MADISON UNIVERSITY STUDENT GROTTO

QUARTERLY JOURNAL

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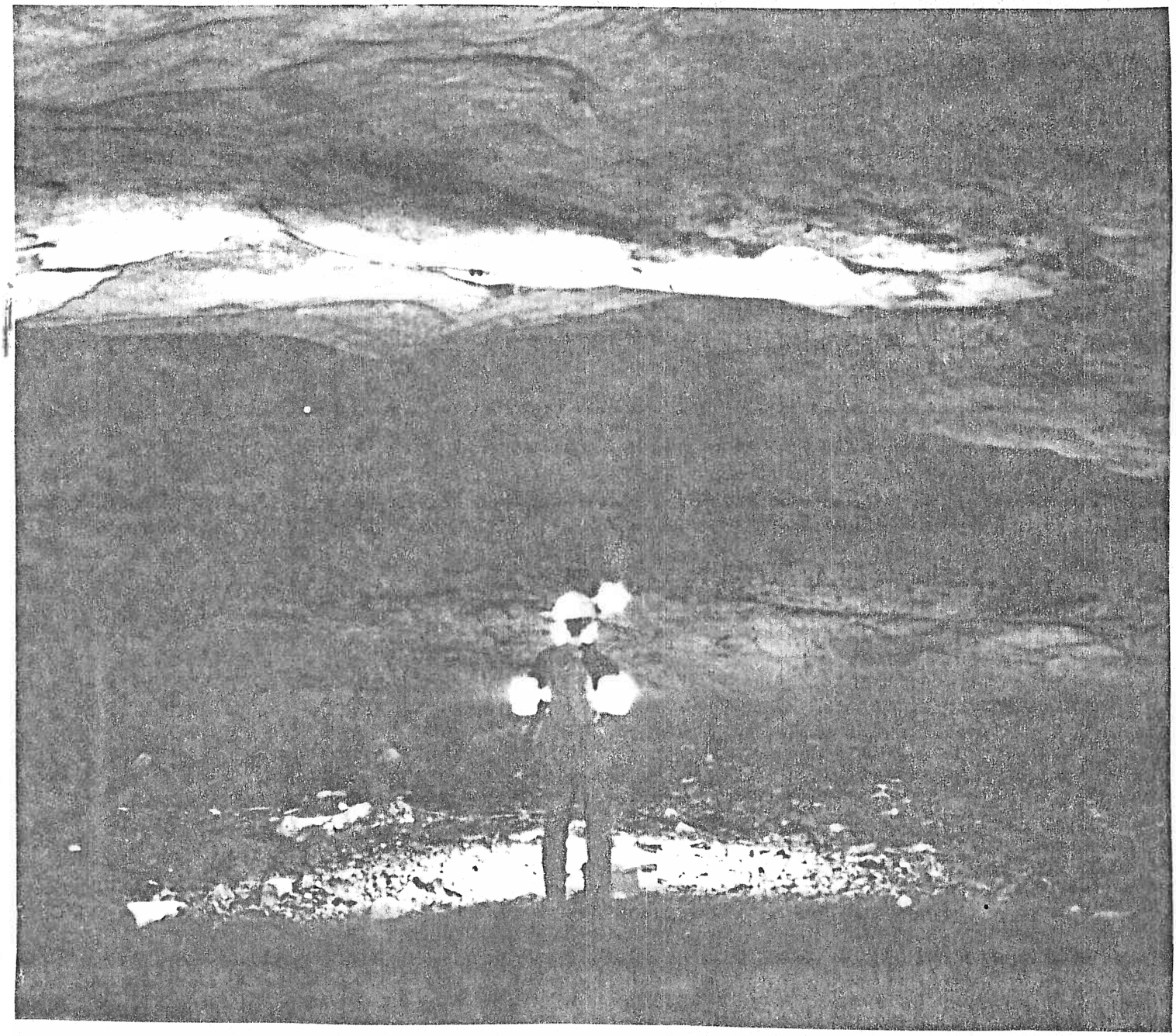
MEMBERSHIP JOURNAL



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Cover photo: Charlie Lucas in Snedegar's; by David DeLand

Our special thanks goes to the VPI Grotto from whom we stole enough articles!

The Madison University Student Grotto Quarterly Journal is published quarterly in July, October, January, and April. Please submit articles to Mike Artz: 201 Ott St., Harrisonburg, VA 22801. Subscription rate is $4 per year. We will exchange with other clubs on request.

STATEMENT OF THE GROTTO ADDRESS

Greetings MUSG, after a summer sabbatical the journal is back! This particular quarterly journal is devoted to training and membership. It's purpose is to present to all interested the threes of MUSG: fun, safe, caving.

The cave club originated in 1978 to fulfill the desires and yearnings of JMU cavers. People had a place to go to learn about area caves, techniques of caving, safety practices, cave conservation, and a place to meet other cavers. In order to better serve the caver, the cave club became recognized as a chapter of the National Speleological Society and founded the official name of "Madison University Student Grotto". Since 1978 and the original five members, we have grown to 63 members and have expanded our interests to many facets of the underground world. I invite all of you to look over this manual/journal and think about the uniqueness of our club. We have much to offer as a whole and as individuals within the club. Through this manual we hope to promote caving to others and to keep our club strong in mind, body, and soul.

Sincerely,

Kelley L. Price, MUSG President 1984
MUSG # 21, NSS #23896

GROTTO OFFICERS

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Membership & Safety Chairman	Dave Shantz

WELCOME

to the Madison University Student Grotto of the National Speleological Siciety. We have published this issue of the MUSG Quarterly Journal to give new members as much information about the club and the reasons it exists as possible prior to the experience of being a part of such a diverse group.

We are proud of the knowledge we have acquired and glad to pass it on to other able people. Anyone can be a caver, but some work is required. Having once become a member you may be called (by the polite) "socially different", but never "ordinary". However, some strive to be nothing more than ordinary; they can never become cavers.

The club members do more than cave. Backpacking, canoeing, cross-country skiing and rock-climbing are all activities vital to different people who also go underground. We have several annual events which usually involve some partying in addition to some of the fun just mentioned. Banquet and Spring Fling are two that you can look forward to. Awards are presented after an excellent meal at Banquet and Lockridge-Aqua campground is usually the base for climbing, caving and partying during Spring Fling.

After a short while with MUSG, you'll find surprisingly strong friendships based on mutual experiences of discovery, growth, and possible danger. These relationships are the biggest reason for the cohesiveness that brings "alumni" back for weekends caving and climbing or annual get-togethers. It's a feeling that's found rarely in other student organizations.

Caving is a truly three dimensional sport; walking, crawling and climbing are all required to navigate underground passages. The reasons for caving are as varied as the people that make up the caving community' we hope you'll find reasons of your own to go underground. The rewards depend upon what you're looking for; challenge, rare beauty, new discoveries, or to publish a map you've helped create.

The most important things to take into a cave on any trip are common sense and a safe attitude. Right off this means don't go caving drunk or stoned and don't come out drunk or stoned. What you do after you're out is your business. Common sense and safety are old themes, but they may mean the difference between driving home with a beer in your hand and riding back with an I.V. in your arm. So please, use your head.

For your first trips a helmet and lamp will be provided from club equipment and others on the trip will have the other necessary stuff in their cave packs. However, if you plan to continue caving you should get your own equipment. Helmets and lamps can be obtained from the club store or various suppliers listed in the NSS News.

Items that should be carried in a cave pack are; spare carbide, water, a container for spent carbide (or dump), a handline, spare parts kit, small first aid kit, knife, hi-energy snack, 2 or 3 spare light sources (a candle, flashlight,

and a complete carbide lamp are good), a garbage bag or two, and some matches or a lighter. If you don't know why you should carry all this, ask someone in MUSG, or figure it out for yourself!

One other aspect of caving is probably more important than anything yet mentioned; Cave Conservation. The underground wilderness is a unique and very delicate environment that took litterally hundreds of thousands of years to develop. Speleothems (or formations) are very fragile and can be totally destroyed by a careless touch; once gone they can never be replaced. Life in caves fall into three basic catagories: troglophiles (cave lovers), troglobites (cave dwellers), and trogloxenes (cave visitors). Some species, like crayfish, can be either troglophiles or troglobites. Troglophilic animals visit caves on a regular basis and could complete their life cycles underground. Troglobitic animals are those that do complete their lives in a cave. Trogloxenes are those that visit caves but cannot complete their cycles underground, like bats, frogs, and humans. The species that are encountered in caves range from humans, skunks, and bats on down the chain to salamanders, insects and microbes. Their environment hangs in a very delicate balance and cavers avoid polluting it.

Landowner relations are also very important, as it is only through the cave owners generosity that we can pursue our underground interests. Ask permission from the owner before entering a cave, park your car where he asks you, and leave any gates as you found them. Climb fences only at sturdy posts, take all your trash home, and don't leave carbide anywhere on his property.

Well, I'm sure this sounds like a lot to know, but it's only a small part of what you will learn if you continue caving. In a nutshell- Go caving, be safe, and enjoy.

There are many books that contain more detailed information about the underground world. One of these is <u>American Caves and Caving</u> by William Halliday. The club library has a copy.

Dave Shantz
MUSG # 46
NSS # 20,073

BUTLER CAVE TRIP

Friday, June 26, found Bob Carts and myself heading toward Burnsville, VA and the largest cave in VA, the Butler Cave-Sinking Creek System. We picked up Mike Artz in Woodstock and after a keg party-type delay at JMU, we were on the final leg of our road trip. Arriving at the Butler Homestead after midnight left us enough time to talk to a few faces in the dark, have another beer and then retire for the next day's long adventure.

Early Saturday morning the Homestead was bustling with people. Cave gear was sprawled out everywhere, everyone attempting to stuff enough carbide, food, water, and dry clothes into their cave pack in order to survive the long journey. After a few hours of preparations, dividing into groups, and acquainting ourselves with the BCCS members and friends (at first we new no one there), we were ready to leave.

Our group consisted of 10 people who had decided to survey in the Marlboro Country section of Butler. I was psyched to go until I noticed the reactions of the other groups of cavers from my mentioning where our destination was. The words "Marlboro Country" drew a large variety of snickers, grunts, and "good lucks" about a place called Crisco Way. After this bombardment of remarks, I proceeded to question Bob about our sanity.

Some time before noon we descended the 30 foot entrance drop on a cable ladder (belayed of course) and proceeded to weave our way down to Sand Canyon (a few hundred feet below the entrance). After waiting for the rest of our group, the race began. A moments pause to admire some of the beautiful limestone pools, soda straws, etc. meant finding yourself way behind the rest of the group who were in the process of setting a new below land speed record. Three point five miles and three hours of squeezing, wading, crawling and walking found us at the beginning of Crisco Way. Crisco Way is a mere 53 feet of slick mud, cold water, and tight passage with about 1/2 inch of water on the floor. It cannot be conquered without thoroughly coating yourself with mud and inch-worming along in every body position possible. I drew many a curse due to my ability to actually stand up and walk sideways through the larger, 10 inch wide areas. No matter how thin, one must eventually submit oneself to the tortures of this passage and by the time we reached the end, I was equally slick, wet, and semi-miserable. Incredible, it was actually fun,; I know Mike loved it.

At the end of Crisco Way is a 40 foot ladder drop in a small waterfall known as Neptune's Throne. There was some delay here in rigging and descending the drop. Being totally soaked, last in line, and waiting for 30 minutes, I could sense a mild case of hypothermia coming on. I decided to jump in front of the four others with me who were still waiting to climb down or else I might have gotten very chilled. At last I was in Marlboro Country and that meant putting on dry clothes and eating some food. Mike's fried chicken smashed into his peanut-butter sandwich was really a disgusting sight but he ate it anyway. When all of us were done with our feasts

feasts, we broke up into our three prearranged survey groups. Rod Riley led our group, which consisted of his brother Ed, Bob Carts, and myself. Mike went off with another group. Unfortunagely (luckily?), the passage we were to survey had changed hydrologically--the supposed walking passage was a near-syphon. All four of us looked at it and after some discussion, we decided it would be smarter to retreat.

Although uphill, coming out of Crisco Way was even more enjoyable because you knew you were heading out. We made good time out and Rod showed us some nice formations as we moved along. I became somewhat tired and clumbsy, I believe from the mild hypothermia I caught waiting at Neptune's Throne. Suprisingly, we actually made it in and out of the cave from Marlboro Country and there was still a bit of sunlight visible, a rare accomplishment I've heard.

Back at the Homestead, Bob and I were treated to some fine hospitality and imported beer as we waited for Mike. He appeared with his group about 4 hours later. We thoroughly enjoyed this beautiful cave and would like to thank the BCCS folks for their friendliness and for showing us around.

Jaime Reep
NSS 21917

(taken from MUSG Quarterly Journal, Volume 1, Number 3)

SHE'S GOT A TICKET TO RIDE

A Conversation

Look, there's a crack that goes right up there! Yeah, sure is. Wonder if it's ever been done. I don't know but it looks awful good. Looks hard too! Good protection though.

The Discovery

We were at Seneca Rocks over Easter weekend and were hoping to catch some good weather to get our muscles in shape. On Sunday we had just finished climbing a 5.10 called "Highway to Hell". As we were walking up the Upper Broadway Ledge in search of some likely prospects for our next endeavor, lo and behold we found ourselves staring up at two 5.10's called "Low Octane" and "Nip and Tuck". Between the two climbs was a line that was just as beautiful but all covered with lichen (as if no human fingers had touched it) but yet so obvious that somebody was bound to have snagged it by now.

Eddie, do you know if this line has been done before? No, I've never seen the name anywhere...pause...I think we can climb up those flakes, move right into those cracks, and end up on Nip And Tuck up by the roof. Yeah, but it looks like the crack might peter out before you get to the roof. Damn, do you think it's been done?!!! Well, I don't want to do it now, let's do it first thing in the morning. Okay!

That night it began to rain on and off throughout the

night, and our hopes of bagging a first ascent the next day were fading. But we woke up the next morning to a cool and overcast day but the rock was dry, our spirits were lifted.

The climb

By noon we were once again looking up at the crack. It looked better now that we were psyched up but still there was the small shadow of a doubt that it had already been done. "Hell, it looks like fun, let's do it anyway.

Mike

Since I had spotted the crack, we decided I would lead. Damn that was nice of Eddie. Eddie was screwing around doing something or another while I set up the rack and I was being meticulous about doing it right. Finally I was ready. "On Belay?" "Belay on! Do it baby!"

My first nut was a saddle wedge just a few feet off of the ground but I couldn't see anymore protection for a good five or six feet. I guess I'll start up "Low Octane" to get to that first flake. Ah, this is pretty nice. After jamming the flake, I pulled up to another flake and popped in a couple of nuts. I was already getting pumped up and I hadn't even started the new route.

After moving right a few feet I was able to stand on the third flake with my left foot and get my right foot on a tiny nubbin. Maybe I can get a nut in out in that crack. Yeah, a number six wired stopper will fit in. "Slack!" Up a few moves and my right hand fell onto a beautiful flake. I had good footholds and I could even rest here. While I got a few more chocks in I looked above me and I could see that all the moves would go.

Up a few feet and I could see a good hand jam and a pinch grip. After another small wired nut, I cleaned some lichen off of possible footholds. There were very few. Up high I could see a small horizontal fingerhold. Slowly I raised my body into an extended position, the hold was within my reach. I grabbed it, jammed my foot into a crack and stood up. Now I was on Nip and Tuck and I was able to get in a bomber number 12 stopper. Beautiful!

"Eddie, I think I'm at the crux, it looks real hard." I moved up and left. That little pocket looks like it'll take a good nut. A number four RP fit in nicely. After getting this in I down climbed a few feet and rested. Well, there's no better time to try it then now.

The regular Nip and Tuck route goes straight up but we were trying to put this route up to the left over to an undercling roof. I moved out left and felt for handholds. There weren't any! I down climbed back down to my pseudo nut. "Eddie watch me real good next time."

This time I had to make it. I could see a decent finger-hold way out to the left. If only I could get to it.

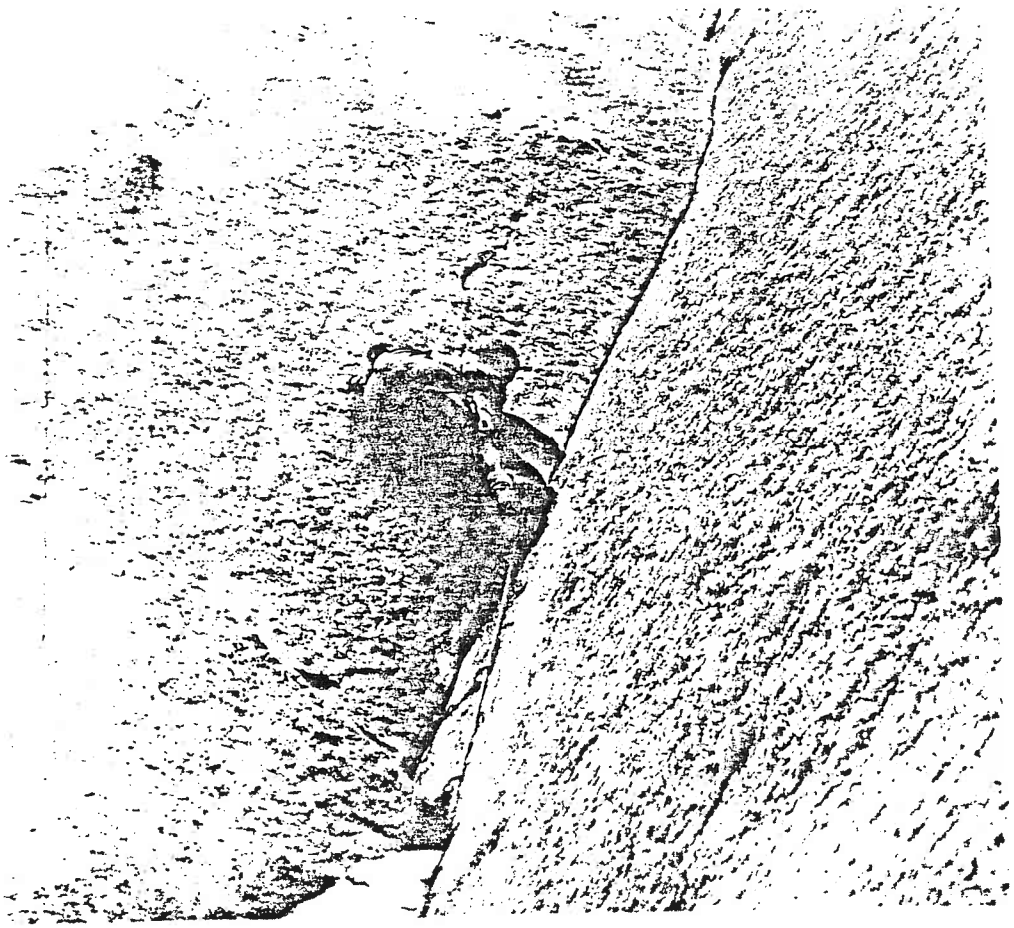
I moved up left again to a by now familiar layback hold. Slowly I cleaned off some possible footholds and gingerly stepped onto them. I found a real small right fingertip hold. Up with my left foot onto a small quarter inch ledge and smearing my right EB on a sloping foothold I was able to reach the good ledge. Slowly I reached up with my right hand and pinched the undercling on the roof. Quickly I moved up into the undercling and put in a bomb proof friend. "Eddie, that was hard as hell! That was definitely the crux!"

Man was I ever glad to reach that undercling. I moved straight up the roof and gained a lichen covered crack. Up ten feet and I was jamming away through a short 5.8 crux. This was great. Twenty more feet and I would be finished. I could see cracks continuing up to the summit. Soon I was enjoying some very pleasurable 5.8 crackwork and there I was on top. Finished! Yay, Whoopee. Yippee. I clipped into a bolt. "Off belay Eddie!" "OK, Belay off."

After a few minutes I had a good solid belay and was positioned so that I could watch Eddie for most of the way. Boy was he a long ways beneath me. That pitch must have been about 130 feet. It was a beautiful day to put up a new route and what a find it was. Soon Eddie had joined me at the belay and we were rejoicing in our ectasy. But wait, "Hey Eddie, look over there at that other climb, some carabiners!" "Lets go get em!" Oh well, off to other adventures.

Mike Artz and Eddie Begoon
MUSG #10 and #27

(taken from MUSG Quarterly Journal, Volume 3, Number 1)



CHECKLIST FOR THE BEGINNING CAVER

NECESSITIES

1. Sign the membership release form.
2. Gas money.
3. Plastic Bags for dirty cave clothes.
4. Chang of clean clothes and shoes.
5. Munchies for before and after cave trip.

A caver should wear clothes appropriate for exercising in 55 degree weather (the temperature of most caves in Virginia and West Virginia is an average of 55 degrees). In some caves there is a chance you'll get wet which will increase the chance of hypothermia. It is important that you are dressed right. Guidelines for what to wear are as follows:

1. Helmet and Lamp -- make sure the leader of the trip knows you need a pair if you don't have them.
2. T-Shirt.
3. Turtleneck and/or sweatshirt (preferably wool)
4. Bandanna to keep your neck warm.
5. Long johns.
6. Loose-fitting jeans -- coveralls or overalls are good if you have them.
7. Two pairs of socks. Wool is good if available.
8. Boots or tennis shoes (Preferably boots--and the ones with lug soles).
9. Work gloves -- not mandatory.
10. Knee pads -- not mandatory.

Any variations of this outfit are fine, just remember that clothes you wear in a cave can get extremely muddy and torn, so do not wear "good" clothes or shoes. The salvation army is a good, cheap place for caving clothes.

If you have any questions, do not hesitate to ask before you get inside of the cave so you can get the full benefit out of your first cave experience.

Happy caving!!! Kelley Price

CAVE CONSERVATION LAW

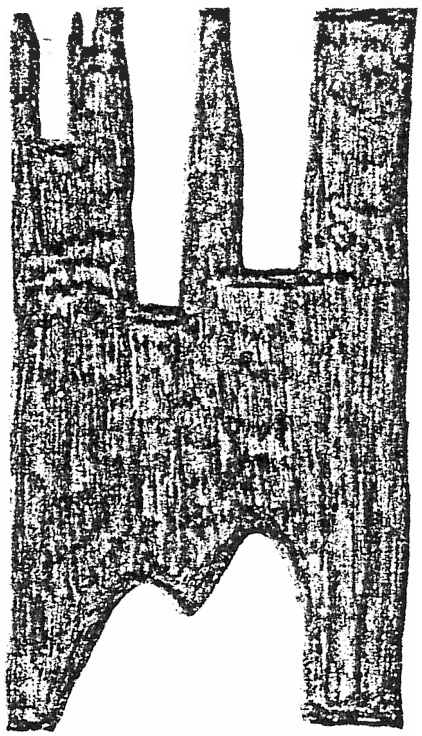
A bill to amend the code of Virginia by adding a section numbered18.1-175.1 so as to prohibit the damaging of caves or caverns:

Be it enacted by the General Assembly of Virginia:
1. That the Code of Virginia be amended by adding a section numbered 18.1-175.1, as follows:

18.1-175.1, (a) It shall be unlawful for any person, without the prior permission of the owner, to willfully or knowingly break, break off, mutilate, injure, deface, or mar or harm any natural material found within any caveor cavern, suchas stalactites, flowstone, draperies, columns, or similar crystalline mineral formations or otherwise; to kill, harm, or disturb plant or animal life found therein; to discard litter or refuse therein, or otherwise break, force, tamper with, remove, or otherwise disturb a lock, gate, door or other structure or obstruction designed to prevent entrance to a cave or cavern, without the permission of the owner thereof, whether or not entrance is gained.

(b) Violators of this section shall be guilty of a misdemeanor.

A misdemeanor is defined as fines up to 500 dollars and sentences up to one year in jail.



ESTABLISHING RESPONSIBILITIES

"The sign out sheet is just to make sure that if a trip goes out, it comes back, too." Well there's a little more to it than that. There are many important responsibilities related to the sign out sheet. The key to an effective sign-out sheet is knowing exactly what the responsibilities of both the caving party and the sheet party (the people who check the sheet) are. Once these responsibilities have been established, they must never be deviated from because if they are, the procedure becomes confusing and basically worthless.

The first responsibility of the caving party is to sign out properly. This is basically self explanatory except for the E.T.R. must be one hour later than you actually plan to return. For example, if you expect to return at 6:00 pm, (this time includes travel and changing time) then write 7:00 pm under E.T.R. There is a very good reason for this: if the caving party has not returned by 6:00 pm, an initial call down for a possible rescue is started. Thisallows one hour to assess who is available, or who can be made available to go on a rescue. Then at 7:00 pm, if the cavers have still not returned, a search team is on the way to the cave. The second responsibility of the caving party is to try their damndest to call someone to change the sheet if they are okay but late. Remember, once a cave rescue is started, you pay for all expenses- if the rescue is real of not. No kidding. The third responsibility of the caving party is to go to the cave they have signed out for. If you know before you leave that the cave might be flooded or you might not find it or whatever, then write down an alternative cave on the sign out sheet. If you did not do this but feel the need to go to a different cave.call someone who will change the information on the sheet. Another responsibility, especially if camping out for a weedend, is to leave a note on thecar stating which cave you're in, the date, and the names f the cavers. This simple precaution seems rarely taken by MUSGer's for some reason.

Had enough of caving party responsibilities? Okay,here's some for the other end of the continum. The whole clubis responsible for looking at the sign out sheet. Therefore, if your driving by the sheet, especially at odd hours, you should try to stop by and check if all the trips are in on time. And of course all who live out by it should check it whenever possible. If you notice a trip is overdue, it's up to you to contact someone listed and make arrangements for a call-down. Another thing you might keep in mind is asking a friend to check if you're back.

Now for the most important part. If you ever find yourself in a situation where one or more of your caving party

is lost, injured, or otherwise, and you need assistance, call one of the numbers listed on the call down sheet. Make sure you have the numbers with you. Remember that calmness pays off; therefore, evaluate the situation as throoughly as possible, and be prepared to relay all important information to the person you contacted. If there is a definite injury call the CRCN first. In all cases, a MUSGer should be contacted.

I"ve heard that at someplaces, it unfortunately takes a real rescue before people realize how important the sigh-out sheet is. I hope this never has to happens to us.

Love,your cave mother,
Anna Weimer
MUSG #35

REQUIREMENTS FOR MUSG MEMBERSHIP

1. At least 20 hours underground in at least four different caves. One of the trips must be a vertical trip of a pit not less than 30 feet deep.

2. Be able to demonstrate the proper use of vertical caving equipment and techniques including belays, cable ladders, ascending and descending.

3. Be able to have a working knowledge of the eight most commonly used knots.

4. Carbide lamp and signout procedures test. Written, discussion, and assembly of a lamp (26 questions).

5. General knowledge test. 51 questions touching on all aspects of caving. Many of the topics covered in the test can be found in this manual.

These requirements are not difficult and can be met in as few as four weeks or as long as 6 months although there is no time limit once you begin the membership process. Being a MUSG "trainee" can be a lot of fun for both the trainee and the sponsors (Ha, Ha!). It's a learning process designed to help everyone of us become more competent and safety-minded cavers. We want people to be able to count on MUSG members for their knowledge and experience. That's what it's all about.

ENJOY!

CAVING COURTESY

Almost entirely due to inconsiderate acts on the part of cave visitors, popular caverns are being closed to caving. Going to caves involves crossing property which the caver enters as a guest and is expected to respect. But, unfortunately, all many owners get from their cave traffic is bother and headaches. The owner does care about discourtesy. Before visiting anyone's cave, here are a few ideas you might consider.

People rarely own or lease land they do not care about. Regardless of the rumors you hear, or the current practice in a certain place; regardless of the owner's ability to observe you entering the cave - ASK FIRST. Disrespect really is an irritant. Before entering any cave, be sure you have the permission of the owner. Even when a "standing invitation" has been extended, you should contact him before each visit.

You need a car to get there but...farmers are constantly moving machinery or livestock about, so check on parking to be sure your car will not block a lane which is in use. Drive on the existing trails and roads to prevent rutting, scarring and erosion in fields. This is particularly important on hills and in wet weather, as a slight spin of the wheels can lead to problems maintaining the road after it ruts. By all means, remember your host does not really enjoy towing cavers' cars out of muddy dirt roads or fields, and he probably prefers you change your oil in town.

Eventually, you will get out and walk. Keep any children with you out of the sheds and off of the machinery. When you cannot avoid climbing a fence, do so at its strongest post and make sure that you do not leave sagging wires or missing rails. Ranching and farming people don't consider chasing animals fun. If there are grain fields, the owner will appreciate it if you ask which route he'd prefer you use to reach the cavern. Walking through grain fields can result in permanent damage to the crop, ($).

Gates are frequently encountered in rural areas. The owner expects you to close and securely fasten any gates you pass through. Again, in speaking with him, you may learn of some he prefers open on a given day. Entering and leaving a cave, replace any barriers that may have been put there to keep animals out. Inwarm weather, the cool air and water in the typical entrance will attract cattle. Around the entrance, you may see piping and pumps. If cave water is being used on the farm for irrigation or drinking, you can expect that its quality is a sore point with the owner. You must use a great deal of care to avoid muddying or spoiling his water supply. An owner frequently is familiar with his cave and is interested in conserving it. His interest in its lore, wildlife and formations may date from his own youthful explorations. While telling him of new discoveries will interest him, showing him

how to protect his bat population or shouldering bags of extracted trash will please him more. While enjoying a cave, remember that the owner, his relatives or friends may visit it next. It is in your own best interest that you leave nothing inside a cavern that does not naturally occur there. Litter, carbide, food, plastic wrappers, photographic debris, names or hometowns sooted on walls or formations, all detract from the natural appearance of a cave. Further, many unlikely items will wreck the life cycle if allowed to contribute food or poisons into the delicate balance found there. Cave fauna are extremely hard taxed just to survive and should be allowed to remain in their natural habitat undisturbed. Probably, all cavers realize they should not "collect" or vandalize formations. However, few of us can manage to keep the accidental breakage under complete control. Remember, a single nudge of your hard hat or helmet will destroy practically any small formation. Where you have an owner who is interested in his cave, you have an individual who will be upset at its deterioration.

After exiting, cavers have on rare occasion dumped spent carbide around cattle. Not only is this a form of littering, but most ranchers and farmers regard carbide as poisonous, and livestock deaths have been blamed on cavers. All carbide and spent carbide must be removed from the premises.

Work involving surface mapping, measuring or electronic equipment could upset an owner who had not been briefed on its uses. Cavers using fluorescein dye for water course tracing should first talk with area residents. Once the tap water has turned green, a tardy "its harmless". will not improve your caving prospects. Perhaps, avoiding an officious or hurried demeanor is one of the best ways to show an owner that your visit is for innocent recreation. If you do get a report or map published, by all means see that your cave owner gets a copy.

After caving, we all feel grungy and groady, But, don't mess up Land Owner Relations by leaving local public restrooms muddy. In the woods, do not use soap directly in a body of water. Do your soaping and dishes in a bucket and discard it at least fifty feet from open water.

Try and leave the landowner happy with your visit.

After all, he need not always give us access to the caves we enjoy.

SURVEYING

Surveying is a major part of the caving activities in MUSG. Last year we completed the map of Glade Cave, the largest in Augusta County. A total of twelve trips netted us 4,961 feet of passageway. Twelve members helped out on the project which allowed us to have the map finished in time for Banquet in January. Mike Artz did the cartography, Yvonne Droms helped sketch and a number of people learned to read compass and set points.

A second project was started soon after Banquet, we wanted to map four caves on the Calvin Sheets property north of Harrisonburg. As of October, 75% of the known passage in 3D Maze and Mad Steer are surveyed, Little Cave has been fully mapped, but we haven't taken any survey trips into Lyle's Pit.

On October 7, Mike Artz, Jason Burkhardt, and I started surveying Better Forgotten in Highland County. We hope to complete the survey this year and will need help.

The club is also starting to get involved in the search for a way into the Cathedral Springs System in Bath County. Seven MUSGers spent a weekend trying to reopen the entrance to Robbins Rift with Robbie Robbins and Dick Sanford. There's plenty to do--ridge walking, entrance checking, and the chances of discovering BIG CAVE are quite good.

So if you want to go caving, just listen up at the meetings or call someone on the phone list, there will be plenty of chances.

Dave Shantz

SURVEYING FOR BEGINNERS

What does a caver turn to when he's seen all the beautiful caves, dropped all the big pits, or strolled through enormous trunk passage? Surveying! Surveying is one of the most rewarding aspects of caving.

There are four basic activities that need to be performed on any survey trip. (1) Taping the distance between stations, (2) measuring the angle of the slope between stations, (3) measuring the azimuth between stations, and (4) recording these numbers and sketching the passage characteristics. Although these activities appear to be nice and concise, they aren't. Each one presents its own special challenges and this is what makes surveying mentally and physically challenging. Each survey trip is unique and different from any other. I will go into more detail about these four activities.

How many people are involved in a survey trip? The answer is as many as you want. An efficient number is three or four. Surveys can be performed with fewer or more people but they tend to be inefficient either because each person is doing too much or too little. One person takes too much time. Two people forces too much work upon each person. Five or more people splits the work up so much that it becomes boring. Typically a four person team is the most efficient.

There are four jobs to be performed by four people: Point Man, compass man, backsight man, and book man.

The point man's most important job is to decide where to place a survey station in the cave passage. In effect, he decides the direction of the survey. Using the tape to keep a straight line between stations, he should first try to place the station as distant from the previous station as possible. Then he should try to set the survey station in such a place that it allows the compass man to take accurate readings. To do this you may not be able to get as long a shot as you want.

All stations need to be marked in some manner. One of the easiest methods is to make a soot mark with a carbide lamp. Often stations are marked with some predetermined system of numbering. For example, (A17". This indicates the seventeenth station of the A-survey. The current trend in deciding which stations to mark is to number at least every third or fourth station. In addition, many survey teams number stations at important junctions and other significant places.

Another important job the point man performs includes holding his lamp at the station for compass and inclinometer readings.

The compass man has a difficult job. He must make sure that he takes accurate readings using either a Brunton or Suuntos. The azimuth is a reading on the compass anywhere from 0 to 360 degrees; 0 degrees being north, 90 degrees being east, etc. An inclinometer is used to measure the angle of the slope between stations. This may be either a positive reading for an uphill slope or negative for a downhill slope. The hardest part of being the compass man is trying to position the compass so that an accurate reading can be taken. This can be very difficult and is why the point man must take great care in placing the station. To really learn to use a compass takes practice. A detailed explanation of how to read one and use it effectively in a survey would be out of context for this article and instead I recommend participating in a survey.

The book man's job is the most all-encompassing. The easiest part of his job is to record the readings. Estimates of the distance from the station to the ceiling, floor, left wall, and right wall are also recorded. The most difficult part is sketching the passages. Many different symbols are used for sketching a map. A copy of these can be found in the MUSG library. The easiest way to sketch a passage is to determine the direction (azimuth), estimate the distance from one station to the next (put both of these on the sketching pad) draw in the cave passages around the stations and fill in any significant features such as boulders, pits, streams, etc. The best way to learn sketching is to look at other peoples work and try it on a survey trip. The book man frequently holds his lamp for a backsight. This gives the cartographer (the map drawer) two sets of readings for each station to check the accuracy of the readings. Often a single person handles this job other than the book man.

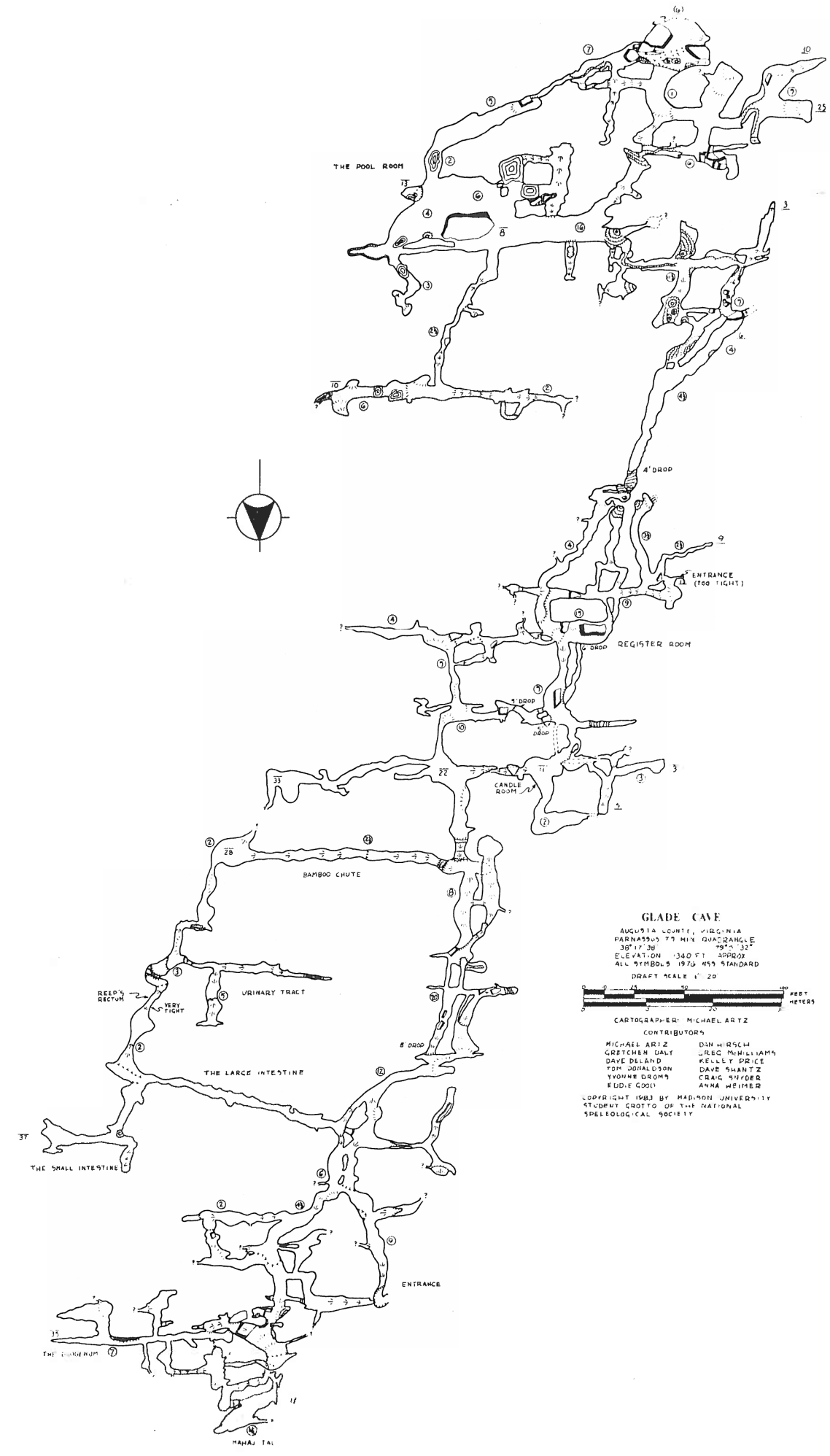
There are many different ways to set up a survey team depending on the number of people you have. I have described a four man survey team. The jobs that need to be performed vary from person to person depending on the number of people on the trip. A three man team splits the jobs up in this fashion. The point man sets the station, reads the smart end of the tape, and holds his light for frontsight compass readings; the compass man holds the dumb end of the tape and takes all compass readings; the book man records the data, sketches the passage, and holds his light for backsight compass readings. A five man team would have the extra person recording data and holding his lamp for backsights.

If you're really interested in surveying, ask to be included on a trip. It's really the only way you'll ever get to learn.

Mike Artz
MUSG # 10
NSS 19,309

Reprinted from MUSG Quarterly Journal Volume 2 , Number 4

FREE TAILED BAT



GLADE CAVE

AUGUSTA COUNTY, VIRGINIA
PARNASSUS 7.5 MIN QUADRANGLE
38°17'30" 79°2'32"
ELEVATION 1340 FT APPROX
ALL SYMBOLS 1978 ASF STANDARD

DRAFT SCALE 1" 20

0 10 20 40 60 FEET
0 5 10 20 30 METERS

CARTOGRAPHER: MICHAEL ARTZ

CONTRIBUTORS

MICHAEL ARTZ	DAN HIRSCH
GRETCHEN DALY	GREG McWILLIAMS
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HYPOTHERMIA: THE SILENT KILLER

Hypothermia is a potential killer. It can kill you just as easily as free falling 150 feet or getting run over by a truck. In some cases hypothermia is the most dangerous risk you will ever come across in caving; partly because it creeps up on you and once it has set in, it is extremely difficult to reverse.

Hypothermia is a condition in which the body loses more heat than it can replace. Actually hypothermia is caused by the loss of heat from the body's core. The temperature of the body's inner core is 98.6°F., when normal. The hands and feet could be as cold as 50°F., while not affecting the body's inner core.

There are three basic ways in which the body can lose body heat. The first way is through what is called radiation. This is where most of the heat loss comes from; and 50% of this type of heat loss comes from the head. The nape of the neck is also extremely sensitive to heat loss. The second way, is through conduction. Heat is lost whenever the body comes in contact with other objects that are colder than the temperature of the body. Clothing acts as an insulator and lessens these losses. The third way is through convection. This is not much of a problem in most caves but whould be expected when entering unknown caves.

One element that greatly increases heat loss, is water or getting wet. In most cases of hypothermia, water is the main cause. Water does not have to be particularly cold; 40°F. is sufficiently cold to limit survival time to one hour, if fully immersed.

The following are the symptoms of hypothermia.

SYMPTOMS:

Core Temp.	Accompanying Symptoms
99°F.-96°F.	Shivering becomes intense and uncontrollable. Ability to perform tasks is impaired.
95°F.-91°F.	Violent shivering persists. Difficulty in speaking, sluggish thinking and amnesia start to appear
90°F.-86°F.	Shivering decreases and is replaced by strong muscular rigidity. Muscle coordination is affected, producing erratic or jerky movements. Thinking is less clear; general comprehension of the situation is dulled, and may be accompanied by total amnesia. The victim is generally still able to maintain posture and the appearance of psychological contact with his surroundings.
85°F.-81°F.	Victim becomes irrational, loses contact with environment and drifts into stupor. Muscular rigidity continues. Pulse and respiration are slowed.

80°F.-78°F.	Unsonsciousness. Victim does not respond to spoken word. Most reflexes cease to function at this temperature level. Heartbeat becomes erratic.
Below 78°F.	Failure of the cardiac and respiratory control centers in the brain. Cardiac fibrillation. Probable edema and hemorrhage in lungs. DEATH.

The time between the initial symptoms and final collapse can be as little as one hour. Any drop in the inner core is extremely dangerous and should be reversed as soon as possible.

WAYS TO PREVENT HYPOTHERMIA

The best way of stopping hypothermia is by being prepared for it. Knowing how the dangers presented by and the general mechanics of hypothermia, we can discuss some of the preventive measures to forestall its occurrence.

1. Before entering a cave where the conditions described above exist, the following should be considered. (These conditions include immersion in water in crawlways or waterfalls.).

2. Team members should be in good physical condition as the first factor in avoiding hypothermia. Personnel should know at least the general characteristics of the cave and what obstacles will be met. A caver can't be prepared with clothing and equipment unless he knows what to expect.

3. All courses on hypothermia emphasize that eating before embarking on an expedition where cold, wet conditions will be encountered is highly desirable. High energy foods should be consumed during the cave trip in order to keep the body producing heat at maximum efficiency. Along this line, warm fluids are good, particularly if there are periods of reduced physical activity, such as waiting at the bottom of a drop.

4. Attention should be given to clothing and protective clothing. And while on the subject of clothing, it should be noted that due to the particular sensitivity of the head to cold temperatures, and to the large quantities of heat which can be lost there, that special efforts to protect the head should be made.

5. Don't get wet unless you have to!

6. Wear wool or polypropylene underwear (polypro is especially good because it doesn't absorb water and retains heat. Carry a garbage to wear if you get cold.

(Taken from Caving Information Series #23 NSS)

CARBIDE LAMP OPERATING INSTRUCTIONS

The carbide lamp pictured below is one of several helmet attachable light sources used in mining and caving. Fueled by calcium carbide ($CaCO_3$), it produces highly explosive acetylene gas, when mixed with water.

The 12 parts directly connected to its operation are labeled and numbered in the picture below.

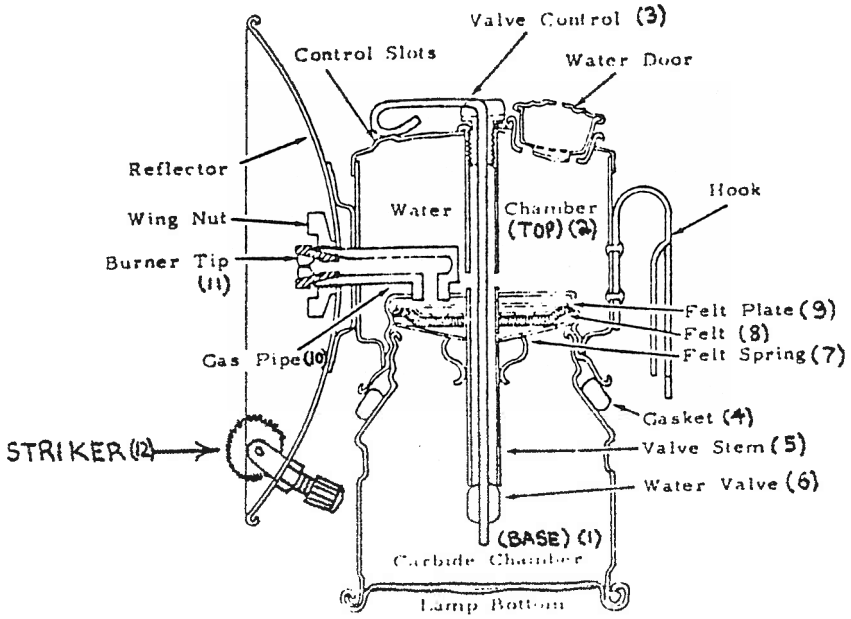


Fig. 1:
Carbide lamp drawing from Oregon Grotto's The Speleograph, February 1980

These parts can be conveniently grouped into the following two categories: water controlling parts and gas controlling parts. The water controlling parts contain the water and regulate its flow to the carbide chamber. Here, its chemical reaction with the $CaCO_3$ produces acetylene gas. This gas is then channelled out of the lamp by the gas controlling parts, where it is burned to produce light.

Materials Needed

1) a clean carbide lamp
2) Water in a squeeze bottle with a squirt top, to prevent spillage when filling the lamp (an old shampoo bottle is good, but be sure to wash it out before use).
3) $CaCO_3$ in a sturdy, waterproof, plastic bottle (a plastic baby bottle is good, but it must be completely waterproof)

WARNING: Calcium Carbide and the acetylene gas it produces are extremely explosive. Store and carry $CaCO_3$ with extreme caution,

10

especially when in the presence of an open flame.
4) a plastic container to put your used carbide in (a baby bottle or a zip-loc bag (doubled) is good but it must not leak)
WARNING: Make sure all of the carbide has reacted before you put it in your dump bag. Unspent carbide produces gas which builds up pressure in you sealed dump bag, creating an explosive situation. Do not use an open flame, i.e. another carbide lamp to look into your dump bag, this could cause a flame up and burn you.
5) A flashlight for illumination when changing carbide
6) A lighter or matches to light your lamp
7) A pocket knife or screw driver to clean spent carbide out of the base of your lamp
8) A tip cleaner to clean a clogged tip
9) A spare parts kit to replace any broken or worn parts of your lamp

Operation Instructions:

WARNING: If you're in a cave, be very careful where you set your lamp parts while changing carbide, as it is very easy to accidentally knock them off a ledge or down a pit or to step on them, which can leave you with out a lamp. Also, have your flashlight handy before you blow your lamp out, as it will be very dark when you do.
1) Make sure the valve control (3) is in the "OFF" position.
2) Clean all of the spent carbide out of your lamp base (1) and put it in your dump bag.
3) Fill the lamp top (2) with water from your squeeze bottle and set aside.
4) Fill the lamp base (1) about 2/3 full of $CaCO_3$. Be careful not to knock the gasket (4) off the base.
5) Adjust the flow rate with the valve control (3) to about one drip per second. Then screw the lamp top (2) onto the base (1).
6) Wait about ½ a minute to allow gas pressure to build up in the lamp, and then check to make sure gas is coming out by putting your tongue right in front of the burner tip (11).
7) When you can feel the jet of gas against your tongue, the lamp is ready to light.
8) Cup your hand over the reflector to trap gas between it and the reflector, the heel of your hand should be resting on the striker wheel (12).
9) After about 15 seconds, bring your cupped hand rapidly towards you. The heel of your hand turns the striker wheel and produces a spark which ignites the trapped gas.
10) If the lamp does not light, repeat steps 8, 9, and 10. If it still does not light, use a lighter or matches or another carbide lamp instead of the striker.

Some Trouble-Shooting Tips

If no gas comes out of the tip---the tip may be clogged or your carbide may be spent.
If you light your lamp and flames come out everywhere---your gasket has probably fallen off.
If your flame gets small quickly---you are probably out of water.
These are only a few of the possible problems. Many others may arise. The vice-president has a troubleshooting list available.

CARBIDE LAMP TROUBLE SHOOTING CHART

Trouble	Solution
Lamp will not light	1. Check striker assembly. Clean and dry if dirty or wet. Replace flint if worn. 2. Check carbide and water. Refill if needed. 3. Check felt. Dry or replace if wet. Replace if worn or brittle. 4. Check tip for dirt or damage. Clean or replace tip, seat tip solidly. 5. Check water valve for stoppage. If water does not drip, blot through filler cap to unblock. 6. Inspect gasket on lamp bottom. Clean gasket, seat, threads, replace gasket if worn. Screw bottom on tightly. 7. Clean vent hole in water door if clogged 8. Check for holes in lamp. Patch or replace part.
Lamp lights but burns irregularly.	1. Check tip for dirt or damage. Clean or replace. 2. Check felt. Dry or replace if wet, replace if worn or brittle. 3. Check water and carbide, refill if needed. 4. Check gasket on bottom for leaks. Clean or replace gasket, clean threads and seats, screw bottom on tightly. 5. Check water valve for free dripping, clean if clogged. 6. Check water door for clogged vent hole, clean if clogged.
Flame around bottom gasket.	1. Inspect gasket, threads, seats. Clean if dirty, replace gasket if worn, screw bottom on tightly.
Flame burns around tip or burns at an angle	1. Check for dirt in tip seat. Clean, reset tip. 2. Dirt in tip. Clean tip. 3. Check fit or tip. Change tips or grind tip and its seat to seal tightly.
Water flow cannot be regulated.	1. Check seating of water valve. Reseat if worn or too tight. 2. Check to see that adjustment lever turns valve. Replace valve assembly. 3. Check lamp for proper assembly at factory.
Water spurts from filler cap.	1. Decrease flow of water into lamp bottom.
Lamp burns well but light poor.	1. Reflector dirty. Clean reflector.

VERTICAL CAVING

When someone mentions vertical caving they are referring to the use of ropes or cable ladders as a means of exploring parts of a cave that are otherwise inaccesible. Using ropes, ladders and the equipment associated with them requires specific knowledge that is best learned thru experience. More care is required when vertical caving since the margin of safety is less than in horizontal caving.

MUSG emphasizes vertical training and you will have plenty of opportunities to learn what you need to know. A good source of information is Single Rope Techniques, a book in the club library, or ask a member to explain any questions you may have.

Cable ladders are generally made of stell cable and aluminum rungs. They should be kept clean, dry, and be tested before each use. A belay, or safety line is always used when climbing on a ladder. Knowing how to rig ropes, ladders, and belays is just as important as knowing how to climb with them.

Caving ropes are made of nylon because of it's strength and resistance to abrasion. A rope should be tested often, at least every other time it's used, and inspected for damage everytime it's used. Ropes are stored away from sunlight and chemicals as these can damage and weaken nylon. Take care to pad a rope at places where it could abraid, don't step on a rope, and wash it often.

There are many devices used for getting up and down a rope. The descending (or rappelling) equipment you'll see most is a seat-harness attached to the rope using a figure-of-eight, rappel rack, or carabiner-brakebar combination. A caver puts on the seat, runs the rope thru the rappel device, wraps the rope around his/her butt, and walks down the wall. A belay is usually given from below by having another caver provide tension on the rope if necessary.

Ascending is a little more complicated. A seat and shoulder or chest harness is attached to the rope in three places by special knots or mechanical equipment designed for the purpose. The two most popular knots are the prussik and helical. With no load these knots will slide easily up the main rope, but when weight is applied they grip tight enough to support several times a persons weight.

Gibbs and Jumars are the most frequently used mechanical ascenders among cavers. Both use a cam to grip the standing rope when weight is applied downward. When the Gibbs or Jumar is lifted up the main rope the cam releases it's grip and slides easily until a downward force is applied.

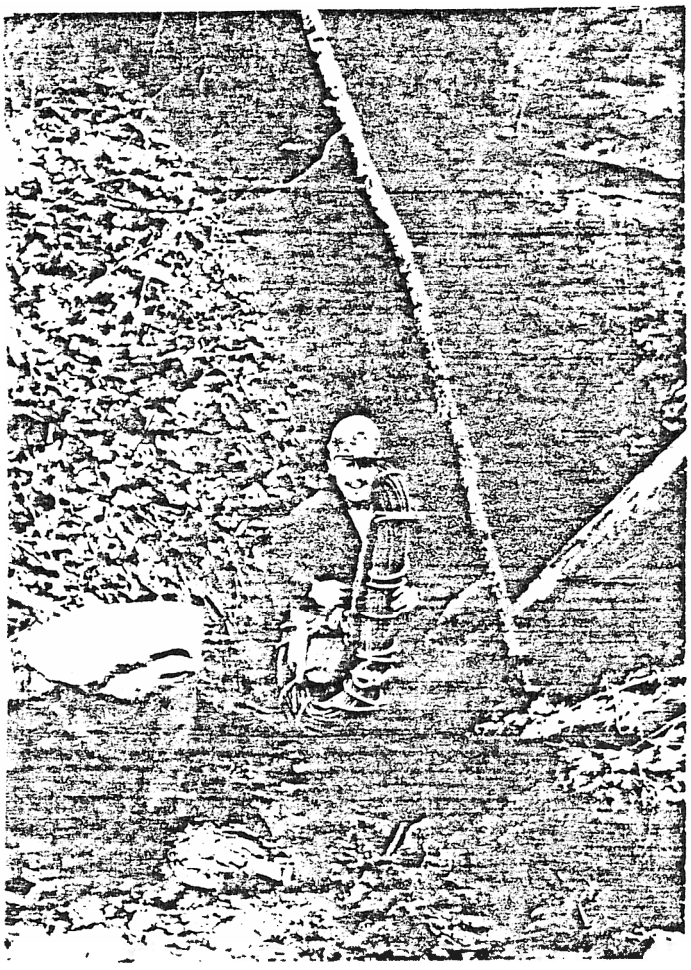
Many different systems are used to attach the caver to the climbing rope via these mechanical devices. The most commonly used is the Gibbs ropewalker where three Gibbs are used; a foot Gibb, a "knee" Gibb that is actually attached to the other foot and the seat harness, and a shoulder Gibb also attached to the seat. Most of the climbing is done with the

the foot and knee Gibbs with the shoulder acting as a safety or for resting.

The Cuddington System is a versatile method using three Jumars and an ascender or chest box. One Jumar is connected to the seat, and one to each foot. Climbing is done with the two foot ascenders or a foot and the seat, running the climbing rope thru the chest box. When the lip is reached, the long foot Jumar is clipped onto the rope above the lip and frees the rope from the chest box, thus taking the weight off the rope below the drop.

A simple knot rig uses three ascending knots (prussik or helical), one to each foot, one to a seat or chest harness. Climbing is done by alternately moving the foot knots up the rope while the seat or chest knot "rides" on the long foot knot acting as a safety.

These are only three of many systems and variations that exist for getting out of a pit. A lot of detail has been left out of this article; before designing your own system you should consult a MUSG member or read thru Single Rope Techniques and the chapters on vertical caving in American Caves and Caving, both of which are in the club library.



BELAY CALLS

The following belay calls were approved in the spring of 1970 as the standard calls for the grotto. An attempt was made to agree with the MIT Manual when possible, but in case of conflict, the calls on this sheet will be used.

When tossing a rope down a drop:

"ROPE" (wait for answer)
"CLEAR" (People below are out of way and rope may be tossed)

Rappeling:

"ON RAPPEL" (rappeler ready to start rappel)
"BELAY ON" (belayer is ready for rappeler to start)
"RAPPELING" (rappeler is starting to rappel)
"DOWN" (rappeler is on bottom)
"OFF ROPE" (rappeler is no longer on rope, next person may rig in)

Prussiking:

"OFF ROPE" (prussiker has reached top and is no longer rigged into rope)

Climbing: (ladders and other climbs with overhead belays)

"READY" (climber is ready to start ascent or decent)
"BELAY ON" (belayer is ready to belay the climber)
"CLIMBING" (climber is starting the climb)
"CLIMB AWAY" (final confirmation by belayer)

"TENSION" (climber wants support of rope for a manuever where he thinks he might fall)
"SLACK" (climber wants some slack in the rope)
"UP ROPE" (climber wants belayer to take up slack in the rope)
"FALLING" (climber has fallen)

"OFF BELAY" (belayer no longer needs belay)
"BELAY OFF" (belayer no longer assumes responsibility for climber)
"OFF ROPE" (climber is no longer rigged into rope)

Others:

"ROCK" (a rock or other object has been dropped down the drop
"EQUIPMENT" (equipment will be sent down the drop. One should wait for a reply of "CLEAR" before sending it down.)

All other talking, by both the climbers and the rest of the party, should be kept at a minimum; especially where echo or sound absorption by mud, etc., makes communication difficult.

Useful Knots For Caving
(text and pictures by VPI Grotto)

The Overhand Knot

The overhand knot is the most easily tied knot and its simple form is a part of many other knots. The overhand is primarily used, alone or in pairs, to back up more complicated knots, in order to insure against slippage and tying errors in the more sophisticated knot. In this role, it is greatly preferred over the commonly used two half hitches because it is more secure, less bulky, and may be tightened snugly.

When used as a backup, two forms of the overhand emerge the inside and outside overhand knots. The inside form should be used because it is more secure, compact, and symmetric. Note with the inside overhand knot, how the two ropes lay parallel to each other, except within the knot itself. When using the inside overhand as a backup, tie the knot snuggly against the first.

By itself, the overhand knot is sometimes used as a stopper (or terminal) knot, in various capacities. But in this use, the knot may jam and is untied only with difficulty after loading, often injuring the rope fibers. A figure eight knot on a bight is a much better alternative.

The Square Knot

"There have probably been more lives lost as a result of using a SQUARE KNOT as a bend (to tie two ropes together) than from the failure of any other half dozen knots combined. If tied with 2 ends of unequal size, or if one end is stiffer than the other, it is bound to spill."

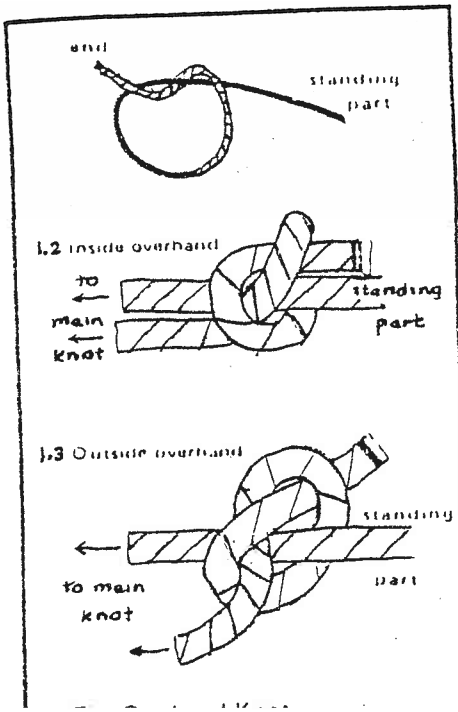
The Ashley Book of Knots *pg. 258*

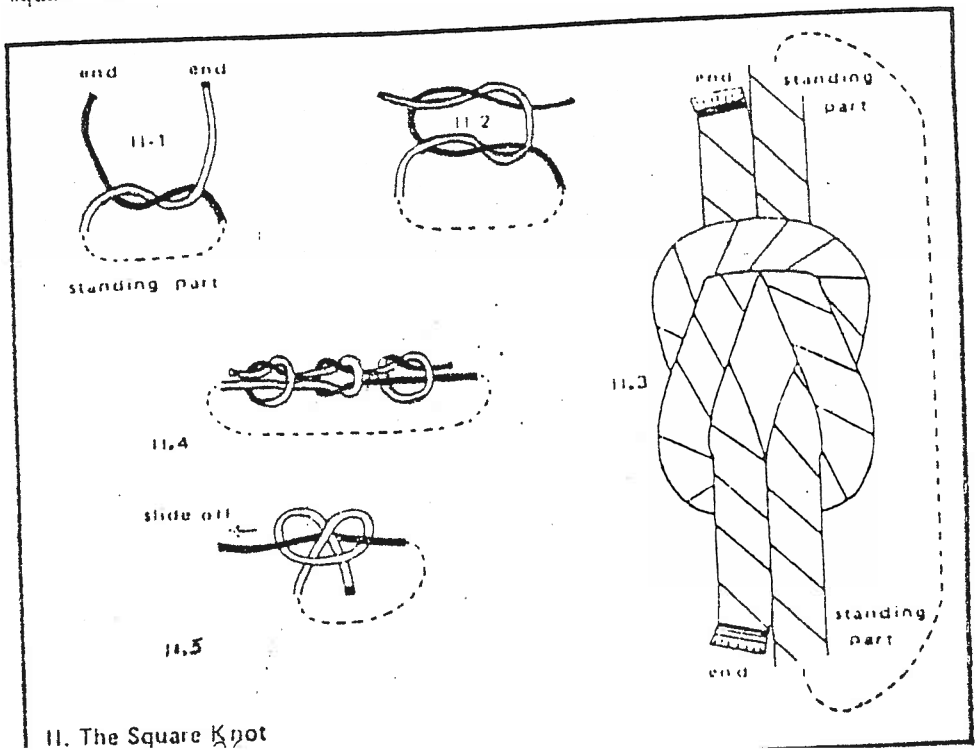
The square knot is a binding knot, frequently used to tie the two ends of a piece of 1" sling together when tying a "swiss" seat. It is a simple knot admirably suited to tying up bags, rolls, etc., because it can be tied and tightened with both ends at once. Also, the square knot is easily untied or spilled even when tightened very snuggly. But Clifford Ashley's warning must be observed. NO free standing square knot (as might be tied in webbing to form a loop) should be relied upon.

The square knot consists of two overhand knots tied on top of each other in OPPOSITE directions. Thus the square knot is generally tied by pulling the first overhand tight (II-1), pressing the overhand with the thumb or finger to keep it from slipping, and then tying the second overhand (II-2) in a direction OPPOSITE from the first overhand. Tightening with the ends will form the square knot (II-3 -. A simple way to remember how to tie the knot is the phrase "right over left, left over right." The square knot is securely backed up by tying one or more inside overhand knots (Rope Tricks I-3 around each standing part with its respective end (II-4) and snugging the overhand knots against the main knot.

Note the form of the square knot both ends are on the same side of the knot and each end emerges parallel to and beside its standing part. It is important to learn how each knot appears in its final form so you may check for tying errors in your knots, as well as those of others. If both overhand knots are tied in the same direction, a granny knot results—one of the least secure knots known!

A square knot (II-2) which has tightened may be untied from a rope by pulling one end away from its own standing part (that is towards the other end) with a hard jerk. The square knot will capsize into a distorted ring hitch (II-5), which may be easily untied or merely slid off the other end of the rope. Knots in webbing are most easily untied and are more secure when the webbing bears a minimum of twisting and generally lays flat against itself within the knot.





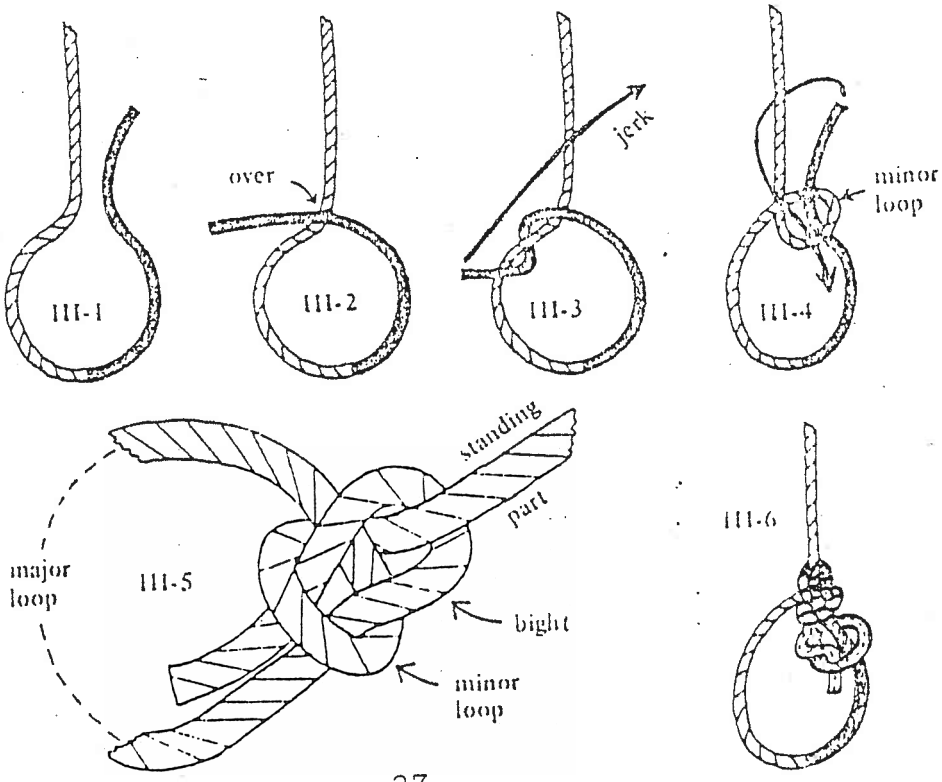
II. The Square Knot

The Single Bowline

The single bowline creates a non-slipping loop at the end of a rope. It is the most basic member of a family of knots, including the double bowline, bowline on a bight, triple bowline, and bowline on a coil, which are easily untied after heavy loading, even when muddy or wet. The single bowline is used to quickly tie a rope around your lower ribcage or other bowline during a time of urgency and stress. After mastering the single bowline using both hands, every caver should learn to tie the knot, quickly and confidently, using either hand individually, in total darkness under stress. This ability is only important in unstable, rapidly changing situations when it could save your life. The single bowline is also used to backup many hitches, as will be seen in future "Rope Tricks." The single bowline is not used as a main rigging knot here a double bowline is stronger and more appropriate. Neither is the single bowline recommended for tying a climber in, when preparing for a belayed climb the bowline on a coil is a much safer alternative.

Figure III shows the single bowline being tied around your body, as it would appear if the rope passed behind your back from left to right. Holding the page up to a mirror will present the view as if the rope ran in the opposite direction. Turning the page upside down will show the knot as if it was being tied around an object in front of you.

To quickly tie a single bowline, first arrange the rope around your body as in III-1. Taking the end in the right hand, pass it OVER the standing part (III-2). With the same hand, form an overhand knot (III-3) and distort it with a quick pull to the right, forming the standing part into a minor loop around the rope end (III-4). Pass the end under the standing part and down through the minor loop (III-4), pulling the end tight; a single bowline knot (I 2, *NSS News*, June, 1976, pg. 115), which lies in the same plane as the minor loop and is snugged tightly against it. Note that the end (III-5) is on the inside of the major loop; no other end position is acceptable. In any use, the loop should never be stressed by itself (without loading the standing part), and the rope end used to tie the single bowline should never be loaded. Either practice can deform the bowline, causing it to fail. The bowline is easily untied after loading, if the bight is first pushed down the standing part of the rope for a short distance, loosening the knot.

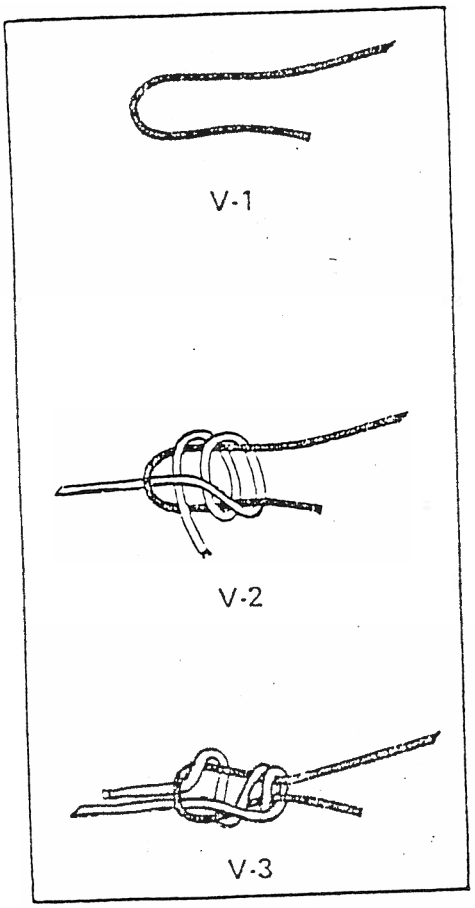


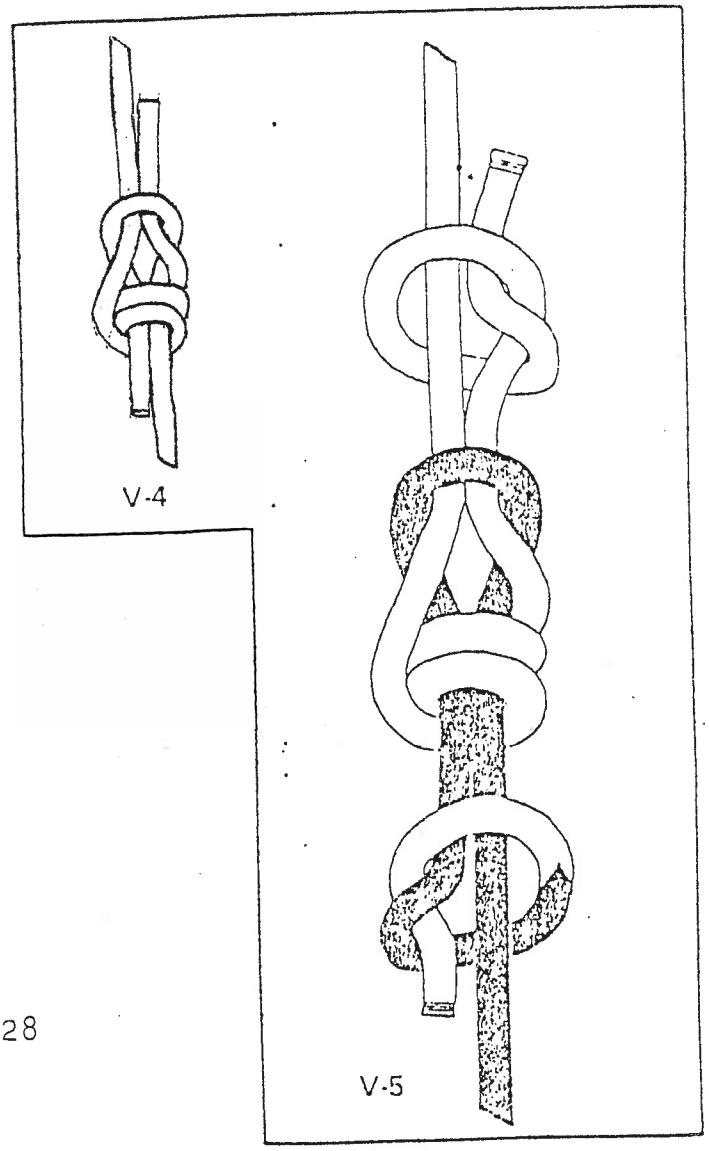
The Tucked Double Sheet Bend

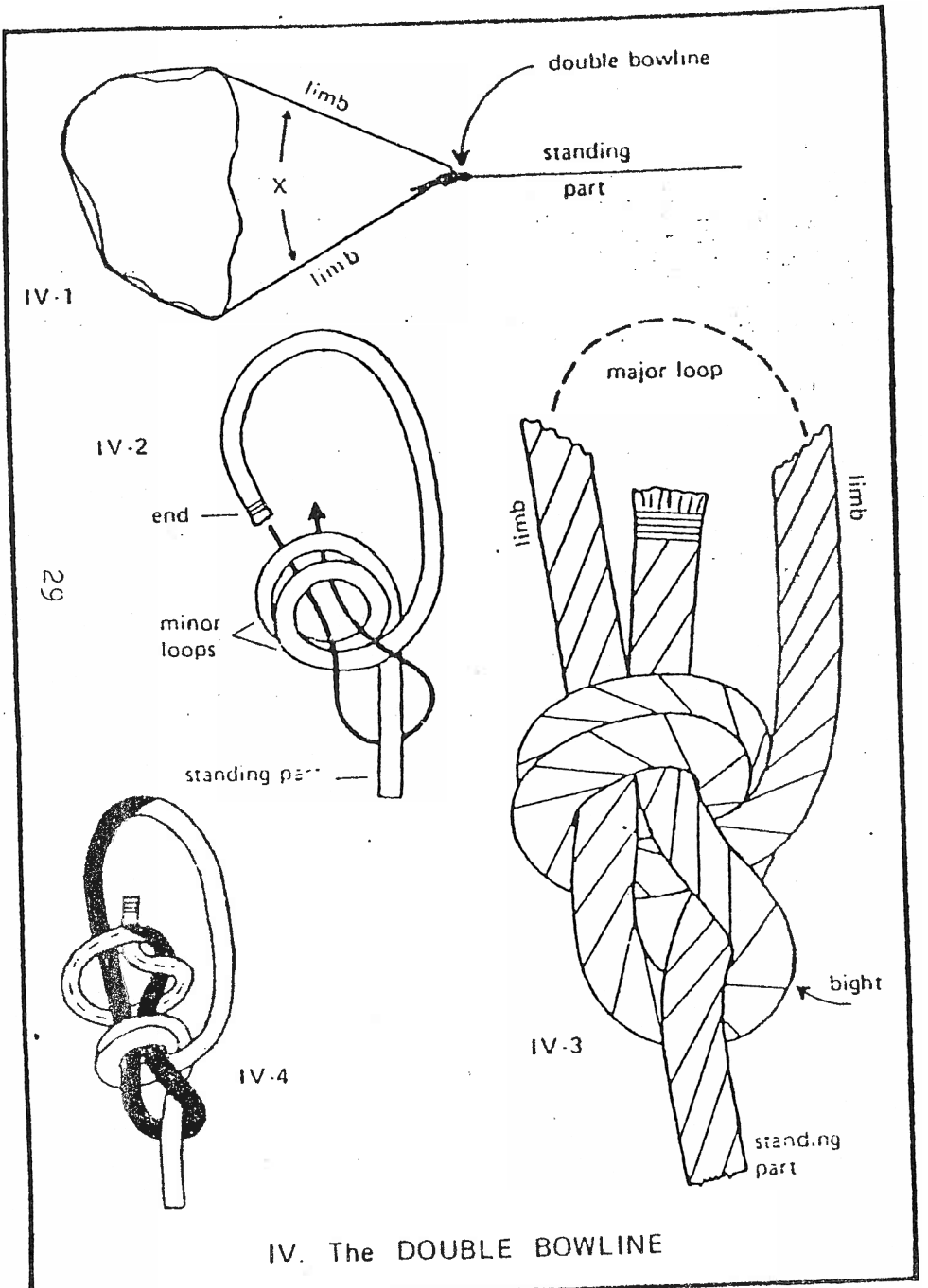
A knot which is used to join two ropes together, in order to make a longer rope, is called a BEND. A bend which is used in caving should be fairly compact and capable of being untied after heavy loading. The bend most generally applicable to caving is the tucked double sheet bend which is strong, secure, and simple in form. (Simplicity is important in order that tying errors may be easily recognized; the complex appearance of the carrick bend with its many crossings, for example, is such a negative feature that the knot cannot be recommended for general caving use.) The double sheet bend may be safely used to join ropes of similar or dissimilar size or flexibility.

To tie the tucked double sheet bend, first form a bight (as in V-1) in the end of the thicker or stiffer rope. (If the bight is formed in the smaller or more limp rope an insecure knot will result.) Pass the end of the second rope through and twice around the bight, passing the end beneath the second rope each time as shown in V-2. Both ends should appear on the same side of the knot at this point and the form of the knot should be checked. The resulting double sheet bend should be tightened somewhat and the end of the second rope passed around the bight again and tucked through the bight parallel to the standing part of the second rope as in V-3. This forms the tucked double sheet bend which will appear as in V-4 when worked up and tightened properly. Tucking the end of the second rope enables secure inside overhand knots (*NSS News*, June, 1976, pp. 115) to be tied in the ends of both ropes in order to back up the bend, as shown in V-5. The inside overhand knot cannot be securely tied in the second rope and tightly snugged against the bend if the double sheet bend is used without the tuck.

Undoing the tucked double sheet bend is made easier if the knot is loosened by breaking the bight back and down the standing part of the second rope (in the fashion of the single bowline, Rope Tricks III, *NSS News*, Feb. 1977, pg. 38), after the inside overhand knots are untied.







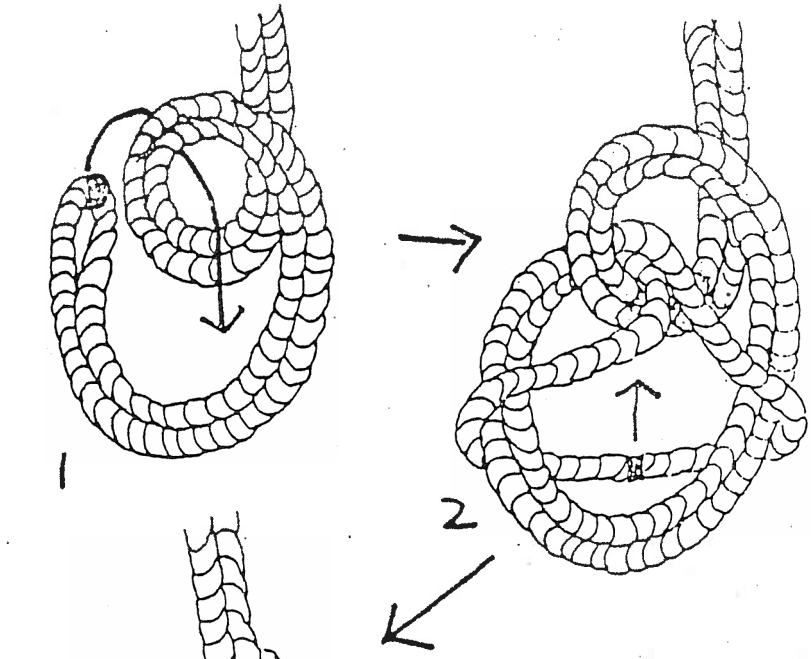
IV. The DOUBLE BOWLINE

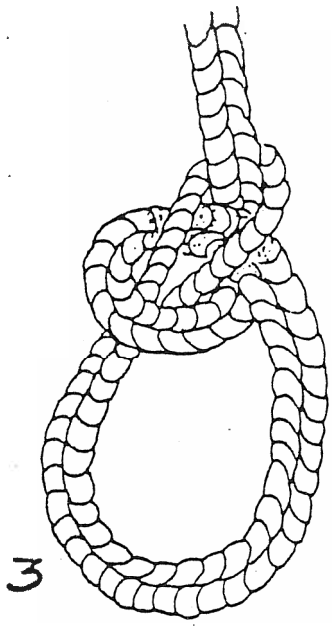
The Double Bowline

The double bowline is similar in many respects to the single bowline ("Rope Tricks III," *NSS News*, February, 1977, pg. 38), but is a stronger and more secure knot. The double bowline produces a nonslipping loop at the end of a rope and the knot is untied with relative ease after heavy loading. These characteristics particularly recommend the use of the double bowline for rigging around large irregular objects such as rocks (carefully avoiding or padding sharp edges). In these instances, it is important that the limbs of the major loop define an angle (X in figure IV-1) which is less than 90 degrees, in order to minimize knot distortion and preclude high tension in the limbs. If larger angles occur, tension in each limb can exceed the load applied to the standing part. Tension in each limb at limb angles of 45, 60, 90, 120, and 150 degrees are 0.54, 0.58, 0.71, 1.00, and 1.94 times the load on the standing part, respectively.

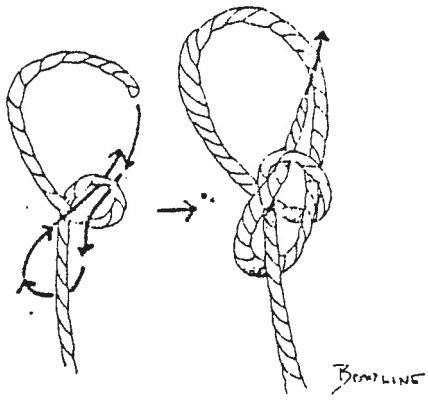
The double bowline also finds appropriate use in forming a rope end loop for rigging into a carabiner. Much better knots, such as the rolling hitch, are available for rigging onto large cylindrical objects, such as trees, though. The rolling hitch (to appear in future "Rope Tricks") not only far exceeds the double bowline in strength, but, unlike the bowline, the rolling hitch can be untied while the standing part is fully loaded – a desirable feature for a main rigging knot. Thus, the double bowline should only be used for rigging around trees when economy of rope is a strong consideration and there is a serious question of whether the rope will actually reach the floor of the drop.

The double bowline is tied by first forming two minor loops with the standing part of the rope, as in figure IV-2, and then passing the rope end up through the loops, under the standing part, and back down through the loops. (Holding figure IV up to a mirror will present the knot as it is tied when the rope runs around an object from left to right.) No knot is secure unless well tightened, and the double bowline is no exception. Carefully work the slack from the minor loops and tighten the knot well by tensioning each rope lead (4) well, as it lays upon leaving the knot proper – the double bowline as in figure IV-3, will emerge. Back the double bowline with an inside overhand knot (1-2, *NSS News*, June, 1976, pg. 115) tied in the same plane as the minor loops, as in figure IV-4, and tightened snuggly against them. The double bowline is easily untied after loading: if the bight is first pushed down the standing part of the rope for a short distance, loosening the knot. The main loop of the double bowline should never be stressed by itself, load should only be applied by a pull on the standing part.





BOWLINE
A BIGH



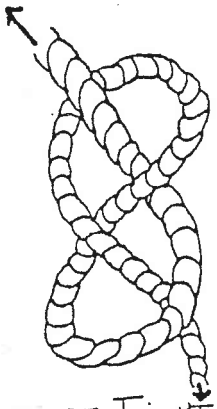
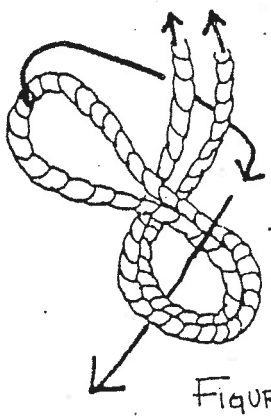


FIGURE OF EIGHT



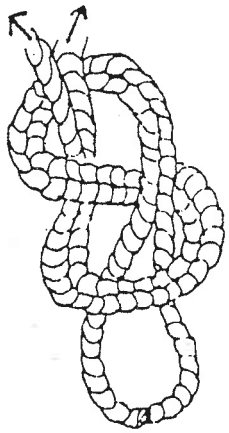
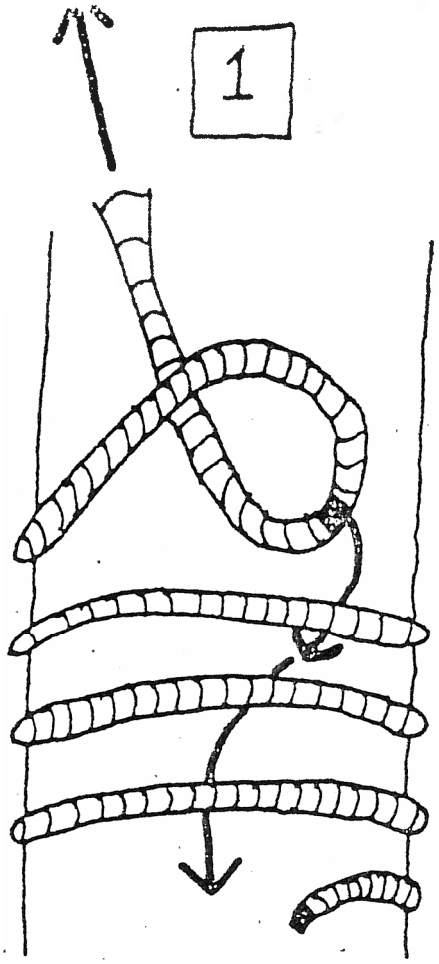
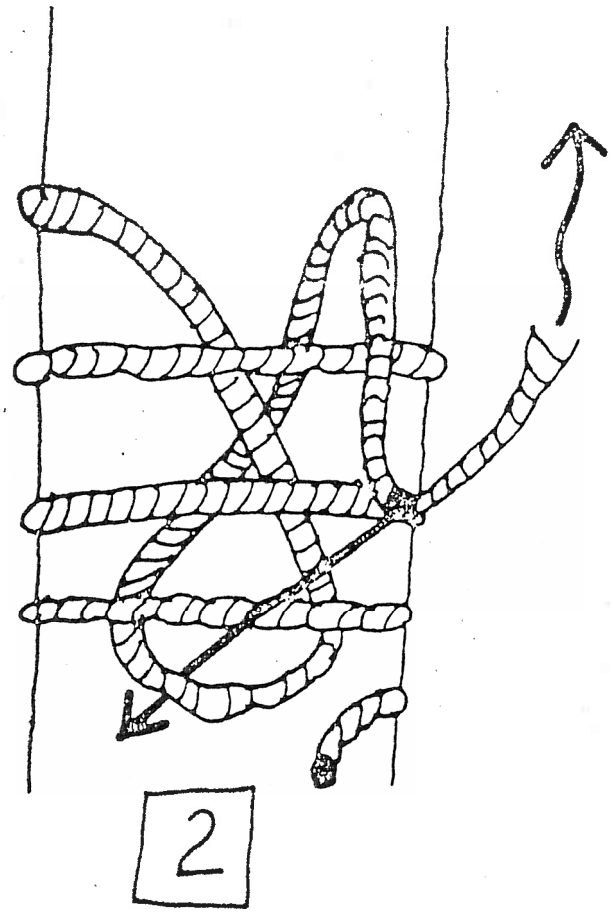
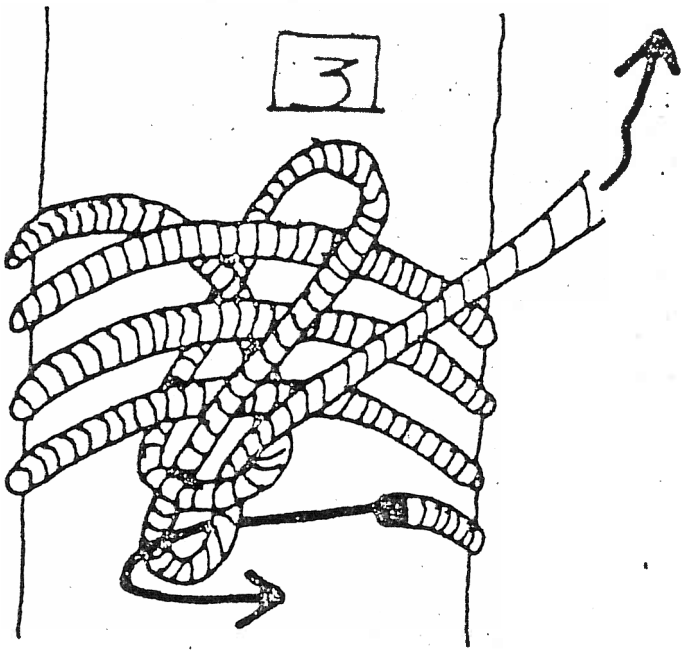
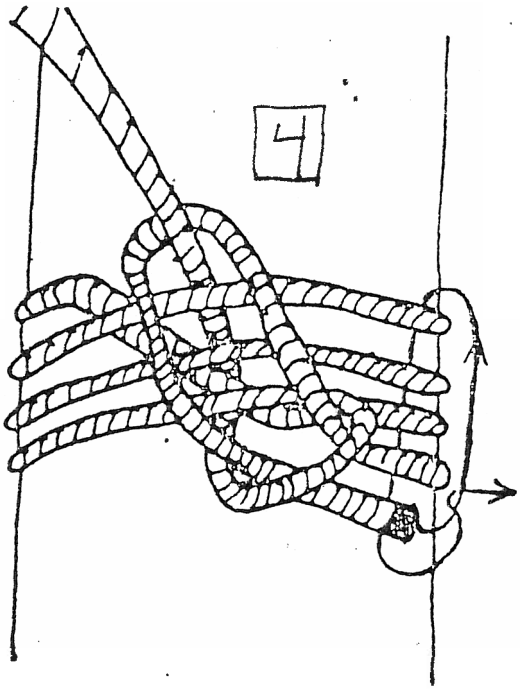


FIGURE OF EIGHT
ON A BIGHT

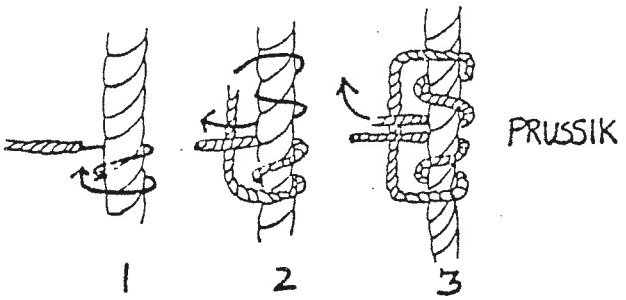




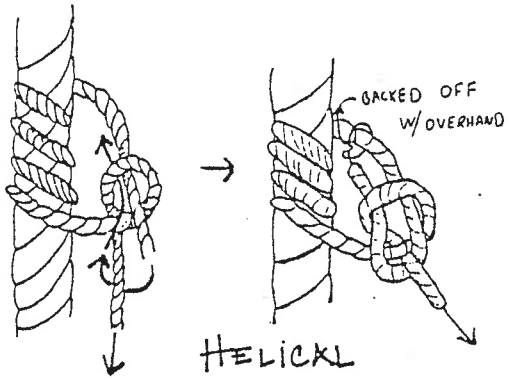




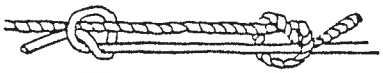
BOWLINE ON A COIL - THIS IS USED TO TIE ONESELF TO A BELAY ROPE. THREE OR MORE COILS AROUND THE BODY SHOULD BE USED TO DISTRIBUTE THE SHOCK IN THE EVENT OF A FALL. SKETCHES ARE SHOWN AS YOU WOULD SEE KNOT LOOKING DOWN AT YOUR CHEST, I.E., YOUR FEET WOULD BE AT TOP OF PAGE. NOTE THAT OVERHAND BACK-OFF GOES AROUND ALL COILS!



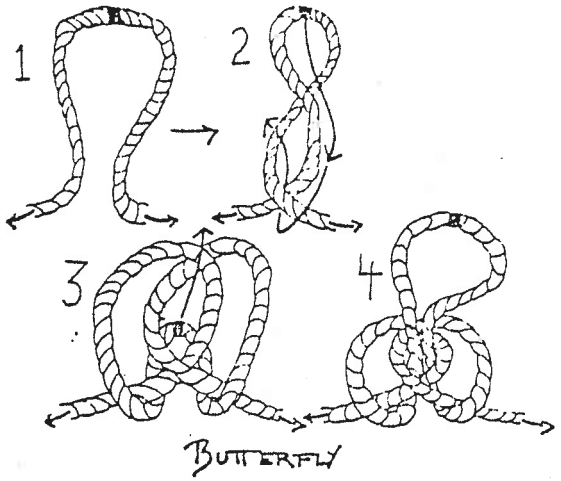
PRUSSIK



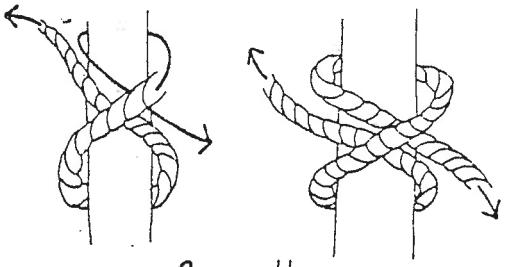
HELICAL



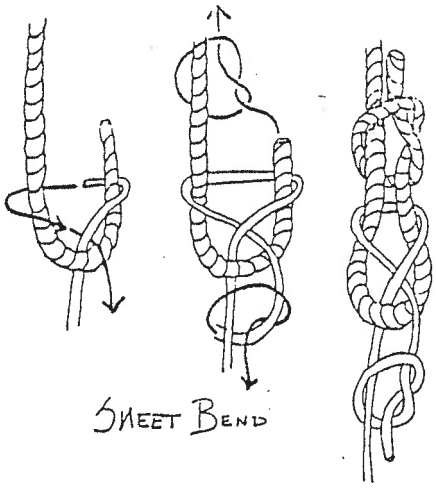
FISHERMAN'S KNOT



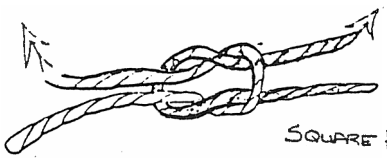
BUTTERFLY



CLOVE HITCH

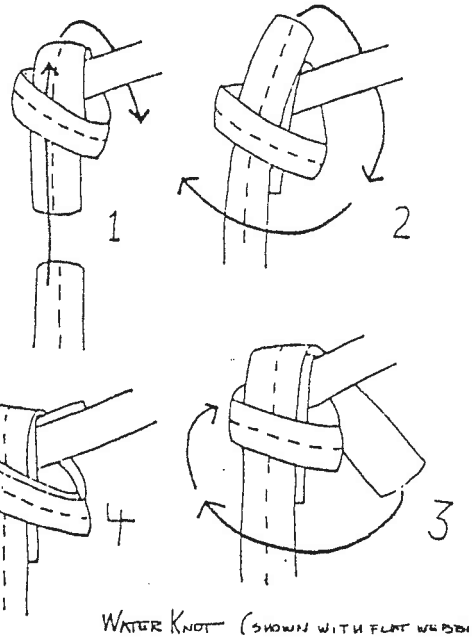


SHEET BEND



SQUARE KNOT

OVERHAND KNOT
-USED TO BACK-OFF ALL KNOTS!



WATER KNOT (SHOWN WITH FLAT WEBBING)

RESCUE AT BOWDENS--FOR SURE

On February 26 and 27, Mike Artz, John Eckman, Kelley Price, Dave Deland, Keith Culley, Tom Donaldson, Vicki Liddle, and myself attended a cave rescue seminar and training session sponsored by the National Cave Rescue Commission. On Friday night, Kelley and I had a great time m...ing out in Mike's car with Tom and John. It was an average road trip, with customary stops at Germany Valley (which looked incredible in the moonlight) and at that poor church that always gets urinated on. We decided to sleep in the PSC Fieldhouse for the night. We encountered a family of deer on the road to the fieldhouse and one of them freaked and ran into the side of Mike's mudmobile, Our anxiety was quickly relieved when we saw that it had run away. We finally reached the fieldhouse and continued our party with Dave, Vicki, Bob (the dog), Ed Ricketts and some friends of his. They were there preparing to do a bat study of Trout. After tiring of caving stories and beer, we crashed for the night.

We woke up on Saturday too early by my standards. But, we had to do this in order to have time for breakfast before the 1½ hour drive to Elkins, WV. Once in Elkins, we found the elementary school where the seminar was being held with no difficulties. Amazingly, we were on time, maybe even early, but it didn't matter because other expected people were late. Anyway, the program finally began with doughnuts and much needed coffee. The first part of the session was a lecture about basic first aid. I think I was the only one who took notes at this part. Even if you're not preparing for a rescue, first aid may be important if one of your caving group members becomes injured.

The next part of the seminar was a "hands on" experience for applying splints, proper methods for checking body injury, and cutting clothes, preparing the stokes litter (a basket-like stretcher) and the victim for extrication and a basic lesson about the supplies in a complete firstaid kit. There was also a vertical set up that got into some very technical (I thought so anyway) techniques. The workshops were the best part of the session because we didn't have to sit on the elementary child-sized cafeteria seats. And it was quite informative indeed.

After the session was over, we went back to the fieldhouse for the night. This was easier said than done. We met John Ganter at the seminar and he said he'd come along with us. So, in order to save on gas, John and Vicki left their cars at Alpine Shores Campground (sight of OTR) and we all piled into Artz's fartmobile. Yes, all of us: Mike, Vicki, Tom and John E. were in front, and Dave, Kelley, John G., Bob and I, laying across them were in the back. We got to the fieldhouse after much laughing and groaning and ate dinner. After a beer, it was off to bed to rest up for the big day. Sunday there was going to be a mock rescue in Bowdens Cave. All of us MUSGers (minus Vicki, Dave and Bob who roughed it in a tent) slept in the same room. We were all unable to sleep

for the longest time, and we ended up telling each other the more juicy parts of our personal lives.

We woke up Sunday, again too early, and piled into Mike's car (same seating arrangement) and went to Bowdens. The mock rescue began with the fifty or so participants splitting off into two groups: one for the stream course and one for the non-stream course. Dave, Tom, John E., and myself went on the latter one. In order to save time, the NCRC people told each group where the victim was (this info, of course, is rarely known on a real rescue). We found her laying on her back in a breakdown room that had many dripping stalactites in it. John and Mark (from Nittany Grotto) did the preliminary medical survey, wrote down the necessary information and then Tom and I tool this info and (theoretically) brought it to the surface. Most of the others, including myself, prepared the litter for the extrication. Our patient was a guinea pig for an experiment to test out an anal hypothermia thermometer. Needless to say, she was very uneasy about this. I, being the only female in the area at the time, offered my support to her. She later told me that I really helped her a lot. In the mean time, a crew of people were going back through the cave to determine the route we would take out with the litter. This is a most important job, for if done incorrectly, much time can be lost and this can have some very negative ramifications for the patient. Once the litter had been prepared for extrication, we attempted to move the patient into it. We did this with some difficulty, but we were finally ready to bring the patient out of the cave. At this point, the NCRC instructors stepped in and showed us many things that we could ahve done differently. They did the whole procedure from finding the victim (who was Tom now) to putting him in the litter in twelve minutes. It had taken us one hour.

We transported the litter through the cave, mostly in the stream, fairly smoothly. We were just about to start the final phase of exiting through the low passages when we had to abort our mission. The other victim on the stream course was having FOR REAL difficulties and the extrication team felt that they might need more manpower at this point. I carried out gear and waited on the surface. Shortly after, the other patient was out of the cave. SUCCESS!

After everyone had changed, we gathered together to talk about our experiences. Then, we each got a card from the NCRC saying that part one of cave rescue training had been completed.

I learned a lot from this mock rescue. Probably the most important thing was learning how to work with others in a rescue situation, which basically means taking orders, being aware of everyone, and knowing your limitations. This article is not meant to be a lesson in cave rescue; it is too simplified. Indeed, the seminar itself was simplified. This article is just meant to make everyone here a bit more aware of the total caving picture. Rescue is a part of that picture, and it can be avoided if common sense is practiced at all times. Remember, I'd rather not have to see any of you in a cave during a rescue situation. Safety first! And happy caving!

-Anna Weimer
MUSG #35

Wild, Wonderful, and Wet!

Mike Reep picked me up Friday night, May 20, for the drive to Seneca Rocks. He didn't feel like trying the DC route so we took the Harrisonburg way, which was good for me because we stopped to see a few friends. Werner's contribution to our weekend was very welcome. So was Vicki's which was munchies and all my caving gear she had been storing.

We finally got to Seneca some time later that night. It really didn't matter what time it was because Bob Carts and Mike Clough (a really neat guy from England) were still up waiting for us. After the usual partying we went to bed.

Saturday it rained. Another typical Seneca weekend. We decided to take Mike Clough on his first cave trip. We headed out to Elk River Valley, home of My Cave and Oil Drum Falls among others. We did Dreen Cave.

We planned to stay in the cave for about 8 hours. It turned out more like 4 because we were wet and miserable. I have never before worn a raincoat to a cave. Elk River Valley, however, was as wet (if not more so) as Seneca. We had to search around for the entrance. I almost wimped out--there was a waterfall gushing into the cave! The boys wouldn't let me though so we went in.

We took the left main passage as most of the water from the waterfall was going into the right passage. This proved to be a good choice; this trunk passage was for the most part dry. Bob had brought his camera gear so while he and the Mikes were photographing, I went up a slippery mud slope to find a very wet room. I explored this room fairly thoroughly. Mike Clough was with me now and watched as I checked out a small hole that ended up not going anywhere.

We returned to the others, still posing for shots. Mike Reep had checked out a side passage that led, he said, to a "small dome that drips". I wanted to see it and so pushed the passage also. I came to a 4' pit; at the bottom was a possible passage. I squeezed past a protruding rock in the pit and got to the small hole in the floor. I struggled through it only to find myself in the wet room I'd already discovered. I should have looked closer at the ceiling of the small hole I had checked.

On our way out (Mike Reep and I were getting chilled), we looked down a dome pit that would be good for a cable ladder (if the club had one). We estimated its depth at 25-30 feet. It was too wide so no one tried to downclimb it. It did look inviting though and I plan to explore it in the future.

Since we had begun moving again, we got warmed up. A mutual "Let's check out the other side of the cave!" made our decision. The right branch as it is officially known, was a lot wetter than the left. Much of this was due to the waterfall gushing into the cave. A stream flows through most of this section. There is also a lot of breakdown here.

We stopped often to wait for Bob to take photographs. Mike Reep found a small pit, probably 10-12 feet deep which I agreed just may be something. We planned a future trip with a handline to check out what, from the top, looked to be passage at the bottom. I didn't want to go down it then because the walls were a bit far apart for me to chimney and I was covered with mud by this time.

We exited the cave after approximately four hours. Mike Clough heartily agreed that caving is great fun. I felt that this cave trip was an expecially good one because I had planned to get wet and muddy and I did!

After another wet night (we camped near Oil Drum Falls) we headed back to Seneca to drop off Bob and England Mike. Mike Reep and I then had an uneventful drive back to D.C.

Meredith Hall
MUSG #9
NSS #21477

HISTORY OF THE CLUB

Once upon a time a group of fellows got together and went caving in Hellhole. Mass quantities of favorite substances were consumed, etc. and upon exit and while lying in an open field, one of the guys, Bob Carts, had a vision while staring glassy-eyed into the oscillating blue sky above him. A vision of a cohesive group of people, a group of people with common activities and goals, activities and goals that need to be shared with other people. On that day in 1978 our club was born. What a fairy tale its been too.

In 1979 our club was chartered as a grotto of the Nss. For several years the Outing Club was a chartered grotto and eventually lost its charter because of a lack of interest. Bob Carts was our first chairman. Because of his contacts and congenial yet somewhat obscene (abrasive) personality he was able to get five NSS members out of the JMU population (the minimum for a grotto). Since I wasn't around in 1979 I don't know much about what happened but there was a tight, closely knit group of MUSGers caving at the time. Some of these people were Bob Carts, Jaime Reep, Blaise Barry, and Fred Heerbrandt. We use to have great parties in Bob's room in Gifford Hall.

In the fall of 1980, Meredith Hall, Paul Clifford, Mike Balenger, Brooks Bozman, Cindy Schroer and I came along (many others but I forget names). The club membership was soon close to 20 active members. We had caving trips every weekend. Most notable were several trips to VPI to Clover Hollow, Newberry-Banes, and Pig Hole; a marathon 30 hour trip to Simmons Mingo and countless other excursions to WVA caves. Everyone gathered at Jaime and Katie's place on New York Avenue for parties. We had a great time.

In 1981, I was elected prez and held that position for 2 years. We were recognized by JMU and our membership grew to about 40 people. Somewhere in that time Bruce Beard, Gary Rodgers, Bob-bob Ebaugh, Kelley Price, Anna Weimer, Dave Deland, Patti Barnes, Anne Durica, Susan Shaw, Zach Krasner, Craig Snyder, Vicki Liddle, Tom Allin, and Art Kohn came into the scene.

There were several trips to Kentucky to Roppel Cave (may we always remember it as Roppel). Friars Hole also.

Spring Fling and Fall Ball and Banquet and Pit Roast became official club functions (they are great for seeing old friends). Who could forget Lee Sattler getting wasted on grain at Fall Ball. Or Mike Reep and his case of JACK at Spring Fling.

In 1982, MUSG hosted Fall VAR at Massanutten Caverns and it was a great success albeit a little cold.

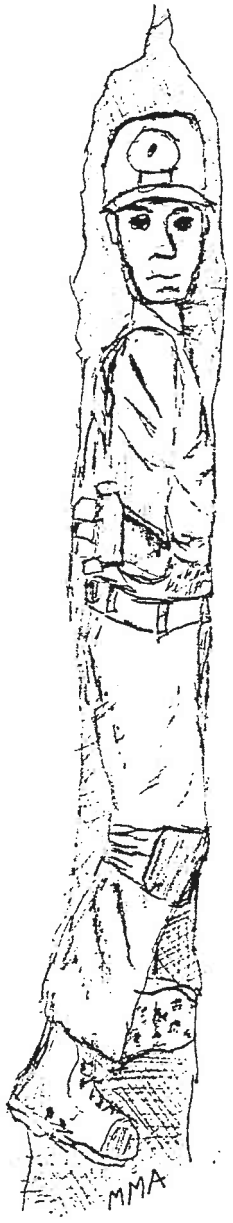
1449E, Squire Hill, was the party spot for 2 years. When we moved out our deposit was kept because the rug was trashed from all the beer and cigarette stains.

In 1983 Dave Deland was elected chairman. Caving started moving into other states. Several of us helped PSC start resurveying Simmons Mingo. Ellisons was invaded and we dropped the 586 foot pit. A few of us met in Yosemite National Park and did some intense rock climbing.

In 1983, the club started its first major project--the survey of Glade Cave. That was finished within 6 months and we began surveying 3D Maze and Mad Steer Cave.

In 1984, Kelley Price was elected chairman. This year has been fiarly active. 3D Maze and Better Forgotten are current surveying projects. Membership requirements have become stricter. It's harder to join now but we can look forward to more competent cavers. Several MUSGers lived in Yosemite for the summer while others went to the National Convention in Wyoming. It looks like this year will be another one to look back and say "Yeah, we really did accomplish something". We certainly have, may it continue!

Mike Artz
MUSG #10
NSS 19309



SPELEORATA

CAVE SOFTLY AMID THE PRETTIES AND NASTIES. AND REMEMBER WHAT PEACE THERE MAY BE IN RAPPELLING. CIRCUMBENT UGLY STREAM CRAWLS UNLESS YOU ARE TRULY MASOCHISTIC. CARRY FIRST-AID. ENCOURAGE MEMBERSHIP IN THE NSS, AND WRITE FOR THE PUBLICATIONS THOUGH CAVE POLITICS BE FOR TURKEYS. IF A PERSON APPEARS IN DOUBT OF WHO HE IS, HE MAY BE A SPELEOPOLITICIAN. BEWARE. CONSIDER THAT IF TWO RIGHTS AND A WRONG GO TO A DEAD END, A RIGHT AND TWO LEFTS MAY NOT GET YOU BACK TO WHERE YOU REMEMBER. WHENEVER POSSIBLE, USE SUUNTOS INSTRUMENTS. BE COMFORTED IN THE FACE OF RISING STREAMS AND SUDDEN ROCKFALLS; SOMEONE WILL COME TO GET YOU OUT IN FOUR TO SIX HOURS. STRIVE NOT TO EAT CAVE CREATURES, DEAD OR ALIVE. REMEMBER ROPPEL, AND KEEP IT HOLY. EXERCISE REASONABLE CAUTION, EXPECIALLY IN VIRGIN TERRITORY. KNOW NOT NO KNOT, AND KNOW WHAT KNOT TO USE WHEN. BE ASSURED THAT PUSHING WET SUMPS BY CARBIDE LIGHT OFTEN LEAVES YOU IN THE DARK. THEREFORE, ATTEMPT NOT NAKED THE "GRIM CRAWLWAY OF DEATH."

SURRENDER GRACEFULLY THE THINGS OF YOUTH: SOLVENCY, SOBRIETY, MORAL MAJORITY, AND KEEP NOT YOUR GORP IN PLASTIC BAGS. BE HEARTENED AMID IMPENDING STARVATION THAT THE STUFF AT THE BOTTOM OF YOUR PACK IS EDIBLE, IF YOU SCRAPE IT FIRST, AND REFLECT THAT, HOWEVER MISERABLE YOU MAY FEEL, IT WOULD ONLY BE WORSE ON A PHOTO TRIP.

YOU, CAVER, PUSH THE LIMITS OF YOUR ENDURANCE, BUT PLEASE CALL IT GUANO WHEN IT STICKS TO YOUR OVERALLS. YOU ARE PRIVILEGED TO GO TO HELL, PROVIDED YOU EMBRACE AGREEABLE POLITICS AND HAVE LANDOWNER PERMISSION. THEREFORE, LEARN TO ABIDE GROTTO FUNCTIONS, PAY YOUR DUES, PARTY (NOT TO EXCESS), LEAVE GATES AS YOU FOUND THEM, AND REMEMBER TO CARRY THREE SOURCES OF LIGHT. KEEP ALWAYS IN MIND THAT CAVING IS AN ACTIVITY PECULIAR TO THE LIVING. BE SAFETY CONSCIOUS, AND ENJOY.

Pat Louden Shorten & Jim Washington
VPI Grotto

MUSG Phone List

NAME	BOX	PHONE	ADDRESS
Foster, Sean	1148	568-5019	
Fox, Tad	1153	568-5563	
Gaidula, Dean	1504	568-5366	
Gaillardetz, Lisa		433-8212	
Giambattista, Mike	1233	434-9745	
Gibson, Nancy	1235	568-5912	
Good, Eddie		434-4086 434-0983	
Grady, Charles		269-2983	Rt. 1, Bos 75 B; Keezeltown
Hall, Maredith		224-9538	11 Locust Avenue; Colonial Beach
Hanshaw, Willie			801 Madison Avenue
Hirsch, Dan	1828	568-7279	
Hirsch, Ted	2098	568-5967	
Horte, Randy	1926	568-4130	
Hoyt, Cliff		433-0612	536 Layman Avenue
Jackson, Andrew		434-1485	449 Eastover Drive
Jackson, Jim	1675	568-7452	
James, Brian	1681	568-4260	
Keller, John	1256	434-9911	222 Campbell Street
Ketterman, Richard		434-0612	Rt. 5, Box 70
Kozlosky, Lewis	1838	434-7572	
LIddle, Vicki & Bob		434-8993	264 D Rocco Drive
Loback, Nancy		433-8212	317 S. Liberty
Mackall, Doug		433-3053	
Martz, Scott	2159	433-2016	
Melton, Mark		433-2816	264 B Rocco Drive
Misenheimer, Eric	2326	568-4817	
Morris, Jim	2904	434-3810	
Mealing, Nancy	5782	433-8611	
Mill, Chris	5492	433-0864	
Owens, Dina	3125	434-8630	
Payton, Tom	2971	434-5834	
Pemberton, Niels W.	2981	433-9189	
Price, Kelley	5576	433-3704	

MUSG Mailing List

NAME	BOX	PHONE	ADDRESS
Amato, Kim		434-5723	1357 S. Main Street
Artz, Mike		434-1370	201 Ott Street
Bain, Tom		434-4614	460 S. Main Street, Apt. C
Baker, Kathy		434-5123	1357 S. Main Street
Bauserman, John	0267	828-6753	Bridgewater
Blair, Gretchen	5048	433-3704	
Blume, Don	L-33	568-6745 434-3540	
Brooke, David	0517	568-7376	
Brunjes, Chris	0562	568-5692	
Burkhardt, Jason		433-1953	Box 139, Rt. 3
Burgett, Eric	0604	568-5535	
Burkholder, Tom	0638	568-4817	
Campbell, Howard		568-6480	
Carts, Vonnie	0719	568-7320	
Clifford, Paul & Sherri		833-2523	
Cogdill, Tammy	0873	434-5794	
Curling, Michelle	5221	434-6943	
d'Andrade, Michelle	1035	434-5794	
Daly, Gretchen	0934	568-4861	
Day, Vincent	1357		
Deland, David	1285	434-1370	201 Ott Street
Dick, Doreen	0983	568-7586	
Dierauf, Andy	0993	568-4746	
Droms, Carl & Yvonne		833-2576	Rt. 1, Box 172; Singer's Glen 113 W Burruss Hall
Durica, Anne		434-8993	264 D Rocco Drive
Eckman, John		433-8445	522 Federal Street
Engbert, Theresa	1283	568-5584	
Estes, Carol	1304	433-2011	
Fay, Mike		433-8212	317 S. Liberty

NAME	BOX	PHONE	ADDRESS
Rickard, Don	3142	568-7547	
Robinson, Terry		434-6943	571 E. Market Street
Romeo, Jon	3378		
Rooks, Garry	3524	568-4139	
Shephard, Jill	3742	568-4813	
Shantz, David		434-1370	201 Ott Street
Shaw, Susan			
Siner, Tom	3816	568-4038	
Smith, Lance	3878	433-1187	
Snyder, Craig		798-1684	307 Arlington Street; Ashland
Staiman, Alan	3611	568-4586	
Vitarelli, Scott			1445 S. Main Street
Watkins, Nancy		433-8998	744 Madison Avenue
Weimer, Anne	3952	434-8333	

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Emergency Services In Virginia	(804) 323-2300	
Sing-out Sheet	434-1370	201 Ott Street

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Well, gang, the phone list is done for another year. . . finally! I hope everyone has a good time caving and climbing this semester and next.

Please be sure to use the sign-out sheet at Dave's, Dave's, and Mike's. This is a very important step before and after you go caving or climbing.

One last note: have a safe year and don't study/work too hard!

Nancy and John