

THE RECOVERY OF A STEAM ENGINE FROM PUTWELL HILL MINE, MONSAL DALE

by

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"Confusion will be my epitaph"

A very wet autumn day in Monsal Dale, walking along the railway track we find a hole in the side of a cutting, shelter!

So, squeeze down the slit, enter an enormous stope down ten feet of signal ladder - this is Putwell Hill Mine, worked for lead in the 18th and 19th centuries and calcite in the first quarter of this century. The stopes, 10 ft. wide, bellying to 15 ft. in places, and up to 60 ft. high, go straight on, exploration is irresistible. A great hole, open to the sky above, marks a collapse and the floor is strewn with rubbish and debris. Beyond, a mud bank slopes up 30 ft. From the top of the bank the stopes are even more impressive, but sticky mud slopes down into blackness. Sliding down with some trepidation, beneath hanging remains of stemples and deads calcited to the walls, high on the east side a slit in the roof shows where the old man stoped out a stringer of lead ore. Splashing through a puddle to a large hole in the floor, which can be passed by a ledge on the left, on past a rotten oozing ladder, a short drift leads to a shaft foot, choked with tailings fallen from above. Out of the choke, tapering into darkness, iron pipes hint at finds to come.

Back to the creaking, rotten ladder, moving gingerly on, one can shuffle past the shaft, to explore the workings beyond.

But those pipes! Ideas become wilder, curiosity more committing, we must find out! Scratching at the choke with helmets and finger nails, humping a pipe brings down stonefall but we dig on, a casting uncovered, more machinery, what? steam engine? hydraulic engine? pump?. We are committed now!

On returning with picks, shovels, as we dig, a rumble from below, and a collapse reveals a deep water-filled hole. Tying ourselves to the machinery we continue. Three more days work, fifteen tons of rubble have filled in the rather worrying hole, and two steam engines, a Worthington-Simpson Duplex and a Pulsometer are uncovered.

At first we think we can't get them out, so we start to clean them in situ, with an idea to seal off the easy entrance, leaving only the 60 ft. pitch where the roof of the stope has collapsed for access, but as more time passes we decide they'll have to come out.

We start on the Worthington first, the smallest and lightest. Sawing through the pipes, as they part they swing alarmingly, bringing down more stone fall. Unfastening the mounting bolts, two of us try to lift it, raise one end a fraction, pack up and go home to think of another way. The next stage, a weekend's work with hammers, chisels, saws, spanners, blow lamp, much sweat and cursing to strip the engine down to its two basic castings and an awful lot of bits. Hauling the castings 8 ft. up out of the engine chamber into the drift with a small block and tackle took ages, and we retired with haversacks full of nuts and bolts, pistons, valves and other small bits. More thinking needed, man-handling the engine out is obviously impractical!

At last our need for much equipment and personnel is answered in the persons of Sheffield University Officers Training Corps. After a few weeks planning and a midweek reconnaissance fifteen people met at Glossop Road Barracks at nine o'clock on a cold, windy, showery Sunday morning. Baulks of timber, wire slings, pulleys, hammers, holdfast anchors, butties, pick-axes, flasks of coffee, radios, 1,000 ft. of 3 inch manilla rope and finally a lot of people are loaded up and a Landrover and a 3 ton truck set off for Monsal Dale. The Landrover arrives first, then the three tonner, very powerful but slow, and the vehicles are carefully manoeuvred over the station platform and down onto the track, and along to the mine entrance. We start to unload, and shortly a battered van bounces along the track bringing reinforcements from Buxton.

The plan is to rig a telefrique from the engine chamber to the large hole in the roof of the stope, and soon two 300 ft. manilla ropes are being lowered down the hole and dragged along through the mine. The span, almost line of sight, is 280 ft., and the suspension cable is fastened to an Acro prop underground, and tensioned on the surface by half a dozen soldiers hauling on a block and tackle, attached to a holdfast anchor. Our communications expert climbs up the old wooden ladder and finds radio transmission from there to the surface excellent. The first half of the engine is lashed up in slings, a snatch block snapped onto the suspension rope, the hauling cable is attached and the casting man-handled along till it will lift freely. At this point the radio fails (probably full of water) and the communications system changes to several people shouting, screaming, jumping up and down, blowing whistles and waving their arms about, but at least it is reliable. The hauling cable is coupled to the 6 ton winch under the 3 ton lorry, taken in slowly and the casting lifts off and floats away, mocking our struggles of the last few weeks.

Across the hole in the floor, the suspension steepens and climbs above the mud slope to the crest. Shouting from below, we stop the winch, as sag in the cable has let the casting ground. Man-handled over the top, the winch started again, the load dips a few feet and then glides up the last steep incline to the surface. A few feet from the top the casting slips into a slit in the side of the stope and jams solid. We lower an

expendable person into the hole to fasten another rope round the load, slacken the suspension cable and drag the casting sideways across the hole, start the winch again and it emerges, by now a large cube of mud.

By now it is 10 minutes to closing time, leaving a trail of helmets and muddy boiler suits we pile into the Landrover and roar up the hill to Monsal Head. Five minutes to closing time the landlord looks up in alarm as combat kitted figures storm in demanding pints. Fifteen minutes later, suitably refreshed, we return to work.

Reposition the suspension cable to avoid snagging again, start to tension it, a calcite wall fails under the strain and the Acro prop pulls out. Shouting for slack, the end is tied to the Pulsometer to save time. This time we know the difficulties in advance, and the second casting is hauled out smoothly in a quarter of the time the first took. While two people remove the suspension cables the two castings are man-handled down through the bushes onto the track.

Of course with all this equipment we forget some means of lifting the parts into the vehicles, so they have to be man-handled into the Landrover as it is lowest. The equipment is loaded into the three tonner and we drive off for Sheffield as darkness falls.

After recovery the engine was completely stripped down to its component parts (195 of them!), after removing mud with a hosepipe. Brass components were cleaned in molar hydrochloric acid followed by mechanical cleaning and polishing. Large iron components were pickled in 10% oxalic acid (15 gallons of it!) followed by hosing and mechanical cleaning, whereas smaller iron and steel parts were cleaned using sodium hydroxide/EDTA/dithionite followed by mechanical cleaning. Mechanical cleaning was carried out by hand or power wire brushing, chipping where necessary, and sanding by band or with power tools. Only one leather gasket, in the pump valve chest, was intact, and was carefully washed, dried, and treated with leather dressing. The remaining gaskets, of leather or fabric reinforced rubber, had perished and were replaced with fabric reinforced rubber. Finally, on reassembly, iron and steel components were greased, if internal parts, and the external surfaces were coated with "Kurust" primer and black polyurethane paint, and external brass components were protected with clear polyurethane varnish.

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15 gallons of acid bubbling away in the garden shed, and pieces of engine taking up half the garage, most of the kitchen floor, dining room table, the top of the sideboard and under the television.

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