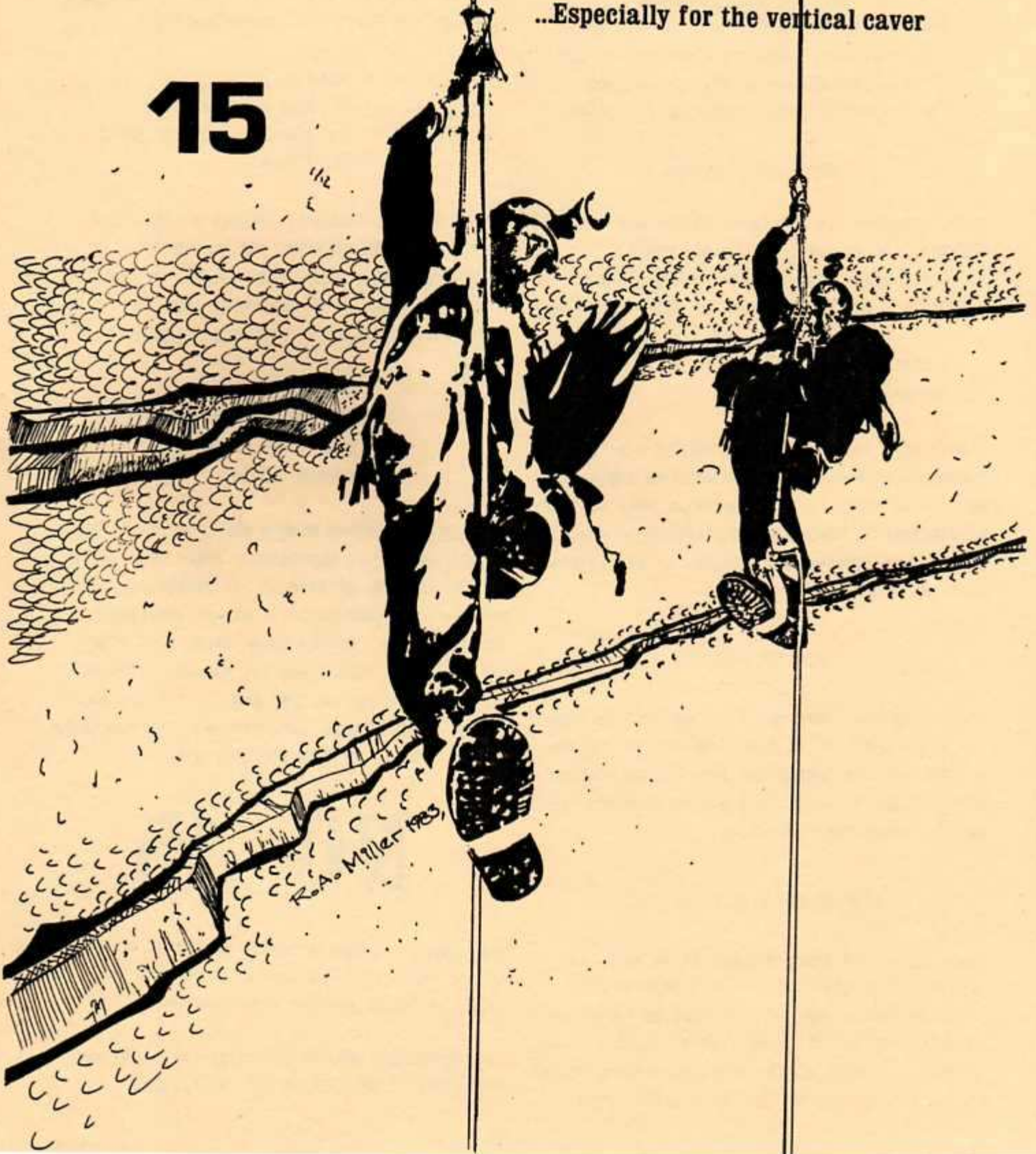


NYLON HIGHWAY

...Especially for the vertical cover

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NYLON HIGHWAY

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78 KING HIGHWAY AVENUE

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ILLUSTRATIONS: UNLESS OTHERWISE INDICATED ARE CREATIONS OF NINA SAVAR AND THE EDITOR.

NYLON HIGHWAY

LETTER FROM THE EDITOR

DEAR PATIENT AND FAITHFULS,

TWO YEARS HAVE PASSED SINCE A NYLON HIGHWAY HAS HIT THE STREETS. I'M HERE TO TELL YOU THAT THE PRINCIPLES THAT THE NYLON HIGHWAY WERE FOUNDED UPON IN 1973 IN BLOOMINGTON, INDIANA ARE STILL ALIVE AND WORKING.

THE NYLON HIGHWAY IS A TOOL WHEREBY VERTICAL AND TECHNICAL CAVERS CAN STAY INFORMED OF THE LATEST AND GREATEST. AS YOU'LL SEE FROM THIS ISSUE I HAVE BEEN SUPPLIED WITH SOME INTERESTING ARTICLES BY SEVERAL VERTICAL EXPERTS.

IF YOU HAVEN'T FIGURED IT OUT, THE VERTICAL SECTION HAS A NEW/OLD EDITOR. SEVEN YEARS AGO I LEFT THIS JOB EXTREMELY FRUSTRATED...VERY SIMILAR TO CHERYL JONE'S STATEMENT IN N.H. # 12. I DECIDED TO ACCEPT THE EDITORSHIP BACK BECAUSE THE CONCEPT IS RIGHT AND THERE IS AN UNBELIEVABLE AMOUNT OF NEW INFORMATION OUT THERE THAT NOBODY'S GETTING.

THIS ISSUE CONTAINS ONLY ARTICLES...STUFF YOU CAN SINK YOUR TEETH INTO. NO MINUTES, NO TREASURERS REPORTS, NO PRUSIK CONTEST RECORDS AND OTHER FILLER ITEMS. WE'RE OFF TO ANOTHER GREAT START AND WITH YOUR HELP AND SUPPORT WE CAN ACCOMPLISH THE GOALS AND DREAMS THE NYLON HIGHWAY WAS DESIGNED TO ACHIEVED.

LOOKING FORWARD TO A GREAT TERM OF OFFICE AS EDITOR.



NO. 15

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Need Ideas For Articles?

MANY PEOPLE CONFESS THAT THEY WOULD LOVE TO CONTRIBUTE ARTICLES TO THE NYLON HIGHWAY, BUT JUST DON'T KNOW WHAT TO WRITE ABOUT OR WHAT WOULD BE INTERESTING. FIRST OF ALL, REALIZE THAT MORE HASN'T BEEN WRITTEN THAN HAS..AND SECOND IMAGINE ALL THE DIAGRAMS, DRAWINGS AND PICTURES THAT HAVE NEVER BEEN THAT SHOULD BE. THIS EDITOR HAS A RESOURCE WHEREBY CRUDE SKETCHES CAN BE REPRODUCED INTO ATTRACTIVE ART...SO DON'T LET THE DIAGRAM/DRAWING HANG UP STAND IN YOUR WAY. I'VE BEEN LOOKING FOR MANY ARTICLES. CAN ANY OF THE NYLON HIGHWAY READERS HELP?

HERE'S A BUNCH OF IDEAS.

1. A COMPARATIVE ANALYSIS OF ALL THE LATEST CLIMBING DEVICES NEEDS TO BE WRITTEN. JUMARS VS. GIBBS VS. CMI VS. CLOGS VS. PETZLS ETC. ETC.
2. A TRULY COMPREHENSIVE ARTICLE DISCUSSING THE GOSSETT CLIMBING SYSTEM.
3. A GOOD ARTICLE ABOUT THE VARIOUS SPELEAN SHUNTS NEEDS TO BE WRITTEN. MANY VERTICAL CAVERS HAVE NO IDEA WHAT THEY ARE FOR AND HOW TO USE THEM...THEIR ADVANTAGES AND DISADVANTAGES.
4. THERE ARE MANY EXPERIMENTAL RAPPELLING DEVICES BEING TESTED AND USED (I.E. KIRK MACGREGORS SQUEEZE BRAKE) WHAT'S GOING ON WITH THE EXPEDITION RACKS?
5. HOW ABOUT A ROPE DESIGN ARTICLE. WHAT ARE THE TRUE DIFFERENCES BETWEEN THE VARIOUS CAVE ROPES INCLUDING THE WEAVE.
6. HOW ABOUT CAVING HELMETS?
7. DO CORDLESS ELECTRIC DRILLS WORK FOR BOLT PLACEMENT? HOW MANY HOLES ON A CHARGE? WHAT SIZE OF HOLES? IS THERE HOPE IN THIS TECHNOLOGY?
8. HOW ABOUT ALL THE PARTICULARS WITH VERTICAL SURVEYING? SO MANY GOOD SURVEYS DIFFER. WE NEED A PROPOSED STANDARD.
9. HOW ABOUT VERTICAL PHOTOGRAPHY?
10. TIE OFF METHODS FOR ASCENDER STRAPS WITH THEIR RELATED ASCENDERS? WHAT WORKS BEST FOR 5/16" ROPE? FOR 1" WEBBING? ETC.?
11. A NEW COMPREHENSIVE ARTICLE ABOUT BOLTS AND BOLTING TECHNIQUE IS SORELY NEEDED.
12. HOW ABOUT A TROLL HARNESS REVIEW?
13. "8" DESCENDING RINGS ARE BECOMING MORE AND MORE POPULAR. HOW ABOUT A TEMPERATURE STUDY? CAUTIONS? WORKING PARAMETERS?
14. ITS BEEN 9 YEARS SINCE AN ARTICLE ON CHICKEN LOOPS WAS WRITTEN. THERE IS SOME REALLY NEW AND GREAT IDEAS BEING USED.
15. THE TRUE HISTORY OF ASCENDER CAMS? (BEFORE GIBBS)
16. NEW ASCENDING SYSTEMS?
17. WHAT DO THE BIG EXPEDITIONS REALLY INVOLVE? HOW MUCH FOOD? GEAR? ROPE? WHO CARRIES IT?
18. CAVE PACKS? NOT ONLY WHAT GOES IN THEM, BUT WHICH PACKS DO THE BEST JOB?
19. RAPPELS THAT ARE OTHER THAN STANDARD. JUST FOR FUN A SERIES DEPICTING VARIOUS RAPPEL POSITIONS OR DEVICES THAT WORK OR HAVE WORKED. (I.E. HELICOPTER RAPPELS, UPSIDE DOWN RAPPELS, BEER BOTTLE RAPPELS. ETC. OF COURSE "FORM" IS OUR PRIMARY CONCERN AS WELL AS SURVIVAL) LET'S HAVE FUN WITH THIS ONE.
20. GREAT VERTICAL EVENTS. THERE ARE NUMEROUS EFFORTS ON GREAT WALLS, PITS AND DOMES THAT WERE BOLD, PIONEERING, AND GUTSY. THE SIGNIFICANCE AND THE RECORDING OF THOSE SIGNIFICANT HISTORICAL EVENTS NEEDS RECORDING. THE NSS NEWS ELUDED TO A MASTERFUL DOME ASCENT BY DON DAVISON AND FORMER NYLON HIGHWAY EDITOR CHERYL JONES THAT WOULD MAKE TREMENDOUS READING.

ALL GREAT VERTICAL EVENTS SHOULD INCLUDE THE FOLLOWING:
 BETWEEN A 300 AND 500 WORD EXPLANATION OF THE EXPEDITION. THIS SHOULD INCLUDE DATES, NAMES OF THE PARTICIPANTS, ROPE(KIND), RIGGING(PARTICULARS), LENGTH/TYPE OF LEDGE, DROP DISTANCE, FREE?, RAPPELLED? PRUSIKED? ANY UNUSUAL OCCURRENCES AND A SKETCH OR PROFILE OF THE DROP (LABELLED AT ALL POINTS). WOULD A MAP BE HELPFUL TO TELL YOUR STORY?

THIS SHOULD GET THE JUICES FLOWING...
 YOUR CONTRIBUTIONS MAKE US GREAT.

THANK YOU



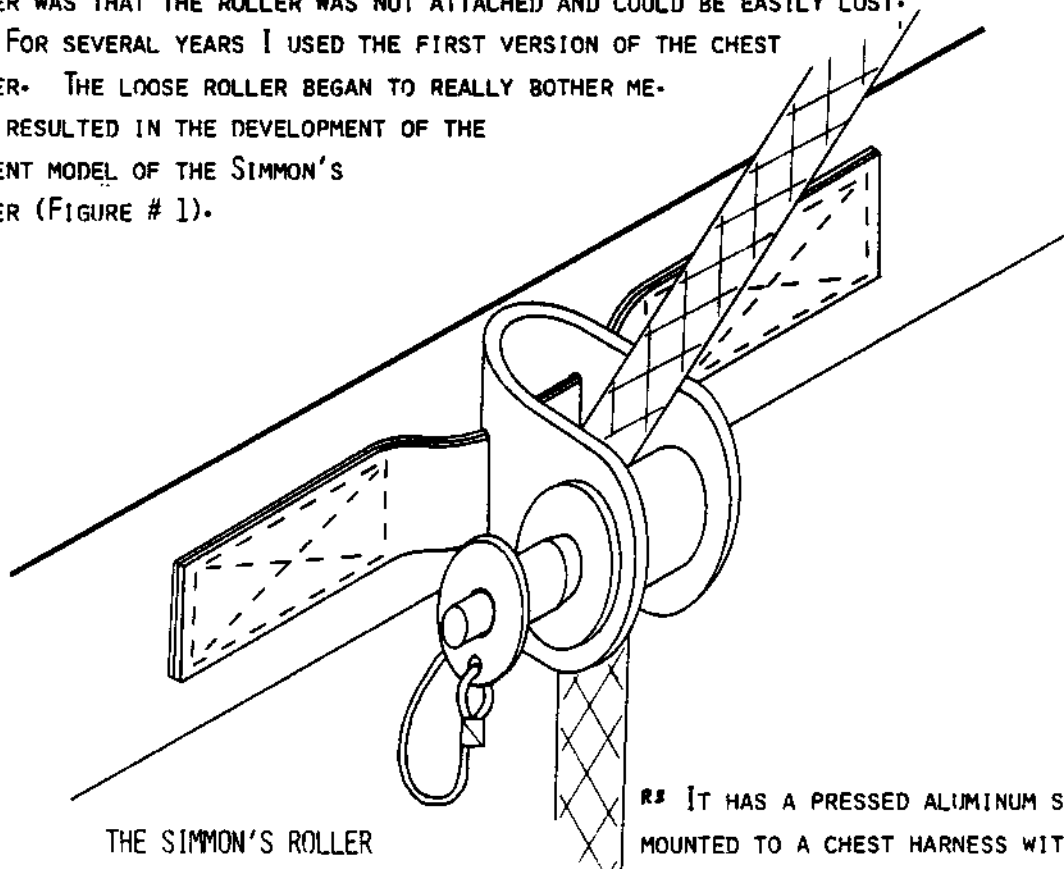
A VERSATILE ROPE WALKER: THE DEVELOPMENT

By Ron Simmons

WHEN I FIRST STARTED VERTICAL CAVING, I BUILT THE STANDARD ROPEWALKER CLIMBING SYSTEM USING THREE GIBBS, ONE OF WHICH WAS A SHOULDER GIBBS. THE MORE I USED THE SYSTEM THE MORE I BECAME DISSATISFIED WITH IT. USING THE SHOULDER GIBBS PUT ME OFF BALANCE. IT TWISTED MY BODY TO ONE SIDE AND WAS UNCOMFORTABLE. I TRIED MANY ADJUSTMENTS BUT WAS NEVER SATISFIED WITH THE SYSTEM. FINALLY, A PLANNED TRIP TO MEXICO SPURRED ME TO COME UP WITH SOMETHING MORE COMFORTABLE.

A FRIEND, WARD FOELLER, WHO WAS ALSO DISSATISFIED WITH THE SHOULDER GIBBS, AND I, DECIDED THAT SOME SORT OF A CHEST ROLLER WAS THE ANSWER. THERE WERE SOME CHEST ROLLERS IN USE, THE BLUEWATER BOX AND THE GOSSETT BOX. THESE WERE INTENDED FOR USE IN A MITCHEL AND GOSSETT CLIMBING SYSTEMS, SO THEY HAD A TWO CHANNEL ROLLER. FOR A ROPEWALKER TYPE SYSTEM, WHERE ONLY A SINGLE CHANNEL ROLLER WAS NEEDED THESE BOXES WERE OVERLY HEAVY AND BULKY. THE OTHER EXISTING ALTERNATIVE WAS TO HANG A PULLEY FROM A CARABINER WHICH WAS ATTACHED TO A CHEST HARNESS. THIS WOULD WORK, BUT IT LET THE CLIMBER HANG TOO FAR FROM THE ROPE, RESULTING IN INEFFICIENCY AND DISCOMFORT. WHAT WARD AND I CAME UP WITH WAS THE FIRST VERSION OF THE SIMMON'S ROLLER. IT WAS A GIBBS SHELL CUT DOWN WITH SLOTS CUT IN THE BOTTOM FOR MOUNTING WITH WEBBING TO A CHEST HARNESS. THERE WAS A TEFLON ROLLER THAT WAS HELD IN PLACE BY A QUICK RELEASE PIN. THIS ROLLER PROVED TO BE JUST WHAT WE WERE LOOKING FOR. THE ONLY PROBLEM WITH THIS CHEST ROLLER WAS THAT THE ROLLER WAS NOT ATTACHED AND COULD BE EASILY LOST.

FOR SEVERAL YEARS I USED THE FIRST VERSION OF THE CHEST ROLLER. THE LOOSE ROLLER BEGAN TO REALLY BOTHER ME. THIS RESULTED IN THE DEVELOPMENT OF THE PRESENT MODEL OF THE SIMMON'S ROLLER (FIGURE # 1).

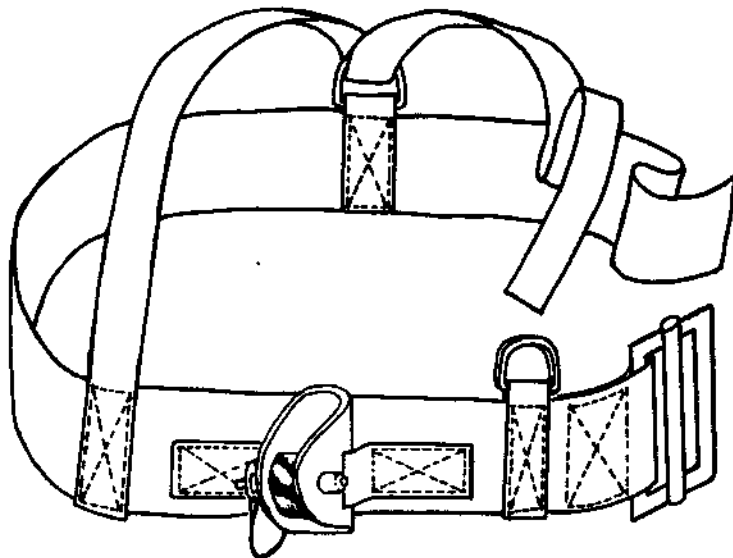


THE SIMMON'S ROLLER
FIGURE # 1

RS IT HAS A PRESSED ALUMINUM SHELL THAT IS STILL MOUNTED TO A CHEST HARNESS WITH A DOUBLE THICKNESS OF ONE INCH WEBBING RUNNING THROUGH SLOTS IN THE SHELL. THE ROLLER CHANGED FROM TEFLON TO NYLON AND IS MOUNTED ON THE QUICK RELEASE PIN WHICH IS ATTACHED TO THE SHELL. NOW THERE IS NO LOOSE PARTS TO DROP WHEN THE ROLLER IS REMOVED FROM THE ROPE.

THE NEW ASCENDING SYSTEM, WHICH I REFER TO HERE AS THE MODIFIED ROPEWALKER, CONSISTED OF THE FOLLOWING: IT USED A FOOT GIBBS, A FLOATING KNEE GIBBS, A SIMMON'S ROLLER ON THE CHEST AND A SAFETY GIBBS, WHICH RODE ON TOP OF THE CHEST ROLLER AND WAS TETHERED TO A SEAT HARNESS. THE SYSTEM WORKED MUCH LIKE THE STANDARD ROPEWALKING SYSTEM, BUT WAS A LOT MORE COMFORTABLE. THE CLIMBER'S WEIGHT WAS CENTERED ON THE ROPE SO THAT HIS/HER BACK WAS NOT TWISTED. I FIRST USED THIS MODIFIED ROPEWALKER MAINLY ON LONG, FREE DROPS WHERE IT PROVED TO BE AN EXCELLENT ASCENDING SYSTEM. THE CHEST ROLLER HOLDS THE CLIMBER'S BODY VERY CLOSE TO THE ROPE AND IN A NEAR VERTICAL POSITION. CLIMBING CAN BE COMPARED TO WALKING UP STEPS. BECAUSE THE CLIMBER IS IN A NEAR VERTICAL POSITION, THE HANDS ARE NOT NEEDED FOR CLIMBING. THE LEGS DO ALL THE WORK AND THE ARMS CAN BE USED FOR NEGOTIATING LEDGES, PIT LIPS, ETC.

OVER THE LAST FOUR YEARS I HAVE USED THIS MODIFIED ROPEWALKER SYSTEM IN MANY TYPES OF SITUATIONS. ALTHOUGH ORIGINALLY INTENDED FOR LONG, FREE DROPS, IT HAS PROVEN TO BE A GOOD GENERAL ASCENDING SYSTEM FOR ALL TYPES OF DROPS. IN CLIMBING, THE SAFETY ASCENDER RIDES ON TOP OF THE CHEST ROLLER. IF ANYTHING SHOULD HAPPEN TO THE CHEST ROLLER OR THE CHEST HARNESS IT WOULD PREVENT THE CLIMBER FROM FLIPPING UPSIDE DOWN. ALSO, WHEN THE CLIMBER WANTS TO REST HE/SHE JUST PUSHES THE SAFETY GIBBS UP AND SITS IN A RECLINED POSITION WITH HIS/HER WEIGHT DISTRIBUTED BETWEEN THE SAFETY, KNEE AND FOOT GIBBS.



SUGGESTED CHEST HARNESS

FIGURE # 2

WHEN A DROP IS NOT FREE THE MODIFIED ROPEWALKER IS STILL VERY EFFECTIVE. FOR DROPS INCLINED MORE THAN 20° FROM THE VERTICAL THE CHEST ROLLER SHOULD BE REMOVED FROM THE ROPE. THE CLIMBER SHOULD THEN HOLD THE SAFETY ASCENDER IN ONE HAND, LEAN BACK AND WALK UP THE WALL PUSHING THE ASCENDER UP THE ROPE AS HE OR SHE GOES. I WOULD RECOMMEND USING ONE OF THE POSITIVE LOCKING ASCENDERS SUCH AS JUMARS, PETZLS, CMIs, SPRING LOADED GIBBS, ETC. REGULAR GIBBS HAVE A TENDENCY TO SLIDE DOWN THE ROPE WHEN NOT LOADED THAT MAY RESULT IN THE CLIMBER TURNING UPSIDE DOWN.

I HAVE USED THE ABOVE SYSTEM FOR A NUMBER OF YEARS AND STILL USE IT ON LONG, FREE DROPS. OVER THE LAST YEAR OR SO IT HAS BECOME NECESSARY TO MODIFY THE SYSTEM TO BE MORE VERSATILE. WHILE THE MODIFIED ROPEWALKER USING TWO GIBBS, ONE JUMAR AND A SIMMON'S ROLLER IS VERY GOOD ON ALL TYPES OF DROPS, I WANTED SOMETHING JUST A BIT BETTER. ON MY LAST TRIP TO HUAUTLA CAVE SYSTEM IN MEXICO, I INTRODUCED ANOTHER CAVER, TOMMY SHIFFLETT TO MY CHEST ROLLER. HE LIKED THE MODIFIED ROPEWALKER RIG, BUT FELT AS I DID THAT THE SYSTEM WAS NOT VERSATILE ENOUGH FOR USE IN A MULTIPLE DROP CAVE WHERE THE DROPS RANGE FROM 10 TO 100 METERS DEEP AND RUN THE RANGE FROM FREE TO 45° INCLINES. DURING THAT EXPEDITION WE CAME UP WITH WHAT PROVED TO BE AN EXCELLENT SYSTEM FOR MULTIPLE DROP CAVES WHERE YOU NEVER KNOW WHAT IS COMING UP NEXT. I CALL THIS NEW SYSTEM THE EXPEDITION ROPEWALKER.

THE EXPEDITION ROPEWALKER SYSTEM THAT I NOW USE IN MULTIPLE DROP CAVES (FIGURE # 3) CONSISTS OF THE FOLLOWING: THE FOOT GIBBS IS RETAINED JUST LIKE IN THE STANDARD ROPEWALKER. FOR THE KNEE ASCENDER I SWITCHED TO A PETZL JAMMER ASCENDER. THIS IS ATTACHED TO MY FOOT BY ONE INCH WEBBING AND TO MY SEAT HARNESS BY FIVE MILLIMETER PERLON. I ALSO HAVE A DETACHABLE 1/4 INCH SHOCK CORD THAT RUNS

THE SIMMON'S ROLLER CONT.

UP AND OVER MY SHOULDER AND ATTACHES TO THE SEAT HARNESS IN THE BACK. THE SHOCK CORD IS ENCASED IN ONE INCH TUBULAR WEBBING, SO THE PETZL WILL OPERATE IN A FULLY FLOATING MODE. I USE THE PETZL JAMMER OUT OF PERSONAL PREFERENCE, BUT MOST OTHER POSITIVE LOCKING, OPEN SIDED ASCENDERS WILL WORK. THE JAMMER APPEALS TO ME BECAUSE IT IS SMALL LIGHTWEIGHT AND FITS NICELY IN THE PALM OF MY HAND WHEN IT IS NECESSARY TO RAISE THE ASCENDER BY HAND. I USE A SIMMON'S ROLLER ON THE CHEST. ABOVE THE ROLLER, RIDES A JUMAR TETHERED TO MY SEAT. THE JUMAR WILL RIDE UP THE ROPE ON TOP OF THE ROLLER WHEN POSITIONED CORRECTLY.



EXPEDITION ROPEWALKER SYSTEM

FIGURE # 3

IN OPERATION THE EXPEDITION ROPEWALKER CAN BE USED AS A WHOLE OR IN PART FOR ANY TYPE OF DROP. ON A FREE DROP THE SYSTEM OPERATES LIKE THE MODIFIED ROPEWALKER. ON SLANTED WALL DROPS THE SYSTEM WORKS THE SAME AS BEFORE. THE TOP SAFETY JUMAR MAKES SLANTED DROPS EASY WHERE THE ROLLER IS NOT USED. ON THE SHORT NUISANCE DROPS THE EXPEDITION SYSTEM EARNS ITS KEEP. ON THESE NUISANCE DROPS, I ONLY USE THE TOP JUMAR AND THE KNEE PETZL AS A TEXAS ASCENDING SYSTEM. THE SHOCK CORD CAN BE LEFT ATTACHED TO THE PETZL WHILE CLIMBING WITH NO PROBLEM. BY USING OPEN SIDED, POSITIVE LOCKING ASCENDERS I CAN GET ON AND OFF ROPE FAST WHICH IS HANDY IF THERE HAPPENS TO BE A WATERFALL ON THE DROP. I BELIEVE THIS EXPEDITION ROPEWALKER ASCENDING SYSTEM TO BE AN EXCELLENT SYSTEM WHERE MAXIMUM VERSATILITY IS WANTED WITH MINIMUM GEAR.

THE SIMMON'S ROLLER IS AVAILABLE FROM CUSTOM CAVE GEAR; c/o RON SIMMONS; 2414-4 BARRACKS ROAD; CHARLOTTESVILLE, VA. 22901. PRICE AS OF NOVEMBER, 1982 IS \$20.00 PLUS \$1.25 SHIPPING.

EDITOR'S NOTE: TO THE BEST OF MY KNOWLEDGE, KIRK MACGREGOR WAS THE FIRST TO INCORPORATE A CHEST ROLLER WITH A FLOATING GIBBS SYSTEM. RON SIMMONS WAS THE FIRST TO DESIGN, MANUFACTURE, ADVERTISE PROMOTE, DISTRIBUTE AND SELL A COMMERCIALIZED VERSION OF A SINGLE CHEST ROLLER.

A SHORT HISTORY OF GIBBS PRODUCTS, INC.

BY PETER GIBBS

MY OLDER BROTHER AND I LIVED IN SALT LAKE CITY WITH OUR PARENTS. WE HAD BOTH DONE SOME CAVING AND HAD ACTIVE INTEREST IN ALL KINDS OF OUTDOOR ACTIVITIES. LATER I WENT ON TO SPECIALIZE IN MOUNTAIN CLIMBING AND RIVER RUNNING. IN 1964 CHARLES MOVED TO CLEVELAND TO START GRADUATE SCHOOL AT CASE INSTITUTE IN MECHICAL ENGINEERING. HE JOINED THE CLEVELAND GROTTO. THERE HE OBTAINED A GOOD INDOCTRINATION INTO VERTICAL CAVING. CHARLES ENCOUNTERED DIFFICULTY WHEN ATTEMPTING TO SURMOUNT AN OVERHANG USING PRUSIK KNOTS IN SCHOOLHOUSE CAVE, W. VA (EXCLUSIVE INTERVIEW WITH CHARLES GIBBS, CLEVEO-GROTTO NEW, NOV., 1980). THIS CONVINCED HIM THAT EQUIPMENT AND TECHNIQUE FOR VERTICAL CAVING BOTH NEEDED TO BE IMPROVED.

GIBBS' SUCCESS STORY CONT.

CHARLES BOUGHT A HOME-MADE CAM TYPE ASCENDER FROM A CAVER HE MET AND REDESIGNED IT. HE CHANGED THE RATE OF CAM CLOSURE, STRENGTHENED THE ASCENDER, AND MADE IT LARGE ENOUGH TO TAKE 1/2 INCH ROPE. HE THEN HAND MADE A FEW FOR THE CLEVELAND GROTTO MEMBERS.

THE SECOND BIG DEVELOPMENT EFFORT WENT INTO A HARNESS SYSTEM THAT WOULD MAKE IT EASIER TO PASS OVERHANGS. CHARLES, ALONG WITH SEVERAL OTHER CLEVELAND GROTTO MEMBERS, DEVELOPED THE "ROPE WALKER" RIGGING. THAT PUT THE ASCENDERS LOW DOWN, ONE ON A KNEE AND ONE ON A FOOT. THIS MADE CLIMBING MORE LIKE WALKING AND MADE IT POSSIBLE TO MOVE THE ROPE AWAY FROM THE LIP OF AN OVERHANG AS THE CLIMBER MOVED UP THE ROPE.

IN 1967 OR 1968 MY FATHER AND I WENT TO CLEVELAND TO VISIT CHARLES. WHILE WE WERE THERE HE DEMONSTRATED THE ASCENDERS AND RIGGING SYSTEM AND GAVE US A CHANCE TO TRY THEM. HE ALSO SUGGESTED HE WAS TIRED OF MAKING THEM AND THAT WE SHOULD BUILD SOME IN SALT LAKE. I WAS NOT SURE, AT THIS POINT, IF HE WAS THINKING ABOUT BUSINESS. I THINK HE JUST MEANT MAKE SOME FOR THE SALT LAKE GROTTO AND THE CLEVELAND GROTTO.

SOMETIME IN 1968 WE STARTED AN ASSUMED NAME COMPANY, AND BEGAN TO MAKE AND TRY TO SELL THEM. THE FIRST BATCH WAS 100 PIECES. WE USED A CRUDE SAND CASTING THAT REQUIRED AN UNREASONABLE AMOUNT OF GRINDING AND SMOOTHING. THE SHELL WAS PRETTY MUCH AS IT IS TODAY, BUT NOT ANODIZED OR NOTCHED. THE BEARING SURFACE WAS A CLEAVIS PIN WITH A PIECE OF SPEEDOMETER CABLE TO HOLD IT IN PLACE. THERE ARE STILL SOME OF THESE AROUND.

WE DECIDED TO PULL TEST THEM ALL TO 1000 LBS. WE SIMPLY DID NOT TRUST CASTINGS. THE FIRST TESTING MACHINE WAS JUST A RAILROAD CAR SPRING THAT WE CALIBRATED ROUGHLY AND A HANDYMAN JACK TO PULL THE SYSTEM. LATER WE WENT TO A HYDRAULIC TESTER. THE ORIGINAL MACHINE WAS SLOW AND A GOOD WAY TO BUILD UP ONE'S ARMS. I SOLD SOME TO THE LOCAL CAVERS AFTER DEMONSTRATING THEM IN NEFF'S CAVE AND GOT THEM PLACED IN A LOCAL MOUNTAIN CLIMBING STORE ON A CONSIGNMENT BASIS. PROSPECTS LOOKED KIND OF GRIM.

CHARLES CAME OUT FOR THE NSS CONVENTION AT LOVELL, WYOMING IN 1969. WE TOOK THE 50 ASCENDERS THAT WERE LEFT TO THE CONVENTION AND SET UP A PUP TENT WITH A SIGN: "ASCENDERS FOR SALE". A FEW PEOPLE STOPPED TO LOOK BUT WE DIDN'T SELL ANY UNTIL AFTER THE 100 FOOT ROPE CLIMBING CONTEST. USING THE "ROPE WALKER" SYSTEM AND OUR ASCENDERS, CHARLES CUT THE OLD RECORD TIME FROM ABOUT 80 SECONDS DOWN TO ABOUT 43 SECONDS. WE SOLD OUT THAT AFTERNOON AND WENT HOME WITH ORDERS FOR A FEW MORE. FROM THERE ON IT WAS MOSTLY WORD OF MOUTH AND SALES GREW VERY SLOWLY.

GEORGE LOWE AND I WERE BOTH IN THE PHYSICS DEPARTMENT AT THE UNIVERSITY OF UTAH AND WERE DOING SOME CLIMBING TOGETHER. GEORGE WAS MAKING A NAME FOR HIMSELF IN YOSEMITE ROCK CLIMBING AND BEGAN USING OUR ASCENDERS. HE ALSO CLIMBED IN PERU IN 1970 AND CAME BACK WITH GLOWING REPORTS OF OUR ASCENDERS FOR ICE AND SNOW. HIS MENTION OF GIBBS ASCENDERS IN ARTICLES FOR VARIOUS CLIMBING MAGAZINES HELPED TO GET US STARTED IN THE CLIMBING MARKET. HE TOOK THEM TO MOUNT EVEREST LAST YEAR.

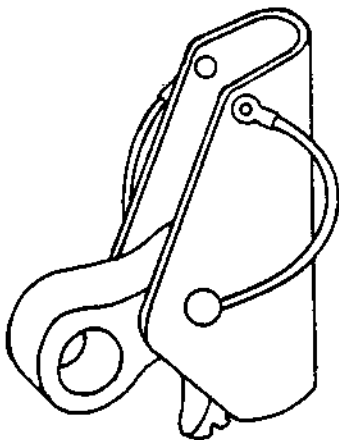
IN 1970 WE BEGAN OFFERING ASCENDERS WITH A QUICK RELEASE PIN. THAT WAS ALSO CHARLE'S IDEA. IN 1972 GIBBS' PRODUCTS BECAME GIBBS PRODUCTS, INC. IN 1977 WE BEGAN MAKING A SPRING LOADED MODEL AND PHASED OUT THE OLD WIRE RETAINER MODEL. SPRING LOADING CAME AS A RESULT OF REQUESTS FROM MOUNTAIN FRIENDS OF MINE. WE WERE ALSO SELLING SOME TO INDUSTRY TO USE FOR WORKER PROTECTION. OSHA LOOKED LIKE IT WANTED TO GET IN THE ACT. THEY WERE GOING TO REQUIRE 5500 LBS. MINIMUM BREAKING STRENGTH FOR ANY FALL ARREST DEVICE. WE BEGAN BUILDING ASCENDERS WITH STAINLESS STEEL-VERY STRONG, BUY VERY HEAVY.

GIBBS' SUCCESS STORY CONT.

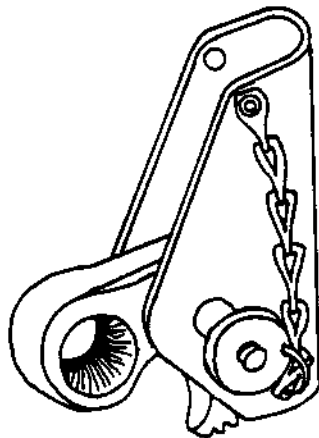
A GREAT DEAL OF THE DAILY EFFORT OF MANUFACTURING AND SELLING THE ASCENDERS WAS CARRIED OUT BY OUR PARENTS. IN 1979 THEY RETIRED FROM THE BUSINESS AND LEFT OWNERSHIP TO CHARLES AND I. IN 1981 I BOUGHT CHARLES OUT AND AM NOW SOLE OWNER.

JUST COMING TO MARKET NOW ARE A 12,000 LBS. TEST PULLEY AND A 6000 LBS. TEST ASCENDER. BOTH WILL ACCEPT ROPE UP TO 3/4 INCH. I AM ALSO TRYING TO ELIMINATE HARD COATING AS AN OPTION. WHEN OLD INVENTORY IS DEPLETED, ALL ASCENDERS WILL BE HARD COATED AT NO EXTRA CHARGE.

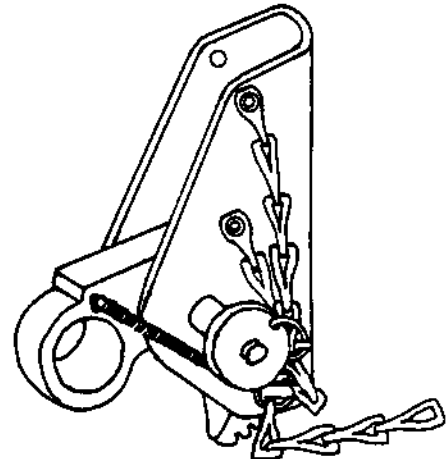
WE HAVE SOLD OVER 30,000 ASCENDERS IN AT LEAST 10 DIFFERENT COUNTRIES. THE BUSINESS HAS BEEN MORE SUCCESSFUL AND REWARDING THAN ANY OF US EXPECTED.



1968 WIRE RETAINER MODEL



1970 QUICK RELEASE PIN MODEL
1977 FREE RUNNING MODEL



1977 SPRING LOADED MODEL

TEACHING NEW PEOPLE VERTICAL TECHNIQUES

By ED SEAMAN
SAFETY CHAIRPERSON, WINDY CITY GROTTO

HOPEFULLY, THE NEW PROSPECTIVE VERTICAL CAVERS HAVE CONSIDERABLE HORIZONTAL CAVING EXPERIENCE SO AS TO BE FAMILIAR WITH USING BASIC CAVING GEAR AND THE CONDITIONS FOUND IN CAVES. THE TYPICAL WAY TO TEACH NEW PEOPLE RAPPELLING AND CLIMBING IS ON A CLIFF OR IN A TREE, BARN, ETC., TO PROVE THE SYSTEMS ON THE SURFACE BEFORE THEY ARE USED IN A PIT.

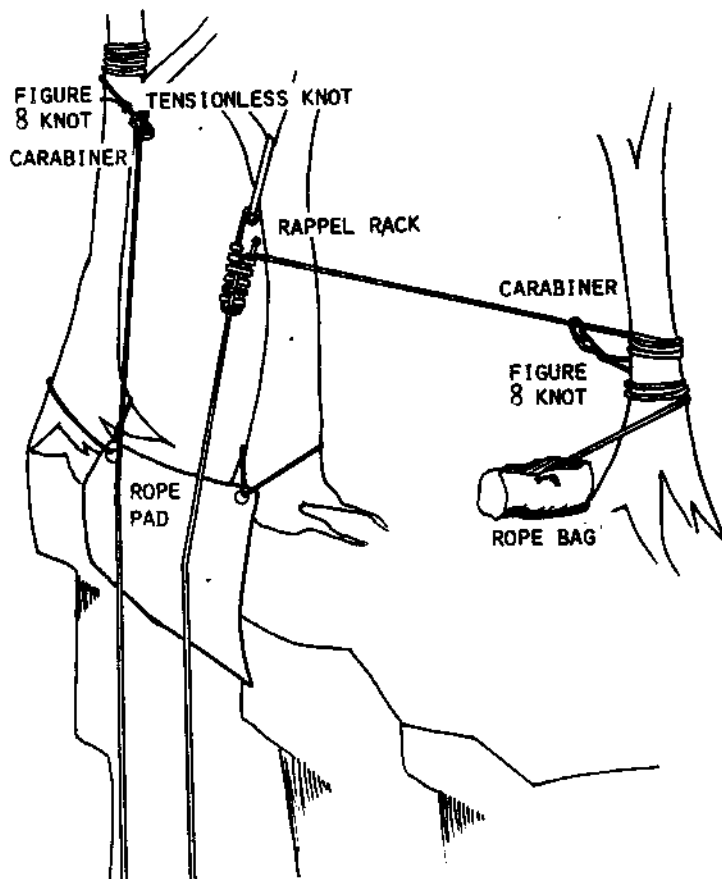
TYPICALLY, THE NEW PERSON IS THEN TAKEN TO A PIT, A ROPE IS RIGGED AND PADDED, AN EXPERIENCED VERTICAL CAVER GOES DOWN AND BOTTOM RELAYS, AND THE NEW PERSON IS WATCHED ON TOP BY ANOTHER EXPERIENCED VERTICAL CAVER.

THE WINDY CITY GROTTO RECENTLY HAD AN ACCIDENT IN WHICH A NEW PERSON BROKE TWO RIBS. I BELIEVE THIS WAS CAUSED BY STANDING ON THE SLIPPERY LEDGE RATHER THAN LEANING BACK FROM IT. THE PERSON SLIPPED, STRUCK THE LEDGE, AND CONTINUED ON AN UNCONTROLLED RAPPEL.

NEW VERTICAL PEOPLE CONT.

I HAVE A METHOD I HAVE USED IN THE PAST THAT I FEEL IS AS CLOSE TO FOOL PROOF AS POSSIBLE. THE NOVICE VERTICAL CAVER IS SHOWN CLIMBING AND RAPPELLING TECHNIQUES ON THE SURFACE AND ALLOWED TO PRACTICE UNTIL HE OR SHE FEELS CONFIDENT TO USE THEM IN A PIT. A PIT IS THEN CHOSEN (AROUND 100') WHERE TWO ROPES CAN BE RIGGED SIDE BY SIDE 2' TO 4' APART. IF A FIGURE EIGHT KNOT IS TIED IN THE END, AS SHOULD ALWAYS BE DONE, AND THE ROPES LOWERED INTO THE DROP RATHER THAN BEING THROWN IN, AS SHOULD NEVER BE DONE, THERE IS ALMOST NO DANGER OF THEM TANGLING.

ONE ROPE IS RIGGED IN THE CONVENTIONAL WAY WITH SEVERAL WRAPS AROUND A TREE PROVIDING A TENSIONLESS ANCHOR AND SECURED WITH A CARABINER. THE SECOND ROPE IS AT LEAST 2 1/2 TIMES THE LENGTH NEEDED (250' FOR A 100' DROP), AND IS ALSO RIGGED TO A TREE, BUT AT THE MIDDLE OF THE ROPE. BIGHT THE MIDDLE OF THE ROPE AND WRAP IT SEVERAL TIMES AROUND YOUR ANCHOR POINT AND SECURE THE BIGHT WITH A FIGURE EIGHT KNOT AND A CARABINER SECURED TO THE MAIN LINE. (SEE THE DIAGRAM) IN ADDITION THIS MAIN ROPE SHOULD BE RUN THROUGH 5 BARS OF A STANDARD RAPPELLING RACK THAT IS ALSO SECURED AT THE TOP OF THE DROP. BOTH ROPES SHOULD BE PADDED PROPERLY.



SAFETY RIGGING FOR NEW PEOPLE

THE NOVICE THEN RIGS ON TO THE LONG ROPE AND HAS HIS RACK AND BINERS CHECKED BY AN EXPERIENCED VERTICAL CAVER. THE EXPERIENCED VERTICAL PERSON THEN RIGS ON ROPE # 1 AND NEGOTIATES THE LIP AND LOCKS OFF WITH THE NEW PERSON'S ROPE IN HIS/HER HAND. THE NEW PERSON'S ROPE CAN ALSO BE LOCKED ONTO THE RACK. THE NEW PERSON IS THEN GUIDED OVER THE LIP AND THE TWO RAPPEL DOWN TOGETHER. THE TECHNIQUES OF LOCKING OFF, SPEEDING UP, AND SLOWING DOWN CAN BE PRACTICED TOGETHER, WITH THE EXPERIENCED CAVER ALWAYS HAVING CONTROL OF THE ROPE.

SHOULD THE NEW PERSON'S HAIR GET CAUGHT IN THE RACK, OR ANY OTHER MISHAP DEVELOP, IT IS A SIMPLE MATTER FOR HIM OR HER TO BE LOWERED DOWN BY A THIRD PERSON ON THE TOP. HE OR SHE WOULD SIMPLY UNTIE ROPE # 2 AND FEED THE ROPE THROUGH THE SECURED RACK. A FIGURE EIGHT KNOT MUST BE TIED IN THE UPPER END OF THE LONG ROPE SO IT COULDN'T POSSIBLY GO THROUGH THE RACK.

CLIMBING IS DONE THE SAME WAY; SIDE BY SIDE ASSISTANCE IS GIVEN. IF ANY PROBLEMS OCCUR, YOU ARE RIGHT THERE TO HELP, AT THE LIP, ETC.

NEVER IN THIS PROCEDURE IS THERE ANY DANGER TO ANYONE ON THE BOTTOM DUE TO FALLING ROCKS OR GEAR, AND THE NEW PERSON QUICKLY DEVELOPS CONFIDENCE AND A PROPER ATTITUDE TOWARD CAVING AND CAVERS.

THE WAY WE PREVENT ACCIDENTS IS BY LOOKING OUT FOR THE NEXT PERSON. DOING IT AS A "TOGETHER THING" TRANSFERS OUR EXPERTISE TO A NEW, INTERESTED PERSON SO THEY CAN ENJOY OUR SPORT AS WE DO. THIS PREVENTS ACCIDENTS AND KEEPS OUR CAVES AND PITS OPEN FOR THE FUTURE.

I URGE THAT HIS METHOD BE ADOPTED AS THE STANDARD IN TEACHING NEW PEOPLE. ANYONE THAT DOESN'T USE IT, TAKES UPON THEMSELVES THE RESPONSIBILITY FOR WHATEVER HAPPENS. I ALSO URGE EXPERIENCED PEOPLE TO TRY THIS SYSTEM OUT DURING A NON-NOVICE OUTING SO WHEN THE TIME COMES TO USE IT, IT WILL BE FAMILIAR.

TEACHING SINGLE ROPE TECHNIQUES SAFELY

OR
"HOW TO BRING 'EM BACK ALIVE"

By MIKE FISCHESSE

ACCIDENT # 1

A CAVER HANGS 1021 FEET OFF THE FLOOR OF MEXICO'S EL SOTANO DE LAS GOLANDRINAS WHILE WATCHING THE SHEATH OF THE ROPE TEAR IN FRONT OF HIS EYES. HE IS 74 FEET FROM THE LIP AND 30 FEET FROM THE NEAREST WALL. THE ROPE IS BREAKING AS IT SLIDES THRU THE RACK. HE STOPS, YELLS FOR ASSISTANCE. NO EXTRA ROPE ON TOP. HE HAS NO PRUSIKS.

ACCIDENT # 2

WHILE ASCENDING TANDEM OUT OF SURPRISE PIT (404') IN FERN CAVE, AL THE TOP CAVER OF THE TWO DISCOVERS THAT HIS HARNESS IS ABOUT TO COME APART, WHICH WOULD RESULT IN HEEL HANG 350 FEET OFF THE FLOOR. THE TOP CAVER IS ABOUT 225 LBS., 6' 1" AND DOESN'T HAVE THE EQUIPMENT, STRENGTH OR KNOWLEDGE TO REGAIN FROM A HEEL HANG.

ACCIDENT # 3

THE ROPE IS SAWED HALF WAY THROUGH IN NEWBERRY BANE'S TRIPLE WELL (202') DUE TO RUBBING AGAINST A LEDGE 20 FEET BELOW THE ANCHOR BOLTS. THE TOP CAVER OF A CLIMBING DUO NOTICES THE NEAR DISASTER AND PASSES OVER IT GENTLY WITH HIS EXTRA TWO PRUSIKS.

ALL OF THE ABOVE SITUATIONS ARE TRUE AND ENDED WITHOUT DISASTER ONLY BECAUSE THE PEOPLE WERE LUCKY. POOR JUDGEMENT, EQUIPMENT FAILURE, AND LACK OF PROPER TRAINING WERE COMMON ELEMENTS IN EACH CASE. EACH CASE WAS VERY CLOSE TO ENDING IN A FATALITY. THESE AND OTHER HORROR STORIES ARE HAPPENING EVERY YEAR AS INDICATED IN AMERICAN CAVING ACCIDENTS 1976-1979. MANY OF THEM COULD HAVE BEEN PREVENTED WITH PROPER PLANNING AND TRAINING.

THE PURPOSE OF THIS ARTICLE IS TO SHARE WITH THE READER A SAMPLE TRAINING OUTLINE USED TO PREPARE HORIZONTAL CAVERS FOR THE SINGLE ROPE TECHNIQUES NEEDED IN VERTICAL CAVING. THE PROGRAM HAS BEEN USED SUCCESSFULLY MANY TIMES AT THE N.C. OUTWARD BOUND SCHOOL FOR STAFF TRAINING PURPOSES. (OUTWARD BOUND STUDENTS DO NOT ENGAGE IN VERTICAL CAVING).

TEACHING SINGLE ROPE TECHNIQUES CONT.

THE FOLLOWING TRAINING OUTLINE HAS COME FROM TEN(10) YEARS OF TEACHING OUTWARD BOUND INSTRUCTORS AND RESCUE SQUAD TEAMS THE MECHANICS OF RESCUE WORK.

WHEN DESIGNING A PROGRAM FOR A SPECIFIC GROUP, THERE ARE A NUMBER OF SUBTLE AND NOT SO SUBTLE FACTORS TO CONSIDER:

1. GOOD CAVERS ARE NOT ALWAYS GOOD TEACHERS.
2. DO YOUR HOMEWORK BEFORE MAKING A PRESENTATION.
3. DON'T HESITATE TO USE YOUR NOTES.
4. BE FAMILIAR WITH YOUR DEMONSTRATION. DON'T LEARN IT AS YOU PRESENT IT.
5. ALLOW PLENTY OF TIME FOR EVERYONE TO PRACTICE.
6. PROPER PRIOR PLANNING PREVENTS POOR PERFORMANCE.
7. STAGE THE WORKSHOP IN A PRACTICAL AND COMFORTABLE SETTING (I.E. FIRE TOWER FOR SRT AND A COMFORTABLE ROOM WITH GOOD VISUAL AIDS FOR THEORY).
8. FURNISH QUALITY GEAR IN GOOD WORKING ORDER - ENOUGH SO TIME WON'T BE WASTED.
9. TEACH IN A PROGRESSION. SOME MIGHT TAKE LONGER TO CATCH ON. DON'T OVERLOAD THEIR ABILITY TO RETAIN THE NEW MATERIAL.
10. SOME OF THE EXERCISES ARE LIKE TEACHING CPR, IT MAY NEVER BE USED, BUT SOMEDAY PARTS OF THAT KNOWLEDGE MAY BE NECESSARY FOR IMPROVISING.
11. KNOW YOUR OBJECTIVES AND INFORM THE PARTICIPANTS.
12. TALK, DIAGRAM, AND DEMONSTRATE BEFORE ALLOWING THEM TO ATTEMPT THE KNOT OR EXERCISE.
13. CONSIDER USING A WAR STORY OR MOCK RESCUE TO INSTILL THE NEED AND DESIRE TO LEARN.
14. SET SAFETY GUIDELINES AND STICK TO THEM. MAKE SURE EVERYONE IS LISTENING AND ACKNOWLEDGES YOUR MESSAGE REGARDING SAFETY GUIDELINES BEFORE PROCEEDING. (E.G. PARTICIPANTS WILL NOT BE WITHIN A BODY LENGTH OF THE EDGE OF A PRACTICE CLIFF WITHOUT BEING TIED ON).

THIS OUTLINE OF IDEAS IS PRESENTED TO THE READER ONLY AS ONE MODEL WHICH HAS WORKED FOR A SPECIFIC AUDIENCE. PLEASE FEEL FREE TO TAILOR IT TO YOUR GROUP AS NEEDED.

TRAINING PROGRAM OUTLINE AND MINIMUM REQUIREMENTS TO BE MET FOR SINGLE ROPE WORK UNDERGROUND

ASCENDING:

HISTORY AND DEVELOPMENT OF ASCENDING RIGS AS THEY APPLY TO EXPLORATION UNDERGROUND.

- LADDER CLIMBING.
- PRUSIKING - DIFFERENT METHODS.
- MECHANICAL RIGS.
- ADVANTAGES AND DISADVANTAGES OF ABOVE TECHNIQUES.

FAMILIARIZATION OF HARNESSSES

- STITCHING (ABRASION, STRESS)
- CAM PARTS (GIBBS).
- PROPER FITTING.
- CARE AND MAINTENANCE.
- IMPROVISATION IF ANY PART FAILS. (USE OF PRUSIKS)

TEACHING SINGLE ROPE TECHNIQUES CONT.

ASCENDING PRACTICE

- CLIMBING RHYTHM (NO BOUNCING, RESTING, PACING).
- CLIMBING TANDEM - PSYCHOLOGY, DISTANCE, RATE.
- DOWN CLIMBING SEQUENCE.
- ASCENDING LAST.
- ROPE CARE, CHARACTERISTICS, AND TYPES.
- REST POSITION.
- SELF-RESCUE IF SHOULDER CAM FAILS (HEEL HANG).
- TANDEM RESCUES (PRACTICED AS IF ONE PERSON IS ON A HEEL HANG SITUATION).
 - PASSING PARTNER FROM BELOW.
 - RAISING PARTNER TO UPRIGHT POSITION.
- CLIMB 500' THRU A PULLEY.

DESCENDING:

HISTORY--SEE TOPICS AS DISCUSSED UNDER ASCENDING.

FAMILIARIZATION OF A RAPPEL RACK AND A SPELEAN SHUNT.

- CORRECT AND INCORRECT RIGGING.
- BRAKING OFF.
- TUNING THE RACK (HAND PLACEMENT).
- DESCENT RATE.

DESCENDING PRACTICE

- THREE 50' RAPPELS USING RACK AND SPELEAN SHUNT.
- TWO 150' RAPPELS WHILE ON BELAY.
- LOSS OF CONTROL - SHUNT PRACTICE.
- BELAYING FROM BELOW.
- CHANGING BARS.
- WHISTLE SIGNALS.
- PADDING LIPS AND RIGGING POINTS.
- SHORT ROPE PRACTICE - RAPPEL DOWN, CHANGE TO CLIMBING GEAR, CLIMB UP, CHANGE TO RAPPEL GEAR, RAPPEL BACK DOWN, ETC.

PRINCIPLES OF MECHANICAL ADVANTAGE-COUPLED WITH APPLIED LEARNING.

- EXAMPLES OF PRACTICALITY
- YOSEMITE HAULING SYSTEM (MODIFIED FOR TANDEM RESCUES)
- BACHMANN HOIST
- Z-DRAG
- PIGGY-BACK HAULING SYSTEM.

ROCK CLIMBING KNOWLEDGE:

REQUIRED THAT EACH MEMBER BE EXPERIENCED IN CLIMBING TECHNIQUES AND PHILOSOPHY.

FIRST AID KNOWLEDGE:

A MINIMUM OF RED CROSS FIRST AID, EMPHASIS ON LONG TERM STABILIZATION AND HYPOTHERMIA TREATMENT.

THE BUTT STRAP HARNESS

By MIKE FISCHESSE

STANDING AT THE BOTTOM OF FERN CAVE'S 404' SURPRISE PIT IS NOT EXACTLY THE BEST PLACE TO BEGIN EXPERIMENTING WITH A HARNESS DESIGN FOR CLIMBING BACK UP THE ROPE, BUT THAT IS WHAT ROGER STEPHENS AND I ENDED UP DOING DURING THE SPRING OF 1977.

ROGER AND I WERE ON OUR FIRST BIG PITTING TRIP WITH DON DAVISON, CHERYL JONES AND R.E. "WHIT" WHITTEMORE. ROGER AND I HAD BEEN ROCK CLIMBING AND HORIZONTAL CAVING SINCE THE LATE 60'S, BUT WE WERE BEING INTRODUCED TO THE WORLD OF SINGLE ROPE TECHNIQUES (SRT). WE HAD RIGGED A SYSTEM OF CLIMBING THE ROPE, BUT DON TOLD US WE WOULD PROBABLY DIE BEFORE EVER REACHING THE TOP, SO WE LISTENED INTENTLY AS HE TOLD US HOW TO "MAKE IT SAFER" BY ADDING OUR PRUSIKS TO THE ROPE.

THAT FIRST TRIP TO FERN WAS ONE OF THE MOST MEMORABLE CAVE OUTINGS I'VE EVER BEEN ON. THE AWESOMENESS OF SURPRISE PIT IS LIKE NONE I HAVE EVER SEEN TO THIS DAY. THAT TRIP TURNED ME ON TO VERTICAL CAVING AND LATER THAT YEAR A TRIP TO THE BIG PITS OF MEXICO WAS THE IMPETUS NEEDED TO DESIGN A SAFER, MORE DEPENDABLE AND COMFORTABLE HARNESS.

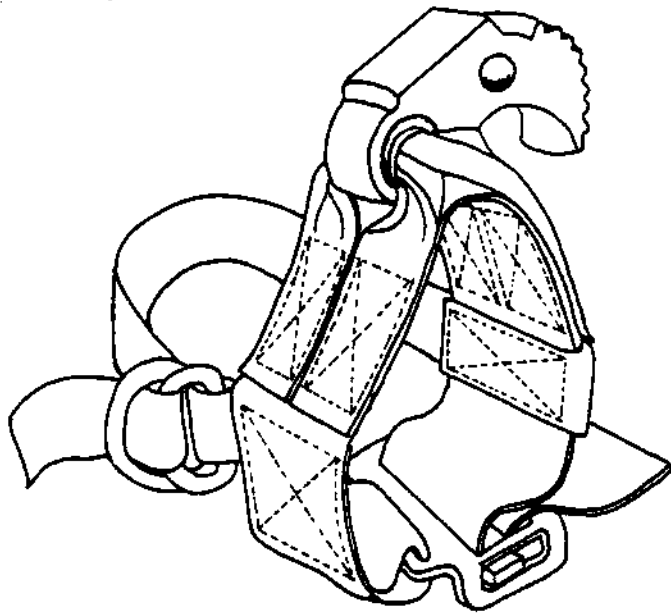
THE IDEA FOR THE BUTT STRAP HARNESS CAME FROM MY CLIMBING BACKGROUND AND ALL THE OTHER SRT RIGS I COULD SEE OR READ ABOUT IN CAVING CIRCLES. IT IS SIMILAR TO MANY OTHER GOOD 3 CAM SYSTEMS. THE HARNESS HAS BEEN USED EXTENSIVELY IN THE BIG MEXICAN PITS AND DEEP PITS OF FERN AND ELLISON'S CAVES IN THE SOUTHEASTERN U.S. WITH AN EXCELLENT SAFETY RECORD.

THE BUTT STRAP HARNESS IS BASICALLY A 3 CAM ROPEWALKER SYSTEM. IT INVOLVES A FOOT CAM, FLOATING KNEE CAM, SHOULDER CAM AND A DIAPER SEAT. THE SYSTEM HAS TWO(2) UNIQUE FACETS: 1. THE ENTIRE HARNESS IS ADJUSTABLE FROM CHILDREN TO LARGE ADULTS AND 2. THE DESIGN OF THE "BUTT STRAP". THE "BUTT STRAP" ADDS ADDITIONAL SAFETY AND COMFORT. BEFORE GOING INTO FURTHER DETAIL ON THE "BUTT STRAP", ALLOW ME TO DESCRIBE THE OTHER PARTS OF THE HARNESS FIRST.

ALL THE STITCHINGS IN THE HARNESS ARE SEWN ON AN INDUSTRIAL SEWING MACHINE WITH SIZE 12, DUPONT POLYESTER THREAD. THERE ARE NINE INDIVIDUAL STICHES PER INCH. THE THREAD IS SO STRONG, TO TRY AND BREAK IT BY HAND, WOULD LEAVE INCISIONS IN THE FLESH.

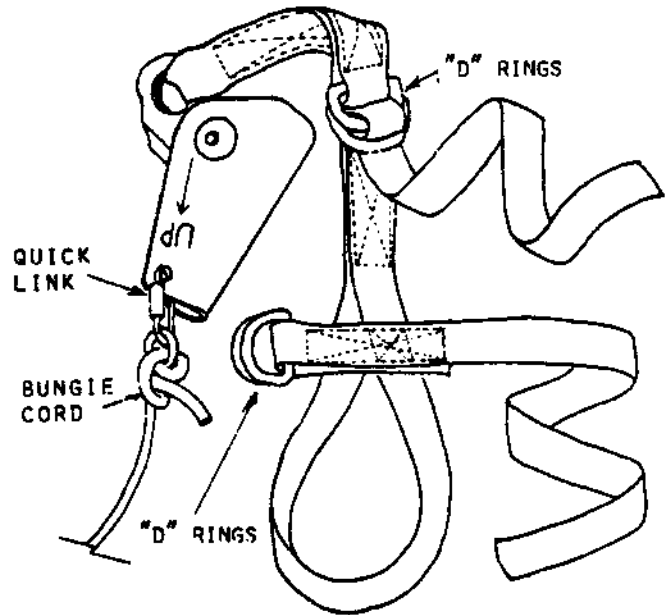
ALL THREE GIBBS ARE OF THE QUICK RELEASE PIN TYPE AND ARE MODIFIED BEFORE THEIR USE. THE CHAIN AND RIVET ARE REMOVED FROM THE SHELL AND PIN AND REPLACED WITH 1/8" NYLON CORD. THE SMALL, RED TAB WHICH KEEPS THE CAM ARM FROM BEING LOST OR DROPPED IS DRILLED OUT OF BOTH ENDS AND IS REPLACED WITH THE NYLON CORD COMING FROM THE PIN TO THE CAM ARM. THE REASON I REPLACED THE EXISTING CHAIN WAS DUE TO THE FACT THAT I HAD SEEN THE RIVET BREAK OFF THE SHELL WHICH SECURES THE CHAIN IN PLACE. I HAVE, ON OCCASION, SEE THE RED TAB ABRAIDED BY THE ROPE. I HAVEN'T HAD ANY PROBLEMS WITH THE PARACHUTE CORD MODIFICATIONS

BUTT STRAP HARNESS CONT.



FOOT CAM FIG. # 1

THE FOOT CAM FEATURES TOTAL ADJUSTMENT FOR ALL SIZE BOOTS AS WELL AS A CHICKEN LOOP.



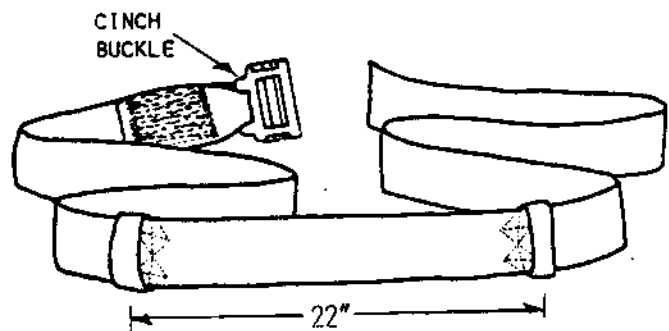
KNEE CAM FIG. # 2

THE FLOATING KNEE CAM FEATURES ADJUSTMENTS FOR ALL LENGTHS OF LEGS AND A CHICKEN LOOP.

THE FOOT CAM IS NOTHING NEW OR DIFFERENT. IT CONSISTS OF A GIBBS CAM SEWN TO A PIECE OF 2" WEBBING, ENCIRCLING THE FOOT AND SECURED WITH A CINCH BUCKLE. A PIECE OF ONE INCH TUBULAR WEBBING CIRCLES AROUND THE ANKLE AREA AND IS SECURED WITH "D" RINGS.

THE FLOATING KNEE CAM IS FAIRLY STANDARD ALSO, EXCEPT THAT IT IS ADJUSTABLE AND THE SHOCK CORD CLIPS TO A "D" RING BELOW THE SHOULDER CAM WITH A LITTLE MINI-BINER. THE FLOATING KNEE CAM CONSISTS OF 1" TUBULAR WEBBING SEWN THRU THE CAM ARM AND A FOOT LOOP WITH A KEEPER SLING SEWN TO IT TO GO AROUND THE ANKLE AREA. THE ADJUSTMENT TO LENGTHEN OR SHORTEN THE FLOATING KNEE CAM IS LOCATED BELOW THE CAM ARM STITCH PATTERN AND IS FASTENED WITH "D" RINGS, WHICH SHOULD BE TIED OFF WITH 2 HALF-HITCHES. THE SHOCK CORD IS 1/4" DIAMETER NYLON AND CONNECTS TO THE CAM SHELL VIA A SMALL QUICK LINK (LOOKS LIKE A TINY CARABINER, BUT WITH A SCREW CLOSURE) PASSED THRU ONE OF THE SMALL HOLES ON THE TOP END OF THE SHELL.

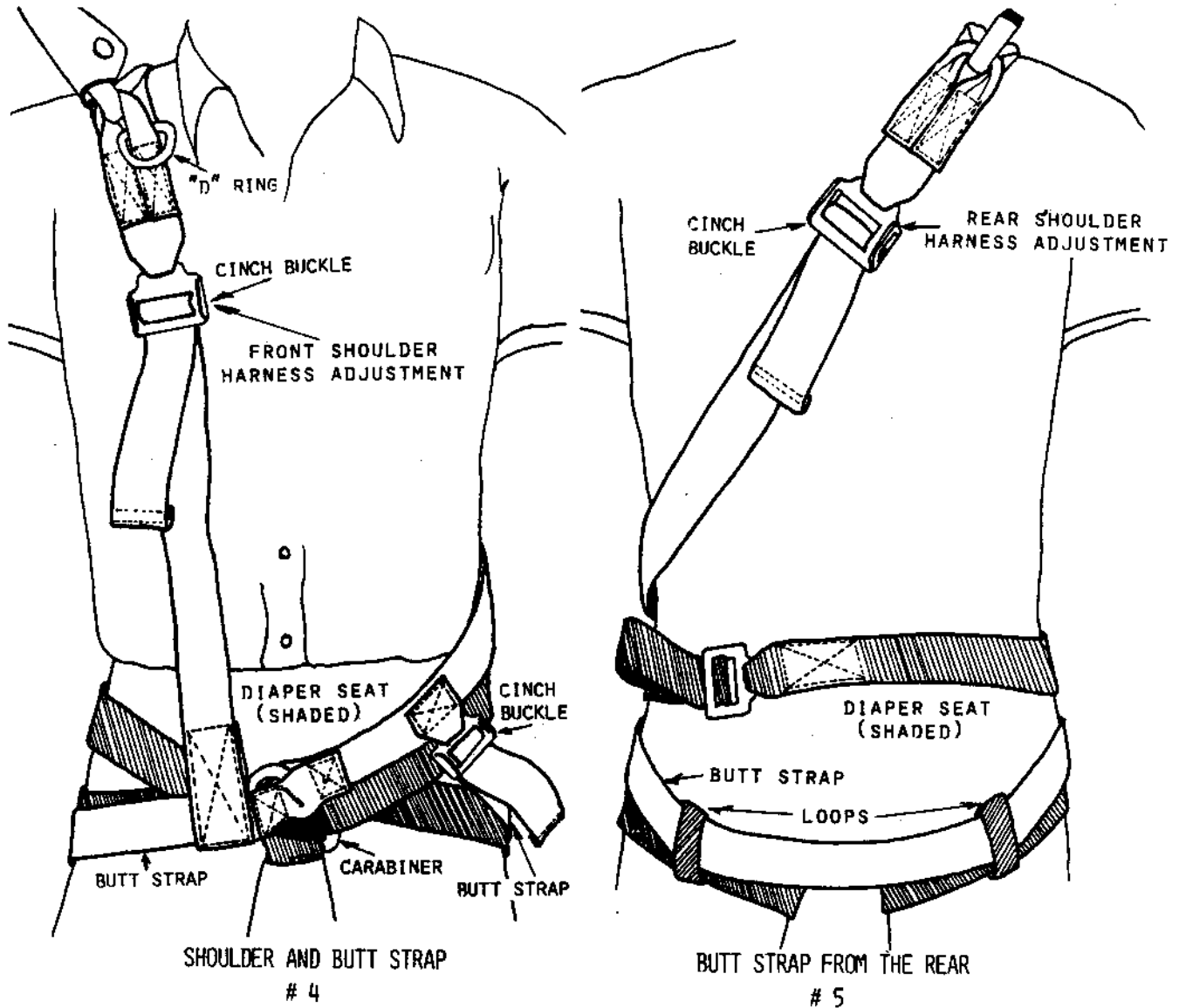
THE DIAPER SEAT IS THE EASIEST TO DESCRIBE. IT CONSISTS OF A SINGLE PIECE OF 2 INCH WEBBING, 11 FEET LONG WITH A BUCKLE SEWN TO ONE END. IT IS ADJUSTABLE FROM A CHILD TO A VERY LARGE ADULT. TWO SMALL 1 INCH TUBULAR LOOPS ARE SEWN TO THE MID-POINT OF THE DIAPER SEAT SPACED 22" APART. THEY RESEMBLE 2 SMALL BELT LOOPS AND SERVE AS GUIDES WHEN THREADING AND SECURING THE "BUTT STRAP" ITSELF. THE DIAPER SEAT MUST BE POSITIONED SO THAT THE 2 SMALL LOOPS WIND UP AT THE BASE OF EACH LOBE OF THE BUTTOCKS. ED. CINCH BUCKLE HARNESSES HAVE PROVEN SAFER WHEN FINISHED OFF WITH A HALF-HITCH.



DIAPER SEAT HARNESS FIG. # 3

NOTICE THE TWO "BUTT STRAP" GUIDES 22" APART.

BUTT STRAP HARNESS CONT.

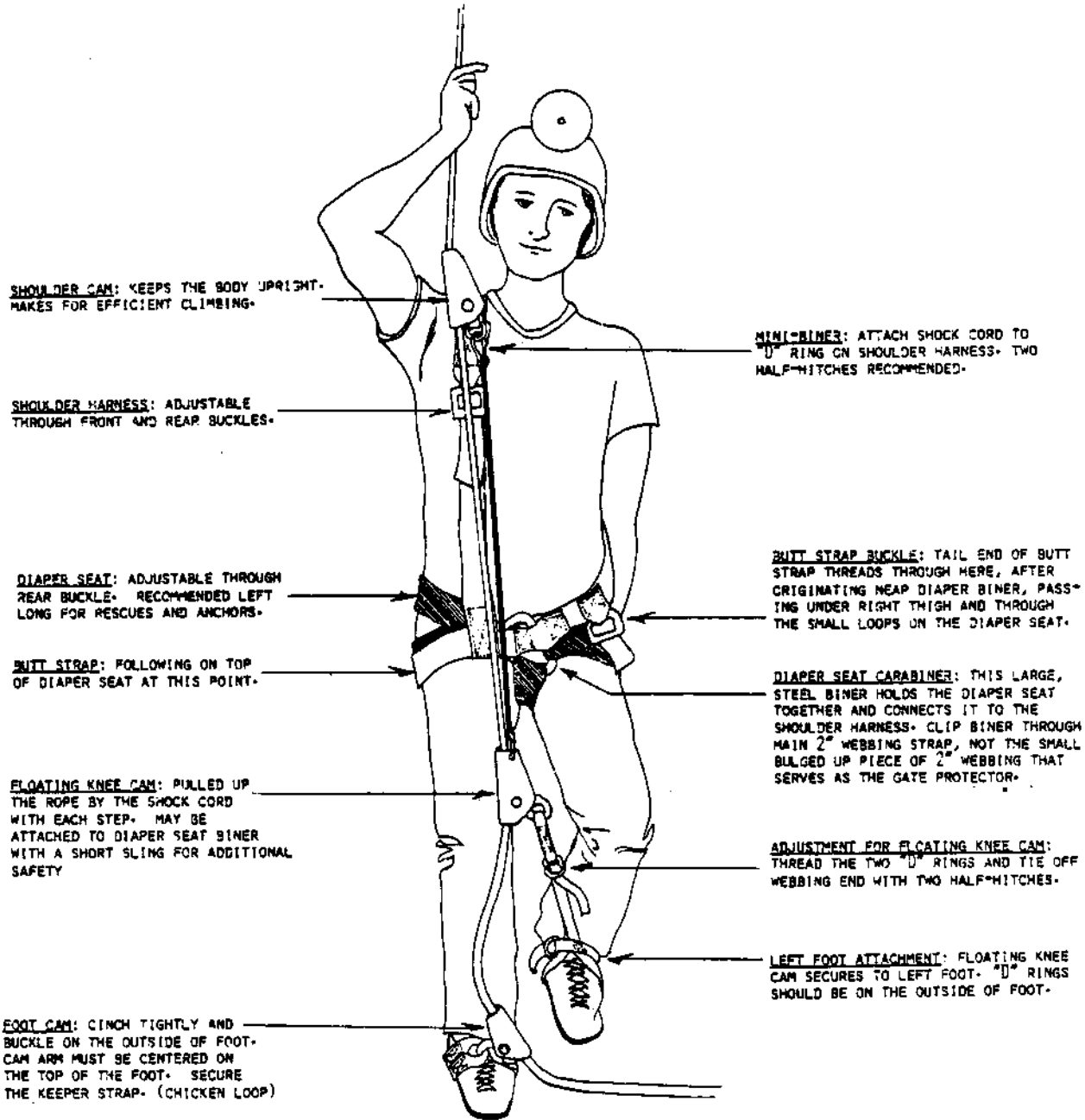


THE SHOULDER HARNESS CONSISTS OF 2" WIDE WEBBING. IT IS PLACED OVER THE RIGHT SHOULDER WITH THE CAM SLIGHTLY BEHIND THE TOP OF THE SHOULDER. THE SHOULDER IS BASICALLY A LARGE OVAL SLING WITH A LONG TAIL RUNNING OUT OF THE SMALL LOOP AREA WHICH IS CLIPPED INTO THE DIAPER SEAT CARABINER (LARGE, OFF-SET "D" BINER, STUBAI). FROM THE TOP OF THE RIGHT SHOULDER IT COMES DOWN ACROSS THE CHEST AND DOWN ACROSS THE BACK TO BE CLIPPED INTO THE DIAPER SEAT CARABINER JUST ABOVE THE CROTCH. JUST BELOW THE SHOULDER CAM ON BOTH THE BACK AND CHEST IS A BUCKLE FOR ADJUSTING. AT THE POINT THE BACK STRAP COMES FROM BEHIND AND BEGINS TO RIDE ABOVE YOUR LEFT HIP AND BELOW YOUR RIBS A BUCKLE IS SEWN PERPENDICULAR TO THE OVAL STRAP AS TO ACCEPT THE "BUTT STRAP". THE "BUTT STRAP" ORIGINATES FROM THE DIAPER SEAT CARABINER...TRAVELS UNDER THE BUTTOCKS, THRU THE TWO SMALL BELT LOOPS, (PIECES OF 1" TUBULAR WEBBING SEWN ON THE DIAPER SEAT; SEE # 3 AND # 5) AND UP INTO THE PERPENDICULAR BUCKLE.

THE "BUTT STRAP" IS PASSED UNDER THE BASE OF YOUR BUTTOCKS WHICH MAKES FOR MORE SUPPORT ON LONG CLIMBS OR RAPPELS. IT IS SECURED THRU THE PERPENDICULAR BUCKLE SEWN ON THE SHOULDER STRAP. BY TIGHTENING THE "BUTT STRAP" IT PULLS THE LEFT SIDE OF THE SHOULDER STRAP DOWN OUT OF YOUR RIB CAGE AND CLOSER TO YOUR LEFT HIP. IT ELIMINATES THE TREMENDOUS SQUEEZING PRESSURE THAT SO MANY COMPLAIN ABOUT WHEN THEY HANG IN THE RESTING POSITION FROM A LOADED SHOULDER CAM.

BUTT STRAP HARNESS CONT.

TESTING: FORREST MOUNTAINEERING OF COLORADO WAS COMMISSIONED TO PERFORM TENSILE TESTING ON VARIOUS PARTS OF THE BUTT STRAP HARNESS (BSH). LOADS WERE APPLIED IN THE SAME DIRECTION AS WOULD OCCUR IN NORMAL USE AND RESCUE. THE STITCH PATTERNS PROVED TO BE EXCEPTIONALLY STRONG. THE SHEATH OF THE SAMPLE CAVING ROPE TORE APART BEFORE WEBBING OR STITCH PATTERNS FAILED. DEFORMATION OF THE PIN HOLES ON THE GIBBS SHELL OCCURRED DURING THE FOOT CAM TEST. THE EYE OF THE CAM ARM FINALLY FAILED AT 5000+ POUNDS. THE DIAPER SEAT WAS TESTED IN A LOOP. THE MACHINE WAS STOPPED AT 8000+ POUNDS. NO SLIPPAGE OR DEFORMATION OF THE BUCKLE OCCURRED. THE ROPE SHEATH USUALLY FAILED AT 2500 POUNDS. THE MEASURING EQUIPMENT USED WAS A "BALDWIN-LIME HAMILTON" LOAD CELL 10,000 LBS. CAPACITY, TYPE U361-C, WITH A "BALDWIN-LIME HAMILTON" DIGITAL TRANSDUCER AMPLIFIER TYPE 450. ALL EQUIPMENT USED FOR TESTING WAS ON CURRENT CALIBRATION AND IS TRACEABLE TO THE NATIONAL BUREAU OF STANDARDS.



THE COMPLETE BUTT STRAP CLIMBING SYSTEM

FIGURE # 6

BUTT STRAP HARNESS CONT.

SOME OF THE FEATURES AND DISADVANTAGES AS SEEN BY THE DESIGNER/AUTHOR.

FEATURES:

1. WITH THE MODIFIED CAMS--THERE IS LESS CHANCE FOR LOST PIECES.
2. ALL THE STITCH PATTERNS ARE EXTREMELY STRONG.
3. IT IS A FOOL-PROOF SYSTEM AND VERY SIMPLE.
4. EACH PIECE HAS MULTI-USES:
 - FOOT CAM CAN BE USED ON THE WRIST FOR HAULING.
 - KNEE CAM CAN BE USED AS THE "KEEPER CAM" WHEN WEIGHED OVER THE EDGE IN HAULING SYSTEMS.
 - DIAPER SEAT CAN BE USED BY ITSELF WITH A RACK FOR SHORT DROPS.
 - KNEE CAM CAN BE USED AS A SPELEAN SHUNT WHILE RAPPELLING.
 - SHOULDER HARNESS AND "BUTT STRAP" CAN BE WORN AS A WAIST BAND WITH A CAM SAFETY ON STEEP MUDDY SLOPES WHERE A FIXED LINE IS NECESSARY.
5. IT IS ADJUSTABLE--HANDY FOR RESCUES, CROSS-OVERS, OR FRIENDS.
6. IT IS FAIRLY COMFORTABLE AS ASCENDING HARNESSES GO.
7. IT CAN BE ADJUSTED FOR A STEEP SLOPE AFTER CLIMBING AN ALL FREE PITCH BY LOOSENING THE REAR SHOULDER BUCKLE...THE TOP CAM SHOULD MOVE FORWARD TO ALLOW UPRIGHT CLIMBING OR SCRAMBLING POSITION.

DISADVANTAGES:

1. IT IS NOT AS HANDY AS JUMARS FOR PASSING LIPS AND PADS.
2. MAYBE A BIT MORE BULKY THAN SOME SYSTEMS.
3. THE EXPENSE OF A 3 CAM SYSTEM.

THIS HARNESS HAS BEEN USED SUCCESSFULLY IN THE DEEP DROPS OF THE SOUTHEASTERN UNITED STATES (FERN'S SURPRISE PIT 404' AND ELLISON'S FANTASTIC PIT 510') MANY TIMES WITH NO PROBLEMS. IT HAS ALSO DEMONSTRATED ITS COMFORT AND EFFICIENCY IN THE DEEP PITS OF MEXICO(EL SOTANO DEL BARRO 1345', EL SOTANO DE LAS GOLANDRINAS 1094' AND HOYA DE LAS GUAGUAS 478').

THESE HARNESSES ARE AVAILABLE COMMERICALLY FOR \$95.00 U.S. FOR FURTHER INFORMATION WRITE:
BUTT STRAP HARNESS MAKERS, 121 NORTH STERLING STREET, MORGANTON, N.C. 28655.

EDITOR'S NOTE: THIS HARNESS HAS THE ENDORSEMENTS OF MANY FINE CLIMBERS INCLUDING LARRY "SMOKEY" CALDWELL AND CHARLIE GIBBS. NEIL MONTGOMERY, AUTHOR OF SINGLE ROPE TECHNIQUES WRITES THAT IT'S "A BEAUTIFUL RIG...ESPECIALLY SUITABLE FOR LONG PITCHES DUE TO ITS INNOVATIVE REST POSITION." IT IS EASY TO PICK AT THINGS AND FIND FLAWS AND SAY YOU MAY BE ABLE TO ENGINEER SOMETHING BETTER, BUT AS I SEE IT...MIKE IS PRODUCING A RIG OF EXTREMELY HIGH QUALITY AND RELIABILITY.

GREAT VERTICAL EVENTS

GREAT VERTICAL EVENTS IS A NEW NYLON HIGHWAY FEATURE. FROM TIME TO TIME GREAT VERTICAL ACHIEVEMENTS TAKE PLACE UTILIZING ROPE TECHNIQUES COMMONLY USED IN A CAVE. OFTEN TIMES THESE EVENTS REQUIRE SPECIAL TALENT, EQUIPMENT, MONEY AND SACRIFICE. IT IS OUR INTENT TO BRING YOU THOSE STORIES AS THEY HAPPEN WITH ALL THE SIGNIFICANT DETAILS.

MOUNT THOR

By KATHY WILLIAMS

SEVENTEEN CAVERS JOINED EXPEDITION COORDINATOR STEVE HOLMES DURING THE MONTH OF JULY, 1982 TO DO THE WORLD'S LONGEST SINGLE ROPE RAPPEL AND ASCENT AT MOUNT THOR ON THE ARCTIC CIRCLE IN BAFFIN ISLAND, CANADA, WHICH LIES NEXT TO GREENLAND. THE DROP IS 3230 ± 30 FEET LONG, MEASURED TWICE BY KIRK MACGREGOR WITH AN ALTIMETER WHOSE READINGS WERE CORRECTED FOR TEMPERATURE CHANGES.

THE BASE CAMP TEAM CONSISTED OF CATHY PERRODIN, ANNE STRAIGHT, DOUG STRAIGHT, PETER UBERTO, AND DAVID YOUNG. THE ROCK-CLIMBING TEAM WAS COMPRISED OF KENT BALLEW, JIMMY FULLER, JIM SMITH, AND BEAR THURMAN. THE SUMMIT TEAM INCLUDED STEVE HOLMES, RODGER LING, KIRK MACGREGOR, MICK NICHOLS (GEO PHOTOGRAPHER), MICHAEL SCHER, MITCHELL SHIELDS (GEO WRITER), DAN TWILLEY, JIM YOUNG, AND MYSELF. A CREDIT TO THEIR PROFESSIONS, BOTH THE GEO WRITER AND PHOTOGRAPHER DID THE DROP.

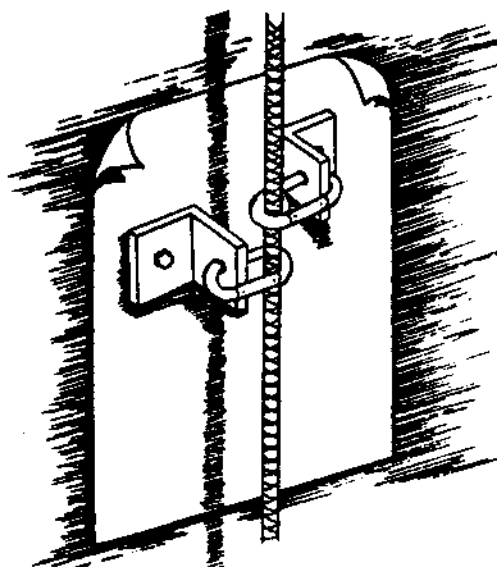
THE MAIN ROPE WAS PMI 7/16 INCH STATIC CAVING ROPE, CHOSEN FOR ITS UNUSUALLY HIGH ABRASION RESISTANCE AND LACK OF BOUNCE AS COMPARED TO OTHER ROPES ON THE MARKET. WE HAVE AN UNCONFIRMED RUMOR THAT THE PMI MANUFACTURERS ADDED AN EXTRA NYLON STRAND TO THE CORE WHICH INCREASED THE BREAKING STRENGTH TO 7000 POUNDS. THE SAFETY FACTOR (ROPE STRENGTH IN POUNDS : LOAD WEIGHT IN POUNDS) SHOULD BE 12 TO 1 FOR A HUMAN LOAD AND 5 TO 1 FOR AN INANIMATE LOAD (CULLINGSFORD, 1969). TO MINIMIZE THE BACKPACKING WEIGHT OF THE HAUL CORD AND YET KEEP WITHIN THE 5 TO 1 SAFETY FACTOR, HOLMES CONFERRED WITH LARRY CALDWELL AND STEVE HUDSON WHO DEvised THE PLAN TO BACKPACK 5000 FEET OF LIGHTWEIGHT CORD TO THE SUMMIT. THIS WOULD BE LOWERED TO HAUL UP 2000 FEET OF AN INTERMEDIATE WEIGHT CORD THAT WAS ATTACHED TO THE MAIN ROPE.

THE MAIN ROPE WAS HAULED OVER THE LIP, PULLED OVER A BLOCK OF ROCK COVERED BY CANVAS ROPE PADS, WRAPPED TWICE AROUND A 6 INCH DIAMETER METAL "TREE" (CREATED BY PETER UBERTO), AND TIED OFF AT THE MAIN AND BACK-UP WHICH WERE 1/2 INCH MASONRY ANCHOR BOLTS. (SEE RIGGING DIAGRAM).

AT THE BULGES LOCATED 300 FEET AND 350 BELOW THE LIP, THE ROPE WAS HELD AGAINST A ROPE PAD BY TWO OPPOSING CARABINERS THROUGH BOLT HANGERS, A SYSTEM DEVELOPED BY STEVE HOLMES. (SEE THE ROPE PAD DIAGRAM)

AN 8 TO 1 MECHANICAL ADVANTAGE HAULING SYSTEM WAS SET UP THAT ENABLED ONE PERSON TO LIFT THE WEIGHT OF THE MAIN ROPE. THIS ALSO ENABLED RAPPELLERS AND CLIMBERS TO EASE THEMSELVES OVER THE LIP ON THE MAIN ROPE WITH NO DIFFICULTY.

THE LIP OF THE DROP WAS A 7 FOOT OVERHANG. ABOUT 1680 FEET OF THE DROP WAS TOTALLY FREE BETWEEN THE UPPER AND LOWER BULGES. (SEE MT. THOR DIAGRAM).

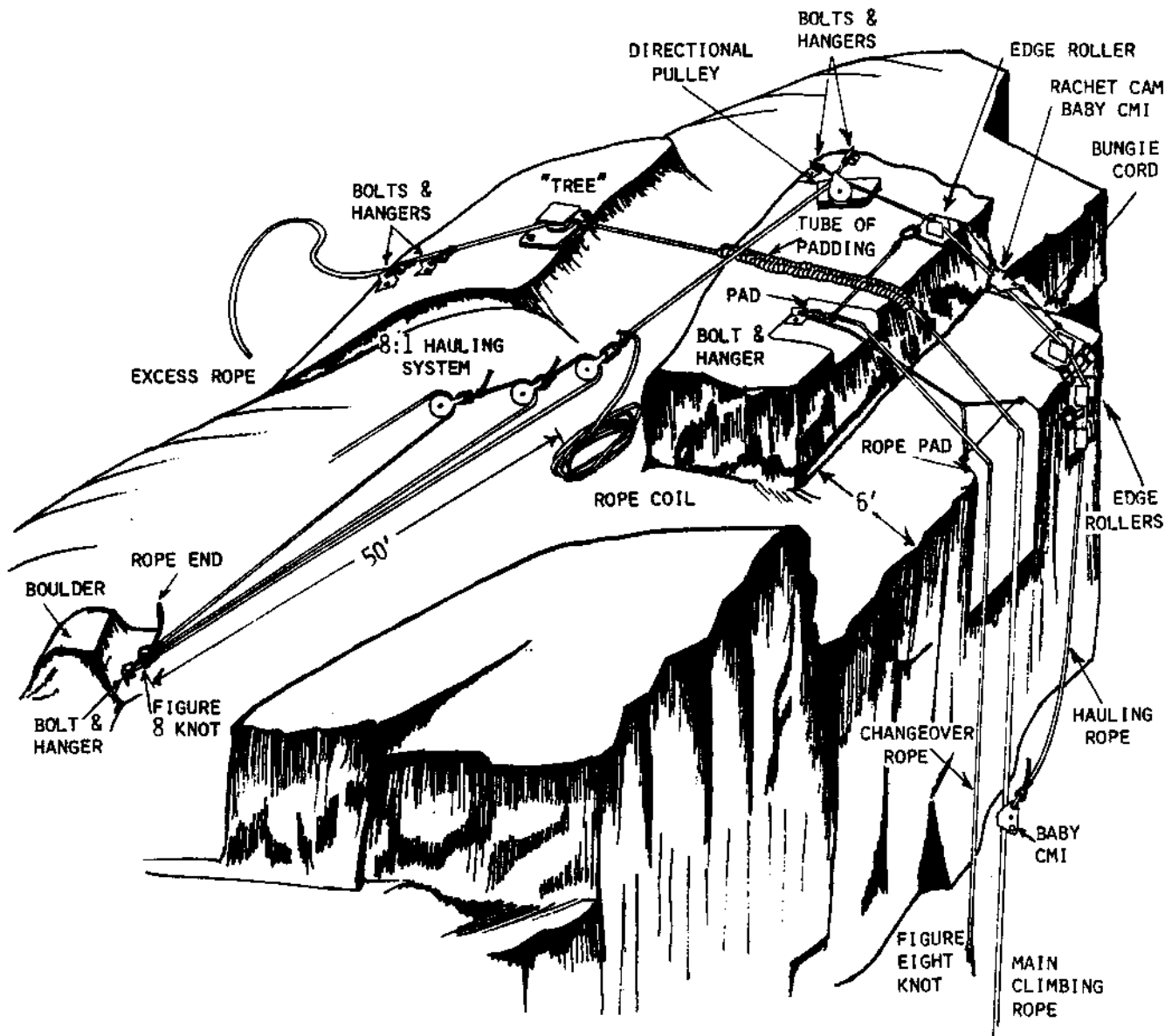


ROPE PAD USED AT THE BULGES
ON THE CLIFF FACE*

*ORIGINAL ARTWORK BY ALAN JOHNSON

GREAT VERTICAL EVENTS CONT.

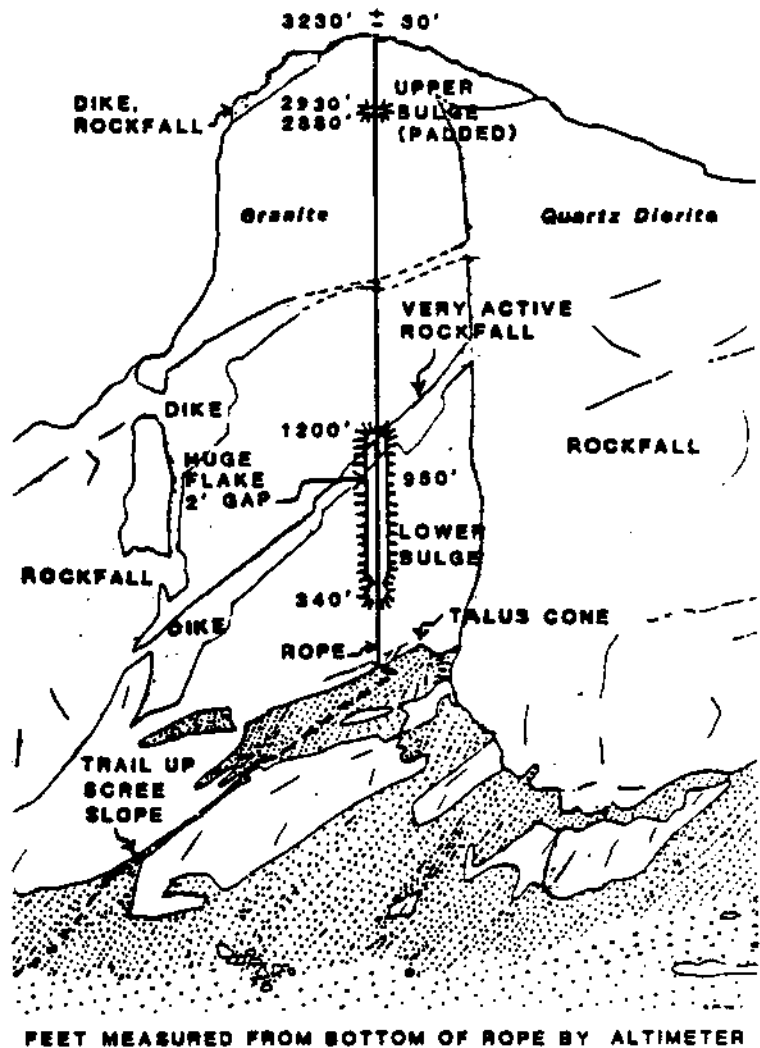
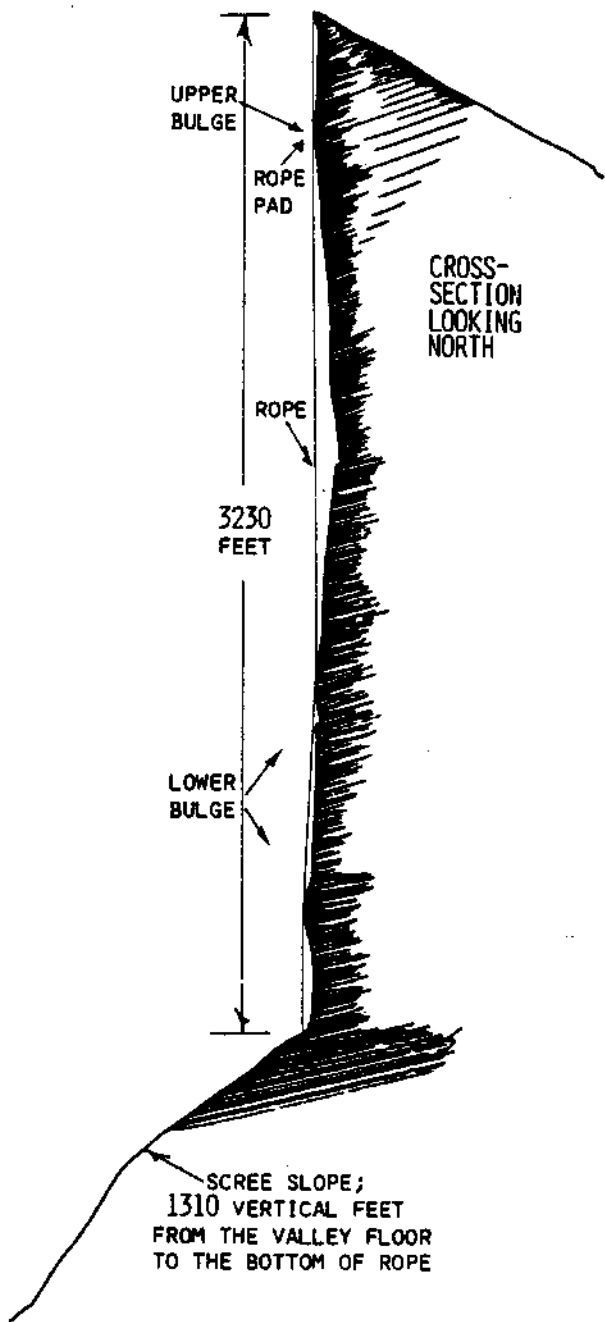
THREE KINDS OF RAPPEL DEVICES WERE USED: 1. THE THOR RACK (MADE BY BUDDY LANE IN CONSULTATION WITH STEVE HOLMES), 26 INCHES LONG WITH 8 BRAKE BARS- 2. THE PMI EXPEDITION RACK, 18 INCHES LONG WITH 7 BARS AND 3. THE SQUEEZE BRAKE (INVENTED BY KIRK MACGREGOR). THE SQUEEZE BRAKE CONSISTED OF TWO(2) ALUMINUM PLATES WITH 10 INCH HANDLES THAT ACTED MUCH LIKE A POWERFUL NUTCRACKER.



RIGGING AT MOUNT THOR
ADAPTED FROM DRAWINGS BY ALAN JOHNSON

KIRK AND I DID A DOUBLE RAPPEL, WITH HIM ABOVE WITH HIS SQUEEZE BRAKE AND I BELOW WITH MY PMI EXPEDITION RACK AND SPELEAN SHUNT SAFETY. A TOTAL OF 16 PEOPLE RAPPELLED THE DROP. THE AVERAGE RAPPEL TOOK ABOUT 30 MINUTES. DAN TWILLEY WAS THE FIRST TO DO THE RAPPEL. STEVE HOLMES AND BEAR THURMAN RAPPELLED THE DROP WITH THOR RACKS IN ABOUT 6 MINUTES FROM THE ROPE PAD AT UPPER BULGE. KIRK MACGREGOR RAPPELLED THE ENTIRE DROP IN 18 MINUTES 49 SECONDS WITH HIS SQUEEZE BRAKE.

**MOUNT THOR,
BAFFIN ISLAND**



DRAWN BY KATHY WILLIAMS

FIFTEEN(15) PEOPLE CLIMBED THE ROPE, USUALLY TANDEM. THE AVERAGE CLIMBING TIME WAS 5 HOURS. DAN TWILLEY AND CATHY PERRODIN WERE THE FIRST TO CLIMB. THE FASTEST CLIMB WAS ACCOMPLISHED BY KIRK MACGREGOR IN 1 HOUR 58 MINUTES 57 SECONDS. KIRK USED A DOUBLE FLOATING GIBBS SYSTEM WITH A HOMEMADE CHEST PULLEY. (THE DOUBLE FLOATING GIBBS UTILIZED TWO ELASTIC PULL CORDS. THE ONE IN QUESTION WAS FASTENED TO THE FOOT CAM AND EXTENDED UP TO THE SEAT HARNESS. THIS TOOK THE PLAY OR SLOP OUT OF THE FOOT CAM STRAP, INCREASING CLIMBING EFFICIENCY...FROM A DISCUSSION WITH KIRK...EDITOR).

REFERENCES CITED: CULLINGSFORD, C., ED., 1969, MANUAL OF CAVING TECHNIQUES: LONDON CAVE RESEARCH GROUP, ROUTLEDGE AND KEGAN PAUL.

EL CAPITAN

ORIGINAL ACCOUNT BY BRAD JOHNSON

ON AUGUST 8 THRU 15, 1980, 18 INDIVIDUALS WERE INVOLVED IN AN EXPEDITION TO DESCEND AND ASCEND EL CAPITAN, YOSEMITE NATIONAL PARK, YOSEMITE, CALIFORNIA ON A SINGLE ROPE. THIS 2650 FOOT DROP REQUIRED 4600 FEET OF 7/16 STATIC CLIMBING ROPE. EIGHT INDIVIDUALS, INCLUDING BUTCH FARABEE, PARK RANGER, MADE THE RAPPEL AND SEVEN MADE THE CLIMB. RAPPEL TIMES RANGED FROM 15 MINUTES TO 1 1/2 HOURS AND WERE CARRIED OUT DURING THE DAY. ASCENT TIMES RANGED FROM TWO HOURS AND 10 MINUTES TO EIGHT HOURS AND 10 MINUTES AND WERE CARRIED OUT IN THE EVENING AND AT NIGHT WITH ONE EXCEPTION.

THE MEMBERS OF THE EXPEDITION WERE: SARA CORRIE, GEORGE CORRIE, MARY FOSTER, LESLIE JOHNSON, KATHY WILLIAMS, DON PAQUETTE, PAULA PORTER, MAT POWLEN, LIZ RUPERT, CARTER HATFIELD, BUTCH FARABEE, STEVE HOLMES, DAN TWILLEY, BILL EIDSON, DONNIE RAWLINS, BRAD JOHNSON, DON BELLING AND DOLPH HATFIELD.

A LARGE "A" FRAME STRUCTURE WAS ERECTED AT THE SUMMIT AND WAS A RIGGING INNOVATION USED ON THIS PARTICULAR DROP. THE MAIN ROPE WAS HOISTED UP THE DROP WITH A LIGHT WEIGHT 1/8" DACRON LINE AND SECURED TO A HUGE BOULDER 60' FROM THE LIP, PASSING THROUGH THE "A" FRAME AT THE LIP. 400 EXTRA FEET OF MAIN LINE WAS HAULED UP AND USED TO CONSTRUCT A HAULING SYSTEM (4 : 1 MECHANICAL ADVANTAGE). THIS SYSTEM WAS USED TO LIFT THE WEIGHT OF THE ROPE WHILE THE RAPPELLERS RIGGED IN AND NEGOTIATED OVER THE LIP.

STEVE HOLMES MADE THE FIRST RAPPEL AT APPROXIMATELY 5:00 P.M. ON 8-11-80. DAN TWILLEY FOLLOWED SOON THERE AFTER. THE RAPPEL MUST HAVE BEEN INTERESTING...BRAD JOHNSON WRITES IN A LETTER:

"AS BREEZES CAME UP AROUND MIDDAY, SOME OF THE RAPPELLERS WERE BLOWN BACK AND FORTH ACROSS THE FACE AS MUCH AS 150'-200'. DURING MY RAPPEL, THE ROPE WAS BLOWN INTO A "BOW" ABOVE ME AND LIFTED ME 20'-25' EVEN AS THE ROPE WAS SINGING THROUGH MY RACK. NOT OFTEN DO YOU RAPPEL UP A FACE. NONETHELESS, AT NO TIME, WAS THE SLIGHTEST ROPE MOVEMENT DETECTABLE AT THE LIP, BUT WE PADDED IT ANYWAY.

"ON RAPPEL, WHEN I DECIDED TO TAKE A PICTURE, RATHER THAN STOP A HOT RACK ON THE ROPE, I SLOWED DOWN AND WENT VERY SLOWLY UNTIL THE RACK WAS COOL TO TOUCH (ABOUT 5 MINUTES) THE CAMERA ANGLE SHOWED NO CHANGE IN THAT 5 MINUTES! THAT'S HOW IMMENSE IT WAS.

"THE LARGE RACKS, EASILY CONTROLLED WITH THUMB AND FOREFINGER ON THE 4TH BAR (5 NEAR THE BOTTOM) WERE CAPABLE OF EXTREMELY SLOW DESCENTS WITH NO TENDENCY TOWARD AN UNWANTED STOP."

THE FIRST ASCENT OF EL CAPITAN WAS MADE BY DAN TWILLEY LATE IN THE SAME EVENING OF THE FIRST RAPPEL. STEVE HOLMES FOLLOWED ABOUT AN HOUR LATER. THE OTHER 5 PARTY MEMBERS TO CLIMB, IN ORDER, WERE: DON RAWLINGS, DON BELLING, BRAD JOHNSON, DOLPH HATFIELD AND BILL EIDSON.

THERE ARE SEVERAL UNIQUE FEATURES OF THIS EXPEDITION THAT ARE WORTH TALKING ABOUT.

1. THE RAPPEL OF EL CAPITAN ON A SINGLE ROPE HAS IMPLICATIONS IN RESCUE SINCE RAPPELS CAN NOW BE MADE WITH 170 TO 200 LBS. OF TENSION ON THE ROPE; I.E., THE WEIGHT OF THE ROPE SUSPENDED 2650 FEET WEIGHED APPROXIMATELY 170 LBS. AT THE LIP OF THE SUMMIT.

GREAT VERTICAL EVENTS CONT.

2. THE DIFFICULTY THAT WOULD HAVE BEEN ENCOUNTERED IN TRANSPORTING THE 4600 FOOT ROPE TO THE TOP OF EL CAPITAN WAS OVERCOME BY LOWERING A LIGHT DACRON CORD FROM THE SUMMIT TO THE BASE, SECURING ONE END OF THE ROPE TO THE CORD, AND PULLING THE ROPE TO THE TOP.
3. THE ACTUAL RAPPEL DISTANCE, 2650 FEET, EXCEEDED ANY PREVIOUS RAPPEL ON A SINGLE ROPE BY MORE THAN 1000 FEET.
4. THE RAPPEL RACKS, 21 INCHES IN LENGTH, WERE DESIGNED TO OVERCOME THE IMMENSE WEIGHT OF THE ROPE DURING THE INITIAL STAGES OF THE RAPPEL AND WERE MADE SPECIFICALLY FOR THIS EXPEDITION BY PMI, INC.
5. THE COMPLETE SUCCESS OF THE EXPEDITION, INCLUDING THE PERFECTION OF THE TECHNIQUE FOR A LONG AND SAFE RAPPEL IS EXTREMELY NOTEWORTHY.
6. IT WAS THIS EXPEDITION THAT THE SPELEAN SHUNT REALLY CAME OF ITS OWN. ONE COULD NOT LIFT THE ROPE TO LOCK OFF THE RACK FOR EMERGENCY OR PHOTOGRAPHY. THE SPELEAN SHUNT BECAME AN ESSENTIAL TOOL THAT ENABLED ONE TO STOP DURING RAPPELS. THE SHUNT PROVED EASY TO RELEASE WHEN ONE WISHED TO RESUME THEIR RAPPEL.
7. EXPEDITIONS SUCH AS THESE ARE NOT WEEKEND OUTINGS...THEY REQUIRED PLANNING AND A TREMENDOUS AMOUNT OF FORTHOUGHT. THEY REQUIRE MONEY, RESOURCES, TALENT, SKILL, A LOT OF HARD WORK AND AN UNBELIEVEABLE AMOUNT OF COOPERATION AMONG THE HUMAN RESOURCES GATHERED.

BRAD JOHNSON WRITES IN A LETTER ABOUT THE RIGGING AND THE DROP...

"THE LIP WAS MADE TO ORDER. FROM THE ANCHOR IT SLOPED DOWN TO THE LIP STEEPLY ENOUGH TO REQUIRE A SAFETY LINE. IT ROLLED TO A 4" LEDGE AT WHICH POINT IT BECAME VERTICAL. THE BREAKOVER ANGLE OF THE ROPE WAS NO LESS THAN $\pm 120^\circ$. THE ROPE LAY AGAINST ROCK FOR ABOUT 6 FEET AND WENT FREEFALL TO ABOUT 80'-100' FROM THE BOTTOM WHERE IT LAY ON THE ROCK FACE AT ABOUT A 70° - 80° ANGLE.

THE BEST DESCRIPTION OF THE DROP IS IMMENSE! WE NEVER REALLY FELT THE SCALE OF IT. MOST OF US EXPERIENCED THE FEELING THAT WE HAD CLIMBED INTERMINABLY, BUT THE TOP GOT NO CLOSER. WHAT LOOKED LIKE 600' TO GO USUALLY WAS MORE THAN 1000'. MOST OF THE TIME THE WALL WAS 10'-30' OUT OF REACH, BUT THERE WERE SEVERAL HUNDRED FEET WHERE WE COULD TOUCH THE WALL. THE WALL WAS VERY SMOOTH--AT NO POINT COULD WE TAKE OUR WEIGHT OFF THE ROPE. THE ONES WHO DID NOT HAVE PADDED HARNESSES FOUND THEIR LEGS ASLEEP DURING THE RAPPEL."

EDITORS NOTE: IT IS EVIDENT THAT MANY OF THE PIONEERING EFFORTS OF THIS EXPEDITION ASSISTED IN ASSURING THE SUCCESS OF THE MT. THOR EXPEDITION.

