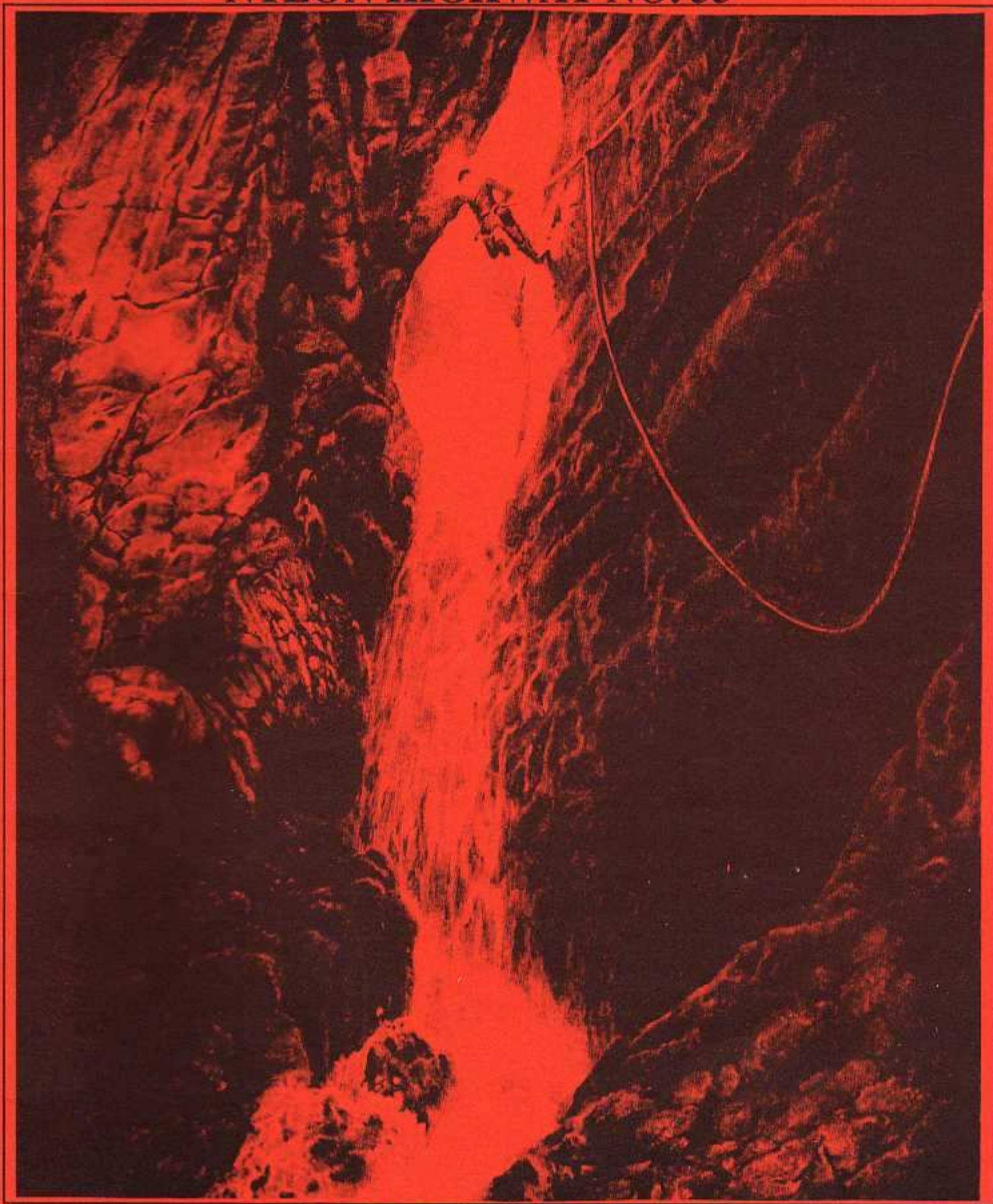


NYLON HIGHWAY NO. 33



...ESPECIALLY FOR THE VERTICAL CAVER

NYLON HIGHWAY

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DUES

Dues for Vertical Section Membership are now \$5.00 for domestic members and \$10.00 for international members. Send all dues payments to Bill Bussey.

THE NYLON HIGHWAY

The **Nylon Highway** is published in a semi-annual basis pending sufficient material. It is the intent of this publication to provide a vehicle for papers on vertical work. All submitted articles containing unsafe practices will be returned to the author. With this issue the Section has over 900 members with a mail out of over 1000 copies of each issue.

OPINIONS expressed herein are credited to the author and do not necessarily agree with those of the Vertical Section, its members or its Executive committee. Reprinted material must give credit to author and source. Some material is designated copy written. Letters to the editor are welcome.

COVER: The final pitch in Dillan Pot, England by Linda Heslop

Dear Vertical Section Members, Thank you for voting me on the Vertical Section Board. Though I have been proxy two times and have always "stood by my man", this is the first time for me to be voted to the board.

Sincerely, Miriam Cuddington.

JANUARY 1991

NO.33

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On the Edge at Bottomless Pit

Ukraine, USSR

by Allen Padgett & Maureen Handler

On June 11 of this year, the American Expedition to the Soviet Union had the chance to do our first vertical caving. Allen Padgett and I were the only ones to bounce the pit. I wanted to write an article about the trip but after reading both our journal entries, I decided the best description was written during our experiences. The following are entries from these journals.

Journal Entry by Allen Padgett

Tuesday June 11

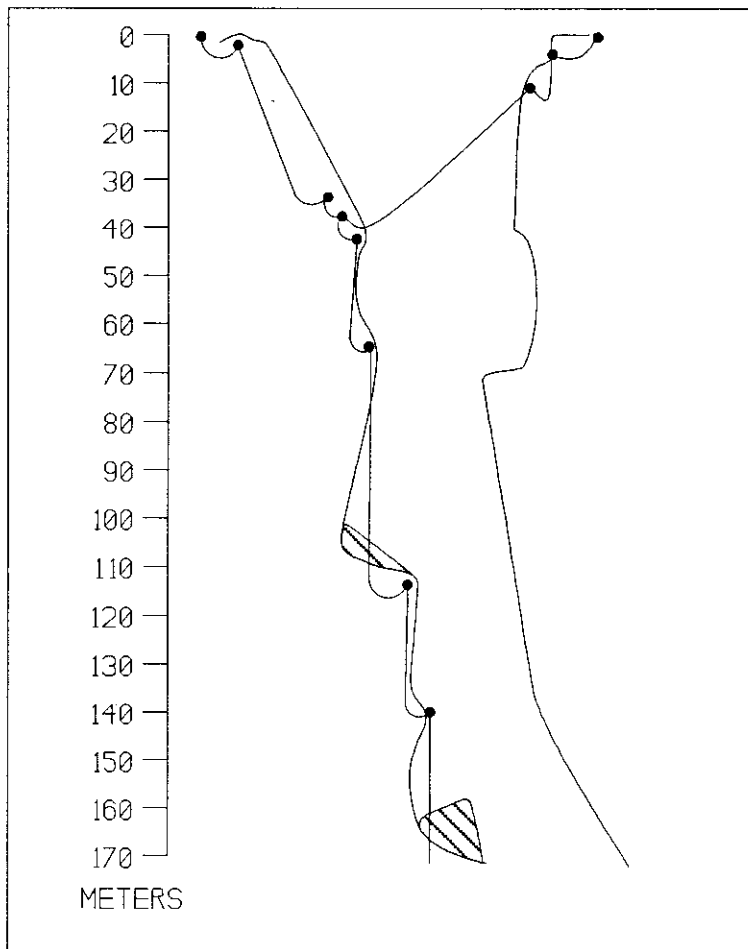
The sun is out and it is a beautiful Crimean day. This morning, we met professor Dublonsky who is a famous karst expert. He led us on a walking tour of the karst plateau. First we drove to the edge of the plateau overlooking a huge forest preserve. The view was like the view of the Smokey Mountains National Park. We hiked at a brisk pace through many sinkholes, near eroded walls of ancient caves and along fault contacts. There were a few small caves, one of which had a poachers shack built just inside the entrance. As we walked on the karst plains, the ground cover was often a low juniper evergreen and I stepped into a small karst hole and scraped my left ankle and leg a good one. OUCH! The hike was a bit longer than planned due to frequent breaks to translate geology information. The planned two hour hike turned into a four hour ordeal.

The end of our walk was Bottomless Pit (Bezdonnyj Kolodetz, 140m deep). We arrive at the large hole at 2 p.m. and have a quick lunch. While we were waiting, two people came out of the pit and they are only slightly damp from dripping water. The Valhalla sized entrance is rigged with a double line 9mm rope that is used to rappel in on. The pit is not a totally free drop. There are ledges as you descend and most of the lower part of the drop is an ice covered wall. Klim, Maureen, myself and Kostia go in. There is a 20 foot high pile of snow and ice at the bottom. Atop this pile is a dead raven. Because of the rappel in on double line, I reversed by rack bars to avoid the wear grooves on my top bars. This does not give me a lot of bar travel distance and the best rope position was off to the left side. Being a bit nervous and unsure of the properties of the Soviet rope, I fed the rope until I was almost on the bottom. The last section was a little drippy for about 120 feet. While Maureen took pictures, we saw some of the chambers just off the pit. It is cold down here. In fact, on top of a small haystack stalagmite, there was a mummified mallard duck that had been there for at least 5 years. Near there was the wrecked remains of a baby carriage. I carry out one of the rubber tires.

Suddenly we hear a loud boom that sounds like a huge rockfall. Maureen scrambles for her life and

we then begin to realize it was a loud clap of thunder. We are relieved and then we realize the drips into the pit are turning into waterfalls. We prepare to climb. The pit is rigged for ascent with a 600 ft. piece of PMI rope using European style rigging consisting of 5 or 6 rebelay. The first rebelay was 120 ft. off the ground. Alexander's son Klim heads up first. Realizing it was going to be a cold climb, I get out a heat pack and place it in the front pocket of my jacket. Our plan was to begin a section of rope as soon as the person above cleared the rebelay. When Klim cleared the first rebelay I started up.

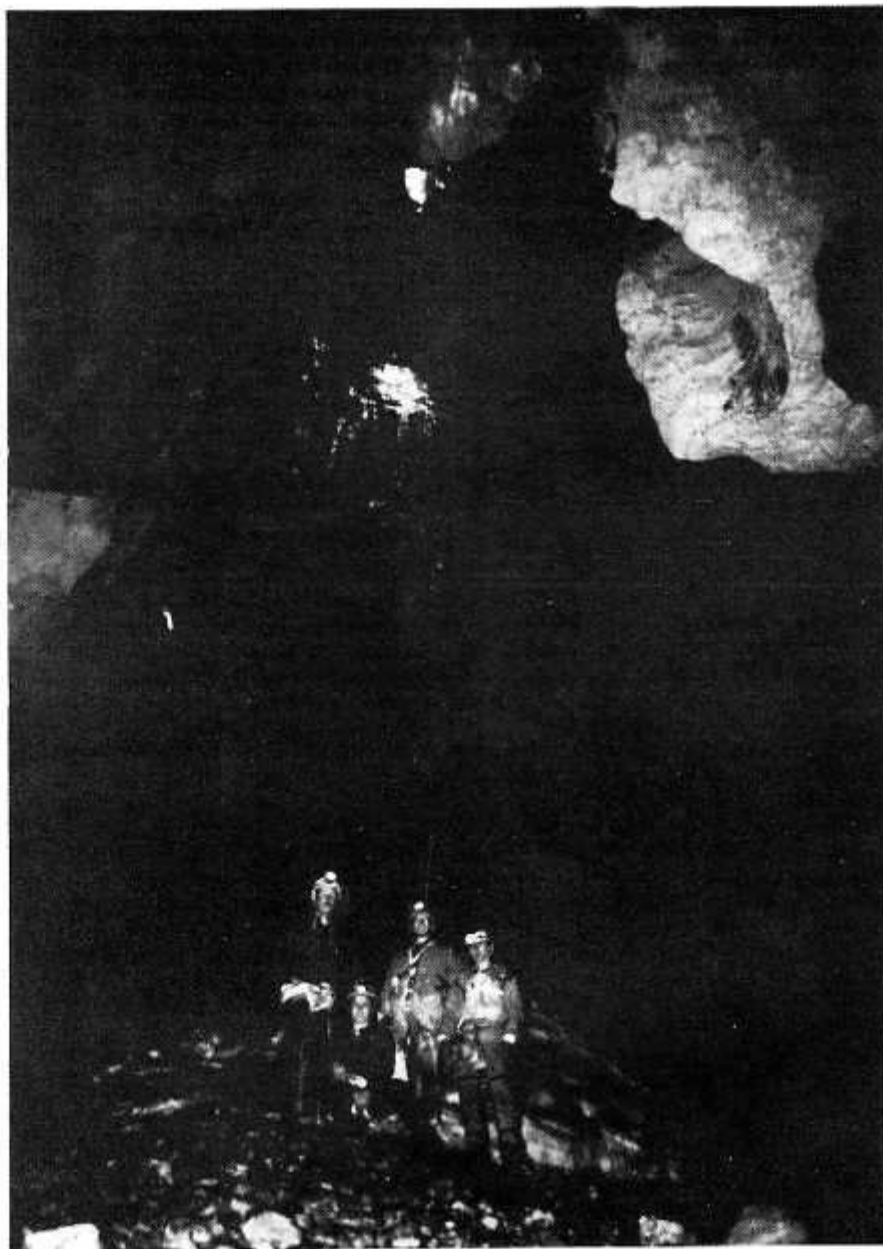
The drip was now a full force waterfall of snow melt. Oh God! The pounding water quickly soaked me to the skin. At one point, I was able to grab the nearby wall and pull myself out of the water. Gathering up my stamina, I climb to the first rebelay as quickly as I could. The bolt was directly in the path of the water and I realize that my hands were so numb already that they would not function. I pushed away with my feet to get my upper body out of the water and used the heat pack to restore



some feeling to my right hand. Realizing it is survival time, I cross the rebelay, carefully double check my rig and realize that I hadn't closed the wing nuts on my chest box. I attach my cows tail biner to my upper Jumar to prevent an inversion and climb. I figured the rope would stay in the box for a while and I HAD to get out of this waterfall. As I come up over the ice wall, I think of Karen and why I must survive.; Because of the water pounding on my hooded head, it is very difficult to communicate with anyone above or below me. T the second rebelay, I can get slightly out of the waterfall. I move carefully because I realize that I am getting colder. I feel Maureen on the rope under me and hope she survives. As I climb hard, I'm getting colder but my hand are not in the waterfall now and more function is coming back. I keep going, I survive. To stop is to die and mite it impossible for those below me to escape. I put the heat pack on the back of my neck and it helps. The upper sections of the pit are much drier except for the rain falling on me.

When I got up into the upper rebelay where Alexander could see me, I could tell he was very concerned. His son had made it out, but his friends were still in a serious situation. When I passed the last anchor point and was off rope it was a truly religious moment. Thank you Lord. I walked up to the truck to get warm and into some dry clothes. Some strong hot tea and the other heat packs began to warm us up. We put the used packs back into the tea pot, recharged them and used them again. Maureen came out in the same condition as I did, she survived. Kostia also survived. Bottomless pit was as close as I've come to the edge in a long time. The Young Lions put on exposure suits to derig and we leave the truck there for them to bring the gear back in. The sun comes out and it's only about a mile back to camp, so we walk. From the field at the pit you can look back up the plateau and see a Soviet military missile tracking station. The walk back got

rid of the stiffness associated with recovering from being profoundly cold. Soon after we returned, the sun started to set in a big red ball. I went up on the ridge across the road from camp and sat and watched it set. As the huge red ball settled, you could see a large sun spot just below the equator on the right side. Everyone returns and we have a huge supper. Afterwards we gather the Young Lions and others and begin to trade gear. Bartering and deal making, we spend hours exchanging gear. It was a wonderful fun time and the gear I got will always be precious and for them, the gear is better than a gift since



Allen, myself, Kostia and Klim in Bottomless Pit, Ukraine

they traded for it. After midnight, we finally run out of gear. It has been a wonderful, frightening, memorable, long day.

Journal Entry by Maureen Handler

6/11 2:30p.m. Top of Bottomless Pit

We finally arrived at the pit after our geology tour of the area through the karst plateau. A geology professor from Simferopol showed up at camp this morning and shortly after breakfast the Institute war wagon drove us up onto the plateau. We walked for the next 4 hours to get to the pit. I'm sure Kim enjoyed the geology field trip but I came here to do pits! Now I'm tired and really don't feel like doing this but I came 6000 miles to do vertical so I'm going down. We have some major clouds coming in so its looking very doubtful as to whether I can even get any photos from the bottom.

6/11 3:30 pm Bottomless Pit

Well I'm now on the bottom of this beautiful pit with Klim and am in a much better mood. Allen just got to the bottom. There was a beautiful ice wall on the way down and a big ice pile on the bottom. There are three ropes rigged. One with rebelay, a 600' PMI. The other is a 9mm Russian rope rigged double rope with a single drop. Allen and I opted for this drop so we wouldn't have to change over. There were hand lines and a traverse to the far side of the pit. It looks like Allen and I are the only two from our group to come in. Kostia is on his way. I will do some photography then head out.

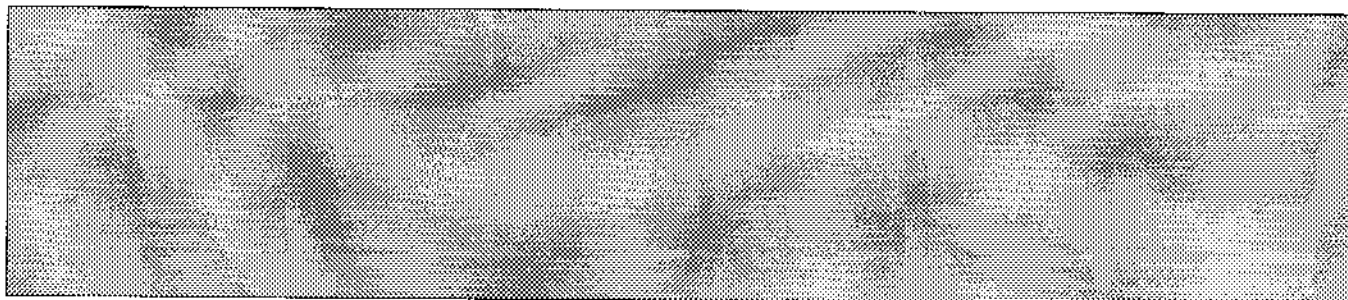
6/11 7:30 pm Crimean Plateau

The adventures just keep on happening. I was taking some photos of the pit, lying on my back shooting time exposures up the pit when I heard an incredibly loud 'boom'. I thought the mother of all rocks was coming down the pit and I was dead meat. I has no time to react! I jumped to my feet and realized that it was a loud thunder clap above the pit. I looked up as it got very dark and the rain really started coming down. The water running off the sheet of ice was probably 35° and it was pouring right down the rope. We had no choice, so we rigged up and started climbing. Since the climbing rope was rebelayed, we could all climb at the same time. Klim started first and when he cleared the first bolt, Allen started after him. I could hear the water pounding off of his rain jacket.

I put on my chest harness and a light rain coat with the roller sticking out through the open neck. This turned out to be a mistake. After Allen passed the first

bolt, I clipped in and started climbing. The water was pouring off the ice sheet and the rope was in an ice cold, raging waterfall. The water ran down the rope, through the chest roller and right inside my rain coat. Inside a minute, I was soaking wet. I couldn't see because of all the water and I couldn't hear Allen or Kostia. I just climbed for all I was worth until I was looking at the knot of the first rebelay. I clipped my safety on the second section and was hanging in the full force of the waterfall. My hands were getting numb and I couldn't get my chest roller undone. My hand were now completely numb and I started thinking if I didn't get past this bolt, I would die here. That thought was enough incentive to get me going again. I finally got my roller past the bolt and was working on automation. All equipment handling was done on visual. I could not feel my hands!!! Finally I was past the bolt!!! I yelled 'one clear' to Kostia and started climbing again. I had to look at my safety to be sure I had a good grip on the ascender. As I neared the second bolt, I was coming out of the heavy water flow. I was right below Allen and I suddenly realized that we had both been on the second section for a while. He cleared the third bolt as I waited. The feeling was coming back to my hands and my fingers felt like they were on fire. They hurt badly but I kept flexing them to keep the blood flowing. I passed the second bolt and climbed across the ice wall. The ice was breaking off in large pieces. It had been weakened by the warmer rain water. I was warming up climbing in the much warmer rain fall. My bungee cord had gotten all tangled so I decided it was a good time to fix it. One more bolt and I was almost out. The last 50 vertical feet I Texased and free climbed. Finally I was out!!!

Alexander gave me a big hug and told me I was the first American to bottom this pit. He and Brian tried to rush me to the war wagon. They were convinced I was freezing. I kept telling them that I was not nearly as cold as I had been 20 minutes earlier. I just needed to stop and catch my breath. Pushing them away, I stopped on the hill side for a couple of minutes as I regained control of myself. The total climb was about 350'. The rain has stopped now and I've got on some dry clothes. Unfortunately, I have no dry shoes here. Some of the others are walking back to camp. I'm waiting in the war wagon watching the sun set while the Young Lions derig the pit wearing dry suits. The sun is a big orange ball on the horizon hidden by a few clouds as the sky clears. It rained only while we were underground. This was so Allen and I could experience real Crimean caving. I'm very ready for a hot meal and a warm bed.



A NEW LOAD DISTRIBUTING ANCHOR SYSTEM

by Stan Friedman and the Colorado Ground SAR Team

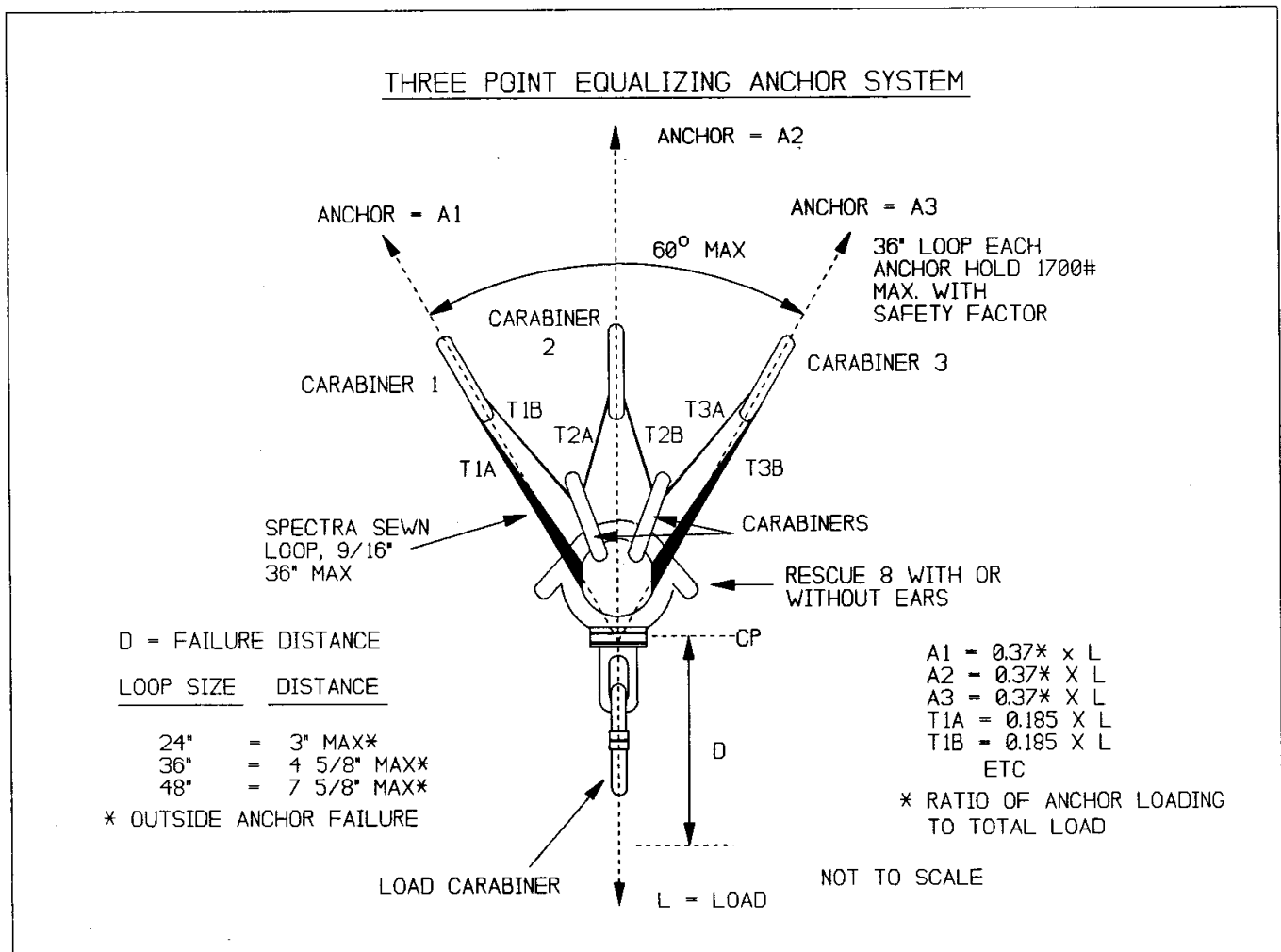
Time to raise your eyebrows and put on your critical thinking cap. A LDA (load-distributing anchor) system is being tested that negates knots, pulleys and rope! It incorporates 36" sewn Spectra runners (6,000#), a Rescue 8 (20,000#) and locking carabiners (6,000#). Spectra slides around the Rescue 8, where rope creates too much friction. Stan Friedman and Colorado Ground SAR Team, Associate MRA, has been developing this system. Keith Schafer, of Springville, Utah will continue testing this and other LDA's.

The Spectra loop is rigged into the Rescue 8 the same way you would rig for a rappel. The loop is clipped into each of three anchors. Next, a carabiner is clipped

onto the loop between each anchor and then clipped down into the large hole of the Rescue 8. A secondary 36" loop clipped into each anchor carabiner and the load carabiner (which is clipped into the small Rescue 8 hole) forms a safety backup.

Reprinted from **Rescue Forum**, Autumn 1990, Vol. 3, No. 1.

John Pelcaux, chairman of the MRA Rescue Technology Committee is interested in comments or tests results of this system. Please send all information to 4620 Hilltop Rd., Evergreen, CO 80439.



BELAY DEFINITIONS

from British Columbia Council of Technical Rescue

prepared by Arnor Larson

Belay - providing protection against a fall by handling a secondary unloaded rope (belay line) in such a manner that it may be taken in or let out as another person(s) climbs, rappels or ascends a fixed rope or is raised, lowered or transported, yet be secure to hold this load in case of failure of the main support.

Self Belay - providing protection against a fall by the person(s) needing the protection moving their adjustable connection point along a fixed rope, that remains without tension until the fall, as they climb, rappel or ascend on a different fixed rope, or are raised lowered or transported by a separate rope system.

Conditional Belay - providing protection against a fall by using a rope, that is already under tension from part or all of the load, to hold the load should failure occur in some other part of the system.

Discussion - As an example, if a rappeller received arm injuries from a rock fall, a "bottom belay" may be applied by another person pulling down on the rope below the rappeller. Assuming that the person at the bottom has not been hit by the rock fall, the belay is still conditional on the integrity of the system above the rappeller. Falls caused by system failures above the rappeller will not be arrested by such a belay method.

Two tensioned rope lowering systems using a conditional belay must be planned so that in case of one rope failing, the remaining rope will be able to sustain the impact force resulting from the first rope's failure.

Conditional Self Belay - providing protection against a fall by the use of a conditional belay that is managed by the person(s) needing the protection.

Discussion - an example is a rappeller using a mechanical rope clamp, hitch of cord or auto-stop descender on the rope that is also supporting him. This is a conditional self belay since if the anchors pull out, the anchor webbing gets cut or the rope becomes severed above the rappeller the belay will be of no service to him.

Auto-Belay - ("Deadman" Belay) - a self activating belay that does not require a positive action to engage it. The term Auto can be applied to any of the 4 types of belays listed above when it is appropriate.

Pseudo Belay - a belay that will not work; that is pretend, counterfeit or false. The term Pseudo can be applied to any of the 4 types of belay listed above when it is appropriate.

The BELAY is > which is:	a totally separate unloaded rope	a rope already under tension from part or all of the load
managed by other	BELAY	CONDITIONAL BELAY
managed by the person(s) in need	SELF BELAY	CONDITIONAL SELF BELAY

NEW PRODUCTS

QUICK CONNECT EFFICIENCY CHEST ROLLER

by R.C.S Metal Fabrication

The following description is about a new chest roller on the market. This is not an advertisement or endorsement for the product. In keeping with the tradition of past issues of the Nylon Highway we present information on new equipment for the benefit of Vertical Section members. The following information was provided by the gear manufacturer R.C. Schroeder.

Safety First

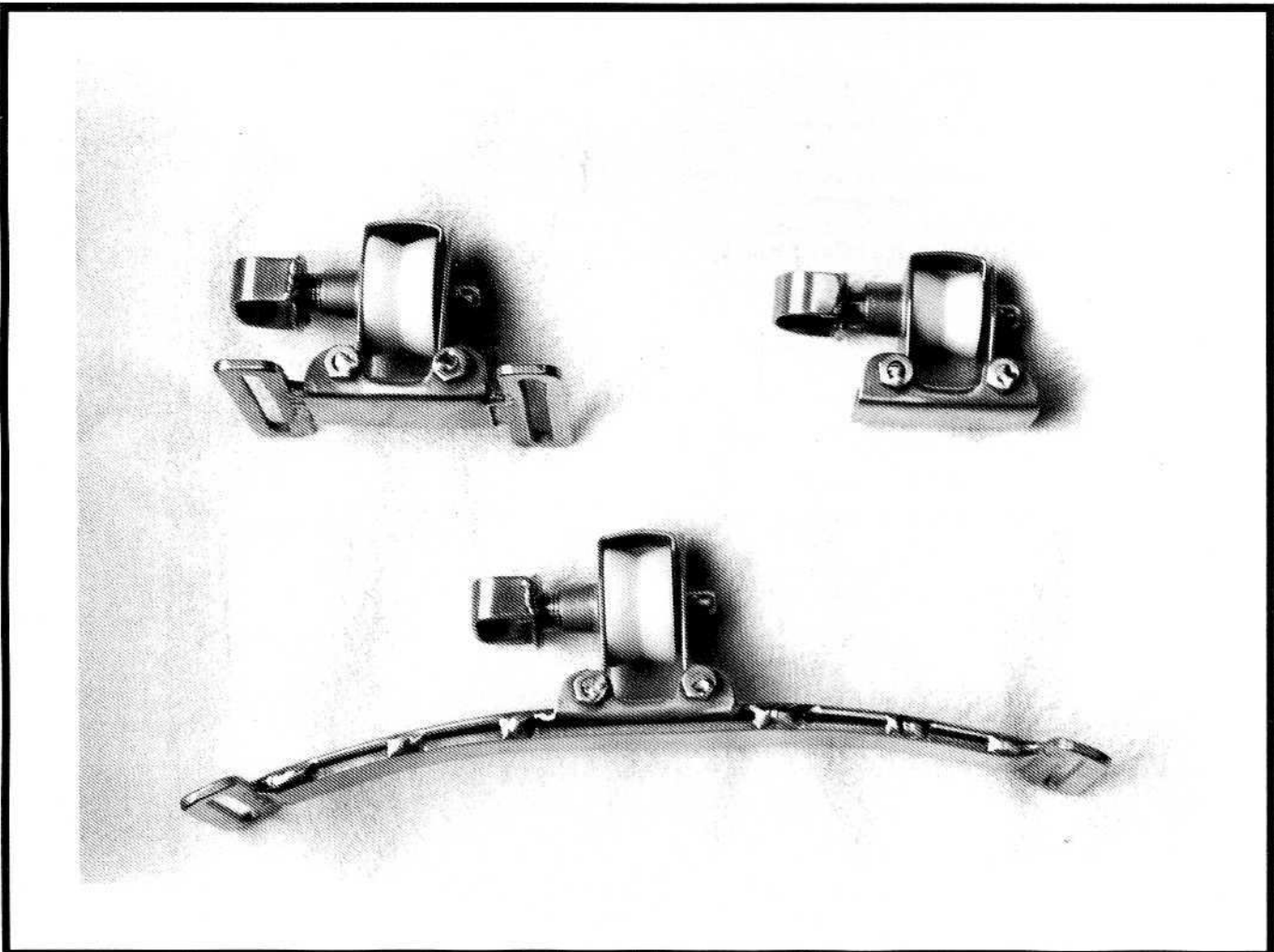
It is dangerous to use this or any other vertical equipment without obtaining expert instruction in its use. One should read vertical technique books as well as

being personally instructed by a qualified individual. The book section of the NSS has a good selection of vertical reference material.

This product is not intended to be used any other manner than as an efficiency chest roller. **Never** use as a means of totally supporting a rope. **Never** use this device to lower a person or gear. This roller was not designed for high speed or heavy loads.

Safety Rules

***Before climbing, always tug on the gate flap to make sure that the pin is fully locked.



***Always make sure that the pin button is fully extended into the thumb guard before use.

***Always have a safety ascender rigged above or directly below the O-C roller and fastened to your seat sling.

***Never change or rotate the thumb guard from its original position!

About the Roller/Pulley

The roller is made from 18,000 PSI compression strength Delron plastic. It is roughly twice as strong as nylon and has excellent bearing characteristics in low temperature, low RPM applications, out testing bronze bushings. O-ring seals have been fitted on each side of the roller to seal out abrasive contaminants. The U-housing has been squeezed fairly tight around the roller to maintain this seal, which makes the roller somewhat 'stiff'. This tight fit insures that contaminants are sealed out and has no adverse effects on the efficiency of the device. The vee shape in the pulley causes the rope to elongate slightly binding the roller enough to 'force' it to turn even under the most adverse conditions. This and the seals are very important as it virtually eliminates roller stalling which would cause the rope to cut a groove in the roller. Heavy mud and grit are easily forced out of the way as the O-C roller makes its way up the rope.

The roller can be disassembled from the U-housing to be cleaned or replaced after excessive wear.

About the Pin

Lock Pin Safety Procedures

The spring loaded ball lock pin is made of 304 stainless steel for long corrosion resistant life. A thumb guard has been added to the pin to prevent an accidental

release of the gate by gear or any protrusions the device might encounter while ascending. It is important to remember that pushing the button while climbing will trigger instant release of the device from the rope. So care must be maintained that nothing comes into the thumb guard enclosure when in use. The second precaution which must followed is: ALWAYS HAVE AN ASCENDING DEVICE ATTACHED TO YOUR SEAT HARNESS AND RIGGED ABOVE OR DIRECTLY BELOW THE CHEST HARNESS. This insures that if the device should be accidentally disconnected, you will still be secured to the rope and won't fall backwards.

One last point must be mentioned about the pin, as so much rides on its proper function. The button must always be fully extended out into the thumb guard to insure that the locking balls are totally secured. Never climb with the O-C roller if the button is not fully extended. Proper maintenance and cleaning will insure years of life for the pin. Always make sure to clean and lubricate the pin before use. If mud and grit do cause problems in the field, it is usually possible to get the button to function by repeatedly pushing until any grit works loose. Sometimes water splashed on dried dirt or mud will lubricate it enough to break it loose. If you cannot get it to function with WD-40 and cleaning, it can be sent back for repair or replacement.

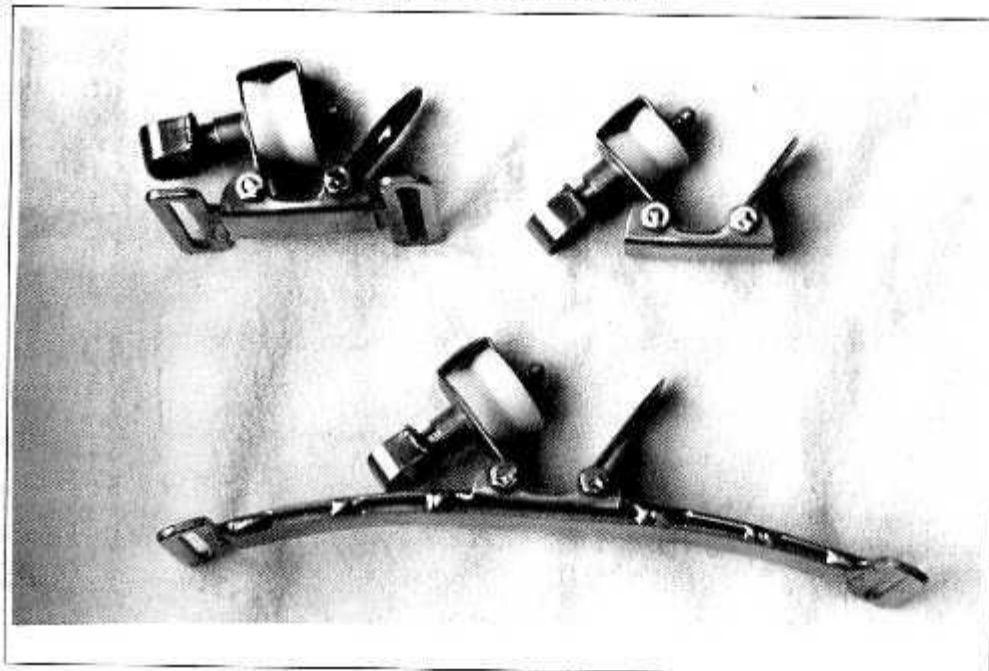
ALWAYS KEEP THE THUMB GUARD ROTATED SO THAT THE HOLE FACES UP. Release the button by placing your index & middle finger on each side of the neck of the pin. Insert your thumb and push to release. The reason that the hole in the thumb guard must remain facing upward is that the gate flap has to have a slightly elongated hole so that it can pass the tip of the pin as it swings away. It is best to have the locking balls of the pin as close to the edge of the hole as possible. This gives the strongest hold on the gate. Just remember that the locking balls must be parallel to the bottom.

Maintenance

The O-C roller needs cleaning and occasional lubrication. The pin should be checked to make sure it does not stick before each use. Usually pushing in and out rapidly will loosen and dislodge dirt. Try squirting lubricating oil in the pin as well and the button should remain free.

Disassembly

It is possible to remove the roller from the U-housing for cleaning, inspection or replacement. The pin simply threads out of the house and the roller comes free. You must remember to push in the button when threading the pin in or out of the



U-housing. Otherwise, the locking balls will bind on the edge of the gate or U-housing holes. If you forget, you will see just how securely they hold when in the locked position. An O-ring is located in the threaded area. It is used like a lock nut so that the thumb guard stays properly aligned with the hole up.

Inspection

Check the Delron and O-ring seals for excessive wear. If they are loose or filled with abrasives which can not be removed by scrubbing with hot soapy water, they will need to be replaced. If the roller does not need replacing, wash and dry thoroughly.

Ball Bearing Models

The ball bearing models have a standard, permanently lubricated, sealed ball bearing for easier climbing. They are not made of stainless steel, however,

so they WILL rust out and are not recommended for use in wet environments. If they have gotten wet, disassemble and dry as soon as possible after use.

For more information contact:

R.C. Schroeder

P.O.Box 2

Onia, Arkansas 72663

Editor's Note: I recently tried the mid-sized model on a quick bounce trip to Moses' Tomb in Alabama. The roller functioned properly and as expected. There were some problems with the field rig chest harness, however, these problems did not seem to be associated with the roller. I found the roller easy to get off rope when loaded. This would have been a great advantage to me on a recent vertical trip in the Soviet Union. I am interested in any comments by individuals using this chest roller. Also, the roller is available in a 'double' model for Mitchell type systems.

Marilyn Gossett

NSS 950F

1923-1991

An early Eastern caver and long-time Western caver, Marilyn Gossett died September 3, 1991. At the 50th NSS Anniversary Convention at Cobleskill, New York, Marilyn was at her usual post at the climbing contests. She was a familiar and faithful presence as a time and records keeper. She gave of herself, supporting the Vertical Section from its formation in 1972 at the White Salmon, Washington, NSS Convention. Appropriately, she met her husband, Jim in a cave. They were early MET Grotto members and she was one of the first women to explore Schoolhouse Cave in West Virginia.

Marilyn was known to family and friends as a giver of her time and hospitality to a generous degree. In recent years, Marilyn and Jim traveled widely and participated as volunteers for several Earth Watch and Smithsonian expeditions and studies. Marilyn was as dedicated to the caving community and goals of the NSS as is her husband Jim. Many will miss this friend and will remember her courageous fight as cancer spread into her lungs.

She will be missed by the entire membership of the Vertical Section and will be remembered for her kind words and encouragement to everyone at the Section Activities.

My Special Friend,

I will miss my special friend, Marilyn Gossett. Before we had the Vertical Section, she came and helped me year after year. She made sure things were done accurately and she was supportive during adversities. Most of all, she would talk to me, listen to me and share feelings with me. I will miss her very much.

Miriam Cuddington.

FROM THE EDITOR

by Maureen Handler

Well another **Nylon Highway** is almost complete. I again apologize for the lateness of this issue. I have been on a job site in central New York since May and did not have access to all of the computer equipment I needed to do my lay out. However, now I'm home and have been working full tilt at publishing issue 33 of the **Highway**. Another reason for the delay in publication is a lack of material. Two of these articles only arrived in the last two weeks. My in box is again empty. If as vertical section membership, you want a quality publication, you must assist in providing material for this publication.

There are some excellent articles in the works. Butch Feldhaus of the Chattanooga Grotto had done some pull testing on curled eye racks and the Section now has a large assortment of Soviet vertical gear which will be described in the next issue.

As of this summer, the Section will celebrate its 20th anniversary. I would like to see some history articles. How has vertical caving and technique and the section changed since you joined? I think this would be an appropriate time to examine the history of the section.

Some notes from the NSS Vertical Contest Chairman, Bill Cuddington. Bill noted great success with using the "Lane Monster Rack" instead of the traditional spool for metering the rope during the contests. You can expect to see more of this equipment at future contests. Also, during the contests in Schoharie, New York, someone climbed the 30 meter rope with a faulty ascender. It succeeded in trashing over 100' of rope. This rope could not be used for additional climbers and had to be thrown away. Please examine your equipment before getting on rope. If you have questions about the quality of an ascender, ask someone at the contests. There are plenty of people to help you.

For the 1992 NSS Convention, our schedule has changed some what from previous years. The vertical contests will be held on Monday and Tuesday with the awards ceremony being before the auction on Thursday night. The Section meeting will be held on Wednesday. Please consult the convention program schedule for exact time and place.

Also, in recent years, we have seen the introduction of a number of new pieces of stainless steel rappel equipment. Since SMC discontinued the manufacture of circular steel bars, other people have tried to fill the gap in demand. I have noticed a variety of circular bars becoming available with varying wall thickness. I am interested in any information on heat dispersion versus wall thickness on some of these bars. Any information or experience you may have can be sent to me at the address listed in the front of this issue.

Anyone who has not renewed their dues, these can be sent to Bill Bussey at the address listed in the front of this issue. Please note that domestic dues are now \$5.00 and international dues are \$10.00. The increase was necessary to help offset increased expenses on the **Nylon Highway**. I am trying to improve the quality of the **Highway**. I have been using a CAD system for many of the drawings. You will notice them in the articles on David Bain's C.R.C., the load distributing anchor and our Soviet Vertical experience. If you can make a fair sketch of your system or equipment, I will try to enter it onto the CAD system.

The Section Executive Committee is considering not printing any more back issues of the **Nylon Highway**. If you are missing issues, consider ordering them now to prevent missing out due to out of print status of older issues. I am considering working on a "Best of the **Nylon Highway**" publication, but this is 2 - 3 years away at best.

I hope you enjoy this issue. Publishing the **Nylon Highway** has certainly become a labor of love for me. Let's see some quality articles for the next issue.

OPTIMUM RACK OPERATION

by Bill Cuddington

The purpose of this article is to present ways to enhance rack operation.

I read Steve Knutson's rappel device article (1990 American Caving Accidents) with great interest. Steve and I share the same opinion about the rack. We both feel that the rack is the best "all around" rappel device.

The problem with the rack is the fact that rappellers are not being trained to set up the rack in the most efficient way and use it in an optimum way.

First, I feel that most beginners should begin with the standard six bar rack complete with six bars. For extremely heavy people, seven bars can be used on a six bar frame, especially if all of the bars are "walked" over the top so that they all pivot from the long leg side. With seven bars, even 250 LB. folks have good control. I realize that some big top bars will not "walk" over the top, but the other bars can be walked over first. I have done this many times.

Note: Some bars may need to be "reamed" out so that they can be "walked over".

Optimum Breaking:

You need to set up your bars for this. If you are right handed, your last bar, when engaged, should have the rope coming down and around under it if you pull the rope across your right hip. This will give you "max" right braking on the sixth bar.

If you are left handed, you will need to set your last bar for "max left". As you gain experience, you may find that use five bars most of the time. If so, go ahead and set your fifth bar for max braking. Be careful when doing this. Be sure that you have maximum control near the bottom of the drop. Near the end is where you must have complete control!

Rack Position: Vertical or Horizontal?

I have so far successfully used racks both of these ways. It is sometimes easier for me when doing multiple rappels to just snap the rack into my seat locking 'biner with another locking 'biner. My rack has a regular eye (zero degrees), so the rack ends up with the bars parallel to me, which is the horizontal position. Also, this extra 'biner makes a change-over much easier.

However, on a very long drop, I prefer the vertical position which has the bars perpendicular to me. If I need to add bars, I can push the rope to my left and right, even using my feet to help. It also seems that the rope comes under the last engaged bar at a better angle.

This last July in Golondrinas, I used the horizontal position and didn't like the feel of it. The long rack was sitting too high and braking was not optimum. A smooth rappel was not executed.

Attitude of the Rack:

I have seen confusion concerning this. The open end (short leg side) should be position so that the rope may be swung back and forth easily during rappel. If the rack is positioned in the "horizontal mode" and you are right handed, the short leg should be on your right. Left hander do just the opposite.

When using the rack in the "vertical mode", the long leg should be next to you, thus putting the open side out in front. Now the rope may be swung easily to left and right to add or disengage bars. Rappel instructors take notice. If these optimum rack positions aren't used, it is very difficult to add or subtract brake bars during a rappel.

Rack Operation

Approach the rigging point and snap your quick attachment safety on the rope. (I do this on every drop!). Then rig in your rack. Next, do as Steve Knutson says: Test your rig! I do this by slacking off the safety, sliding it down near the top of the rack and putting as much weight as possible on the rack. If the rack pops off, my safety will catch me. If it checks out, I remove the safety at the last instant before I begin the descent.

Smokey Caldwell, Victor Bradford, Buddy Lane, myself and others feel that you should go over the edge which as many bars as reasonable possible. Remember, on some lips, your full weight is not completely on the rope until you clear the lip.

On Rappel

To get a smooth, effortless descent, you may have to take off a bar. Don't do this until you are sure! Sometimes just a few pulls on the rope and/or spreading out the bars will get you moving.

Now, many rappel instructors are not teaching the students the technique of incremental control. John Cole discovered this technique when he invented the rack.

This merely means that the last bar that is engaged on the rope may be pulled down to go faster or pushed up to slow down or stop.

When this last par is pushed up, you should definitely slow or stop. If a hard push is needed, you

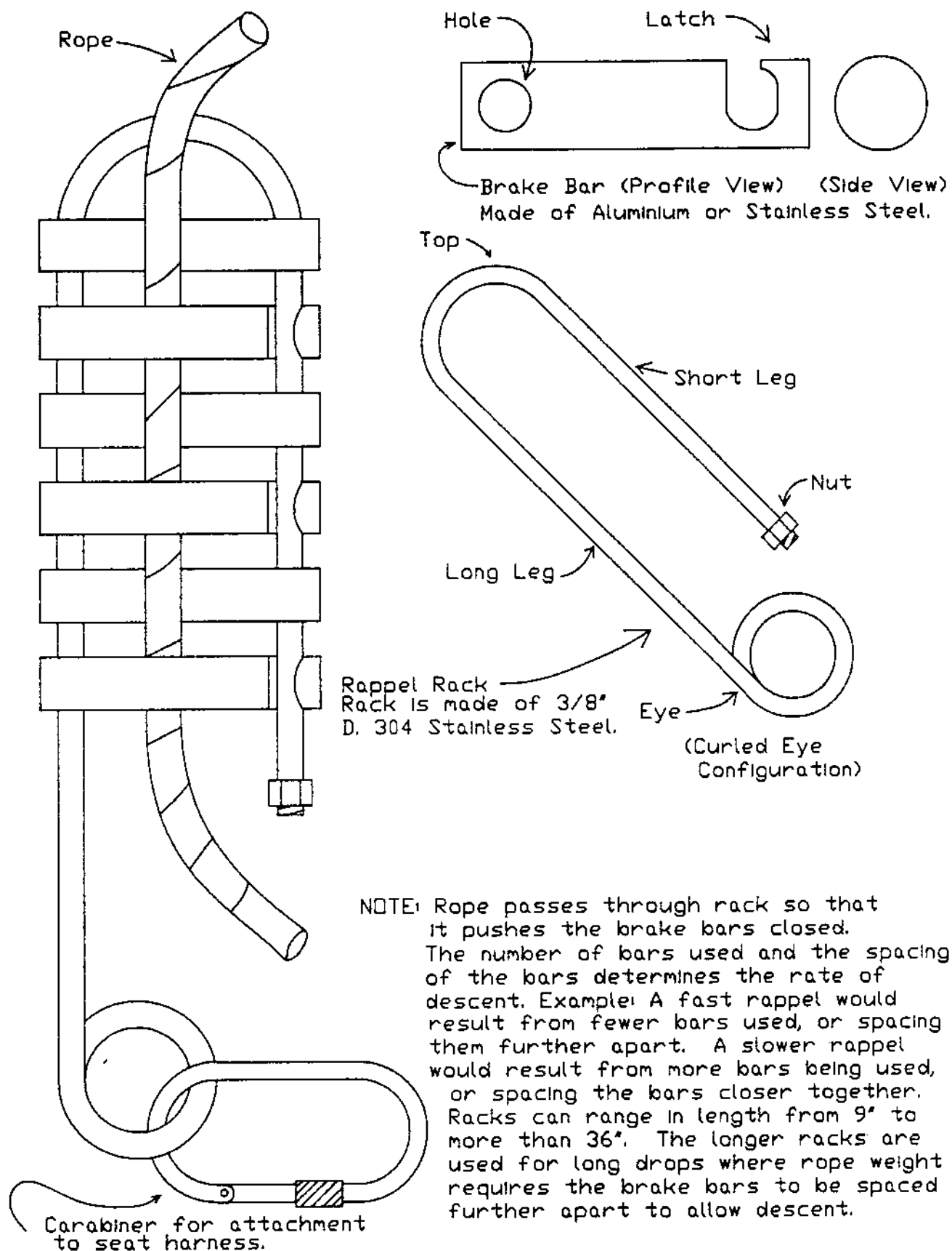


FIGURE - Brake Bar Rappel Rack.

Drawn by Butch Feldhaus

need to add another bar. In fact, as soon as you feel the need for more control, add another bar. Remember, it is better to add one too soon than too late.

Right handed people should be using their left hand to push or pull the last engaged bar. In fact, usually your thumb and fore finger will suffice. Your right hand, the strongest and most skilled, should be the hand that holds the rope below the rack. Left handers would have their hand positions just the opposite.

My wife, Mirian, has made four effortless rappels into Golondrinas using this technique. I am left handed and my best rappels there have been made mainly using right hand thumb and fore finger on the last engaged bar for incremental control most of the way.

Spacers:

Spacers are seen on many racks now. Some people don't really need them. They are used to distribute the heat among the top bars and on very long racks for smooth rappels on long drops. When spacers are used, usually less control is realized and 1 or even 2 more bars must be put on the rack to get optimum control back. I have a special long rack with many spacers containing 9 bars. I named it "The Lane Monster" as it was designed by Buddy Lane. This is a great rack for tremendous drops and for use in belaying the rope in the rope climbing contests. I don't let beginning rappellers use these types of rack with spacers.

Brake Bars:

There are hollow steel bars and aluminum bars available. Hollow steel (SMC now makes a U shaped bar instead of the hollow steel) are faster so an extra bar

is needed for control. Many beginners feel more comfortable with aluminum. In our classes, we start everyone on steel with belay protection on their first rappels. This way, they "break in" on steel and really have less qualms about the bars from then on. I and many others feel that hollow steel is the best.

Special Racks:

A standard six bar rack is best for beginners, as mentioned earlier. There are 5 bar racks which are lighter and a little more compact, but only experienced people should use these.

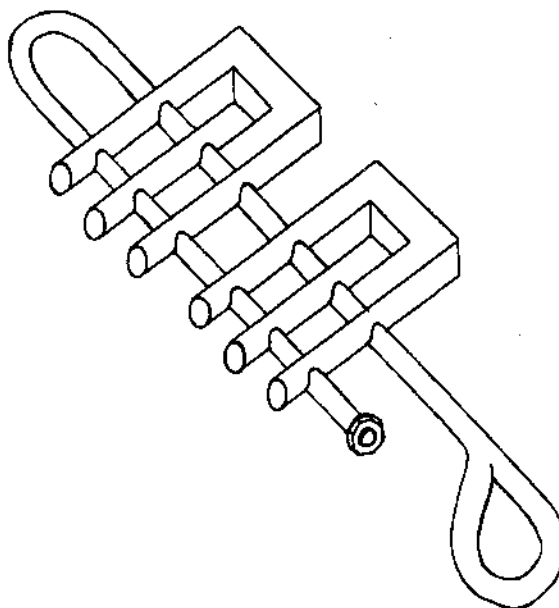
Long racks for long drops have a nice advantage in that 6 or more bars may be used during the entire drop. At the top of the drop, the bars may be spread out; then near the bottom, pushed together for excellent control on the entire drop.

I have done this on an 1100 foot drop several times. Of course, a clean rope was being used. A standard 6 bar rack may be used on an 1100 foot drop, but you may have to begin with 4 or 5 bars and add a bar or two on the way down. Remember, If you are going to do this, you must rappel at a moderate speed. The rope weight is a factor to considered on a long drop when using any rack, particularly a standard rack

Conclusion:

Over the years, I have noticed many people rappelling the "hard way". Perhaps this article will help them plus present instructors and even future instructors, to teach the use of the rack more efficiently. Always be safe. Be just as careful on your 10,000th rappel as you were on your first.

The Double U-Bar Rack
Steve Storey
Dogwood City Grotto
Atlanta



Super Bungee

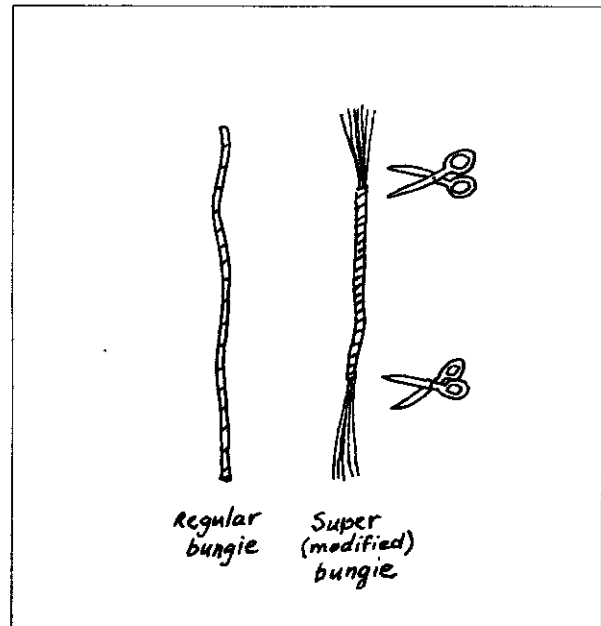
by Kevin Allred

After using a single bungee system for 2 years, I have been disgusted by the limited stretch of the bungee cord. Taking 8 or 9 inch steps is OK much of the time, but I want to be get big steps too. The regular Bungee cord just doesn't have what it takes. A friend used a ropewalker system using surgical tubing, but it was full of knots from several breaks. I didn't want a double bungee system or a long bungee over my shoulder. The answer seemed to be in the bungee itself...the rubber strands within the cord can stretch 3 times its length but the sheathing limits travel to only 1.7 times. By peeling back the end of the sheathing enough to get hold of the rubber strands, one can pull out the rubber portion about 10 inches and gradually bunch up about 10 inches of sheathing. Then the other end is cut a foot or so longer than you need and the rubber pulled out of this end as well. The result is "super bungee", with the capacity to stretch some 2.7 times! The only thing which is changed is that the sheathing is now bunched up on the unstretched rubber.

By using a weigh scale, I next experimented with a few different bungies (See Table 1). The 1/4 inch bungee was found to be much harder to stretch and fight on each step. Regular bungee was also too limiting regardless of size, causing one to fight the unstretchable sheathing near the apex of each step. The double length, regular 3/16 inch bungee offered only slightly less effort to stretch the same amount that short super bungee, (with the exception of the 1/4 inch regular bungee, in which the poundage dropped nicely but still is too powerful for my own taste).

Conclusions:

3/16 inch modified bungee provided high stretch at low effort. 1/4 inch bungee would probably also function much better, but be unneedfully too powerful. Perhaps others use this same trick with their bungee cords, but I could find no reference to it so pass the idea to folks wishing to take bug steps with super bungee.



	max. length	lbs for	lbs for
	stretched	12" step	9" step
16" long, 3/16" regular bungee	27"	na	3.5
16" long, 3/16" super bungee	43"	4.0	3.0
32" long, 3/16" regular bungee	54"	3.5	3.0
16" long, 1/4" regular bungee	28"	12	10
32" long, 1/4" regular bungee	56"	7.5	6.0

HIP SWITCH: A BRAKING TECHNIQUE

By Bruce W. Smith

It is alarming the number of out-of-control rappels that have yielded serious injury and major rescue efforts in recent months. Almost all of these were classified "pilot error" and I feel each situation was a result of friction loss. (Bars not doing their job.)

Rappelling on my own, I usually start with more friction (bars) than I need and then remove friction (bars) to achieve a controlled rappel. Here in lies the problem. If your control hand (the one that should be holding your bottom bars) is somewhere else, like hanging on to the rope above the rack, dropping a bar can easily result in the dropping of two bars and a

figure 2.) If one drops a bar to reduce friction, move the rope to the opposite hip; the HIP SWITCH! Then hold the new bottom bar with your control hand, even though the angle of the rope captures the lower bar and holds it in friction position. This skill is not so precise that it takes a brain surgeon, rather moderate ambidexterity.

Keeping that rappel controlled, when reducing friction, required both a hip switch and a control hand in the right position (on the bottom bars that are in friction position). The reverse is also true. (See Figure 3.) Adding friction required a hip switch to keep the bottom bar captured in friction position.

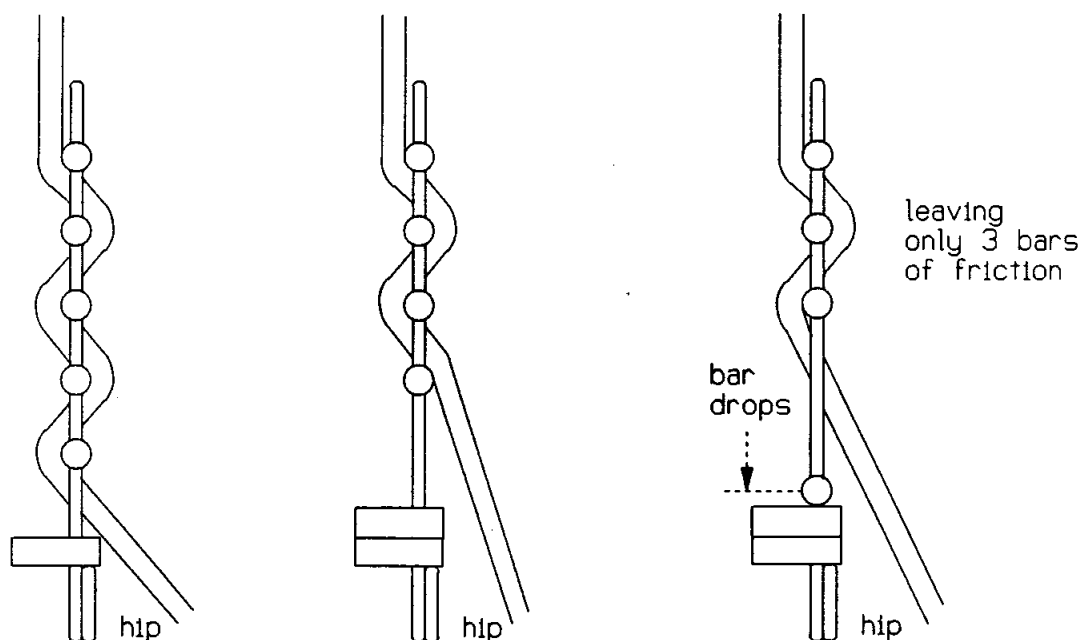


Figure 1. Assuming 5 bars on a muddy rope is too much friction, remove the 5th bar. Unfortunately, the rope angle off the hip allows the 4th bar to fall, leaving only 3 bars to control the rappel, a very dangerous situation.

dramatic loss of friction. (See Figure 1.) This could easily result in an out-of-control rappel.

The problem is two-fold and can be corrected easily by the adjustment of either wrinkle. The angle that the rope has coming out of the bottom of the rack can help or hurt. If it comes off in such a direction as to hold or capture the bottom bar in friction position, one can easily rappel while leaving the control hand clenched to the rope above the rack (even though it is not recommended).

the best solution would be to develop the skill which allows the rappeller to use either hip as a brake. (See

The examples pictured throughout this article are for 5 to 4 to 3 bars or 4 to 5, etc. These are only examples and are surely applicable when going from 6 to 5 or 5 to 6.

Maintaining the right amount of friction on any rappel depends on many factors: new rope, old rope, fuzzy rope, flex or sport, wet, muddy, weight, diameter, rappeller weight and obviously, the amount of friction applied to the rope. Careful adding and subtracting of bars to achieve the desirable friction can be achieved more safely by incorporating the HIP SWITCH.

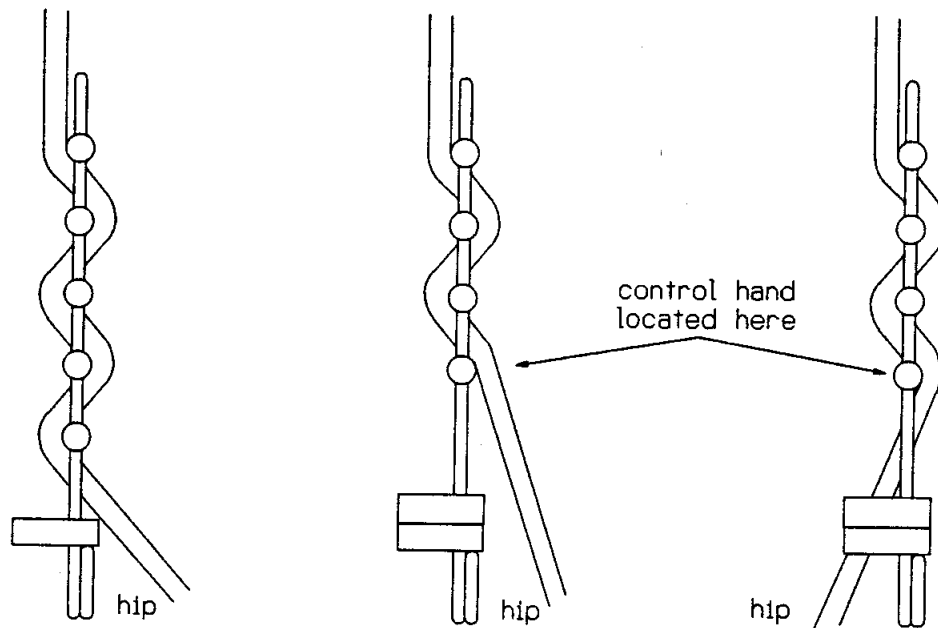


Figure 2. Reducing 4 bars required the control hand to be maintained on the 4th bar and then a hip switch to capture bar #4 and keep it in the friction position

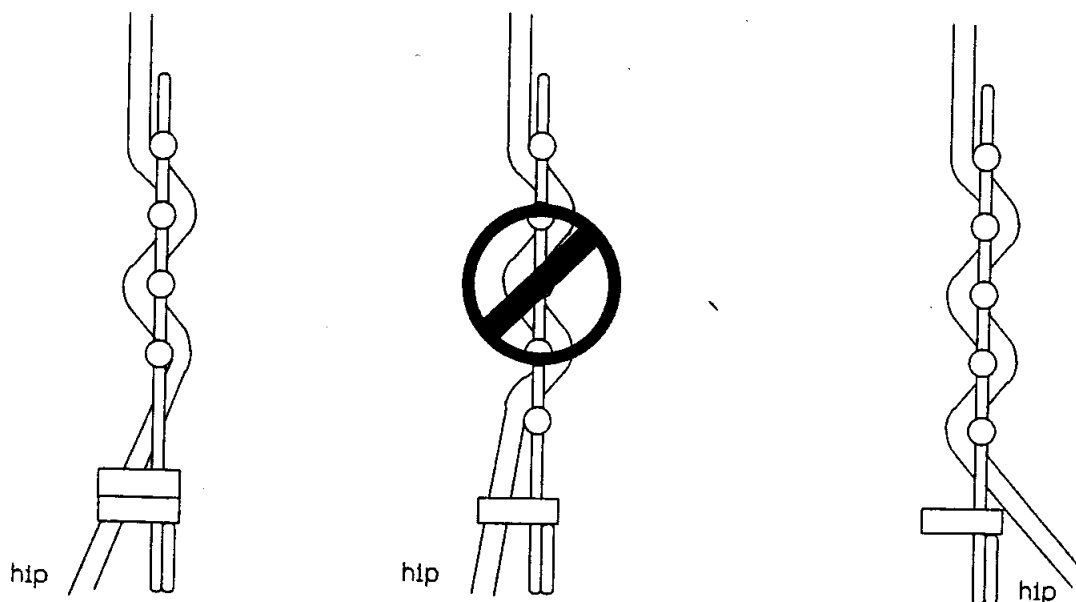


Figure 3. Adding bars requires not only the maintaining of the control hand on the friction position bars, but a hip switch to keep the bottom bar captured.

Letter to the Editor

by Jeff Cody

Dear Editor, Nylon Highway

I am writing in response to the article False Security on page 5 of Nylon Highway #30.

I do not understand the test done by the Australian cavers on the Spelean Shunt. If you use a shunt on a separate rope from the rappel device, it will ride down below the waist. That will not allow proper slack in the accessory cord.

I have been under the understanding that the shunt was made for single rope applications, therefore the test does not hold much water in my opinion. While on a recent trip to TAG, I was told of an incident at Ellisons where someone lost control while on rappel. Do you think this may have been prevented with the use of a shunt?

I know how to properly use my rack and I practice with it on a regular basis, above ground and in caves. I use a shunt on long drops such as Surprise Pit or Mega Well because the chance of an out of control rappel is greater on a long drop. I do not use it in fear of a short rope situation since I always tie a figure 8 knot on the end of the rope. I use it for a safety in case of an out of control situation while it is above the rack with proper length of accessory cord.

I have practiced above ground and out of control situation (while on belay) and have been able to stop every time with the shunt.

I am not writing this letter as an attack on Allen's expertise. I am familiar with his credentials and respect his opinions and advice, but I just don't understand the test in question here.

Reply to the Editor

by Allen Padgett

Dear Editor, Nylon Highway

It has become apparent that some people misunderstood what I tried to relate concerning the use of the spelean shunt in Nylon Highway #30. The experiment conducted by the Australians confirms the basic flaw in the use of a shunt type device. The experiment used two ropes so that the shunt could ride one rope top to bottom and a shorter rope was utilized so that the shunt user would experience a system failure in the test. He would simply rappel off the end of the rope during the experiment. The conclusion reached in this test is that in a system failure, there is a serious inability to activate the shunt. Why is this? For example, let us design an eye protection device that to operate requires the user to resist and defeat the instinctive human reaction of blinking. Under simple test and day to day use this eye protection device is successfully used because the operator has been trained not to blink. But suddenly in the real world, an object flies toward the eye. The nerve impulse from the eye travels to the base of the brain. A quick reaction is required. The human nervous system has a quick reaction system that kicks in automatically and the impulse returns to the eye and it blinks! The device is defeated and no conscious thought was involved.

The spelean shunt, to properly operate in a system failure, requires the operator to overcome this human nervous system design. The human instinct, upon falling, is to grasp strongly with both hands. This reaction is activated at a brain center not in the conscious thought. This powerful instinct kicks in and tries to save the falling human. The powerful command is to grasp the shunt and not let go! The design is the same as the eye survival crisis. Instinct takes over. Learned behavior takes a back seat and our safety device fails to function in the real world. For any safety device to function, it must not operate contrary to instinctive behavior.

If you wish to use a shunt, fine. However, realize it will not necessarily protect you in a system failure. This seems odd because most shunt users operate the device simply to protect against system failure. If it my opinion that safety would better be served by using two hands and training to operate the primary rappel device properly. The PLACEBO effect should not be overlooked here. If the shunt makes you more cautious, then you are safer. Safer until a system failure occurs, then you are less safe because the device fails to work along with human design.

CARABINER RACK CONFIGURATION

by David L. Bain

When changing from climbing to rappelling, I have found that tying off the rack before removing the top ascender comes very near to bending the rack when I stand up on my knee ascender to remove the top ascender. And, performing the above maneuver without tying off the rack frequently left me with my knee ascender jammed into the rack. Not fun!

After scratching my head awhile, the Carabiner-Rack Configuration (C.R.C.) pictured in figure 1 occurred to me. It worked very well. I was able to stand on my knee ascender to release the top ascender without tying off the rack. Because the C.R.C. jams the bars together so tightly, I can remove the knee ascender without the rack, and me, sliding down the rope. To start the rappel you may remove the rope from the carabiner and adjust the bars appropriately. If you need extra friction, which is significant, then merely adjust the bars leaving the rope passing through the carabiner.

I have found the extra friction to be enough to allow me to rappel myself and a great amount of free load weight such as scuba tanks, duffel bags full of camping gear, passengers, etc... without much difficulty.

INSTRUCTIONS

Change-over from climbing with a Gibbs rope walker to rappel using the C.R.C.:

1. Set the top ascender, or safety ascender, so that it supports all your weight.
2. Remove the foot ascender and chest box or roller from the rope.
3. Pull some slack into the section of rope between the top ascender and the knee ascender.
4. Attach the rack to your main seat harness carabiner with another carabiner.
5. Attach the rack to the rope as close as possible to the top ascender.
6. Attach a carabiner above the top bar on the rack. The carabiner should be hanging on the open side of the rack. It is not necessary for this carabiner to be locked.
7. Bring the rope under the bottom bar on the rack and up through the carabiner.
8. Take out the slack in the section of rope between the C.R.C. and knee ascender.
9. Move the knee ascender up enough to allow you to stand up and remove the top ascender from the rope.
10. Stand up and remove the top ascender.

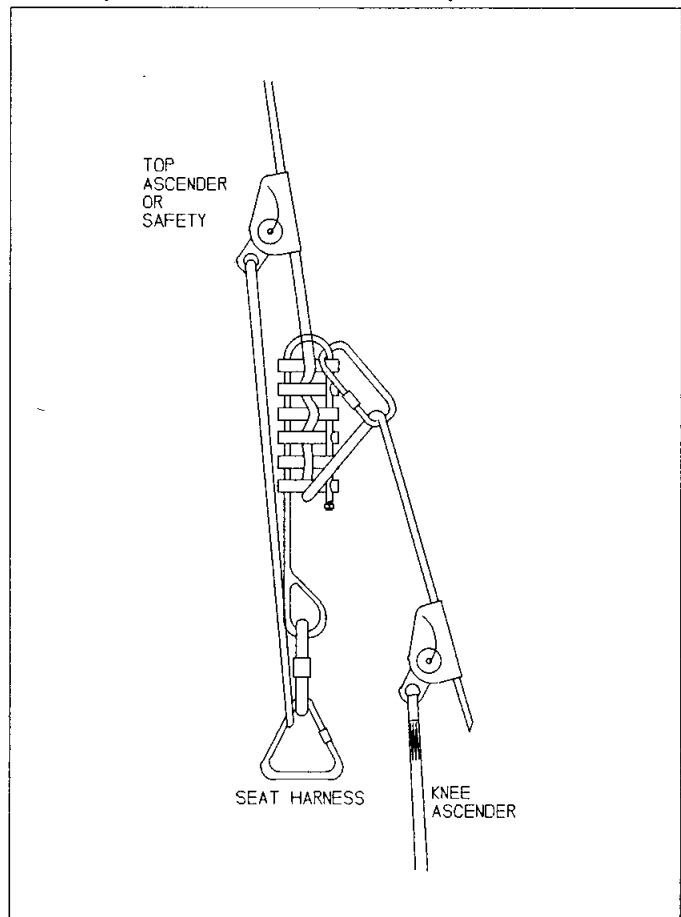
11. Now sit down, the C.R.C. is supporting you, and remove the knee ascender from the rope.

12. You are now ready to rappel using the C.R.C, if you need the extra friction, such as might be need is you chose to pick a patient off rope and rappel with him/her attached to your rack. If extra friction is not needed then remove the rope from the carabiner and continue as usual.

By standing up on the knee ascender, the C.R.C squeezes the bars together effectively "tying off" the rack. the climber may now remove the top ascender and sit back down. The C.R.C. is now supporting the climber. The climber removes the knee ascender from the rope and takes the rope out of the carabiner at the top of the rack. The climber is now ready to rappel.

The C.R.C. is also useful if the rappeller intends to rappel with a lot of extra weight. The C.R.C. provides much more friction than just using the rack.

I demonstrated the C.R.C at the National Cave Rescue Commission seminar in Schoharie, New York. Those people that tried the C.R.C. appeared to be impressed by its simplicity and usefulness. Please Try the C.R.C. yourself and let me know what you think about it.



GETTING INTO HIGH LEADS

by Richard Market

It would be real nice if we could take an aluminum ladder back to a high lead and climb up to it. Things are not always that simple. There are two other basic ways to get up to that lead.

First is the scaling pole. This is an old means. If you have ever read about the history of Mammoth Cave, you will find many referenced to using logs, such as the crossing of the bottomless pit.

Today, we have better material to make our poles from. Although the scaling pole sound like a fast easy way, there are a few things you should know. There are a lot of parts to carry through the passage and assemble before you can climb. The pole must be stabilized to prevent it from slipping side to side or kicking out from under you. If only one part of the pole fails, you will probably fall from the top. There have been may accidents involving the scaling pole.

The second way is bolting. This is the way our mountain climbing friends do it. All the equipment you need for a 100 ft. climb fit onto one caving bag. This is much safer and as fast as the pole when all things are considered. The speed at which you can reach the lead can be very important to you and your partners getting cold at the bottom.

The self drilling anchor should not be used in my opinion. They are much too slow, do not penetrate the rock deep enough and the hole depth must be just right.

The best bolting kit on the market I have used and seen to date is from "Dakota Bolt Works". A 1/4" wedge anchor has a shear strength of 2,161 lbs. and 1,346 lbs. pull-out. a 1/4" self drilling anchor as 1,960 lbs. shear strength and 1,280 lbs. pull-out.

If you are making a long climb, you arm will get tired hitting the drill with the hammer. If you are rich or have a large Grotto with extra money, you can get a good hammer drill for about \$350.00. to get around that, I got an inexpensive Black & Decker battery drill for \$36.00 and added an auxiliary battery pack. I soon found out why no one else was using them. My Dakota drilled holes just as fast and did not use a heavy battery. After some cut and tries, I came up with a hollow point drill which is twice as fast as the Dakota drill and yet doesn't run the battery down very fast. This may not be as fast as the hammer drill, but it is a close, low cost method for us poor boys.

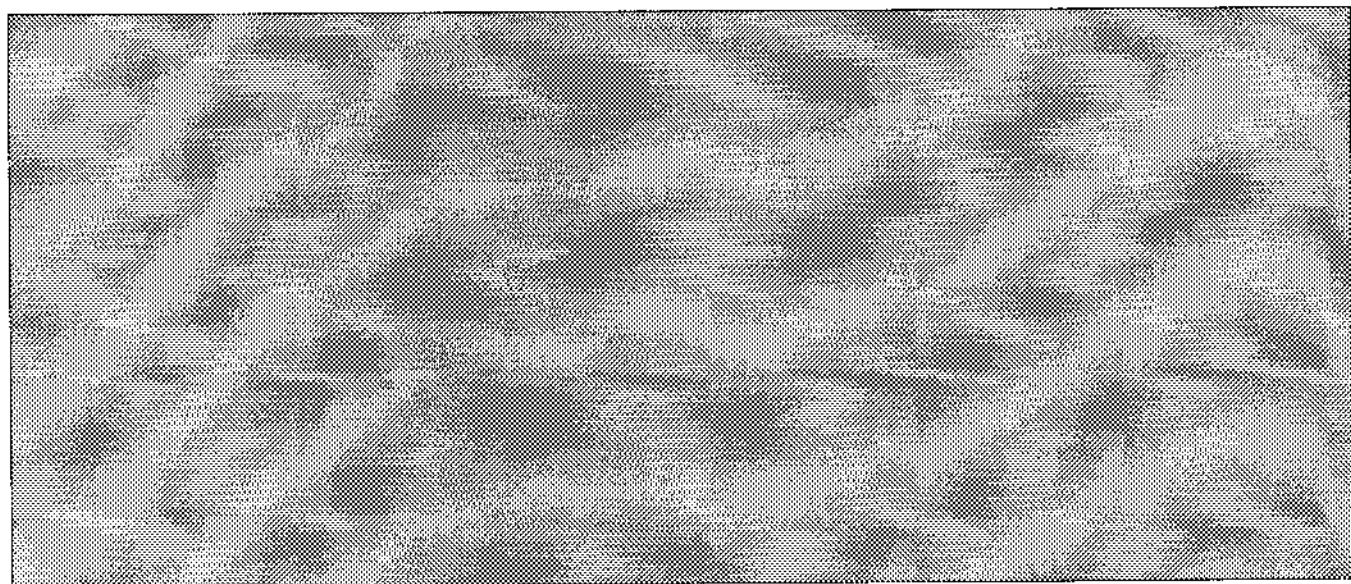
"Vermont American" has just come out with a new industrial duty drill for rotary drills. This drill has a special point which makes it three times faster than a regular masonry drill. the name of the drill is "Lickety Split" and can be found in most large hardware stores.

Most of the time spent on a bolt climb is not setting bolts, but rigging and moving up. Much more time can be saved by rigging correctly and knowing the right moves.

If you do not know how to bolt climb, do not go out on your own. First, you should study up on bolting and then get someone to coach you. Bolt climbing is not very difficult and you can get a great reward of virgin cave.

REMEMBER - Safety Comes First

Reprinted from the Evansville Metropolitan Grotto newsletter Petroglyph, Vol. 27, No. 1. July 1991.



NSS VERTICAL SECTION

MEETING MINUTES

by Bill Bussey

July 1, 1991

The 1991 NSS Vertical Section meeting was held on Monday, July 1st, 1991 in Bouck Hall at the State University of New York at Cobleskill, NY. Executive Committee members present were Gary Bush, Bill Cuddington, Maureen Handler and Ed Sira. Bill Bussey joined the meeting later. Chairman Allen Padgett could not make the meeting.

Gary Bush called the meeting to order at 1:30 pm by introducing the Executive Committee.

Maureen Handler read the **Secretary's Report**. We have 1015 members and would mail 1116 Nylon Highways as of May 31st.

Treasurer's Report: Total Income: \$6870.08. Expenses: \$7697.78. Net loss \$827.70. Current Balance \$4101.75. Reasons for loss included the postal increase which tripled the cost of mailing and increased printing costs. However, the Dec. 1, 1990 dues increase from \$3.00 to \$5.00 per year should help.

Chairman's Report: Allen Padgett will not run again for chairman.

Editor's Report: Maureen enjoys the job. Quality has gone up along with the cost of printing. The editor's IN box is empty and articles are needed for the next issue. Doing more editing, but trying to have more diversity in articles, including humor. Gary Bush asked for membership contributions.

Vertical Session Report: Ed Sira reported on the planned presentations and asked for more.

Contest Chair Report: Bill Cuddington noted PMI donated 1200 feet of rope including two lengths of NSS Golden Anniversary rope. Two ropes will be used for the contests one for 120 meter and one for 30 meter. Everyone must sign waivers. Be sure to warm up before climbing. Spectators should try and stay in bleachers.

Vertical Techniques Workshop Report: David McClurg reported that PMI donated 700 feet of rope, Gibbs Products donated some ascenders and Ron Simmons donated some rollers to the Workshop. These are going into 5 adjustable rigs for workshop use. The workshop can handle 36 participants with 6 students per station. David needs people to run the racked ropes for instructors. Gary Bush noted that costs for doing the workshop have gone up, especially with participants receiving a year of Nylon Highway. Dave McClurg moved to increase the amount charged for the Vertical Techniques Workshop to \$15. Seconded by Kirk

MacGregor. The majority of Section members voted for raising the fee which will go into effect at the 1992 NSS Convention.

Training Committee Report: Jim Hall reported that his committee has a suggested Beginner Level Training Outline ready for Executive Committee review. There was some discussion concerning the importance of, and pros and cons of formalized training. Gary asked for members to send to the Vertical Section Executive Committee any Beginner Level Vertical Training Outlines used by their local groups.

Rebelay Course Report: Gary Bush reported that a Rebelay course will be open Thursday afternoon. We are still learning how to set up these courses, so we need ideas and input.

Soviet Exchange Program Report: Maureen reported on the visit of six Soviet cavers to the US last August. She will give a slide show on the NSS caver visit to the USSR this past May as part of the Vertical Session.

Old Business: Bill Bussey asked for volunteers to update the present vertical related "How To" articles in the NSS Caver Information Series (CIS). The following volunteered to update or write CIS articles: Noel Sloan - Frog System, Snake Owen - Stop Bobbin, Peter Grant - anything, Bill Cuddington - Mitchell System, Bob Zimmerman - Knots, Dick DesJardins - Ropewalker System, Dave Hughes - Rappel Rack, Jim Gossett - gossett System. Various solutions to supplying artwork were discussed.

Noel Sloan volunteered to be the 1992 NSS Convention Coordinator. He will check out and describe the Contest and Vertical Techniques Workshop facilities at the 1992 Convention and report to the appropriate Chairs.

The following change in the Vertical Section Constitution was read for a second time: The Vertical Section shall be governed by an Executive Committee made up of a Chairman, a Secretary-Treasurer, an Editor, a Contest Chair, a Vertical Techniques Workshop Chair, and three Executive Committee members At-Large. This was moved last year by Bill Cuddington, seconded by Ed Sira and printed in Nylon Highway #31.

The question was called with the resulting vote being 44 to 4. Since this Constitution change passed with greater than a 2/3 majority, the motion carries.

New Business: Maureen Handler moved that the Vertical Section sponsor two years of both NSS and

Vertical Section membership for Valeriy Rogozhikov, Layosha Gavro Street 14, KV. 101, Kiev, Ukraine, 252211, who is the principal vertical instructor in Kiev and the surrounding region. Ed Sira seconded. Bob Zimmerman moved and Dick DesJardins seconded to amend one year membership instead of two years. The amendment failed 19 For with 26 Against. After more discussion, the motion passed with two voting in opposition.

Elections: Bill Bussey was re-elected Secretary/Treasurer. Maureen Handler was re-elected Editor of *Nylon Highway*. Gary Bush, Ed Sira, Mirian Cuddington, and Angela Morgan were elected At-Large Executive committee Members.

The meeting was adjourned at approximately 2:45 PM.

Later that week, the Executive committee met and selected Gary Bush as Chair. Bill Cuddington was re-appointed Contest Chair and David McClurg was re-appointed Vertical Techniques Workshop Chair and both will serve on the Vertical Section Executive Committee. Angela Morgan, as the newest EC member, will organize and emcee the Vertical Session at the 1992 NSS Convention.

NEW EQUIPMENT

by Gibbs Products, Inc.

In keeping with the tradition of reliability and durability, Gibbs Products would like to introduce the new Gibbs Quick Ascender. The Gibbs Quick is the first hinged ascender to carry the quality features of the Gibbs line.

The hinging action of the Gibbs Quick permits easy installation and removal. With a little practice, this can be done with one hand for those tight spots and special situations.

The Gibbs Quick, like all Gibbs Ascenders, completely encloses the rope so it won't come off accidentally.

The shell of the Quick is injection molded with a special aluminum alloy to provide a maximum breaking strength of 2500 lbs.

The cam is the time tested cast cam available in previous models. It is hard anodized for long life and yes, this simple, high tech handful still holds well on iced and muddy ropes.

The Gibbs Quick is versatile. The Quick is shipped to you spring loaded, but the Quick's nylon spring cover has a removable set screw. With this screw removed, the Quick becomes free running in the tradition of the original Gibbs Ascender.

For more information contact any cave equipment vendor or Gibbs Products, Inc., 2608 East 3820 South, Salt Lake City, Utah 84109.

