

DISCUSSION

Dear Sir,

It was with great interest that I read Dr. T. D. Ford's letter in the last issue of the Bulletin (Vol. 2, No. 1), concerning the cutting of grooves in shaft walls by ropes, chains or kibble handles.

Since the publication of the letter last May I have taken observations at the tops of all ladder pitches I have been on whilst caving, with the expressed intention of finding grooves worn by ropes or similar articles.

On those pitches where a lifeline normally rubs on the rock at some point near the top of the pitch there is always to be found a polished and often grooved patch of rock. In some places where lifelines tend to run in one place all the time, grooves are sometimes found up to $\frac{3}{4}$ " deep and about $\frac{1}{2}$ " wide.

Since some of these grooves have been noted in purely natural systems, e.g. Nettle Pot, Simpson Pot and many others, they could only have been caused by Cavers' lifelines, made of one or the other of the following materials: hemp, sisal, nylon, terylene, polythene, etc., and not by chains, wire hawsers, kibble handles or any other metal implement used in mining. Also, since the actual number of hours that a lifeline is dragged over the rock is very small compared with the number of hours of hauling that must have gone on in some mines, i.e. Longcliff, two things are indicated. 1. The groove cutting by ropes must be relatively rapid for the development to have advanced so far in some systems. 2. The large size of some of the grooves in shafts and mines is simply accounted for by the much longer time they had to develop. Probably connected with this is the fact that the kibble plus ore would put a greater load on the hauling rope than the average caver puts on a lifeline whilst climbing a ladder.

Another slightly different example of the extremely abrasive nature of wet grit laden ropes has come to the fore since the advent of electron type caving ladders, causing quite a lot of consternation in caving circles. This is the very rapid wearing of holes in the tubular rungs of flexible metal caving ladders.

Only a few weeks ago I witnessed this unpleasant thing happen on some of my own club's ladder whilst on a visit to Nettle Pot.

It was on coming out, the lifeline on the top pitch had been snagging and it was moved to a less troublesome position unfortunately running over some of the ladder rungs. On derigging the pitch it was found much to my alarm that a hole had been worn in one of the rungs where the lifeline had been running. The hole was about $5/16$ " diameter

worn through 16 gauge H.T. 18 hard aluminium alloy tube 9/16" diameter, it must have been caused by not more than 1,000 feet of 1 1/4" circumference nylon rope running under load over the rung.

I am sure the above observations give weight to Dr. Ford's argument that ropes were the cause of the grooves in Longcliff mine hauling shaft.

R. J. A. Travis
Nottingham, September 1963.

Dear Sir,

The following is part of a letter from Mr. A Richards, who was the chief engineer at Mill Close from about 1930 until 1938, whilst the mine was under the management of Mr. L. B. Williams.

"There were three Cornish Pumping Engines erected on this Mine, officially named Jumbo, Alice and Baby, after the Zoo elephants.

"Jumbo: Maker and Engineers, Messrs. Harvey and Company, Hayle, Cornwall, 1875.

"Cylinder 30" diameter, 10'0" stroke indoors, 9'0" stroke outdoors. Cast Iron double plate bob, double main loops, cast iron cap with Watts parallel motion. Top nozzle with three double beat valves, governor steam and equilibrium. Bottom nozzle exhaust with one perpendicular pipe bracketed for carrying the exhaust levers. Double plug rod with adjustable slides for regulating cut off of valves. Three arbors in bottom chamber. Top equilibrium, middle steam, bottom exhaust. Injection valve worked from exhaust gear. Two cataracts with all necessary quadrants and catches. The outer end of the bob was connected by two iron rods to a crosshead working in slides below the collar of the shaft, and the first wood rod connected to it. The idea was that the engine could be run faster with this arrangement, but to us it did not work out so. At one period we were working this engine at eight strokes per minute - our maximum speed.

"I believe this engine was what we looked upon as Harvey's standard and was probably designed by Mr. Jabez Bickle.

"In 1917 this engine was fitted with Hathorn Davey's Differential Engine for operating the valves. This gear worked very well and did away with the horns and handles, also cataract gear, but it was not so handy to start the engine. I also found that the gear was so linked together that it spoiled somewhat the setting of the valves, as in the old gear each valve gear was separate and gave a better control and more definite diagram.

"In 1921 the engine house caught fire and burnt out all beams and floors and left everything swinging in mid air. With my own men we fitted her up again and substituted mild steel everywhere, except the spring beams. Jumbo kept on working after that until February 1932, when we installed electrically driven centrifugal pumps.

"The engine was dismantled and broken up in 1933 for scrap.

"Alice Pump: Makers: Messrs. Thornewill & Warham, Burton-on-Trent in 1857.

Cylinder diameter 60". Stroke indoors 8'0", stroke outdoors 7'6". Cast iron double plate bob connected to piston rod by double main loops, wrought iron cap with "C" rings. Top nozzle with governor valve, steam valve and equilibrium valve. Bottom nozzle with exhaust valve, with two perpendicular pipes, one pipe a dummy and the other for equilibrium steam. Arbors in bottom chamber and gear similar to that of Jumbo Engine, when first installed.

"This engine was built for the Wakebridge Lead and Spar Mine at Crich, Derbyshire and re-erected at Mill Close Mine by Messrs. Markhams of Chesterfield in 1889.

"Baby Pump: Makers: Messrs. Thornewill & Warham, Burton-on-Trent in 1860.

Cylinder diameter 50". Stroke indoors 8'9", stroke outdoors 7'9". Cast iron double plate bob and in all details the same as Alice Pump, except the radius rods and anchor blocks were some distance past the piston rod, whereas Alice anchorage is in line with piston rod centre.

"These engines are approximately as Watt left them as regards design and they are both housed under one roof. Each engine works on its own cataract, as Alice engine was used as a standby for years, Jumbo and Baby engines keeping the mine clear of water.

"Enclosed please find prints of Jumbo and Baby engines, which will explain themselves; and are sent through the kindness of our General Manager, Mr. L. B. Williams; also diagrammatic sketch of pump work, the whole of which was installed by a Mr. Stephen Thomas of Leedstown, Cornwall, whose family are still in the employ in the mine.

Yours faithfully,

A. Richards. "

The engine referred to in Miss Kirkham's excellent article is the Baby pump which was in operation at Old Mill Close and was erected there by the manager, Mr. Wass, in 1859, where it worked until 1896, when it was moved to the Warren Carr Shaft to work along side the 60" Alice pump in the same shaft.

I am indebted to Mr. Edgar Brook for the foregoing information and the loan of the photographs reproduced in Plates 7 and 8. Plate 8 (indoor) shows on the left the 60" Alice cylinder and on the right the 50" Baby cylinder. Plate 7 (outdoor) is a photograph of the pump rods, Baby on the left and Alice on the right.

W. E. Smith,
Sheffield, October, 1963.

ADDENDUM

Volume 2 - Part 2:

Page 8 - Acknowledgment:

With thanks to Derby Library for the loan of the block for Plate 1.

Page 47 - Add to Acknowledgments:

The photograph used in Plate 5 was taken from the Records of the Peak District Mines Historical Society.

Downloaded from www.pdmhs.com