

THE TECH TROGLODYTE



SPRING 2018

The Tech Troglodyte is published each semester (assuming that people bother to submit articles, which they often don't) by the VPI Cave Club, a student grotto of the NSS. All submissions, subscriptions, inquiries, donations, and comments should be sent to: Trog Editor, VPI Cave Club, P.O. Box 558.



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THE TECH TROGLODYTE

A Journal of the Virginia Tech Grotto of the National Speleological Society



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LETTER FROM THE EDITOR



Dearest VPI Cave Club,

Firstly, I want to thank everyone who sent in the articles and other materials that went into the making of this year's Tech Troglodyte. As it turns out, you will read the journal more thoroughly than you ever have if you find yourself as the editor. The club has shared short stories, recipes, histories, art, poetry, cave logs and much more for us all to enjoy. It's been a pleasure reading and editing every single one. The club is an incredibly special community and few things exhibit that more than our written tales. So with that, I hope you enjoy this edition of the Troglodyte. And as always, happy caving!

Respectfully submitted,

Kellen Levinson

LETTER FROM THE PRESIDENT



VPI Cave Club,

This year has been incredible. We celebrated our 75th anniversary, had a Heck of a Banquet, voted in 12 new members (464-475) and have many more nearly there, added several local caves to our repertoire, opened up our TAG cave access, restarted Spring Break TAG trips, have greater vertical proficiency than I've ever seen and more active projects than I can count! Our caving is so diverse now that several of the newest members have only repeated a cave once, yet have over 100 hours underground. I can remember "back in my day" the repetitive Pig Hole/Links/Tawneys/New River trips, with an occasional treat of Clover Hollow or rarer still, Murder Hole. We're caving harder, and more often, than I've ever seen. I'm proud of us all for making it happen, I'm excited for the club to keep up the trajectory, and I'm looking forward to seeing more of these caves myself. Regrettably I wasn't able to accomplish all my goals during my term, but I am looking forward to working with the new executives. Here's to another 75 years!

Sincerely, Phillip Moneyhun

INTRODUCTION



Welcome to the VPI Cave Club!

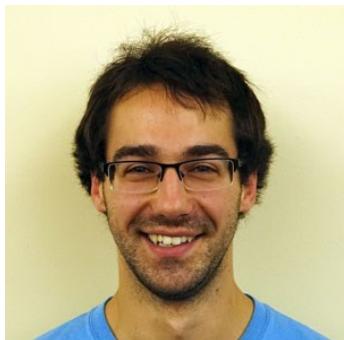
The VPI Cave Club is a student grotto of the National Speleological Society. Our goal is to promote interest in and to advance the science of speleology, to promote conservation of caves and safety in their exploration, and to encourage fellowship among Virginia Tech students and alumni interested in caving.

That's the description on our website. What our site doesn't say is that we're also a community of the most colorful, adventurous, quirky, awesome people you could ever find! Our site says we're cavers, but we're also students, teachers, doctors, scientists, athletes, cooks, musicians, parents, veterans, men, women, young and old-fart, engineers, rescuers, writers, artists, and the list goes on. Caving is what brings us together but the community is what makes you never want to leave (and many of us literally never leave.)

So if you've never caved with us, ask a member to get on a trip. You'll learn a lot, see a lot, and you might even get some life-long friendships out of it.

I want to give a big thank you to everyone who makes the cave club possible. Our club wouldn't be what it is without all of our generous members, landowners, and friends who sacrifice their time and energy for the club. They share their property and homes with us, they lead trainee trips, they organize and host events, educate the young-ins, donate resources and gear, and generally make an inclusive environment that really feels like a family.

NEW MEMBERS



#464 Nick LaPointe



#465 Richie Brooks



#466 Kyle Daniel



#467 Caitlyn DeGrace



#468 Kellen Levinson



#469 Andrew Schoenewolf



#470 Randolph Colby



#471 Nathan Kearney



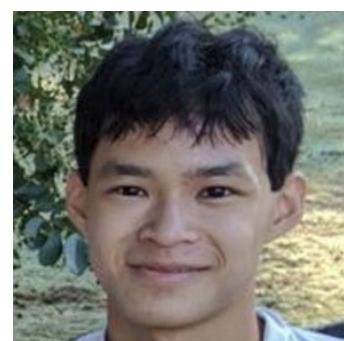
#472 Peter Gioia



#473 Gillian Rowland



#474 Meredith Blanco



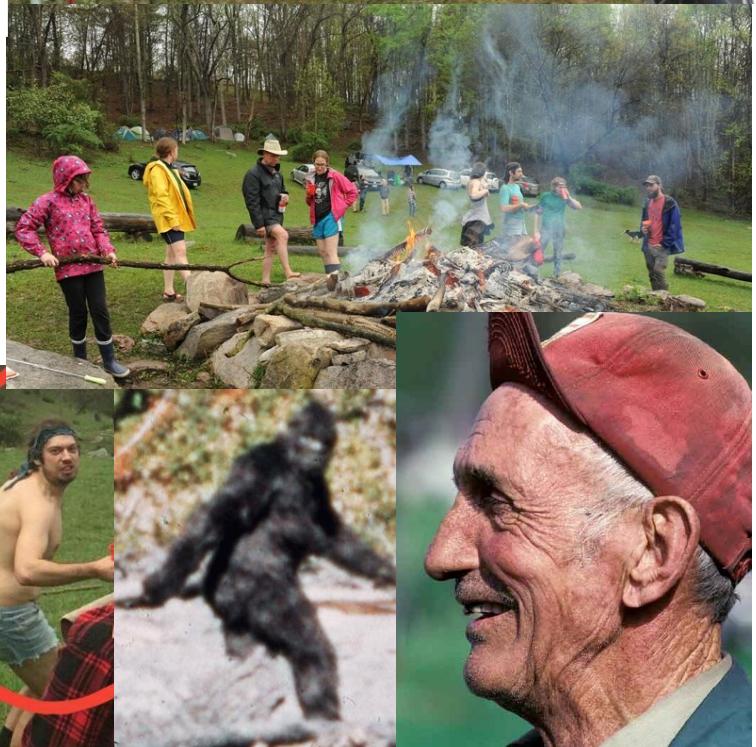
#475 Matthew Kok

PICNIC



2017 Picnic was a wonderful, wet and rainy weekend! The Sunday morning rain storm threatened to drown those too hungover to crawl from their tents.

Despite the occasional drizzle, there was successful caving, mushroom hunting, camping, cooking, and merriment.



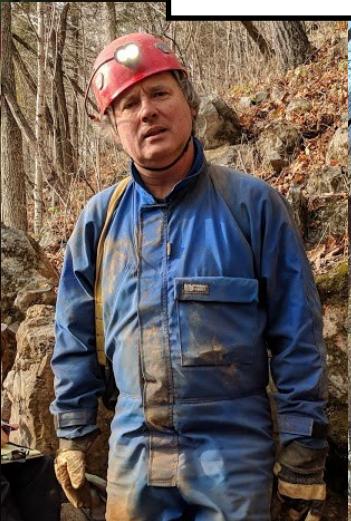
PRACTICE RESCUE



Everyone learned a lot and the litter team was forced into the stream. The first patient had a broken leg, and the second had kidney stones, but both were in good spirits.



Team Old-Fart:
Making the Dream Happen



HALLOWEEN AND EASTER BEER

Two fantastic events hosted by our generous landowners at the Bat Ranch. Mika and Ava have been hosting the Halloween party and Easter Beer event at their property since most of us young-timers can remember. Both events involve camping, bonfires, hot tubs, creek-runs, road clean-up, and sometimes even a little caving.

Halloween features wild costumes and decorations, and cavers go all out with individual outfits and group costumes. For Halloween 2017, the landowners even constructed a magnificent bat effigy, which was burned to appropriately celebrate All Hallow's Eve. Each year Ray Sira shares his costume photo collection with the club.



Easter Beer features a special Easter hunt for tinfoil-wrapped beer and other goodies hidden around the property for visitors to find. For many of us, it's the first time we emerge from our winter dens and caves to bathe our pasty-white bodies in the spring sun. Both events also provide a valuable opportunity for the club to give back to the landowners and community by cleaning litter off our adopted road, Zell's Mill. Members and trainees both turned out in force to help clean the road of cans, wrappers, and sometimes even a dead animal or two double-stuffed into a garbage bag.

Just ask Randolph, I think he may have gotten critter-juice on him.

BANQUET

75TH ANNIVERSARY!



This year was the 75th anniversary banquet for the cave club!

We had a record turn-out of over 200 people, including many that we haven't seen in a long time! The Hyatt was a great venue and the dancing went on way past everyone's bedtimes. Richard Cobb put on a great slideshow for the banquet, awards were distributed, and Bob Alerson and Bill Douty delivered an excellent program on the history of Clover Hollow! Big thanks to everyone who came, spoke, and helped bring banquet together. Extra big thanks to Aaron Thomas for herding us ~~eats~~ cavers.



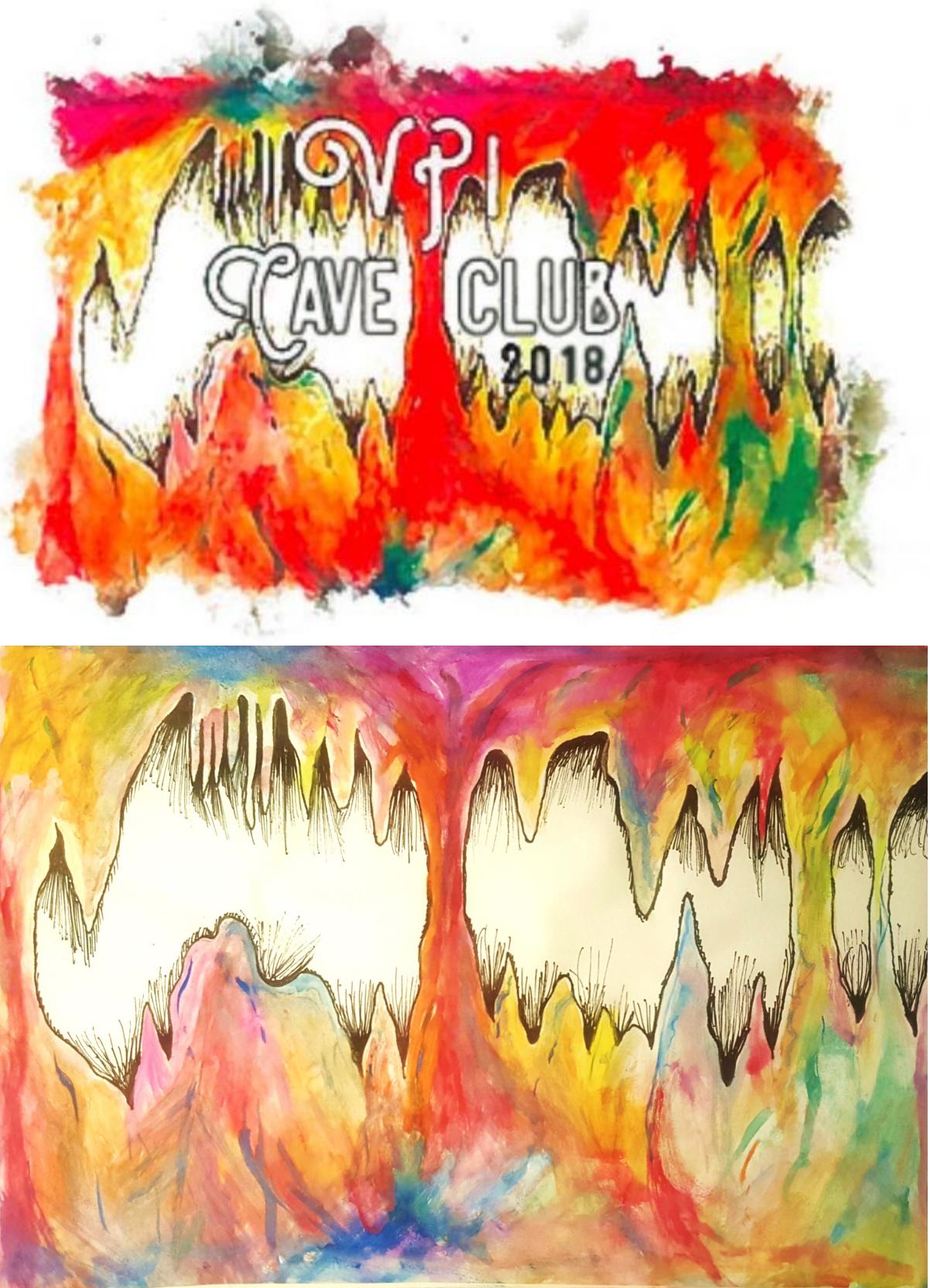
Philip Balister and Sandy Knapp won the A.I Cartwright award and A.I Cartwright even delivered it to them himself. They later climbed on a table and danced to "Teenage Wasteland" and celebrated with their adoring fans. Other awards were given, such as Never-an-Armchair-Caver awarded to Bill Koerschner, Flameout awarded to Andrew Schoenewolf, Firefighter awarded to Jason Delafield, Brain-Bucket to Reilly Blackwell, Good Driver awarded to Will 'Skippy-the-Wonder-Pig' Borin, and the prestigious Bad-Ass Trainee awarded to Rowan Berman.





2018 CLUB TSHIRT DESIGN

Shirt Design and Original Artwork by Taren Woelk





Surprise, Surprise.....

Peter Gioia

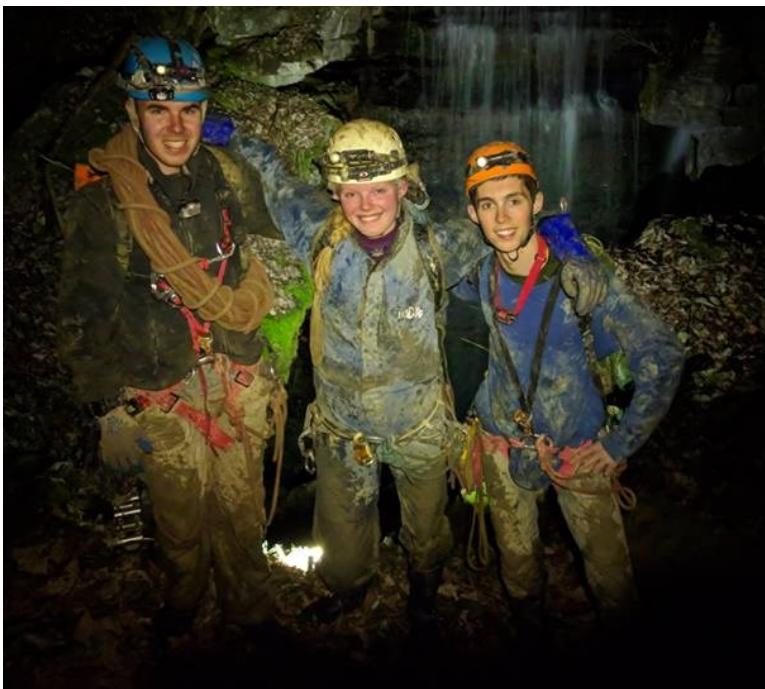
During spring break, Reilly Blackwell, Eric Hahn, Phillip Moneyhun, and Andrew Schoenwolf fearlessly led a group of trainees, Nathan Kearney, Meredith Blanco, Peter Morisey, Matthew Kok, and myself through the caves and pits of TAG. We were extremely excited to go to Surprise Pit in Fern, our third cave of the week. I was so excited I even volunteered to carry the 750' rope up the mountain first. I was doing pretty well until we took a break and I sat down and fell over with the rope on my back. Sitting back up was fun in itself.

We made our way through the cave until we got to the rig point for the pit. Mud sculptures filled the ledges with items ranging from head sculptures to cars. We made sure to find a spot for a large "VPI" to go up. Phillip began to rig to some strangely-angled iron hangers with a backup to a boulder. As Eric opened the rope bag, he noticed that a creature had been stirring and it was a mouse. Out of the rope bag Eric pulled yellow insulation: the creature's nest. We watched closely as he began to flake out the rope looking for spots the mouse had gotten to. We found three spots where the mouse had chewed pretty deep and tied knots to isolate them. The only question was whether those knots would be at the bottom of the pit since it was only a 404' rig point and a 750' rope.

Phillip's ability to climb really fast was put into good use in order to examine the situation. He discovered that there was only a single knot about 50' off the bottom. The plan then became that Eric would brave the heavy mist at the bottom and belay the trainees who would changeover before the knot and climb out. Trainees who were strong with changeovers would be the ones to rappel. Nathan was the first trainee to go. Over the radio we figured out that Eric was able to use his superior belay skills to pull Nathan over to a tall pile of breakdown to completely avoid the knot. This made things much easier.



I was next to go. Now, Surprise was my first pit of that size, but I didn't think that made a difference. After I got going and got a good feeling of my bars I began to enjoy the ride and look around. It was overpowering. I began to feel emotional. Eric came over the radio and told me to turn off my lights as he was going to turn his on. I stopped, got myself situated and Eric turned on his lights. I thought the pit was overpowering before, but now it was completely different. The mighty pit made me feel microscopic. The true power of nature finally hit me. A combination of this and the beauty of the pit brought me to tears while I was on rope. I would've been sobbing by the time I got to the bottom, but I had to keep from air rappelling. I gathered myself as Eric pulled me over to the breakdown. I signed the register and began to

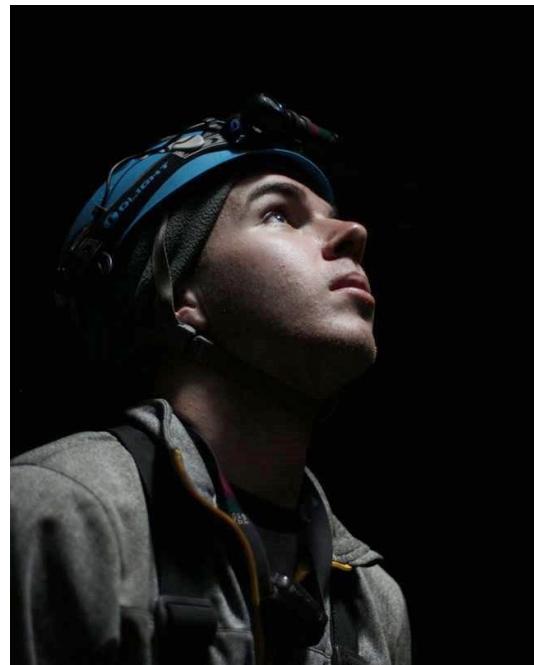


climb. About 150' feet up the pit began to overcome me once again. I stopped and looked, almost crying again but couldn't because I purposely hadn't paced myself well and was tired. I got myself together and continued climbing, less emotional this time because it's hard to climb and cry at the same time (at least for me). After I got back up, got some food and a dry shirt, I watched Andrew go down. I once again thought I was fine until Andrew was close enough to the top of the pit where I could see flashes of his light as he climbed. I still didn't understand why this pit was like this but I just felt so amazing even

seeing flashes of the top. After everybody had gotten back up, I volunteered to help de-rig since I had climbed and loved the pit so much.

Later in the week I tested my theory of maybe it was just the big size of the pit when we dropped Fantastic Pit in Ellison's. This was not the case at all, I simply had the thought of "this is cool", rather than a wave of emotion. The trip was amazing any way you look at it, and I am very thankful for Reilly and the other members who took me through the caves, and helped to solidify my love for vertical caving.

*As a side note, that was the first time I had cried in a long time so the pit was something pretty special.



The unanimous Declaration of the Carbide Lamp Test

A Cave-Related Parody of the Declaration of Independence

By Matthew Kok

When in the Course of caving shenanigans and hooliganism it becomes necessary for cavers to dissolve the opinions on lighting that have connected them with another, because we can and I need to write a Trog article, in the interest of other NSS grottos they should declare the causes which impel them to a different Light.

We hold these reasons to be self-evident, that not all headlamps are created equal, that some are created with superior properties, that among these are Heat, Toxic Acetylene Gas, and the pursuit of reasonable carbide shipping costs – That to secure these attributes, Headlamps are carried by cavers, utilizing their light to pursue Passage, – That whenever any Form of Light is realized to be inferior to the others, it is the Right of the Club to alter or abolish it, and to institute new Light, laying its foundation on such principles and organizing its light in such form, as to them shall seem most likely to affect their ability to cave effectively. Prudence, indeed, will dictate that Headlamps briefly adopted should not be changed for insignificant and petty causes; and accordingly all experience hath shewn that cavers are more disposed to suffer, while lights are sufferable than to right themselves by abolishing the forms to which they are accustomed. But when a long series of dead batteries, cracked lenses and loose wires, chasing Virgin passage reveals a list of flaws, it is their right, it is their duty to cast off such Lights, and to switch to Carbide for their future light. – Such has been the patient sufferance of this Club; and such is now the necessity which constrains them to alter their former Mechanism of Lighting. The history of the present LED Headlamp is a history of dead batteries and nowhere to charge them, all having in direct object the establishment of an inferior Headlamp over this club. To prove this, let Facts be submitted to an impartial university.

It has allowed the art of Carbide Caving slip into obscurity among the latest generation of cavers.

It has been removed from the Trainee Program, such that the Old Farts may argue that VPI cavers of today are inferior to themselves.

It has subject Trainees and recent Members to the tales relevant to carbide caving, usually beginning with “When I was a Trainee” or “Back in my day”.

It has caused much undue financial burden on destitute college students by way of \$90.00 Zebra Lights and \$10.00 18650 batteries.

It has caused a shortage of carbide among online merchants, and rising shipping costs of carbide.

It has sensitive electronics which are not easily repaired in-cave or outside.

It has not the ability to graffiti cave walls to make known that you were the first through a passage.

It has required the use of ugly, flimsy elastic bands to be secured to helmets.

It has not the ability to be used in a heat tent to warm hypothermic Trainees.

It has not the ability to be passed onto posterity as gifts and heirlooms.

It has not the nostalgia nor historical significance of Carbide.

For producing an inferior product overseas, thus taking away jobs and capital from this Nation.

For dividing this club between Old Farts and Everyone Else.

For limiting cavers to a handful of preset light intensities.

It has excited insurrections against us, and has endeavored to bring on the inhabitants of the pits, the savage CHUDS whose known diet, is an undistinguished array of all ages, sexes, and abilities.

In every stage of these Misfortunes We have Heckled for redress at meetings and over Listserv: Our Heckling has been answered only by repeated mockery and disregard. A Lamp, whose character and usefulness is less than that of cotton in a wet cave, is unfit to be the Light of VPI cavers.

Nor have We been wanting in failures to our LED devices. We have heckled time and time again of their menial nature and for the return of the Carbide Lamp Test. We have discussed in meeting the return of the Carbide Lamp Test. We have replaced battery after battery and charged them night after night. We have prayed to our cave overlords for the return of the Test, and we have made offerings to them in the form of crappy Easter Beer, stale GORP, and Library Books. They too, have been unresponsive to the voice of reason and progress. We must therefore, return to the ways of Carbide, and train with them as we do all other skills, in the form of the Carbide Lamp Test.

We, therefore, the Representatives of the VPI Cave Club, in no particular manner of seriousness, are appealing to the Mostly-Adequate Leaders of the club for the rectitude of our training program, do, in the name of some important person, and by the Authority of the Old Farts of this club, solemnly publish and declare, That this united Club is, and of Right ought to reinstate the Carbide Lamp Test, that it will return to using Carbide Lamps, and that all LED Headlamps between members and the Club Gear, are and ought to be totally rejected; and that as a Carbide-using Club, it has full Power to graffiti walls, dump spent carbide wherever it pleases, cave with dubious hardware and technique, and to do all other Acts and Things which Old Farts may have done “Back in their day”. – And for the support of this Declaration, with a firm reliance on the divine Approval of Old Farts, we mutually pledge to each other to restore the Carbide Lamp Test to our trainee program.

TL;DR: Bring back the carbide lamp test.

The Miller Campaigns

Richard Cobb - VPI 215

Few topics in Cave Club lore have reached the legendary status of the **Miller Campaigns**. The "Miller Money" has been an object of reverence, derision, and debate for so many years. This is an attempt to summarize some main points for those age-challenged youth who did not have the privilege of living the events (and for those age-challenged Old Farts who lived them, but can't remember them). What follows comes from hours of reviewing meeting minutes, Trogs, and the author's fuzzy memory.

Part 1 - From Rags to Riches

Before the start of the Miller Campaigns in 1975, the Cave Club was just another poverty stricken student organization. The treasury often had a couple of hundred dollars in it, although it ranged from less than \$10 to over \$500 (just before the bills for Banquet were paid).

The first mention of the Miller Contest was in the Spring Quarter of 1975, although there are not many details in the records. It appears the first Contest Chairman was Ed Loud (yes, that Ed Loud of ELMT fame) – presumably because of special expertise related to beer. There are no details of that first contest, other than a Dewey vs Truman gaffe on the part of the Collegiate Times – who reported a Frat as having won the contest, instead of the Cave Club (who actually won it). It seems first prize was a fancy stereo, which was sold to Bill Douty for \$800 (about \$3-4,000 in today's dollars - see explanation in Part 2).

After that first win, the Miller Contests became a key Cave Club activity every Spring and Fall (although, from the Trip Reports in the Minutes from these times, it appears that caving did *not* suffer because of it). It was thought that the Frats accumulated containers for the contest by starting with full ones and drinking the contents. While the Cave Club also contributed in that manner, the real accumulations came from walking roadsides and Dumpster Diving. The rural refuse-collecting dumpsters were not fenced and attended as they are today, and many hours were spent inside dumpsters ripping open bags and extracting cans and bottles (often requiring heroic commitment to overcome particularly adverse conditions).



the Miller Logo were provided for pickup, which found their way to other uses as well (such as a Halloween costume).

Can and bottle collecting was often done on pleasant (or not) Spring and Fall weekday afternoons. It was an activity you could engage in most places you found yourself, even with only an hour or two to spare. It did not even require leaving town, as late night (or early morning) forays into the dumpsters behind the downtown bars could prove quite profitable. Perhaps the biggest advantage the Cave Club had over frats was much less reluctance to dive into dumpsters and other Izod-less locales.



Many War Stories were told of the most heroic efforts at collecting cans. My own best War Story was a dumpster I found containing a whole bunch of trash bags apparently from the same household. The contents were almost exclusively two items: beer cans and used baby diapers. There was speculation that someone was not bonding well with new parenthood. Nonetheless, that find was a rich source for empty aluminum cans, and yours truly harvested them all.

In some early morning downtown hours, behind Daddy's Money (a local bar of the time), "Big John" Lohner and some others found a nice stash of containers. John waited while the others went to get a vehicle for transport. In the meantime some fraternity guys came upon the same containers and were exclaiming at their good luck. Big John, who was no small boy, puffed himself up a bit bigger and said "boys, those cans are mine". Apparently he did it convincingly enough that he was still in possession when the others arrived with the vehicle.

The following excerpt is by Dave Shantz, from the Fall 1980 Trog (w/Paul Kirchman):

"I think we just found a bunker, Dave. I can see a lot of them from here." "Oh, yeah'? Well, let me grab a bag and we'll see how many we can capture. It does look pretty good!"

Paul and I jumped eagerly into the twin dumpsters, having taken only a small number of enemy personnel in the two previous sorties earlier in the day.

We found them to be a determined and devious lot, with several nasty tricks up their sleeves.

We attacked them with cries of "You'll not escape! I see you under that rotten head of lettuce!", and "We'll get you! No use mingling with the Browns!" (The Browns are a cowardly bunch, lending help only when they think they won't be discovered, but they can be a real nuisance. However, we passed them by for the real fighters.) Some of the Hessians [clear glass], in their desperation to escape, committed suicide rather than face the humiliation of a trip to the reclamation center. Others burrowed into a half-baked pizza (with topping!), getting themselves so entangled that we decided they were worse off where they were, and offered no release.

Paul soon secured his dumpster and retired to the pickup bed to sort and classify the prisoners according to concentration camp destination. I was still encountering pockets

of resistance, and was twice forced to call for reinforcements from Paul. On the whole, things were going well, and I was whistling as I went from one defense pod to another, ripping them open and plucking forth the cowering, terror-stricken occupants.

I had nearly decided the area clear of defenders, when I spied one last pod, well hidden beneath some discarded supply containers. I advanced with a shout of triumph, tore at the fragile pod walls with malicious glee, and nearly fainted! I reeled backwards, retching uncontrollably as the despairing troops inside released wave after noxious wave of garbage gas and methane in my face! Retreating momentarily, I managed to gasp some fresh air. Spurred by their resistance, I buried my nose in the shoulder of my jacket and attacked the flank. A fierce battle ensued; bits of old sub buns, bad tomato, and sacrificed Browns flew in various directions. It was tough going for a while, but I somehow incarcerated the entire group. I lurched weakly to the opening of the dumpster, gulping in the sweet fresh air of victory and freedom, thankful beyond words for my miraculous escape.

We finished sorting, and having literally flattened the unruly pfc's [cans], turned our backs on the gore-littered scene, leaving some early-morning employees of Daddy's Money gaping in disbelief.

For more stories, younguns should ask Old Farts around a fire (they may not remember, but that won't stop them from making something up). Collecting for the Miller Campaigns was a large part of club lore and activities for several 'generations' of Cave Club members (at least 7 or 8 years).



Following the initial win in the Spring of '75, the Club "defeated all comers" the following Fall to win a fancy console color TV. The Spring of '76 we won again with 138,000 points, which represented 51% of the total points for the entire school combined! We won again in the Fall of '76 and Spring of '77. Lest you think this was easy, consider these numbers: near the beginning of the Spring '77 Campaign, the Club made a turn in of 1,800 lbs of bottles and 300 lbs of Aluminum cans for a cumulative

score of 36,500 pts. We finished the contest with a total score of 119,000 points (292,000 points for every club in the school combined). You can do the math. Aluminum cans are about 25 to 30 per pound. There were a *lot* of filled clear plastic Miller bags hauled!

From the Fall of '77 to Spring of 1980, there is little mention in the Minutes or Trogs of the Miller campaign, so perhaps it was not held during that time period. However, the Treasurer's reports had grown to report on both the Active treasury and Savings. From Fall of '77 to Spring '79 the Savings part increased about \$1k to a total of over \$2,700. So perhaps some more contests were won during that time, or it just took awhile to collect the money already won (like selling TV's and stereos, when those were given instead of cash).



Jerry Redder announced a new contest at a meeting in the Spring of 1980, which the Club won in the 'Open Division'. Few stats are listed, other than we turned in 564 lbs of aluminum cans – which is somewhere around 15,000 cans. Although the 'Open' division was for smaller clubs, we still beat the bigger ones in total points. So for Fall of '80 we were moved to the (supposedly) more challenging 'Frat Division', and won again anyway. There was an article about that in the Jan '81 issue of the Collegiate Times

Friday, January 9, 1981, The Collegiate Times--3

13 Groups Pick Up Miller Cans

By Kathryn Thompson
Staff Writer

Thirteen Virginia Tech organizations which participated in Miller Brewing Company's fall quarter "Pick 'em up" campaign collected enough bottles and aluminum cans to give Tech a shot at a top 10 ranking among 75 schools across the nation, campaign organizer Michele Tourtellotte said.

Ms. Tourtellotte, an employee for Miller Brewing

Company and a student at Tech, said the Tech groups brought in cans and bottles totalling 79,166 points.

Points were awarded according to the amount of materials collected, she said. For every 100 pounds of aluminum a group collected 1,000 points were awarded to that club along with a \$25 prize. For every 100 pounds of

bottles collected, the club received 100 points.

Fifteen hundred points

were required for an organization to qualify for prizes.

Blue Ridge Beverage Company, which owns Miller Brewery is excited that the contest has done as well as it has, Ms. Tourtellotte said. No other brewery has done as well as this company.

"Many company officials are Tech alumni and are happy that everyone is benefiting," she said. "You just can't find aluminum cans on the road anymore."

In the fraternity division of the competition, the Cave

Club received the grand prize of \$1,500 for scoring 29,177 points.

Although the Cave Club is not a fraternity, Ms. Tourtellotte said it was placed in the fraternity division because of its success last spring.

"We decided that the Cave Club's performance was more on the same level of the fraternities as opposed to the other clubs," she said.

"The did a super job. Some schools don't even get that much."

Delta Gamma sorority won the \$1,000 prize in the open

division for cans totalling 3,674.5 points. The open division includes sororities and clubs.

The three group runner-up prizes of \$500 went to Tau Kappa Epsilon, Alpha Tau Omega, and Sigma Phi Epsilon fraternities for collecting 22,012.5 points, 10,953 points, and 3,331 points, respectively.

The competitions will be held at Tech each fall and spring quarter.

Ms. Tourtellotte is waiting for notice of Tech's national ranking in the competition.

The MILLER BREWING COMPANY

and BLUE RIDGE BEVERAGE

Salute

The FALL 1980 PICK-EM-UP WINNERS!

SUPER GRAND PRIZE WINNER! — **CAVE CLUB \$1,962.60**

GRAND PRIZE WINNER! — **DELTA GAMMA \$1,072.24**

Runners up --- **TAU KAPPA EPSILON \$843.56**

ALPHA TAU OMEGA \$685.52

SIGMA PHI EPSILON \$551.12

A total of 88,756 pounds of bottles and 8,881 pounds of aluminum were returned for recycling!

Thanks to all groups who participated:

Beta Theta Pi	Phi Delta Theta
Sigma Phi Epsilon	Circle K
Kappa Alpha	Delta Zeta
Sigma Chi	Zeta Tau Alpha
Kappa Sigma	

A notable quote from the article "They [Cave Club] did a super job. Some schools don't even get that much."

Also from the article, bottles were worth 1 pt per pound, and cans were 10 pts per pound, and the club won with over 29,000 pts. If those were all cans, that would be over 75,000 cans!

The prizes were even amounts, but the total amounts included the aluminum recycling fees as well. Each club was paid the going rate for aluminum for all that they turned in, so a club could make money even if they did not win a prize.

For the Fall '80 prize of \$1962.60, \$1,500 was actual prize money, and the remaining \$462.60 was for the recycled Aluminum. In the Spring of '81 the Club won again, with another check for \$1,858.77. Towards the end of the contest some figures are listed in the minutes: 1,176 lbs of aluminum cans, 629 lbs of bottles, for 12,389 points and \$329.33 in Aluminum cash. Those are not the final numbers, but close.

The \$358 for Aluminum in the final tally is considerably less than the \$462 of the previous Fall.

It seems the Club was getting bored with the Contest, and some of the Frats were starting to figure things out, so it became more effort to win. And the prizes seemed to be getting smaller. The Miller officials announced in the Fall that the contest might be discontinued if there were not more containers turned in than had been the previous Spring. We started the Fall Quarter of 1981 with over \$4,700 in savings, and were in second place at one of the early turn-ins. By the end of the contest we had fallen to fifth place, but still managed to get \$500 out of it.

In the Spring '82 Minutes there is one mention that we were "way behind", and nothing else, so presumably not a win. However, in the Fall of '82 Kent Thompson took over as the Miller Chairman and managed to inspire/browbeat us back to a first place win for another \$1337. But that enthusiasm was hard to maintain, and in the Spring of '83 we eked out only a 4th place finish.

In the Fall of '83 a motion was made to not compete in the contest, but was defeated when Ray Hogwood volunteered to be Miller chairman. In November of '83 the treasurer's report listed \$7,361 in the savings account, but there is very little mention of Miller campaigns after that, so probably the Spring of '83 was the last time we won anything. I have found no record of when the Miller Campaigns were discontinued, so it may have been that the contests were discontinued after that, or the Club just stopped competing. Either way, the Miller Campaign Era drew to a close.

Part 2 – The Miller Money

At this point the Club was like some poor folks whose rich uncle had died, leaving them a pile of money. Many of the people who had been in the early parts of the contests had moved on, and there were as many opinions as members about what the Club should do with the money.

To appreciate just how much money was being discussed, it is useful to look at comparison costs and prices between then and now. For the 2017-18 term, VT lists in-state full time tuition as \$13,000 and dorm/meals an additional \$8,700, for \$21,900 a year.

When I was an undergraduate (late '70's), tuition and dorm/meals were ~\$650/Quarter, or just under \$2,000 for a full year. That is a 5.4:1 ratio. Consider that the Grand Prize money for the Fall '80 contest shown above would have covered an entire year of tuition, room and board. The 'inflation index' for the 30 years 1978-2018 is listed as only 3.8. But beer could be had back then for right around \$1 a six-pack for the PBR/Schmidt's/Rheingold end of things, up to nearly \$2 for the pricier options (which almost no one considered). The charge for the 1980 Banquet was \$7, and \$9 for 1982. So, for items of immediate importance to students, such as tuition and beer, a 5:1 difference is a nice round number to keep in mind. When you look at that \$7,361 figure from November '83, think of it as over \$35,000 in today's dollars.

Of course, you had some folks who could see no further than free kegs every weekend, but they were in the minority. Because many of the people who were now deciding what to do with the money had not played a large role in earning it, there was an emerging consensus that the money should be used to somehow benefit the club as a whole, and maybe over a long term. But that did not move things very far along, as that was still a pretty nebulous goal.

One semi-popular idea was to 'invest' in a field house in either Giles or the Skydusky area, so that survey trips could reduce commute times and spend more time in the caves. The obvious drawbacks of this idea was that it would saddle the Club with taxes, maintenance, insurance and other issues – quite possibly for something that would not be used by further generations. In a dynamic organization like the Club, there is a fresh flow of new folks coming in and older ones moving on, and preferences/projects/attitudes evolve. So the question remained, and was debated, for some time as to a good use for the money.

In the Fall of 1984 I became Chairman of the Inactive Funds Committee to look into options for long term strategy. Kay Jacobsen was Treasurer at the time and also on the Committee.

CAVE CLUB - 1984 CALENDAR YEAR - FINANCIAL STATEMENT (Prepared by Kay Jacobsen & Richard Cobb)		
FUNCTIONS		NET EXPENDITURES
Banquet	+ \$1141	Store (Net) - \$728
	- 1093	Trogs (3 + Trng) - 609
NET:	+ 48	Club Gear - 248
Picnic	+ \$331	Carbide - 118
	- 323	Beer - 109
NET:	+ 8	Total: <\$50 - 184
Float Trip	+ 167	-----
	- 163	TOTAL NET SPENT: -\$1996
NET:	+ 4	-----
Halloween NET:	- 48	NET INCOME
-----		*****
NET FLOW:	+ 12	Dues: W + \$160
-----		S + 110
CLUB STORE		F + 835
*****		INTEREST + \$672
Deposits:	+ \$3030	Miller (Alum) + 68
Expenditures:	- 3758	Functions (Net) + 12
-----		TOTAL INCOME: + \$1857
STORE - NET:	- \$728	-----
-----		TOTAL NET CASH FLOW
TOTAL CASH ASSETS		*****
*****		INCOME + \$1857
12/31/83: \$7664		EXPENDITURES - 1996
12/31/84: 7528		-----
ACTUAL DECREASE -\$136 <<<<<>>>>>		NET CASH FLOW -\$139

Kay summarized the Club treasury activity for the calendar year, 1984, shown above. (The \$68 entry for Miller aluminum indicates there must have still been some low level contest activity during that year)

At the time Kay produced the statement, the money was in a standard interest bearing savings account, and even at that lower rate the Club received \$672 in interest. All dues for the same period totaled \$1105, so the interest provided over a third of the income for that year, and we still ended up in negative cash flow (although that could be explained by the Club Store – the net 'loss' of \$726 to the store could have been offset by a similar increase in the inventory in the store). But the main take away was that the interest from the Miller Money had become a significant part of the Club finances.

The proposal that emerged from discussions was to consider the Miller Money as an income producing endowment. The capital would be invested, and the dividends used as part of the Club's annual operating expenses. This would provide a long term benefit to the Club in that student dues

and costs for things like Banquets, etc. be charged at a reduced rate.

Total Funds:	\$7690
\$6000 - invest in CD (11.25% interest):	\$675/yr income
\$1000 - reserve acct in passbook (5.5%):	56/yr
\$690 - active operating account (5.25%):	33/yr
Total Annual Income:	\$764

The following proposal for division of funds was made on March 29, 1985: The motion was voted on and passed April 12, 1985. And that is the basis of how we got to where we are today.

VPI GROTTO OF THE N.S.S.	
Financial Report for the Period of April 24, 1987 to April 1, 1988	
Opening Balance (checking)	\$3248.87
Correction	<u>60.62</u>
	\$3309.49
EXPENDITURES	
Halloween	\$ 71.80
T-shirts	399.00
Trog printing, mailing and supplies	413.58
Prospective member info	92.61
Banquets	2813.13
Picnic	290.73
Practice rescues and classes	293.52
Club store	3800.42
Float trip	80.00
Phone lists	18.81
Post office box fee	22.00
Stamps and envelopes	5.22
Phone bills	17.43
Flowers	35.53
Service charges	12.96
Garbage bags for conservation trip	4.77
Total Expenditures	\$8371.51
RECEIPTS	
Dues	\$ 806.00
Club store	3153.61
Picnic	356.79
T-shirts	324.50
Convention bid reimbursement	100.00
Eastern Region NCRC class	385.00
PMI Rescue class	60.00
Banquet	1377.00
Donations	71.00
Interest on \$6000 CD	981.00
Interest on checking account	133.64
Total Receipts	\$7748.54
Net loss of	\$ 622.97
Closing balance (checking)	\$2686.52

Respectfully submitted,
Beth M. Wichterman
 Beth M. Wichterman, Treasurer

This plan seemed to work well, at least in the beginning. I found this statement for a one year period in 1987-88. While it is not clear from this why the interest received was higher than expected in the proposal, it is clear that the Club received more in interest for that period than it received in dues. So the investment was apparently working well as an endowment.

However, nothing stays the same, and change happens. My own involvement in the matter of the Miller Money ended at this point, as I had moved away from the area. But in researching this article I discovered that the Club undertook a new financial analysis in the early 1990's. It appears the goal of that analysis was to make the Club self-sustaining, apparently without the use of the interest income, and dues were raised accordingly. As no mention of interest income was included in the statements, I can only guess that the decision was made to reinvest the interest into growing the investment.

If that is so, then the money lost its original purpose as an endowment, and became an investment for its own sake. And the purpose of that investment, if it was ever known, appears to be lost to present knowledge.

Interest rates today are extremely low (which is somewhat balanced by inflation being much lower as well, at least for now...), so returning the money to the original purpose of the endowment makes little sense, as the income produced would be minuscule. Hopefully this article will provide a good starting point if/when the Club takes a whole new look at the Miller Money.

Author Note: While I was part of, and advocated for, the original investment decision, it is obvious that the basis of that decision is no longer valid in this time. The Club seems to be much more adept at keeping a positive balance sheet these days, and the relative value of the money is perhaps a fifth of what it once was, even if the actual balance remains the same.

To my thinking, the main value of that money lies in the history of its heritage, but that is not a spendable asset. While I see no need for immediately spending the money, I also see no need to hold on to it if a worthwhile purpose can be found. And if that purpose can have a long term benefit for the Club, all the better.

One such purpose I could readily support is if there were another local cave conservancy project such as New River cave – that money would represent the Clubs contribution to preservation of a local cave for all time. Another suggestion I could support is to use those funds to ensure that equipment for new trainees is always in sufficient supply and working condition. Those are just two suggestions, and I'm sure there are many worthy ideas.

The current generation of the Club has the reigns now, and I'm sure whatever they choose will be fine.

CAVE CLUB – January 1, 2017 to April 10, 2018 – FINANCIAL STATEMENT
 (Prepared by Richard Cobb, Caitlyn DeGrace, & Aaron Thomas)

Functions

Banquet 2017	+\$1,186.00
	<u>-\$945.70</u>
NET:	+\$240.30
Trogs	-\$191.70
Spring Picnic	-\$263.73
Summer Picnic	-\$592.28
Banquet 2018	+\$8,585.00
	-\$6,731.96
Banquet 2019*	<u>-\$231.30</u>
NET:	+\$1,621.74
Student Scholarship Fund	\$500.00

*We were overcharged by the Hyatt by \$231.30 which was then applied to next year's booking fee. The amount needed to complete the booking fee for Banquet 2019 will be \$268.70.

Other Expenses

Green Rope	-\$30.00
Post Office Box Fee 2017	-\$134.00
Post Office Box Fee 2018	-\$134.00
T-Shirt Posters	-\$321.95
Lights	-\$200.71
Dues	+\$910.00
Vertical Gear	-\$390.00

Net Difference

Our General Treasury account started with \$4,331.72 January 1, 2017.
It ended with \$3,691.28 on April 10, 2018.

Our Club Store account started with \$1,088.39 January 1, 2017.
It ended with \$200.00 on April 10, 2018.

Our Student Scholarship Fund was started with \$500.00 on March 28, 2018.
It ended with \$500.00 on April 10, 2018.

The total value of these, our business accounts, is thus \$4,391.28.

Certificates of Deposit

Our certificate maturing on July 26, 2019 is currently gaining 0.35% interest and is worth \$3,414.28.

Our certificate maturing on July 26, 2020 is currently gaining 0.65% interest and is worth \$3,045.71.

Our certificate maturing on July 26, 2018 is currently gaining 0.35% interest and is worth \$3,562.86.

The total value of our certificates of deposit is thus \$10,022.35.

Mutual Funds

In fiscal year 2017, by our Wells Fargo Mutual Funds accounts, we appear to have made \$148.74 in Total Ordinary Dividends; \$117.18 in Qualified Dividends; \$113.23 in Total Capital Gain Distributions; and lost \$0.00 in Federal Income Tax Withholdings! Our Total Proceeds and Total Cost from Broker and Barter Exchange Transactions were \$155.00 and \$131.79 respectively (\$23.21 net).

During the first quarter of fiscal year 2018, by our Wells Fargo Mutual Funds accounts, we appear to have made -\$106.24. However, we are expected to make \$154 this year.





What Does the NSS Do?

By Reilly Blackwell, VPI #461, NSS #68044

Legend has it that what the National Speleological Society mostly does is waste time and money. While I can't say that never happens--all cavers are accomplished time-wasters and chit-chatters--in my time working at the headquarters of the Huntsville Good Ol' Boys' Club I've gained some perspective on how the NSS benefits the caving community as a whole. Two obvious contributions are Convention, a yearly gathering of cavers from all over the country, and the NSS publications (NSS News, Journal of Karst & Cave Studies, and books published through the NSS), which keep us all up to date on some of the Cool Stuff happening in the American underground. Here are some others I've become familiar with recently:

The NCRC

The National Cave Rescue Commission is chartered by the National Speleological Society. Many VPI members received NCRC training this fall in the form of Level One or Small Party Assisted Rescue. As cavers, the responsibility to participate in and run cave rescues falls on our shoulders, and rescue training is an invaluable resource to ensure that we have the necessary skills. Having accessible rescue training also makes us safer and more competent cavers, reducing the number of rescues that happen in the first place.

The Library

By far the best room in the whole NSS Headquarters is the Library, which is run by Bill Torode, a legendary Alabama caver. If you're ever in town, it's worth stopping by and hoping Bill is feeling friendly enough to talk; he's got some great stories, some of which are even true. While you're there, you'll have a chance to see the incredible store of knowledge and history the NSS Library contains. Every grotto newsletter since 1941 is preserved there, and every Convention guidebook and NSS bulletin. The National Cave Files are sixteen filing cabinets full to the brim with maps and survey data from across the country. One of the shelves is devoted to academic theses on hydrology, karst, and cave biota. Newspaper articles about caving have their own filing cabinet, and informational texts written by cavers for cavers fill another entire shelf. There's a room full of slides donated to the NSS by cavers past and present. Basically, if there's information you want on caving history, cave science, or the activities of cavers in the United States, the Library has it collected and organized for you to use.

The NSS doesn't collect all the maps that have ever been produced in the United States, because survey organizations don't report directly to the NSS, but the NSS has huge collections of maps that have been donated by older cavers. I spend my days in the Library surrounded by more maps than I've ever before seen in one place. As surveyors and cartographers I think it's important to

recognize the value of an organization that stores and organizes the work done by generations of American cavers.

Campground

The Spring Break TAG trip this year spent its first 3 nights camping (it's free for NSS members) at the NSS Headquarters. It is an easy place to car-camp with access to restrooms and outlets. It is also remote enough to facilitate plenty of car-horn honking when your tripmates don't wake up on time. Meredith Blanco would like you all to know that "triggering the horn on Matthew's car was a great pastime and was effective to annoy people with. Button pushing at its finest!" Testimonials about the quality of the campground include "Not awful" and "Better than the Blue Hole." There are cooler campgrounds in TAG, but making the drive back to Cavers' Paradise after an Ellison's trip is more likely to put you in the running for the Good Driver than it is to be fun, and the NSS campground has everything you need to be reasonably warm and comfortable before driving 30 minutes to some of the country's nicest caves.

Supporting Young People!

This is perhaps a biased perspective, but the NSS made it possible for me to move to Huntsville, Alabama for five months and hang out at HQ, work on caving-related books and articles, and go caving four days a week. The most useful function of the NSS is that it's an organization that cares about the future of caving and cavers in the United States, and it is comprised of smart cavers with good connections who want to help you out! Many people who spend their time working with the NSS are no longer active cavers, but a lot of them were very accomplished cavers at one time or another, and all of them are committed to spending their time and effort to benefit caving in the US. The NSS should not be overlooked as a resource, especially if you're just getting started and want information or opportunities to cave in the USA far away from your home grotto.



ODE TO WINDY MOUTH CAVE

A trek through the woods, a steep climb ahead -
The Windy Mouth visitor faces with dread.
When puffing and panting he arrives at the top,
The most hardy of cavers is ready to stop.

A gulping for breath, a creaking of bones,
A shifting around for a seat on the stones.
Now rest for a moment and charge up your lamp -
And remember the knee pads you left back at camp!

There's stirring around you, the others are ready.
The air's full of tension, excitement is heady.
There's big cave ahead you know from reports,
There's canyon and crawlway - there's cave of all sorts!

The entrance yawns lowly, so down on all fours -
Your buddy has knee pads, you wish you had yours.
You enter "The Big Push" now eager to see
What lies ahead darkly, mysteriously.

Forever you crawl, at least so it seems
To your poor aching kneecaps that conjure up dreams
Of cushions and padding or some other thing
To soften the bruising and take out the sting.

You crawl and you duck-walk nearly nine hundred feet
First banging your head, and then scraping your seat.
And just when you feel that you surely can't last,
There's head room ahead - you scramble on fast!

It's "walking cave" now, you don't mind the damp
Or the mud or the breakdown that's shown by your lamp.
Side passages open to left and to right
There's more cave ahead dimly seen in your light.

Push onward and inward, duck-walk where you must
Over water, through mud, over rocks, and through dust.

The height of the passage, the shape of the wall
Says you're approaching the famed "Hero Hall".

Pause here for a moment, pay homage to fame -
In mem'ry of him from whom "Hall" takes its name.
Now onward again down the back-breaking strand,
You swear it's the longest low crawl in the land.

A parallel passageway's seen on the right.
Ignore it and scramble on deeper in spite
Of interesting gypsum and anthodites there.
A half-mile long crawlway - too much wear and tear!

It's long and it's mean; the floor's covered with stones
That bruise you and cut you and jab in your bones.
The wiggling and squirming, the long belly-crawl
Combine to persuade you to by-pass it all.

Ahead it grows higher, you walk upright awhile.
It's hard to believe you've gone less than a mile.
A pause now for rest and to carbide your lamp,
To lie down and stretch out, relieving that cramp.

Still onward and inward - the first canyon's ledge
Is conquered. You're down now; turn left by the edge
Of a stream trickling past an unusual sight:
A cluster of helictites - tiny and white.

Now back to the main cave, still stretching ahead.
Walk onward - there's lots left to see, reports said.
The "Y" is at hand now - which way shall you try?
First leftward; the other you'll see by and by.

A canyon comes in now - the second you've seen.
The floor opens up, but the drop's not too mean.
Climb carefully downward, but watch where you tread;
A slip in the mud and you might wind up dead!

You're down now (and living) but boy, you are pooped!
You've walked and you've climbed; you've crawled and you've stooped.
You're bruised and you're scratched and your muscles are sore,
But the spelunker in you just hollers for more.

The passage you're in is the largest one yet.
A thirty-foot ceiling - the floor's mostly wet.
The breakdown is covered with slippery mud,
You discover how slick as you land with a thud!

The "Junction Room"'s next. Decide now once more
To go right or go left; to go aft or fore.
A stream wanders down from the left passageway
Enticing you there over breakdown and clay.

You walk and you crawl over mud-covered rock,
This trip has now lasted five hours by the clock.
Your eagerness dies as the passage grows small -
It's a long hard trip back so you sadly recall.

Pass up all the other ways, pass them all by,
Go back past the "Junction Room", back to the "Y".
Stop for an apple, a shared candy bar;
Delicious, though bruised up - you've dragged them so far.

Though tired and bedraggled, you've just got to know
What lies up the right of the "Y", so you go
Deeper again into Windy Mouth's guts -
You're determined to see it: no ifs, ands, or buts.

The going is pleasant, the crawlways you find
Are nothing compared to the ones left behind.

Reluctantly pass up the side avenues;
The passage ahead is the one you should choose.

Gypsum is seen on the walls now and then,
There's more here than any place else that you've been.
You're crawling; abruptly the rock starts to tilt
And you ease your way over the clay and the silt.

You hear it ahead now - a waterfall's roar!
To the sights you've examined get set to add more.
The room's entered high on a mud-covered slope -
Not too steep to climb down it safely, you hope.

The thundering boom is impressive all right,
And so is the scene that's revealed by your light.
The water cascades down a multi-step drop
That's a fully twenty feet from the bottom to top.

It's late now, you're tired - Safety First is the rule-
You'd better not chance the slick climb past the pool.
With longing you peer past the falls through the gloom-
The next trip you'll go past the "Waterfall Room".

Nut now aching muscles - bruised, battered, and sore -
Tell you to quit - you can't take any more.
So back through the walkways, the crawls, and the slime;
There's more cave, but you'll have to see it next time.

Go out past the "Y", past the canyon, past all
Of the walkway, the stoop-way, the duckwalk and crawl.
The "Hall" is behind you, "The Big Push" ahead.
Better rest first; relax on your stone featherbed.

Up now, by golly. And summon your strength.
You'll need it - remember the height and the length
Of the knee-crushing, back-breaking crawlway you face;
It's abundance of mud and its big lack of space.

Again you crawl on 'til you're ready to drop.
How far is the entrance - does the cave never stop?
At last stars are seen out ahead of your light.
And groaning, you stagger out into the night.

It's great. You can stand up, move freely around.
And yet it's so nice to just lie on the ground,
And tiredly discuss all the wonders you've seen;
The big stuff - so nice - the crawlways - so mean.

The cave lies behind you: Windy Mouth in her glory.
You're left with your memories - some grand, and some gory.
'Twas worth every ache, every pain, and bruised bone -
But now, with tired steps, you start back for home.

--John Davis

Written by: John Davis, 1960

Submitted for reprint by: Nick Socky

Transcribed by: Kellen Levinson



Cave Charcuterie

Kyle Nenninger

I love food. More specifically for the purposes of this article I'm into cured meats, charcuterie, and generally anything I can create and carry in a pack for an indefinite period of time. Needless to say I spend a lot of time thinking about what food to take with me into a cave, but what about food that can be produced in a cave? Better yet, what about food from a cave to be eaten in a whole different cave? Historically caves have been used for cellaring food, to the extent that cheeses such as Roquefort have a protected designation of origin and must be aged within specific caves under EU law, but what could I accomplish in my own back yard?

I had some specific concerns regarding aging food in a cave, namely that I would lose the degree of control over the environment that I would have had aging it in a converted cooler or even a cellar. That said there has been a lot of great research coming out in recent years about biodiversity in caves due to the rapid appearance of white-nose syndrome in 2006-2007, and there's something to be said for knowing what you're up against. Notably in 2013 the International Journal of Speleology published "A world review on fungi, yeasts, and slime molds in caves," a compilation of existing research. This review lists more than 1000 cave-dwelling species, ranging from the bacteria responsible for botulism, tetanus, Weil's disease, as well as flesh-eating varieties and the fungus responsible for histoplasmosis or "Cave disease." Well that doesn't sound even slightly fun.

The important thing to remember, though, when working with and around bacteria is no matter what you do your food will become contaminated, and you need a strategy for dealing with that. There are a few options here: you can consume the food before the bacteria gets to problematic levels, you can kill the bacteria (and, if it produces toxins, denature them), and you can find ways to halt or slow its growth. For things aged in a cave #1 is out by default, and #2 becomes problematic as it most commonly requires fire. This leaves us with #3: creating conditions that are otherwise hostile to undesirable organisms.

According to the USDA temperatures lower than 42F (equivalently refrigerator temperature) prohibit organism growth sufficiently that food held at these temperatures will remain safe for consumption for a more substantial period of time. Caves are not this cold - averaging 50F around SWVA - but this isn't as hard of a line as it's portrayed, and temperatures below 60F still do something to inhibit growth.

The pH of an environment, how acidic or alkaline it is, has a fairly wide range of effects on potential infections. Most commonly when speaking of pH it's in relation to growth of lactobacillus and similar "probiotic" lactic acid-producing bacteria responsible for the fermentation of everything from yogurt to kimchi to summer sausage. With the use of a starter culture, and salt, we create conditions that allow these bacteria to acidify their environment quickly enough that they are able to out-compete other, less desirable species.

Dehydration is important enough to discuss on its own, as it's the hardest mark to achieve quickly and well, but arguably the most important for the long-term creation of shelf-stable food. According to the USDA food with water activity of less than 0.85 does not pose a health hazard under any storage temperature. To give you an idea of where this ranks: hard cheese is ~0.92 Aw and grocery store-grade salami is ~0.87 Aw (true salami is closer to ~0.82 Aw). While caves are certainly damp places, dry air is not necessarily better as too dry of conditions will cause a rind to develop that can then trap moisture. To boot: that caves naturally breathe and circulate air with weather fronts make ideal conditions for curing meat.

Curing meat through the use of salt and treatment with smoke are time-honored traditions with rich histories. Salt and saltpetre, the latter for the nitrite and nitrate content, have been used for food storage since prehistory to prevent the growth of the bacteria that causes botulism. Smoking meats provides the second part of this defense, helping inhibit mold growth and infection by parasites. In more recent years hops have also been shown to be effective at controlling the growth of gram-positive bacteria (most notably not E.coli, but inclusive of most other bacteria relevant to food and caves).

Taken alone any individual item from the above would be beyond what I could reasonably rely upon in a cave; however, studies by the USDA have found that these methods used in conjunction are just as effective. Specifically, research from 2003 on summer sausage shows that a combination of water activity less than 0.96 (think cheddar cheese), a pH less than 5.3 (less acidic than coffee), and at least 4.5% water-phase salt will create a product resistant to harmful bacteria.

I've taken a trial run making a fermented sausage called landjaeger at home, and I'm happy to report that three months later I'm still enjoying it, uncooked, without ill effect. I've submitted my recipe for publication in this edition of the Trog for those who are curious. Now, to find a cave to hang the second round...

Landjaeger

Recipe and Guide by Kyle Nenninger

This is an uncooked, lightly smoked, fermented sausage traditionally from Germany that takes about a month to make. Apart from light and oxygen turning the fat rancid, this is entirely shelf-stable, and as long as it's caught early most mold can be cleaned off with a clean rag and diluted vinegar, or at worst cut away. If you have a cellar they can hang indefinitely. That said, they will pick up smells from the refrigerator, and apart from stress-testing I keep mine tightly wrapped in the freezer.

As this is an uncooked sausage, and one made with game, I would strongly advise following best practices and freezing the venison for at least a week to kill potential parasites. That said, the roundworm that causes trichinosis is resistant to freezing, and nothing in this process handles the hazard it presents. You have been warned.

My minimum batch for this type of project is ~8lb as it gives me a decent feeling of return on the time investment, but this recipe will scale down to 2lb as long as you are careful to evenly mix in the curing salt.

For casings I typically use hog, but for this application they are a little large. Sheep casings make good snack sticks.

Ingredients:

6.25lb venison, cleaned and ground	5t. sugar
1.75lb pork fat, belly or jowl, skin removed and ground	Starter culture *while bacteria cultures can be ordered online I personally just pureed and mixed in 1/4c kimchi*
Casings, 16-20ft hog or 36-48ft sheep, soaked, inspected, and rinsed	1c red wine
80g or 1/4c salt	1/2 head of garlic
8g or 1.5t Insta Cure #2	1/2c fennel bulb, chopped
	1/4c sage - fresh, or substitute 1.5T dried

Directions:

I personally grind my own meat and add the last group of ingredients during the second pass, but it's fine if you don't - just be sure to very finely chop the first 3 and grind the second 3 ingredients.

Always work with very cold, but not quite frozen, meat and equipment to avoid smearing the fat. Mix the salts and the sugar together to ensure even distribution, and work it, as well as your choice of starter culture, into the meat 12-24hr before stuffing.

Add the wine ~2hr before stuffing, or give it at least as much time as it takes to absorb. Personally, I find it takes about as long as preparing the casings and setting up my equipment.

When stuffing it is extremely important for this sausage in particular to avoid air bubbles, as we are relying in part on anaerobic conditions to prevent nasty things from growing inside. If you do get an air bubble, wait until after stuffing then sterilize a needle with a lighter to prick it and work the air out.

Weigh your sausages and record it - we'll be using this to tell when they're done.

This sausage is traditionally pressed, and I find that I prefer the texture when it is. Unpressed it's somewhere between a bologna or liverwurst, but coarsely ground and not at all unpleasant. If you choose to press them: make sure your equipment is clean or plastic-wrapped, and while I've heard lumber works well I used textbooks and cookbooks. Pressing, depending on the amount of pressure used, will take 8-12hr, but its fine if it runs over as long as you make sure the sausages don't dry out.

The first 48hr of these sausages' lives, because lives they have again with the introduction of the culture, you will want to keep them moist, out of the light, and at room temperature to give the bacteria culture time to get started. Hang the sausages together on S-hooks or what-have-you, and a cut-up black plastic drum liner I've found works well to protect them and maintain humidity. Check them every few hours, and spray with a bottle of water as needed. Too wet is preferable to too dry at this stage.



After initial fermentation, cold-smoke the sausages over something mild (not mesquite) for 2-4 hours. On top of being delicious, this step greatly increases the sausages' resistance to mold. If you don't have the setup for a cold smoker you can use a tray of ice to try to keep the temperature of the sausages below 100 F, although anything up to 120 F isn't catastrophic. If your temperature starts to creep to 120, however, pull the sausages out and put them under ice to stop the cooking process.

From here, you'll need to ferment the sausages somewhere damp, with decent airflow, and at cellar-ish temperatures (or in a cave!) Up until about 58 F is safe, 48-50 F I consider ideal, and anything lower won't hurt but will make the fermentation take longer and produce a less-tangy sausage. Cellars are ideal, converted refrigerators work great, and I've even done it in a large cooler before. Put a shallow bowl of water in the bottom of your "cave" to increase the humidity, and be sure to change the air twice a day by either opening the door for a few minutes or MacGyver'ing a fan into the mix.

Check your sausages frequently: you should not see any signs of the skin drying or tightening for at least the first two weeks, and if you do it would be worth lightly misting them with water. White mold is typically ok, but if you see any other colors you should promptly wipe it away with a clean cloth and a diluted vinegar solution.

After the first week and a half weigh your sausage again, and you should see a drop of 5-8%. You can start reducing the humidity of their "cave" from here - once they reach 85% of their original weight they are good to eat, although you can certainly dry them for longer.



Pizza, Helmets, and You: A Mis-Guide to Cave Nutrition

By Eric Steinberg

We've all been there. You've packed your lights, water, and some things to keep warm. Just one thing left: food! The Annotated VPI Cave Club Bylaws are non-specific on this matter, stating "Everyone has their own preference of caving food, from candy bars to spaghetti. See what others bring along, try different things, and decide for yourself what works best." In this article, we will examine what the average VPI caver brings for food, and surely go off on a myriad of tangents which will leave the reader with no useful conclusions, but at the very least, leave that reader a more broken and confused caver than before. Here we go!

A ~~tightly controlled~~ survey was conducted, and its results painstakingly examined to produce ~~statistically relevant~~ data. Respondents ranged in age from 12-87, with an average of 36 years old. 54% were male, 28% female, 4% "attack helicopter", and 14% "other". 74% of respondents classified themselves as human, while the remaining 26% are CHUD's. Participants were asked to rate the two snacks mentioned in the club bylaws. "Spaghetti" received a disappointing 2.1/10 weighted average, and "Candy Bars" fared little better at 2.7/10. Clearly the architects of our constitution had no clue about cave nutrition!

Survey participants were also asked about their personal preference for cave snacks, as well as the best and worst snacks they have seen on cave trips. The most commonly packed cave snacks included nuts, trail mix, energy/granola bars, candy bars (mostly Snickers), jerky, cheese sticks, fruit snacks, and PB&J sandwiches. Other honorable mentions were tuna, sardines, cheeseburgers, avocados, bananas (also cited frequently as the "worst" cave snack possible), "mini-bagels filled with cream cheese, grape jelly, and Hormel canned ham-really", ROCKS, blueberry poptarts, Cave Salamander Stew, egg sandwiches, Ensure, "garlic roasted bat w/ fried crickets", and helmet pizza.

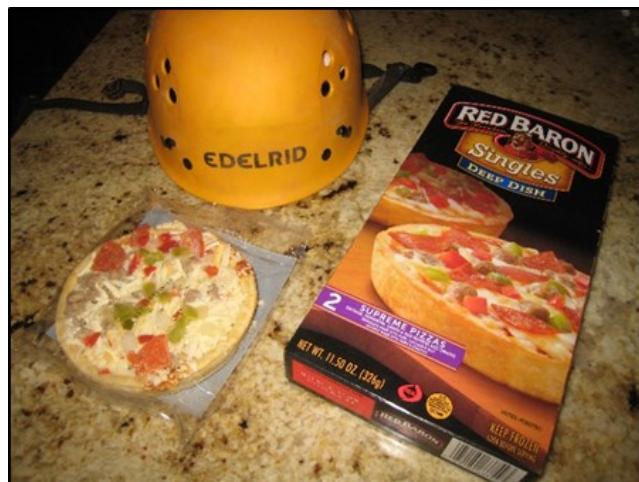
Some interesting results and correlations are worth noting:

1. A whopping 36% of CHUD respondents identified tuna or sardines as the "worst" cave snake. Perhaps we have discovered an effective CHUD repellent!
2. "Best" cave snack responses included: Edible Panties, Meat Tubes, Pie, and Rack Eggs. Imagine that four-course meal.
3. The tears of trainees have adequate nutritional value for long cave trips according to one respondent. Another suggests eating the slowest/weakest trainee, and other trainees' food while they climb rope (use caution when caving long trips with this 47yr old male caver).

The most intriguing snack suggestion was, of course, helmet pizza. Disturbingly, only a few survey respondents made mention of helmet pizza- this treasure must be shared! It's hard to determine when helmet pizza was invented, but we do know that pizza was invented in 1889AD, and helmets were invented in 900BC. While cavers will argue at length about the exact degree to which suspension helmets are superior, no one can ignore the unique storage advantage of a hardshell suspension helmet.

Here is where the magic of helmet pizza resides. Follow this simple illustrated guide, and you too can enjoy helmet pizza on your next cave trip!

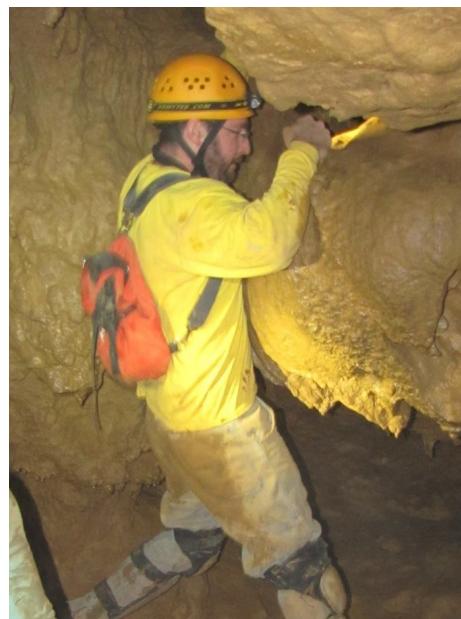
Step 1: Heat your personal pizza according to the manufacturer's recommendations.



Step 2: Wrap pizza and install in your helmet.



Step 3: Cave.



Step 4: Enjoy!



Cavers take safety very seriously, and helmet pizza deserves a thorough safety evaluation. The user manual for the Edelrid Ultralight helmet contains the following:

GENERAL INFORMATION ON SAFETY, PRODUCT LIFE, STORAGE, CARE AND IDENTIFICATION

Safety notices

If original components are modified or removed from the product, its safety aspects may be restricted. The equipment should not be modified in any way or altered to allow attachment of additional parts without the manufacturer's written recommendation.

Since the installation of pizza into the helmet would be considered a modification, it seemed prudent to seek a written recommendation from the manufacturer. The following message was sent to Edelrid:

Good day. I have a question about the Ultralight helmet, which I use for caving.

The user manual states that "If original components are modified or removed from the product, its safety aspects may be restricted. The equipment should not be modified in any way or altered to allow attachment of additional parts without the manufacturer's written recommendation."

The styrofoam insert in the top of the helmet has come unglued. Rather than glue the foam back into place, I'm curious if it can be removed, and the vacated space in the top of the helmet then used to carry some supplies? Ideally, I would like to carry some food rations here, such as a mini pizza. Conveniently, the pizza would be kept warm by escaping body heat.

The RED BARON Singles Pepperoni Deep Dish Pizza (<https://www.redbaron.com/products/single-deep-dish/single-deep-dish-pepperoni.htm>) appears to be a good fit for this helmet. While I do not have any quantitative information on the mechanical properties of this cooked pizza, I can qualitatively say that it is quite delicious.

Could you please give me your written recommendation for this proposed modification?

Unfortunately, the manufacturer has not responded in a timely enough manner for the publication of this article. Surely, a team of German engineers has been in round-the-clock meetings in order to determine an appropriate recommendation. Stay tuned for updates, including real-cave testing data.

When You Can't Take the Cave Home with You

A Guide to Artificially Growing Calcium Carbonate Crystals

By Kellen Levinson

Do you ever wish you could have a piece of cave on your shelf? Have you ever found a broken chunk of calcite in a cave and longed to take it home like the pack rat you are? As cavers know, well taking formations from a cave not only deprives other visitors from enjoying the naturally formed rocks and minerals, but harms the cave and carries a hefty fine for those who swipe cave stones. But fear not, fellow caver! There is hope for people like us who are obsessed with sparkly things and wish to have a pretty, white chunk of calcium carbonate to look at when reminiscing of the hours spent crawling around in the crust of the earth.

The good news is that you can grow calcium carbonate and other crystals in the comfort of your own home.
You don't even have to put on a cave suit to do it!

Aragonite Crystals: How does it work?

Most of the caves in our area are solutional karst caves and form through limestone. Limestone contains a mix of minerals, chiefly calcite and aragonite. The water that forms these caves is saturated with carbon dioxide from the air and soil. When it contacts limestone, calcium carbonate dissolves from the rock into the water and reacts with carbon dioxide to form a calcium bicarbonate molecule. When this solution is exposed to air, the chemical reaction is reversed and calcium carbonate is deposited onto whatever surface the solution touches. This is how flowstone, soda straws, cave bacon, and other calcite formations are born.

This home experiment uses dolomite and acid in the form of vinegar to create a similar solution. Dolomite is a common stone and a naturally occurring source of calcium carbonate. When combined with the acidic vinegar, the calcium carbonate from the dolomite will dissolve and saturate the acid. As the vinegar evaporates it will deposit the calcium carbonate back onto the surface of the dolomite stone in the form of aragonite crystal, a pretty white mineral you can keep on your bookshelf not unlike the formations underground.



Aragonite Crystals: What you will need

- Dolomite (you can buy 50lb bags for ~\$10)
- Vinegar (acetic acid)
- Tupperware, jars, or other containers



Above: Dolomite

Aragonite Crystal: How to grow the mineral

- Select your favorite rock or rocks to grow crystals on. The aragonite will not grow all the way around the entire stone, but rather grow on one of the surfaces. Keep this in mind when choosing your base stone.
- Wash and dry your rocks. Place one or more into your container.
- Pour your vinegar into the container so that it partially covers the stone, but leaves the uppermost face or point exposed. This is where the crystal will form.
- Partially cover the container. Over the next 5 to 14 days, your calcium carbonate will form as the vinegar evaporates. You shouldn't completely seal your container or the vinegar won't evaporate.
- You can remove the crystal when you are happy with the size or continue to add more vinegar to make the crystal larger. You can also add dolomite powder to the top of the stone or to the solution to provide more calcium carbonate. Remove your stone from the container and allow to air dry.



Above: Bismuth crystal, another species easily grown at home.

Other tips for Aragonite

- You can experiment with using calcium carbonate crystal as a seed to deposit more crystal onto and dolomite powder as a calcium carbonate source.
- Using dolomite powder allows you to skip using the dolomite stone. Instead of the stone, aragonite can be deposited onto other non-smooth objects in the container.
- Other minerals and colors can be added to the solution to change the color and appearance of the crystal.
- Spray your minerals with a sealant to preserve them from dust and moisture that may damage them.



Left: Example of calcite underground.

"Aragonite is lame, I want to grow calcite!"

You can't grow calcite. Well, *you could*, but you'd need lab equipment or a hundreds or thousands of years to wait around.

This is the case for many of the mineral formations that occur in caves.

Gypsum crystals, for example, can be grown in a lab or extremely slowly by nature. Gypsum is not particularly water soluble and applying heat does little to increase the solubility. To dissolve gypsum you'd need to start with hydrochloric or sulfuric acid, otherwise you'll be waiting around a long time.

Many cave formations, including those composed of carbonates, are created very slowly and under conditions that are hard to replicate at home. This makes the formations in our caves that much more special!



Above: Aragonite crystal similar to kit-grown aragonite.

Other crystals to grow at home

Crystal growing is a popular hobby and has a huge amount of information available online. Minerals and crystals can be grown through evaporation, suspension of a seed or object into a solution, electrodeposition, or a number of other methods.

I recommend that beginners in the hobby experiment with growing the following crystals before turning their garage into a crazy crystal-growing laboratory:

- Borax
- Alum
- Monoammonium Sulfate
- Bismuth (metal with a low melting point)
- Magnesium Sulfate
- Copper Sulfate



Above: Alum Crystal

If buying chemicals and ruining all of the cups in your house with saturated solutions and molten metal doesn't sound fun, there are a slew of crystal growing kits available online.

So go ahead, cover your bookshelf with responsibly obtained crystals. Bask in the beauty of your new shiny rocks that resemble the old shiny rocks we all love so much!

*Images used in the article are Public Domain and can be found at <https://commons.wikimedia.org/>

Eggcited About Cave Snacks

Author: Skylar Hopkins, VPI #463

On the topic of cave snacks, I append recipes for the official cave snack of the March 2018 TAG trip: The Eggcellent Sandwich. When you need to frog 230ft, there is simply no better snack to help you get yolked.

To the great sadness of all, KDaniel could not attend the March 2018 TAG trip. Yet despite his absence, he was our TAG hero, for he sent us a wondrous and confusing contraption: an electric egg cooker. Contained within the device was a very sweet note from KDaniel, which implored us to think fondly of him, and which contained absolutely no instructions on how to use the egg cooker. Fortunately, we avoided a potentially eggspllosive situation by calling KDaniel early Saturday morning before attempting to cook our eggs. He warned us that the egg cooker must be fully heated before adding the eggs, or else the eggs would run out of the cracks in the device. Challenge Eggcepted.

Armed with this knowledge and the egg cooker, we cooked eggs at the baconning of each day to place within our tinfoil wrapped sandwiches. Thankfully, all of our eggs turned into perfect egg patties throughout the trip. However, one egg ended up in the BnB sink with the copious sink noodles (JMcGuire needs a strainer), so we have yet to perfect the Neversink Sandwich.

Note: if you try to bring raw eggs to the top of the Valhalla road, you might accidentally break one into RBlackwell's helmet. The author of this article is not responsible for any such happenings, nor did she attempt to fry eggs on a bobbin while rappelling.

Below are our recipes, which improved through trial and error.

Recipe 1: The Distress Bacon

Suggested pairing: Kennamer Cave

Ingredients: One English muffin (toasted/burnt), one egg, one slice of bacon, one slice of Munster cheese

Verdict: A bit dry, but it was flat enough to fit in a helmet, and it was bacon us so happy after the slightly eggshausting entrance crawl in Kennamer.

Recipe 2: The Original Eggcellent Sandwich

Suggested pairing: Valhalla

Ingredients: One plain bagel (toasted), two eggs, one slice of bacon, one slice of Munster cheese

Verdict: It might sound cheesy, but this was eggsactly what we needed for a long, rainy trip to Valhalla. (See photo of ASchoenewolf consuming his sandwich at the bottom of the pit.)



Recipe 3: The Eggstraordinary Sandwich

Suggested pairing: Tumbling Rock

Ingredients: One plain bagel (toasted), two eggs, one slice of bacon, one slice of American cheese, one slice of tomato, and guacamole.

Verdict: Raw Eggscellence. Seriously, this eggciting sandwich was all it was cracked up to be. The only downside was that it was too fat to fit in a helmet.

Recipe 4: The Eggsquisite Sandwich

Suggested pairing: Stephen's Gap

Ingredients: One plain bagel (toasted), one egg, one slice of bacon, two slices of American cheese, one slice of tomato, and guacamole.

Verdict: Mozzarhella good. An eggceptional ending to a five-day TAG adventure.



Picture: Reilly's egged helm.

Blue Spring Cave Trip Report

Tommy Cleckner

Participants: Clinton Elmore, Phillip Moneyhun, Reilly Blackwell, Tommy Cleckner

Objective: Climb, crawl, or generally suffer our way into new passage

Preface:

This report was originally written to accompany my survey notes and to an audience already very familiar with Blue Spring Cave. For those unfamiliar, Blue Spring Cave is a 40-mile long cave in White County, TN. It is the longest in the state. BSC has a lot going for it, but it is known first and foremost for its seemingly endless borehole. You get underneath the plateau, get into a dry 30'x15' tube, and just walk for a few hours while ogling the gypsum coating everything. Sometimes it gets bigger than 30'x15'. Luxury caving, really.

It's been on my personal list of caves to visit for a few years, but I didn't make an attempt to go until 2017. Reilly and I, but mostly Reilly, made nice with certified TAG cavers Clinton Elmore and Lee White during trips over the summer and at the TAG Fall Cave-In. We started discussing the possibility of doing a long camp trip into BSC with Lee in October/November— he had some bolting projects in there that he had been putting off, and was excited to get a team in there. It didn't take too much convincing to get Clinton on board. Lee dropped out in mid-December due to scheduling issues, but we had the gear and manpower to do the trip anyway. The very short story is that between Christmas and New Year's, we set up a very cozy camp 3 hours (and something like 4 miles) from the entrance and spent a few days pushing leads further in, with some success. The primary discoveries were made off a section of the cave known as Mega Canyon – a 150' tall and 30' wide passage that goes for hundreds of feet and ends seemingly far too soon. It is roughly 5 hours travel from the entrance, one way. Despite our efforts, it still ends far too soon. We did map some cool stuff though.

Summary

Everyone likes a TL;DR. To summarize the primary discovery: the large breakdown room in which we did most of our climbing is ~50' x 40', with a 20' ceiling. There are 3 domes in the room – 2 40-footers (NU20, 21) and a 60-footer (NU18). The 60-footer was climbed by Phillip and Reilly on our last day there, and the 40-footers remain. The passage at the top of the 60-footer sounded unappealing, but it goes and is in need of survey. All three appear to break through the same ceiling layer and the tops are on roughly the same vertical level. A series of dome-pits leaves the room, trending roughly north. This is where we found the 80-ft domes and pits. There is potential for a bolt-climb at NU41, where the survey ended. The passage pinches off at the bottom, but the passage is large immediately before and may continue at a mid-level (but it is not apparent from the bottom). No airflow was noticeable. Potential bolt climbs also remain at NU9 and NUA3 – both look like 60 foot domes with similar character to the ones we climbed. We decided to name the new room ‘the Hall of Northern Aggression.’

Additional survey was done in other areas. A bolting lead was marked on the map at NAH24 – it was free-climbed, surveyed, and does not go. The NAH survey was looked at pretty hard – no other leads were found. Clinton found a climb at NUA5 – it was surveyed to NUA11. The survey ended in drippy and unstable breakdown. There may be passage beyond, but it is not recommended due to the nature of the breakdown. Luckily, the cave appears to take almost a complete 180 degree turn at the breakdown, and the continuing passage that Reilly could see seems to be trending towards the 60-ft dome at NUA3. Any passage that could be found past the breakdown may be reachable through a bolt climb. The stream passage up and downstream from NE9 was looked at as well. It sumps downstream almost immediately (survey data was taken) and splits into several infeeders soon upstream.

No leads were found in one of the major branches (I believe it was the one that trends west, do not remember the survey designation) and the other was not looked at (trends north). The trip totaled 100 hours, with 880 feet of total survey. We had a good time doing it – thanks to Clinton for showing us around and thanks to Lonnie for providing access to such an awesome cave!



Tuesday 12/26/17

Phillip, Reilly, and I arrived in Cookeville around 7 PM. We had aspirations of going into the cave that night to set up camp, but better judgment prevailed and we drank beer instead. We leafed through the map with Clinton and got a better idea of what areas we were going to focus on – Baghdad Breakdown and Mega Canyon were identified as promising regions to push leads and find new cave.

Wednesday 12/27/17

We distributed gear and packed in the morning. A quick stop was made at Bojangles for our breakfasts and Clinton's camp food. The three of us from Virginia took notes. We changed as quickly as was possible at the cave, and hiked to the entrance in search of warmth. The trip started at 11 AM, and we made good time to our camp location (~3 hours) near the third river crossing. We unpacked and set up camp, before heading out to the Baghdad Breakdown area around 3 PM. We also discovered that sand and kneepads had already begun to do some damage to the skin on Phillip and Reilly's knees. Ouch. Somehow it did not slow them down much for the duration of the trip. The main item of interest was a bolt climb 'to good passage' marked on the map in the NAH survey. We located the climb fairly quickly – I free climbed to the top of it while looking at the ceiling for the bolting lead. Clinton and I surveyed down it back to the tie-in while Reilly and Phillip bolt-climbed a promising phreatic feature seen earlier in the passage. It didn't go. Clinton and I poked around the NAH survey for an hour or so without finding any remaining leads. It seems safe to cross the area off the list for future efforts. The survey of the climb netted 113.3 feet in 5 stations (no designation), with a tie-in at NAH 24.

We made it back to camp around midnight.

Thursday 12/28/17

We got up and slowly organized before heading out towards Mega Canyon. Some stream leads were identified as promising – 'they're wet, so they probably weren't surveyed' was Clinton's operating theory. We made good time out to Mega Canyon, and spent some time lighting the ceiling up to look for high leads. None were spotted. The three Virginians took an hour or so to bounce Crashing Spire Plunge (150 ft, and reputably the most remote big pit in TAG) – I reasoned that we definitely wouldn't be interested again if we managed to find water or mud later in the day. While we did that, Clinton found a way to crawl up and around to a ceiling feature near the turn-off for the pit. It did nothing interesting.

After our pit-bouncing detour, Reilly and I checked out the cross-cutting stream passage at NE9. Reilly found some water and mud pushing downstream to find that it sumped within 40 feet. I stayed on the bank and sketched it in. We put a few shots into it to make a tie-in, which totaled 92.3 ft – most of which was tie-in shots in Mega Canyon. We then pushed upstream to look for leads, and found none. One branch of the passage may still go – I do not recall the survey designation but Clinton recalled the survey team wanting to name it 'The Cat Turd.' It's all yours.

Phillip and Clinton split off to look at pit and dome leads marked near the NU survey. Many of those leads remain unchecked, because the 1st one they checked went into new cave immediately. Clinton went through the tight crawl that begins the NU survey first. He found a promising dome (~NUA 3) and an upclimb at NUA5 that he proceeded to climb. The trip almost made a turn for the worst at the top of the climb, where a huge slab (my guess puts it at ~500 lbs) dislodged and slid into place over the hole he had just climbed out of. Fortunately, Clinton is a lot stronger than any of us, and was able to shift the rock enough to escape. We resolved to name the passage he found 'Elmore's Escape.'

Survey notes reported a 'dome-pit into blackness' at NU7 – a second look by fresh cavers found it to be a 7-foot downclimb into a decent sized room. Phillip Moneyhun pushed the breakdown at the end of the room, and popped out into a large breakdown chamber with multiple bolt climbing leads. Phillip and Clinton then returned to Mega Canyon to tell Reilly and me that we could stop pushing wet stuff and start surveying the new discovery.

We returned to the room pretty late in the day, and only had enough time to complete minor objectives. Phillip and Clinton started (and finished) a 20-ft bolt climb to see if the apparent canyon leaving the breakdown chamber could be followed. Reilly and I headed back out of the new area to survey Elmore's Escape (extension of the NUA survey). We mapped 93.2 feet through mostly nice passage, minus the trapdoor rock. It ended in a very drippy breakdown pile. Reilly pushed into it for a few body lengths, and found that the passage turns almost 180 degrees and trends back the way it came. This suggests that it might intersect the dome near NUA 3. The breakdown was still shifting 5 minutes after Reilly left it – the dome is probably the safer lead to push for more discoveries in this area.

We met up with Phillip and Clinton and headed back to camp. They had finished the bolt climb they started, but found that the ledge they had climbed up to took them almost immediately to a 60-ft climb.

Friday 12/29/17

We got something of a later start on Friday, and headed back to the new area. Phillip and Clinton continued ahead to start the newest bolt climb, and Reilly and I stopped at NU7 to start surveying to the room. The area is quite dome-y; there is a 70-ft dome with potential for upper level passage in the first room encountered (NU9). We proceeded from the room through the breakdown until we reached the new chamber where the other team was climbing. The survey of the room finished just before Phillip needed the bolting gear our team was carrying – good timing. We climbed up the 20-ft rope rigged at the 1st climb (NU29), and offered advice and commentary to Phillip as he finished the next 60-ft climb (NU31). He finished the climb, and rigged a static line up to the ceiling channel he had reached. He declined to scoop his discovery, and generously offered the privilege to the survey team while he and Clinton left the area to acquire more static rope. Mud may have been a factor. We set a meeting time at camp of midnight. Reilly and I climbed up (and surveyed to the top), and quickly discovered an 80-ft pit (NU32). We were able to drag the rope we had just climbed up and dropped it down the new pit. The rope reached with maybe a foot to spare, and we were able to place a survey station there. Reilly went down first, and called me down to help her find a way to the shower we could hear close-by. I attempted the tight, horribly muddy (by TN standards anyway) climb she had been looking at, and found that it 1) wasn't so bad and 2) popped out into a new 80-ft dome with a small stream pouring down from the top. We pushed a little further from there, but determined there was not enough time to survey and still make it back to camp at the agreed-upon time. Both of us enjoyed the climb up the pit – the rope was unfazed by any rub points and the lip was exactly as pleasant as it had promised to be on the way down. Nobody cussed. We finished the day with 27 stations (NU8-NU33) and 492 feet, counting a few splay shots in the room.

We met Phillip back at camp at 11:30 PM or so – Clinton had packed up and left the cave as had been previously discussed. We brainstormed a little about what we could accomplish without being able to break up into two teams of two.

Saturday 12/30/17

We had reached a broad agreement Friday night that this would be our last full day of exploration, based on energy level and the prospect of a New Year's Party. We agreed that I would solo-survey the dome-pit series we had found at the end of the last trip, while Reilly and Phillip worked on a promising 60-ft bolt climbing lead in the large breakdown room.

Phillip came up to the top of the 80-ft pit with me to set a bolt or two and eliminate the horrific lip that Reilly and I had enjoyed the day before. We then split up, and I started my survey. I did not discover any cave beyond what we had seen the day before – the survey wrapped up in 8 stations and 88.8 feet of survey. Those numbers aren't made up. I did find that the muddy climb could be bypassed with a longer rope and a bolt or two – a window half-way down the 80-ft pit at NU32 drops down into the waterfall dome (NU 38).

After finishing my survey, I climbed back up to NU32 and considered my choices in life. The ceiling channel I was in continued over the pit, and had appeared visible at the top of the waterfall dome. Pushing it could save a lot of potential work – so I did. Awkwardly crawling over the drops using fairly slick, muddy footholds did not feel like a great idea, but it got me to the water source for the dome. The water comes out of a too tight, gnarly canyon. There is a too tight belly crawl above it that is dry. There was no noticeable air – it is not a lead that will keep me up at night.

I rejoined Phillip and Reilly, and spectated while Phillip finished his climb (near NU18). It was another 60 footer, and we left the area close to midnight after reaching the top. There is a tight canyon at the top that still goes – no survey was done there. We packed up the bolt climbing gear and headed back to camp. While at camp, I made a quick shot between S2 and SJ1. Clinton had been fairly sure that the SJ survey had been mapped but left floating – if that is the case the data is now available.

Sunday 12/31/17

The trip out was uneventful. We made most of the right turns on the first try, and made it to the entrance 4 hours after breaking camp. The BO crawl was a lot less pleasant going uphill. We exited at 3 PM to a sunset we enjoyed and bitter cold that we did not. The trip totaled 100 hours, with 880 feet of total survey. We had a good time doing it – thanks to Clinton for showing us around and thanks to Lonnie for providing access to such an awesome cave! We made it back to Blacksburg that night with just enough time to stink up a caver New Year's party.

Windy Camp

By Nick Socky and Kelly McCarthy

August 11th, 2017

Andrew Lycas, Nick Socky, and Scott Zagrodny left the WVACS field station around 9:30 am and made their way to the parking area at Second Creek. The river level was low enough that taking the lower route around Red Rocks worked great (especially hauling two packs per person). The team got to



the cave at 11 AM and started the long crawl and 1.5 mile trip to The goal was to drop bolting gear at the turn off for L survey, get to set up camp, and then head to the upper levels. After 2.5 hours of lot's of groaning, sighing, and bitching; Andrew, Scott, and Nick arrived at camp. Nick and Andrew went back the waterfall room to retrieve the stashed gear from the previous trip and camp set up began.

Camp is positioned directly after the short crawl way just past the waterfall room and is at the turn off into the N Survey, where the Mud Plug passage is. It is a very dry cozy camp with a great flat area on a shelf for a kitchen, 8 ft tall passage, and it can support up to 6 people very easily. More areas on the mud bank to the right (looking up stream) could be dug and flattened to allow



for more people if needed. After claiming sleeping spots, everyone got to work with tidying up the place in preparation for Joe Calderone and Kelly McCarthy to arrive later that evening.

At 3:00 PM, Nick, Andrew and Scott made way to the upper levels to pick up off where Nick and Scott had left the ME survey going back in January 2017. The way to the upper level section includes a very sporty trip involving walking, hands and knees crawling, belly crawling, climbing, and canyoning.



After a 50 ft belly crawl, you rejoin the stream and the Junction of Black Water Falls and a narrow 30 ft tall stream canyon. Traveling up the canyon involves lots of stemming at various levels to avoid the water and breakdown chocks. Another sporty climb at the M junction and then a bedrock crawl to the Gold Line Showers Room. There is also a bit of exposure in this room, named for the old Gold Line and Cable ladder used to ascend a 25 foot waterfall pit. Luckily

there is a shelf you can scoot along to avoid climbing the very broken ladder and sketchy rigging from back in the 1960's. After the climb, a bit more stream crawling brings you to the ME survey which is nice walking passage with very pristine formations and flowstone on the right wall. It takes approximately 40 minutes to get to the lead from camp, which was known to be the furthest point in the cave at 2.15 miles from the entrance.

With Nick doing sketch, Andrew doing front sights and cross sections, and Scott doing point and back sights, the survey started! After completing a small loop around a flowstone pillar, where the tie-in to ME existed, the team continued into nice walking canyon with flat contact ceiling and a small trickle of water meandering down the middle of the passage. Scott checked out a few low wet leads which will need some survey at some point. The survey slowed a bit when the passage got complicated when the contact ceiling disappeared into a breakdown room. After some cursing from the sketcher and an awkward climb into a phreatic mud section to the right of the room, the loop was completed.

The character of the passage changed again. What was most noticeable were the waterfalls coming out of a crack in the ceiling in two sections of the cave passage. It was also noticeably more wet and colder. Moving forward, past the waterfalls, the formations in this area of the cave increased greatly as well as the ceiling became very tall: averaging about 15 to 20 ft tall.



After surveying a few 40 ft shots, everyone stopped for a lunch break, where it was noticed how much the air was still moving. It was cold up there! The survey of the upper levels ended in 30 ft tall, 10 ft wide canyon with amazing helectite bushes on the left wall. The passage does continue fairly tall but breaks into a complex multi intersection with passage going forward, left, right, and up. To the left, the ceiling drops to about 5 ft tall and has flowing water. To the right, is a breakdown mess of a room with water also coming from along the right wall. The forward and upward passage looks as if it connects to both the left and right passage in maybe 20 to 30 ft and it might also intersect another upper level passage.

On the way out, a few pictures were taken of the fantastic helectites and formation as well as the large canyon passage. A real photo trip will need to be done to the upper levels of the cave to really capture how impressive this passage is. It took about 50 minutes to return to camp where a resounding



"BABA!" was heard as everyone approached. Kelly and Joe had been in the N survey up in the mud plug section of the cave.

They had entered the cave around 5:30 pm on Friday August 11 after an exceptionally humid (even for Richmonders) hike along the river. 30 seconds after

Kelly breached the drip line the skies opened up...this was taken as a good omen and after a minute of quiet contemplation it was decided to head into camp. An uneventful hike along the usual thoroughfare and the destination was reached; there was a definite upswing in sights after picking up Joe's second pack before first canyon (the timing a coincidence for sure). Some quick work setting up sleeping bags and all were ready to go. With a description of "N" as a mud plug survey, expectations were low; a good lesson in not making assumptions as the next 15 min involved caving through beautifully decorated passage. The "NB" survey began just past the formations with a passage full of breakdown blocks and a small stream meandering back and forth across and out of the passage. A small room/loop containing a pool full of scum and the passage settles down into a small old stream bed lined with cobbles. After 2.5 hours (probably, no one remembered a watch and thus were relying on Joe's impressive sense of time) 315 feet of passage had been surveyed with Joe sketching and Kelly on point and DistoX. The passage continued onward but food and sleep were calling so they ventured back to camp.

With a nearly full camp of 5 cavers, everyone was cracking jokes, telling stories, prepared food and hot drinks, and was merry over the fact that they were camping in a cave. Nick went and set a few bolts in camp for a clothes line and a way to hang a lantern. A lone bat also decided to join in the fun and fly back and forth a few times. Everyone got ready for bed, excited about the next day.

August 12th, 2017

The alarm went off at 7 am and everyone stirred and slowly started getting up. Nick got up first and started boiling the water for breakfast! After breakfast, camp was packed up and stowed until next time. The plan was to leave the cave that evening and travel back to WVACS to allow Scott to visit with folks who haven't seen him in 8 months. No one wanted to wake up at 5 am on Sunday to make the 9 am meeting either. With 4 industrial garbage bags sealed with

desiccants and stored, everyone left camp and made for the waterfall room and on to the L survey.



It was a quick 30 minutes for everyone to get to the turn off, and once there gear was re-organized between packs and people so a full extra rigging bag did not need to be hauled up the Buppet Puster. Joe had his food and extra clothes stored in everyone else's pack, while he carried the bolting gear as his pack. Three sets of vertical gear were brought: two for the bolting team and one to be shared by the survey team going up the second dome. With much cursing, grunting, and complaining, it took approximately two hours to go the 900 feet to the domes. Moving through the passage has gotten easier because the way up and down the narrow slot canyon is becoming more obvious with the additional travel in this area of the cave.



At the 30 feet dome room, everyone dropped their packs and broke into two teams. Andrew and Joe got geared up to start the bolt climb while Nick, Kelly, and Scott headed to the 20 feet climb for Nick to clean the route and make sure a bolt was ok. Nick climbed up, fixed the bolt, and then was able to retrieve 5 hangers from the climb.

Arriving back at the 30 feet dome, Joe had successfully set 2 bolts and was making his way up the pit. Nick took over belaying Joe from Andrew, and him and Kelly headed up the other rope and started surveying the new cave!

Meanwhile, Joe continued and set another two more bolts getting 15 feet up the bolt climb. Joe then hit a bad layer of rock and spent about 30 minutes hammer and digging around. Nick then went up the climb, and hammered and dug around for a while as well. He eventually found some good rock and set a higher bolt and got a few more feet up the climb. The darker layer about 18 feet from the floor that was thought to be good

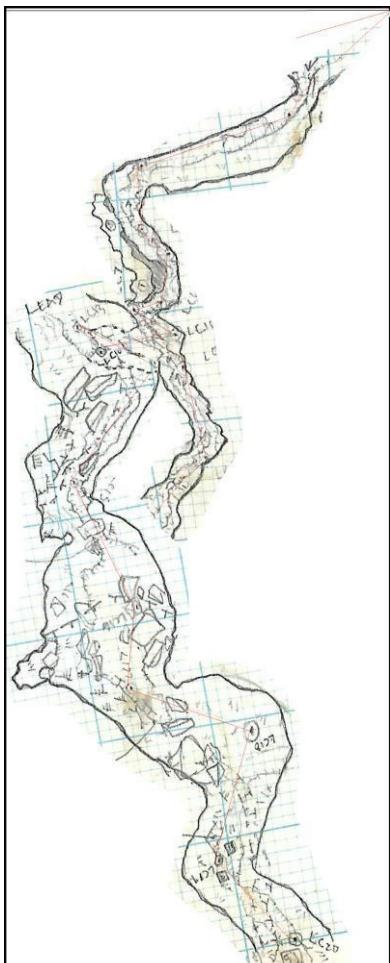
limestone turned out to be several feet of dirt and mud. Nick started digging and hammer all around trying to find where the good rock was. Whenever a potential good layer might have been found, the rock eventually shattered and turned out to be a larger piece of breakdown stuck in the mud. Joe and Nick proceeded to trade off



digging and trying to find good rock, for the next 3 hours but were unsuccessful. To make the digging more interesting, the mud bank that was being dug into was overhung and about 3 feet above the person bolting. Scott enjoyed watching Joe or Nick rain down dirt, mud, and rocks on themselves. To make it worse, you could see up the last 12 feet of the mud shoot into walking passage.

Much cursing and sighing was heard until the effort was forfeited around 4:45 pm. At around 5:10 pm,

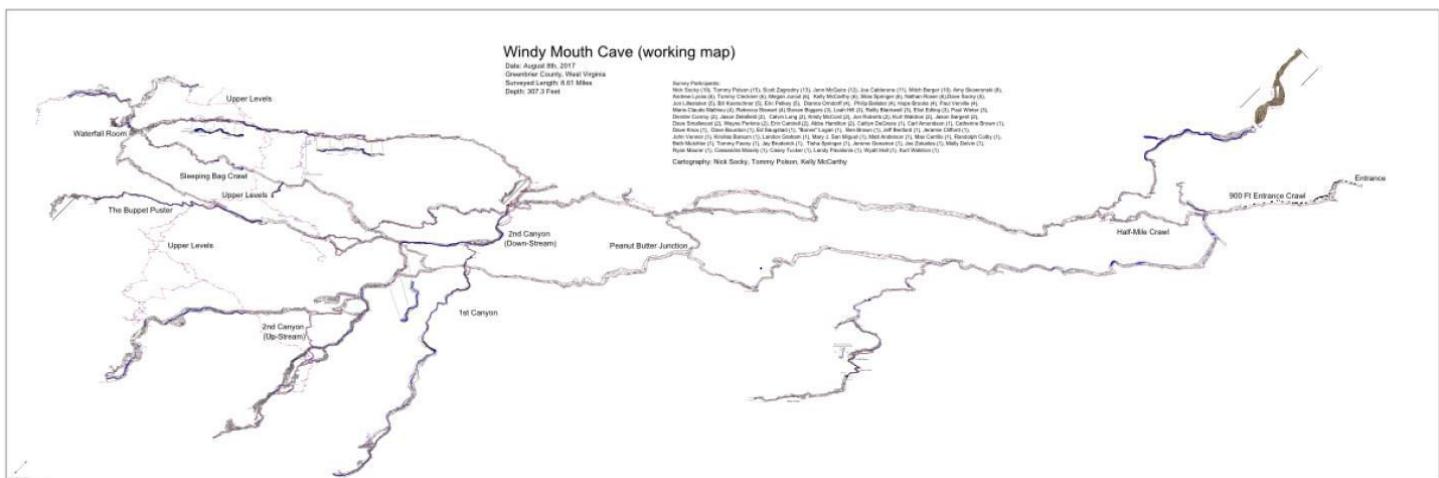
Kelly and Andrew returned all a twitter with what they had found up past the 20 feet climb. They delved into the details of what they found and Joe and Nick started packing up some of the bolting gear for the journey out of the cave.



Andrew and Kelly ascended the second (but first bolted) dome into the unknowns of an upper level. Scott helped tie into the room below with a tandem before the survey delved into the passage ahead. Kelly sketched with Andrew on point and DistoX. At first the passage fulfilled expectations, a narrow jagged contortion canyon baring significant resemblance to the Buppet Puster below. However, a couple of turns in Andrew spotted a lead to the left and climbed into the crawl way to investigate. A large passageway was discovered 20 feet wide and covered in black stalactites, flow stone, and soda straws. Full of enthusiasm and inspiration the team descended back into the canyon to survey a few more stations before turning the survey into the walkway above. At odds with the passage below the upper section was covered in black mud and it was decided to follow in the direction of the stream below. It was soon realized that the two passages were winding back and forth connected via a number of openings in the floor of the upper passage. The survey halted at an 11 feet drop off the edges coated in mud rendering them impassable, but the stream (now barely connected puddles of muddy water) continued on 16 feet below in walkable passage. Descending into the steam passage, they were forced to turn back (having reached the time limit) and soon passed by the last station in the canyon on the way back to the dome.

With this new information, and looking at the sketches, it was decided that this upper *upper* level area, that had been found, might very well connect to what Joe and Nick had been trying to bolt up into. Just in case, the belay rope and gear was left in the cave for a future bolting trip – ONLY after the upper level had been checked to make sure it did not connect next time. The decision to leave a majority of the bolting gear (minus vertical gear, drill, and batteries) in the cave made for a much more pleasant journey back out the Buppet Puster. Andrew also enlarged some of the tighter regions of the stream canyon. As usual, it took only 1.5 hours to get back to the main B survey and then another 1.5 hours to exit the cave. The trip through the main passage was slow going, but uneventful. Everyone exited the cave at 9 PM on Saturday.

The entire camp trip yielded a total of 1486.7 feet surveyed in the cave. Lastly, Bill Koerschner, Silas Springer, and David Smallwood surveyed in the Sleeping Bag Crawl to J/W survey completing one of the last major loops of the cave. Their survey of 468.3 feet brought the total surveyed length of the cave up to 9.01 miles!! With an original estimated mileage of 18 miles, Windy Mouth has reached the halfway point of the resurvey project in slightly less than 2.5 years. The end of year goal is to have Windy Mouth at 10 miles by the end of 2017.



4 Things I've Learned as a Rescue Nerd Turned Caver

Ashley Lewis



Photo 1: Six cave rescuers moving a patient through a rocky subway-tunnel-sized lava tube affectionately known as Charlie the Cave in Deschutes County, OR.

The National Cave Rescue Commission (NCRC) is the NSS's "representative on issues of cave rescue training and operations" (ncrc.info/about). NCRC develops curriculum for cave rescue and offers courses through national and regional training seminars aimed at both cavers and rescue nerds. The "Level 1" course teaches you how to be a not-terrible team member on a rescue, "Level 2" tries to make you an adequate team leader. "Level 3" is designed for trickier rescue techniques and to teach people how to manage the utter clusterf**k of a cave rescue incident. "SPAR" class is for MacGyvers and "TOFE" is for wizards. I've had the glorious opportunity to attend or assist with three NCRC training events in the past year and would like to share some of that knowledge for those of you who haven't yet had the experience of being sandwiched between a litter and lava rock (or any rock). See Photo 2.

Lesson #1: Always check your anchors, especially if they are lava. One of the cool things about caving/attending seminars in different places is you get to experience caves with different geology. The Level 1 course I attended was in Redmond, Oregon. Oregon's caves are lava tubes. Lava caves pretty much feel like the opposite of our limestone caves. Lava is grabby and abrasive, like velcro. Assume if you're touching it



Photo 2: Ekey demonstrating adequate “paving” technique during a mock rescue in Starnes. If you thought sport caving was grim, try rescue caving! Sometimes the best way to move a litter is to literally (yay puns) lay your body on the ground and slide the litter across your back or chest. You do this if the passage is either (a) too difficult/rocky/etc. for 6 people carrying the litter to walk without falling or dropping the patient, or (b) too bumpy/rocky/awful to slide the plastic litter across without losing half of the plastic to the cave. The special term for this is called “paving”. Being a “paver” is like laying on a bed of nails with a 200 pound weight on top of you. Double fun! (photo credit: Caroline Bull)

you won't be able to slide. It destroys your gloves. It steals your soles (of your shoes). Also, lava rock is generally quite porous: BFRs that would usually be bombproof anchors in limestone could be moved and picked up with far less effort than you would imagine.

Lesson #2: There are some things a caver can do that most rescue nerds can't (or wouldn't think of). The Level 2 class I attended near a town called “3 hours from Starbucks” in Texas was comprised half of people who would consider themselves cavers and half of people who would consider themselves rescue nerds (mostly firefighters). We all learned a lot from each other. I had the awkward role of cavers thinking I was a firefighter and firefighters thinking I was a caver. All it really meant was that I got to show off to the firefighters my dark sense of humor, my A+ dirty jokes and my nimble wriggling skills that I only developed by spending time underground answering the question “Will I fit through that?”. Texas caves are strangely small and full of opportunities to chimney, wiggle and otherwise slither your way into places some of the burlier rescue nerds’ harnesses wouldn't even fit. Rescue nerds need cavers.



Photo 3: Ropely lava in Karen's cave near Bend, OR. It is hard to win the “floor is lava” game here.



Photo 4: The “Flower” directional in action at the entrance to Lemon’s Ranch Cave in

Lesson #3: There are some things a rescue nerd can do that most cavers can’t (or wouldn’t think of). See Photo 4 for the “Flower” directional. This technique provides high redirection of a rope purely by attaching a pulley directly or by tether to your D-link and using brute strength of your arms and legs along with the rescue haul system to help get the patient/litter over an edge.

Firefighter Fluornoy (nicknamed Flower) used this exceedingly successfully and safely in multiple caves. I’ve tried this technique and seen other cavers do it, but not to the same level that Flower accomplished. He was an adequate above and below-ground rigger, but the simplicity of this technique when other high help opportunities were limited was something thrilling to behold. Also exciting was watching his finely chiseled calves and biceps flexing against the weight of the patient and the litter. I got to experience being tied up between Flower’s thighs when he did this and have only compliments about the event. I think I made him blush. Cavers need rescue nerds.

Lesson #4: Pocket bacon is the best cave snack. There is something inexplicably tasty about bacon that has been marinating in your pocket all day while you’re underground (see Photo 5). Maybe it is the tenderizing that happens to it when you’re navigating The Nasty. Maybe it is the extra seasoning that sneaks into the bag. Maybe it is just the grease. Regardless, pocket bacon is the way to go. If you want to go more advanced, try the Bagel Bacon Cream Cheese (courtesy B.Ekey) or the Eggs a la Rappel (J.McGuire and R.Blackwell). However, I do not recommend Cave Quiche.



Photo 5: Pocket bacon, 5 seconds before it was demolished by a hungry cave demon

Experiments with an out-of-cal DistoX2

W F Koerschner 3-25-2018

Four hours into the cave and the foresights are 2 degrees off from the backsights. Oh Fudge! What do we do now professor? Scooping is not an option.

In a perfect world your Cams all have factory teeth, your cave suit still has an ass to it and your DistoX is in perfect calibration such that it reads the same values in any orientation. But, **COME ON, Folks** we are dealing with cavers here. "I should really go home and re-calibrate the Disto before tomorrow's trip but okay, maybe just one more beer". Thus one can assume that nearly every DistoX is in some state of less than perfect calibration. The question is how do you get the best survey accuracy in an imperfect world?

In the years since I purchased my DistoX2 I have heard a lot of advice about how to survey with one: *You should shoot foresights and backsights! Backsights are a waste of time – just shoot double foresights! Well, in Europe, we always shoot all 4 orientations and average them. Well, back in my day, real men surveyed with Bruntons!* (Wait! That was me!) Tired of the BLA BLA BLA; I decided to do some experiments to prove it for myself.

First I needed an out-of-calibration DistoX. Well, what do you know, I just happened to have one! You see, on the most recent survey trip to Lowmoor Cave we discovered that the backsights were 2 degrees off from the foresights and proceeded to survey anyway. Who cares - not my project (Sorry, Dave Socky. Will reshoot if you like).

Method: I laid out a 9 shot survey course in the woods; 446 ft long, horizontal extent of 425 ft, vertical extent of 20 ft. First I very carefully surveyed the course with Suunto & tape shooting both foresights and backsights; this "Analog" loop closes with a horizontal error of 0.2 ft and a vertical error of 0.7 ft. The East, North, Up (ENU) of this loop is 0.2, 0.1, 0.7. Next I surveyed the course with my out-of-calibration DistoX2 shooting foresights and backsights in all 4 orientations (Display Up, Display Down, Display Right, Display Left).

I did not shoot the course with the DistoX cocked at 45 degrees, 'cuz everyone knows not to do this (right trainees?) - perhaps the subject of a future experiment. The survey data is shown in **Table 1**.

Data Reduction: The data were input into the cave survey software Walls. An individual survey file was created for each loop around the course with a different instrument orientation (eg. Display Up double foresights only, Display Up double foresights/double backsights, Avg foresights all orientations, etc). There are 16 loops with the DistoX plus the Analog Loop. The horizontal closures and ENUs for these loops are shown in **Table 2** and **Table 3**. Vertical closure was near perfect for all loops and will not be discussed.

Station	Distance	Up Azi	Up Inc	Right Azi	Right Inc	Down Azi	Down Inc	Left Azi	Left Inc
1									
Suunto Frst	41.7	113.5	-3						
Suunto Bkst	41.7	293.5	2.5						
Frst 1	41.7	114.5	-3.1	113.6	-3.2	115.4	-3.3	116.2	-3.2
Frst 2	41.7	114.7	-3.2	113.6	-3.2	115.3	-3.3	116.2	-3.2
Bkst 1	41.7	293.5	3.2	294.6	3.2	292.7	3.1	292	3.2
Bkst 2	41.7	293.5	3.2	294.7	3.2	292.7	3.1	292	3.2
2									
Suunto Frst	31	157	-9.5						
Suunto Bkst	31	337	9						
Frst 1	31	156.6	-9.3	154.2	-9.3	159	-9.4	160.2	-9.5
Frst 2	31	156.8	-9.3	154.4	-9.3	158.9	-9.4	160.2	-9.4
Bkst 1	31	338.2	9.4	339.4	9.2	335.3	9.2	334.4	9.4
Bkst 2	31	338.2	9.4	339.3	9.3	335.1	9.3	334.3	9.4
3									
Suunto Frst	19.9	185	-9						
Suunto Bkst	19.9	5	8.5						
Frst 1	19.9	184.8	-9	181.9	-9	186.6	-9.1	188.2	-9.1
Frst 2	19.9	184.7	-9	181.9	-9	186.6	-9.1	188.2	-9
Bkst 1	19.9	6.4	9	9	8.8	4.7	8.8	2.5	8.9
Bkst 2	19.9	6.3	8.9	9	8.8	4.5	8.8	2.5	8.9
4									
Suunto Frst	30.6	182.5	1						
Suunto Bkst	30.6	2.5	-1.5						
Frst 1	30.6	181.8	1	179.8	1	183.6	1	185.6	1
Frst 2	30.6	181.8	1	179.9	1	183.8	1	185.4	1
Bkst 1	30.54	4.3	-1	359.7	-1	2.1	-1.1	359.9	-1
Bkst 2	30.54	4.2	-1	359.7	-1	2.1	-1.1	359.9	-1
5									
Suunto Frst	38.1	291.5	9.5						
Suunto Bkst	38.1	111.5	-10						
Frst 1	38.1	291.2	9.5	291.9	9.5	290	9.5	289.7	9.6
Frst 2	38.1	291.2	9.5	291.8	9.5	290	9.5	289.7	9.6
Bkst 1	38.1	112.6	-9.5	111.4	-9.5	112.3	-9.6	113.6	-9.6
Bkst 2	38.1	112.6	-9.5	111.4	-9.5	112.2	-9.6	113.6	-9.5
6									
Suunto Frst	27.73	330.5	0						
Suunto Bkst	27.73	150.5	-0.5						
Frst 1	27.74	331.1	0.5	333.5	0.5	329.6	0.4	328.1	0.5
Frst 2	27.74	331.2	0.5	333.6	0.5	329.6	0.5	328.1	0.5
Bkst 1	27.72	150.7	-0.4	148.8	-0.4	151.8	-0.5	153.4	-0.4
Bkst 2	27.72	150.5	-0.4	148.7	-0.5	151.8	-0.5	153.3	-0.5
7									
Suunto Frst	24.8	0	1.5						
Suunto Bkst	24.8	180	-2						
Frst 1	24.8	1.6	2.2	3.5	2.1	359.2	2.2	357.6	2.2
Frst 2	24.8	1.6	2.2	3.4	2.2	359.2	2.1	357.6	2.2
Bkst 1	24.8	179.5	-2.2	177.5	-2.2	181.4	-2.4	183	-2.2
Bkst 2	24.8	179.4	-2.3	177.5	-2.3	181.5	-2.3	183	-2.3
8									
Suunto Frst	32.5	3	4.5						
Suunto Bkst	32.5	183	-5						
Frst 1	32.5	4.4	4.3	7	4.2	1.5	4.1	359.8	4.3
Frst 2	32.5	4.4	4.3	6.9	4.3	1.4	4.1	359.8	4.3
Bkst 1	32.5	181.7	-4.3	179.6	-4.3	183.5	-4.3	184.9	-4.3
Bkst 2	32.5	181.9	-4.3	179.7	-4.3	183.7	-4.3	184.9	-4.2
1									

TABLE 1: Raw survey data

TABLE 2: Survey loops in the 4 orientations

Survey Loop	East	North	Up	Hz Closure
Display U Dbl Frst	2.1	-0.6	0.0	2.2
Display U Dbl Frst / Dbl Bkst	-0.1	0.1	0.0	0.2
Display D Dbl Frst	-4.5	-2.5	-0.3	5.1
Display D Dbl Frst / Dbl Bkst	-0.6	-0.3	0.0	0.7
Display R Dbl Frst	9.0	1.3	0.0	9.1
Display R Dbl Frst / Dbl Bkst	2.0	0.0	0.0	2.0
Display L Dbl Frst	-9.2	-3.7	0.0	9.9
Display L Dbl Frst / Dbl Bkst	-0.5	-0.1	0.0	0.5

TABLE 3: Other Survey loops

Survey Loop	East	North	Up	Hz Closure
Analog Frst / Bkst	0.2	0.1	0.7	0.2
Average all Frsts	-0.6	-1.3	-0.1	1.5
Average all Frst / all Bkst	0.2	-0.1	0.0	0.2
Display U Frst / Display D Bkst	2.7	0.6	0.2	2.8
Display R Frst / Display L Bkst	8.6	2.4	0.0	9.0
Display U Frst / Display R Bkst	-1.4	-1.0	0.1	1.7
Display D Frst / Display R Bkst	-4.7	-2.0	-0.1	5.1
Display U Frst / Display D Frst	-1.2	-1.5	-0.1	1.9
Display R Frst / Display L Frst	-0.8	-1.2	0.0	1.4

Analysis: So how bad was the cal on this disto? Examination of the raw survey data in **Table 1** shows deviations from the Suunto bearings ranging from 0 to over 4 degrees depending on the instrument orientation and the direction of the shot. The Suunto has been shot on CRF's compass course so I know it is correct and theDistox gives matching readings when it is in calibration. Also, the Analog loop closes nearly dead on (0.2 ft) over 425 ft.

FRST/BKST disagreement in the same orientation ranges from 0.1 degrees to an atrocious 7.1 degrees with 2 to 3 degrees being the most common.

Now let's examine the loop closures shown in **Table 2**. They range from 2.2 ft for Display Up Double Frsts to a miserable 9.9 ft for Display Left Double Frsts. The Display up loop would be good enough for most cave surveys – after all it's **only** a cave map! The 9.9 ft would surely cause scowls and perhaps objects to be thrown in your direction.

So, what is the effect of averaging Foresights and Backsights? It drops the horizontal closure error from 2.2 to 0.2 ft for Display Up. Now for the unexpected – shooting backsights and averaging the shot for the really bad Display Left orientation drops the closure error from 9.9 to 0.5 ft. Holy Frig Batman! This closure improvement was seen in all orientations.

Does this work if you average foresights with backsights shot in different orientations (**Table 3**)? Up Frst with Down Bkst is 2.8 ft off; Down Frst with Right Bkst is 5.1 ft off; Right Frst with Left Bkst is 9.1 ft off. The answer is HELL NO! Do not ever average a Frst and a Bkst shot in different orientations unless your DistoX is in perfect cal (which it is not!) Paradoxically, these mismatched orientations can have better Frst/Bkst agreement (see R Frst/L Bkst in **Table 1**) but result in worse closure. Gee Toto I guess we are not in Suunto Land anymore! Apparently only Frst/Bkst pairs shot in the same orientation will properly cancel out calibration drift. Backsights have an important function in a DistoX survey beyond simple blunder detection.

The last 2 rows in **Table 3** show the effect of averaging Frsts shot in flipped orientation (eg. Up & Down). This method seems to improve closure over regular double Frsts but not as much as averaging a Bkst for most orientations.

So what about the Euro method? Averaging all the Frst orientations for each survey vector yields a loop closure error of 1.5 ft. Combining these with the 4 Bksts drops the closure error to 0.2 ft. Clearly this method works, but the effect of averaging in the Bksts appears to be much greater than the effect of averaging Frsts in all orientations. On this course, shooting one Bkst in the Up orientation is as good as shooting and averaging 8 orientations (and much more efficient). Perhaps a course with more vertical extent would show a different result – future experiment.

These experiments point to the following conclusions but it is unknown if they apply generally to all out-of-cal DistoXs or just to one that has drifted out in this particular way on this particular survey course. Please see if you can replicate these results with your own DistoX!

Conclusions

A DistoX is not an electronic Suunto and does not behave like one!

Averaging Backsights with Foresights will cancel out the effect of calibration drift but only if YOU SHOOT BOTH SHOTS IN THE SAME ORIENTATION!

Backsights will improve the closure of your loops over that obtained with double foresights if your DistoX is out of calibration.

If your Foresights and Backsights do not agree, DON'T PANIC. It will still be okay if you shoot Backsights in the same orientation. Do not cherry-pick orientations in the cave to get better agreement; this will make you feel better but will make the closure worse!

Bats: Pilots of the Underground

Kyle Daniel

Bats: The defacto spiritual animal of all cavers. These damn cute creatures not only eat annoying insects but are also extremely talented pilots. Imagine some of the places you may have seen bats, deep in passages past many tight twists and turns. To be able to fly in these confined spaces bats must have incredible maneuverability as well as the ability to hover. These unique creatures have incredible aerodynamic control that is a direct result of the complicated structure of their wing and the inherently unsteady dynamics of their flapping flight.

This fact has not gone unnoticed by researchers. Recently a group at Brown University performed experimental measurements on bat flight in order to study the kinematics of the wing motions as well as the flow structures in the wake behind the bat. To achieve this, the researchers in this study took high-speed video of straight, forward flight as well as PIV measurements of the resulting wake. PIV is an acronym for a flow imagining technique called particle image velocimetry. This technique allows the calculation of the magnitude and direction of velocity vectors in a given imaged area. For this technique to work a flow is impregnated with tiny particles called seed. A high power light source, usually in the form of a laser sheet, illuminates a slice of flow while a high speed camera takes a picture of the illuminated seed particles. Two pictures of the flow are taken in quick succession and loaded into a software program. The position and direction that each particle moves in between images is calculated on a statistical basis. By knowing the distance and direction each particle travels as well as the time between images, a velocity vector at each point is calculated.

Lesser short-nosed fruit bats were the subjects of all tests. These natives of Southeast Asia natives were chosen because they do well in captivity and respond well to handling and training. During the tests, reflective markers were attached to key points on the bat's chest and wings using medical adhesive. The bats were then directed to fly along the length of an enclosed flight cage while two specialty low light cameras captured their body and wing movements.

The recorded video showed that the motion of one wing beat is highly articulated and much more complex than the flapping motion of the wings of birds and insects. The researchers found that the shape of the bat's wing, as well as its relative position, changed drastically during forward flight. This is enabled by the fact a bat's wing has more than two dozen independently controlled joints which allows it to stretch and deform. During flight the wing experienced periods of both positive and negative angle of attack (angle between the incoming flow and the chord of the airfoil) and the camber of the wing changed dramatically, resulting in complex 3-D surfaces. In comparison, the shape and angle of attack of the fixed wing of an airplane in steady forward flight remains constant and can be easily modeled as a 2D structure.

However, characterizing the kinematics of flight is not enough to describe the aerodynamic control achieved by bats. How the flow interacts with the complex 3D shape of the wing and resulting aerodynamic forces must be evaluated. To better understand this, the researchers took PIV measurements of the wake behind the bat as it flew. This technique was performed on the wake of a bat by lightly misting the air with DEHS (di-ethyl-hexyl-sebacate) particles. This mist is non-toxic and had no apparent effect on bat behavior. They then placed a laser beam-break sensor in the flight path of the bat. After the sensor was tripped and a set lag time passed, a low power laser sheet illuminated the flow volume directly behind the bat. Through the collected PIV data the researchers identified a complex wake vortex structure.

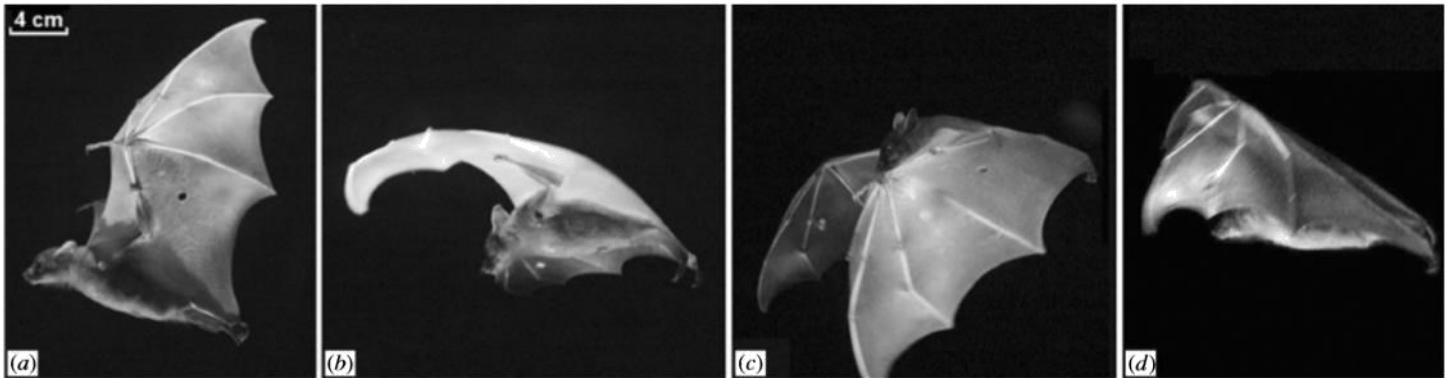


Figure 1. A dog-faced fruit bat (*Cynopterus brachyotis*) in flight. (a) Beginning of downstroke, head forward, tail backward, the whole body is stretched and lined up in a straight line. (b) Middle of downstroke, the wing is highly cambered. (c) End of downstroke, the wing is still cambered. A large part of the wing is in front of the head. (d) Middle of upstroke, the wing is folded toward the body.

These types of flow phenomena are important because their strength and position can be related to the magnitude and location of aerodynamically generated lift on a wing. The wake vortex found comprised of a wing tip vortex as well as a vortex shed from the middle of the wing. These vortices also varied in strength as function of time. This meant that the variation of the lift in time could be related to wing shape as it changed during forward flight.

However, in the conclusion of this experiment the researchers admitted that still much work is to be done in this area. The kinematics of bat flight still has not been fully described and understood. Further, much more work is needed to relate the shape and position of the wing to the aerodynamic forces it generates. Thus we can begin to see how complicated the motion of bats flight is and how it can be used as inspiration to develop flying vehicles capable of extreme complex aerodynamic maneuvers.

References

- Tian, X., Iriarte, J., Middleton, K., Galvao, R., Israeli, E., Roemer, A., Sullivan, A., Song, A., Swartz, S., and Breuer, K., "Direct Measurements of the Kinematics and Dynamics of Bat Flight," 36th AIAA Fluid Dynamics Conference and Exhibit, May 2006.

Safety with Trust

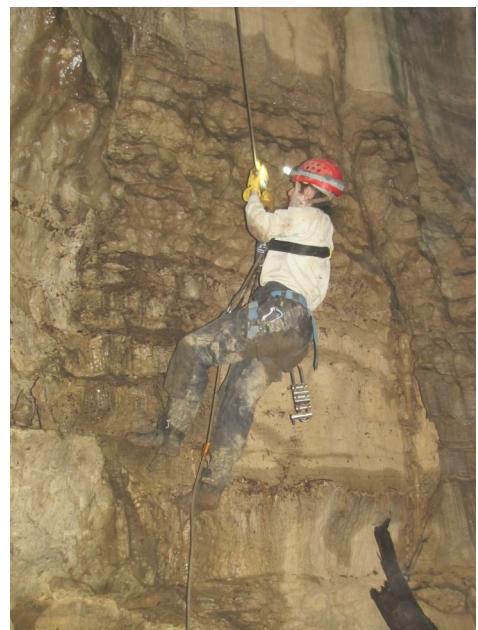
Meredith Blanco

I was told after a walkie-talkie call saying “Holy f***” that I was next to go down the Fantastic Pit. As I approached the pit, I grabbed the rope with forty pounds of rope weight, weaved it through my rack with six spaced bars being my only attachment, and prepared myself for the descent. Phillip Moneyhun, the president of the VPI Cave Club, told me that I had someone at the bottom holding the other end of the rope to stop me from falling. So, I swung my shaking body over the 586 foot pit and contemplated all the decisions that I have made up to this point in my life that led me to be under something in which I could not see the bottom. I was terrified. I concentrated all my attention on the device attached to my harness. Slowly, my hand moved the bars away from each other to create space in between them to allow the rope to move and begin my controlled fall.

Knowing the type of gear that one borrows or purchases should allow someone to feel safe. This feeling of safety with gear could be based on the brand or how much of the system the caver knows how to use. One of the trainees I was with on the trip, Nathan Kearney, voiced his opinion on the topic of gear. I asked him his thoughts on his ascending gear, descending gear, harness, and various other parts of his apparel. He responded that, “Everything is made in factories where they know the exact breaking points and exactly how and why they can fail and this gear is made for what we do. Therefore, it is made to withstand the issues that we have.” With this, I can conclude that a point of trust that makes a trainee or caver feel safe, in general, is the brand and manufacturer chosen when gear is used. Within the cave club, I have heard and used gear from trusted brands named OnRopeOne, Petzl, Black Diamond, Zebra, Fenix, OLight, and Gonzo Guano Gear. These brands have been tested in and out of caves by generations of cavers and professionals to ensure their users to have a safe experience when doing a dangerous sport.

By going on multiple cave trips, a trainee has the potential to become familiar with the experienced members as well. On the Tennessee, Alabama, Georgia (TAG) trip, four members were present to the six trainees. We, the trainees, as inexperienced cavers, put a lot of our trust in the members and ourselves to keep us safe. Even then, some members still have to prove themselves to each other to gain a space of trust to make other members feel safe in their presence. Reilly Blackwell, the trip leader and a member of the VPI Cave Club, mentioned that trust can be broken and that there are cavers that she refuses to cave with- not due to lack of knowledge, but overconfidence. She trusts Eric Lee Hahn, the current Vice President of the club, to teach trainees the skills they need to know and as a person to cave with in general. Phillip pointed out that he not only felt uncomfortable caving with a completely nervous caver, but a completely overconfident caver as well. If someone is not aware of their environment and the dangers that it holds, the distrust that they create leads to an entirely unsafe space for themselves and the people around them.

In essence, safety is earned with factors including the trust of one’s gear and the people they surround themselves with while caving through experience and knowledge.



Caving is Dangerous. Don't Go.

Gillian Rowland

September 10, 2017

That is the beginning of the end...

It all started at 10 am in the Smyth parking lot. That is the day everyone's life would change, but no one knew the extent of it. Just some girl who fell in love with caving.

Starnes'. First 3.5 hours underground. We saw both waterfalls, went up the sketchy ladder (which I later discovered that experienced cavers do not even climb because it is so sketchy), and had a mud fight while going down the mud slide.

Links. Links again. Three weeks apart and added four more hours in total.

3.5 hours: Now, October 28, 2017 that's the day. My sister visited, who is somewhat claustrophobic. Tried to do an activity for me, which ended with her falling in that cave. Yeah, I was not the favorite sister for some time (even though I am the only sister), but don't worry, I bribed her with Benny's pizza.

6.5 hours: I felt really bad about that one, but that couldn't stop me from going on more trips. Tawney's. Then Tawney's again within the same week. I learned cave rescue in this cave and had the pleasure to experience Grim Tawney's. Both completely opposite experiences but had a blast both times and I could not stop smiling the entire time.

5.5 hours: Smokehole. Snow. Mud. Water. Exploring. Mud slide.

6 hours: Giant. Pig Hole. Vertical caving! Finally. That is all I'm saying. It's a blast and I love seeing bats and the members telling us to "Go explore, kiddos".

9.5 hours: Windy Mouth. First survey trip was so different from sport caving, but it was a blast. The only scary part was the traverse to get to the cave. I loved the cave itself and how can you not love it with a passage called Peanut Butter Junction!

6 hours: Pig Hole. Rain... a lot of rain. An attempt at my rigging test, but hey it was a good learning experience. More vertical caving and a lot of learning.

Five months today made 44.5 hours underground. What do all of these things have in common? No, not that I was underground for a certain period of time. And no, not being an idiot doing something dangerous. But yes, a girl becoming 'The Most Annoying Trainee" (which I am very proud about) and also learning more about Blacksburg and the surrounding towns. This is home now and for so many reasons.



How and Why to Get Hypothermic

By Nathan Kearney

"Wanna go get hypothermic?" That's how our trip started. Within 5 minutes of entering Grim Tawney's, we had just slipped through a tiny hole in the bottom of a crater only to be met with a slippery slope that was inconveniently lacking anything to grab hold of. After sliding down as slowly as possible, I came to see Joker crouched over a short stream at the base of slope. The adrenaline just began to spike as soon as I heard him say "Oi! Fack me!"

We spent all of three hours crawling through the thickest baby poop mud on hands and knees, except for Gillian. The best word to describe what she was doing would be wallowing. Where some of us only got brown up to our elbows, she was completely covered up to her chin. It felt like we swam through hundreds of yards of this nasty, slimy, cave slop! I probably ate as much food in the mud as I did on a leisurely survey trip. We had gotten so cold, that Joker's promise to catch hypothermia came close to true. The whole time, we were shivering, but continuing kept us warm. Wool and polypro layers were my best friend. By the time we got out, we were basically brown slop monsters, sprinting through the freezing temperatures back to the car. There has never been anything as satisfying as getting out of sloppy cave gear and into the warmth of Joker's truck.

Now a little bit about Joker. He had told us so many stories about his shenanigans from New Zealand and the land down under, that in my mind, he always has a bad Australian accent. He had taken us under his wing and wanted to show us everything caving had to offer. For anyone who doesn't know this man, make sure you meet him and get him talking. You'll have no idea what you're getting yourself into, but it is always exciting.

The moral of this story: If anyone ever asks you if you want to go get hypothermic in a cave, especially Joker, say YES!



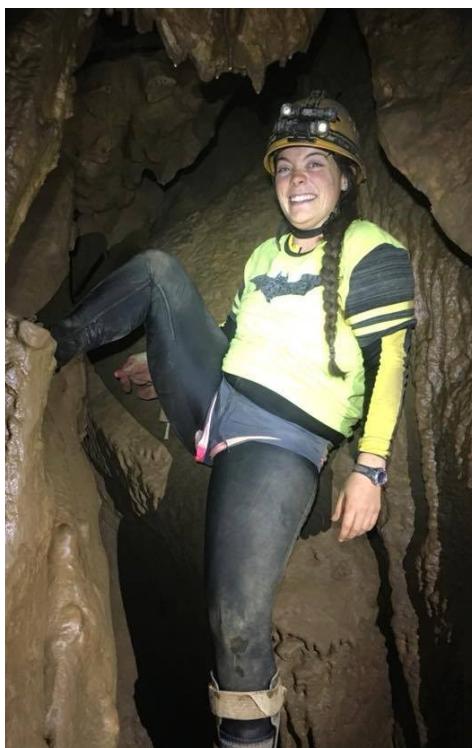
QUOTABLE QUOTES



Eric Hahn: "So is that your final decision?"

Pete Gioia: "Well..... Ah, F*** it."

Peter Morisey: "Not what you want to hear during a rigging test!"



Hit her up for caving if you were-

Skylar Hopkins: "raised on a mountain, born in a cave, and tr*ckin and f*ckin is all that you crave."



Tommy Cleckener: "We gotta go. It's beer o'clock."

Sam McCarter: "I wanted to wait 'till the bottom of the canyon because I hate having to take my harness off."

Alex: "Yeah, I kept thinking 'why don't you just unzip your fly' but then I remembered you don't have a p****."

QUOTABLE QUOTES



Ray Sira: I'm dangerously sober."



Kellen Levinson: "Nick looks like a majestic denim Clydesdale. "



Phillip Moneyhun: "If you have reflective tape and a lit candle, the tape counts as a secondary light source."



Will Borin eating a fig newton-Reilly Blackwell: "EEW! He bit it and looked up at me!"
EHahn: "I love it when he does that."

TRIP QUOTES

Cave	Members	Comments
Giant	Andrew Lycas, Dan Crowder, Amy Akowronski	"I'm glad I got my falsetto back. I lost it for a few years after I stage-dived an Italian guy on a couch."
New River	Skyler Hopkins, Reilly Blackwell, Chris Gewirzt	"If you were a cave you'd be Tawney's" "Is that 'cause I'm easy???"
Spring Hollow	Tommy Cleckner, Nick LaPointe, Reilly Blackwell, Kyle Daniel	"I'm trying to convince my body that I didn't just shit myself."
Doe Mountain	Amy Skowronski, Nick Socky, Andrew Lycas, Eric Pelkey, Tommy Polson	"If you don't put the rope pad on, I'll just fall on you from 100 feet."
New River	Amy Skowronski, Elisa Brown, Cameron Brown	"Is this how babies feel when they poop their diapers?"
Links	Sarah Crowder, Caitlyn Degrace, and many others	"Your help is like a River straight to my soul."
Smoke Hole	Chris Garguilo, Dan Crowder, Megan Junod, Patrick Cheek	"The hand bone's connected to the-" "DICK BONE!"
Tawney's	Skylar Hopkins, Nick LaPointe	"Oh SHIT, that's the cow!"
Link's	Kellen Levinson, Pete Gioia, Nick Polidoro, Mac Hussey, Nathan Kearney	"Lead the way, navigator extraordinaire!" "But I don't know where I'm going.."
Giant	Chris Garguilo, Will Borin, Kellen Levinson, Dan Crowder, Taren Woelk, Matthew Kok, Nathan Kearney, Gillian Row-	"This climb would be really easy if this ladder wasn't here."
Stay High	Jenn McGuire, Eric Steinberg, Andrew Schoenewolf, Alex Booker, John Echols, Jason	"Jesus take the slack!"

