

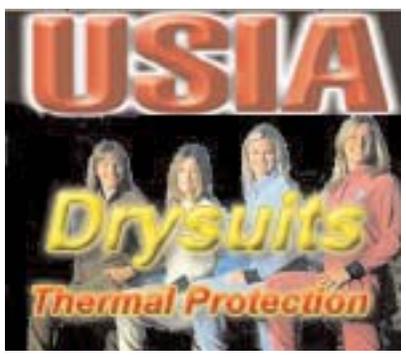
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Maxwelton Sinks Cave; Cave Digging's Price, Lessons and Rewards

by Carroll Bassett

Foreword

I began thinking about this report soon after the event described herein. Feeling that a brief history leading up to the event was important to understand the circumstances, I have included an extremely abbreviated version. The conclusions on the events are mostly my own. Discussion and responses are encouraged and important to this community. My goal is to, in some small way, make digging safer.

A Short History

The original entrance to this cave was at the end of a blind karst valley fed by a small stream which had been dug open in the late 60's only to be permanently flooded shut in 1971 by hurricane Agnes. Before this unfortunate event however over 10 miles of passage had been surveyed and mapped with many more leads left to explore.

With the auction of the property in the late 90's, the West Virginia Cave Conservancy (WVCC) began a difficult and frustrating series of negotiations with the new owners, an investment group who planned to develop the remaining property. After a verbal agreement was arrived with the new owners, a survey was completed on the approximately 5 acre piece comprising the bottom of the karst valley, most of which had been designated as flood plain and undevelopable under FEMA regulations. Upon entering into an agreement with the Greenbrier Valley Economic Development Corporation (GVEDC), a state funded entity created to bring industry into the area, the new owners abandoned on their agreement with WVCC.

A new round of negotiations with the GVEDC produced another verbal agreement but this time the surveyed property was to be donated to the WVCC in return for public acknowledgment of their generosity

and environmental concern. The amount that the GVEDC agreed to pay to the new owners, which was essentially state money, was more than three times what they had paid at the original auction 6 months earlier.

The jubilation of the new owners at their windfall was to be short lived however. Apparently state law dictates that any development with public money requires environmental impact studies before transactions can be finalized. The results of the study indicated that development might directly threaten at least two endangered species. These results may have led to a suspected withdrawal for political reason the GVEDC takeover. Consequently, the owner was alienated from the caving community due to some kind of environmental trump card to ruin their very profitable deal. This, of course, was not the case and destroyed our chances to acquire access to the property at the old entrance.

With no chance of gaining access to the original entrance and most of the original survey data either lost or of questionable accuracy, any hope to gain an entrance to the cave seemed unlikely until Dr. Dave Scott purchased property he believed overlaid sections of the cave. He expressed an interest in trying to gain access to the cave below and digs were undertaken both manually and with mechanized equipment (i.e. track hoe, which was financed by Dr. Scott). These digs were frustratingly unsuccessful and hope of opening the cave waned until Jeff Bray started studying the area for micro-gravity anomalies. His work indicated passage at a number of locations and a six inch test well was drilled at one of the most promising spots. A modified black and white surveillance camera was lowered into the well and voids encountered at 30 and 105 feet were remotely video taped. The 30 foot void did not seem particularly promising but the 105 foot void contained larger passage and a stream flowing almost due north. This corresponded with the existing map of the cave to indicate we had probably drilled into the "Heaven" passage of Maxwelton

Sink Cave.

105 feet straight down is a very long way to dig especially when it is mostly solid limestone so it was decided to try a second dig with the track hoe. A spot about 100 feet south and downhill from our drilled hole that had indicated passage in the previous micro-gravity study was chosen.

Digging proceeded well and at 38 feet down from the upper edge of the hole we found breakdown with good air flow. Being at the limit of the reach of the track hoe we began digging by hand in a mostly horizontal direction following the air.

Over the next several weekends an extremely dedicated dig team, of which I was a member, made excellent progress. Traditional digging techniques were used to remove small rock and dirt while micro-blasting was used to open spaces between the large breakdown blocks. This technique also helped to reduce rock blocking our progress to manageable sizes. By the end of September we had dug our way approximately 70 feet to the top of relatively large passage with a stream running through it.

In the Blink of an Eye

On the evening of Oct. 1, Dr. Dave Scott, Jeff Bray, and myself, in a state of high expectation, prepared to enter for the first time in 30 years what we believed to be Maxwelton Sink Cave. I took the lead and on our way in disturbed something which unleashed an avalanche of rock upon myself. After kicking a number of smaller rocks off my legs I realized that my right arm and knee were pinned by what I was soon to realize was a 1,000 pound plus slab of breakdown. Pressure on my right knee was not severe but I was unable to move it; pressure on my right arm between my elbow and shoulder was extreme. My disbelief at the predicament very soon gave way to the harsh reality of my situation. No amount of effort that I made even began to move the rock pinning me and although I could move

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my right forearm and fingers my entire right arm was becoming progressively and ominously numb. Luckily I remained conscious and Jeff went outside to call for help while Dave stayed with me. My arm being subjected to so much pressure became the priority and we called for the screw jack and handle from my Toyota pickup to be brought in. It soon arrived and with my free left hand I placed it just above my right shoulder while Dave cranked the handle from his position in the tight passage about three feet above me. Positioned horizontally between the wall of the passage and the rock pinning my arm the jack now shifted the rock slightly putting greater pressure on my right knee. Backing off the jack returned the rock to its original position relieving the added pressure on my knee but my arm was still badly pinned. We realized that to free my arm we would have to chock the slab somewhere down by my ankles but to access them Dave would have to pass over me and the slab on top of me. Four feet directly above the the slab was another 200 pound slab hanging vertically and held in place at its upper end by the breakdown that made up the ceiling, not an easy choice but at this point seemingly the only option. Summoning up a good deal of courage as well as the aid of the appropriate spirits Dave made his move and made it across the slab without further deterioration of the situation. My arm now was completely numb and yet extremely painful. It seemed to be dying and I deeply mourned its apparent passing.

Having made it across the slab, Dave became energized with optimism. I think this was a turning point for both of us. Even though I was not yet free the problem and its dangers seemed suddenly more defined and the solution seemed within our grasp. Dave placed the the jack under the slab and raised it slightly. Attempts to chock up the slab did not work however, the available rocks and the geometry of the the space he attempted to fill with them were incompatible, they slid out from under the slab as he lowered the

weight of the slab onto them. We realized we would need a second jack, one for raising the slab by my feet and holding it up and the second to slide it off my arm. A second jack quickly arrived. By this time the call for more cavers to help had been answered, and Mike Corbett took up the position above my head where Dave had previously been.

I positioned the second jack with my left hand as in the previous attempt to free my arm. Mike cranked the handle until the jack made solid contact with the passage wall and the slab. Dave then started cranking up the slab at my ankles and within a minute or two I was able to move my right knee from the space it was trapped in. Mike then carefully began to crank more on his end and within another minute I was able to drag my arm from the constriction.

I had been pinned for an hour and a half but it felt more like a week as I pushed myself up from the semi prone position I had been in. At the point when I was again standing the chilled blood trapped in my arm and now circulating through me lowered my body temperature to the point that I began to shiver uncontrollably and I could barely catch my breath, instant hypothermia. The shivering subsided after about a minute and I crawled another ten feet and rested as Daryl Trusty, caver/paramedic, checked me out. I got the "good to go" and mostly under my own power crawled the last forty feet to the entrance where a helpful boost popped me out. I had made it out but the struggle was far from over.

Almost four months later nerve function has returned to my right hand to allow simple grasping motions and slow typing (definitely faster than one hand typing). To get to this point I have undergone painful nerve studies, acupuncture, osteopathic manipulation, STEMS treatments and masses of physical therapy. I list these things only to give an idea of the repercussions of this incident. Although a serious situation, it could have been a lot worse. I consider myself lucky to have not been hurt any more than I was. Initial projections by my doctors for

recovery agreed on about six months. Given the rate of recovery thus far I would say they were right on target and I am very grateful.

As a result of this incident I have had a fair amount of time to consider many of the aspects of it and have come to some conclusions I hope might be useful to others.

The Scary Truth?

Dig long enough and something is going to fall on you!

If you are VERY LUCKY you will simply crawl out from under it or push it off of you with no ill effects other than a bad moment.

If you are JUST LUCKY, someone will be able to help get you out and you will recover EVENTUALLY.....

If you are NOT SO LUCKY, you will be rescued but will sustain permanent injury to one degree or another, possibly after a long and miserable struggle involving many others.

If you are UNLUCKY you will DIE, maybe after a long and miserable struggle by yourself or with others trying to help you but you will be dead and your rescuers, friends and family will suffer. Would a quick death help here? Not anyone else but you.

I wouldn't deny this before the accident if asked but I wouldn't have written this then either. So if this is the truth, and it is for me now, was I in denial or just ignorant? Will this be true for you after an incident or is it true for you now after reading this? If not true to you now, are you in denial and if so why would anyone want to cave or dig with you? These questions are rhetorical and need to be answered privately first and then maybe discussed with others. At this point I believe that these are the facts and they need to be faced.

In my mind facing these facts has not eliminated digging for me but it has convinced me that we need to be prepared as best as we can to deal with these incidents quickly. We need to have some plan in place before an emergency.

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So It Happens and Someone is not VERY LUCKY

In any dig if there is a collapse, shift, etc. and someone is trapped, time will be of the essence especially if they are pinned or otherwise in close contact with the passage. "Self rescue" should start immediately by your party as well as alerting others outside the cave/dig to a possible callout. If you have been digging for any length of time you have probably already performed some small self rescue but do you have available equipment for the probable inevitability of a more serious event?. Nearby? Prudence would put some thought into what you might do well before an incident and have ready at least some gear and expertise to deal with the problem quickly.

Besides the normal tools of the trade, i.e. dig bars, buckets, shovels, hammers etc., I would have nearby what I am calling a "Crunch Pack". This would consist of a durable bag containing at least but not limited to the following:

2 small mechanical screw jacks with handles found in small cars and light trucks. Small hydraulic jacks do not operate well in all positions so they should be avoided. An exception to this would be a "port-a-power" set which uses a remote pump. These tend to be large and not as dependable as mechanical jacks but they can do some amazing things in a small space.

20 wooden wedges. A good size would be 3" wide by 8" long by 1" thick and made from oak*. These wedges will allow shimming and wedging rock that may be unstable. They also can back up progress made with jacks and be used to favorably position jacks when jacking surfaces are slightly out of parallel. They can be used as cribbing when stacked in "opposition" to themselves (thin end on fat end).

I would encourage the reader to play with these tools and feel free to add any other equipment they think important to this short list. This is meant as only a minimum but bear in mind that if the "crunch pack" gets too big it may not always make it to

the dig where it may be needed quickly. If you need something quickly you'll need it that much more.

These tools are for dealing with rock and in the case of an engulfment buried by loose materials, the victim is more likely to suffocate from lack of air or an inability to breathe because of compression from the engulfing materials. Obviously in these situations you will only have at most a few minutes to act before the incident becomes fatal. Engulfment should be carefully guarded against as it is most often fatal.

Commercial excavators are bound by many safety rules as a result of hundreds of fatalities from engulfment incidents.

Since diggers have higher risk than the general caving population (excluding divers) it would also seem reasonable that they should gain some cave rescue knowledge and certainly some practical first aid training to offset this risk. If you find yourself needing to call for help in a dig accident the combination of rescue training and digging skills seems far more likely to lead to a good outcome. Besides, the rescue community will gain from your participation and I believe you will to too. I know that the people that responded to my incident were far better diggers than rescuers and had I not been able to direct my own rescue the outcome might not have been as favorable. If nothing else it would have taken much longer which in my case might have led to further damage to my right arm. This is debatable of course and by no means meant as criticism. I was really glad they were there.

This leads me to the last big point I want to make in this paper and that is in what cave rescue circles refer to as "psychological considerations". After I realized just how serious a situation I was in, I became extremely focused on figuring out how to solve my dilemma. In retrospect this seems like a defense mechanism and a good one at that. The greatest threat to that focus was the look of fear in the eyes of my rescuers in the early stages. When I encountered this I could feel my resolve weaken quite noticeably and only

through sheer stubbornness was able to maintain my commitment to free myself. Conversations about how bad things look are counter productive to someone who needs help, but your patient may pick up on your fear in ways that are more subtle. If possible this should be guarded against. What is required is a kind of professional "can do" attitude grounded in competence. That confidence experience yields. Fear has no place in rescue only because it tends to degrade I.Q. and erode the necessary confidence a patient needs; concern on the other hand is the reason anyone gets rescued, a thin and difficult line to walk.

I hope this has been of some use to you, my apologies for stating the obvious if it has seemed that way. My intent was to share my experience and conclusions with you in the hope that my words might spare someone this ordeal. DIG SAFE!

*Larry Fisher has made up 100 of these oak wedges which are available as a service to the digging and cave rescue community at cost for \$1 each plus shipping. Call 304-497-4311 for details.

After word

Since the events of 10/1/02 there have been 2 trips into what is indeed Maxwellton Sink Cave so all our efforts have not been in vain. We are working on a new and more stable entrance at which time, hopefully later this year, the cave will at last be open.

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