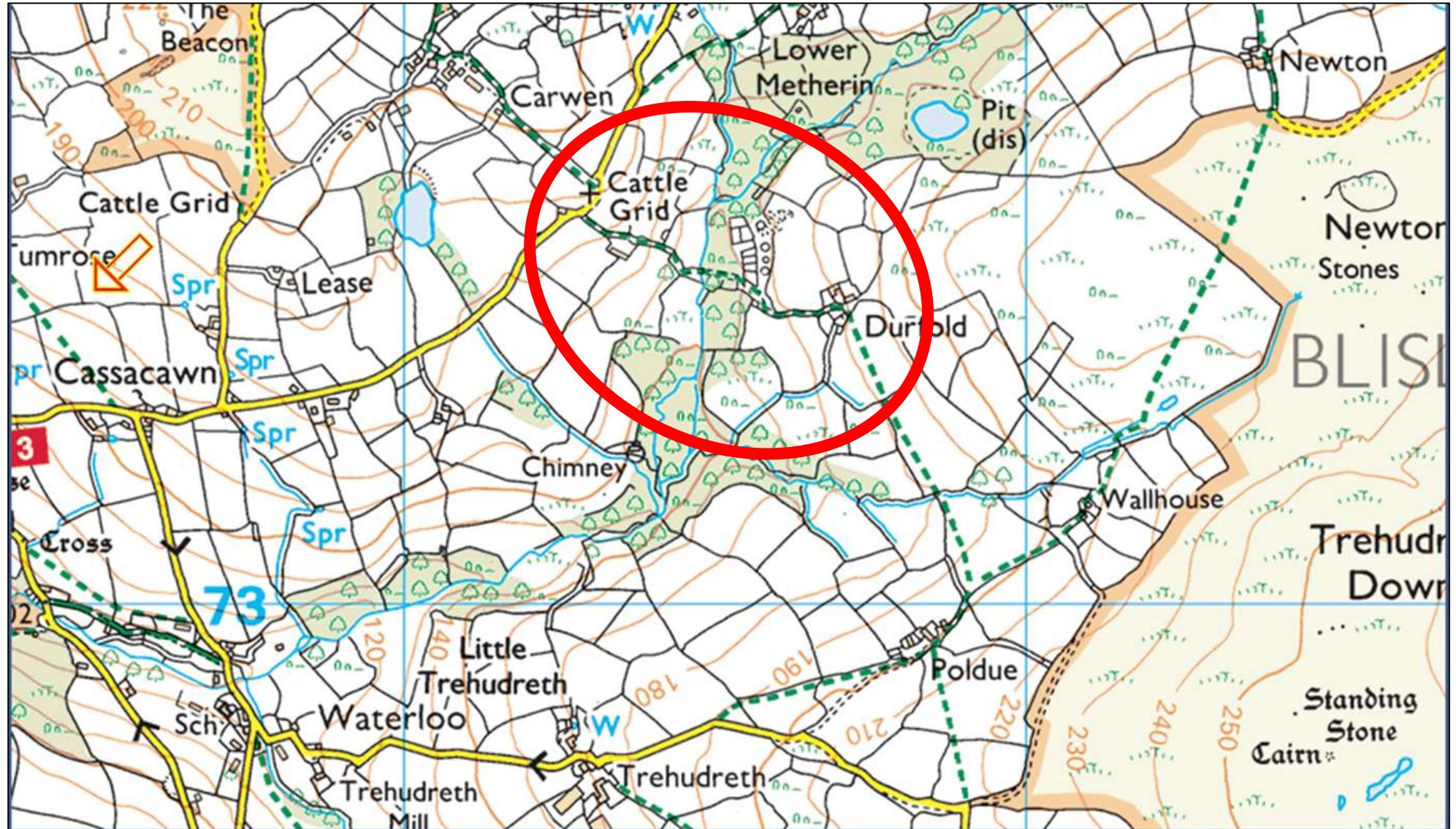
1888

Enlarged



TODAY

There is nothing that can be seen now from the Durfold footpath



DURFOLD STREAM VALLEY TODAY

Footpath to Durfold

View Looking East



DURFOLD STREAM VIEW TODAY

View Looking North

Footpath to Durfold



GAWNS WHEEL

- This is the Snaefell Waterwheel during Construction at Durfold.
- Sent to Wadebridge by sea and Durfold by traction engine.
- But where is this location?



GAWNS WHEEL

- In working condition
- What was it used for?
- Clay slurry pump?



- There are accounts of a Waterwheel driving Flat Rods across Bodmin Moor to a clay pit at Temple.

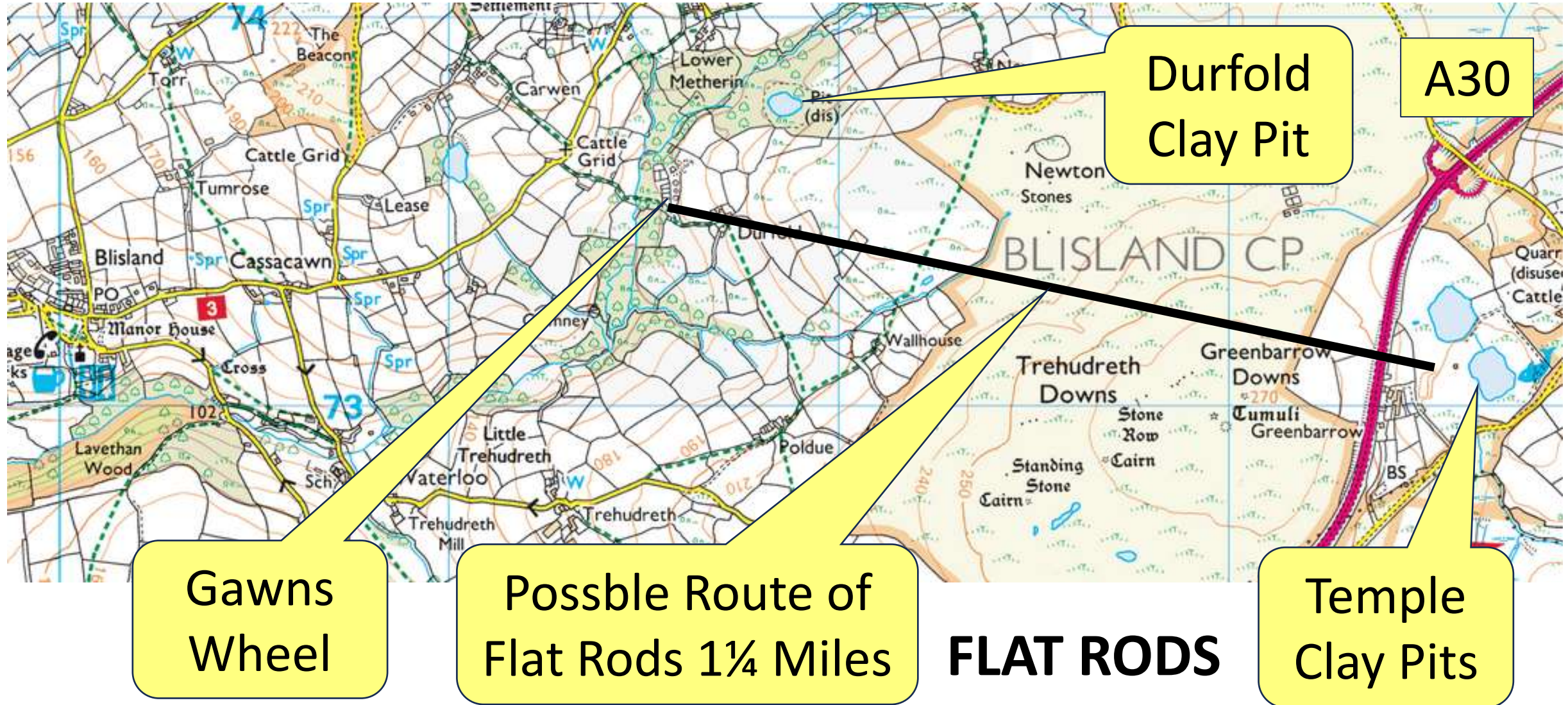
Bodmin Moor's Archaeological Heritage

Page 67:

*The pumps were water powered from the **Gawns wheel**, 50 feet in diameter, which pumped, by **Flat Rods**, Temple clay works 1¼ miles away.'*

- Measured on a map, Temple is 1¼ miles away from the site of the Waterwheel.

There and back again, the story of a waterwheel



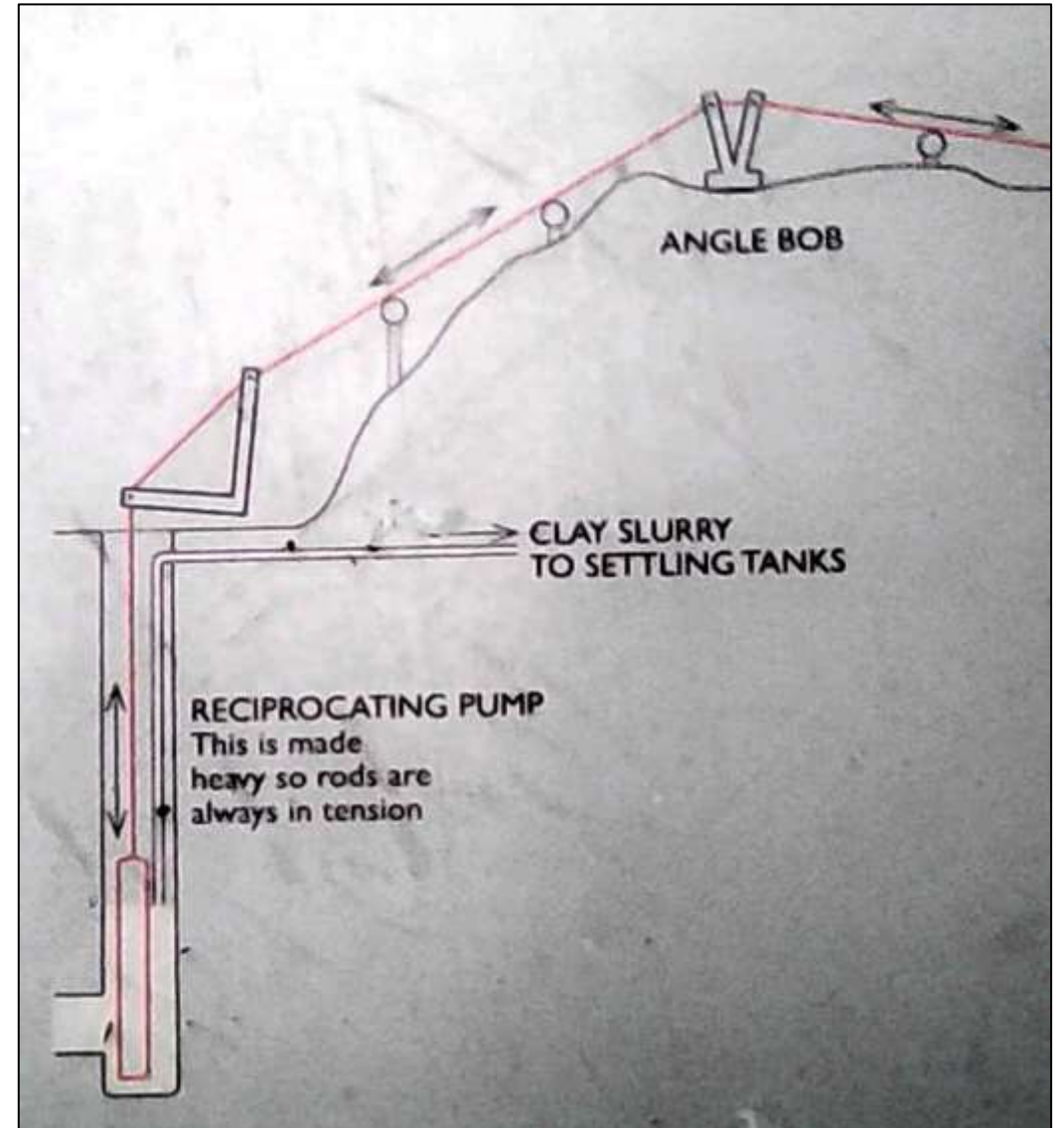
FLAT RODS AT WHEEL MARTYN



FLAT ROD DRIVING A SLURRY PUMP

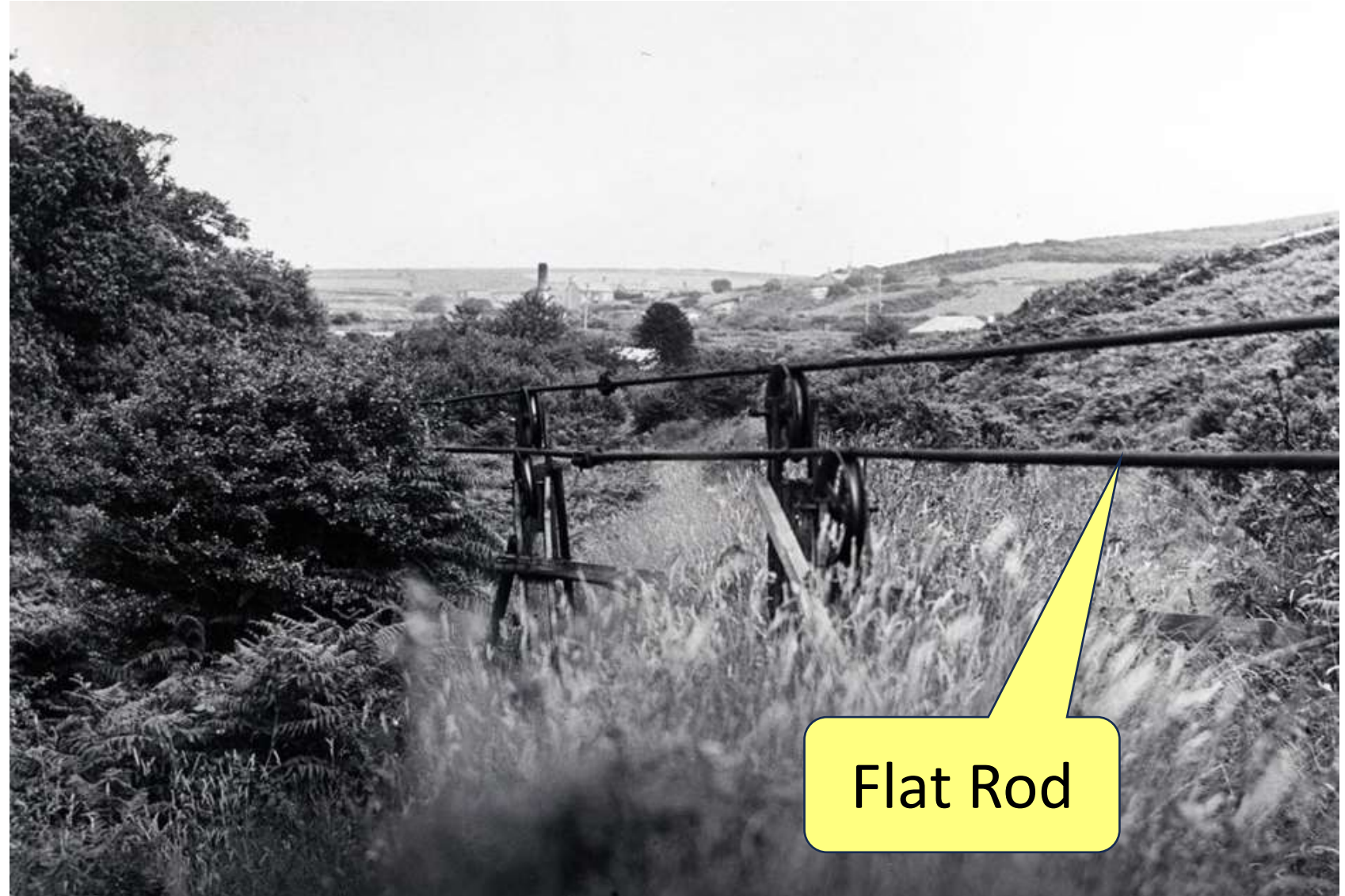
(Wheal Martyn Illustration)

- Clay slurry arrived at the base of the Pump.
- A bucket lift piston and valve mechanism to lift the clay to a launder or pipeline which led it to the Settling Pits.



FLAT RODS

- Flat Rods in Cornwall running across the photograph.
- Clay works in distance.



1969

WATERWHEEL DERELICT

At the end of its life in Cornwall the Waterwheel was abandoned and slowly became derelict.





1971

**Ownership Transferred to the:
Cornish Wheel Preservation
Society**



1974

**Cornish Wheel Preservation Society
merged with Trevithick Society and
ownership was transferred**



1976

**Move from Durfold China Clay Pit
To
Llywernog Mining Museum,
Wales**

There and back again, the story of a waterwheel



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1976

**BLISLAND
TO
LLYWERNOG MINING
MUSEUM, WALES**

(164 miles)

Llywernog
Museum

Isle of
Man

Blisland

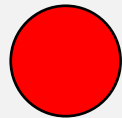


There and back again, the story of a waterwheel



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Llywernog Mining Museum, Wales



CAST IRON HUB

- One of the two 7 feet diameter hubs.
- Weight 2 tons.



CAST IRON RIM SEGMENTS

- A few of the 40 cast iron rim segments.
- A number needed to be renewed.



CAST IRON COMPONENTS

- The cast iron parts from the Waterwheel were lying in Wales for 27 years.
- On the 15th March 2003 the Trevithick Society agreed to move the wheel to Isle of Man.





PREPARATION FOR TRANSPORT

- On the 20th September 2003 members of the Laxy Mines Restoration Group and the Trevithick Society met at the Llywernog Mining Museum.
- The components of the Waterwheel were successfully loaded by crane onto a large lorry.
- The Waterwheel was going back to the Isle of Man after being away for 95 years.

TRANSPORTATION

The Waterwheel Axle being loaded for the journey to the Isle of Man.





2003

**Move from Llywernog Mining Museum
To
Laxey, Isle of Man**

There and back again, the story of a waterwheel



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2003

**LLYWERNOG MINING MUSEUM,
ABERYSTWYTH, WALES
TO
LAXEY, ISLE OF MAN
(126 miles)**

Isle of
Man

Llywernog
Museum



**22nd
September
2003**

The Snaefell
Waterwheel
Components
arrive at Douglas
Harbour, Isle of
Man





October 2003

Restoration in the Isle of Man

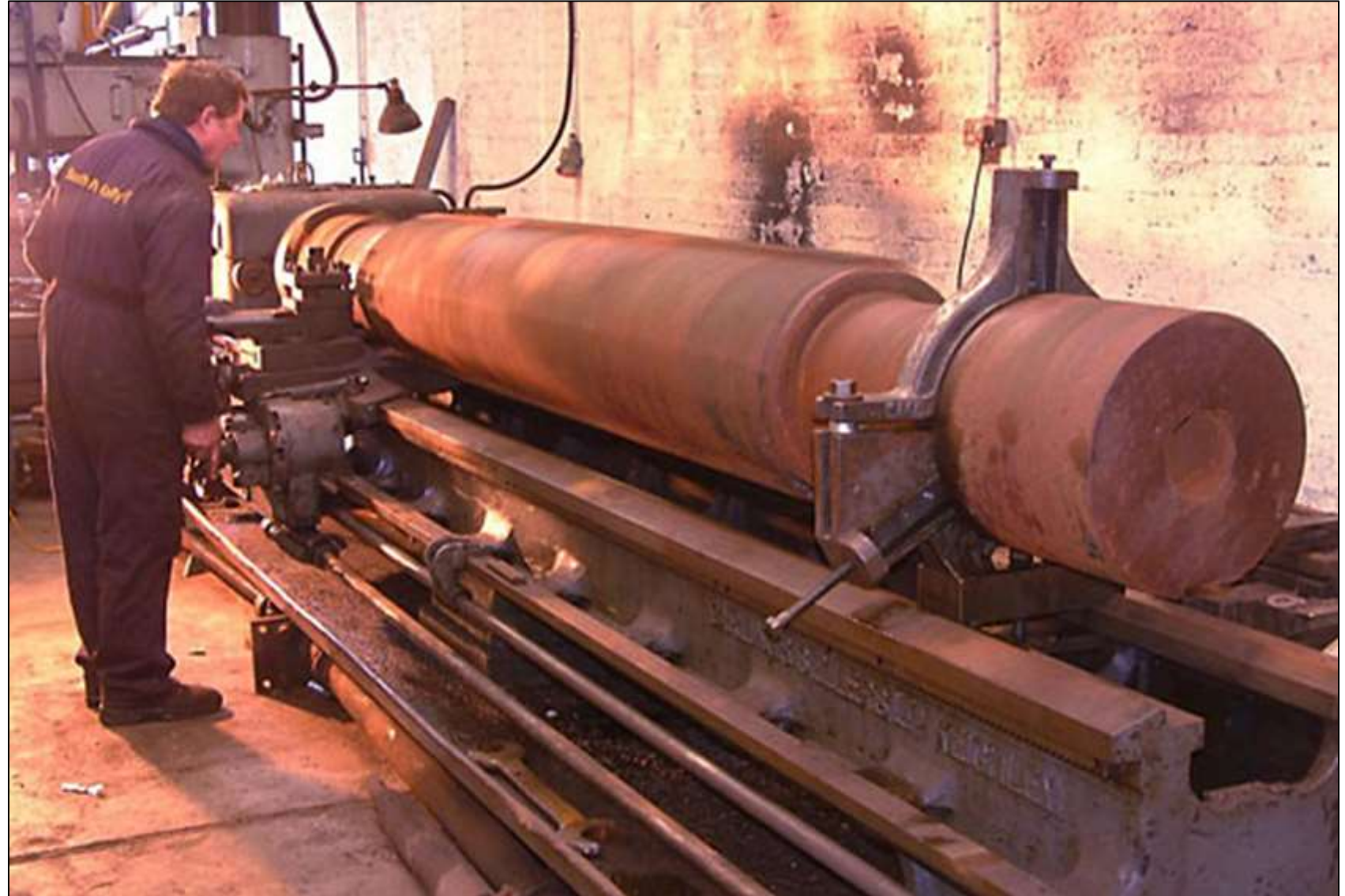
5th October 2003

- The location of the Waterwheel on the Laxey Mine Washing Floors where a previous Waterwheel had stood.
- The circle shows the wheel size.



AXLE

The 3ton axle
being set up in a
huge lathe at
Ramsey Shipyard,
Isle of Man.



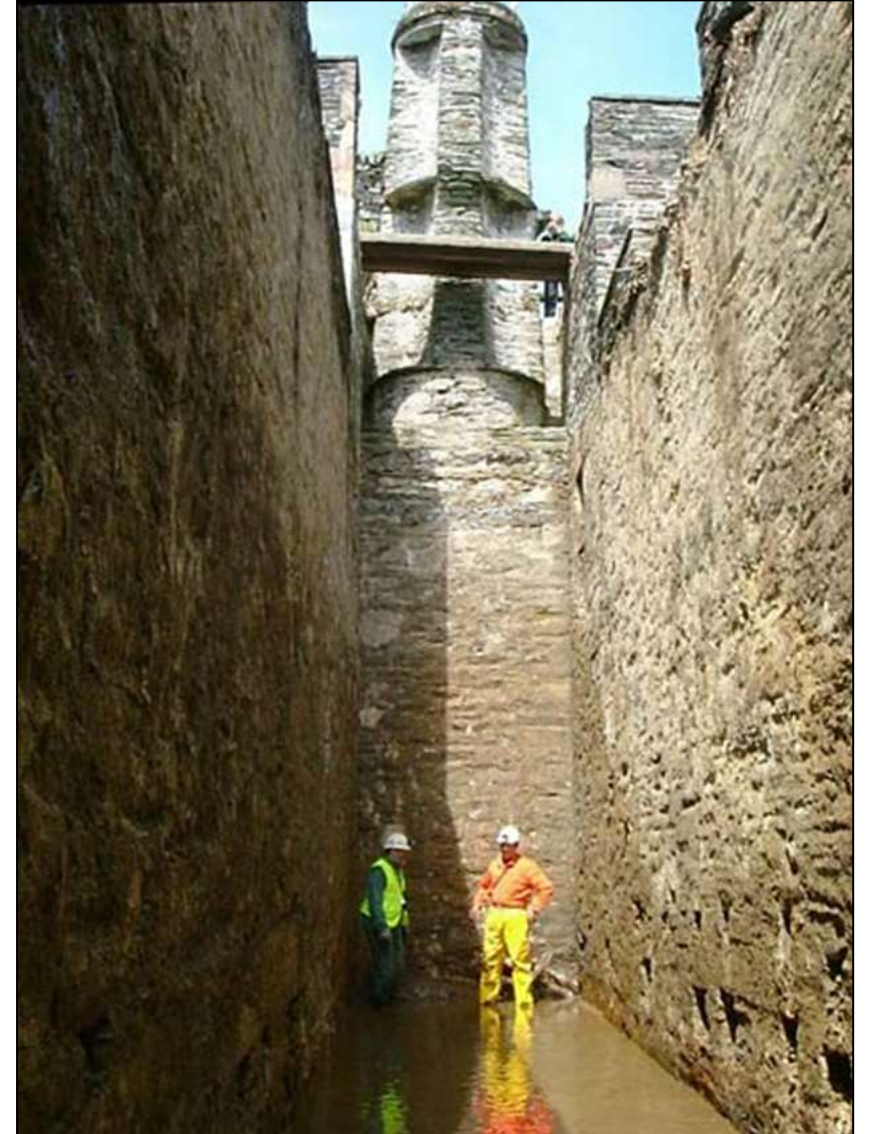
WHEEL PIT EXCAVATION

- Excavation of the Wheel Pit.
- 9 feet deeper than the riverbed.
- Had to be excavated with a dragline.



WHEEL PIT

- The wheel pit now at its final depth
- The dark area on the left wall is the damp caused by river on the other side and three meters higher.



SPOKES

- One of the 40 Spokes being cut to the required taper to match the sockets on the Hub and Shroud ends.
- Each Spoke is 22½ ft long.



SPOKES

- A pile of new completed Spokes.
- All forty were made at Ramsey Shipyard.



WHEEL HUB

- One of the two finished wheel hubs.
- The hubs wouldn't have looked any better when they had originally been made.



SHROUD PATTERN

- The Progress Foundry in Stoke made the wooden patterns for the reproduction of the Shroud sections of the wheel.



CASTING THE SHROUD SECTIONS

- Hot gasses and flame leap out of the vent holes on the mould as the molten metal is poured into the mould.



PAINTING

- All the metal work has been given a two thick coats of bitumen paint



WHEEL BEARINGS

- The new phosphor bronze bearings on arrival at the workshop.



BEARING BLOCKS

- One of the now fully restored bearing blocks and new bearing cap.
- The cap has been fabricated out of steel and made to look like a 100 years old casting.



ASSEMBLED WHEEL

- The assembled Waterwheel showing the Bearings, Axle and Spokes.





6th August 2006

**Dedication of restored Waterwheel
in Laxey, Isle of Man**

(Final distance travelled 656 miles as the crow flies!)

Flags of the 3 Celtic Nations involved in the Waterwheel

- Cornwall
- Isle of Man
- Wales



6th August 2006

- Crowds gather on the upper washing floors in Laxey for the dedication of the Waterwheel.



- Picture of the original maker of the Waterwheel, **Gilbert Howell** of Flintshire.
- It was presented by one of the great grandchildren of Gilbert Howell who were present for the dedication





The Snaefell Mine Waterwheel Plaque



THE LADY EVELYN PLAQUE

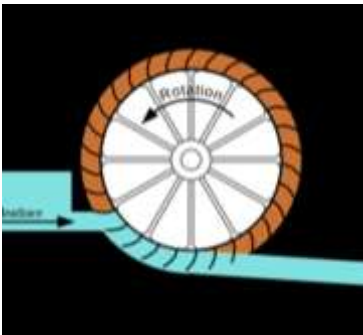
The wheel named Lady Evelyn to mark the extensive work of Evelyn Jones in supporting the Laxey Mines Research Group.



- The Waterwheel in Laxey from the road to Ramsey.
- This area was the ore dressing floor.
- The original wheel here would have driven the 'Stamps' to crush the rock and release the ore.



- The Waterwheel from under the water supply pipe.
- The Waterwheel is now configured as a 'Breast Shot Wheel'.



Water
Supply
Pipe



2023

THE SNAEFELL WATERWHEEL at LAXEY



ACKNOWLEDGEMENTS

Thank you to:

Cornwall: Wheal Martyn & China Clay History Society

Isle of Man: Laxey Mines Research Group

General: Wikipedia