

Deep Level-Deep Water-Deep Trouble

Jeff Wilkinson and Mark Ellyatt ©

Note: A version of this article originally appeared in a mining history newsletter in 2005.

This exploit continues the great tradition of exploration in the Coniston Coppermines. It is unlikely to see any repeats from even the most fanatical or experienced mine explorer!

Background JW: Over the years hundreds of mine explorers have peered into the flooded Old Engine Shaft, within the Deep Level crosscut tunnel at Coniston copper mine. Many will have wondered what it was like down there in that eerie, hostile, subterranean world! In 1996 I was involved in a project with extreme diver Rich Stevenson. He was keen to see how deep he could go down the flooded Old Engine Shaft. My memories of those dives were the mass of gas tanks, a shivering, blue lipped Rich hardly able to speak and the feeling of being part of a special exploration event. Sitting alone in a tunnel for 3 hours with only air bubbles for company did a great deal to a vivid imagination! A staggering depth of **126 metres** was reached. I have since learned that back then Rich was in unknown territory pushing the absolute limits of deep Tri-mix diving. I tried on many occasions to get him to write an article about his dives but sadly it never happened.

In 2002 while working at the Ruskin Museum in Coniston I was approached by a guy who was showing an unhealthy interest in Dave Bridge's Coppermines CD-ROM and asked probing questions about a certain deep flooded shaft. Déjà vu! Within a few minutes it became obvious that this was no scuba diver trying to impress. Mark has not come from the cave diving or mine exploration route. The following article by him was written for a diving public so it is a bit technical but it does capture the spirit of exploration, beyond any rescue and totally ALONE. He visited an area the rest of us will never see. Technology has moved on a great deal since 1996 but make no mistake this is still high-risk cutting edge exploration in a hostile environment.

To quote Bill Smith who worked in a mere 45 metres of open-water to recover Bluebird from Coniston Water: *"deep Tri-mix divers are technically brilliant but die with monotonous regularity."* Sounds a bit harsh.

A mind-blowing depth of **170 metres** (around **557ft**) was reached taking him past the magic 90 fathom level! Truly Amazing.



Copper Mine Dive by Mark Ellyatt.

Saturday 26 Oct 2002, the date for my latest sortie into Coniston Copper Mine. The four previous dives were carried out to obtain video footage and feel more comfortable with the 309m deep, 2m square shaft with its 9° C water temperature and pitch black darkness.

Finding buddies who would assist in diving the mine was almost as tricky as the dives themselves. Christina Uwins (Medical student/Divemaster) and Brian Gilgeous (commercial diver) were ideal for the job. Both had dived the mines before, both were experienced with technical diving, and decompression medicine and even better, both were free that weekend!

Jeff from the Ruskin Museum was a mine (free pun) of useful information. As a museum custodian and a passed explorer of the mines he had access to articles and plans and was very helpful with his knowledge of the mine systems.

The weather that weekend was very wet and windy; the mine entrance can only be reached by crossing a rain swollen river. Mark, Christina and Brian carried the equipment into the mine over 2 days in 6 hour shifts! Carrying twin 20 litre tanks over rapids takes a lot of care. When all the kit was in place, the deco tanks staged on lines, we exited the mine to relax and suit up before the dive.

Dive tanks were a 20 litre twinset of Trimix 5/76 bottom mix, stage tanks of Trimix 14/50 and Trimix 20/30. Brian would descend to 60m supply backup 20/30 and remove the used 14/50. Christina would descend to 40m with Nitrox 32 and 36. At 21m a 20 litre stage tank of Nitrox 50 was pre-staged together with a 7 litre of Nitrox 50. The 20 litre tank was to be used during in water recompression if the need arose. At 6m we staged a 12 litre twinset of oxygen with long hoses to reach the 3m 2m and 1m stops.

Attached to the big twinset was the argon suit inflation, and battery packs for Otter Electric Suit Heater system and Abyss HID lighting. While kitting up a backup light fell into the void...never to be seen again.

With the kit checks done, I slipped into the black water, the rain pouring like a water fall down the shaft above, the visibility was nil near the surface.

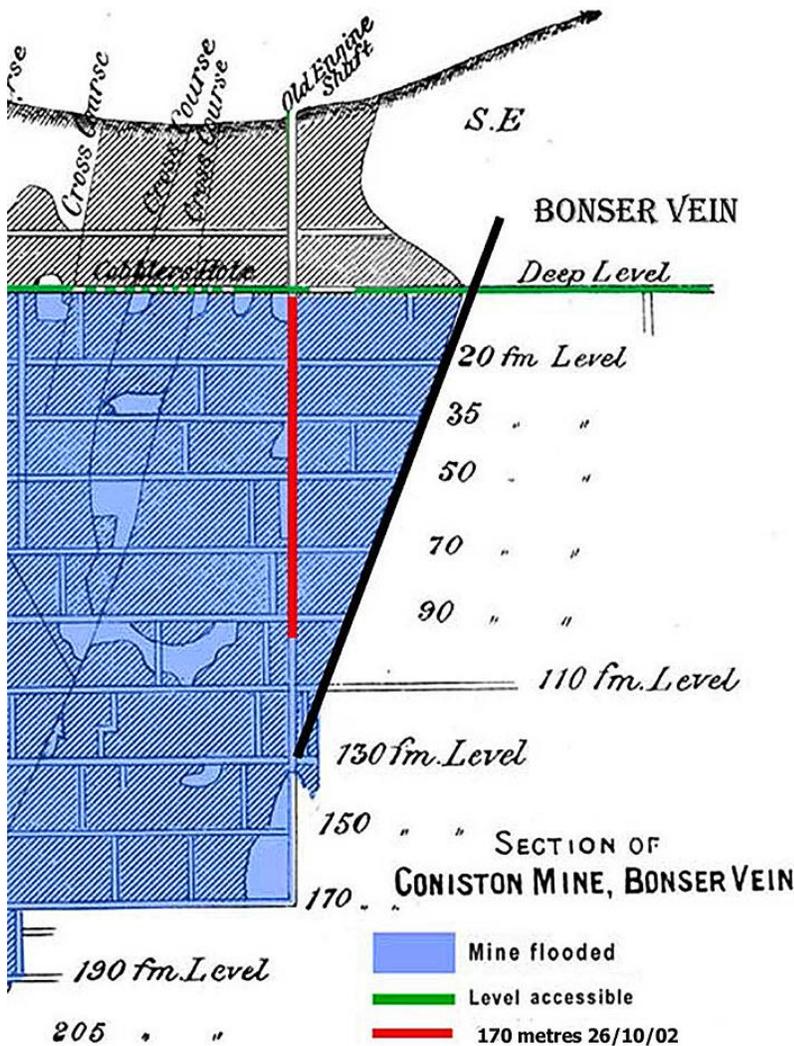
Descending through the darkness, I dropped to the first restriction at 33m. At various levels, the shaft has stagings and crosscut tunnels that join it where the copper ore vein was intersected. I placed my weights into this tunnel, as I didn't need additional weight below this depth. I clipped my strobe at the tunnel entrance.

Dropping down to 54m on trimix 20/30, I passed the next restriction and swapped directly to Trimix 5/76 bottom mix. It was very easy to breathe so I turned in the resistance screw on the second stages and checked all venturi levers were set to the minus position to avoid free flows. I signaled back to the surface with 2 pulls for OK on the descent line.

The topside cover could watch my progress on the 6 foot square black water virtual "TV" screen in front of them. I would pull the line periodically to indicate my progress. At 150m and 7 minutes into the dive the next big restriction came into view, it was a solid staging platform covered in debris. I carefully started to remove the timbers and pile them up on one side so I could get past. At 160m and 9 minutes another pile of timbers stopped my progress and I worked carefully to remove them, the visibility was bad. I noticed a glow below me and was very surprised to see my lost dive light sitting back from the main shaft, glowing brightly. My primary light consisted of a Suunto Navy 80 which was working fine and an Abyss HID light, which proved less water tight at 130m!

At this point I did a kit and self check. I was down to 170 bar, and 2 Q40 headlights had gone to sleep, my head mounted chem-lights had also split from the pressure and were all leaking green alien blood! I checked my twin SL6's and SL4 backup lights, they still worked fine. I felt no HPNS symptoms, only a dull ache in the spine area.

I picked up the lost TEC 40 light and dropped further. The wooden floors were coming far more often than in the shallower areas, the next one just 7m lower at 168m. This staging consisted of 2 solid diagonal timbers which each bisected the shaft. Large timbers lay loosely on top. I removed these. ***Dropping through the gap I'd made caused my twin-set to get wedged on something. I tried to pull back up but my side mounts were now below the level and I was stuck.*** Visibility was almost nil; I shut my eyes to relax. Alarm bells started ringing in the back of my mind. I was pretty much trapped. It was time to leave at 12 minutes descent time, but I could afford another 7 minutes at this depth before the deco plan using the RGBM algorithm would be compromised.



I tried to free myself upwards, but could manage nothing. Concern flicked across my mind, I looked at my back gas contents gauge, it showed 100 bar. I slumped down and found my back tanks free but only going downwards. I dropped below the restriction, down to 170m now 17 minutes in and 70 bar left. I checked my isolator valve...maybe it was off, but no luck there. I looked up at the underneath of the floor, looking for a way through. I moved across the shaft, and put my hand up and started to fin up, the loose timbers lifted and with a big effort I was through. The plan called for 147m by 20 minutes. I got there early and started the deep 30 second stops. My mind slowed down. The 15 metre END helped enormously.

The next stops trickled along, but, by 130m my back gas tanks equalised with the surrounding pressure, and would not supply gas. I turned on my left stage tank of Trimix 14/50. For some reason it just free-flowed violently, I put it in my mouth. Taking a breath I turned

the tank off. This tank was to be used at 90m and shallower, but needs must so I used it. With all the excitement I forgot about the next restriction near 120m. It wasn't much of a restriction, taken on the correct side. *I ascended into the wrong side and was wedged into the cross timber.*

On this mix, my equivalent narcosis value was 60m ish. I had a stop here for a minute and used the time to signal to the surface I was trapped at 120m with twelve pulls of the rope. I got a response asking if I was OK. I wasn't, and definitely needed support diver Brian to descend earlier than planned, bringing the spare gas. There was no rope signal for this, so it didn't happen. I'd asked Brian and Christina not to attempt giving assistance below 60m, because of the restriction dangers at this depth.

Dumping the gas from my wing and suit, I got free and headed up. With the free flowing reg still going it didn't last as long as it should and by 100m the tank stopped breathing. I closed it and switched to my trimix 20/30. Every few breaths I would swap to my back gas to average out the high pO₂. All the stops over 30 secs were reduced to 30 secs, to reduce gas consumption; also the planned max depth wasn't reached. By the time I reached 60m I was ahead of schedule by almost 10 minutes, Brian wouldn't be coming for a while. It left me breathing whatever was left during the stops. At 60m I settled on top of the restriction here. I dumped all my wing gas and replaced it with exhaled trimix 20/30, this might be useful soon!

Brian showed up by the time I got to 40m. I ascended up with him still breathing my 20/30 and back gas till 21metres. The first tank on a rope appeared at 21m it was nitrox 50. This stop at 21m I increased from 6 minutes to 40 minutes, an ounce of prevention here could save some trouble later.

At 6 metres I moved onto oxygen for 30 minutes, then 4 metres for 20 minutes and 3 metres for a further 30 minutes, every 15 minutes I would have an air break for 5 minutes. I chose back gas switching here but this was a mistake because of the really hypoxic trimix 5/76, ***after just 2 minutes of breathing this I felt my brain and vision shutting down***, so it was quickly back to the oxygen. The further air breaks I used some trimix 20/30 (the theories behind this, attempt to prevent pulmonary related decompression problems and not simply buffering the CNS clock). A further ten minutes at 2m and ten minutes at 1m served to relax my bodies' gas tissue tensions, a useful technique I'd used before when forced to deco on back gas etc.

After all this extra deco, I felt confident that the bends were not coming. With all the extra deco stops, it meant close on *200 minutes in the cold water*. I was still warm and dry, my drysuit worked perfectly. I had spoken with Otter a couple of weeks before and they mentioned a new Artic 300 undersuit. I got one of these and was very pleased I did. My support divers had mere mortal undersuits and felt the cold pretty much throughout.

I would still like to explore this mine shaft deeper, but any further deep dives would need several clean up dives in the 170m range. The reasons for doing these deep dives are mostly



for the exploration and adventure. Another reason is to improve my teaching ability as a Trimix instructor trainer. **Mark Ellyatt** © Images added by Jeff Wilkinson

Summary: JW Photo showing a large square hole in the wooden partition (which separated the main shaft from the ladder way/pump rods) was edited from a video stream which Mark took during one of his earlier dives. Mark also entered one of the crosscut tunnels on an earlier dive and could see where it intersected the Bonser vein. Some of the lower stagings appeared to have been completely timbered over and at his deep point the shaft for some reason was starting to become wider. Could this be due to geological faulting or was the shaft getting close to the Bonser vein system? Records say that the Bonser vein intersected the shaft considerably lower, at the 130 fathom level. He also commented that the wooden ladders within the partition continued all the way down the shaft.

Some weeks later Mark asked if the museum would be interested in having a "SOLID COPPER INGOT WEIGHING ABOUT 60KG" and having the appearance a bit like a Toblerone chocolate bar! He had recovered it from a dive wreck. It turned out to have a very interesting history.

Mark removed ingots from a wreck sunk off the Channel Islands in 1916. It was the French vessel "Jean Marie" which was sunk by the German submarine "UC18". The submarine in-turn was sunk nearby by the disguised torpedo boat "Lady Olive" which was also sunk during the exchange. All in all a busy couple of days! The fact that the French owned "Coniston Electrolytic Copper Works Ltd" produced copper ingots from ore recovered from the spoil heaps at Coniston by the new electrolytic process between 1911-1914 gives us a tenuous link, though it would probably be stretching it a bit too far to suggest that it was originally produced here at Coniston. Wouldn't it?

Update 7/9/05

Had a call from Mark. I was delighted to hear that he was keeping well and still alive!! He had also just broken the *World Solo Diving Record* with a dive of **313 metres or 1,026 feet!!** Total time in the water, 6 hours 36 minutes; absolutely amazing. The dive details are on his website: www.inspired-training.com.....Now then, how deep is the Old Engine Shaft? I wonder!!

Update April 2009

Mark is still alive.....and running his successful diving business; he has also published a book on his diving adventures from around the world.....Ocean Gladiators.

He still holds the record for the deepest dive in the Coniston copper mines.....unless someone out there knows different?