FACE TO FACE WITH

THE TECH TROGLODYTE

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A JOURNAL
OF THE V.P.I. GROTTO OF THE N.S.S.

Officers

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		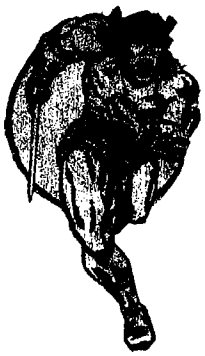	
Mike Wolf	Bob Alderson	Lor Windle	Donnie Carter

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Trog Staff -

EDITOR: Lor Marshall Zarth Nolan Windle

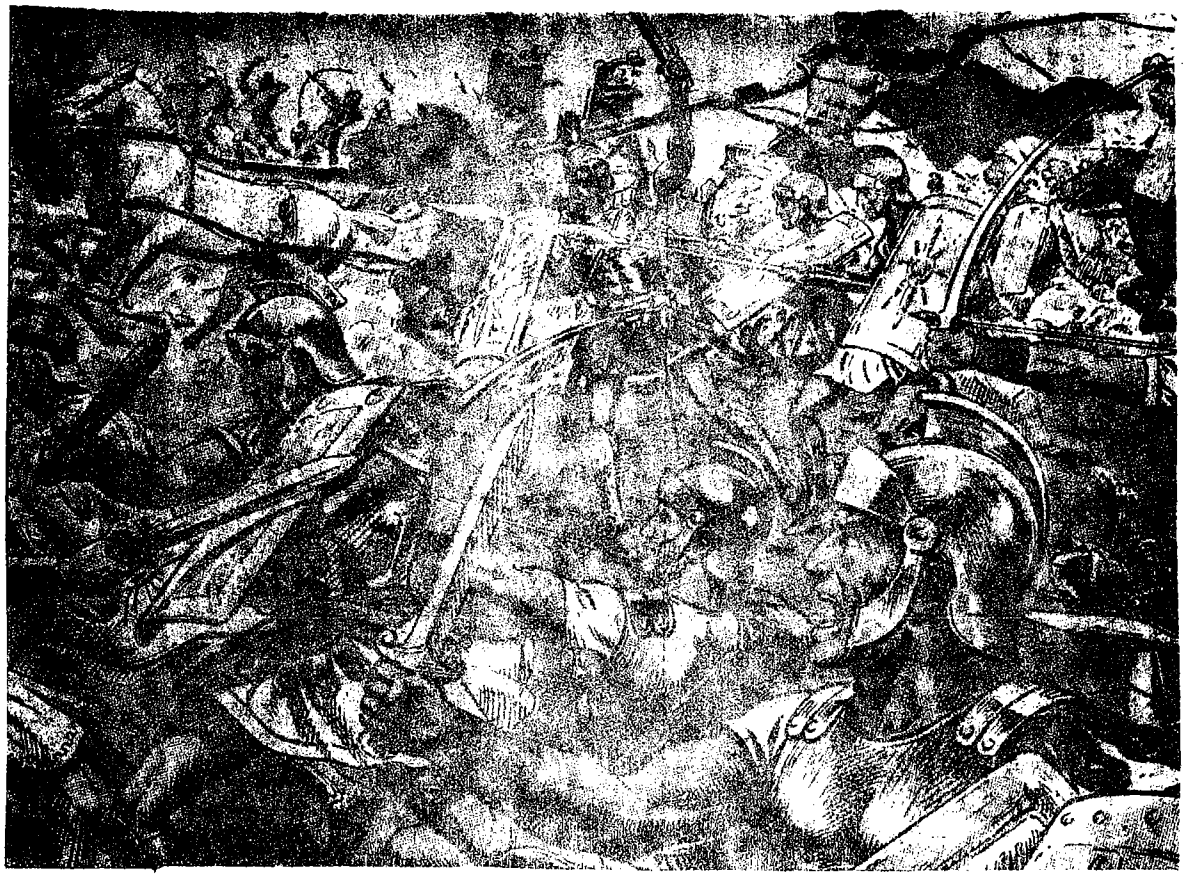
Exchange Editor: Ed "Buckwheat" Richardson

Any complaints concerning this publication will be ignored due to the fact that, other than writing articles and drawing the cover, I did everything by myself.

Exuberant Editor

Explicative Statement on the cover: Drawn by Bob Page after a meeting of the New River Valley Grotto. It was decided that such displays of rebellion on the previous covers were in poor taste. A. I. Cartwright had to be brought back! However, the old cover could be improved on (at least made different). So we compromised: We put A.I. back on the cover, but in a new form. Like I said... It's different.

Retinue!



PICTURE #1. Recent photo by unknown photographer of VPI Grotto meeting. Exact date is not known. Note beer can in third archer's hand.

Wolf Howls

I address this column to those people who are, have been, or will be, a voting member of this grotto. What I wish to say has been on my mind for some time; it concerns the responsibility we all have as active members of the V.P.I. Grotto. At the end of last quarter, a major change in the Constitution was pending the approval of the membership. At the same time, we were beginning a search for candidates for elected Grotto offices. To my dismay, I detected a great deal of apathy towards these two issues. We conduct business in the Grotto with the approval of the active membership, not an executive committee like some grottos do. Our membership resides within a limited geographic area and theoretically should be able to easily attend the meetings. Instead, it took over a month to finally act upon the Constitutional amendments. One of the primary reasons for the delay was that a number of times not enough people showed up at the meeting to vote on the issue. I realize that notification of the membership concerning the amendments was not carried out effectively the first time, but this does not excuse the fact that many members were failing their responsibility to the Grotto by not showing up, whether important business was on the agenda or not. The only difference between a member and a trainee is the right to vote and hold elected office. Certainly by attaining membership a trainee has proved him or herself to be a competent caver, but a trainee may, at times, be a better caver than many members.

When a trainee becomes a member this person is taking on a responsibility to the Grotto not only in terms of what we stand for in cave safety and conservation, but also in terms of the running and administrative functions of the club. Not everyone needs to take an interest in holding a Grotto office, but every member has to be ready at all times to use his or her vote in a knowledgeable and responsible manner. The easiest way to do this is to attend the meeting and keep informed as to what is going on. The grapevine is very active. Words on different matters get around fairly easily, but many people have lost contact. This same responsibility applies to the election of officers. I am sure that no one uses their vote to elect a friend rather than a person who they realize would do a better job. The election of officers usually receives a good deal of attention and an intelligent vote. However, the same does not hold true for an ordinary meeting when a simple motion over a matter of policy may be the most important business. The point is, both matters are of equal importance and should receive the same undivided attention of the membership. We all agree that many meeting get boring with most of the business brought up, but it only takes a few hours a week. I would like to see in my term as President an increasing concern for the direction the club is heading on the part of a <u>responsible</u> membership.

Well, that's it for the heavy stuff; so go open another beer.

Drink Beer, Raise Hell!

Wolf (no "E")

El Presidenté

Listen. When the wind blows, turn to the source and perhaps you will hear it. At first, it sounds like the sea in a seashell held to the ear, but it slowly evolves; changing tone and intensity. Animals cringe when they hear it, babies in their cradles cry with an unknown fear, old men clutch their hearts in terror as they perceive it. It could be the anguish of a god crying out or the protest of mother nature against man's insidious advance. No, it is merely the sound of cavers in action. Thus, then; learn of our deeds. Learn, for this is

The Grotto Grapevine

Another scholastic year has swept inextricably past. School has taken its toll on our motley crew. Many sheep shall desert the fold. Others, however, will remain ensnared by unexplained forces. Randy Wood and Kathy Cronau are graduating, but both will return to graduate work in the fall. Michael Richardson will pull free of the school and no one (except maybe Stringfellow) really knows what he plans to do. Twila Frieders has completed her masters work here. Both she and her husband, though, have been incredibly silent recently. Former President Doug Yeatts will escape this hole with more than he had when he came---Boots is expecting in the fall. Tom Calhoun is going to masters work at another school. Thor Brecht will complete his masters work this summer and go his way from there. Bob Simonds will be leaving us, as will Jean McCarthy; together. Carolyn Lewis will obtain her Bachelor's and her Master's this summer. Ed Loud, if he doesn't flunk out this quarter, will graduate. Bunch of smart-asses!

Our good friend, Eros still lingers around. Aside from the pending wedding of Randy Wood and Kathy Cronau, mentioned in the previous Trog, one other wedding and one more engagement have appeared. Bob Simonds and Jean McCarthy will be sharing their caving gear in matrimonial harmony starting in early June. The other, perhaps more startling news, is the announcement that Mark Slusarski, the Polish Dog, is now engaged to a girl he met at school in Tennessee (hmm, do I hear someone whistling the refrain to "Tennessee Stud"?).

A.I. Cartwright, too, has been busy. He has spurred us to overthrow our old regime and place a new puppet in charge. (Some people dare to call this turmoil an election). Mike Wolf is now the president of the grotto. His number two in charge of trainees, etc., is Bob Alderson. Supporting them is the treaurer, Donnie Carter. The actual person-behind-the-scene-who-runs-everything is the new all-powerful secretary, Lor Marshall Zarth Nolan Windle (who by an amazing coincidence and a powerful show of force is also the Trog Editor). To maintain the power of the club, we have brought in more cave-fodder. New members are: Doug Thompson, Ed Devine and Chuck Shorten. VPI numbers are now up to 188 for any who would keep track. A. I. Cartwright, himself, was busy caving while these events took place. He so abused the Library in Clover Hollow that it had to be taken out before it completely collapsed. In a show of bravado and ignorance, Mike Wolf led a trip to put new satiating material in the cave. In turn, old A.I. granted us much pleasure with our own entertainment.

Yes, indeed; VPI craves entertainment. On the 10th of May we and all of our friends charged madly into Mr. Penley's field armed with tents, sleeping bags, and five beer kegs. The fiasco that followed, more commonly called the VPI Picnic, was a typical success. By Sunday morning bodies were strewn from the entrance to Newberry's down to the road. Few people could recall all the events of that night.

It all started calmly enough; people tearing up the road, getting stuck in the mud, being pushed out, while others played volleyball and fell in the mud, and still others drank---and fell in the mud. As darkness fell, most people gathered around the fire and there talked until Don Davison whipped out his guitar and started the singing. Skip Whitehurst amazed everyone by the utter vulgarity and perversity of the words that spewed forth from his mouth. We heard some of the most incredible lyrics to "Wild West Show" and "Rodriguez, the Mexican Pervert", and all were impressed by the physical display of "Swing Low, Sweet Chariot". In the mean while, Jim Denton decided to impress his friends so he took his big ugly Toyota, turned on the back-up lights, and got out of the Toy. The Toy, though, decided to back up anyway. Doing so, it smashed people aside and ran over two dining canapes before Don Davison (ever present as it were) leaped into

the cab and stopped it. From there on, the party went downhill. People started going to sleep and by 6 o'clock the party was virtually over. About 7 o'clock it started up again. Freezing people stood around the fire and waited. As the day warmed up, so did the adventurous spirit. Bob Page and Ed Loud took their vehicles and romped over the hillsides. Jim Denton finally recovered from the previous night and got Mr. Penley's permission to tear up a sticker patch. In the process, he knocked down a tree a got stuck on top of it. Dixon's Toy came up in support and with a great effort pulled him free. A few more hours of such wild activities and the party ended. The field was cleaned, people were cleaned, and thousands of drunk drivers attempted to play hide-and-seek with the police.

Two weeks later, these same drunks and others could be found on the New River. The event: The VPI Annual Float Trip. More and more people took rafts down this year. Every clique had a raft. The beer drinkers, the pot-heads, even the L.A. Some of the most unique rafts showed up. Don Anderson and his daughter (just how old is he, anyhow?) brought a 4 by 8 foot piece of styrafoam and built a shelter over it. Hixson and his boys had a raft that looked like an inner-tube orgy. Doug Yeatts was Float Trip Admiral and he picked a site that was about one-third of a mile higher up than last year. The trip began and eventually everyone fell over the rapids. Keith Ortiz got the "Udder-futility award" for trying to float down on several thousand half-gallon milk cartons. Even more amazing, though, is the fact that he made it. Below the rapids, the armada was met by Lor Windle and the Inexpugnable Nazi Magoo, a most amazing man! Not too much exciting happened after that. Lor Windle had his head bashed in by Bill Douty, who was very rambunctious without his Pumpkin to watch out for him. All in all, the trip was completed very swiftly with little wind resistance. Following the Trip, everyone went home to put something into their bellies prior to the murderous grain punch. The party was held at Denton's and Redder's on Main Street. With a slow start, the party built up to a climax matched only by the total eclipse of the moon. Much punch was spilled, but more was guzzled down. Minor excitement was created when someone stole a jug of punch, but it was recovered safely and everyone relaxed again. Relaxed so much, in fact, that damn near everyone fell asleep and the party was concluded early; 4 a.m.

The Magnificent 7

The 3rd of May dawned early. Too early for the seven intrepid cavers who were daring the elementals and planning on trying to skydive that afternoon. They and their fans journeyed out to Dublin in the morning hours and rendezvoused at Don Anderson's residence. Once they had gotten their courage up (again) they moved out to the New River Valley Airport and procedded to sign away their chances for a quiet, contented, afternoon. They were put through an intensive training program in preparation for their folly. In the afternoon, the first plan load bailed out: Gary Moss went first, landing short of the mark at the bottom of a small hill; Nancy Coleman followed, she was also short---over a hill on the far side of route 100; Skip Whitehurst came last, landing in between the runway and taxi strips. The weather turned to the worse and everyone retreated to the relative safety of Don Anderson's, where again we luxuriated in true southern hospitality. Sunday dawned calm and overcast. The brave souls returned to the airfield where, with persistence, managed to get Ed Richardson to jump with a group of free-fallers. They pushed Ed out early, though, and he landed in a puddle on the far side of the field. After the weather cleared up, the last group pushed their luck. Rolf McQueary led off and landed over three fields and four barbed wire fences away---the longest distance for the entire group. Doug Perkins managed to land about half as far away. Jan Davis floated past Perkins and also landed some distance away. Everyone rushed out to find them and help them back, then helped themselves back to Don Anderson's for another quick refreshment break. A top off the hat to the falling fools and a note of condolence and thanks to Don Anderson and his patient, tolerating family.

The Good, The Bad, & The Ugly

As you should know, last September three VPI cavers gained official police notice of the fact that they were drunks. On April 27th, three more VPI cavers ran into a little attention themselves. Rick Cooper, Doug Perkins, and Bill Stringfellow were out in the country planning on taking a scenic train ride. They

had their tickets and were cruising through town when they passed a set of funeral pylons placed out on the road. With much cunning and subtlety, they slammed the car to a stop, leaped out, and shoved the pylons in. Less than a mile down the road, they were pulled over by a cop. "Holy Shades of Bob Barlow!", Perkins exclaimed. At any rate, they were taken to the local JP who caught them on a charge of Disorderly Conduct and fined them 1¢. Unfortunately, the court costs were $16 apiece so they just managed to make it with $3 to spare between them. In closing, they were run out on the rail. (As to the title---you figure it out).

Elsewhere in the news; a new grotto has been formed: in Radford, its name is the New River Valley Grotto. It is a regular grotto, will have some affiliation with Radford College through the Radford Cave Club, also being formed. A fair number of VPI members have shown interest in this grotto. Don Anderson has become chairman with assistance from Ed Richardson and Carolyn Lewis from VPI and Dave Engels and Dr. Reggie Scalero from Radford. This five man team makes up the Executive Committee. We are hoping for much productive cooperation between our two grottos.

Our grotto has been engaged in much conservation this past quarter. Unfortunately, it was not underground. We were engaged in the Miller Pick-Em-Up campaign contest. This contest was between frats and clubs and sororities and dorms. The object to drink Miller Beer for points and clean up Miller's trash. Well, the frats drank and we cleaned up. In the end, we had a 7 thousand point lead (our final score was 38,000 points) on the closest frat. As a result of this display of might, we shall win a fairly valuable prize, resell it for cash, and increase our depleted treasury.

One last quick note: Fall VAR is going to be sponsered by VPI this year so keep your eyes, ears, and nose open for the news. And when the time comes, keep your mouth open for the beer. God bless all of you and don't pick your nose with any stalactites.

It is the editor's opinion that there is no need for an editor's column since the editor has already edited any material he objected to, added all material he wanted put in, and expressed his own opinions in the previous article.

Lor Windle

Report on the Accident at Dig Spring

In February of this year, trainee Bill Koerschner and I started ridgewalking in the Brown's Ridge area of Mercer County, W. Va. near Dry Fork. Our efforts were quickly rewarded with several finds, including two springs needing digging out. One of them, named Dig Spring, was blowing air. This and the hopes of making a connection, convinced us to begin excavation.

On May 11th, our fourth visit to the spring, we came armed with a winch and cables to pull a large rock from the entrance. Our working area was an alcove about ten feet long, eight feet wide, and six to eight feet high. Two rather large blocks lay on the ground, damming the spring. These we wished to winch out as a sledge hammer had proven worthless the week before.

In order to minimize the effect of mud suction, we started digging around the rock's base, which would also give us a better hold with the chains. While we were doing this, Bill got carried away and started to dig away from the target rock; at the base of the blocks forming the right wall. A few minutes after he started digging there, he said, "I hope this thing doesn't fall on me". A minute or two later I heard, and then saw from the corner of my eye, some crumbs of dirt roll down from the side of the block. I looked up, expecting to see someone standing above us on the small cliff. What I saw instead was the right wall of the alcove toppling toward me. In a split second I jumped for my life toward the outside of the alcove, yelling as I did, "It's falling, get out!" Bill, who was crouched at the very base of the wall when I yelled, had time to stand up and make a brief move to his left before he was hit. The wall was composed of two three to four ton blocks with a half ton of smaller stuff on top. With a ripping noise, the whole stack toppled, the bottom block was stopped by the target rock, but the upper block slid off the lower one, hitting Bill on the right side of his body, knocking him down.

I got up, dismissing my minor scrapes, and looked over to Bill. His shirt was in shreds, his shoulder was bent in a grotesque angle, and a deep gouge in his lower right arm showed the tendon or bone. He said something about going to black out, so I left for aid. I got a local to call for an ambulance from Princeton, 15 miles away. While the local waited for the ambulance at my car, I returned to Bill with some clean clothes to cover the wounds with. I covered him with the clothes to keep him warm and minimize shock, and kept talking to him to keep him with us. About forty minutes after the accident, the ambulance crew arrived. After securing the lower block with a cable, we dug his foot out from the rubble and put him in a stretcher. It took another 30 minutes to carry him back to the road, and about two hours after the accident he was in the hospital. He underwent four or five hours of surgery. His injuries were a broken jaw, broken shoulder, broken lower right arm, and various nerves, muscles, and blood vessels ripped loose from the upper arm. The orthopedic surgeon who worked on Bill described the injuries to the arm as as bad as he's seen for survivors of mining accidents. There is considerable question now as to whether any use of the right arm can be recovered, even with future surgery attempts to put the nerves back in place.

Even considering the serious injuries sustained by Bill, both he and I were lucky. If I had not heard the crumbs of dirt rolling, neither of us would have had any warning. I would have been struck frontally and Bill would have been pinned or crushed by the lower block. Bill was lucky that the rock hit him while he was standing and that it didn't hit him more on his head. We were also lucky that I could go for help.

What can we learn from this? Certainly not that digging should be stopped, for part of the essence of caving is digging to new passage. It is rather that entrances feature the more unstable walls and ceilings and cavers should respect potentially unstable rocks. Bill and I got too careless, ceased thinking about collapses. We thought about part of the alcove collapsing after we removed the target rock, but we didn't think it would happen as soon as it did. Perhaps having only two people digging was unwise. We needed a third or fourth person.

Joe Saunders

Rescue? Bullshit!

Few Grottos are directing efforts towards developing personnel competency in cave rescue. Too often, practice rescues are only basic; involving passage in no manner complex or difficult. Situations far underground and behind multiple ascents, descents, climbs, and crawls are briefly considered and then dismissed. The logistics of a major multi-squad relief effort, demanding rapid and continuous activity over a period of 12-14 hours, are never considered. A 12 hour mock rescue would define the limits of individual human endurance in a real manner and might actually humble with reality those forever stating their grotto's rescue capabilities. But, they might have to miss dinner or tax their flaoby bodies.

Go tackle a cave (with one 70' drop, climbs, and straddle pits) that requires the use of a ½ mile of rope to rescue a stretcher case only 800 feet underground. Fail, but learn! Don't even tackle the tightest crawl problem that you know of in a popular cave, but rescue over the other difficult physical obstacles you can find: tight drops, long distance crawls and sloping passage, or straddle pits and chimneys. Don't throw in sub-freezing weather; snow, ice, freezing rain, or flood. Make it easy!

Your rescue call comes in after you have already been caving all day. Now pick your body off the floor, move accurately and think straight for the next six strenous hours. Only four men can be gathered for a rescue effort. The team moves through difficult trunk, 3/4 of a mile underground, and finds that the initial evaluation of the situation is far too optimistic. How many members of your grotto could competently solo to the entrance? Or would your leader, with the situation demanding that he, with his medical abilities (how many members of your grotto are trained at the level of Emergency Medical Technician or above?) and two others remain with the injured parties, be the only one capable of the feat? Rescue? Bullshit!

This brings us to the purpose of this article: Good cavers are made, not born! You can walk in Mammoth's trunk passage all your life and still get psyched at a tight crawl. You might never know a single knot, or know how to belay correctly, behave at the edge of a drop, use vertical gear, chimney, climb a ladder, drive bolts, cave dive, or know about exposure, jumars fouling in mud, or... For we learn by doing. You can't know what endurance is until you press its mental limits. You cannot learn to think and climb until you accept the challange and maybe take a few falls.

An individual who thinks that a "Super-Caver" is any guy who can cover 400' of rope in under 10 minutes is pitifully naive. But too many cavers think that they are great and can handle anything! Without knowing #1 about hard caving realities. This is where the accidents happen. Rescue is fine, but only by striving to make yourself into an all-around experienced, competent, physically fit, thinking caver can you reduce your chance of being an accident. That's the key to the whole idea of rescue---Preventing the Accident!

There are idiots who try to do a 500' pit without gloves and have no idea about which end of a rack goes where. Tell some people about exposure in a given cave and they act as if they are perpetual heat machines. Others don't know that it is advisable to try to keep dry and that this may take some effort from their flabby bodies. A "vertical caver" (read it on the back of his helmet) rappels into a deep pit without checking the ledge; and a 4 pound rock is sitting loose at the lip, just 6" from the rope. FOR GOD'S SAKE THINK!! Belayers belay and aren't sure if the rope they are holding goes directly to the climber or into the pile of extra rope.

Never cave alone. Never jump in a cave. Yes, parrot the phrases. Never think. Sit in your own little programmed box and grow mentally fat and content. Don't try rock climbing. Always be a follower. Yes, little Corporal, your General will always be healthy and capable of continuing. You will always be belayed. And if you have trouble on a thirty foot climb, while pushing a lead, or while 100' down a rope, have faith. You are not alone. For an Angel of Mercy will fly to you and wipe your nose and tie your shoes for you. WAKE UP, cavers! It's your ass in the cave. You've been alone since you came out of your mother's womb. It's you, your knowledge, and equipment against the environment. Wise up before somebody kills you.

~Don Davison Jr.

What We've Done on Sinking Creek

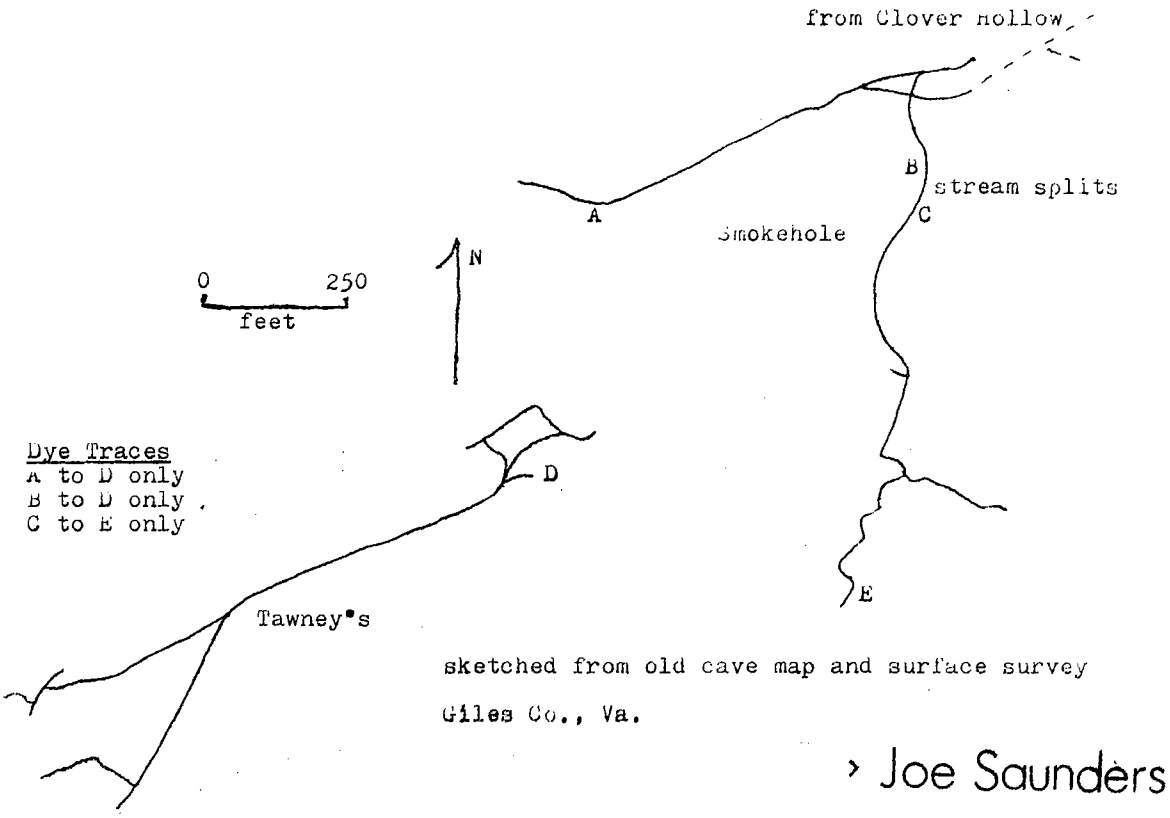
In brief, we've been tracing a lot of water a long ways, but not finding much in the way of a new cave. Sinking Creek itself has been traced to a rather large spring on the New River, about three miles from where it sinks in dry weather. The creek sinks in no large holes thanks to an attempt in the thirties by the WPA to plug these openings. However, we did pull a small log out of one hole and then watched as a beer bottle floated down the stream, made a right angle turn, and was sucked into the hole. At the other end, the water reappears at a 150 foot long spring downstream from Eggleston. Right now I don't know whether a cave was at one time enterable from the spring, but present rubble from the railroad tracks makes entrance impossible. Whatever it is that we can't get into has got to be huge. All of Sinking Creek gets sucked up for about six months out of the year and there is evidence that more water than just that from Sinking Creek is flowing down there. Two seperate dye traces from the sinking stream near William's Gulf Station on the Mountain Lake Road, made in high flow conditions, have reappeared over five miles away at both the resurgence spring for Sinking Creek and at a major spring a mile further downstream. This suggests some kind of overflow route between the system feeding the two springs.

Farther upstream, the main stream in Clover Hollow Cave has been traced four miles to the southwest where it reappears in both Tawney's and Smokehole Caves. When we found this out, we rushed into Smokehole to see if we could find the place where the stream splits. Sure enough, we found a place where half of the stream disappears into a low narrow crevice. Two dye traces from within Smokehole verified that water disappearing into this slot reappeared as the main stream in Tawney's. A small stream at the western end of the Big Room in Smokehole was also traced to the Tawney's stream.

Dye was also used to verify that water flows under the bend in which Link's Cave is located, probably much as Link's Cave used to carry water through the bend.

What remains to be done in the area is the survey of Smokehole. The old map was done in the forties and there is no indication I can find of what quality survey it was. Since then, the "impenetrable" breakdown upstream has been penetrated by way of a belly-crawl in the rapids and the main stream can be followed for several hundred feet to a place where the ceiling drops to within ten inches of the floor, still with the main stream present. This is <u>definitely</u> not pushable. One obscure side lead in the area goes some distance to a large room with a deep lake. This appears to be the farthest location from the entrance. None of this new stuff is mapped and Bob Page, who has remapped some of the old section, estimates that the cave has at least double the 2000 feet shown on the old map.

In October, Bob Hixon and I mapped the downstream section of the cave (400 feet) between the spring and where the slope from the dry entrance encounters the stream. In order to do so, we removed all loose rocks from the spring, and all logs and debris from under the bridge nearby; lowering the water level from 3 to 4 inches. After hammering away chert nodules from the six inch near-siphon at the spring end, we surveyed upstream in spacious passage with water depths averaging 3 feet. The passage averages 12-15 feet in width and 10-15 feet in height. It's really worth getting soaked to see. Just before we came to the upstream near-siphon which seals this section off from the rest of the cave during most of the year, we encountered deep water. Using an inner tube and the tape to retrieve it, we set one station along the wall and crossed over the rest of the deep area. A later party through this section of the cave punctured an inner tube trying to get it through the downstream near-siphon.



sketched from old cave map and surface survey

Giles Co., Va.

› Joe Saunders

SECRET CAVES DEPT.

In what may be a journalistic first, the Letcher County Community Press (in Kentucky) is running a full page feature called "Cave of the Month". The feature is written by Gary Jessey, author of "Letcher County's Pine Mountain Caves", which was panned in the NSS book reviews and banned from the NSS Bookstore. April's cave was the Whitesburg Garbage Dump Cave, a heavily decorated 50 foot blind pit. Gary Jessey is supposedly presently mapping Linefork Water Cave, the longest known Pine Mountain Cave---with one and a-half to two miles of passage.

Big Ed

To The Tune Of "Big John"

Perkins
&
Wolf (NO E)

Every night at the party you could see him arrive,
He stood six foot-two, weighed one ninety-five,
Broad at the shoulders, but broader at the hip,
And everyone knew you could always sip
With Big Ed.

Nobody seemed to know when Ed went home,
He always partied late and passed out all alone,
He didn't puke much; rarely even tried,
But when he saw a keg he'd try to drink it dry
Big Ed.

He came from the north, looking kind of lean,
Where he got in a fight over a can of beans,
And a crashing blow from a huge right hand
Sent a D.C. Caver to the Promised Land
Big Ed.

Then came the day at the V.A.R.,
When the kegs from Richmond didn't go far,
And cavers were praying and hearts beat fast,
And everyone thought that they'd drunk their last
'Cept Ed.

Through the dust and the smoke of that partying Hell,
Walked a drunk of a man that the cavers knew well,
Grabbed a cooler-chest and stood there alone,
And from a six-pack pulled a beer of his own
Big Ed.

And as he stood there, the pride of our club,
A caver called out, There's a Beer in his glove,
And twenty men scrambled over to his side,
Swore Big Eddie---We'll drink 'till we die!
Big Ed.

With mugs and vessels they started to drink down,
Then came a rumbling by the keg on the ground,
And smoke and gas belched out of Ed's ass,
The fateful knew it was over at last
For Big Ed.

Well they never revived that worthless sot,
But they placed a marble keg on the spot,
And these few words are written on that stand:
At the bottom of this keg lies a dead, drunk man...Big Ed.

Battle of Wounded Knee

Cave Club Crawling Contest

The idea for a crawling contest was first suggested to me by my brother after hearing tales of the long distances some cavers crawl. It sounded better when I mentioned this idea to Keith Ortiz; especially if we could crawl around the Tech Drillfield. In order to sell the idea to the administration, we would disguise the event as a fundraising drive along the same lines as the "Hike for Hunger". The proceeds would go to Muscular Dystrophy and we named the contest, in jest, the "Crawl for the Crippled". The Cave Club agreed to sponsor this insanity with the use of its name, people to help organize, and, of course, some crawlers. Keith got an appointment with some campus committee and, much to our surprise, was granted permission to use the drillfield.

A quick letter to the Guiness Book of World Records brought back the word that the current record stood at 6.67 miles set in three hours, twenty minutes. We were primarily interested in the distance, but we kept the time in mind. We were also informed that kneepads, gloves and a five minute rest per hour was allowable. We got under way. Forms were printed, help was organized, advertisements were placed in the student newspaper and on several radio stations. Alan Armstrong supervised the layout of the 1000 foot long course, having decided that this would be easier to mark off and patrol than a course around the drillfield.

Saturday, April 26th, dawned sunny and hot. At 9:45 the first of ten brave crawlers got down on all fours and set off. Here was where the put-on ended and the put-down began. The Crawl was no longer a joking scheme of the future, but a real event where we had to put our knees where our mouths were. I dropped out first, after one hour and 6000 feet. I had discarded my kneepads after 5000 feet, but to no avail. My knees were killing me. One look at my knees convinced me. Several square inches less skin on the knees: it would be seen often during the long day.

Others crawled on, though. Reggie Neal, the disc jockey from Christiansburg, was given all the beer he could drink every time he came in for his breaks. Several crawlers had radios dangling from their chests to keep their attention from the featureless ground stretching before them and the pain creeping through them. Carol Godla had several other things dangling from her chest and it was the highlight of each lap to pass Carol crawling in the opposite direction, dressed in a halter top. There was a quiet guy in a red jersey and foam-rubber pads who, along with Ed Richardson and Keith Ortiz, held up to the grueling one mile-per-hour pace. Their form soon developed into a cross between a monkey walking on his feet and fists and a very slowly plodding turtle. The disc jockey was still moving, but had less laps than the other three. His radio station kept broadcasting his progress and wishing him luck. The crawlers who dropped out could be found recuperating at the official's table along with a sizeable crowd.

When Keith dropped out, it was down to our man, Ed Richardson and Dave Smith, the red flash. Neither was close to the record, yet, but both looked determined enough to break it. A great cry of dejection went up when Ed finally conceded defeat after crawling a little over four miles. A look at his knees showed little damage because he had kept them dusted with talcum powder. His arms had given out on him, however. The crowd of cavers had grown at the official's table and all eyes were now fixed on the red flash. On his face was a continious grimace, but he looked determined to go all the way. He had refused water and was pushing for the last two miles to break the record.

As Dave's pace slowed even more, and he passed the official's table less often, talk turned to other things. Suddenly a shout rang out! Dave was standing up in defeat and making his way to the table. There, he collapsed, muttering about sleep and making his statement to the Roanoke Times reporter short. His distance, the best for the day, was 27600 feet. Only 5.2 miles, so the record stood. Second place was Ed Richardson with 22000 feet. Keith managed third place with 16000 feet.

Joe Saunders

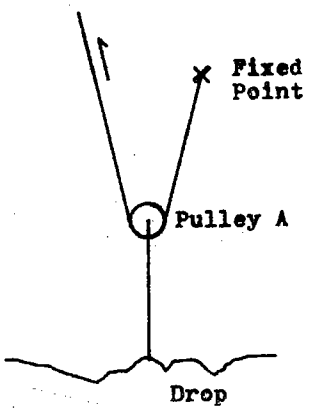


Figure 1. The basic 2 to 1 pulley system.

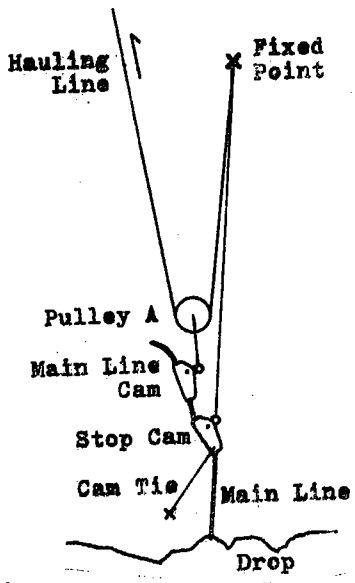


Figure 2. A 2 to 1 rigged with the purchase method---ready for a hauling session.

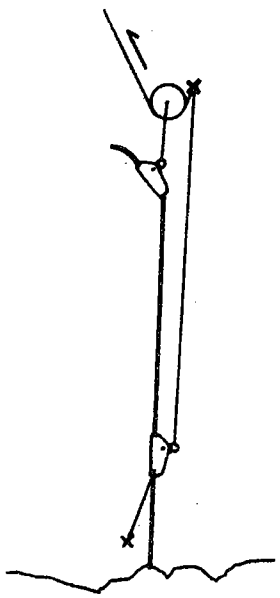
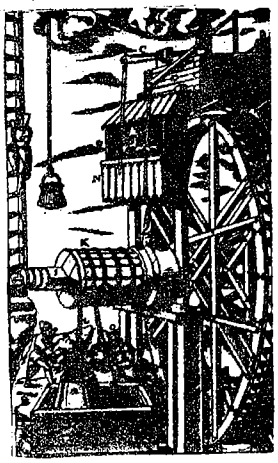


Figure 3. A 2 to 1 rigged with the purchase method---at the end of a hauling session.



Hauling

PART 1

Simple pulley systems of great mechanical advantage can easily be constructed using the concept of the 2 to 1 pulley system, the most basic pulley configuration. Pulley systems thus constructed have less energy loss through friction than any other pulley arrangements of the same ideal mechanical advantage (because there are fewer pulleys); therefore with these piggy back sys tems the actual mechanical advantage is the maximum obtainable. We shall examine the 2 to 1 and develop a 4 to 1 system requiring the minimum equipment with which it is possible to construct the ideal 4 to 1: one fixed point, one rope, 2 pulleys, and 2 Gibbs Ascenders. An 8 to 1 requiring no additional equipment, save one pulley, is also shown and therein the principles for constructing more powerful systems are illustrated.

In principle, a 2 to 1 pulley system requires only one pulley, one rope, and one fixed point, as is shown in figure 1. As a result of the physical limitations imposed by available rope lengths and a desire for simplicity and safety, pulley systems used in actual deep pit hauls are modified to incorporate the purchase method. Figure 2 illustrates the configuration of a 2 to 1 pulley system using the purchase method, ready for a hauling session to begin. Figure 3, in contrast, portrays the same system at the end of a hauling session. Let us follow a complete hauling session starting with figure 2. Here, the main line cam is close to the stop cam, which is engaged and holds the load of the main line. As the hauling line is pulled, the stop cam releases itself and swings into the line of pull. When sufficient recovery has occured, pulley A will collapse into the fixed point and further progress cannot be gained, as shown in figure 3. As tension in the hauling line is gradually released (to minimize shock loading), the stop cam sets itself and swings into the line between the fixed point and the point at which the main line crosses the lip of the drop. The stop cam now bears the main line load and the main line cam is slid down near the stop cam (as in figure 2) and another hauling session may be initiated.

The cam tie, in figures 2 and 3, serves to hold the stop cam in the most dropward position possible. Thus, its use helps to minimize the inevitable shock loading which occurs when tension in the hauling line is released (i.e. each time a hauling session ends or when the entire hauling crew slips!). If an inflexible cam tie, such as avalanche cord, etc., is used, a very sloppy and inefficient system will result, especially if the hauling direction differs considerably from the anchoring direction (for, if tight, the cam tie, being unable to stretch, will cause a friction producing bend at the stop cam or if tied lossely, hauling must be done in one specific direction to both eliminate the bend and maximize the recovery). With a shock cord cam tie, as found on the Davison System knee assembly, the stop cam always rides in the most dropward position possible so that recovery is maximized and no bend is produced. The flexibility of the shock cord automatically compensates for changes in hauling direction. The behavior of the shock cord cam tie is illustrated in figures 2 and 3, but is more dramatically shown in figures 10 and 11. The cam tie may be secured to a heavy pack or a rock projection. If no cam tie is used at all, an extra caver must stand at the stop cam and hold it in position manually. He must minimize shock loading and assure that the stop cam engages and releases at the appropriate times. Note that, in figures 2 and 3, the stop cam has been anchored to the only fixed point available. Generally, a second fixed point closer to the drop can be used instead; but we are trying to work with minimum requirements—both equipment-wise and natural!

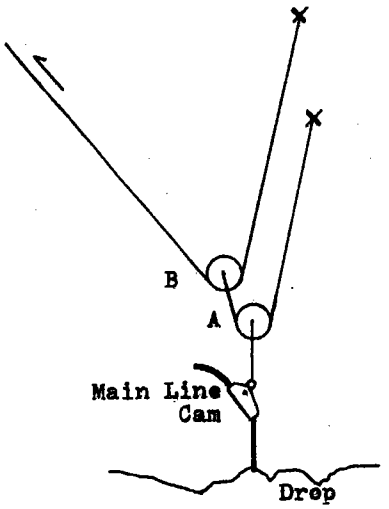


Figure 4. A piggy back 4 to 1 rigged from 2 fixed points---at the start of a hauling session. The stop cam has been omitted for illustrative clarity.

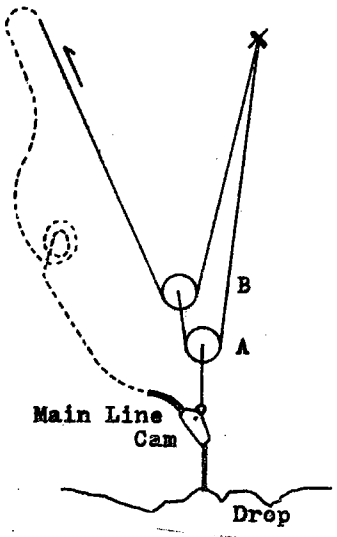


Figure 5. A piggy back 4 to 1 rigged from 1 fixed point with 2 ropes (ignoring dashed line) or 1 rope (using dashed line) ---at the start of hauling session. (Stop cam not shown).

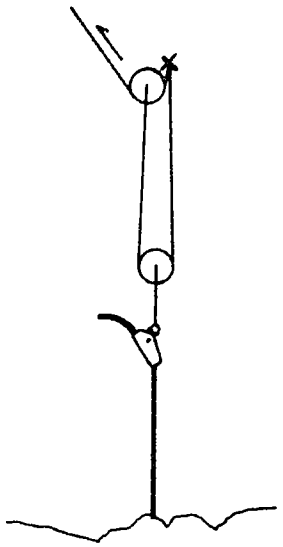


Figure 6. A piggy back 4 to 1 rigged from 1 fixed point with 2 ropes---at the end of hauling session (Stop cam not shown).

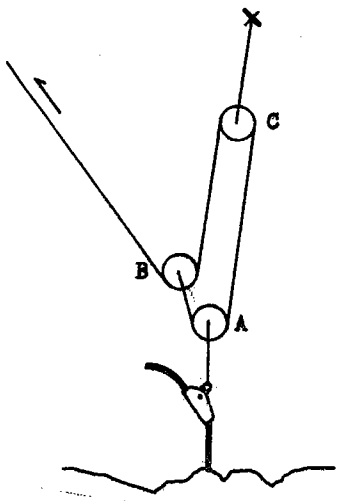


Figure 7. A 4 to 1 system which incorporates a third useless pulley C. Taken from Nylon Highway #2. (The stop cam is not shown)

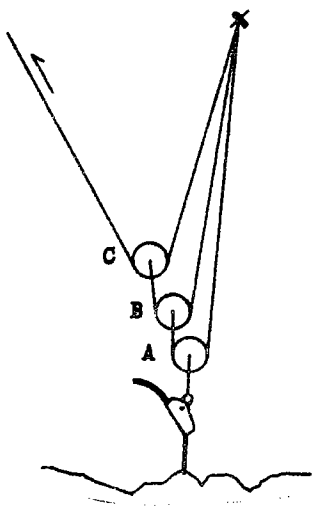


Figure 8. A piggy back 8 to 1 rigged from one fixed point---at the start of a hauling session. (The stop cam is not shown)

A 4 to 1 pulley system requires 2 pulleys and is shown in figure 4 (in figures 4 to 8, the stop cam and associated items have been omitted for the sake of clarity. The stop cam must be used in an actual haul though). A second 2 to 1 is pulling on the hauling line of our original 2 to 1. If only one fixed point is available, as in figure 5, it is easy to see how the system in figure 7 might evolve in some people's minds. This is the configuration which is indicated in the article on "Pit Rescue", page 4 of Nylon Highway, #2. But pulley C in figure 7 is completely unnecessary; for when hauling, no movement takes place over pulley C. It just sits there! (Try the arrangement to satisfy your own mind.) The dashed line in figure 5 illustrates how the 4 to 1 could easily be rigged with one rope.

The behavior of the 4 to 1 piggy back pulley system must be understood if it is to be used efficiently. Initial rigging, immediately prior to a hauling session, is shown in figure 5. The haul is over, figure 6, when pulley B collapses into the fixed point. The system must be re-extended for any additional recovery. Note that pulley A still remains about ½ of its initial distance from the fixed point. This type of 4 to 1 can therefore only be used with the purchase method (as opposed to the suggestion in the previously cited article).

Suppose that the purchase method was not used and the 4 to 1 in figure 4 was extended to the very bottom of the pit. The main line would be discarded since pulleys A and B would be at the bottom. Our victim would clip directly into pulley A with a carabiner and the haul would begin. The victim would be halfway up the drop when pulley B collapsed into the fixed point. There would be no further progress. Even if the configuration in figure 7 were used, the victim would be halfway up the drop when the system collapsed from a 4 to 1 to a system with a mechanical advantage close to or below 1! The purchase method must be used with all the pulley systems we are discussing except the 2 to 1.

If each caver would carry 2 small rescue pulleys, he would be capable of constructing the ideal 4 to 1 by himself, and absolutely sensational systems are possible with a group of caver's. For example, in the same piggy back manner that the 4 to 1 was generated, pulley systems of 2^P theoretical mechanical advantage may be constructed; where P is the number of pulleys involved. With 3 pulleys, figure 8, an ideal mechanical advantage of $2^3=8$ could be obtained, or if 4 pulleys were available, $2^4=16$, or,..

In the classic block and tackle configuration, that arrangement used most frequently on a world-wide all occassion basis, the ideal efficiency of the pulley system is equal to the number of pulleys plus 1 or $P+1$. Block and tackle systems can be developed on one axle or multiple axles. Figure 9 illustrates some block and tackle arrangements.

The energy lost as friction, G, as a pulley rotates on its axle or a rope slides over a carabiner is:

$$G = U \times L' \qquad (1)$$

where U is the coefficient of friction and L' is the load perpendicular to the moving surfaces. The actual mechanical advantage, or actual efficiency, AE, is:

$$AE = L/F \qquad (2)$$

where L is the load to be raised and F is the force necessary to move the load continuously (in this discussion, the energy of the rope deformation as it crosses the pulley or carabiner is considered to be negligible). In classic block and tackle (B&T) type pulley systems, the load upon each pulley, L', is reduced as more pulleys are incorporated to produce systems of greater theoretical or ideal efficiency, IE. Thus friction and AE calculations become a bit more involved than is generally realized. But we diverge! In the B&T method, each pulley in a block is under an equal load and

$$L_1' = L_1/P_1 \qquad (3)$$

where L_1 is the load on the entire block, L_1' is the load on each pulley in block 1, and P_1 is the number of pulleys in the block. Similarly,

$$L_2' = L_2/P_2 \qquad (4)$$

The total load on the pulleys of each block equals L:

$$L_1 = L_2 = L \tag{5}$$

thus

$$P_1 \times L_1' = L = P_2 \times L_1' \tag{6}$$

The friction, Fr_1 and Fr_2, of each block is:

$$Fr_1 = U \times L_1' \times P_1 \tag{7}$$

and

$$Fr_2 = U \times L_2' \times P_2 \tag{8}$$

respectively. Substituting equation 6 into equations 7 and 8 yields:

$$Fr_1 = U \times L = Fr_2 \tag{9}$$

The total friction of the B&T system, Fr_T, is

$$Fr_T = Fr_1 + Fr_2 \tag{10}$$

or from equation 9:

$$Fr_T = (U \times L) + (U \times L) = 2(U \times L) \tag{11}$$

The force, F, needed to move a load continuously with a pulley system is equal to L/IE, the theoretical frictionless minimum, plus the force necessary to overcome friction (2(U x L) as shown in equation 11). Thus from equation 2, the actual efficiency, AE, of a B&T system of 2 blocks is:

$$AE = \frac{L}{F} = \frac{L}{L/IE + 2(U \times L)} = \frac{1}{1/IE + 2U} \tag{12}$$

The AE of a one block B&T system (IE = 2, only) in contrast is:

$$AE = \frac{1}{1/IE + U} = \frac{1}{0.5 + U} \tag{13}$$

since in this case L_2', P_2', and Fr_2 are all zero.

AE calculations for the 2 to 1 piggy back (PB) series of pulley arrangements involves a power series because each pulley which is added to the system comes under ½ the load experienced by the previous pulley. For example, in figure 8 the load on pulley C is ½ of that on pulley B which carries ½ of the load experienced by pulley A. Thus for piggy back systems:

$$AE = L/F = \frac{L}{L/IE + (U \times L) \times (1/2^0 + 1/2^1 + 1/2^2 + \ldots + 1/2^{P-1})} \tag{14}$$

or

$$AE = \frac{1}{1/IE + U \sum_{x=0}^{x=P-1} 2^{-x}} \tag{15}$$

Using equations 12, 13, and 15, and the values of U; 0.11 and 0.33, experimentally determined for slightly used REI nylon rescue pulleys and nylon rope over two aluminum SMC carabiners respectively, table 1 was generated.

No. of Pulleys	IE B&T (P+1)	IE PB (2^P)	AE, REI Rescue Pulley (U=0.11) B&T	AE, REI Rescue Pulley (U=0.11) PB	AE, Double Al Biners (U=0.33) B&T	AE, Double Al Biners (U=0.33) PB
1	2	2	1.64	1.64	1.20	1.20
2	3	4	1.81	2.41	1.00	1.34
3	4	8	2.13	3.15	1.10	1.42
4	5	16	2.38	3.72	1.16	1.46

Table 1. Efficiency characteristics of pulley systems with biners and pulleys.

The inspection of Table 1 reveals many interesting points. The advantages of the piggy back system over the block and tackle system are clearly indicated in the AE and number of pulleys columns. Also the use of carabiner systems with IE greater than 2 is shown to be self defeating. The AE of the biner 2 to 1 should be considered when one feels that he must use carabiners to change the direction of a rope being used for hauling. The indications are that very large AEs will be possible, even approaching IEs, if well made, inexpensive, sealed roller bearing pulleys become available. Therefore, now and in the future, remember the 2 to 1 and the piggy back system.

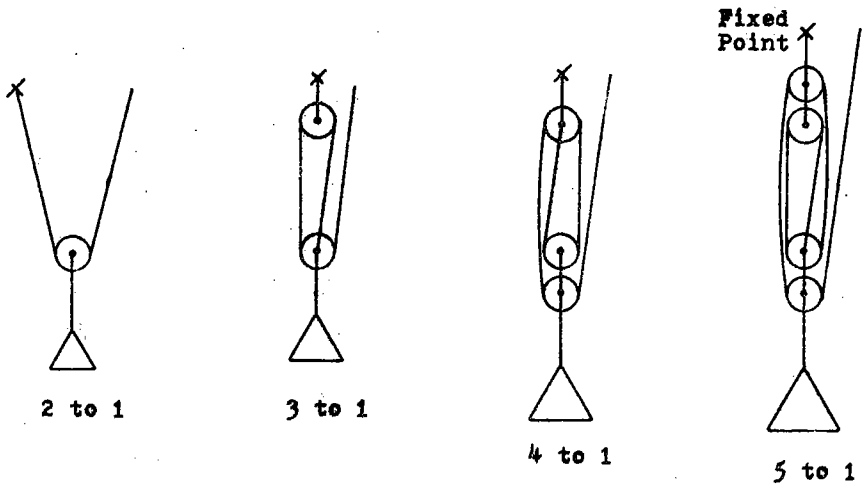


Figure 9. The weaker members of the family of block and tackle pulley arrangements. The triangle symbolizes a load and the ideal efficiencies of each arrangement is indicated.

Hauling

PART 2

The Davison System by itself (with the addition of one rope) provides all the materials necessary to construct a pulley system with an ideal mechanical advantage of 4 to 1. With the addition of just one carabiner and 2 pulleys, an actual mechanical advantage closer to 4 can be achieved. If only a short piece of rope, such as the excess at the end which is tied off, is available, a maximum effort 2 to 1 can be constructed with the System and used until sufficient slack has been recovered to allow a pulley arrangement of greater advantage to be constructed. In all cases, the use of the Davison System components allows the available physical energy to be used when hauling, and at a high rate of return.

One use of the knee assembly, as a stop cam, was mentioned earlier, but all three cam components (shoulder strap, foot rig, and knee assembly) are adaptable to a variety of hauling uses. In most situations, the knee cam assembly will be used as the stop cam. The knee assembly (see Nylon Highway, #2) consists essentially of a Gibbs Ascender with a foot loop of 1" tubular nylon webbing attacned to the cam jaw eye with several feet of ¼" shock cord attached to the cam shell. During a hauling session in which the pull is not directly towards the fixed point, the flexibility of the shock cord cam tie will allow the cam to automatically position itself, without putting a bend in the rope, into the most downward position possible, as in figure 10. As tension in the hauling line is released, the stop cam will swing in an arc, as the load upon it increases, to finally lie in direct line between the fixed point and the point where the rope crosses the lip of the drop, as shown in figure 11, under maximum load. The stop cam, thus arranged, requires no attention but is always positive in its release and locking modes insuring maximum recovery from each hauling session.

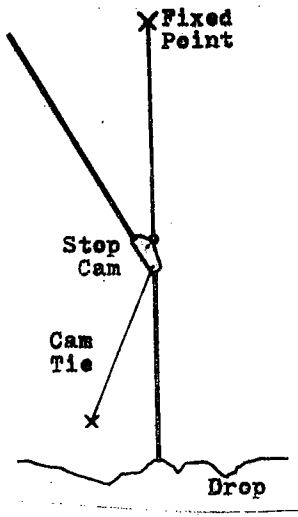


Figure 10. The knee assembly of the Davison System being used as a stop cam with shock cord tie. The cam is set and supporting the load of the main line. Note that the hauling direction is at a substantial angle to a line between the fixed point and the point at which the rope crosses the lip of the drop.

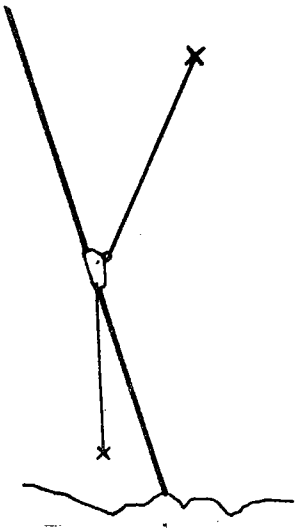


Figure 11. The knee assembly in hauling configuration. The cam has released and swung into the direct line of haul.

The shoulder strap and foot rig are, in essence, each a piece of 2" non-tubular nylon webbing to which a cam jaw has been solidly attached (in a specific manner to encourage shear as opposed to straight tension on the stitching) by means of tubular nylon webbing passed through the jaw eye and sewn to the 2" webbing. Both the shoulder strap and foot rig have a buckle sewn at one end of the 2" webbing. A loop in the webbing is thus easily produced and either component can be used in this manner to haul. The foot rig would generally be used as the main line cam with the shoulder strap serving as the hauling cam. A hauling cam is used by an individual to create a positive grip on the hauling line when raising a load. After the cam on the shoulder strap is attached to the hauling line, a rather long loop is buckled into the 2" webbing. By passing the hand through the loop and grabbing the sides of the loop with the same hand, the caver has created a configuration in which the majority of the force of hauling is taken on the back of the wrist and hand, thus preserving the caver's grip. A strong grip is essential for handling anything as it comes over the lip (or hangs thereupon), even if no further caving is done. The 2" webbing distributes the load over a large surface area thus enabling the full force generated by all parts of the body working in unison to be applied to the haul. Often the second hand will grip the hand in the loop. In this manner the force from both arms may be used, in addition to that generated by the back and legs.

If one Davison System is the only available equipment at a hauling site, you still have 2 harness rings (used together) and one Bonatti carabiner to use as pulleys in a 4 to 1 pulley system. The use of more equipment such as pulleys and carabiners is obviously desirable but these are not always available.

Now, suppose you only had 4 feet of rope available at the tie-in point with the rest of the rope just sufficient to reach your friend on the bottom. A 4 to 1 would be out of the question. Here, again, the System provides an answer. Rig a 2 to 1 using your foot rig, with a tight loop in the 2" webbing, as the main line cam. Rig the knee assembly as the stop cam and slip the shoulder strap, still attached to the harness, off of your shoulder. The shoulder strap is tightened and placed at the very end of the rope, as a hauling cam. You can now haul while facing away from the drop. You can lean your body and drive with your legs while pulling yourself along the rope towards the fixed point. With this maximum effort configuration, one can produce large forces. The arms and legs are working in the same direction and the load is distributed over a large area about the hips. If sufficent trees, projections, or irregularities exist, one might be able to continue past the fixed point, but at least 1 foot will be gained in each hauling session, even under high loads. When sufficient slack has been generated, a 4 or 8 to 1 can be rigged.

The knee assembly may also be used as an automatic-return hauling cam. This use is particularly appropriate if two Systems are available or if a non-gigantic tree is convenient to the edge of the drop. (in the latter case, the shoulder strap extended with the foot rig with necessary, may be buckled snugly around the tree to form a good stop cam. Hauling should then be done in a direct line defined by the stop cam and the point where the rope crosses the edge of the drop.) The shock cord is tied to a projection close to the vertical plane of the hauling line, dropward of your hauling stance. A heavy pack can be used instead of a projection or another caver can just hold or stand on the end of the shock cord. By repositioning your body or retying the shock cord, the tension in the cord can be easily adjusted so that, as each hauling session is ended, the cam automatically rides forward, ready for another haul. When more than one knee assembly is used in this manner, the rythm and coordination produced often enable large loads to be raised very rapidly with a straight line 1 to 1 pull and only a few haulers.

Don Davison Jr.