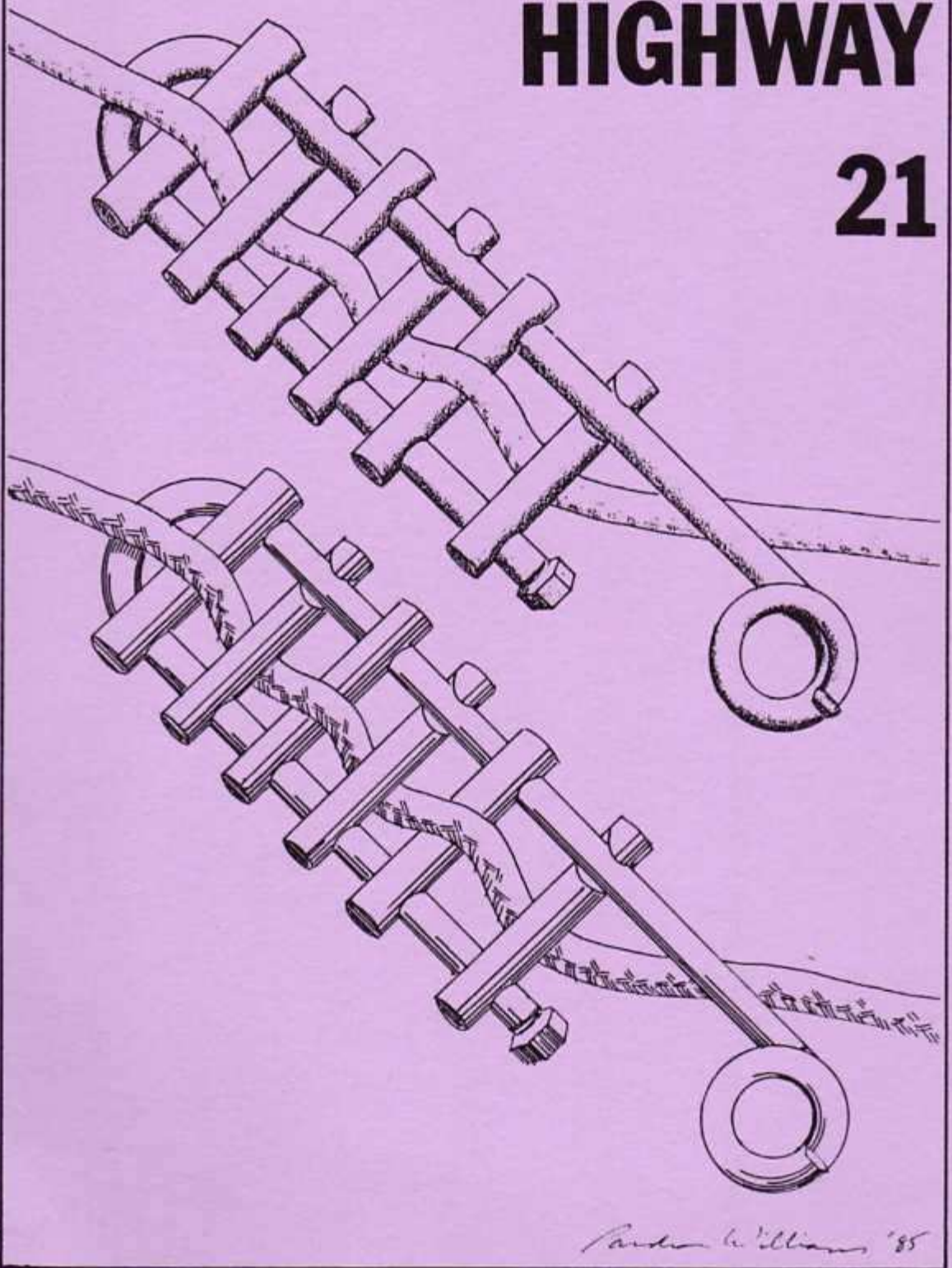
NYLON HIGHWAY 21



. . . ESPECIALLY FOR THE VERTICAL CAVER

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NO. 21

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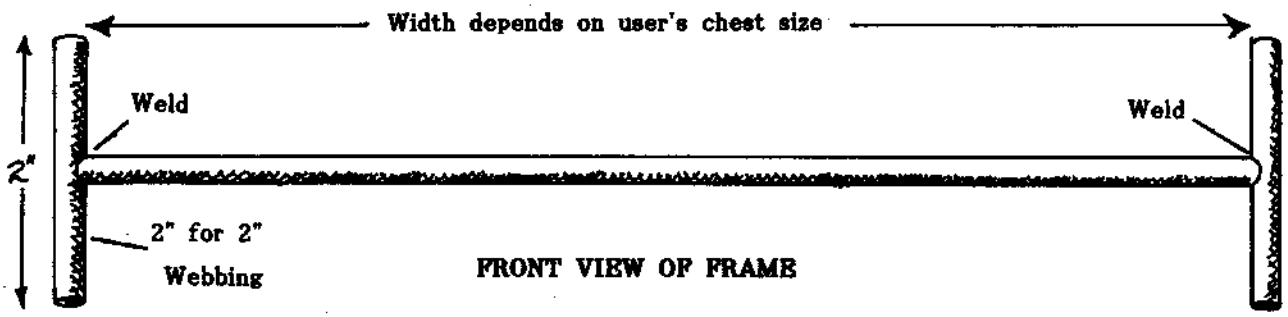
THE COVER: The Rappel Rack: The finest most versatile rappelling device ever developed as drawn by Pandra Williams, one of the artists viaing for the illustrator privileges for the book "On Rope" The rack was first invented by John Cole in 1966.

A LIGHTWEIGHT FRAME FOR THE SIMMONS ROLLER

BY John Ganter



FRONT VIEW OF FRAME

The Simmons Roller is an excellent device for keeping a climber close to, and centered on, the rope. Most cavers are quite content to use the roller on a chest harness similar to the one described in **Nylon Highway #15**, and also shown in the directions accompanying the rollers. There is, however, a small problem with this rig which may be bothersome to some users.

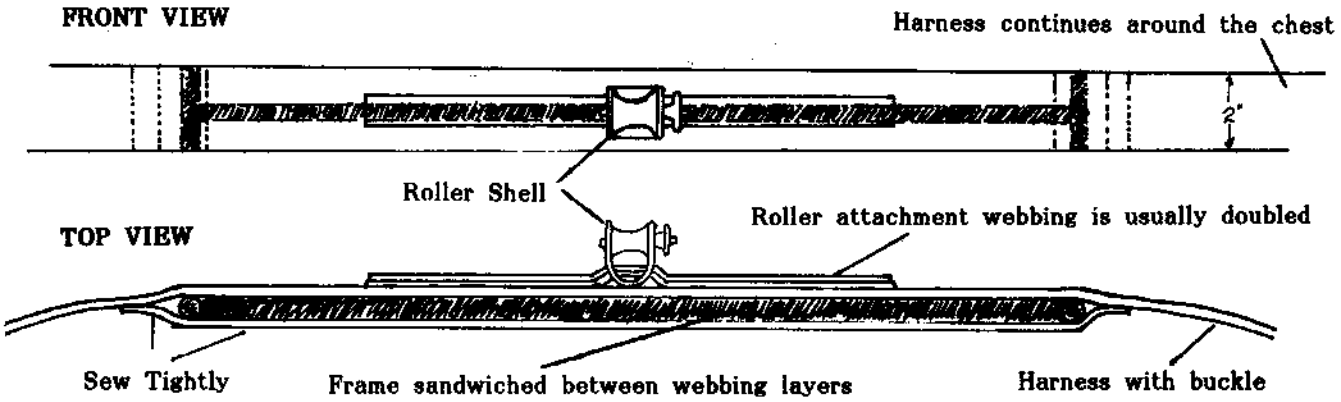
When one begins climbing, his or her ribcage, pectoral muscles and breasts compress just enough to allow the roller to move away from the chest an inch or so. This may be barely noticeable, but the result is that one is just slightly off balance. My reaction, and it's hard to suppress, is to hold onto the rope, which soon becomes tiring.

Custom Cave Gear (Ron Simmon's company) sells a "Racing Plate" which solves the problem nicely. The roller is attached to an aluminum plate about 3" wide and 10" long, and the harness then attaches to the plate. Some cavers are using these for long drops and big pits, but their use is mainly restricted to racers because of the added bulk and weight.

I decided to look for a solution that would preserve the roller's small bulk and weight. Roberta Swicegood said she had seen a steel rod run through the roller shell, then sewn into the harness webbing. I thought that this was an interesting suggestion, but it seemed like the rod would have to be fairly thick, perhaps 3/8", to resist bending. I would thus reduce the amount of room for the rope to run through the roller.

What I came up with was an I-shaped frame constructed of 7/32" spring steel rod (See Figures). This is compact (the rod is less than 1/4", obviously), adds considerable rigidity and weighs a tolerable 2 ounces. The frame is enclosed in a webbing "pocket" behind the roller: this allows easy retrofitting and has no possible effect on the roller itself. The procedure in building this device is as follows. Unfortunately you will need an oxyacetylene torch.

1. Get a valve spring wherever engines are repaired or scrapped, Size is not critical, but the spring should be formed of rod no larger than about 1/4".



2. Clamp the spring in a vise and heat to red-heat with the torch. Unwind the spring with pliers or tongs until you have at least 12" of rod.
3. Decide how wide you want the frame by measuring your chest. My frame is 8" wide: it comes to within about 1" of the limits of my ribcage.
4. Cut the rod to the appropriate lengths. The heating should have made it soft enough to cut with a hacksaw.
5. Line the pieces up and weld together. Since there will be no impact or heavy loading of the frame, it's not necessary to preheat the steel.
6. Heat the whole frame to cherry red and allow to cool on a firebrick or something similar. The frame will now be fairly soft, but extremely tough--it should be almost impossible to bend by hand.
7. File off sharp edges, then give the frame a couple of coats of plastic sealant to keep it from rusting.
8. When the coating is completely dry, sew the frame onto the harness as shown. Make sure that the frame is well-centered and that stitching is tight.

Having used the frame for almost the whold time I've owned the roller, I really can't judge its effectiveness very well. It definitely does add some bulk. This is noticeable when one goes to put the roller in a pack. It doesn't fold up as compactly. Of course, the biggest disadvantage is that it's hard for the average caver to make! Those interested in such things may want to play with the idea. One obvious improvement would be making something similar out of stamped sheet metal: this could be even lighter and smaller, yet just as strong. ■

SPECIAL APOLOGY In Nylon Highway #20 Bob Thrun provided us with a comprehensive article on Vertical Cave Surveying. He had indicated that the piece be Copywrited and the Editor neglected to include that special point. Please honor Bob's request and write for permission if reprinting is desired. I'm sorry Bob.

OUR REPRINTING POLICY We have always felt that it can only benefit everyone if the vertical procedures as described in the **Nylon Highway** be reprinted in every publication that will do it. We only request that the Author receive credit for his/her work and the **Nylon Highway** receive credit as being the original publication.

CLIMBING LIKE SEVENTY

(Promoting prusik practice)

By Darrel Tomer

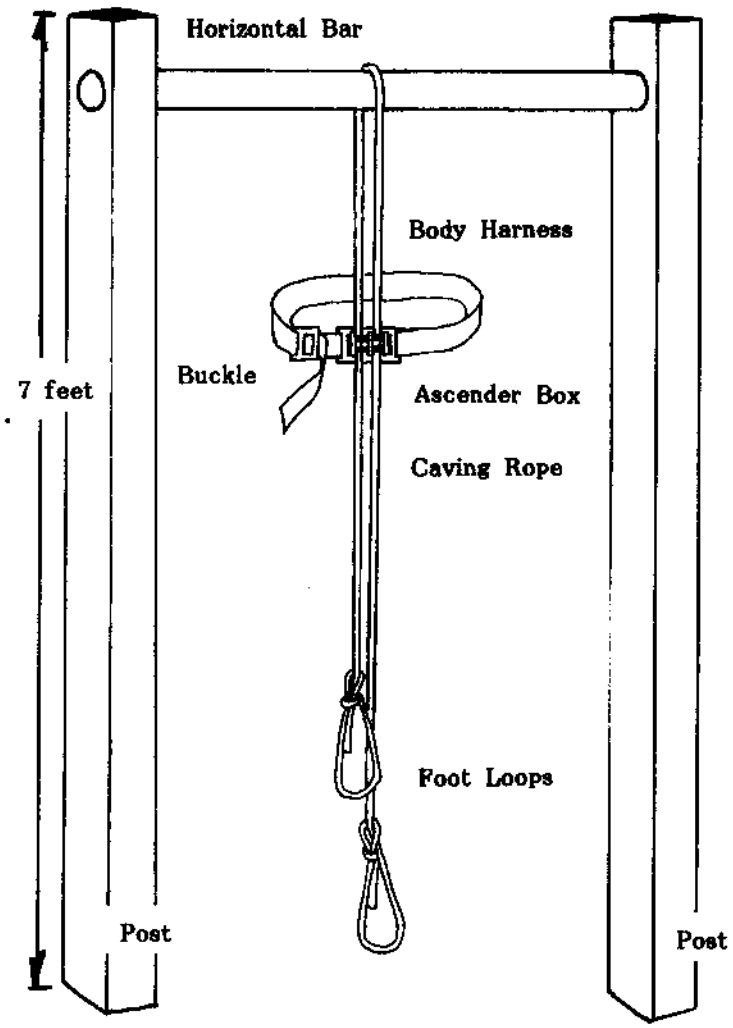
A very significant milestone was passed during the NSS Convention 1985 Prusik Contest: One man and one woman of ages seventy-years-plus participated. This "first" will not be "last", as ever more people practice better health care through nutrition and physical fitness programs, more of them will preserve their mental and physical vigor decades longer than in previous years.

The purpose of this article is to give you a means of preserving yourself by frequently exercising on your own prusik climbing simulator. You can build it for little or no cost depending on what you already have on hand. **NO SPLICING of rope is required.**

The device I used to get in shape for the contest is small (about 2" X 8" X 18") and weighs about 3 pounds. It needs to be hung from a stable support seven or more feet above ground. I trained with it three times a week for three weeks, then rested one week before the contest.

Instead of describing my prusik practice device in detail, I will only describe the basic idea along with some of the faults inherent in such an over-simplified arrangement.

See the diagram on the opposite side of the page.



That's all there is to the idea, and it will work just as it is drawn. You don't even need a set of ascenders or knots to use it. With no hands you are rope-walking; with a hand on each side of the box, you are practicing Mitchell; with both hands above the box you are practicing the Gossett System. It can also simulate a two knot prusik and a simple modificatin will allow practicing a three knot prusik climb.

The Irritating Idiosyncracies

1. It wears the rope rapidly.
2. Particles of rope fiber fall down and you breathe them.
3. At some speeds you will develop a pendulum motion.
4. The rope may keep edging along the bar in one direction.
5. When it over heats the rope may tend to sieze to the bar.
6. It may chatter, squeal or vibrate.
7. It requires less effort than actual rope climbing.

So why don't I let you in on the details of the improved model that eliminates or reduces the above objections? It is because I want to challenge the inventiveness of all you wonderful, cantankerous, creative individuals with guts enough to work your way through the bowels of the earth.

So, Speleo-Edisons, fix it up your own way, and when you get it to work satisfactorily, please send a photo or sketch to our Editor, Bruce Smith, and include any necessary written explanation. Let's give Bruce so many reports, he will have to devote an entire issue to prusik practice. (ED. I can dig it)

Editor: It should be noted that Darrel climbed 30 m. mechanical in 45.4 seconds and the 120 meter mechanical in 7 min. 24.2 seconds...Quite a testimonial for his practice climbing system. ■

ALWAYS LOOKING FOR GOOD ARTICLES

TREASURER'S REPORT

NSS VERTICAL SECTION

JUNE 21, 1985

INCOME:	
Memberships	1279.00
Subscriptions	30.00
Back Issue Sales	1294.20
Bank Interest	72.54
Other	7.68
TOTAL	2683.42
EXPENSES:	
Editor:	
Mailing **Nylon Highway #18**	64.28
Printing **Nylon Highway #18**	270.00
Printing **Nylon Highway #19**	540.00
Mailing **Nylon Highway #19**	35.15
Postage Permits	140.00
Printing **Nylon Highway #20**	529.08
Mailing **Nylon Highway #20**	75.69
Other postage	56.10
Mailing Envelopes	65.04
Other Supplies and Materials	35.32
Other	15.00
Secretary-Treasurer:	
Supplies	93.26
Postage	238.03
Advertisements	24.00
Service Charges	10.01
TOTAL	2190.96
NET INCOME	**492.46**
BALANCE AS OF JUNE 21, 1984	**1367.27**
BALANCE AS OF JUNE 21, 1985	**1859,73**

SECRETARY'S REPORT

NSS VERTICAL SECTION

JUNE 21, 1985

Number of Single Members	298
Number of Family Members (number of people)	10
Number of **Nylon Highway** Subscribers	16
Number of **Nylon Highway** Sent free	7
Number of **Nylon Highway** Exchanged	20
Total Number of Section Members	308
Total Number of **Nylon Highways** mailed	345

DAMAGE TO WEBBING DUE TO ROPE CONTACT DURING RAPPELS; INITIAL TEST

By Rob S. Elron*

Accidents in which seat slings were abraded or glazed when they were in contact with the rope during rappels have been reported for many years. A quick review of these reports in **American Caving Accidents**, and discussions with other vertical cavers has resulted in two observations about these accidents. First, all cases occurred on "high speed" rappels where the rappeller was almost certainly going faster than 10 feet per second. Second, no cases were reported where the seat harness webbing broke or was cut in two. In fact very little reference was made to the extent of the damage in terms of how far through the webbing was damaged. There were no reports of webbing damage during "slow speed" rappels (2 feet or less per second); so an informal test was designed to investigate what damage might occur when seat harness webbing came in contact with the rope during slow speed rappels.

The rope used was a piece of Blue Water II that had seen little use and had no glazing marks on it. The drop was a 54 foot free fall, that resulted in an actual rappel of 50 feet (±2 ft.). The "weight" was a rappeller who weighted 200 to 203 lbs, including gear. The webbing was three pieces each of; one inch tubular, two inch flat, and 1 13/64 No. 6 parachute webbing, for a total of nine pieces. Two inch tubular webbing was not used as none was on hand at the time.

The pieces of webbing were sewn into loops which fit over the break bars of a Blue Water Short Rack. On each rappel, a loop was placed

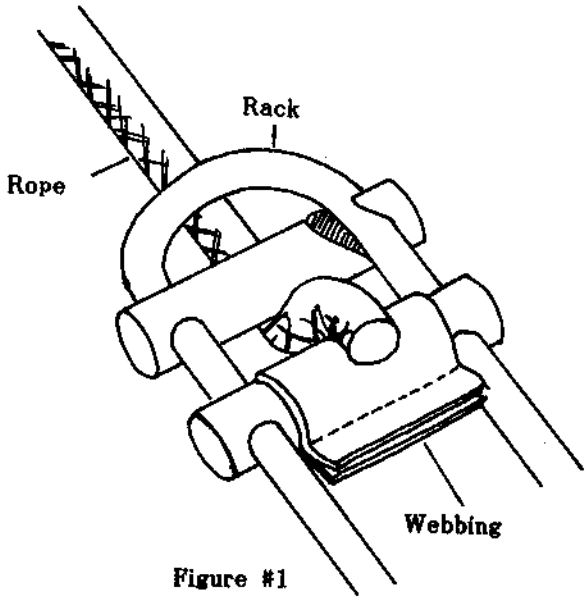


Figure #1

over either the second, third, or fourth break bar of the Short Rack (figure #1). The loops were locked into place between the bar and the rack on the notched side of the bar (figure #2).

WARNING: This prevents the bar from completely closing...and is a clear hazard to the rappeller Each rappel was done at as steady a

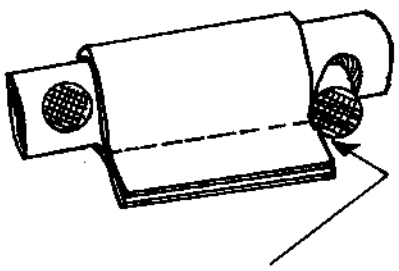


Figure #2 Webbing pinched between bar and rack keeping the webbing from spinning, but also keeping the brake bars from completely closing.

speed as possible, while attempting to maintain a speed of 1 foot per second. The actual speeds varied and the time for each rappel is noted with each test loop in Figure #1. Nine rappels were made, of which six provided useable results. These six are shown in Figure #1. The three one inch webbing loops either pulled free and spun, or the rope slid off the webbing onto the bar negating the test.

Damage to the rope consisted of two lines of glazing on opposite sides of the rope. the lines were usually less than 1/8" wide, and at the maximum were 1/4" wide. The glazing affected only the surface threads and "fuzz" in the crest of the "weave checks" (the area in the center of a square of exposed yarns that is furthest from the center of the rope), and did not otherwise affect the rope. It was noted during the test that the amount of glazing appeared to change only when the test loop was on the second bar.

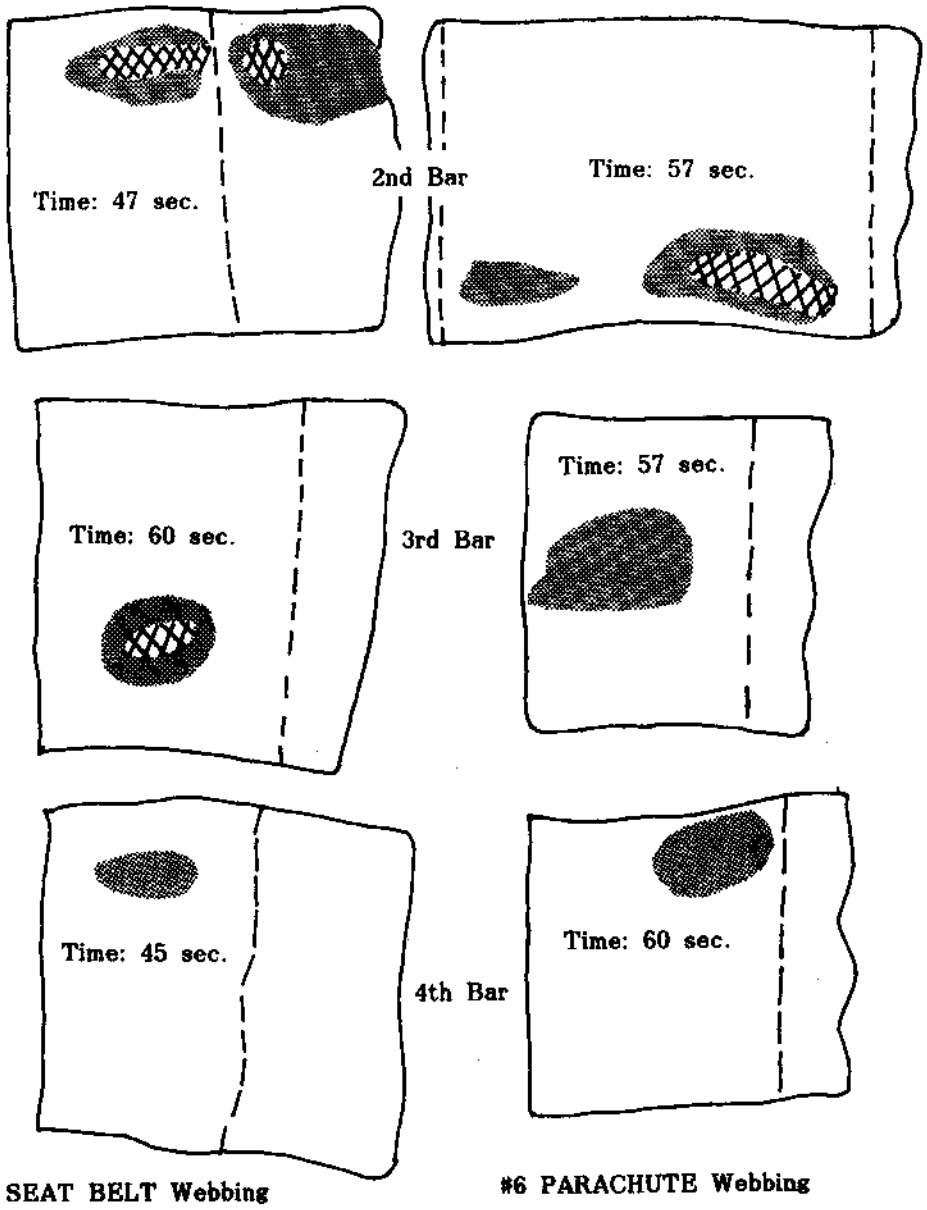


Figure #1: Damage to webbing loops after 50' rappels

The amount of damage to the webbing (figure #3) decreased significantly from the second bar to the fourth bar. Which correlates with the decrease of friction supplied by the bars during a rappel. This suggests that even less damage would occur on webbing that was used as a seat harness, even if the rope contact did provide some friction (such as having the rope wrapped around the hips). Further practical tests in this area need to be done to determine what actual damage is done to a seat harness when the rope is wrapped around the hips or leg(s) to provide extra friction during a slow speed rappel. It is very probable that the tension on the webbing and, where the harness

Continued on page 8.

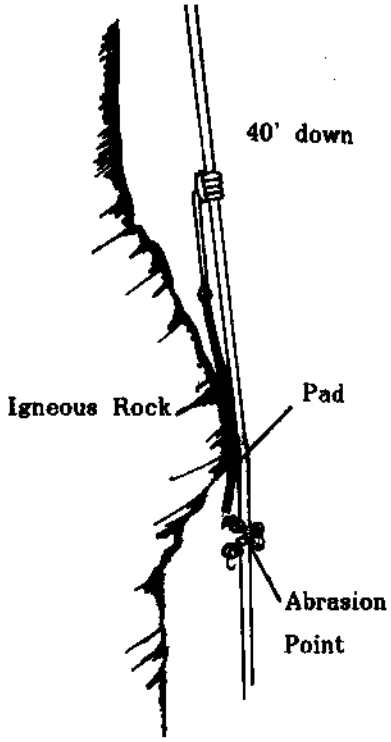
DANTE'S DESCENT: A NEAR MISS

By Barbara am Ende

On Sunday, 2-24-85 Hans Bodenheimer, Doug Powell, Kevin Craig and myself took a trip to Dante's Descent, Arizona to make sure Kevin, who had done some vertical work, could handle some of the big stuff. He was a litle nervous at first facing such an awesome pit, but came through with flying colors. We rigged Hans' 300' PMI and my 200' PMI with someone else's Bluewater II tied to it. That way someone could go down and up along side Kevin. Doug went down first, then Kevin and Hans together with Hans on the tied rope. I went down last on the 300'. About 40-50' down there was a point where the rope came in contact with wall. (EDITOR: The top of the pit is developed in a layer of sharp igneous rock) It was difficult to determine exactly where the abrasion point would be and I wound up below the threating spot. I found myself someone frustrated in that I couldn't reach the pad knot which was attached to the main rope. The whole time I was fiddling with the pad, It rained a lot of rocks down. The walls are very loose.

Shortly after I arrived on the bottom Doug started up the knotted rope. While he was climbing I went over and looked at a very dead owl Hans had found. As Doug approached the loose rock area the rest of us took cover. Doug repositioned the pad on the 300' rope and continued up to the top.

Next, Kevin and I ascended side by side (sort of). He climbed the three hundred and I climbed the knotted rope. When we got to the padded spot, I noticed a severe fray on the rope. The rope had been cut clear through the sheath on one side.



When we hauled the rope up after we all had climbed out, the core popped out at the fray.

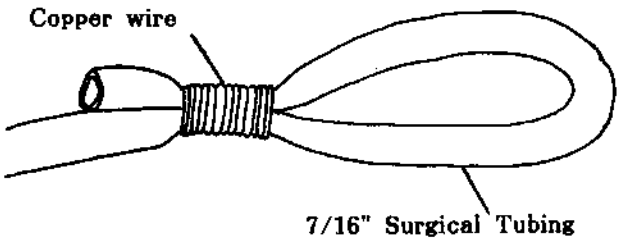
It was difficult to determine exactly what caused the fray since the rope and pad were in the proper position when I saw them. Hans thought I should have whipped the rope in a S wave to reposition the pad after Doug may have moved it out of position. I don't think that would have helped and may actually have positioned it in the wrong place. It's difficult to tell.

Two factors in particular may have been important in causing the fray. I bounced a lot while climbing resulting in a sawing action of the rope against the rock. However, when I arrived at the fray, the pad was in place and the fray was below it, so the pad should have kept the rope from abrading. This suggests that while the rope

Continued on page 8.

MORE ON ASCENDER FLOTATION

By John Ganter



In **Nylon Highway** #17 (December 1983) there was an article (p. 20) on using surgical tubing to float ascenders. The method of attachment (shown on page 23) was called "The Chinese Finger Trap" by Dave Thorpe, who drew the illustration for Sligo Grotto's **Subterranean Sun** which he was editing at the time. ("Finger Trap" refers to the tubing staying on a smaller-diameter object by constriction, like the Chinese noveity.)

While the surgical tubing has worked great in the intervening couple of years, the "finger Trap" has not withstood the test of time. The problem is that a gummy residue forms on the inside of the tubing, and eventually it slips off the "finger." I found this out recently when the tubing came off and smacked me in the face! It was wet and would not stay on again, so I hand-floated my knee ascender up a bunch of drops. Something had to be done.

The solution is simple: you just wrap the tubing around the point of attachment and then bind it tightly with heavy copper wire. In a pinch, you can even get by with duct or electrical tape, but leave plenty of tubing at the end, or it will pull through.

If you're having trouble with bungie cord not being stretchy or abrasion-resistant enough, try surgical tubing. It's available at surgical supply stores or saltwater fishing tackle shops. Be sure to get natural, latex synthetics aren't stretchy enough. ■

Webbing Abrasion continued from page 6.

comes in contact with the rope (on the rappeller's side near the friction device, on his hip, or on his side away from the friction device), are primary factors in the amount of damage that occurs. Even so, rope to webbing contact still remains a factor that every rappeller needs to be aware of, for eventhough damage is reduced as speed and friction are reduced, the damage is not totally eliminated.

*Special thanks to Joel Dickson and Art Dodds for their assistance. ■

Dante's Descent continued from page 7.

was moving up and down due to bouncing, the pad moved up and down with it since the pad was tied to the rope. It seems that the pad probably rode up above the abrasion point and the rope below the pad was then free to be abraded. A longer rope pad would have prevented this. Of course, not bouncing would also have reduced the problem a lot, but for some reason I couldn't keep from bouncing while I was climbing.

EDITOR: Over the years, it has been my experience that Dante's has an apetite for rope and many a new rope have been severely abraded by walls of Dante's. ■

THE KISA SHOCK ABSORBER

By John Ganter

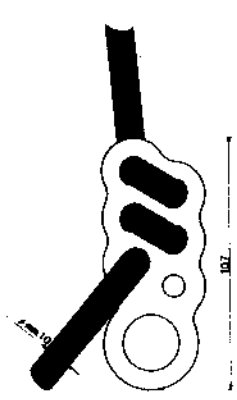
While looking through a Caving Supplies Ltd. catalog not long ago, I came upon a brief mention of a new device which was supposed to reduce the shock of roped falls in climbing and caving.

As you might expect, I promptly bought one, and what arrived was the strange-looking aluminum plate illustrated herein. The idea is that one threads the climbing or caving rope through the KISA's holes in various configurations depending on the size and condition of the rope, fall expected, etc. and it allows limited slippage in the event of a fall.

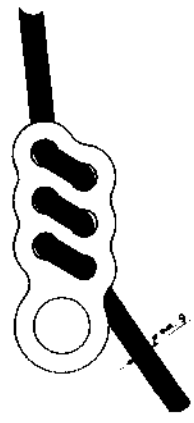
Does it work? Personally, I can't answer: this article is just intended to let others know that the device exists. Mr. Phil Brown, proprietor of Caving Supplies, did perform some of his own tests before stocking the KISA and has sent me the results. He cautions that his tests may not be reproducable, but did convince me that the KISA was a viable product. Let me briefly summarize his results:

1. On 9 to 10mm static rope falls of force factor 1 and 2 caused slippage of 1 to 2 feet, and 3 to 4 feet, respectively. This varied somewhat depending on how the KISA is threaded and the condition of the rope.
2. With 8 to 10 mm static ropes, falls force factor 1 and 2 caused a Petzl Jammer to consistently damage the rope sheath. When the KISA was installed there was little or no sheath damage.

Clearly, energy which would be ripping up the rope sheath is being burned off as heat in pulling the rope through the KISA's contortions. If you have access to a dynomometer or other test facilities, I'd certainly encourage you to do more testing of the KISA. I have an extra that Mr. Brown sent me that you can have, otherwise I'll probably donate it to Gary Storrick's Museum of Vertical Gear!



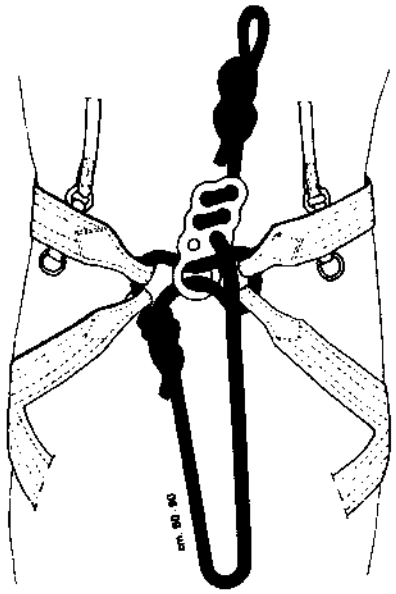
Normal use with rope 10 mm in dia. Rope will slide between 300 and 400 kg. of shock loading force.



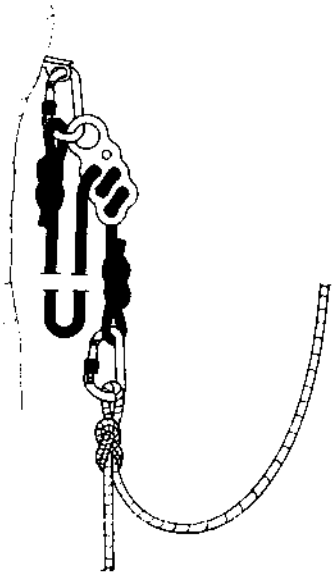
Normal use with rope 9 mm in dia. Rope will slide between 300 and 400 kg. of shock load.

Less frequent use with rope 10 mm in dia. or 9mm on ice. Rope will slide between 150 and 300 kg of shock load.

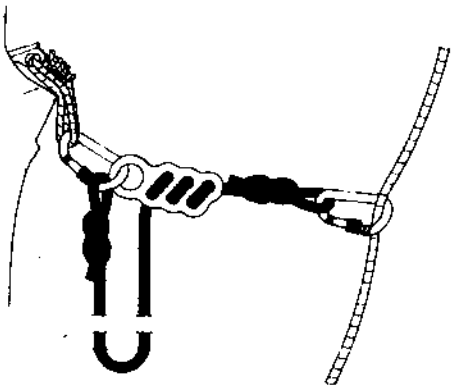
Normal use between harness and rope when rock climbing.



Recommended normal use when cave exploring.



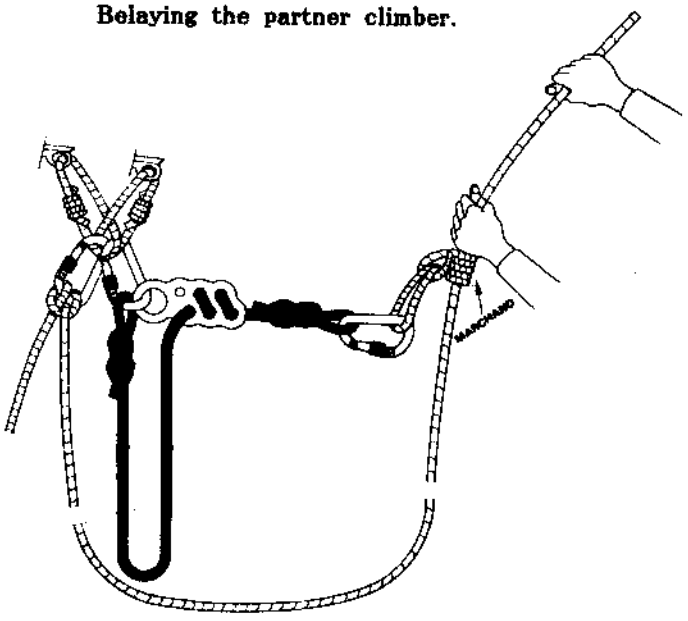
For use with "critical" pitons and/or sharp edges.



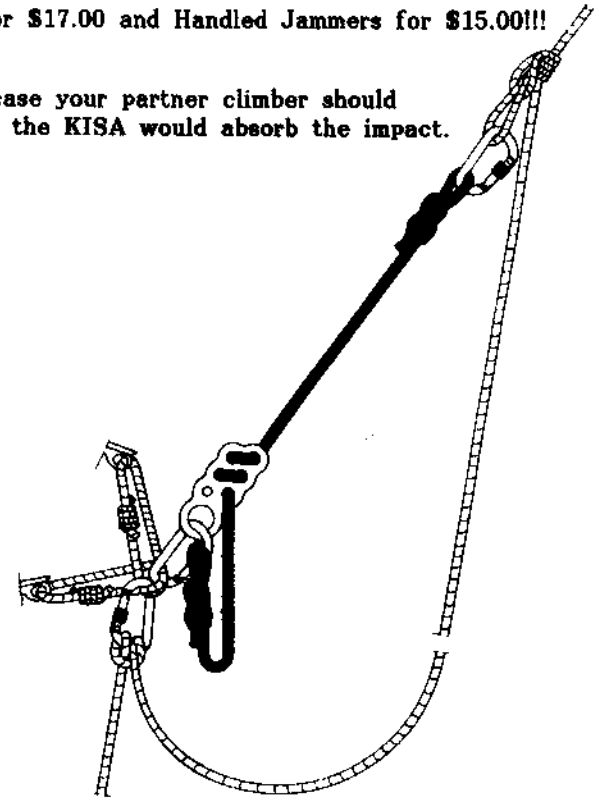
<u>How to get one:</u> The Bonaiti KISA costs 4.75 pounds plus shipping from Caving Supplies, 19 London Road, Buxton, Derbyshire SK17 9PA, United Kingdom, A free catalog is available upon request.

<u>A word about buying British Caving Gear</u>: I've placed a number of orders with British firms, and have been highly impressed with their service...and the prices are just plain unbeatable. Typically, they are 1/2 to 1/3 those in the U.S. Airmail can run up to 20 or 25 bucks for a large order, but who cares when you're getting Ultimate helmets for $17.00 and Handled Jammers for $15.00!!!

Belaying the partner climber.



In case your partner climber should fall, the KISA would absorb the impact.



Continued on page 14.

DUTIES of the VERTICAL SECTION OFFICERS

Did you every wonder what the responsibilities of the Vertical Section Officer's consist of. At the meeting in Kentucky in 1985 Kirk MacGregor proposed the following list of responsibilties and activities necessary to keep the Vertical Section alive. The Editor has added his responsibilities. This list will be reviewed by the Executive Committee and then presented to the Vertical Section body in 1986 in New Mexico for approval.

DUTIES OF THE CHAIRMAN

-Being responsible for the well being of the Section. If any problems arise for the section, the Chairman should lead the other Executive Committee members, and Section members as a whole, in solving them. As a last resort, the Chairman should personally do whatever is necessary to overcome problems.

-Chairing the Section's annual meeting at the NSS Convention. Whoever is Chairman at the start of an annual meeting chairs the whole of that meeting, even if defeated in elections during the meeting.

-Producing one substantial article for **Nylon Highway** each year. It is acceptable to produce this article by persuading someone else to write it.

-Communicating with other Executive Committee members and other people as needed to handle any committee business that arises between annual meetings.

-Ensuring that all Executive Committee decisions are made properly. This involves fully informing all committee members about the matter being considered, obtaining comments, if any, from all committee members, circulating the comments to all committee members, and getting votes from all committee members. Less adequate procedures may be used only after a genuine attempt to do things properly has taken place. Such circumstances are extremely rare.

DUTIES OF THE SECRETARY-TREASURER

-Maintaining the Section's main bank account. This should be an interest bearing account. It must be in the name of "NSS VERTICAL SECTION". At least one member of the Section's executive committee other than the Secretary-Treasurer should also be able ot sign for money from this account so the section can easily retrieve it's money should the Secretary-Treasurer become incapacitated. Normally, the Secretary-Treasurer would be the only person working with this account.

-Maintaining a ledger showing all monies received for Section dues, **Nylon Highway** subscriptions, and **Nylon Highway** back issues sales; regardless of whether the money was collected by the Secretary-Treasurer of some other person (e.g. the Editor), plus all Section financial transactions conducted directly by the Sec-Treas.

-Keeping the Section's list of members, **Nylon Highway** subscribers, **Nylon Highway** exchanges, etcetera, up to date.

-Producing the self-adhesive mailing labels needed for mailing **Nylon Highway**. These labels should be produced from the most up-to-date information possible, should be in any systematic order specified by the Editor (e.g. by ZIP code), and should be delivered to the editor quickly.

-Ensuring that Section members and **Nylon Highway** subscribers are notified when they need to renew. This can be done either by the Secretary-Treasurer mailing notices, or by the Editor including notices with **Nylon Highway**. In the latter case, the Secretary-Treasurer should provide information on which people need notices to the Editor.

-Sending money to the Editor to pay for **Nylon Highway** and related expenses. This normally involves one lump-sum payment per issue. The Secretary-Treasurer is not to supervise the Editor dollar by dollar.

-Running an advertisement for the Section in every issue of the **NSS News**, and possibly in other publications as well.

-Keeping the Secretary-Treasurer's file copies of **Nylon Highway**. Two copies of each issue from number one onwards are to be kept, and passed on to succeeding Secretary-Treasurers. One copy of each issue can be disassembled to facilitate photocopying or printing. the other copy of each issue is to be kept in pristine condition. These **Nylon Highways** are <u>not</u> to be loaned out, except to thoroughly trustworthy Section members on <u>very rare</u> occasions. They are <u>not</u> to be considered any part of a lending library.

-Storing roughly half of the Section's back issues of **Nylon Highway**. (The other half of the back issues are to be with the Editor, so all cannot be lost in one fire, etc.) If the Secretary-Treasurer does not have enough space, some other trustworthy person can store these back issues.

-Selling back issues of **Nylon Highways** both by mail and thru the consignment bookstore at the NSS Convention.

-Receiving Section dues payments, **Nylon Highway** subscription fees, and most other payments to the Section.

-Making payments for the Section, except those made by the Editor.

-Answering enquiries about the Section.

-Preparing the annual Treasurer's Report, showing income, expenses, and balance. This is prepared immediately before each NSS Convention, using the Secretary-Treasurer's ledger and the Editor's detailed record of expenses, etc. This report is presented at the Section's annual meeting and then published in the **Nylon Highway**.

-Preparing the annual Secretary's report, showing the number of members, **Nylon Highway** subscribers, **Nylon Highway** exchanges, etc. This is prepared immediately before each NSS Convention. It is presented at the Section's annual meeting and published in the **Nylon Highway**.

-Preparing the minutes of the Section's annual meeting at the NSS Convention for publication in the next issue of the **Nylon Highway**. When the Secretary-Treasurer changes in the election held at the meeting, the outgoing Secretary-Treasurer is responsible for the minutes for that meeting. The new Secretary-Treasurer first prepares minutes for the meeting about a year later.

-Preparing the annual report to the Internal Organizations Committee, using the form provided by that committee. This involves answering about four pages of questions and producing a membership list complete with addresses and NSS numbers. This report is due on February 15th each year.

-Communicating with other Executive Committee members and other people as needed to handle any committee business that arises between annual meetings.

DUTIES OF EXECUTIVE COMMITTEE MEMBERS

-Doing whatever is necessary to keep the Section running normally until the next annual meeting should the Secretary-Treasurer, Editor, or Chairman become incapacitated.

-Communicating with other, Executive comittee members and other people as needed to handle any committee business that arises between annual meetings.

-Producing one substantial article for **Nylon Highway** each year. It is acceptable to produce this article by persuading someone else to write it.

DUTIES OF THE EDITOR

-The Editor is not a member of the Executive Committee and as such does not carry an Executive vote although the position carries with it substantial influence and responsibility.

-Collect articles, type/word process and correct for grammical errors and usage, paste up and print at least two(2) **Nylon Highway** issues per year. (A "year" to run from NSS Convention to NSS Convention.)

-Send controversial material to at least one other Executive Committee member before printing for review and recommendations as to the appropriateness for publication.

-Acquire a Non-Profit mailing permit, afix mailing labels to each issue (either in an envelope or not) and disperse to the entire membership, subscribers, appropriate grottos and other special exchange situations.

-Maintain a library of back issues and distribute as requested. Collect money for back issues and subscriptions and mail money and subscriptions on to the Secretary-Treasurer. Editor's operational funds should be dispersed only from the Secretary-Treasurer.

-Maintain back issue masters for reprinting purposes.

-Printing: A printer should be arranged for that can provide the highest quality at the lowest cost possible. Each issue's run quantity should be at least twice the anticipated mailing. A printing run of 600 should be considered minimum.

-Maintain a ledger of all expenses and receipts from the Secretary-Treasurer. Receipts should be kept for one year, submitted to the Secretary -Treasurer annually for justification of expenses. Postage can be considered a section expense, while telephone cannot.

-Acquire all the mailing rubber stamps, return address labels and other associated mailing necessities.

-Write, phone, coerce, beg, threaten, bargain and communicate with people in the main stream of vertical caving to acquire articles that reflect the most progressive/informative information possible.

Duties

-The Editor should avoid controversial and polical articles as it is the purpose of the **Nylon Highway** to be an information tabloid, not a forum for political issues or points of view. Advertisements should be kept to a minimum.

-Attend the NSS Convention each year. At the Convention the taping of veritcally oreinted presentations and the later transposition of those presentations may prove to be an abundant source of material for the **Nylon Highway**.

-Assist as needed with consignment sales at the NSS Conventions.

-Communication with other Executive Committee members and other people as needed to handle any committee business that arises between annual meetings. ■

KISA continued from page 10

To order, I simply write what I want and my VISA card information on a 35 cent Aerogramme, put it in the mail and wait. Air mail usually takes about 2 or 3 weeks to the Eastern U.S. Surface transport takes 4 to 6 weeks and isn't much cheaper.

Caving Supplies seems to have the best prices and I'm particularly impressed with their practice of testing what they sell. In the spring of 1984, for example, they discovered that Petzl was selling "polyester" belts and harnesses that were made of nylon! Their prompt action resulted in a recall and possibly prevented some disasters.

If you don't mind waiting, I think you'll like buying British. ■

VERTICAL SECTION: CALL FOR PAPERS

If you have some piece of research, or experimentation you have done, or an interesting discovery, or perhaps a new piece of vertical equipment and wish an opportunity to present your findings at the NSS Convention in New Mexico. Put your thoughts on paper and send them to this year's session chairman, Bill Bussey, P.O. Box 311, Stanley, N. C. 28164. Deadline for these descriptions of your findings is April 15, 1986. This will insure that the presentation will appear in the Convention Guide Book.

ADMINISTRATIVE

NYLON HIGHWAY: is published by the NSS Vertical Section, and available to Subscribers and Vertical Section members for $3.00 per year. For Delivery outside North America add the following extra postage charges:

Air Mail.....$4.00

For Spouse memberships add an additional dollar. Please insure that these payments are in U.S. dollars. Frequency of the publication is based on the availability of material. All material that is submitted must be readable. The editor is able to arrange, upon request, professional quality drawings explaining your topic. Checks made payable to the NSS Vertical Section.

SPECIAL THANKS Take careful notice of the names listed under each Feature Artiacle in the Table of Contents on the inside of the cover. These are the movers and the shakers of the vertical world...these are the people that feel being current about vertical stuff is important. Their concern keeps this publication alive and I truly appreciate their contributions. Words can not express my gratitude. Thank you...

THE USE OF KNIVES IN VERTICAL CAVING

By Geary Schindel

Many cavers feel that a knife is an essential piece of vertical caving equipment. The purpose of this article is to show how knives are misused by vertical cavers, describe proper technique to avoid their use, and to describe the few cases when a knife should be used. Vertical cavers commonly substitute a knife for common sense and good technique. A knife is one of the most dangerous tools a caver carries, both to himself and his fellow cavers. The placement of a knife next to a loaded rope or sling is similiar to placing a loaded gun next to your head; a slight slip of the hand and you can make a BIG MESS. This paper will describe the problem of knife use in vertical caving by example and discussion.

EXAMPLES

Example 1

A caver was rappelling into a 160 foot pit. As he reached the first sloping ledge about 70 feet from the bottom of the drop, his white shirt became caught in his rappel rack. He pulled out his knife and proceeded to cut his shirt out of the rack. He noticed a fine white fiber appear as he cut. Upon closer examination, he had cut through most of the core of the rope. He quickly attached a seat Jumar to the rope above the cut.

Example 2

A young woman, with little vertical caving experience, was starting a rappel into a 100 foot pit in West Virginia. She had very long hair that she had tied behind her back. About 35 feet from the bottom of the pit, her hair became caught in the rappel device. She ended up hanging with her hair jammed through the rappel device. Another caver at the bottom of the pit climbed up the rope and handed her a knife. The woman then cut her hair out of the rack while they both were loading the rope.

Example 3

A woman, who had only rappelled with a top rope belay, was using a rappel rack for the first time. She wanted to use a prusik knot attached to her seat harness as a self belay. While backing over the edge of a 50 foot high sandstone drop, she slipped and allowed the prusik knot to jam before it passed over the lip. The fingers on her left hand were smashed under the rack which became caught on the lip. She pulled her fingers free and asked for assistance from her friends. An experienced vertical caver proceeded to help. The caver had two rigged Jumars with him, but decided to use his knife to cut the prusik. The caver was afraid that the knot would jam again out of his reach, and insisted on cutting the sling against the wishes of the stuck rappeller. The prusik was cut next to the rope where the prusik knot passed from its wraps.

Example 4

An experienced vertical caver was rappelling during a grotto vertical session. About 30 feet from the bottom, a piece of clothing became jammed into his rappel device. He pulled out a knife and prodeeded to cut himself free. At this point, he cut through the rope and fell, breaking his ankles.

DISCUSSION

Having a rappel stopped by either a jammed knot or by an object caught in a rappel device is a common problem. Most commonly used rappel devices are subject to jamming especially the rappel rack. Many self belay devices can also become "loaded" and require weight to be removed before the rappel can proceed. How the caver solves this problem is very important. A jammed rappel or self belay device is not an immediate life threatening problem and a knife near a loaded rope is not the solution.

The first four examples presented in this paper represent a gross misuse of a knife. In each example, a little forethought, experience, and self control could have adverted the possibilities of a disaster. A knife should never be used or placed near a loaded or unloaded rope or sing unless it is intended to cut it. A sharp knife can go through a loaded rope with little trouble.

A simple experiment will show what a sharp knife can do to a loaded rope. Start by trying to cut an unloaded piece of rope laying on the ground. Don't use your hand to hold it in place. You will find that you can do some damage by pinning the rope between the knife and the ground, but it is difficult to cut it clean. Then have someone help you pull the rope tight. It cuts much easier. Next, try it with body weight on it. If you don't get the message, try cutting it with two people's weight loading the rope as in example 2 or with a loaded hauling system. You will find that the rope almost explodes.

Now, with a little feel for how ropes and knives interact, let us look at example 2 again. Think of the young woman with her head jammed next to her rack. She can't see where her hair is caught. The other caver climbs up to her, adding additional weight to the rope, and hands her a knife. The young women then cuts her hair from the rack by feeling with her fingers. If you think about it, this is not the recommended method for obtaining a punk haircut.

The jammed rappel problem is easy to solve. It requires a little bit of practice, standard vertical caving gear, and a little bit of common sense.

Required Vertical Equipment

The first and most important piece of equipment for this technique is a seat(safety) ascender. Any spring loaded ascender that can be easily placed and taken off the rope will work. This includes some of the ascenders made by Jumar, CMI, Clog, and Petzel. The ascender is attached to the seat harness with a sling and with a second locking carabiner. Do not clip the seat ascender into the rappel device carabiner. It will remove the play in the system sometimes required to shift the loading from the ascender back onto the rappel device. The seat ascender sling length should be long enough to extend six inches to a foot above a rappel rack when it is clipped on the rope. You should be able to reach the ascender when it is attached to the rope and loaded. This ascender should always be attached to the seat harness when in or near a vertical environment and is a good indicator of vertical competence and experience. The ascender is used as a safety around lips (it has to be clipped onto an anchor rope to work) to assist with removing material caught in a rappel device, assist in going over bad lips, switching from rappelling to ascending, etc. Some people will subsitute a shoulder cam (Gibbs) from a rope-walker system as a seat safety ascender. This must be done with caution

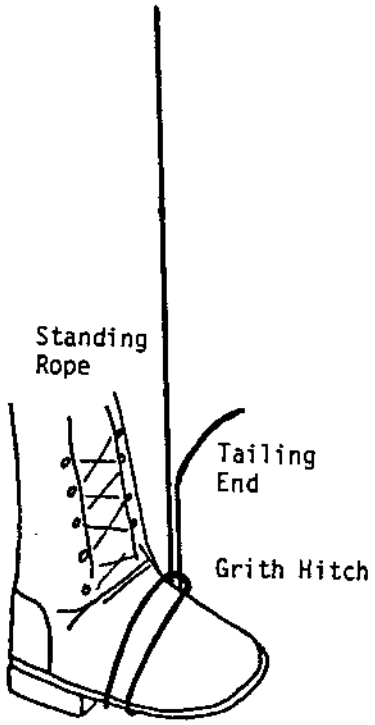


FIGURE 1

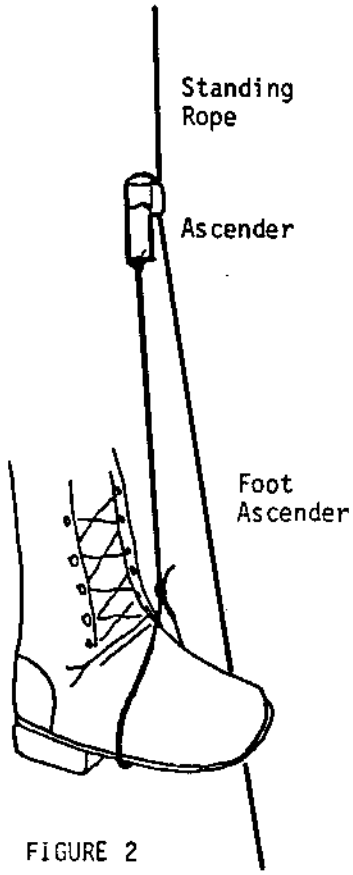


FIGURE 2

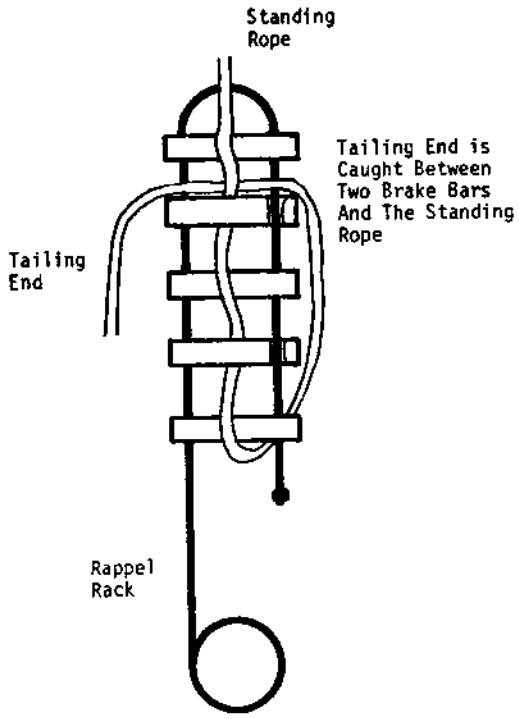


FIGURE 3

as the ascender must be spring loaded to guarantee it will grab the rope. The difficulty in quickly placing a Gibbs on the rope is another drawback.

A second ascender with an attached foot sling will also make the following described technique easier. Any style ascender will work, but a spring loaded ascender with an attached sling reaching to knee height is best.

DESCRIPTION OF TECHNIQUE

When an object becomes caught in a rappel device, the rappel device should be locked off, if possible. The seat (safety) ascender should then be attached to the rope above the rappel device. The ascender is pushed up the rope as far as possible. The rappel device is then unlocked and a small amount of rope is allowed to pass through it, until the seat ascender is loaded. The ascender now has the weight of the user on it and the object caught in the rappel device can be removed by loosening the rope from the rappel device. This has solved the problem of material caught in the rappel device and has not required the use of a knife.

To proceed with the rappel, and solve the problem encountered in example 3, weight must be removed from the seat ascender. Slack should be removed from the rappel device and, if possible, the device locked off again. The user now has a choice of using a girth hitch on the rope or using a foot ascender (Figure 1 and 2). The method of choice will depend on the rappel device being used and how comfortable the caver is with the different techniques. In either case, **Do Not** remove the seat ascender from the rope until full control is obtained with the rappel device. The rappel device should be locked off if possible before weight is removed from the seat ascender.

Use of Knives

Care should be taken when using a rappel rack. The standard method of locking off a rack by looping the trailing end over the top bar, will cause the lock off loop to become caught between the upper two bars if weight is applied to the rope below the rappel rack (Figure 3). This problem can be solved by either using a foot ascender with a sling long enough to reach over the rappel rack and seat ascender or by placing all the brake bars of the rack on the rope and loading the rope below the rack without running the trailing end over the rack. Apply weight to the rope below the rack with a foot girth hitch or ascender. The loading of the rope by placing weight below the rappel device, is the same method used to control a rappel with a bottom belay. If an ascender is placed below the rappel device, be careful not to place it too close to it. When the rappel device is loaded, it can slide down the rope and jam on top of the ascender.

To remove weight from the seat ascender, stand in either a girth hitch or an ascender. Reach up and grab the seat ascender. Slide the seat ascender down until it rests just above the rappel device. **Do Not** remove the seat ascender from the rope. The seat ascender is used as a safety when control is removed from the bottom ascender and placed onto the rappel device. If control is lost, the seat ascender will become loaded and the rappel stopped. The technique of unloading the seat ascender must then be repeated. As weight is removed from the girth hitch or ascender, care must be taken so that control of the rappel device will be maintained. Weight will now be on the rappel device. If the rappel device is not locked off, do so now. Remove the bottom ascender or girth hitch. Unlock the rappel device. Remove the seat ascender from the rope. Start rappelling.

It is recommended that the above technique be practiced in a tree under the supervision of a qualified vertical instructor (whatever that is). The vertical caver should practice this technique with the different rappel devices they might use. Being familiar with the technique makes it easier to perform under more demanding conditions.

Some cavers have recommended replacing the use of a knife in vertical caving with blunt nosed medical scissors. Scissors are a cutting implement consisting of two opposing blades joined by a swivel pin. They usually have two looped handles acting as levers. Scissors can be just as dangerous as a knife and their use should be given the same consideration.

Example 5

A caver was rappelling into Fantastic Pit (510 foot rig point in Ellison's Cave, GA. About 400 feet off the floor, his hair became caught in his rappel rack. He placed his seat Jumar on the rope and rappelled a few inches until the Jumar was loaded. He then pulled some slack through his rack and removed his hair. He removed the slack from the rack, made a girth hitch below the rack and stepped into it. He was then able to slide his Jumar down the rope until it touched the top of his rappel rack. He then sat back down and had contol of the rappel with his rack. He then removed his Jumar from the rope and proceeded to rappel. A knife was never used and what little hair left on his naturally balding head was left to fall out another day.

When Should A Knife Be Used?

There are very few occasions in vertical caving where the use of a knife is the only answer to

Continued on page 21

LEANING TOWER; YOSEMITE

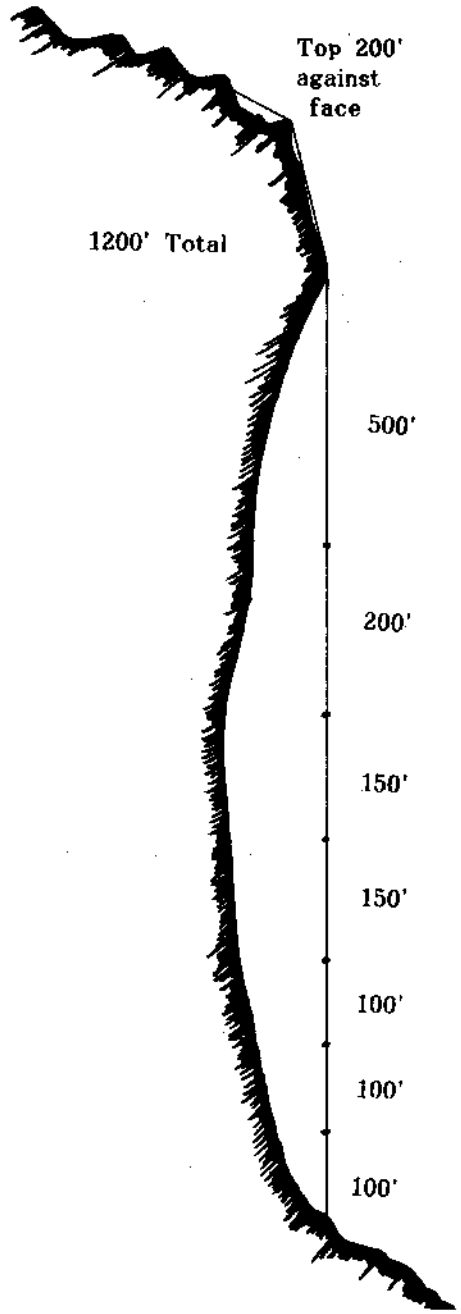
By Peter Strickland*

On the right side of Bridal Veil Falls, close to 20 years ago the first 1200' drop was assaulted using vertical cave techniques by a team of vertical experts led by Peter Strickland and Charlie Townsend. On June 20, 1966 following the NSS Convention at Sequoia, CA, permission was obtained to climb the Leaning Tower, a 1200' drop...1000' of which is free fall. The support team consisted of John Strickland, Mike Townsend, Chip Carnie and others. Prior to this assault the record drop was the the nearby Watch Tower 1125', completed only a week earlier.

Since no rope long enough was available, it was necessary to tie several ropes together. It took 7 ropes and 6 knots to complete a lifeline long enough. The lifeline started with a 600' piece of Goldline secured at the top with 2 three-eighths inch nail and lead anchor bolts. A 200' brand new Goldline was attached to the 600' with 2 bowlines, followed by 150' perlon, 150' white nylon and 3 other borrowed ropes of unknown origin. Each was tied together with 2 bowlines (the accepted knot at the time for joining two ropes). Each climber and rappeller had to cross all 6 knots which were approximately 20" long each.

The rope was carried to the top via the Glacier Point road. The rope was secured and the assault plan established. Charlie was to descend and ascend first, while Pete was to follow.

Charlie's descent was marred by an incident that could have been tragic. Charlie used double brake-bars to descend (racks had just been invented, but not widely available). It was necessary to Jumar down the rope using a foot stirrup to acheive progress (figure #1). Upon arriving at the first knot, Charlie performed the necessary maneuvers to descend over a knot. Upon reattaching the brake-bars, he accidently loaded them in a twisted position (Figure #2), illiminating 2 of the 6 friction points. On the



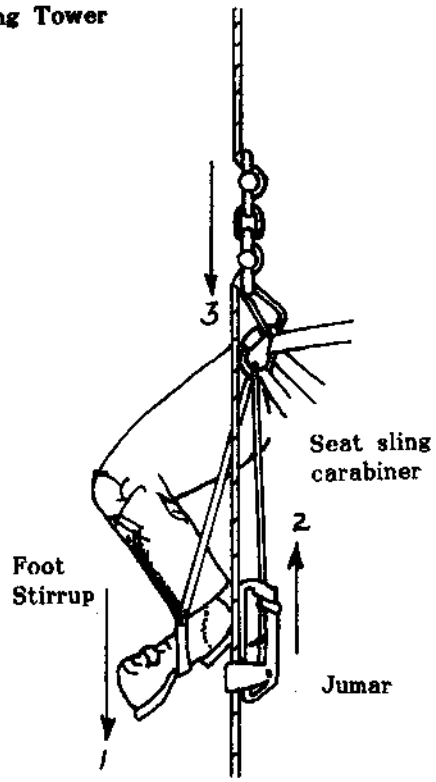


Figure #1 Jumaring down the rope in an effort to overcome the friction and weight of the rope. 1) Foot pushes down, 2) Raising Jumar 3) Thus pulling the rappelling system down the rope.

super slick new Goldline, he descended out of control for 200'. His gloves were severely burned before his descent was stopped as he slammed into the next knot. Charlie flipped upside down, painfully bruising his hip. The remainder of his descent was slow but concluded as planned. Charlie evaluated his condition as unable to ascend.

Pete, without a radio, not knowing what had happened waited impatiently. Finally, in an effort to discover what happened to Charlie hiked down the back side via the Gunsight climbing route. Pete reached the road at dusk and discovered Charlie's fate upon reaching base camp.

The next morning, Pete inchwormed up the 7 ropes, crossing all 6 knots without incident in 1 1/2 hours. Pete used a total of 4 Jumars to ascend (2 of which were on upper body slings).

Figure #2 Double Brake-bars inverting elimating the two center friction points.

Upon reaching the top he untied the rope and dropped it. Pete removed one of the bolts by simply pulling it out with his hand before walking back down via the Gunsight route.

The first 1000' freefall concluded with only one rappel and one prusik. The drop was repeated in 1972 using a 1500' piece of BW II. The rope was pulled up with parachute cord and over 10 people rappelled the drop. No one climbed the rope. The rope was lowered at the conclusion of the one day of rappelling.

*The information in this article was obtained from several interviews with Pete Strickland by the Editor.

Editor: I think it is interesting to note the pioneers of big vertical drops. Some of these early drops included some of the most uncomfortable, inconvienent and sometimes impossible circumstances, such as no radios, crossing knots, and no lights or warm clothes as night darkened the big walls, and yet without their initial attempts and triumphs we would not be where we are today. My hat's off to Pete and Charlie and the many others just like them. ■

The Use of Knives in Vertical Caving continued from page 18 by Geary Schindel.

solving a problem. The Author believes that a knife should only be used if there is an immediate danger to a life and a rope must be cut to save it. Even then, great care must be taken. A good example is seen when a rope is holding a person underwater; the caught person will quickly drown if action is not taken. This is much more common in river rescue problems. There might be a case for the use of a knife in cave rescue when vertical systems become jammed because of poor rigging conditions or inexperience. This should be very carefully considered on an individual basis.

CONCLUSION

The techniques and no-knife philosophy discussed in this article are very simple and should be taught the first day of vertical practice for beginning cavers. Variation of this technique is used to switch from rappelling to ascending and back to rappelling, passing knots, passing other climbers on rope and switching ropes, etc. and is an important basic vertical caving skill.

It is hard to understand why cavers insist on using a knife around vertical equipment. These thoughts on the use of knives are not new, nor are the techniques. Could it be a statement on the average level of vertical competence by organized cavers?

This article originally appeared in the **NSS News** November 1985 p. 349 under The STC Column. We appreciate the opportunity to print it again. ■