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A REPORT ON THE EXCAVATIONS AT THE CHIMNEY SHAFT, COCKHILL MINE

M.C. Gill & J. McNeil

The Cockhill Mine worked a complex of veins trending North west to south east across Greenhow Hill and a number of nearly north-south cross veins, of which Greenhow Rake was one of the strongest.

The Sunside Lead Mining Company put down a sump 20 fms deep (below adit) in the Greenhow Rake between the years 1859-62.

It now seems probable that this sump is the one equipped with a steam pump and haulage engine by the Pateley Bridge Mining Company in 1875. The company sunk a further 10 fms and housed five boilers underground near the head of the sump.

Prior to excavation we were told that one engine was mounted on a boiler, in a like manner to the mobile engines of the day, castings found on one boiler confirm this.

The bore of the pump barrel is said to have been about 12ft dia. At about 20 fms. a donkey pump was set up to assist the main lift.

In the 1920's, the Bewerley Mines Ltd. re-opened the Mine and pumped out the sump using a steam sinking pump. At least one original boiler was re-used and a steam pipe run down chimney shaft from an auxiliary boiler at the surface. The 30 fms level was entered and found to be blocked and the water could only just be kept in fork so the sump was abandoned.

Chimney Shaft is located at NGR SE 10936419 which is at 1250 ft AOD.

The stone lined shaft (2' 6" diameter) is vertical through shales of the Keld House basin for 100 feet at which point the limestone comes in. Here Lumb Vein, or one of its parallel strings, is cut; heading slightly north. At 150 ft from surface a north drift reaches the head of a stope from adit level (at approx. 1000 ft. AOD). Lumb vein at this point is vertical and from 3 to 4 feet wide, containing calcite and fluorspar the latter predominating at 200 ft from the surface.

The workings from the shaft foot follow the parallel vein to Lumb vein eastwards to an area of stoping at approx. 170 ft from the surface. Here the vein is from 2 to 3 feet wide and bearing fluorspar (where seen in pillars). Stopes from adit level on this and Lumb vein can be entered from these workings. Also at a point near the union with the Rake, the vein adopts a steep northerly hade (about 45^{o}).

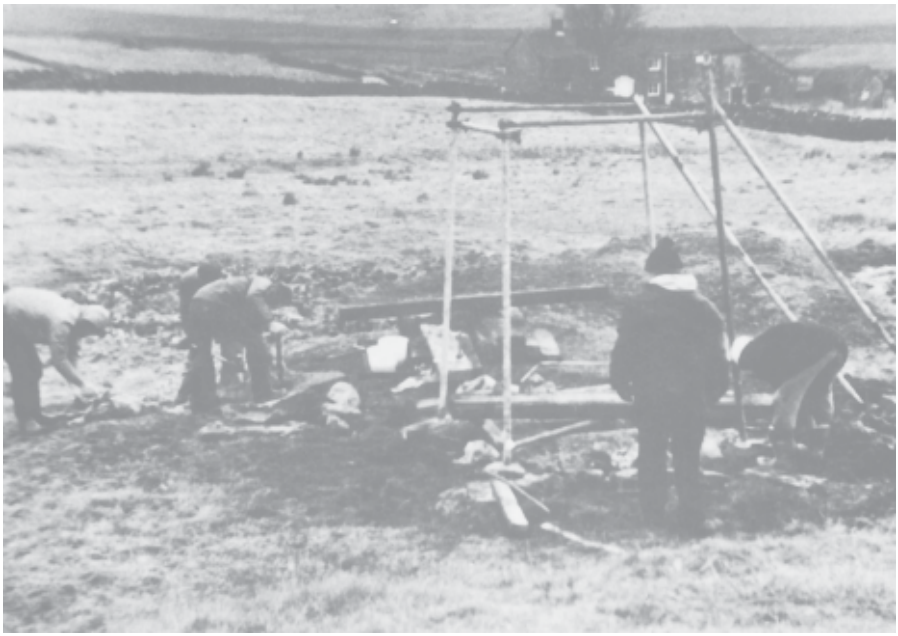


Plate 3 Constructing Surface Installations.

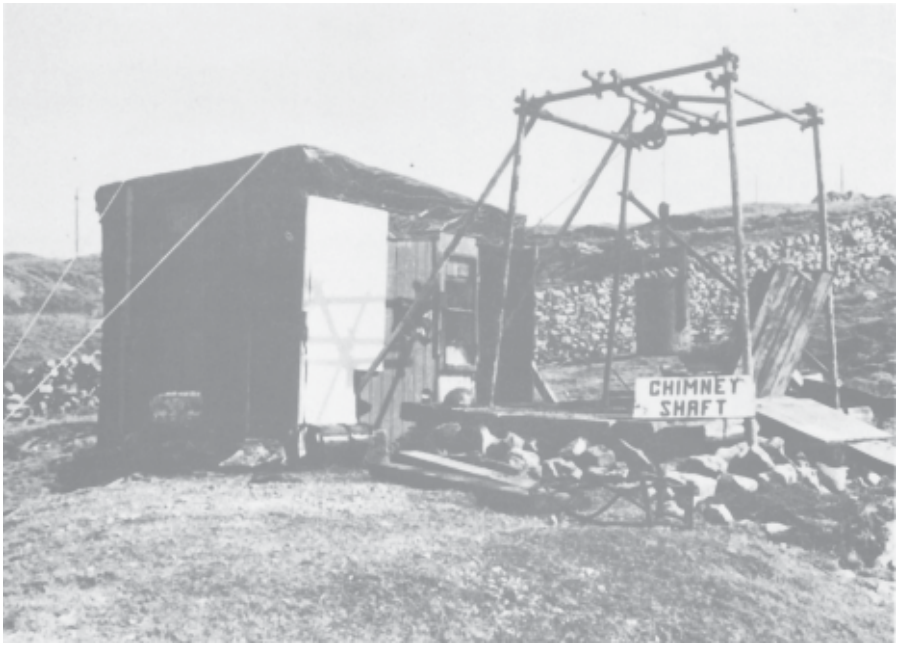


Plate 4 Surface Layout

A south crosscut leads to North Maiden vein, heading south and very poorly mineralised. The matrix being mainly clay and limestone with some calcite.

A rise from adit level in North Maiden gives access to the boiler house. This chamber is cut into the hanging wall of Greenhow Rake and is about 20ft wide x 30ft long and 15ft high. The 30 fm sump stands open but flooded.

The Rake workings prove that vein to have been from 6 to 10 feet wide and vertical at the adit. The stopes have been in fluorspar and calcite and in places are 50 feet high to stemples. A roof fall blocks progress southwards to Greenhow Quarry.

The adit continues as a drift westwards along Lumb vein until intersected by Gulf vein, where disturbed ground has collapsed.

Exploration of the adit towards the portal is blocked by deep water.

The adit northwards from the boilers is driven in Fielding vein, heading steeply west, to its intersection with Lumb vein. This contortion [54] is caused by the number of strong veins traversing this area and was the ideal place for a trial in depth on that part of Greenhow.

The Boiler House can only be entered in dry weather and has the remains of three boilers: 1. Cornish (A) and 2. Multi-tubular Boilers (B and C).

Description of the Boilers:
The three boilers remaining in the boiler house are shown in plan. The boilers have been labelled A, B and C for the purpose of this report.

(A) Single flue or Cornish Boiler

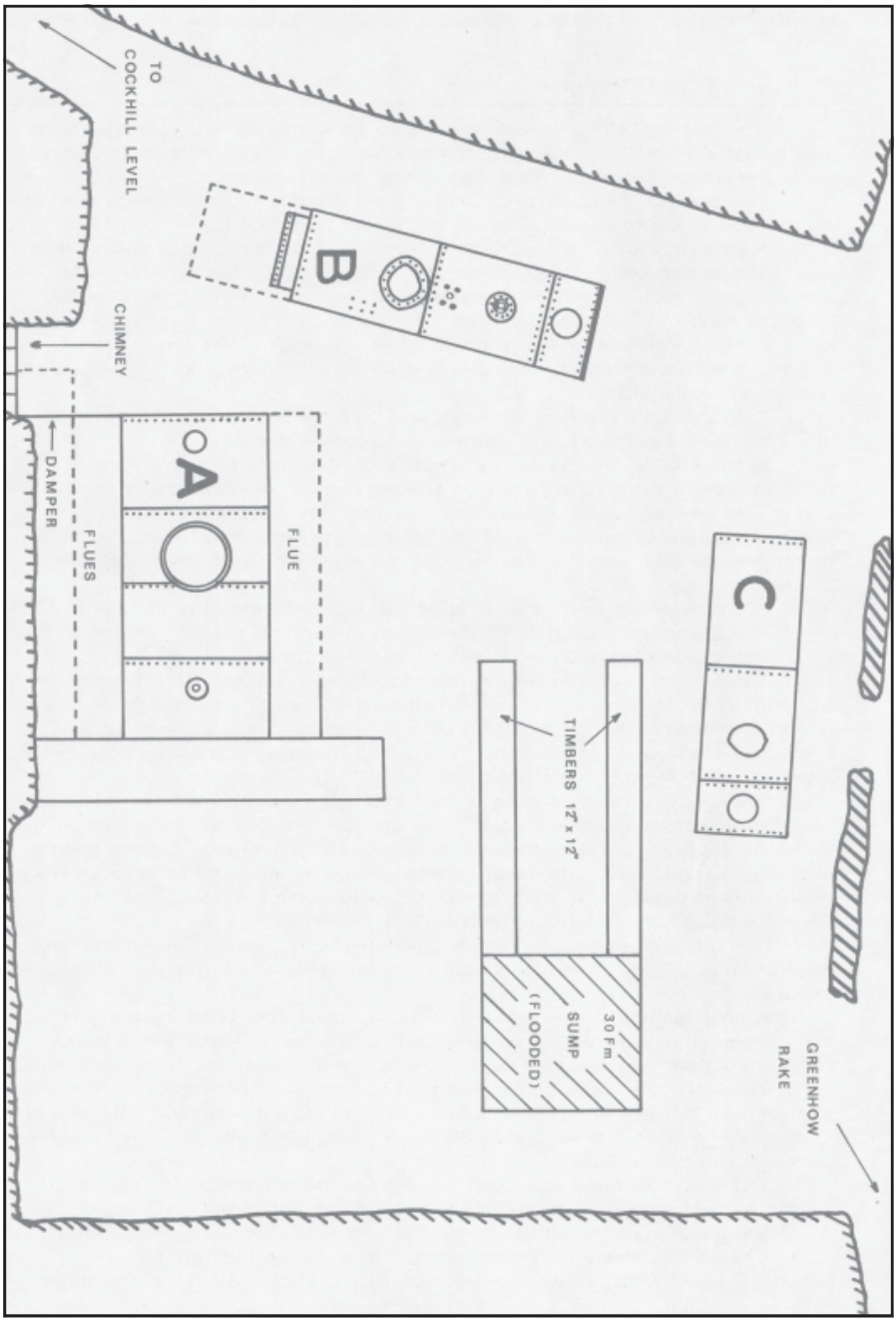
Principal Dimensions

Length of boiler	11' 0"	Diameter of firetube	2' 6"
Diameter of boiler	4' 6"	Diameter of manhole	l' 4"

Distance between top of fire tube and top of boiler 1' 9"

The boiler shell is made from 3/8" thick plate. All the seams are single riveted and the rivets are pitched 2" apart. The furnace tube has flanged seams. It is not possible to measure the firegrate area since the firegrate has been removed and the boiler is half submerged.

From other dimensions of the boiler however, the grate area would have been about 7 or 8 sq. ft .



The steam from the boiler was taken through a 3" diameter opening near the rear of the boiler.

The hot flue gases and smoke were ducted by the flues into the chimney (the present entrance to the boilerhouse).
The Safety valve, waterguage and other fittings have all been removed.

(B) Locomotive Type Boiler.

Principal Dimensions

Length of boiler shell (less firebox)	9' 6"	No of iron firetubes	28
Diameter of boiler shell	3' 0"	Dia. of firetubes	3 ft external 2½" internal

The boiler shell is made from 3/8" plate and all seams single riveted, the pitch being 1⅝". There are 28 fire tubes each 8' 4" long. The firebox of the boiler and the shell have been removed, no doubt as scrap copper.

The backplate of the firebox is still in place and measures 2' 4½"wide by 3' 0" high; from this it is possible to estimate the length of the firebox as being between 2' 6" and 3' 0".

Steam was drawn from the boiler through a 2ft diameter valve near its front end. A 12" by 14" inspection manhole is provided on top of the boiler.

The smoke box occupies 1' 7½" of the boiler and the chimney was 10½" in diameter.

At some time during the boiler's life one of the firetubes has been blanked off. All fittings have been stripped.

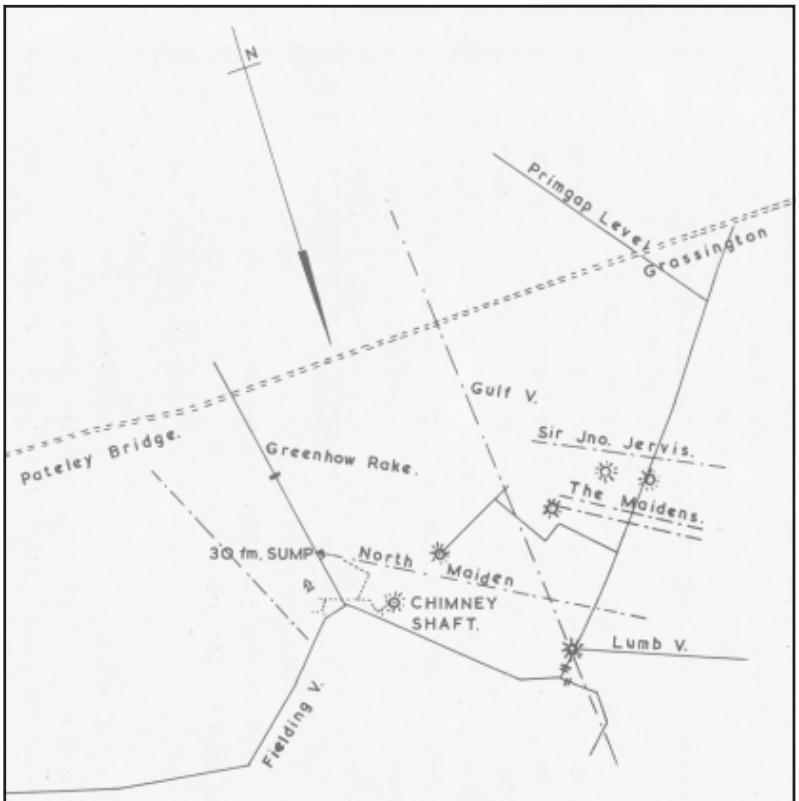
(C) Locomotive Type Boiler

Principal Dimensions

Length of boiler shell (less firebox)	9' 7"	Diameter of boiler shell	2' 10"

No. of Fire tubes 28

The construction of the boiler is very similar to boiler (B) just described.
The major difference being that it is made of 5/16 inch thick plate.
The firebox and tubes of this boiler have been removed indicating that they too were made from copper.
The smoke box occupied l' 8" of the shell's length and the chimney was 11" in diameter.



PLAN OF

COCKHILL MINE.

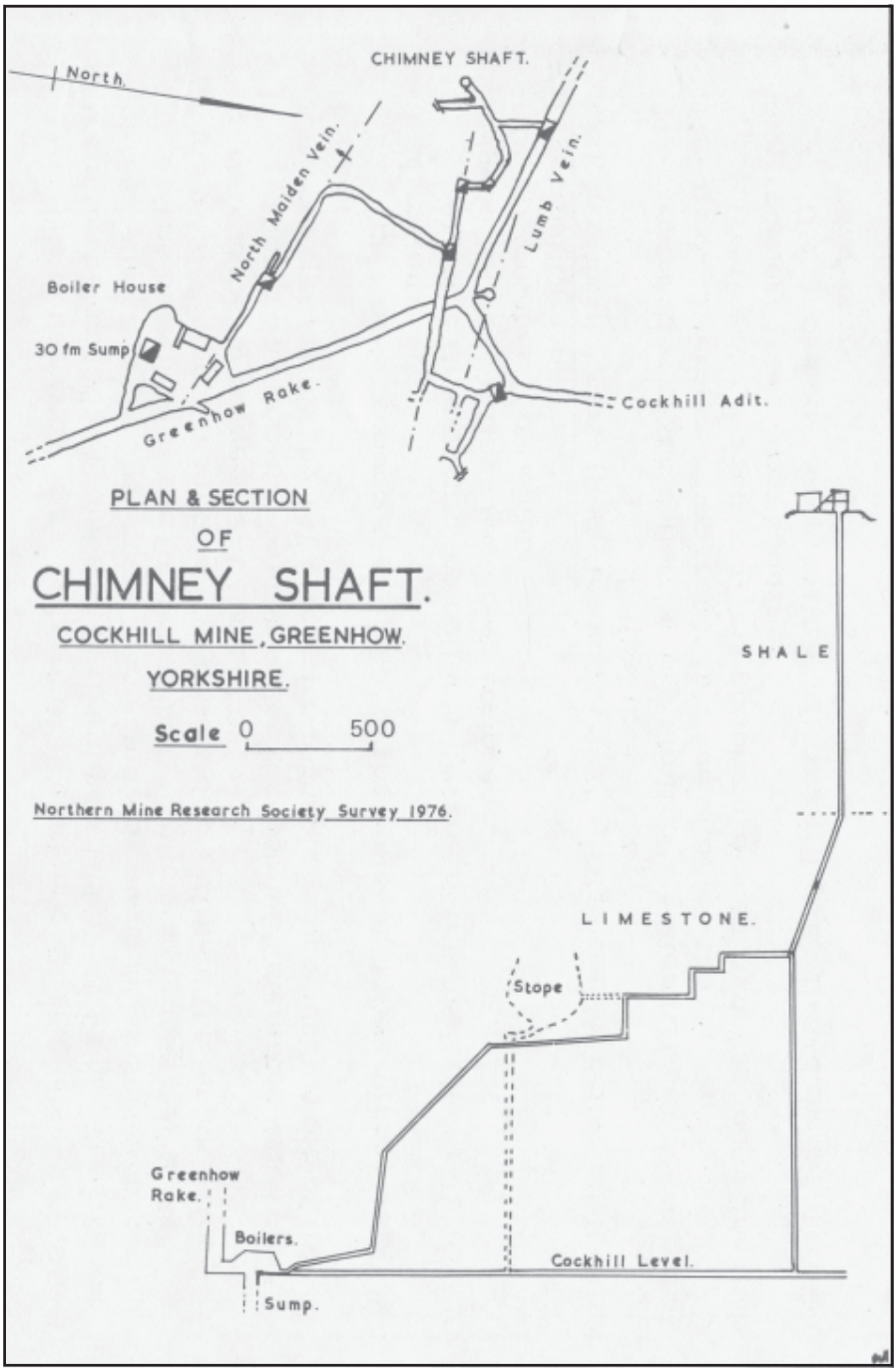
GREENHOW RAKE AREA.

A.W. PHILIPS 1806
N.M.R.S. 1976.

CHIMNEY SHAFT N.G.R. SE10936419
ALTITUDE A.O.D. 1250 FT.

SCALE 0 2500

0 20 40 60 80 100 120 Metres.


North.
CHIMNEY SHAFT.
North Maiden Vein.
Lumb Vein.
Boiler House
30 fm Sump
Greenhow Rake.
Cockhill Adit.
PLAN & SECTION
OF
CHIMNEY SHAFT.
COCKHILL MINE, GREENHOW.
YORKSHIRE.
Scale 0 500
Northern Mine Research Society Survey 1976.
SHALE
LIMESTONE.
Stope
Greenhow Rake.
Boilers.
Sump.
Cockhill Level.

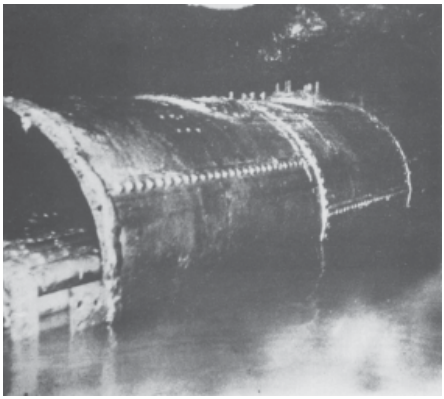


Plate 5

Plate 6

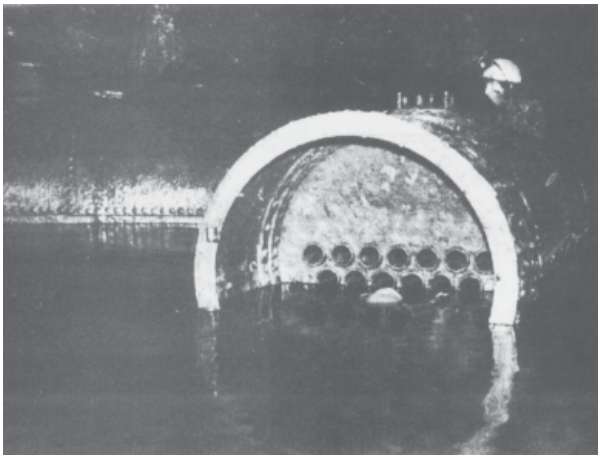


Plate 7

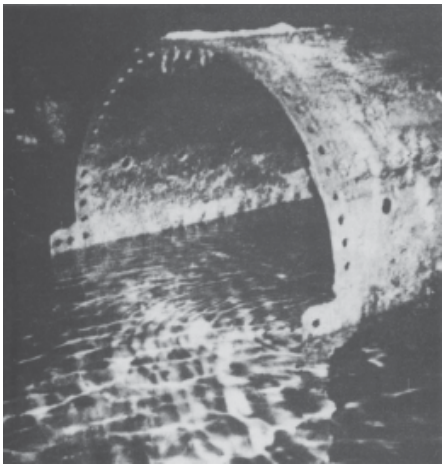


Plate 8

Plate 5 ‘B’ Boiler showing tubes (left)

Plate 6 ‘A’ Boiler near Chimney Shaft exit

Plate 7 Smoke box of boiler ‘B’
‘A’ Boiler in background

Plate 8 Boiler ‘B’, Firebox end.

The boiler is provided with a 14ft by 12" manhole and another smaller one between the boiler and smokebox.

Large studs and castings on this boiler suggest that parts of the engine were mounted on it.

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Acknowledgements

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NOTE: Photographs by A.P. Finch, J. McNeil, M. Gill.