

CASCADE Cater

Published by the Cascade Grotto of the NSS

Spring 2009, Volume 48, No. 1



Cascade Caver

CASCADE GROTTO

Volume 48, Issue Number 1
Copyright 2009 by the Cascade Grotto, All rights reserved

January 2009

The *Cascade Caver* is published periodically throughout the year by the Cascade Grotto, a local chapter of the National Speleological Society. Any material in this newsletter that is not copyrighted by an individual or another group may be copied or reprinted by internal organizations of the National Speleological Society provided that credit is given to the author and to the *Cascade Caver* and that a copy of the newsletter containing the material is sent to the Editor. Other organizations must contact the Editor.

Opinions expressed in the *Cascade Caver* are not necessarily those of the Cascade Grotto, the editors, or the NSS. Unsigned articles may be attributed to one of the editors. Great pains is taken to assure proper attribution of copyright and to use works in the public domain when the copyright is not clear in the case of illustrations. If you feel that this publication has infringed upon your copyright, please let the editor know immediately.

All material to be published, subscription requests, renewals, address changes, and exchange publications should be sent to the Grotto address.

GROTTO MEMBERSHIP

Membership in the Cascade Grotto is \$15.00 per year. Subscription to the *Cascade Caver* is free to regular members. Membership for each additional family member is \$2.00 per year. Subscription to the *Cascade Caver* is \$15.00 per year. Subscription via email is \$11.00 per year. Members can save \$4.00 per year by subscribing to the e-mail version of the caver

GROTTO ADDRESS

Cascade Grotto
P.O. Box 66623
Seattle, WA 98166.

This post office box should be used for both the grotto and for the *Cascade Caver*.

GROTTO OFFICERS

Chairman Kari Doller (253) 797-1606
Vice Chairman Mark Sherman (206) 365-5386
Sec/Treasurer Tom Evans (425) 646-9138

OTHER POSITIONS

Trip Coordinator Open Position
Librarian Stuart Monson (425) 271-2258
Regional Rep. Kari Doller (253) 797-1606
Program Chair (253) 797-1606
Conservation Hester Mallonée (253) 838-6464
Safety Dave McElmurry (253) 951-1995
Editor Michael & Nikki McCormack (425) 941-4619
Email: michmcco@microsoft.com

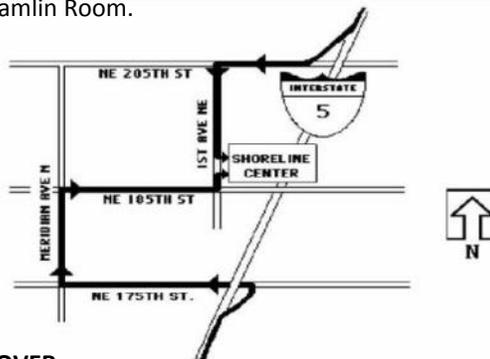
MEETINGS

Regular grotto meetings are held monthly at 7:00 pm on the third Friday at the Shoreline Community Center, Hamlin room. 18560 1st Ave NE in Shoreline.

To get to the Community Center from Seattle:

Take Exit 176 on Interstate 5 (175th St. N) and turn left at the light. At the next traffic light (Meridian Ave. N) turn right. Turn right at 185th St. N (the next light). Turn left on 1st NE, which again is the next light.

The Community Center is on the right. Enter the building on the southwest corner and find the Hamlin Room.



COVER

Tom Evans climbs up Twin falls after rafting in the calm pools below the waterfall. Danny Miller took this time lapse photo with a Nikon D70, while Aaron Stavens and Michael McCormack painted the waterfall with their LED Headlamps.

Upcoming Events:

- NCA Regional, Trout Lake WA
May 22 - 25
See <http://tinyurl.com/c3mnta>

Inside this issue:

THE NEW CASCADE CAVER	3
PROPOSED KNOT SKILLS FOR NEW VERTICAL CAVERERS	3
A TRIP WITH BEGINNERS. NOT A BEGINNER TRIP.	5
THIRTEEN WAYS TO KILL YOUR GROTTO	9
TRIP REPORT: MT. RAINIER STEAM CAVES, JULY 13-	10
LAKE AND APE CAVES	15
CAVES AND CAVING IN VIDEO GAMES	16
SPELEO-ED 2009: A GERIATRIC PERSPECTIVE	17

The New Cascade Caver

February 6, 2009

By Michael McCormack
Webmaster and Librarian

Have you ever been reading the Caver, and wished you could tell the author something?

Have you ever wanted to get an article in a more timely fashion?

Have you ever submitted your stuff and just wanted other people to see it sooner than next year?

With the Cascade Caver Blog, these and more are possible!

What is a Blog?

A Blog is a site to help you publish and share information. It is our place on the World Wide Web.

Blogs are typically displayed in reverse chronological order (newest entries first), and consist of frequent short postings. With this Blog, it is

also possible for site visitors to comment on your postings.

This Blogs will be used as the submission and online publication method for the Cascade Caver. Every new article will be published here soon after they are received

What about the Print Caver?

The print Cascade Caver will still be published both in PDF and in print format. The frequency will likely even be a little bit more predictable than our current schedule.

What about cave locations and other sensitive information?

The Cascade Caver has never allowed the printing of sensitive information (well not since that type of information was agreed upon in the late 1960s anyway). The Blog will be no different. The mere fact that it's online does not change the fact that this is an edited publication. Our esteemed editor (Nikki McCormack mostly) will still be editing and ap-

proving content.

What about Photographs and Maps?

A blog entry can accept the insert of photographs and maps just like a word document.

What if I can't figure it out?

Send your article to the editor just as you always have. When the editor has time, she will edit and post your article to the blog. Note that submissions made in this way can take considerably longer.

See the blog here:

<http://tinyurl.com/cb5c7k>

and read the articles before they are published!

By the way, we are using TinyURL.com and bit.ly to keep links manageable and readable in the print format. The links in this article and most articles have been clicked on by the editor and verified.

Proposed Knot Skills for New Vertical Cavers

February 6, 2009

By Aaron Stavens

Introduction

Barring an exceptional circumstance, it is my belief that a minimally competent vertical caver should be capable of solving common problems on rope without intervention from another party. Further, I believe that proficiency is supported by a working knowledge of knots and how to use them.

There exists a multitude of knots far beyond the practical needs of the vertical caver. Thus the prospective

vertical caver needs guidance about which knots are the most useful to learn first.

I would like to propose a set of knots for the Cascade Grotto to incorporate into its vertical training activities. The goal is not to identify all knots that *might* be useful to a vertical caver, but instead to identify the *first* set of knots that a new vertical caver should master.

Candidate Knots

Table 1 lists the knots detailed in the National Cave Rescue Commission's Level III student preparation guide (current as of the national weeklong

NCR Knot Recommendations Table 1

- Figure Eight Follow Through
- Double Figure Eight Knot
- Bowline with safety
- Münter Hitch & tie-off
- Butterfly Knot
- Clove Hitch with safety
- Trucker's Hitch & tie-off
- Water Knot (Ring Bend)
- Prusik Hitch
- Double Overhand Bend/Double Fisherman's Knot

training in Mentone, Alabama in May 2008).

Knots for the new vertical Caver (Table 2)

- Figure Eight on a Bight
- Figure Eight Follow Through
- Münter Hitch & tie-off
- Butterfly Knot
- Water Knot (Ring Bend)
- Prusik Hitch
- Double Overhand Bend/Double Fisherman's Knot

This list represents an excellent starting point for discussion. If the listed knots meet most of the knot needs of the cave rescuer, then surely there is significant overlap with the needs of a new vertical caver. However, the new vertical caver's needs are less rigorous than the needs of the cave rescuer. Therefore, the knots needed by the new vertical caver are not an exact match with the knots needed by the cave rescuer.

In the next section, I will discuss my thoughts on which knots should be in the new vertical caver's repertoire and which can be excluded.

Knot Discussion

Table 2 list the knots I believe every new vertical caver should learn. The rest of this section is a discussion about why each knot was included or excluded.

- **Figure Eight on a Bight** – This one seems obvious to me. Although not listed in Table 1, everybody knows and uses this knot. We use it in the ends of our rappel ropes as a stopper knot and we use it to create tie-in points for anchors. The new vertical caver needs to be familiar with this knot for both its utility and its prevalence.
- **Figure Eight Follow Through** – This was a tough one although it ulti-

mately made the cut. The primary utility in this knot is the ability to tie around something. Examples are tying around tree for an anchor or tying into a harness. The disadvantage is the need to estimate the location of the Figure Eight foundation knot before threading the rope around the anchor. To see the problem, imagine tying a Figure Eight Follow Through around a big rock. If you choose the wrong location for the foundation knot, you might not have enough rope to finish the follow through and you must then retie/move the foundation knot. Alternatively, the wrong location for the foundation knot can also result in wasted rope. Depending on the amount of rope available, this may or may not be an issue.

Now consider the Bowline. It has the same advantage as the Figure Eight Follow Through without the requirement for tying the foundation knot before the rope is threaded around the tie-in point. I chose the Figure Eight Follow Through over the Bowline for two reasons. First, Cascade Grotto vertical cavers do not commonly use the Bowline. Therefore, learning the Bowline will not be regularly reinforced with the new vertical caver. Second, the finished Figure Eight Follow Through looks identical to the finished Figure Eight on a Bight. Thus, the new vertical caver will find it more familiar than the Bowline and will likely have better retention.

- **Double Figure Eight Knot** – Although a worthwhile knot, the Double Figure Eight Knot is not commonly used within the Cascade Grotto. I have mostly seen it used to create a multi-point anchor. I think the knot can best be taught by the rigger at the time it is used rather than requiring the new vertical caver to memorize a knot that they might rarely see or use themselves.

- **Bowline with safety** – I would like to see greater familiarity with the Bowline. When tying around something such as an anchor it doesn't suffer from the foundation knot placement issue as seen in the Figure Eight Follow Through. It is also easier to untie after it has taken a load than the Figure Eight family of knots. However, the Bowline does not enjoy much popularity with the vertical cavers I know. Therefore, it is probably gratuitous to require it of new vertical cavers when they already know other knots that adequately serve the purpose.

- **Münter Hitch & tie-off** – This is another tough one. Most of the vertical cavers I know use some kind of mechanical descending device and I have rarely seen the Münter Hitch used in normal vertical caving. From an exposure point of view, the new vertical caver will not often see or need the Münter Hitch. However, in an emergency, the Münter Hitch can be used as a backup descender/lowering device. It can also be used as a belay, thus I think it belongs in the new vertical caver's problem solving tool kit.

- **Butterfly Knot** – The Butterfly Knot is an excellent multi-directional knot that can be used to create mid-rope attachment points. It can also be used to "tie-out" a bad section of rope by putting the bad section in the unloaded loop of the knot. It is also easy to tie. I believe it should be in the minimum set of knots.

- **Clove Hitch with safety** – I have rarely seen the Clove Hitch used among vertical cavers except in rescue training. As such, I don't see a need to require it of new vertical cavers.

- **Trucker's Hitch & tie-off** – I have ever only seen the Trucker's Hitch used in the context of advanced rigging. Rigging skills are valuable, but there is no reason to burden the new

vertical caver with a skill they are unlikely to use early in their career.

- **Water Knot (Ring Bend or Overhand Bend)** – Webbing is often used to construct anchors and the Water Knot is the primary knot for which webbing is used. It is important that the new vertical caver be aware that the knot performs poorly when it is not properly set and dressed. Then they'll have some capacity to inspect the knot for this particular error.

- **Prusik Hitch** – In my opinion, the Prusik Hitch is one of the more useful knots the new vertical caver can

know for getting out of a jam. It creates a multi-directional, adjustable attachment point that can be applied to loaded and unloaded ropes alike. Once applied it can be used as a handhold, a foothold, or a harness attachment point. It is also easy to tie. The Prusik Hitch obviously belongs on the list.

- **Double Fisherman's Knot (Double Overhand Bend)** – The Double Fisherman's Knot is mostly used to create Prusik loops. Given that the Double Fisherman's Knot is practically a prerequisite for the Prusik Hitch,

it must be on the list.

Summary

The result of this proposal is the seven knots listed in Table 2. As knots that are commonly used with general utility or with specific self-rescue applications, these are the knots I think we, the Cascade Grotto, should be teaching to every new vertical caver. Students and instructor that wish to explore beyond this minimum set are, of course, encouraged to do so. However, I believe that the minimum set should not be further reduced.

A Trip with Beginners. Not a Beginner Trip.

May 25, 2008

Crystal Ice Cave, Wapi Lava Field, Idaho
By Matt Williams
Photos by Michael McCormack

On Sunday morning of the NCA Regional, a small group of cavers headed over to the Great Rift for a through trip of Crystal Ice Cave. Cascade Grotto members included Aaron Stavens, Michael McCormack, Dave McElmurry, Jerome Hagen, and myself. Jacob Earl intended to make the trip as well, but unfortunately injured his knee while preparing to descend into the cave.

We walked a few hundred feet from camp to one of the entrances of Crystal Ice Cave, put on our vertical gear, and got ready to descend the 140-foot drop. This would be Jerome and my second real vertical experience (the first was a 12-15 foot drop into Sullivan's Cave on the same trip), so there was a lot of anticipation and excitement as we waited to descend. The temperature outside would have been a comfortable 80 degrees had we not been in cave suits and carrying assorted gear.

Aaron and Michael took the drop first, followed by Jerome, who reached the bottom without incident. I, on the other hand, descended without issue until about 130 feet, at which point the base of my chest harness (that I later discovered was one size too large for my body type) found its way into my micro-rack (the descending device, and my primary connection to the rope). The ride came to a complete stop, and I was hanging 10 feet above ground. The ground, however, was the top of a 30-foot ice slide into the cavern. Aaron stood at the edge of the slide, belaying me, while Michael and Jerome waited at the bottom of the cave (a bitter 30 degrees), and Dave was standing patiently above.

What followed was an hour of Aaron

helping me fix the problem. I calmly explained the situation to him, and



Aaron Stavens prepares to descend into Crystal Ice Cave.



Aaron Stavens inspects the rocks protruding from the ice that makes up the waterfall he is about to climb (below).

he recommended that I do a changeover (from descending to ascending gear) in order to untangle the harness from the rack. To which I re-

sponded that my Croll (a piece of gear that I would need to use for the changeover) was pulled tightly up against the rack and wouldn't budge.

Aaron's next suggestion was that I use a Prusik knot as a substitute for the Croll, so he tossed a short length of rope my direction and instructed me to tie the knot. My experience tying a Prusik knot was minimal, having only been shown the process once by Hester Mallonée (be assured that I have since practiced and am now competent with Prusiks).

I soon realized I couldn't tie the knot, so Aaron decided to climb up the rope and assist. To be honest, I'm not sure how he did it without hurting himself, as he had to swing out over the ice slide and avoid slamming into the rocks on the other side, but he made it up and helped me tie the Prusik. Then, after I was safely connected to a point above my rack (via the Prusik and a carabiner), he lifted all 200 pounds of me



Dave McElmurry slides down the snow on rappel.



Aaron Climbs the Ice Falls



7 Spring 2009



Dave McElmurry makes his escape through the old tourist window.

up incrementally as I inched the Prusik high enough to remove the stress on the rack, so I could disengage that connection and finally untangle it.

Although I dangled there for an hour, I didn't experience suspension trauma. I did, however, experience icicle trauma. There was a row of icicles just a few feet above me, dripping cold water on my crotch the entire time. By this time, everyone else was dealing with their own issues. Jerome and Michael were freezing, and I can only assume that Dave was smoldering.

The rest of us made our way down the down the ice chute and stepped into the first segment of the cave. The Great Cavern is a huge, rocky room with a pool of water at one side and a large pile of stones leading up to a skylight on the other. Sunshine was coming down through the skylight, hitting a small patch of snow, and the steam that was rising from the snow cast a shadow on the

thin coats of ice covering the rocks below, making the cavern shimmer slightly.

We found our way through the rock fall and encountered our first ascent. It was a 40-foot wall, largely covered in ice with precarious, protruding boulders (that Jerome refers to as the "ice waterfall"). Before clipping on to the rope and climbing up, we

briefly explored a narrow passage under the wall. Thick sheets of ice were holding the rocks in the ceiling of the passage. The scene was absolutely beautiful, but none of us felt that we could trust the stability of the passage, so we backed out and pulled ourselves awkwardly up the ice waterfall, one by one.

Aaron, Dave, and I made it up to the top when a group of 4 other cavers, who came in from the other direction, met us. They asked if we would be willing to wait while they descended and convinced us they would be speedy, so we told them no problem. Thirty minutes later, only one the cavers had made the descent. A 12-year-old boy in their group was having quite a bit of trouble. He was using a figure-8 descending device and couldn't seem to put enough weight on it to force himself down the rope. Eventually, they replaced the figure-8 with a rack and the boy slipped down the wall. All of us were particularly cold by the time

everyone reached the top, but we had some snacks and liquids and were soon moving on again.

The troubles we'd dealt with were quickly forgotten when we saw the next section of the cave. The floor in the area near the entry was a bit slushy, but soon turned to solid ice. We walked a few more feet and our eyes were drawn to an array of enormous ice sculptures. Stalactites and stalagmites of varied shapes and sizes lined the walls and a few ice clusters dominated the center of the cavern. The room was exquisite, even taking into consideration the wooden shack hidden behind one of the clusters and the occasional fluorescent light half melted into the floor.

This was the portion of Crystal Ice Cave that had been developed into a tourist attraction in 1965. Apparently, a developer blasted a shaft from the surface down to this section of the cave (about 150 feet) that now runs parallel to the cave. He installed three large windows between the shaft and the cave, and took visitors down the shaft so they could view the ice cave without having to worry about freezing temperatures. Sadly, what ultimately happened was that heat entering from outside the shaft began melting the ice in the cave. Due to this and lack of maintenance, the cave was shut down in 1985 and the man-made tunnel was blocked off to prevent further air flow into the cavern.

We followed this magnificent passage until we reached one of the windows. We needed to climb through this window to reach the exit point. It was only about 7 feet above us, but there was a giant ice cluster sloping upward that we had to scale to reach the window, and it was slippery and dangerous, to say the least. Some of us were having

enough of a tough time staying vertical on the icy floor. Dave took the lead, climbed up and through the window, and tossed a rope down to make it easier for us to do so. I felt a little insecure as I stepped on an ice stalagmite to reach the window, and was somewhat concerned that the wood near the base of the window was going to give way as I put my weight on it. It didn't, and we all made it through without any problems.

All of us were now in the shaft parallel to the cave, but before walking up toward the exit, a few of us wandered down to the base of the shaft, which was being reclaimed by the ice. Toward the end of the lower shaft, almost the entire hallway had been overtaken by ice (the ice had

become the floor). The passageway kept getting smaller and smaller until, in the final portion of the tunnel, we were unable to stand. One of my favorite images from Crystal Ice Cave came from this area of the shaft - there was a light-switch on the wall half covered by the ice floor.

It took Aaron a few minutes to figure out where the final ascent out of the cave was. While he was searching, Michael and I walked all the way up the shaft to the tourist entrance and checked out the huge, steel door that blocked us from the outside world. Being fairly cold and tired, I think both of us wished we could have simply pushed the door open and exited the tunnel. The way out, however, was through a small opening in the wall, halfway up the tun-

nel, which opened into a vertical shaft.

The last climb was a relatively easy 42 feet straight up, and then a 10-foot diagonal climb to a tiny hole at the top. I remember asking, "What if I'm too big to get through the hole?" Michael and Aaron responded, "Then you're going back the way you came." Needless to say, I made it through the tiny exit, as did everyone else. The first thing we noticed as we exited the cave was a metal sign that someone left near the hole that said, "Duck Crossing."

That was the trip, more or less. It was a wonderful caving experience, and despite a few minor mishaps, I think everyone would agree that it was worth every bit of pain and a lot

Thirteen Ways to Kill Your Grotto

The following article was first printed in Vol. II, No. 3 of the Michiana Caver and is taken from the August, 1980 issue of the CIG Newsletter. Is there a message here for you?

1. Don't come to the meetings.
2. If you do come, come late ... in time for the program, but not in time for the business meeting.
3. Never accept an office as it is easier to criticize than to do the work.
4. Get sore and gripe if you are not asked to a committee ...If you are asked, accept, and then do not attend committee meetings.
5. If you are asked by the Chairman to give your opinion regarding some important matter, tell him you have nothing to say ... After the meeting, tell everyone how things should be done.
6. Do nothing more than absolutely necessary, but when other members willingly and unselfishly use their abilities to do the work, howl that the Grotto is being run by a clique.
7. Never announce your intentions, then complain when you weren't included, or better yet, keep everyone in the dark as to your plans, being as indefinite as possible right up to the last minute. With a little help from other members, you can turn the whole thing into chaos with very little effort.
8. When your membership dues come due, don't pay. Or better yet, pay at least two months late since this confuses bookwork and leaves the leadership in doubt as to how many members there are. (If you choose not to pay at all, go directly to 13).
9. Keep your eyes open for something to go wrong. When you find it, resign. This is most helpful, if you are a leader or can get others to resign with you. (After resigning, go directly to 13).
10. If you do attend a meeting, vote to do something, then leave, and do the opposite ... or ...
11. If you attend a meeting, agree with everything said at the meeting, then disagree with it afterwards.
12. When all else fails, cuss the Secretary and the Chairman.
13. Go on all Grotto trips, attend all Grotto functions, etc. but do not join or pay dues. Do nothing to support the Grotto's efforts to be a success.

Trip Report: Mt. Rainier Steam Caves, July 13-17, 2003

February 24, 2009*

Mt. Rainier, WA

By Stuart Adler

Photos by Stuart Adler

Permit #:MORA-2003-SCI-0012

Name of Principal Investigator:

Stuart Adler

Background and Motivation

During the first documented summit climb of Mt. Rainier by Stevens and van Trump (1870), the climbers survived a cold night at the summit by huddling over a hot fumarole just inside one of many small melted-out cavities in the ice inside the caldera. Few ventured more than a few feet into these cavities until 1969, when a number of people started to explore them more fully, and discovered that they open up inside to a system of large chambers 60-100 feet across (Mitchell, 1969; Molenaar, 1971; Nelson, 1971; Whittaker, 1970). Then between 1971 and 1973, Eugene Kiver and coworkers conducted a series of volcanological expeditions, in which they surveyed and photographed extensively, and made the first measurements of humidity, temperature, gas composition, etc. Several expeditions have taken place more recently, including a recent study by the French volcanologist François Le Guern, which provides some interesting info and pictures available on the web: <http://tinyurl.com/c77jzs>

Known technically as geothermal ablation caves (Kiver and Steele, *NSS Bulletin*, 37(3), p. 45, 1975), the caves are formed by geothermal steam, which seeps up through the earth and rock of the caldera, and melts the ice cap covering the

crater. The greatest localized melting occurs along a ring about 50 m inside from the rim, forming a large toroidally-shaped cave passage, as shown in Fig. 1. The cave floor, which comprises the 35-40° conical scree slope of the caldera, is relatively dry earth and rock except where steam seeps up and forms wet spots or patches of ice. The roof (up to 50+ feet high) is a semicircular arch of smooth, continuously melting or sublimating firn ice. As the ice in contact with the inside of the crater evaporates, fresh snow continuously falls, compacts, and flows downward, establishing a steady-state ice thickness of about 360 ft. at the center of the eastern crater. Fresh ice flows downward at about 3 meters per year, so any articles left on the surface eventually appear in the caves, including bird remains, artifacts from earlier climbs (as far back

as the 1800's), and an airplane that crashed on the summit in 1991.

After an initial probe trip to the caves in 1992 by Stu Adler and Dave Brown of the Washington Alpine Club (see trip report dated 8/2/2002 on WAC website, www.wacweb.org), a more detailed trip was planned for the week of July 13-17, 2003, involving a collaboration of members of the WAC and the Cascade Grotto. A 4-person team traveled to the summit, and explored the Summit Steam Caves in the Eastern Crater. The purpose of the trip was to explore the caves, obtain color photographs of the largest chambers, and also to place a temperature/humidity logger within the caves in order to better understand the progression of freezing and thawing that takes place to form the various ice formations and passages.

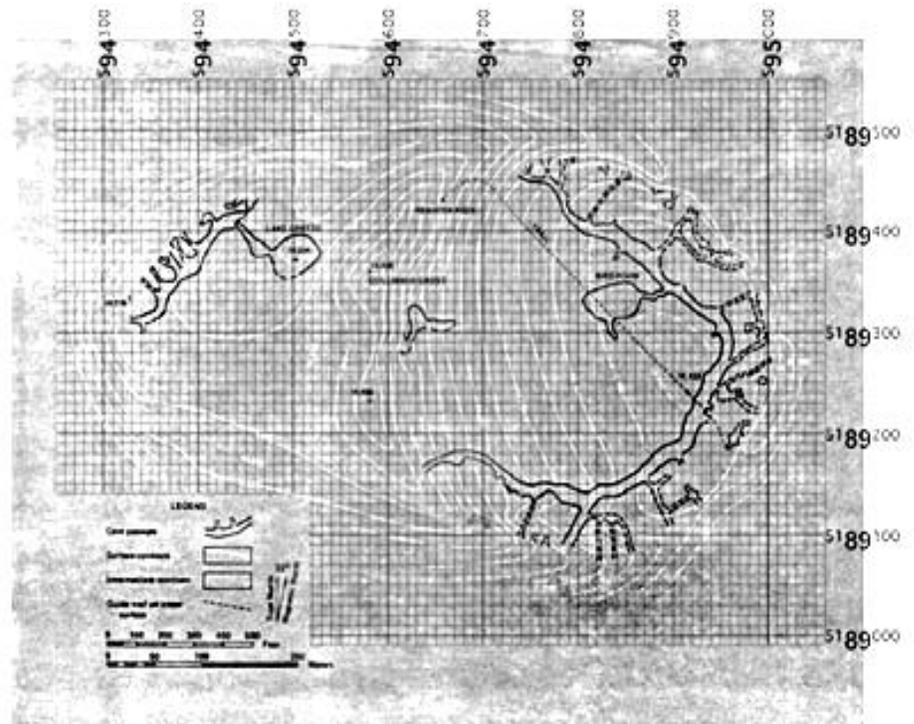


Fig. 1. Cave Survey Published by Kiver and Steele, *NSS Bulletin*, 37(3), p. 45, 1975. A UTM grid has been added to show the exact location of the caves relative to the caldera rim.

Participants in the project included:

Organizer, Co-Leader

Aaron Stavens—Cascade Grotto

Principal Investigator - Co-Leader

Stu Adler—U. Washington

Washington Alpine Club

Party, Washington Alpine Club

Dave Brown

JP John, Jr.

Observations

Weather was cooperative, with a pleasant hike into Glacier Basin and ascent July 14 to Emmons Flats. (We thank Sarah Adler and Danny Miller for extra help hauling gear in and back out July 13-14.) Our route was up the Emmons-Winthrop Glacier starting from Emmons Flats on July 15. We departed Emmons Flats approximately 8:30 AM with full camping gear, and arrived at the summit about 5:00 PM. Conditions at the summit were sunny and relatively warm (~ 28°F), but windy (~30 mph gusts). We stayed two nights at the summit (July 15 and 16). Our camp consisted of two tents located toward the north rim of the eastern crater. We also set up a wind-protected cooking bivy under the lip of the ice cap covering the caldera, close to one of the cave entrances.

Caving began approximately 10:00 A.M. July

16. As indicated in the survey (Fig. 1), several cave entrances line the north rim of the eastern caldera, and require crawling under the edge of the ice cap where enough melting has occurred to permit a person to fit (See Fig. 3). Inside one of these entrances we found a passage that descended the scree slope, opening-

up to a down-climbable entrance passage about 4-7 feet high, and 15-20 feet wide. This dropped about 70 or 80 feet in elevation to the main passage, which runs circumferentially around the caldera. We spent approximately 8 hours in the cave, and explored most of the length of the toroidally-shaped perimeter pas-



Fig. 2. Top: A beautiful Day July 15, heading up to the summit, ~13,000 ft. Bottom: our camp, located near the north end of the crater, Mt. Adams in the background.

sage. From the main passage, we also dropped down into what we believe to have been the “Bird Room”, a large dome-shaped chamber located another approximately 80 feet below (and south) of the northern portion of the main perimeter passage. It was connected to the main passage by a relatively narrow passage descending through the firn on the south wall.

The upper passageways of the cave were surprisingly dry – moisture was only apparent in spots where steam actually emanated from the rocks or earth. This seems to agree with the 1971-73 study, which measured less than 100% relative humidity. Yet the presence of ice crystals everywhere on the ground indicated that the temperature is below 32°F, trapping steam as it escapes, and forming long dendritic crystals similar to limestone helectites (see Fig. 4, top). We also noticed the firn ice in this area had a shiny, “dry ice” appearance, suggesting that the ice sublimates rather than melts. Thus it appears that the steam warms the passages enough to provide a driving force for ice evaporation, but the air exchange keeps the passages cold enough to prevent dripping water, at least in the upper portions of the cave.



Fig. 3. Top: View out of one of the entrances passages, crater rim in the background. Bottom: Dave Brown examined the typical "scalloping" of the firn ice comprising the walls and roof of the cave. (Photos by J.P. John).



Fig. 4. Top: helectite-like ice formations seen everywhere on the floor of the cave in the upper passages. Bottom: Dry icicle seen in one of the upper passages.

These observations of a dry upper cave are similar to what we saw in 2002; however it should be pointed out that the outside air temperature both times we visited was below freezing. Kiver's 1975 paper reports upper passage temperatures above 0°C. Also, as shown in Fig. 4 (bottom), we saw icicles in a few places in the upper parts of the cave, suggesting that temperatures exceed freezing at least some of the time. Furthermore, as we descended further into the cave, we found the temperature and humidity to generally increase with depth; for example we measured the temperature in the Bird Room as 46°F. At this point in the cave no ice formations were seen on the floor despite numerous obvious steam discharges, and there was standing water in many places, with water dripping from the ceiling.

In order to better understand possible temperature variations occurring in the main upper passage, we placed a temperature and humidity logger (Hobo) in the main passage, to track variations in temperature and humidity in the cave over the course of the following year. The sensor was mounted on a labeled wooden stake, 10-20 feet left of the entrance to the Bird Room. The label reads:

<<PLEASE DO NOT DISTURB>>
Humidity and Temperature Logger
Mount Rainier Caves Project
University of Washington
For info or questions please contact:
Stuart Adler (UW) at 206-543-2131
Barbara Samora (NPS) 360-569-2211

The batteries on this sensor are good for about 2.5 years, thus if we are unable to recover the sensor for some reason this summer (2004), it can be recovered the following year.

In addition to taking photos of the firn ice and other ice formations, we also used flash bulbs to light up some of the larger chambers. For example, a color photograph of the "Bird Room" is shown below. In passing, we noticed that the rough location of this chamber was consistent with the survey published by Kiver in 1975, but that the exact layout of the room (and its grottos and appendices) was quite different than that reported in 1975. However, we did not conduct any surveys to confirm or document this.

Although limited to 8 hours, what we were able to see was amazing, and beautiful. The size (and silence) inside the main chamber was awesome. Motivated in part by the persistence of Adler's symptoms of AMS, as well as a clear weather win-

dow, we broke camp early on July 17, and headed down and out. The descent went smoothly, and we welcomed a short break at camp Shurman before glissading down the Inner Glacier and heading for home.

Additional Comments

Having done a lot of caving in limestone, I would describe the Mt. Rainier Firn Caves as an equally delicate and sensitive ecosystem, that deserves as much care in exploration as any other cave. Visitors should adhere to generally-accepted good caving practices (e.g. avoid treading on delicate formations, do not pee or poo in the cave (use a pee bottle), and ensure personal safety by taking three sources of light and an emergency bivy/food, etc.). Notable hazards included loose rock and boulders on the inner slope of the caldera,

which forms the floor of the cave throughout. We improvised a policy of moving one at a time in the radial passages, and taking cover before others would be cleared to move. This was generally found to work well; however we advise extreme caution, especially when people are moving near the bottom of the perimeter passage. In addition, altitude was found to significantly effect people's ability to move and stay warm in the cave, particularly one member of our party who suffered moderate symptoms of AMS. Proper acclimatization is advised for people spending more than a few hours at the summit.

* The date used on this article was the date it was posted to the blog. The original article date was not included.



"Bird Room," about 150~200 ft. below surface of the ice cap. Note JP John sitting upper right. (Photo by S. Adler)

Lake and Ape Caves

July 6, 2007

By Thomas Evans

I remember vividly my first cave trip. It was to Fitton Cave, a beautiful limestone cave in Arkansas. The trip was full of cavers hazing me, marvelous conversation, world-class mapping, cave formations, crystal growths, and beautiful fossils in the cave walls. It was an unforgettable experience, one I can only hope to repay by introducing others to caving.

The trip to Lake and Ape caves was attended by myself (Tom Evans, aka Puppy King of the Beatles), Marla Pelowski, and Chris Polson. It was Chris' first time in a wild cave, and it showed.

Chris met up with me at the Bellevue transit center at 7 am on a bright sunny Friday morning. We drove south to Marla's place and got there at 7:30, 30 minutes ahead of schedule. To Marla's credit, she got ready fast once we were there. With gear all ready to go we piled into my van and headed for Mt. St. Helens.

The drive down was charming, with delightful conversation and many a joke as we all figured out each other's personalities and tolerances. Chris fits in just fine. He was curious about everything and asked us many questions which we attempted to answer as cogently as possible. At least Marla's answers were cogent... mine were often totally useless.

We arrived at the mountain late in the morning and spent time gearing up, giving Chris lights and a helmet, and teaching him how to use them. We walked to Lake Cave and immersed ourselves into the grandeur that is a wild cave. Chris was speech-

less. Really, he was speechless. It was the one time the entire day where Marla and I were talking and Chris was silently amazed at what he saw. He spoke little, immersed himself in the experience, and looked at everything. Cave slime, the walls, the ceiling, breakdown, rocks, sand, whatever, all captured his gaze...and held it. It took a while but he finally caught up with us, and we made our way through the cave, explaining what we were climbing over, under, or looking at. It was delightful to see that we had witnessed the birth of a new caver.

On our way through the cave, we ran across the stream passage on our left, so we spent some time exploring leads in the tight passages. For those who have not been in this portion of the cave, the main passage is low with a small stream channel. Throughout the passage, there are numerous tree casts, branch casts, and stump casts. It was incredible. I found myself crawling through trees on more than one occasion. I don't know if any paleobotanists know about this subterranean forest, but it has to be one of the coolest paleobotanical things I have ever seen! It is worth a trip just to go back there and enjoy that one portion of the cave.

We continued our trek to the 'lake' at the end of Lake Cave. Shortly after leaving the stream passage, we hit the remains of the lake. Remains since there is no lake, only sand. Watermarks on the wall suggest that, at times, the lake is large, and quite deep (greater than 10 feet), however, that day there wasn't a drop left. We spent a bit of time eating and drinking before heading back up to the entrance.

At the entrance, we gave ourselves a bit of time to bask in the sun before we dove back in to the entrance, but this time to the northerly portion of the cave. It's small and incredibly beautiful. I will not spoil it for anyone, but this entrance is one of the most beautiful pieces of rock I've ever seen, and on a sunny day, it really is a paradise. We frolicked there for a while before determining we should move on. Given the time of the day, we chose not to head to Ole's cave, but to head to Ape Cave.

As always, Ape Cave was a kick. We put on all our dirty caving gear and walked to the main entrance, enjoying the stares and hushed comments of the spelunkers who passed us. We chose to walk the upper passage, and set off rather rapidly up the cave. A group of children navigating a large pile of breakdown was our first glimpse of humanity in the cave. It was both entertaining and scary to watch. Moving at our brisk speed, we passed many a family, only one of which was carrying a huge bowie knife, clearly a mandatory piece of caving equipment. At the lava falls, we encountered a mother separated from her children below. I was volunteered to be the human staircase, and the family was reunited once again. Reaching the upper entrance, we chose to move on to see the end of the cave, which is rather charming. There is even a lava bench on which one can sit and eat.

We exited the cave to a clear blue sky. We quickened our pace back to the car and a fresh change of clothing. Daylight was waning, so we hit the road only to stop at Jack's to eat. The ride home passed quickly, though I got home after midnight because I had to drop Chris off in

Seattle.

This trip was enjoyable for three reasons. First, it was marvelous to introduce a new caver to the family and get to know him. It reminded me

of how I felt the first time I was in a cave with all the friendly people who helped me learn the ropes (both figuratively and literally). I hope caving never loses that community. Second, going back to caves I have al-

ready visited shows me how caves change over time. This perspective is delightful and I hope others can experience it in their lifetime. Lastly, it is intoxicating to be in a cave. Need I say more?

Caves and Caving in Video Games

February 21, 2009

By Matty Williams

Over the years, there have been few video games about caves and fewer about caving or cavers. I wanted to take a moment to share two of my favorites, *Colossal Cave Adventure* (a classic text adventure (bit.ly/68iB2l)) [1976] and *URU* (a *Myst* (bit.ly/5jbeF4)game) [2003].

Colossal Cave Adventure

Colossal Cave Adventure (bit.ly/7Eydzl) was actually created by a caver in the 70s and based on caves in the Mammoth Cave (bit.ly/5v6bgE) system in Kentucky (particularly, Bedquilt Cave). Real features and formations are referred to in the game, and it's been said that anyone familiar with these caves can easily navigate the game map.

Here is a great article (bit.ly/6wQlUE) on the history of the game and its connection to the *real* Colossal Cave.

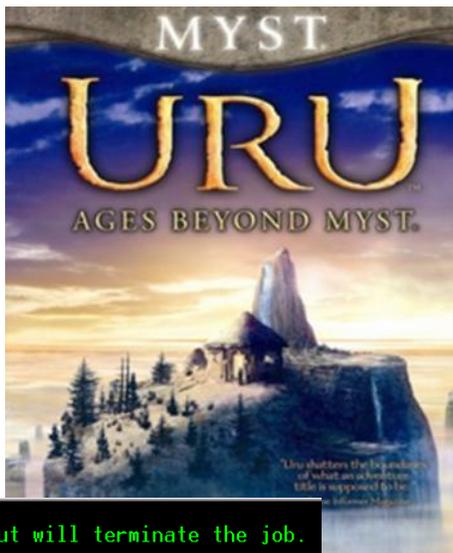
Colossal Cave Adventure is a text-only game (no pictures). You can play the game online for free: HTML version / Java version.

bit.ly/8QQrDI

bit.ly/50YlgP

(If you have never played a text adventure before and need some pointers, follow this link bit.ly/4Ye2FV.)

URU: Ages Beyond Myst



URU: Ages Beyond *Myst*

bit.ly/7JEZyC (is a game where you are a caver, exploring caverns under the New Mexico desert and deciphering clues left by an ancient civilization who constructed a massive city within the caverns. Excerpt from the Wikipedia entry:

"According to the game's fictional history, archeologists found an entrance to a vast underground cavern in the 1980s near a volcano in New Mexico. The caves led to an ancient abandoned city built by the D'ni civilization."

If you wish, you can look at a selection of pictures that I took on various trips to *URU* in my gallery (bit.ly/5GjmlE). Additionally, here are some screenshots from the official site. bit.ly/55hS8z)

URU is a puzzle-oriented adventure game (bit.ly/6HXz3W) (similar to the original *Myst* games (bit.ly/5jbeF4), but in 3rd person view), so it may be a bit complicated for beginners to video games or the genre. That being said, there is no shame in referring to hint guides (bit.ly/5RS2rr) when playing *URU*, as it is more about the exploration experience and the beautiful visual and auditory environments.

URU has two modes of play - one is single-player mode, the other is online play (which is now free, as *Uru Live* has recently become open source software). The game is appropriate for people of all ages.

```
PAUSE INIT DONE statement executed
To resume execution, type go. Other input will terminate the job.
go
Execution resumes after PAUSE.
WELCOME TO ADVENTURE!! WOULD YOU LIKE INSTRUCTIONS?

y
SOMEWHERE NEARBY IS COLOSSAL CAVE. WHERE OTHERS HAVE FOUND
FORTUNES IN TREASURE AND GOLD, THOUGH IT IS RUMORED
THAT SOME WHO ENTER ARE NEVER SEEN AGAIN. MAGIC IS SAID
TO WORK IN THE CAVE. I WILL BE YOUR EYES AND HANDS. DIRECT
ME WITH COMMANDS OF 1 OR 2 WORDS.
(ERRORS, SUGGESTIONS, COMPLAINTS TO CROWTHER)
(IF STUCK TYPE HELP FOR SOME HINTS)

YOU ARE STANDING AT THE END OF A ROAD BEFORE A SMALL BRICK
BUILDING. AROUND YOU IS A FOREST. A SMALL
STREAM FLOWS OUT OF THE BUILDING AND DOWN A GULLY.
```

As far as I know, the stand-alone version of the game is for PC only, but the online version may eventually be available to Mac users. You can pur-

chase *URU* on Amazon for \$30 (or much cheaper used). I recommend *Myst Uru: Complete Chronicles* (bit.ly/4ySY8X) as opposed to *URU*:

Ages Beyond Myst (bit.ly/5iY4Md), as *Complete Chronicles* includes all the updates/patches and expansion packs.

Speleo-Ed 2009: A Geriatric Perspective

April 14, 2009

By Hairy Chin

(aka Jerry Thompson and Jim Harp)

The fifteenth of August 2008 while wrapping up a thirty plus mile bike ride on the Interurban Trail, Cascade Grotto member Jerry Thompson spotted a juvenile garter snake on the I-5 bicycle overpass just north of 128th Street. It was a hot day and that coupled with the fact that the snake was thirty-five feet above six lanes of freeway traffic didn't give the little snake much of a chance. Thompson wheeled his bike around and rescued the snake before it could find its way into traffic.

With the snake cupped in his left hand, he headed for the exit ramp off the overpass. As he gained speed on the ramp, he quickly realized that he was unable to break and steer his bike with just his right hand. There was a serious tumble at the point where the ramp turned to join the trail. The little snake wasn't seen or heard from again but Thompson's trouble had just begun. Six months of shoulder pain led to a surgery late in February with physical therapy starting in the middle of March. Cascade Grotto member Jim Harp, who has become a "snowbird", invited Thompson to spend some recuperation time at Harp's new wintertime home near Palm Springs. At about the same time, Harp and Thompson received a PDF file that was circulated by Michael McCormack announcing the Speleo-Ed 2009 event that was being presented by the Western Region of the NSS. All this generated enough excitement in old Thompson

to immediately book a flight to Palm Springs.

Harp and Thompson started out for the event early in the morning of March 20th and drove two hours north of Jim's place to Owl Canyon Campground not far from Barstow in the northern Mojave Desert. Driving into camp the boys encountered an endangered Mojave Desert tortoise welcoming their arrival as it crossed the road.



Why did the Tortoise cross the road? So Jerry could take a picture of course. .

Their early arrival into camp allowed for some exploration for the two before registration activities began that evening. In addition to Harp and Thompson an earlier explorer of this area was fur trapper Jedediah Smith who in 1826 was the first American to explore the area. Later in 1844,

Captain John C. Fremont, accompanied by Kit Carson, was the first member of the US Army to visit this new western frontier. Captain Fremont established a camp near Bitter Springs that served travelers on the Old Spanish Trail for years to come.

That afternoon the old codgers visited the tourist trap ghost town of Calico located about ten miles east of Barstow. Situated on the side of tow-

ering King Mountain, Calico was developed in 1881 during one of the largest silver strikes in California. The town was named for the variety of colors in the mountain that were thought to be "as purty as a gal's calico skirt." Calico boomed during 1881-1896; but the end came to the silver



Jim Harp and Jerry Thompson spend some quality time at camp.

rush in 1896 and by 1904 Calico was just a ghost town. The citizens of Calico are still mining silver though, only now the mine is from the pants pockets of the unwary tourists who find their way into the old town site.

On the way back to their Owl Canyon camp, they took a driving tour of the spectacular Rainbow Basin located adjacent to Owl Canyon. Rainbow Basin has been designated as an Area of Critical Environmental Concern due to the numerous landscape features and paleontological resources in the area. Many visitors come to view the exciting and diverse multi-colored rock formations, hills, canyons and washes as well as the desert flora and wildlife. As the day progressed event participants continued to arrive and the old boys happily located a campsite far away from the noise and activity centered around the large main gathering tent.

On Saturday morning Harp and Thompson were up and ready to go way ahead of the scheduled nine o'clock start time for the day's activities. They used this time to explore the canyon and walk through Owl Canyon Cave located not far from the campground. Common to the desert regions, Owl Canyon Cave is a soil pipe or erosional cave formed by the

erosive power of water eating through the soft dirt and clay. These caves are popularly termed "pseudokarst" or "erosional" caves as they do not result from the solutional processes associated with hard rock caves. Some fairly lengthy soil pipe caves have been found in California's Mojave Desert.

While waiting for things to begin they visited with other Cascade Grotto members, Nikki and Michael McCor-

mack and Marla Pelowski. Morning activities included a digital cave photography seminar, a desert drawing and painting class, a canyoneering field trip, and a group of lecture-slide shows in the large circus-type tent set up in the campground. Saturday afternoon, Harp and Thompson had signed up to participate in the Black Mountain Indian Rock Art field trip being led by an archeologist familiar with the area.



Jim Harp visits with U. of Hawaii class doing geologic mapping in Rainbow Basin.



Jim Harp in the canyon above Owl Canyon Campground.

Harp, however found he was missing his glasses as the trip was about begin. Since he had volunteered to take on a couple of extra riders for the trip he continued on with the field trip while Thompson stayed behind to look for the glasses. Harp had his prescription sunglasses so he followed the trip leader from one rock art location to another. The eight thousand year old indigenous hieroglyphics appeared to him to be like gang tags and graffiti done by children and he thought they were less than impressive. In the mean time, Thompson retraced the footsteps the pair had taken earlier in the day, but didn't find the glasses. The only ground not gone over again was the trail from Owl Canyon to the cave. Thompson visited the activity center of the regional and enlisted the help of three lovely ladies in looking for the glasses in Owl Canyon. The ladies were Susan Olson who had presented the drawing-painting seminar, Susan's friend Debbie and Debbie's daughter Sarah, all from Barstow. This group with all eight of their eyes had a pleasant walk up the canyon but found no glasses. But Thompson

had a happier afternoon than Harp who complained about the rough roads traveled to reach the rock art area. Marla Pelowski and the McCormack's spent the afternoon on a soil pipe cave field trip in Rainbow Basin and Hidden Canyon.

Around six o'clock that evening, beer, wine, sodas and a beef stew dinner were served to the hungry participants. While waiting for dinner, Harp complained to event organizer, Matt Bowers that he had lost his glasses earlier in the day and his sunglasses just didn't work in the dark tent interior. Matt then informed Jim that someone had turned in a pair of glasses shortly before. With the return of his glasses Harp was much relieved and continued his evening in a happier mood. The banquet, "Dinner in the Desert" was a hearty beef stew followed by a regional business meeting and later a schnapps tasting party. The aged duo excused themselves and headed to their campsite. High winds and cool temperatures during the night challenged most everyone except the Cascade Grotto contingent who live with these conditions most of the year anyway.

The next morning the Cascade Grotto members along with many other cavers from the western region drove to the Fort Irwin National training Center where they visited the Goldstone Deep Space Communication Center. According to NASA's website the NASA Deep Space Network - or DSN - is an international network of antennas that supports interplanetary spacecraft missions, radio and radar astronomy observations for the exploration of the solar system and the universe. The network also supports selected Earth-orbiting missions. The DSN currently consists of three deep-space communications facilities placed approximately 120 degrees apart around the world: at Gold-

stone, in California's Mojave Desert; near Madrid, Spain; and near Canberra, Australia. This strategic placement permits constant observation of spacecraft as the Earth rotates, and helps to make the DSN the largest and most sensitive scientific telecommunications system in the world. The cavers got a grand tour of the Goldstone center which consists of several huge antennae including the seventy-one meter diameter Mars Antenna. The information control center which is a large room full of nineteen-sixties vintage mainframe computers and a control room that looked like something out of Star Trek. The connection between the cavers and NASA is that NASA is sending an orbiter to Mars along with a couple of rovers to look for signs of life. It seems that NASA feels the best place to find life on the unfriendly planet would be in caves which would have a more stable environment than on the surface. Therefore they are involving the caving community to show them how to look for caves and how to look for life in caves. The search for caves will be via infrared cameras mounted in the orbiter in harmony with the rovers which are being designed specifically to traverse the uneven cave interiors. (Very interesting)





Cascade Caver
P.O. Box 66623
Seattle, WA 98166

