WINTER 1980

SEARCH & RESCUE

MAGAZINE

Lowering victim and rescuer (from LeMoore Station) after "fixed line fly-away" rescue from Cathedral Rock in Yosemite in July, '79.

See article excerpt from exciting new Tim Setnicka book.
Page 14

Photo by Tim Setnicka

SEARCH AND RESCUE MAGAZINE
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PUBLISHER'S FORUM

By Dennis E. Kelley

I am most happy to announce the addition of a brand new columnist to *Search & Rescue Magazine* who is a most famous backpacker newsletter author in his own right, FRANK ASHLEY. Frank has consented to lend his considerable expertise on the backpacking industry to SAR. There **are** three (3) immediate benefits to you our readers from Frank's involvement.

First, backpacking equipment is frequently used by various SAR organizations. Frank's intimate knowledge of this equipment will help us do our job.

Secondly, backpackers, as a subset of the SAR victim categories, deserve to have someone like Frank through which to give feedback to SAR.

Finally, you will be very much surprised with Frank's astute observations in general. For example, his column in this issue on the need for a backpacking association equally applies to SAR. We in SAR have various and sundry national associations none of which enjoys the support and representation of the others as the umbrella organization. You'll find many stimulating ideas like this in Frank's column.

In addition, if you really enjoy Frank Ashley's writing as I do, here is the subscription address of his monthly newsletter at the bargain price of $13/yr. I sinerely recommend it! Frank Ashley's *RAG*, Box 291, Culver City, CA 90230. ::

NEWS AND RUMORS

LIGHTS! ACTION! BORDER-CROSSINGS!

By Frank del Olmo
Los Angeles Times Editorial Writer

October 3, 1980 — Two very different movies dealing with the same complex subject — the illegal migration of Mexican workers to the United States — opened in Los Angeles this week. The premieres and the controversy that one of them engendered among Latino activists were sure signs that the issue of illegal immigration has finally implanted itself on the public imagination.

The more heavily publicized film, *"Borderline,"* is an action film starring Charles Bronson as a brave, resourceful U.S. Border Patrol agent trying to help stem the "illegal-alien invasion" while tracking down the killer of a fellow patrolman. It is the propaganda film that the Border Patrol has always wanted to help it convince the public that it needs more money and manpower to beat back the alien hordes.

The second film, *"Alambrista!"* by director Robert M. Young, is far more subtle and artistic than the Bronson vehicle, and less well known. *"Alambrista!"* is a sympathetic portrait of a young Mexican father who leaves his home and family in rural Mexico to find work in California's Central Valley. (The title is a Spanish slang term used to describe persons who cross the U.S. border illegally. *Alambre* is metal wire; an *alambrista* is a wire-jumper.) In its own way, it is also a propaganda film that will be used by the defenders of illegal immigrants to bolster their arguments against this country's current immigration system.

The films should be seen together to get a truly balanced view of the many problems along the border, but they probably won't be, because they appeal to different audiences. I fear that they will do little to bridge an increasingly wide gap in the public understanding of a terribly complex issue.

The problems along the Mexican border are varied and difficult. To deal with them, this nation will first have to answer some very hard and fundamental questions about its future — economically, socially and politically. Fundamental questions cannot be dealt with in a routine action film like "Borderline."

Continued on page 20

CALENDAR

December 1-4, 1980
REGIONAL EMS TECHNICAL ASSISTANCE WORKSHOP
Red Lion Motor Inn, **Boise, Idaho**
Contact: Judy Atkins, Emergency Medical Services,
6525 Belcrest Rd., Hyattsville, MD 20782 301/436-6295

December 12-13, 1980
THE NATIONAL REGISTRY OF EMERGENCY MEDICAL TECHNICIANS — EMT PRACTICAL EXAM WORKSHOP
Hyatt House, **Des Moise, Iowa**
Contact: Janet Schwettman, P.O. Box 7131,
Des Moines, IA 50309 515/247-8731

December 13-14, 1980
AVALANCHE RESCUE SEMINAR
Colorado Mountain College, **Breckenridge, Colorado**
Contact: Jon Gunson, Summit County Rescue Group
P.O. Box 2208, Breckenridge, CO 80424 303/453-2130

January 26, 1981
INTERAGENCY COMMITTEE ON SEARCH AND RESCUE (ICSAR)
Washington, D.C.
Contact: A. J. McCullough, Secretary,
U.S. Coast Guard (G-OSR-4/73), 400 7th St., S.W.
Washington, DC 20590 202/426-1932

February 9-13, 1981
NATIONAL YMCA SCUBA PROGRAM — BASIC SCUBA SEARCH AND RECOVERY PROGRAM
Key West, Florida
Contact: Steven F. Hardick, National YMCA
Underwater Activities Center,
P.O. Box 1547, Key West, FL 33040 202/859-4384

February 16-20, 1981
NATIONAL YMCA SCUBA PROGRAM — ADVANCED SCUBA SEARCH & RECOVERY SEMINAR
Key West, Florida
Contact: Stephen F. Hardick, National YMCA
Underwater Activities Center
P.O. Box 1547, Key West, FL 33040 201/859-4384

February 19-22, 1981
NATIONAL SAR DOG SCHOOL
Lake Alpine, California
Contact: Judy Hesselbarth 209/258-8885 or
Dick Martin 916/694-2238
WOOF, P.O. Box 14303, South Lake Tahoe, CA 95702

February 23-27, 1981
AIRCRAFT CRASH MANAGEMENT COURSE
Arizona State University, Tempe, Arizona
Contact: William H. Allen, Program Director,
Office of Professional Development, College of
Engineering and Applied Sciences, Arizona State
University, Tempe, AZ 85281 602/838-9072

June 8-12, 1981
AIRCRAFT CRASH MANAGEMENT COURSE
Arizona State University, **Tempe, Arizona**
Contact: William H. Allen, Program Director,
Office of Professional Development,
College of Engineering and Applied Sciences,
Arizona State University, Tempe, AZ 85281 602/838-9072

SEARCH AND RESCUE MAGAZINE provides a way for rescuers from coast to coast to keep current with significant SAR events. Every issue we run a 'Calendar' column that simply lists SAR related conferences, schools, seminars, and events sponsored in your local area. Lead time is important so let us help you by keeping us abreast of current events in your area early. ::

SEARCH & RESCUE

MAGAZINE

WINTER 1980

Table of Contents

FEATURES & DEPARTMENTS

Publisher ..... Dennis E. Kelley
Consulting Editor ..... Lois McCoy
Advertising ..... Renee Havens
Art Director ..... Richard Stanley
Production ..... Marion Christner

ADVISORY PANEL

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Training —
Rick LaValle, Washington State SAR Coordinator

Communications —
Rick Goodman, New Mexico SAR Coordinator

Survival —
Gene Fear, Survival Education Assn. President, Washington State

Backpacking —
Frank Ashley, California

Equipment —
John Gunson, Summit County Rescue Group, Colorado

Mountaineering —
Bill March, University of Calgary, Physical Education Facility

Cave —
Tom Vines
Applachian Search & Rescue Conference

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86

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NEW ZEALAND RESCUE

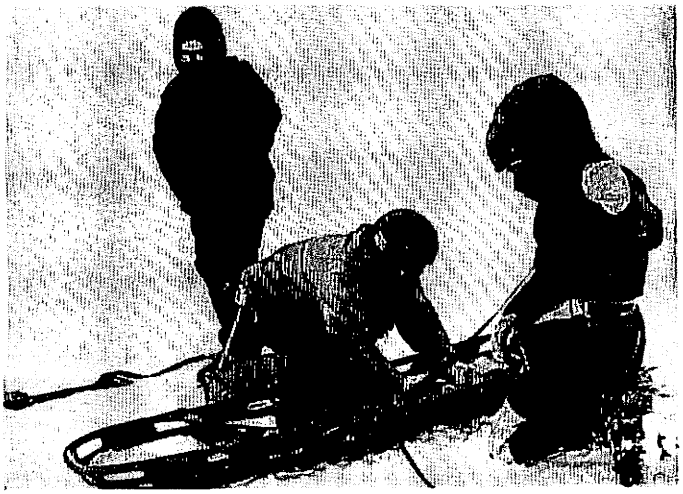
Manuscript by Alison Wilkinson
Photos by Gerry Wingenbach
1747 Gordon Avenue
West Vancouver, BC Canada V7V 1V4

Despite their tradition of alpinism, the New Zealand Alps still stand, a raw seemingly unexplored massive and descriptions of them today vary little from the eloquent observations made by early mountaineers such as Conrad Kain and William Green. People who tackle the summits of the Southern Hemisphere do not look for signposts, trail markers or nicely carved footpaths. Each trip is a foray into true wilderness leaving behind the ease of civilization. But when the crackling voice of distress woke up the duty ranger at Mt. Cook National Park it was obvious that a climbing party had attempted too much of that pioneering self-sufficiency and had collided with the axioms of safety.

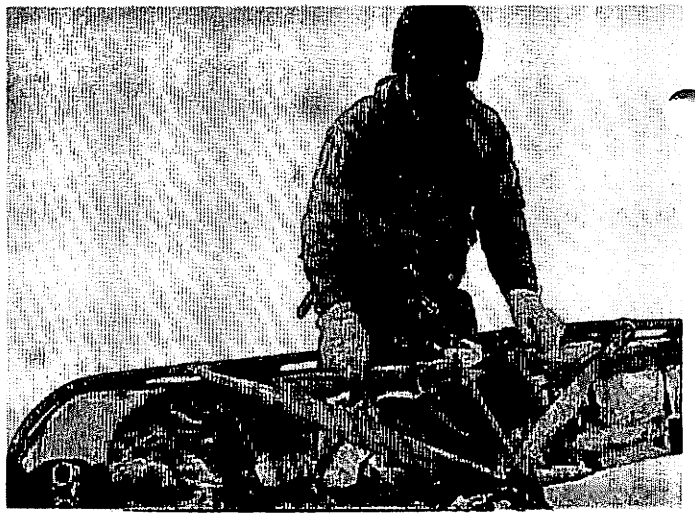
The words were half smothered with relief as the ranger sleepily answered the emergency alarm coming from the Tasman Saddle Hut at 3:30 am. Certain conditions in New Zealand are reminiscent of those faced by the early explorers but fortunately the search team is aware of mountain dangers. All huts in the Westland and Mt. Cook National Parks are equipped with two way radios which are connected to an emergency bell in the rangers' headquarters. Anyone finding their way to the hut is assured of raising some response in the valley below.

After the call-in events snapped together like a well-rehearsed drill. The seven search and rescue climbers were aroused from their beds and briefed. A hidden cravasse had claimed one of a three man party. They were out too late and darkness had left them, still on the glacier, trying to make it to the Tasman Saddle Hut. They had hurried along unroped until the ice had presented them with one of its deadly surprises.

The search team gave thanks to the ceiling of stars and half moon that would make the 5 hour climb from the startpoint on the Ball Hut Road to the Tasman Hut easier. An advance party of 4 was sent out ahead of the others who waited for the Bell Helicopter that was ready to leave at dawn. After a tooth rattling 8 mile jeep ride up the Ball Hut Road the climbers pulled on their packs and headed down the moraine onto the glacier. The long narrow tongue of ice blew a chill into the pre-dawn and as the climbers quickly roped together they could barely make out the silhouette of the Malte Brun Range to the east. Their expectation of good weather was disappointed when Mt. Cook in the west disappeared in a cloud bank. Luckily they had all been in the vicinity of Tasman Saddle the week before and had spent 3 days practicing rescue procedure so they were not too hindered by the poor visibility.



Three reserve team members tying in the American made Thompson stretcher in preparation for lowering down the crevasse.



The rescuer and victim as they emerge from being pulled out of the crevasse.

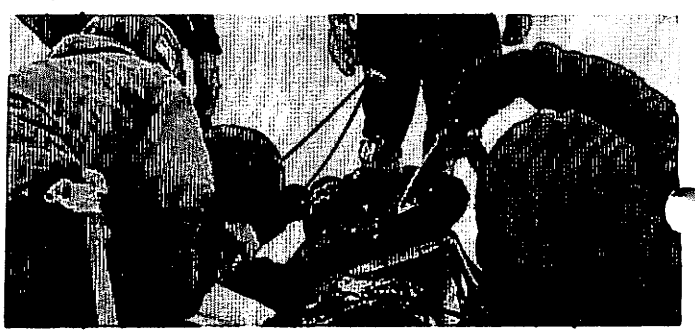
When the rescuers reached the hut it was 9 am and an anxious climber greeted their shouts. He was confident that the team would arrive but it had been hours since he left his friend to tend to the crevasse victim. The 4 men fortified themselves with a billy of tea, an everpresent New Zealand custom and within 20 minutes were off again following the climber to the scene of the accident.

The party had made a foolish, though common mistake in climbing unroped but they had gathered their wits once the incident had occurred. The unfortunate climber had fared well considering his night long vigil 30 feet below the surface of the ice. His partner had lowered dry clothing and thermos' of hot tea to him so the risk of hypothermia was minimized. He had fallen into the cravasse crashing through ice protrusions until he was wedged between two walls — in the fall his leg was twisted into an ugly multiple fracture.

When the rescue team arrived they made a cursory search of the area to check for hidden cravasses and determine the best place to set up their anchors. They pulled out their Thompson stretcher and quicly pieced it together. The most efficient way to get the stretcher down and the climber out was the 'z' pulley system secured with snow stakes and ice screws. One man edged down into the cravasse and tied the victim to the stretcher. Then, with one climber working the pulleys the others easily hauled the victim out.

The team cleaned the leg and splinted it, keeping the man well covered with a Polar Guard sleeping bag. They had hoped for helicopter relief but the clouds had turned into a near whiteout so they roped up again and slid the stretcher between them to the toe of the glacier. The rescuers were fit and well prepared but the victim had to bear the jars with clenched teeth. The helicopter finally met them on a grassy patch by the moraine and whisked the party off to a Christchurch hospital.

Like so many accidents, this one could have been averted. Unroped climbers leave themselves open to tragedy and on a glacier tragedy so often lurks unseen. But this party had been lucky and their rescue had been a good one. ■



Team members examining injuries to the victim.

BUSH ON SAR

By Stan Bush, President
Colorado SAR Board
2415 East Maplewood Avenue
Littleton, Colorado 80121

PLAN FOR SERIOUS ACCIDENT VICTIM EVACUATION (SAVE)

Introduction

This plan has been created to serve as a guideline for the Colorado Search and Rescue Board and associated agencies to insure the best possible search and recovery services for the victims of a major accident in a remote area. While the most likely such occurrence is a plane crash, this plan should be of value whenever a remote accident involves a large number of people.

As the size of any rescue mission increases, so do the organizational difficulties. While there usually is a single base of operations, with all activities coordinated through this base, it is unwise to do this during major operations. Specific responsibilities and functions should be handled where they will be most effective *and* command must be at the appropriate place.

A. Levels of Operation

1. POLICY LEVEL (CSRB Directorship)

The policy level is not generally functional during the emergency, but will provide preplaning in the areas of general guidelines, legal aspects, coordination of state response, preparation of agreements between agencies and groups, inventory of available supplies and equipment, and the stockpiling of certain supplies. It should be respresentative as is the Colorado Emergency Council. CSRB policy level activities should take place in the development of plans and the commitment of volunteer units prior to an emergency.

2. COORDINATION CENTER

Responsible for the coordination of all aspects of the emergency. Located at or near the roadhead closest to the emergency commensurate with good communications facilities both to the field and to town. This center should be staffed by the Sheriff, state and/or federal personnel as is appropriate to provide the necessary support for the emergency with the authority to secure that support. A coordination director will be assigned to be in charge of this function in close cooperation with the local Sheriff. This area must be staffed to handle the following functions —

- Contact and request for assistance from groups and agencies.
- Provide equipment and supplies for coordination and field levels.
- Establish communications to field and to other areas of the state.
- Provide security of area and of access routes to the emergency site.
- Administrative function — log of all activities and accountability of manpower and equipment.
- Public information function — for press releases and general information.
- Arrangements for relief of field units and personnel if the emergency is of long duration.
- Arrange for feeding and housing of all personnel.
- Screening of personnel going to the emergency site — to eliminate spectators and untrained units.
- Provide all support for field command and field personnel.

3. FIELD COMMAND LEVEL

This is placed as close to the emergency site as practical. Personnel on this level must be in command of the emergency site and the evacuation operations. Delegation of authority for this command should be from the local Sheriff in connection with CSRB personnel.

The field command level will have the following functions —

- Evaluation of the extent of the emergency and request for adequate assistance.
- Establishment of triage, landing zones for helicopters and organization of emergency care procedures.
- Assignment of teams to specific areas or duties.
- Initiate evacuation procedures to nearest landing zone or roadhead.
- Establish communications with field teams and the coordination center.
- Provide security for the emergency site and the command post.
- Keep accurate records of the incident including manpower and equipment involved.
- Supply information to the coordination center for release.

The field commander must delegate sufficient personnel to handle these functions and must be in charge of all field operations. If the Sheriff's officer in the field is not highly trained to function as a field commander, he should work directly with and provide authority to the person holding this position.

4. FIELD LEVEL

Whenever possible, each team sent into the emergency site by the field commander should be led by a trained rescue leader. Such persons will be responsible to the field commander.

Field leaders will have the following duties — in the following order of priority:

1. Be responsible for the health, welfare and safety of all team members.
2. Be responsible for the care given to victims by his team.
3. Direct search, rescue and recovery operations of his team.
4. Be responsible for the accurate relay of information on team operations to the field commander.

B. Chronology of Events

It is obvious that no fixed plan will work effectively in all (or even one) emergency situations. Also, functions and duties may vary. Therefore, this is the *general* set of guidelines for emergency response.

1. Report of an incident is received by rescue, sheriff or state personnel. Within the shortest time possible, as much basic information is obtained as possible. Regardless of which group or agency receives the report, the sheriff's office should immediately be advised.

Continued on page 22

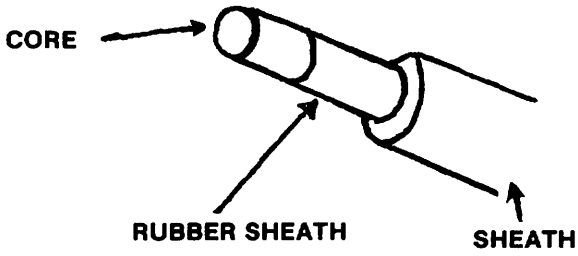
MARCH ON SAR

By Bill March
Faculty of Physical Education,
The University of Calgary
2500 University Drive, N.W.
Calgary, Alberta, Canada T2N 1N4

WATER REPELLENT ROPES

England — Ibex ropes have impregnated their nylon fibres of the core and sheath of their 9 and 11 mm climbing ropes with a special compound which makes them water repellent. The normal characteristics of the rope are unaffected but there is no information as to how long this treatment will last. Ibex Ropes, Britannia Works, Manchester Road, Mossley Lanes, Ashton Under Lyme, England.

France — Joanney ropes have come up with a simple concept for reducing water absorption in their ropes. They have developed a kernmantle rope with the core (kern) covered in a rubberized plastic waterproof sheath. This in turn is covered by and protected by the normal nylon sheath. These ropes will be supplied to the Canadian Mount Everest Expedition in 1981.



Any development which reduces the weight of wet ropes will be welcome in the mountain rescue field and may also find application in river rescue.

DUAL PURPOSE — CAPE/TENT

A British firm have developed a waterproof cape which turns into a one man tent. It is constructed of 3 oz. polyurethene coated nylon and weighs approximately 2.2 pounds complete with alloy pole and pegs. The Triad, as it is called, comes in two sizes medium and large. The medium is a metre high at the pole and two mitres wide at the base. When folded it forms a 10" by 4" cylinder. The cost is 31 sterlings — optioned extras are a heavyweight P/V groundsheet and a full door panel. Available from WG and AG Parry 109, Belgrave Road, Liverpool.

NEW ECOLOGICAL SOLES

Ken Ledwards of Klets, England has developed a new type of sole for hill walking and backpacking. An analysis of British mountain accidents indicated that the main cause was slips on steep ground. A contributing factor was stones and soil collecting between the lugs or cleats on the boot soles especially in wet weather. The rigid soled mountain boot does not flex to release the accumulated debris. To some extent this can be overcome by kicking the boots against the rock to release debris rather like one hits the edge of one's crampons with the ferrule of the ice axe to release balled-up snow. The real problem was the narrow slits between the cleats and the new sole has much wider gaps between cleats and a sole of circular studs to provide traction on steep ground. As a by-product the new sole collects less debris and is consequently less damaging on the environment. Klets boots are available from Winits the British sport shoe manufacturer at a price between £20 and £22. This light weight flexible boot with leather uppers is ideal for hill walkers and backpackers.

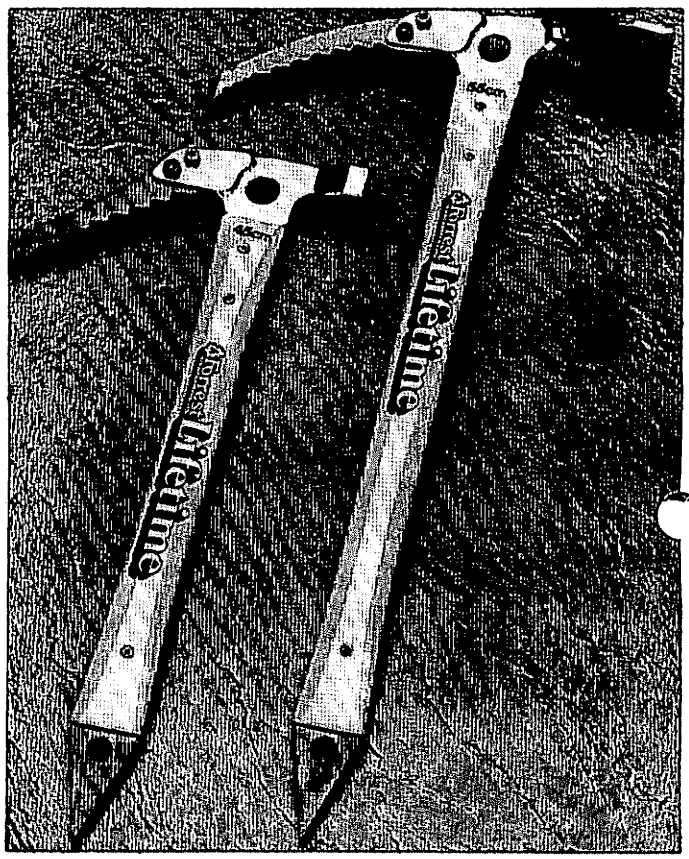
NEW HARD ROCK DRILL BIT

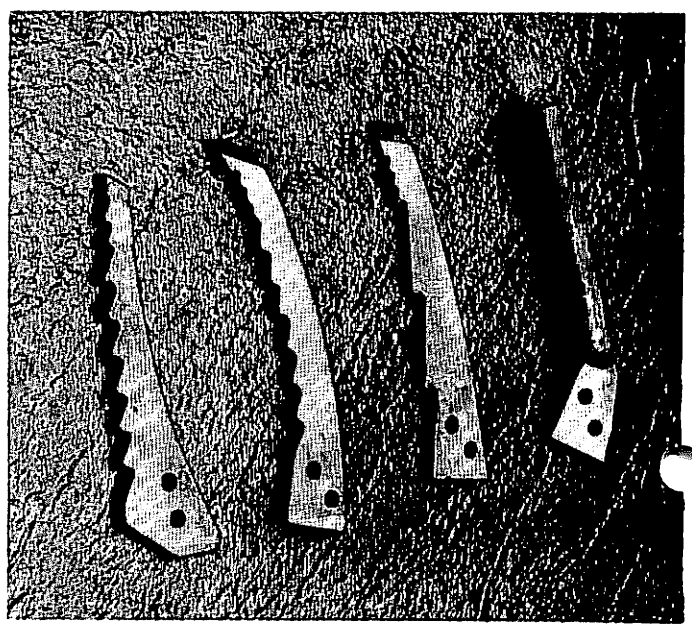
On a recent excursion into the Black Canyon of the Gunneson, Bill Forrest and I had some problems placing belay bolts in the extremely hard rock i.e. one drill bit one bolt hole! After some searching Forrest Mountaineering have come up with an extremently tough drill bit which worked really effectively on a subsequent trip and played a part in completing the big wall rou we had been trying. Although very expensive, I can recommend t drill bit which may be available from Forrest Mountaineering.

ICE GEAR

Forrest mountaineering have developed a completely new line in ice climbing equipment; an ice axe and a north wall hammer with a series of interchangeable picks. The equipment is an extension of the original Forrest idea found in the Mollinjer hammer. The new picks combine the latest in design technology and have been tested in a wide variety of ice conditions on some of the hardest Canadian winter waterfall climbs. Vector I is an inclined pick with its upper

Continued on page 22





LETTERS TO THE EDITOR

Dear Sir,

I received the book *"Mantracking"* a week or so ago and have found it satisfactory. In fact I would like to commend you for the book. Thanks for sending the book.

Yours sincerely,
Wayne Turner
P.O. Box 350, Gympie 4570
Queensland, Australia

Dear Mr. Kelley:

In the winter, Spring, Summer magazine, Mr. Farrell P. Wilson asked for information on Rescue Dog Training and associations. Would you please send me the same information. Recently I bought a black Labrador and would like to train him the proper way.

This is the reason that I need the information. At the beginning of this month, a 63 year old man, walked away from a country fair. My brother and I were called in to help with the rescue on our scanner, at 5:00 p.m. He had left other members of his group at 2:30. He lives in a convalescent home and had gone to the fair with other residents of the nursing home. He was on medication and had no idea where he was. He and others of the home had supervision from some of the nursing staff. The point I am trying to make is we have nothing to offer the people in this county. Police or Fire Dept. staff that was him did not notify the Police or Fire Dept. or the people that ran the fair that he was missing. My brother and I are trained for tracking, drove into a mass confusion. The only thing that we could obtain about the gentleman, was who he was and what he was wearing. There were fifty people there and there was confusion of where to search. We thought it was best to search alone when the team leader just pointed to you, you and you, go this way. That's when my brother and myself looked at each other and left and started our own search for the missing man. We spent an hour looking for any sign, but it was getting dark. Then there was a all for help, one of the searchers had a possible sign. We called him on the radio and told him we would be right there. I could not believe the confusion in the woods. Nobody knew what they were doing. After four hours of this we found four people who had half an idea how to search. There was only one person with a map. We grabbed him and started to work. We finally found him in an area that had been searched three times before, 3/4 of a mile from the fair.

I would like to coordinate a program. I need all the help I can get. The search started at 5:00 p.m. and ended at 11:30. The time was spent searching and researching. If you cannot help us, please put us in contact with someone who can. Thank you for your time.

Sincerely yours,

Gary Spaulding, HELP
107 Pamela Avenue
Groton, Conn. 06340

Dear Sir:

I am inquiring about membership in NASAR. I am a paramedic for Cooper Green Hospital in Birmingham, Alabama. I am on a disaster team for the Jefferson County Civil Defense, and also a member of a five-man medical aid team that works out of Cooper Green. I would like information sent to me about NASAR where we could obtain information about SAR plus be of some service to SAR and NASAR.

Thank you,

Johnnie Knoblock E.M.T.P.
117 5th Street
Warrior, Alabama 35180

(Editor — contact the National Association for Search and Rescue (NASAR) at: P.O. Box 2123, La Jolla, CA 92038)

Dear Mr. Kelley:

The attached clipping from the *Journal of Civil Defense* apparently orginated in your magazine.

I am interested in knowing more about the incident and would appreciate it if you would mail me the appropriate issue of *Search and Rescue*, along with subscription information.

SCOUT TRICK SAVES LOST PILOT

In the age of radio, radar, lasers, sattelites and a few dozen other miracles of science it sometimes takes a primitive technique to solve a touch-and-go problem.

Take James Prochnow in a small Cessna-188 flying over the South Pacific. With his new automatic direction finder malfunctioning he was suddenly and simply completely lost. Radio contact with Auckland, New Zealand was of no help. Radio contact with a diverted passenger plane searching the general area was also of no help — that is until pilot Gordon Vette remembered the old Boy Scout finger trick. A comparison of the setting sun with the horizon by both pilots determined Prochnow was west of Vette's air liner. (Prochnow had more room between the sun and the horizon than did Vette.) The planes then flew toward one another on an east-west axis. With the Boy Scout finger trick — and an awful lot of luck — Vette spotted Prochnow's lights and guided him safely to an airfield on tiny Norfolk Island.

Sincerely,

Peter Michelmore
75 Hickory Lane
Closter, New Jersey 07624

(Editor — Can anyone help?)

Dear Editor Kelley:

You are holding my story on the Coast Guard training pigeons in search and rescue operations. Do you have it scheduled for publication yet? The reason I ask is that I have heard rumors of a large Coast Guard budget cut this year, with the result that this very positive-results program will lose much of its funding. Therefore, a sidebar probably should go with the story pointing this possibility out. Let me know if you want me to write it up for inclusions.

Most sincerely,

Bob Loeffelbein
General Delivery
Clarkston, WA 99403

A BLIZZARD RESCUE

Ernest Wilkinson
3596 West U.S. Highway 160
Monte Vista, CO 81144

As I picked up the phone receiver at 7:00 p.m. that cold December night, the voice on the other end crackled across, "Hello, Ernie, this is Sheriff Bob Wynne and I have a problem. A sheepherder started down out of the foothills this morning with a band of 540 head of sheep. He hasn't showed up at the river ranch yet and the sheep owner could not locate him or the sheep before dark."

"Looks like you want us to take a night ride?," I replied.

"Well, not exactly," answered Sheriff Wynne. "This blizzard has moved down from the mountains and visibility is nil. Could you alert your crews to be ready to go out for a search tomorrow morning at daylight?"

"Gosh," I countered, "If that fellow isn't dressed for it, he won't survive the night in this storm. Can I get clearance to get a small experienced crew out tonight and alert other crews for another mission in the morning if needed?"

Sheriff Wynne thought a moment, then yielded, "Okay, reckon your boys know how to take care of themselves if they do get lost in this storm in the dark."

I concluded with, "See you at the Fire Station in Del Norte in thirty minutes. Can you have the sheepowner there for more details?"

After several fast phone calls, I loaded my snowmobile and gear into the van and headed for the town of Del Norte ten miles west of my shop. While getting details from the sheriff and the sheepowner, Roy Bouquet, other members of the San Luis Valley Search and Rescue Association began to arrive. The crew consisted of ranchers Bob Wilkinson and Larry Ehardt; a local plumber, Corkey Bethe; a sporting goods dealer, Harry Bielser; a vegetable inspector, Leland Pinkerton; and myself, a trapper, taxidermist, and president of the rescue association.

We learned the sheepherder, Milton McGuire, 54 was last seen coming across the foothills with the sheep at 2:30 p.m. with only about four more miles to go to reach the home ranch along the Rio Grande River. Then the blizzard came howling down the mountain and across the foothills. As darkness moved in at about 5:00 p.m. during the short winter days in December, the rancher's efforts to locate the herder and the sheep were in vain, so he had notified the sheriff soon as he got down to a phone.

With six to ten inches of fresh snow on the ground, it was decided to keep all foot searchers out of the area until daylight and use only snowmobiles that night. We could use the snowmobile lights for probing the darkness and then there would be no man tracks in the fresh snow except those of the sheepherder.

Our crew of six, accompanied by the sheriff and Mr. Bouquet, drove about six miles north of Del Norte to the Old Woman's Creek area where the snowmobiles were unloaded from the vehicles amidst the falling snow. We divided into three two-man teams, each driving off in a different direction to complete a circle in an attempt to locate the sheep tracks with agreement to meet back at the starting point in one hour or less.

Sheriff Wynne had parked his car and turned the red beacon light up into the murky sky to mark a rendevous point, but after going fifty yards and glancing back, that red glow had all but vanished from sight in the swirling snow. The six drivers were all expert snowmobilers, knew the terrain of the Old Woman's Creek area and were able to orientate themselves by various gulleys, rock outcrops, and other landmarks that loomed up in the snowmobile lights.

Occasionally the wind would shift the clouds and we could see a faint red glow reflect from the light pointed skyward from the sheriff's car. I had teamed up with my brother Bob, and we cruised across the sagebrush slopes about fifty feet apart watching for any sheep or man tracks that might not be erased by the driving snow. Several jackrabbits and coyotes jumped up in front of the snowmobiles and quickly disappeared out of the lights into the darkness and swirling snow. One time Bob ran into some barbed wire hidden by the snow and it took us a few minutes to get the snowmobile free of the mess before proceeding.

As the three snowmobile teams filtered back to the red light after an hour's circle in the darkness across the rolling foothills, we learned that Leland and Larry had come across the blurred tracks of the drifting herd of sheep.

The rancher's pickup and the sheriff's car were maneuvered up several more miles through the snowdrifts and the red light again pointed skyward. One snowmobile team sped into the darkness to check some old cabins we knew to be nearby in the area while the other four searchers started following the tracks of the 540 head of sheep. These tracks were sometimes obliterated by the blowing snow but could be picked up again in the depressions and wind protected areas. These sheep had apparently refused to be driven into the storm and were drifting ahead of the driving snow.

After about a mile, we located the sheep closely bunched together and bedded down in a depression out of the wind. We moved the sheep in case the man was unconscious and laying among them, but found nothing.

There were numerous faint sets of human tracks, sometimes visible and sometimes blown over in the snow, moving away from the sheep. We split into teams of two and began checking out each track as best we could. These tracks wandered out into the surrounding sagebrush area and back to the sheep several times, then eventually completely left the area and wandered aimlessly across the hills and were soon lost in the blowing snow.

The team returned from checking the cabins which were old uninhabited relics with most of the doors and windows long gone. They reported finding blowed over footprints around the cabins where the herder had circled several times but had made no attempt to improvise a shelter. The tracks wandered off across the slopes and were soon erased by the wind and driving snow.

In an effort to again locate those tracks wherever he had wandered out of the area, all six snowmobiles grouped together and drove up several miles. There we split with three machines on each side to make a wide half circle by each team around the entire area in an effort to locate any tracks leaving or entring.

During this process, the wind slacked off at about 10:30 p.m. and it quit snowing at eleven o'clock with the stars coming out, allowing the temperature to drop drastically without the cloud cover.

To make a long story short, we soon located fresh man tracks which were now easy to follow without the drifting snow. At 11:40 p.m. Larry Ehardt came across Milton McGuire stumbling blindly through the snow.

Hypothermia had completely set in; the herder did not even recognize another human from ten feet away and just keep plodding on. After getting him to the sheriff's car, some hot coffee into the man, and other details enroute to the hospital, the staff there reported only frostbitten fingers and frozen toes. They felt the man would have been past reviving in another thirty minutes.

The temperature dropped to 32 degrees below zero that night and you can imagine the final results if our crews had waited until daylight to search for the sheepherder. Besides a feeling of satisfaction for a successful mission, we all learned first hand the true effects, to an individual, of hypothermia. We much better understand it now and members of our search and rescue association now give numerous lectures and demonstrations to local youth and outdoor groups concerning the effects of cold (or heat) on the human system, preventive search and rescue, and other related subjects.

The San Luis Valley Search and Rescue Association is composed of volunteers such as packers and guides, snowmobilers, ski patrol, rock climbers, amateur radio clubs, and others whom are familiar with our mountain terrain and weather conditions. We pride ourselves in past successful missions including other night blizzards where others preferred not to venture.

We have received some very sizeable contributions from the victims or their families. These have been used to purchase radios, stretchers, and other equipment which we hope is never needed, but is available if necessary whenever the sheriff or other agencies do call for assistance.

ASHLEY ON SAR

By Frank Ashley
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OPEN LETTER TO THE BACKPACKING INDUSTRY

I write this column with mixed feelings.

I realize that it will upset, disturb and alienate many readers within the backpacking industry as well as those readers who are active hikers and backpackers. This will result in hate mail, denials and rebuttals. I will be called a boob; a lackey of big oil and big lumber; a would-be rapist of our rapidly disappearing wilderness areas; a throwback to the "woodcraft era" of the 1920's.

So be it!

I only ask that you read this letter with care prior to picking up the poison pen.

First, it is a basic fact that the backpack equipment industry is on the decline. True, some firms are doing quite well in sale. However, on the whole, it is a "down" market.

The signals are all around us.

Retails are not paying their suppliers. Manufacturers are not paying *their* suppliers. Many retail speciality shops are phasing out their backpack lines. Other speciality shops are simply closing their doors. Still other shops can no longer hardly be called "speciality" as they stock racquetball gear, running shoes, fishing gear, roller skates, dried salmon, etc., in an attempt to stay in business. "Speciality" manufacturers are marketing wallets, book packs, soft luggage, marine wear, motorcycle clothing, etc., in an attempt to stay afloat. Most manufacturers and retailers alike hype to the high heavens any new trend and/or "miracle product" that comes down the pike without the slightest thought as to effectiveness, durability or necessity.

Manufacturers have "clearance sales" in their factory parking lots within a few miles of their retail accounts. Imports obtain resale licenses, then make mass junk mailings to potential retail consumers. Manufacturers issue catalogues with retail order blanks, thus competing with their own wholesale accounts. A major manufacturer, known for being highly selective in signing up retail dealer accounts, states in their house organ that they expect 10% of their dealers will be out of business by early 1983.

Even the "speciality" backpacking magazines are starting to stray from their original concepts. The leading consumer magazine in the field, *Backpacker,* is not only much smaller than it was a few years ago, but both the editorial and advertising content is slowly (but surely) drifting into other fields such as cross country skiing, canoeing, river rafting, etc. The leafing "trade" magazine, *NOON,* is now expanding their coverage into bicycle touring, fashion wear, canoeing, etc., in an attempt to generate more of their life blood . . . advertising.

Ladies and gentlemen of the backpacking industry: Why? Why is this happening?

Simple! You are working on the money of the "after-market," the "up-grader." How many specialty manufacturers and retails would be out of business if new "miracle fabrics," female garments, dome tents, etc., had not hit the market within the last few years.

Where is the "new market" consumer? Why has this market dried up?

Some reasons are obvious. Inflation is a factor. Many young people, the prime age group for the industry, simply do not have the funds necessary to buy good quality gear from the ground up. The decline of the Boy Scout movement has hurt badly. The energy shortage, regardless of what some members of the industry claim, may have hurt more than we realize. However, in my opinion there are two separate, but closely related reasons for the constant shrinking "new market" consumer. They are:

1) The lack of a national backpack equipment trade assoication.

2) The ever increasing restrictions placed on the public entry to public lands.

During the past few years I have come into direct contact with literally thousands of novice would-be backpackers as a result of conducting backpacking classes and seminars throughout the Southern California area. Almost without fail, the inexperienced backpacker is shocked to learn that permits are required to enter public lands; that quotas are in effect in most wilderness areas; that in certain areas hikers must set up camp in a specific spot next to a certain "yellow pipe"; that if they want to hike up Mt. Whitney in August they must enter a request for a permit prior to February 1st. When these same individuals are shown a copy of Don Deck's *Wilderness Digest* and read the scores of pages of confusing methods of obtaining wilderness permits in California, they obviously question the great wonders and benefits of "escaping to the wilderness" by means of backpacking. The backpack industry knows nothing of these individuals as they never buy backpacking equipment. Their business (i.e. money) is lost forever.

The Backpack Industry is the *only* industry dependent upon use of public lands that does *not* have a trade association and/or lobby group established to protect future access to such lands. The *only one,* The American Motorcycle Association has paid lobbiests in various state capitals and in Washington, D.C. to protect the rights of cyclists. We all know of the great power of the NRA and the fa-t that they use that power. The Far West Ski Association is but one of the many powerful groups fronting for skiiers and the downhill ski industry. Try to dam a California river and the commercial rafters create a "Save The River" group. Try to ban motors on rafts in Grand Canyon National Park and we see a massive mail campaign supporting an attempt to cut off funds for the Park Service. Fishing interests have their various trade groups. Horse outfitters have their various "outfitter" associations. Canoe outfitters have their group. When bureaucratic federal/state land managers attempt to restrict these special interest groups from use of public lands what do we see? Lobbiests go to work, law suits are filed, protest meetings are scheduled, letter writing campaigns are organized.

What happens when a bureaucratic land manager, *without public hearing of any kind,* restricts the entry of backpackers/hikers onto public lands? What does the backpack industry do?

Nothing!

Ladies and gentlemen of the Backpack Industry, what have *you* done to protect the continued access of backpackers and hikers to public lands? What have you done for the backpacker/hiker except take their money? What have you returned to the user? What have you done to insure your continued reason for being? Have you ever wondered why only 75 people are allowed on the Whitney Trail, and not 76 or 77? Have you ever wondered why a Federal agency will station a ranger at a trailhead to check permits all day, while claiming they have no funds to provide security to backpackers' vehicles left overnight at a trailhead? Do you realize that some land managers definitely want fewer people going into the backcountry due to budget considerations? Are you aware of the fact that if fewer backpackers are allowed on public lands your number of portential consumers . . . your bread and butter . . . will decrease greatly?

You better wake up and get organized ***NOW!*** ::

TEACHING IN A COLD ENVIRONMENT

By Alan Ewert
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Alan Ewert is a Graduate Student (Ed.D.) at the University of Northern Colorado studying Outdoor Education. He has also been an instructor for Northwest, Colorado, and Minnesota Outward Bround School. He was also a member of a Hasty Search Team for Spokane ESAR, and a Survival Instructor for the United States Air Force.

With the dramatic growth of Outdoor Experimental Educational Programs the probability of students being placed in a cold environment becomes greater. As Outdoor Educators, the problems and potentials increase anytime our students and the cold meet. Problems in dealing with fear, comfort-mindedness, cold injury and short amounts of time all become paramount to the instructor. Fortunately, potentials also arise with an increased sense of accomplishment, self-concept, and ability to deal with a foreign, often hostile environment. The key to a successful program lies in treating the cold as a problem which can be dealt with while still accomplishing the program goals and objectives.

This paper was written in an effort to give the instructor some workable and practical ideas for dealing with students in a cold environment. Because of the large amount of literature on the subject an effort was made to make the report adaptable to individual needs. To do this the report is divided into three sections. **Section 1** deals with what a cold environment is, some fundamental laws of heat, and some physiological reactions of the body when placed in a cold environment. **Section 2** lists the most common cold injuries and current treatments. **Section 3** presents techniques the instructor might use in dealing with students in a cold environment.

SECTION 1

In this report a cold environment is meant to be an outside area where the temperature is low enough to cause a cold injury. Cold injuries include: chill clains, immersion foot, hypothermia, frostbite/frostnip. In an educational sense, cold can also inhibit learning because students naturally focus in on the cold and nothing else when they are uncomfortable. Consequently, this uncomfortableness must also be dealt with.

When concerned with people in a cold environment several factors need to be considered. The instructor will find a thorough understanding of cold physiology valuable in forming his/her method of teaching students to combat the cold. Let's start with the basics and from there formulate some cold weather strategy.

The human body *produces* heat in three ways[1]: 1. basal metabolism 2. exercise 3. thermoregulatory. Heat produced by basal metabolism arises from essential processes of life, is of a slowly altered, fixed rate, and is partly controlled by the thyroid gland. This fact may eventually be exploited in treating hypothermia.

Exercise can liberate vast amounts of heat for short periods of time, and is the product of the chemical reactions within the muscle tissue. For the most part, exercise is thought to consist of useful movements which distinguishes it from the third source of body heat, thermoregulatory.

Thermoregulatory heat production is the end result of deliberately wasteful metabolism and has a primary function of producing heat. A common example of this is shivering. Shivering can increase heat production by five times and uses up energy to the equivalent of a slow jog.[2] Unfortunately most of this heat, (nearly 90%) is lost from the body through convection.[3]

Heat production can be interferred with by three ways. These include:

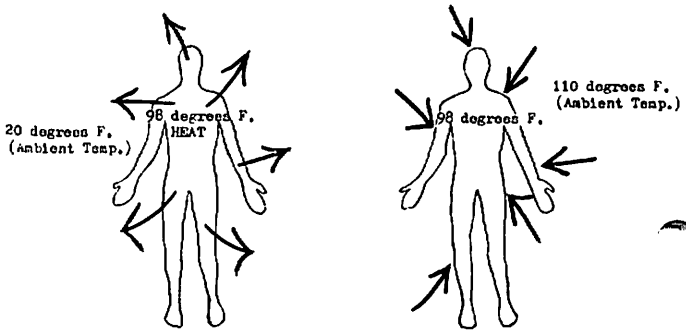
1. Insufficient amounts of oxygen (high altitude, carbon monoxide).
2. Inadequate circulation (impairs waste disposal, oxygen and nutrient uptake by cells).
3. Failure of nervous system to sense, initiate, and regulate body functions, (alcohol, drugs, or fatigue).

Where this heat is produced may be of interest when trying to decide where and how to insulate. The following chart illustrates where and how much heat is produced.[4]

BODY AREA	RESTING	ACTIVE
BRAIN	16%	3%
CHEST/ABDOMEN	56%	22%
SKIN/MUSCLES	18%	73%

HEAT PRODUCTION IN VARIOUS BODY AREAS AT RESTING AND ACTIVE STAGES

When discussing how the body loses heat a fundamental law of physics comes into play. Simply stated, heat will always move to a colder environment. If the environment is less than 98 degrees F. (37 degrees C.) the body will "give off" heat. This concept is illustrated below:



With this factor in mind, the body loses heat in five ways:[5]

1. **Conduction** — the transfer of heat by direct contact with a cooler surface.
2. **Convection** — Carrying away of heat by moving molecules of air or water.
3. **Radiation** — Heat loss from the body to a cooler environment via infrared waves.
4. **Evaporation** — Loss of heat from the body when water is transformed into water vapor (540 calories are required to convert a gram of water to a gram of vapor).
5. **Respiration** — Heat lost when inhaled air is raised to body temperature and then exhaled. Heat lost through respiration can account for more than 20 per cent of the body's heat loss.[6]

When exposed to the cold the body elicits several physiological reactions. Initially, temperature sensors in the skin and hypothalmus are triggered which in turn cause the person to "feel cold."[7] This "cold" feeling usually causes a person to seek shelter, put more clothing on, build a fire, or huddle with others — ***but not always,*** a fact vitally important to us as outdoor instructors.

Shivering is another heat producing function by which the body combats a negative heat load. Shivering as previously mentioned, can liberate large amounts of heat but is generally considered inefficient. Inefficiency results from the fact that active moving muscles require an increase in the circulation of the skin, which in turn exposes more warm blood to the cold environment thereby causing a heat loss.

A process akin to shivering is the excitation of the muscles at the base of skin hair follicles, also known as goosebumps. By creating a goosebump the body causes its skin hair to stand upright thereby creating a thicker layer of still air surrounding the body. This in turn reduces the amount of convective heat loss and conserves body heat.

Another physiological reaction to cold is termed non-shivering thermogenesis and is related to the release of certain hormones (catecholamines; epeinephrine and norepinephrine) within the body. These chemicals increase the metabolic rate and cause an crease in available body heat.[8] With the addition of these hormones a greater increase in oxygen consumption, blood glucose, blood pressure and decreasing heart rate are also evident.

Norepinephrine also appears to be responsible for another of the body's attempts to increase insulation — vasoconstriction. With a cold stress, the blood vessels in the extremities — the hands, feet, ears, nose, etc. constrict forming the "capillary shunt."[9] This constriction effectively reduces the amount of blood close to the "colder" body surfaces, but subjects the affected area to a freezing injury. One result of this vasoconstriction is a cooler skin temperature and a more stable internal temperature.

As a person acclimatizes to the cold, his basal metabolic rate increases and the temperature at which the shivering response is activated is lower. Heavier people appear less susceptible to heat loss than average or ectomorph body types.[10] Chronic cold exposure also seems to "lessen" the person's sensitivity to the "cold feeling."

ENDNOTES

[1]Moore, R.E. Physiology of the Response to Low Temperature, *Mountain Medicine and Physiology*, 1975, p. 7-10.

[2]Carlson, L.D. and Hsieh, A.C.L. (1965) Cold. In: Edholm, O.G., and Bachrach, A.L., (Eds.) *The Physiology of Human Survival*, 15-52, New York Academic Press.

[3]Van Wie, Claudia, *Physiological Responses to Cold Environments*, Institute of Arctic and Alpine Research, University of Colorado.

[4]Aschoff, J., and Weaver, R. (1958), NATURWISSENSHAFTEN, p. 477.

[5]National Ski Patrol, *Winter First Aid Manual*, 1974, p. 5.

[6]Steadman, R.G. (1971), "Indices of Windchill of Clothed Persons" *J. Appl. Met.*, 10, 674-83.

[7]Hensel, H. and Boman K.K.A. (1960) "Afferent Impulses in Cutaneous Sensory Nerves in Human Subjects." *Journal of Neurophysiology*, 23, p. 264 - 78.

[8]Carlson, L.D. (1960) *Federal Proceedings*, 19, p. 25.

[9]Washburn, Bradford, *Frostbite*, Museum of Science, Boston, 1970, p. 10.

[10]Wyndham, C.H., Williams, C.G., and Loots, H. (1968) "Reactions to Cold." *Journal of Applied Physiology*, 24, p. 282-287.

SECTION 2

COLD INJURIES AND THEIR TREATMENT

Cold injuries (injuries which result from the body's exposure to a cold environment) can and often take place in progressive manner. With this in mind, cold injuries and some treatments will be discussed in order of severity beginning with the milder forms of injury. The following are injuries or ailments commonly associated with cold environments.[1]

Snowblindness: Characterized by the eye being exposed to too much solar radiation. Treatment involves cold compresses, a dark environment, and covering the eyes.

Windburn: A burn like irritation which can be alleviated by a grease or oil based ointment.

Sunburn: A first or second degree burn prevented by using clothing, opaque ointments, or lotions containing aminobenzoic acide (PABA).

Earache: An irritation of the eardrum by the wind. This is prevented by placing a plug of cotton or soft tissue in the outer ear canal.

Skin: Cold, dry weather can lead to dry skin. Excessive washing with soap removes important body oils and inhibits the supercooling phenomenon where skin with its natural oils may be cooled from 32 degrees F. down to 20 degrees F. for a time before frostbite sets in. Animal or vegetable oils can be used to eliminate dry skin.

Beards: A controversial subject, with one school of thought believing a beard keeps the face warm. Another school of thought states that a beard hides the signs of frostbite. Personal experience has shown beards to accumulate ice and can make it difficult to open the mouth when frozen over.

Dehydration: Even in a cold environment the body loses moisture to the tune of 2-5+ quarts per day. If not replaced, symptoms including: irritability, deep orange or brown urine, economy of movement, headaches, etc. Dehydration causes the blood to become more viscous which leads to a lessening of cardiac efficiency which in turn decreases the body's ability to carry out its functions. Treatment involves adequate fluid intake. Instructors should note that dehydration appears to be a contributory factor in many student difficulties and complaints.

Chillblains: Commonly occurs with repeated exposure of bare skin at temperatures between the low 60 degrees F. and 32 degrees F., (rosy cheeks). The skin is red, rough, itchy and no loss of tissue. Treatment consists of preventing exposure and a soothing ointment.

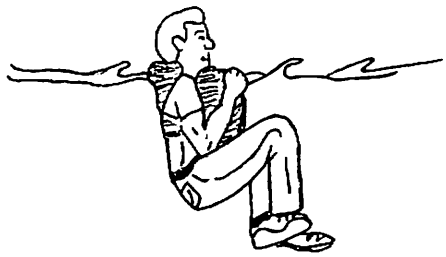
Immersion foot (trench foot): A cold injury usually associated with the foot, caused by a prolonged exposure to wet conditions, (usually above freezing) for hours or days. With students this can occur when using vapor barrier boots or wearing wet socks and leather boots for extended times. Symptoms include: pain, redness, numbness, and cracking of skin. Treatment focuses around drying feet, warmth, and restoring circulation. The U.S. Navy Polar Manual, (1965) suggests small amounts of alcohol to aid in vasodialation.

Accidental Hypothermia: A lowering of the body temperature which produces symptoms of shivering, careless attitude, poor coordination, poor speech, irrationality and eventually death. Predisposing factors include: wet, windy, cool conditions and an awareness of the victim as to potential danger. Treatment consists of stopping the heat loss, shelter from the elements, body movement, administering warm fluids (if conscious) flesh to flesh contact, an external heat souce, and gentle evacuation if necessary.

Immersion Hypothermia: Upon immersion into cold water, 28 degrees F. - 70 degrees F. the body can lose immense heat and produce hypothermia with the attendant symptoms of accidental hypothermia. Treatment consists of the following:[2]

1. Shore should be less than one mile at 50 degrees F. water temperature before swimming.
2. When without a life jacket, body heat can be more effectively conserved by treading water rather than utilizing drown proofing technique. While in a personal flotation device, research has shown that survival time can be increased by 50% if the person holds still with the inner sides of the arms tight against the side of the chest, the thighs pressed together and raised. See below illustration.

ILLUSTRATION 3



H.E.L.P.
(Heat Escape Lessening Posture)

Clothing can reduce loss of body heat by as much as 75%. Once out of the water, treatment is similar to accidental hypothermia. Because of the danger of "after-drop," (the sudden drop in body core temperature caused by blood being sent to a cold periphery, being chilled and returning to the inner body) only the body core, (head, neck, and trunk) should be donated heat via warm showers, warm water poured over the core and warm baths. If victim is unconscious administer mouth to mouth resuscitation.

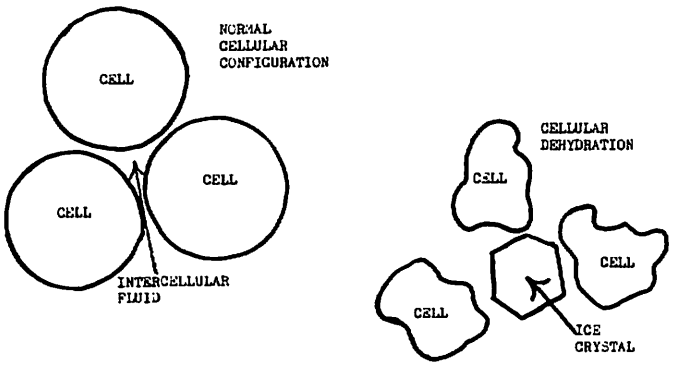
"Frostbite" of the Lungs: Associated with heavy breathing in a cold air environment. Symptons include: breathing discomfort, coughing, asthmatic type reactions, and coughing up blood. Treatment consists of pre-warming the air (hoods, masks, etc.), humidifying the living environment if possible and eliminate smoking.

Frostnip: The only type of frostbite which can be considered medically inconsequential, and can adequately be treated "on the trail." It is a sudden blanching (whitening) of the skin usually located on the ears, fingertips, tips of toes, nose, cheeks, or chin. Treatment consists of rewarming the part by a warm hand, warm stomach, or armpit, (any warm spot on the body) or by blowing warm air on the affected part. The "buddy system" of watching one another coupled with constant personal vigilance is particularly effective.[3]

TEACHING IN COLD — continued

Frostbite: A true medical problem which involves actual tissue damage. When tissue is chilled below freezing, two phenomena take place: first, capillary beds constrict, become damaged, and the blood becomes viscous or sludges, all of which inhibit circulation to the area. Secondly, ice crystals begin to grow between the individual cells. Damage occurs from these ice crystals drawing off water destined for the individual cells and causing the cells to dehydrate, as illustrated below:

ILLUSTRATION 4



INTERCELLULAR ICE CRYSTAL GROWTH

Cellular injury is also caused by the disruption of nutrients, waste elimination, and oxygen uptake. Symptoms of superficial frostbite include: a white waxy appearance, numbness and resilience to touch. Upon rewarming, the area becomes mottled, blue or purple and usually stings or "burns" for a period.[4]

Deep frostbite, (freezing) differs from superficial in that it involves not only the skin and subcutaneous tissue but also muscles, bone, tendons, etc. The affected part becomes rigid, waxy colored, cold to the touch and painless when unthawed. Some tissue loss is usually expected.

Treatment of frostbite for the field instructor's uses involves: identification of injury, protection of injury, and evacuation to a medical facility. As differentiated from frostnip, frostbite is a true medical problem which is best treated by qualified medical personnel in a hospital setting.

ENDNOTES

[1]Hedblom, MC, USN, U.S. *Navy Polar Manual*, 1965

[2]*Man in Cold Water*, brochure by the University of Victoria.

[3]Washburn, Bradford, *Frostbite*, Museum of Science, Boston, 1970.

[4]Ward, Michael, "Frostbite," *Mountain Medicine and Physiology*, ed. Clarke, Ward and Williams, Mountain Safety Research, 1975, p. 19-27.

SECTION 3

TECHNIQUES AND METHODOLOGIES

When faced with conducting a class or program for students while in a cold environment, the outdoor instructor is confronted with several problems. He must attempt to satisfy the objectives or the course while avoiding cold injuries to both his students and himself. Secondly, his students will be focused in on creature comforts, in this case staying warm, and tend to disregard everything else, hence learning may be at a new all time low. Finally, depending on the severity of the cold, some of our students will experience an intense fear of the cold to the point of thinking they are doomed to freezing to death. These methodologies and techniques may be utilized by the instructor when working in a cold environment. (See Illustrations 5).

MAJOR CONSIDERATIONS WHEN IN A COLD ENVIRONMENT

1. **Alleviate fear of the cold** — talk about how to deal with it, suspect it in everyone until proven otherwise.
2. **Dehydration** — should be avoided since it inhibits both the body's functions and its avility to keep warm.
3. **Awareness** — make your students aware of what their body (feet, hands, head, etc.) looks and feels like when they are healthy so they may be able to notice when they are not.
4. **Communication** — should be an important part of your student rapport. Students should feel like they can and ***should*** tell you when abnormally cold or ill.
5. **Teach by *example*** — rather than words. Students often emulate you and if you show correct cold weather field techniques — so will they.
6. **Assume Nothing** — as to what your students know or can do without first doing some checking and observationa.

TECHNIQUES FOR HELPING STUDENTS THAT STAY WARM WHILE IN THE COLD

The following list is by no means a complete summary of techniques you as the outdoor instructor can utilize. Doubtless you have your own, which work equally as well or better. The following are ideas you might want to include in your cold weather "bag of trucks." The assumption is made that the outdoor instructor already possesses basic cold weather skills, teaching methods, and common sense in the outdoors:

1. Use a hat to regular body heat, particularly the back of the head and neck. (a cold brain is a numb brain; only dumbrains get numbrains).
2. A scarf or earband can be a valuable and adaptable piece of clothing.
3. There are no "little jobs" at temperatures less than -30 degrees F.
4. Moderate amounts of alcohol neither significantly increases total body heat loss nor decreases heat production and may actually enhance an individual's tolerance of hypothermia through vasodialation.[1] Overindulgence can lead to poor judgment and interference with the shiver reflex.
5. Hot drinks usually add a very small amount of heat to the body mass, however, hot drinks produce an immediate peripheral vasodialation which can have a positive effect.[2]
6. Smoking acts as a vasoconstrictor and decreases the circulation to the fingers and toes and increases the possibility of cold injury.[3]
7. Insulated cups are preferred over metal containers in cold weather for retaining food warmth.
8. Lack of body movement predisposes cold weather injury through a decrease in periphery circulation.
9. Lack of body movement decreases body heat loss in cold water immersion.[4]
10. To prevent their faces from freezing, arctic explorers often "made faces" to stimulate circulation.[5]
11. When using closhing following the letters:
    - **C** — keep your clothes **CLEAN**
    - **O** — avoid **OVERHEATING** (sweating)
    - **L** — wear your clothes **LOOSE** and **LAYERED**
    - **D** — keep your clothing **DRY**
12. A light dacron vest that covers the thorax, kidneys, and upper belly conserves large amounts of body heat.[6]
13. Pull thumbs into palms, and arms out of sleeves and inside parka if they become extremely cold.
14. Blacks are more susceptible to cold injuries than caucasians.[7]
15. Hypoxia from high altitudes causes an increase in blood flow to the surface with an increase in body heat loss.[8]
16. An overboot or woll sock covering over ski boots reduces heat loss through the foot.
17. Have students assume responsibility for both themselves and others to prevent cold injuries. Place responsibility upon the students as well as yourself.
18. In inclement weather have students form a half circule with their backs to the wind. When giving a talk, be sure it is concise, understandable and to the point.
19. An overnighter before the actual field trip often prepares students in a realistic and effective manner in dealing with the cold.

20. If using tarps, place them end to end thus creating one large shelter, ("circus tent") this will enable the instructor to monitor the group as a whole.

21. If feet are cold after the shelter has been erected, one way to warm them is to have students dry their feet, change to dry socks, and sit in a circle with their feet to the center. Cover their feet with a sleeping bag and have them wiggle their toes. Hence the instructor can talk to the group while the students warm their feet, (Snakeballing).

22. Zipping sleeping bags together can allow the students to pass a cold night safely.

23. Leakproof water bottles filled with warm water can pre-warm cold sleeping bags besides providing unfrozen water in the morning.

24. If overheating is a problem, besides removing the hat, mittens, etc., unzipping pants or pulling pants above knees can effectively eliminate surplus heat.[9]

25. Consider the following chart. (illustration #6) when in a cold stress environment:[10]

FACTORS WHICH AFFECT COLD STRESS

INCREASE	DECREASE
WIND	INSULATION
WETTING	HUDDLING*
EXHAUSTION	SHELTER
INJURY	SOLAR RADIATION
DRUGS	EXERCISE
HYPOXIA	

*Animals huddle together to increase over-all body size which decreases exposed body surface besides creating a wind break. Humans may want to utilize the same principle.

ILLUSTRATION #5

COLD WEATHER STRATEGY

Before Students Arrive:

ANALYZE Students
Area/Temperature
Program/Equipment

Upon Arrival of Students:

DISCUSS Fear of the Cold (i.e. Initiative Games — "Fear in a Hat," etc. Guided Discussion Stories).

Prior to Outdoor Field Experience:

TEACH The Mechanics of Cold Injury How to Stay Warm

PREPARE Give Students Trial Run Progressive Exposures to Cold Simulations

Field Experience:

OBSERVE Students for correct: Procedures, Actions, Awareness, Correct Immediately and Firmly, Explain the Why's and What For's.

TRANSFER AND CHECK Responsibility for staying warm and healthy onto the students while maintaining some control for possible mistakes.

MAXIMIZE SUCCESS The cold ***can*** be successfully dealt with, instill this self-confidence into your students.

After Student Departure:

EVALUATE What went right, what went wrong, how to improve on dealing with the cold.

This report has been an attempt to aid the outdoor instructor in dealing with students in a cold environment. Hopefully the instructor will be able to glean some techniques from this report and combine them with the methods s/he already uses in dealing with students. With the goal of producing successful and safe outdoor courses while in a cold environment almost any method that works and is safe can be considered a good one. Since effectively dealing with the cold is an active, rather than passive art, using direct, effective techniques, however small, can often mean a successful cold weather outing instead of a trip to the hospital.

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HELICOPTER SAR: THE POWER AND THE GLORY - Part II

This article is an excerpt from **Wilderness Search & Rescue** by one of this nation's outstanding authorities on mountain rescue, **Tim Setnicka,** edited by Kenneth Andrasko, published by Appalachian Mountain Club, 5 Joy St., Boston, MA 02108, $12.95, about 656 pg., 150 photos, 175 drawings. Major sections on search theory, technical rescue tools and techniques, rescue systems, cave SAR, whitewater SAR, snow and ice and avalanche SAR and field medical considerations.

Helicopter Design

It is important to understand a few basic principles of how a helicopter flies and why it can land or hover only in certain areas and under certain conditions. The physics of helo flight determine landing zones.

For this discussion we'll use the type of helicopter with a large main rotor and a smaller, vertical tail rotor. There are also some helicopters with two rotor blade systems of the same size, where the rotors turn in opposite directions.

The larger, horizontal rotor is referred to as the main rotor, and the smaller, vertical rotor is called a tail rotor. The main rotor may have many blades, but all helicopters have at least two. The Huey type helicopters are examples of helos with a two-blade rotor as well as a two-blade small rotor.

In cross section, the rotor blades are a classic airfoil, shaped like an airplane wing. The air flows faster over the top of the airfoil than the bottom, creating lift. The angle of the blade to the air flow is called the angle of attack; this angle and the speed of the blades creates and controls lift.

The pilot has three major control systems for the helicopter. The *collective* varies the main rotor's angle of attack, and commands vertical movement of the ship, in conjunction with engine rpm, controlled via a hand throttle. The plane in which the rotor blades spin is controlled by the *cyclic,* which tilts the spinning rotors in any direction and produces forward, backward, and sideward movement. Two *foot pedals* alter the pitch of the tail rotor, effectively a rudder. The tail rotor counters the torque effect of the main rotor, preventing the helicopter body from spinning in a direction counter to that of the main rotor as power is increased. Manipulation of the foot pedals enables a hovering helicopter to pivot around its vertical axis at zero airspeed.

The next time you watch a helicopter take off, try to follow the sequence of events. After sufficient engine and main rotor rpm are attained, the pilot uses the collective to increase the angle of attack of the rotor blades. This begins to lift the helicopter off the ground, and takes a great deal of engine power and torque. As soon as he has assessed the power margin, the pilot will move the cyclic forward to begin a transition from vertical lifting to forward flight. As the helo builds up airspeed, additional translational lift is generated by the flow over the rotors. After effective translational lift speed has been reached, the engine power required to continue to turn the main rotor at its constant rpm is reduced, and the pilot can lower the collective and fly straight ahead at higher airspeeds without climbing. Or, he can climb by maintaining the collective at a relatively high setting.

Consider a situation in which a helicopter hovers, a maneuver similar to the first part of takeoff. Only engine rpm and the collective create the lift necessary to keep the helo in the air. On a warm day at high altitude, hovering next to obstructions, a helicopter's engine and transmission are operating close to redline. This rapidly produces heat and wear on the mechanical system. The pilot is under stress too, because he must maintain altitude and correct position, check blade clearances, and monitor instruments. The increased mechanical stress on the machine, the physical and mental stress on the pilot and crew, all this affects safety margins.

The general rule is to absolutely minimize hover time. Rescuers might, for instance, walk to a landing area rather than being hoisted or one-skidded out of a tight spot. The probability of a downdraft, power settling, or recirculation effect occurring is high during a hover. Downdrafts can occur at any time and are a constant danger, especially in canyons or against walls. Power settling is usually associated with a condition of high gross weight and a descending flight at or near hover power. When a helicopter descends into its own disturbed air mass created by rotor wash, this type of lift loss results. Recirculation is a similar phenomenon except that the helicopter is commonly operating in a confined area, say a tight canyon. Confinement increases the instability of the air mass by the action of the rotors, and lift is lost. The only way to recover in these situations, after maximum power is used, is to partially lower the collective and move the helicopter into forward or sideward flight in order to escape the disturbed air mass. Overall, the importance of minimizing hover time cannot be overemphasized.

Landing Zones

The selection of a good landing area is based on a number of factors. Try to establish a landing area that gives maximum advantage to the helicopter in taking off into the wind and making the transition to forward flight. A run-out is prudent for hovering tactics, in case there is a loss of lift due to recirculation of air flow, downdrafting, or loss of engine power. The helicopter may be able to immediately drop into forward flight, gain airspeed, and recover maneuverability.

If possible, locate a spot on an exposed knob with a 360° range of approach and take-off options. A 20 meter minimum width (in the case of a Huey) approach and departure path, as long as possible, should be cleared, to avoid the safety compromises of vertical take-offs.

Helos should be able to land and take off into the wind to increase lift, especially at higher elevations. Avoid sloped landing zones. If the only possible spot is in a canyon or on bottom land, remember that a vertical takoff is considered dangerous at any elevation, and that a small helicopter must be at least 100 meters above the ground in order to safely autorotate or glide back to the ground in case of power failure. Avoid dead air spots on the lee sides of ridges or canyon bottoms. The best path for takeoff on level ground should be at least 100 meters long and slightly downhill. In glacial cirques and canyon bottoms, make sure there's not a downdrft from a neighboring ridge. If the canyon is deep, the helicopter will need a long forward run to gain enough altitude to pull out over the rim.

A last resort is a "hover hole" helispot, where the pilot must slow to a hover above the landing area and then descend. When taking off, he must gun the engines to power straight up until clear enough to begin forward flight. The dangers are obvious.

Mark the landing zone in some manner. An *H* pattern or *T* pattern is considered standard. Colored or reflectorized material may also be used. Wind direction should always be indicated with smoke, streamers, hand signal, or by radio contact. Packs and rescue gear should be weighted down and loose natural debirs removed to prevent rotor or engine damage.

General Helicopter Safety

Before approaching in a helicopter, make sure the pilot has got the ship down on the landing area the way he wants it. Often he will need to jockey the helo around a bit before he feels comfortable enough to ease the power off, a noticeable change in engine pitch. The almost universal "thumbs up" sign can be given by either you or the pilot. If the pilot is not ready for you to approach, he will let you know in a hurry.

You should approach or leave a helicopter only at an angle visible to the pilot. As you approach the ship, squat in low profile to maximize head and rotor clearance. Don't look at the ground, though — keep watching the pilot. Depending on the landing zone and other flight factors, he may have to hold a bit of power on. If so, the helo may pull off suddenly due to precarious positioning, or if it goes into ground resonance (a wheel configuration with three or more blades can, when experiencing shocks of a certain nature, begin to vibrate due to harmonic imbalance between landing gear and rotor blades). In either of these cases the helo must become airborne. The same cautions about sudden lift-off are particularly pertinent to landings on snow and ice.

For one-skid or hover boarding and exiting operations, extra caution should be used, and a few signals and procedures discussed beforehand with the pilot. Stepping in or out of a helo balancing on one skid should be done very e-a-s-i-l-y to avoid a radical weight change on one side of the ship.

Heli-jumping is more serious yet, and before attempting it one should have a helmet and solid boots at the very least. Jumping is much faster and less complicated than rappelling or hoisting, and is a reasonable technique if you work with an adequate safety margin and within the limitations of the particular helicopter.

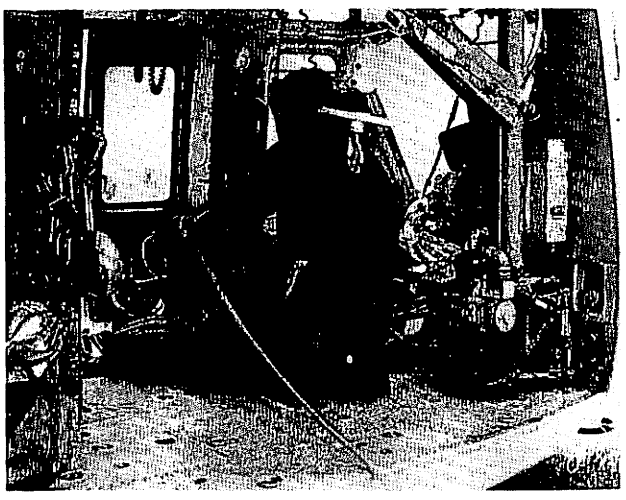
A general rule of thumb is to try to find or make a place to land, rather than performing one-skid or hover flying circus routines. Any helicopter work is hazardous, so if you can decrease the uncertainty by moving an injured victim to a proper landing area instead of picking him up with a hoist, it is advisable to do so. A routine evacuation for a broken leg can transform into tragedy in an instant if the helicopter goes down for any reason. Landing zones are a given in helicopter work. Master their use. If the victim is critically injured, it may be decided that touching down or hovering for only a split second is the answer. Think it through.

Picking a landing spot (or helispot, as it is sometimes called) can be tricky in flat terrain with intermittently thick forest. The width of the landing zone is gauged by pacing off the length of the rotors plus an additional half-length. However, if obstructions surround the area, the helo may still be unable to land because of its power limitations. Indicate wind direction with smoke, dirt kicked or thrown in the air, a small smoky fire, or streamers; or, put your back to the wind and extend both arms parallel. If the landing zone slopes, be sure to approach or leave the helicopter from as crouched a position as possible. When the pilot is idling or shutting down, the rotors lose their momentum; just before they stop they often dip very close to the ground, or the wind forces them down. Approaching on the uphill side is therefore life-threatening.

Once around the helicopter, remember the danger zone of main rotor clearance and that of the tail rotor. There is no reason, ever, to go back past the skids or the side doors. If you must change sides, be sure to walk around the front of the helicopter, where you and the pilot can always see each other. While loading or unloading, try not to step or stand inside the skids. If the pilot has to suddenly pull on power and lift off, you probably won't want to be between the skids or back by the tail rotor.

Wear goggles and a hard hat with a chin strap that fastens. Always buckle in when in the ship.

On any SAR, a safety or helispot coordinator should be officially designated. This person has a hard hat, goggles, and radio. He focuses his attention strictly on loading and unloading people and equipment safely, keeping in mind the helicopter's safety as well. This person can weigh loads, schedule flights within the weight limits the pilot has given him, load people, brief them on how to open doors and on emergency procedures, keep the helispot secure, and in general be responsible for a safe operation. On big operations, everyone tends to be preoccupied with what he or she is going to do upon arrival at the rescue site, and safety is often forgotten. Hence, one safety officer whose main job is to help the helicopter and its passengers think about safety is advisable.



Stacking a belay rope in a canvas bag after a mission. Note deck rings, used as anchors, hoist on right, and open door (removed just prior to mission). Photo Kenneth Andrasko

Sling Loads

If your helicopter is equipped with a sling loading hook, all the better. Sling loading people underneath a helicopter on a mechanical hook is, to say the very least, extremely unsafe, but you can still fly a large amount of equipment into a site efficiently. For example, on a technical rescue on a cliff face with no landing site nearby, rescuers could rappel to the brink, or they could be flown into a landing spot some distance from the scene with only basic bivouac gear. Meanwhile, most of the rescue equipment could be sling loaded directly into the rescue site at the lip, thus saving all the time and effort necessary to carry it.

Pilots tend to look at sling loading as consisting of two basic problems: the weight of the load, and the aerodynamic properties of the load. Weight limitations are determined by the helicopter type and related flying factors of altitude, temperature, and winds. Aerodynamic considerations question whether the load will fly evenly or begin to swing, rise, or become involved in some violent mongrel motion. The length of the sling rope varies, but is usually over 70 meters. The pilot's experience dictates many specifics the rescue leader needs to know.

A load of myriad bits and pieces like packs, ropes, and litters, is fine if each piece is weighed separately and the whole is secured together by a cargo net, parachute canopy, or similar catch-all. A swivel is necessary and is hooked directly into the cargo hook below the helicopter. The sling rope is attached between the swivel and the load. The load, sling rope, and swivel are neatly laid out in front of the helicopter, in the pilot's view. The swivel is attached while the helicopter is sitting on the ground, and is brought to the cargo hook directly from the front, not over the skids or from the rear of the ship.

Once the signal is given, the pilot slowly raises the helicopter until the sling rope is taut, and he gradually compensates for the load's weight. Usually he will not want to fly passengers while carrying sling loads. On the ground at the drop site, someone wearing a helmet and goggles assists the pilot in positioning the load and giving the drop signal. If possible, avoid having someone working with the load under the helicopter. If someone must secure the load once it is dropped, he must have a helmet and goggles, as the swivel and sling rope are dropped along with the load.

More than one sling load can be carried at the same time, in tandem. The heaviest load should be placed at the bottom and a short sling rope (one meter) is used to attach each succeeding load to the heaviest.

Sling loading has been a standard way to move objects and equipment for many years in firefighting and commercial enterprises. It is a proven method and one which the SAR team should actively cultivate. Equipment is also easily air dropped if fragile items are packed properly.

One-Skid Landings.

One-skid landings occur when one skid (or a part of it) or wheel of a helicopter is placed on the ground and the helicopter retains high rotor rpm's to keep it level in the air. During the loading or unloading process everyone should move efficiently, and be mindful of their tasks, and change position slowly and smoothly. The pilot needs time to adjust his controls for the increased or decreased load coming onto or off of one side of the helicopter. The last thing a pilot wants is a clumsy 110 kg rescuer pumped full of adrenalin and suffering from mountain sickness or fleas.

Close all doors securely, and make sure nothing will fall out or inhibit the pilot's control. This is especially critical in small helicopters, without extra crewmembers to double check for mistakes. Remember, *you* are riding in the ship! Extreme care must be taken when there are dual controls and a non-pilot is sitting in the co-pilot's seat. Any slight bump of the controls as someone gets in or out can result in disaster.

Frequently, the tightness of the landing area where a one-skid takes place is steep or complicated terrain. Do not run uphill onto the rotor blades, or scramble out of the way along a rock arête where one slip will mean a long fall. Hold your position and wait for the ship to complete its task and take off. Protect yourself however possible from the usual hazards, which would normally be noted but are not always readily apparent when a helicopter's engine is screaming full-throttle one meter away from your head on the top of a pinnacle.

Helijumping

Helijumping officially began in 1947 in conjunction with fire fighting activities. Like any new program, it had its difficulties, and was prohibited for a few years. In 1957, the program was reinstated under United States Forest Service regulations with standardized techniques. Helijumping is still infrequent, due to increased hazards to the fire fighter, but the techniques are sometimes used by SAR personnel, and should not be wholly discounted.

Under the Forest Service guidelines, the jumper wears a thick, padded, two-piece suit with break-away zippers. The suit includes heavy gloves and a motorcycle style helmet with a caged face mask. Sturdy high-topped boots are also required. All this paraphernalia provides safety to the jumper, who often launches into brush and small trees. Most SAR units do not have this gear available, but under some conditions, when a victim's life is in danger, rescuers will jump anyway.

The critical factors are a helicopter that can safely come to a complete hover, and an adequate jump spot. If possible, select a flat area which is open and bare of stumps, logs, and rocks. The maximum height of jumps into open ground should be under two meters. Jumping into brush and trees, therefore, should only be done with approved gear. If a flat area cannot be located, choose a slope which is under 45°, at a place where the helicopter can continue across the slope.

The jumper goes out of the helicopter on the uphill side. Check the area's run out, especially if it is a rock slab. If one must jump on a slab, it should not slope more than 20° or 25°. If the slab is close to a cliff or broken area, it has to be avoided. Never jump onto ice rock or any appreciably sloping snow or ice, no matter what. Jumping onto a glacier is possible, but remember the possibility of breaking through into a hidden crevasse. Now you see him; now you don't.

After the spot has been selected, let the pilot hover to check the area, pull into an approximate position as a test run, pull off, and go around for the jump pass. If there is some question about the jump site, use a pack as a test. It is much better to lose a pack than to injure a partner. Before anyone exists, the pilot and jumpers must agree on the jump location, tail and main rotor clearance, stability of the helicopter, minimum risk posed by ground hazards and vegetation, jump height, and general overall safety.

The individual helicopter will determine which side is used and how many jumpers can go at once. The pilot's experience is law. Some helicopters need a jump step with a hand grip installed before any jump could be considered safe. Others, like the Bell Jet Ranger (206A), can be jumped from with standard skid gear. The doors must be either pinned open or removed prior to any jump.

The general procedure for executing the jump is as follows. At the pilot's signal, the jumper prepares to jump. He unfastens his seat belt, refastens it behind his back, and prepares to step out to the skid step or onto the skid itself. The jumper constantly watches the pilot. At the pilot's signal, the jumper swings one leg out at a time onto the step or skid, keeping his shoulders well back toward the body of the helicopter. The closer the jumper's weight is to the helicopter's center of gravity, the easier and safer the jump becomes. When he is in position, he acts on the pilot's final signal, and he *steps* (*not* jumps) off the skid gently, avoiding unnecessary forward momentum.

After leaving the skid, the jumper keeps his legs together and arms folded against his lower chest, with elbows snug against the body and chin tucked into the chest. Upon contact with the ground, the feet and knees absorb the shock, and he remains in a prone position, trying not to roll, until the helicopter has passed the jump spot. One should never jump with a pack, climbing hammer, hardward sling, ropes, knife, or other survival gear on his person. Everything else can be dropped before or after the jump has been safely completed.

After the helicopter is clear from the area, the jumper uses a "thumbs up" or similar signal to tell the pilot he is all right.

Helicopter Rappelling

Rappelling from a helicopter on a static rope is another tool which increases SAR operation efficiency. Helicopter rappelling can be performed, and should be considered, regardless of whether or not a helicopter is equipped with a hoist. Rappelling has certain advantages over hoisting: it is faster, is safer (rope vs. cable), requires no mechanical winch systems, and is more accurate, as the rappeller can control his own rate of descent and landing point.

An overview of a few standard systems illustrates some of t possiblities.

The anchor point of the rappel rope should be bomb proof, needless to say, and its use in accordance with the aircraft manufacturer's specifications and recommendations. Whenever possible, use existing deck rings or structural members, as any addition or modification requires FAA approval that the change is in concert with the manufacturer's use stipulations. Deck rings rigged properly and linked together into a self-equalizing unit form a simple and safe anchor which is readily set up. The hoist arm has also been used to anchor the rappel ropes. The U.S. Forest Service has developed a simple anchor bracket that attaches to the roof of a Bell 212, which has worked well. If there are doubts about a potential anchor point or system, check with the manufacturer before using it.

Once an anchor has been established, there are number of rappel systems to choose from. The Sky Genie is an elongated metal spool that the rappel rope is wrapped around. Increasing the number of turns decreases the speed of descent; however, the rappeller can stop or control his speed as he wishes. The Sky Genie should be attached to a rappel seat or harness with a locking carabiner.

One significant disadvantage, however, is that the rope must be a special braided nylon, not the kernmantle rope generally used in mountaineering. Laid rope such as Goldline also will not work well in the system. The rope used is 13 mm (½") diameter and very strong, with a tensile strength of 2600 kilograms. It is kept loosely stacked in a drop bag, which is jettisoned from the helicopter to deploy the rope.

In the military procedure for a Sky Genie rappel, one end of the rope is secured to the anchor point. The rappeller puts on his or her harness and attaches the Sky Genie to the rope, while still tied into the helicopter in some manner. The helicopter comes to a safe hover. At the aircraft commander's signal, the drop bag containin the rappel rope (usually 30 or 80 meter lengths) is, in the case of a Huey helicopter, tossed out the side door over the skid. Once the bag is on the ground, the rope is checked for any kinks or knots. If everything is in order, the rappeller unbuckles his helo safety belt, steps slowly out onto the skid, receives a final safety check, and upon an "o.k." from the pilot via the crewchief, begins a reasonably fast rappel, although not fast enough to cause heat damage to the rope.

As he descends, he watches for kinks or snarls. If the system were to get jammed and he could not free it, he would have to be promptly flown to a landing area and set down. Once he has reached the ground, he quickly unclips and the rappel rope is dropped down to him. It usually takes less than one minute for the full cycle of hover, rappel, and return to forward flight. Rappels are routinely made up to 250 feet with this system.

The U.S. Forest Service uses the Sky Genie for rappelling both firefighters and equipment into remote fire sites. So far over 5000 rappels have been accomplished with no major injuries.

Another system uses a rappel seat, a figure eight descending ring, and standard kernmantle or Goldline rope. The Los Angeles Sheriff's Department and the Montrose Search and Rescue Team use this system as a matter of course. The 13 mm (½") Tubbs braided nylon rappel rope, either 30 or 60 meters long, is hooked onto a special swivel hook on the Sikorsky CH-34s hoist system and then dropped. The figure eight descending ring is placed on the rope by the crew chief, and then handed back to the rappeller, who attaches it to his rappel seat. On signal, the rappeller steps out the door and descends quickly.

Standard six carabiner brake systems have also been used on mountain lay or kernmantle ropes in a manner similar to that described above. The six biner brake system is not as fast or as easy to place and remove as the Sky Genie and the descending ring.

LOOK FOR MORE . . . .

HELICOPTER TECHNIQUES

IN FUTURE ISSUES. . .

ACCIDENT REPORT FORM

D WILLIAMSON, CHAIRMAN, SAFETY COMMITTEE OF **THE AMERICAN ALPINE CLUB, 113 East 90th Street, New York, NY 10028,** is soliciting statistical and narrative accident data for mountaineering accidents. Their annual **Accidents in North American Mountaineering Report** deals specifically with climbing accidents as opposed to searches or accidents incurred by hikers. Fairly accurate user day statistics for specific climbing areas have begun to be developed and your help as to current data, reporting data, and use of data suggestions would be appreciated. Please complete the following and return to Jed Williamson.

ACCIDENT REPORT FORM

Description and Purpose. This form is to be completed by a person familiar with the circumstances of the particular mountaineering accident. If possible, the person(s) directly involved should either fill it out, or at least review it. As the primary purpose is the ***prevention*** of accidents, full narrative descriptions and suggestions for future climbers are welcomed. If persons involved in the accident do not wish to have their names recorded or printed, such requests shall be honored by the editor of the Annual Report.

1. Report Completed by _____
(Name and Address or Affilliation with Accident)

2. Date _____ 3. Geographical Location & Route of Climb _____

4. A. Names ***(or number)*** and Age of all Persons Directly Involved (use extra sheet if necessary):

NAME (OR NUMBER)	AGE	INJURY					
		NONE	SLIGHT	SERIOUS	HOSPITAL	UNCON.	FATAL
1.							
2.							
3.							
4.							

B. Total number of persons in party or class _____

5. Details of Accident: A. Terrain: ☐ Rock ☐ Snow ☐ Ice ☐ River ☐ Unknown

Weather _____

C. Time of Accident _____ *D.* ☐ Ascending OR ☐ Descending

E. Who investigated and carried out rescue operations? _____

F. **Immediate Cause** *(You may check more than one)*

- ☐ Fall or Slip on Rock
- ☐ Fall or Slip on Snow
- ☐ Fall or Slip on Ice
- ☐ Falling Rock or Object
- ☐ Avalanche
- ☐ Exceed Abilities
- ☐ Exposure and/or Hypothermia
- ☐ Stranded
- ☐ Failure of Rappel
- ☐ Loss of Control - voluntary glissade
- ☐ Failure of Piton
- ☐ Failure of Nut or Chalk
- ☐ Pulmonary Edema
- ☐ Frostbite
- ☐ Illness
- ☐ Fall into Crevasse
- ☐ Lightning
- ☐ Faulty Use of Crampons
- ☐ Failure to Follow Route
- ☐ Skiing
- ☐ Prussik/Ascending Device Failure
- ☐ Heat Protration
- ☐ Other (be specific) _____
- ☐ Unknown

G. **Contributory Cause** *(You may check more than one)*

- ☐ Climbing Unroped
- ☐ Exceeding Abilties
- ☐ Inadequate Equipment
- ☐ Climbing Alone
- ☐ Bad Weather
- ☐ Failurer of Piton
- ☐ Failure of Nut or Chalk
- ☐ Darkness
- ☐ Party Separated
- ☐ Exposure and/or Hypothermia
- ☐ Old Rope
- ☐ No Hard Hat
- ☐ Failure to Test Holds
- ☐ Placed No Protection
- ☐ Waste/Harness Failure
- ☐ Other (be specific) _____

7. Affiliation with Climbing Group or Sponsorship by School. This Climb was:

A. Affiliated with or sponsored by _____

B. ☐ Unaffilliated C. ☐ Unknown

8. Estimate of Experience: ☐ None or Little (first year) ☐ Moderate (1 to 3 years) ☐ Experienced (3 or more years) ☐ Unknown

Significant Climbs: _____

9. If there was **equipment failure,** please list the type of equipment, type of failure, and the manufacturer:

10. Narrative Description of Accident *(use extra sheet if necessary):*

11. Analysis of Accident: What knowledge and techniques will help prevent future accidents? *(use extra sheet if necessary)*

Personal Observations Concerning the Mt. Shasta Events of 18-22 February 197?

Article By Fred Camphausen
824 Graaf, Ridgecrest, CA 93555

Analysis By George Barnes
Bay Area Mountain Rescue Unit

SUMMARY

Five climbers were hit by a vicious storm on the Whitney Glacier of Mt. Shasta on 19 February 1977. The storm resulted in the death of Geraldine ("Dina") Lombard sometime during the night of 20-21 February. Participants in the intended climb of Mt. Shasta by the standard northern (Whitney Glacier) route were:

Dina Lombard (+)(45) of Mountain View, California
Bill Robinson (43) of Palo Alto, California
Phyllis Olrich (about 27) of Palo Alto, California
Paul Venutti (about 26) of Palo Alto, California
Fred Camphausen (43) of Ridgecrest, California

Dina was known to be a capable climber by the remaining participants. I believe that the physical cause of her death was: exhaustion and cold exposure induced by an unexpected storm. I further believe that actions taken by all participants during the course of the emergency were prudent and that nothing our group could have done would have predictably altered the tragic outcome.

MAJOR DAILY EVENTS

17 Feb.: Group of five arrived at roadhead and bedded down.

18 Feb.: We departed the roadhead and hiked to our 10,100 ft. camp on the Whitney Glacier.

19 Feb.: Four departed for the summit climb. Two turned back with altitude sickness at 3 pm. Dina and I reached the summit at 4:15 pm. Storm commenced at nightfall and we settled in for a bivouac.

20 Feb.: Our feet were frozen in the bivouac. The storm continued. We attempted to get down but Dina collapsed and a snow cave was dug for her. I went down to camp for supplies but was unable to immediately return with them.

21 Feb.: I climbed back up and found the snow cave destroyed by wind and Dina deceased. Returned to camp.

22 Feb.: I departed from camp and walked out to the roadhead.

18 FEBRUARY (Friday)

After dinner at the Piermont Inn in Mt. Shasta City on 17 February, the five of us drove to the normal summer roadhead at a logging road (5360 ft. elev., W½ of Sect. 18, R3W, T42N). We arrived there at 8:30 pm and an overnight camp was made near the station wagon. On the morning of 18 February we had breakfast, packed our gear, and departed along the trail which headed south along Bolam Creek toward the Whitney Glacier.

The forest and ridge between Bolam and Whitney Creeks required the use of snowshoes. A campsite was reached at about 5 pm. The selected location for the two tents was in a shallow bowl within the eastern margin of the Whitney Glacier at 10,100 ft. elevation. The weather was mostly clear and cloudless, with light wind, until about 4 pm when the wind strengthened and altostratus clouds appeared to be moving in from the south.

19 FEBRUARY (Saturday)

Two rope teams of order me and Dina, Bill and Paul, departed camp at 9 am to climb the summit of Mt. Shasta. Phyllis complained of weakness and remained in camp. The initial route held along the snow gullies on the east side of the glacier. Weather was cloudless or with very thin cirrus, with wind gusts to 20 kt, and these conditions persisted until the afternoon. The steep part of the glacier beginning at about 11,000 ft. presented crevasses, patchy ice, and an icefall. After checking the icefall for a passage, the four of us elected to proceed up along the crevassed west side of the glacier to a point above a narrow bergschrund. Our ascent then bore southeast toward the ridge that arches down to the central part of the glacier from the Red Banks. We stopped and ate lunch. The wind was now a bit stronger with occasional spindrift snow which streamed close to the surface. Upon reaching a crossing point on the ridge, at about 2:45 pm, Bill and Paul decided to turn back since they had developed headaches. They were last seen on the ridge at about 12,700 ft.

The two of us continued climbing along a snow rib directly north of Red Banks toward a junction with the Avalanche Gulch route to the summit. Crampons were removed for the south-facing slopes and the dry Mt. Shasta summit was reached at 4:15 pm. The winds on the summit were strong, perhaps 40 kt gusts, and we stayed only a few minutes. Distant mid-altitude cumulus clouds were seen in all directions but none were near the mountain. The return to the glacier was by way of a snow-filled chute that reached the upper end of the glacier. The dividing ridge on the glacier was crossed and the wind at this time was occasionally blowing snow above eye level. We reached a point above the bergschrund, with the steeper glacier below, and ice was encountered at about the time when the wind became very strong. Wind-blown snow from the south (over the Shastina Saddle) made it difficult to see the surface and it became prematurely dark, as if we were suddenly in a thick cloud. The time was probably about 6 pm. We had originally hoped to have crossed over the narrow ice bridge which spanned the largest of the crevasses before needing the flashlights since this one move would require a careful belay.

Dina proposed a bivouac. She indicated her concern with descending on ice under the prevailing conditions. We had wh[illegible] felt to be adequate warm clothing for a bivouac so I told Dina [illegible] head up toward some nearby dry ground and rocks running downslope along the west edge of the glacier. No consideration could be given to making a cave in this area since the ice and snow above the bergschrund was very thin. The rib of rock gave us protection from the direct wind although we were still buffeted by winds coming over the rock. The ground contained small ledges of frozen rock debris which I tried to scrape flatter with the ice axe. We sat on the rope and an Ensolite pad. Few additional ledges were suitable for holding our packs and other gear; the slope was generally about 45 deg. I took some runners and anchored Dina and myself to a boulder in the wall behind us.

Extra clothing on hand included ample down-filled articles and these were donned. Dina wore a lined wind parka and I put on a cagoule over by down parka, nylon wind shirt, bulky sweater, thermal shirt, and T-shirt. We both wore wool pants and thermal underwear, and wool caps and parka hoods. Dina also had a face mask. Crampons and boots were removed and carefully stored. The down booties were placed over our socks and we then put our feet inside Dina's large Synergy model pack. We exchanged gear between the two packs so we could place soft items under our feet. Dina also wore laced-down nylon overboots over her booties.

At first our feet became quite warm. We remained generally warm by making frequent exercises and by massaging. Spindrift snow rapidly piled up on us so we had to keep brushing it away. Eventually our feet began to cool. This came about when fine snow found its way into the pack. We feared losing the pack and part of our gear in any attempt to remove the snow with our mittens on. Exposure of our hands to the wind with only our undergloves quickly made them numb. We decided that we should risk our feet to the cold, if necessary, but maintain our general warmth and the use of our hands. We could feel [illegible] frostbite spreading from toe-to-toe, and then to the heels.

Dina lost a down mitten to the wind but this was replaced by a spare Dachstein mitt. We were both hit on the head several times by volcanic rocks that were thrown by the wind.

Available food consisted of a large supply of cashews, sunflower seeds, Soyettes, banana chips, and candy.

Unavoidably, most of these small bits of food were lost to the wind when we attempted to eat them with mittened hands. We each had two pieces of candy but then I accidently spilled the rest and they were lost. The amount of food we consumer was gligible.

20 FEBRUARY (Sunday)

The storm continued undiminished when daylight came and we remained in our places until about 8 am. Our wristwatches, inappropriately retained on our wrists, frosted over and also produced unnoticed frostbite of the adjacent skin. The difficult procedure of getting back into our boots, gaiters, and crampons was begun. Dina's feet were swollen and her down booties had to be cut away with a knife. Her boots also needed cutting along their tongues to enlarge them sufficiently for wearing. Mittens could be removed only briefly to lace boots, zip up and snap gaiters, and tighten crampon straps. It took us about two hours to prepare for moving.

We roped up and I was belayed down along the loose scree below the rock rib so that I could explore the possiblity of climbing directly down to the glacier. This was the first of three attempts to leave our bivouac, each failing for one reason or another. The ice slope below the scree steepened to near vertical and the thought of sliding down it to the glacier was abandoned since the glacier's distance could not be seen. I returned to wait with Dina for an hour or so before making another attempt to leave.

I next started climbing upward in hope of gaining the Shastina Saddle and traversing downward around the south ridge to the Horse Camp cabin. Right away the windblown snow stung the eyes and I was unable to withstand the force of the wind.

The third attempt involved crossing over the rock and heading back toward our original route on the glacier. This came to near disaster when (apparently) a gust of wind knocked Dina down the ice slope and I was pulled over backward by her fall on the rope. We were both able to arrest the slide and we returned to the bivouac spot.

We rested for a long time. I felt that we would not last through another night in the semi-exposed bivouac so we again tried to reach our original route. We started out as before, descended, and then crossed below the bergschrund where it was narrow. There was an accumulation of deep snow below the bergschrund and crossing it took a lot of energy. Dina frequently stopped but I couldn't see her since we were separated by about 60 ft. of rope. I went back and shortened the rope to about 15 ft. She stopped again and I saw her digging into the snow with her hands. She said that she couldn't stand up anymore and had to get into a snowcave. I started digging with her and after a long time we had a fair sized cave. She crawled into it and I told her I would try to get down to get the stove and food and then return. She requested that I also bring back an Ensolite pad. I spread the rope out for her to sit on. (We no longer had the small Ensolite pad used in the bivouac as it froze into the ground and tore into pieces when we tried to remove it.) I placed her pack in the entrance to the cave and marked it with her ice axe.

I probed the snow directly down the slope and came to the edge of a crevasse. Moving to the right (east), I came to the ice bridge and I was elated at finding it in the whiteout. The strong winds made it necessary to straddle the bridge and slide along it to the other side. There were two more crevasses to wind around, followed by the steep ice pitch. Descent to the lower part of the glacier was then easy. Along the glacier, I fell up to the armpits into a narrow crevasse and rested there for a long time. Rocks and boulders on the glacier became visible and, although darkness had come, I made it back to the tent in good time.

Nobody was in camp. Our tent remained but the tent used by Bill and Phyllis was gone. I got into the tent, started the stove, and melted snow to make hot drinks. Dina and I hadn't taken a drink in 36 hours as we weren't thirsty until the bivouac and by then the water bottles were frozen solid. I wrote a note about the cave and went outside to hang it on the tent and to put on the crampons. I tried to move around in the wind but didn't have the strength to stay on my feet. So I got back into the tent and removed the boots. My toes were frozen. I fell asleep right away but the wind slamming against the tent later woke me up and I spent most of the night worrying about Dina.

21 FEBRUARY (Monday)

The wind was unchanged when light came. Spindrift had leaked into the tent through the teeth of the zipper in the doorway. After rewarming the water in the bottle and melting snow for breakfast, I pulled the boots on over the feet which were now swollen. My toes had begun hurting and were partially thawed; I found that I could bend them slightly.

It was after 9 am when I left the tent and headed back up the glacier. I looked ahead and sometimes imagined that I saw Dina coming down. The visibility was better at first but it became a total whiteout again by the time I passed the easy rock-lined gullies. Wind gusts were strong and I had to crawl over short stretches on hands and knees. The steeper slope indicated that I was near the pitch below the crevasses, but I couldn't find the place where it was climbed. I finally started upward and crossed a heavily snowed-over crevasse, then I could see the large open crevasse which was bridged.

I crossed the bridge and then ascended until I reached snow of about the same steepness and depth as where we had dug the cave. The poor visilibity made it necessary for me to make several traverses and I finally find Dina farther to the west than where I thought she would be. She was lying down in the snow, dead. Her pack, which had originally blocked the snow cave, was gone. The wind had apparently blown away snow from above the cave until the cave was obliterated. I got back down to camp just after nightfall.

22 FEBRUARY (Tuesday)

The wind diminished during the early morning. I broke camp and descended generally along the upward route, resting very frequently since I carried all of the gear including much of Dina's. Clouds up the mountain were behind me and it became frequently sunny. I put on snowshoes when I reached treeline and I continued down to the roadhead. Just after arriving there a helicoper carrying Paul and a sheriff deputy landed beside me while, simultaneously, Bill and Phyllis drove up in their station wagon. I was very tired.

I was told that I was spotted by Bill and others from an airplane while I was coming down off the mountain. The aircraft was flown over from the Bay Area by a member of the Bay Area Mountain Rescue Unit (BAMRU). The weather had then cleared sufficiently for using the helicopter and the BAMRU personnel were ready to begin searching the mountain. I was driven by Bill and Phyllis to the Mt. Shasta Hospital where I was advised to see Dr. Schnack in Weed. We first went to rescue base next to the high school and I made a quick trip in the helicopter to point out the location of Dina's body. She was only about a hundred yards from our first night's bivouac. I then was driven to the clinic in Weed. Dina was returned to Mt. Shasta City in the early evening.

ANALYSIS By George Barnes

(1) The deceased apparently died of hypothermia contributed to by exhaustion, bad weather, lack of shelter, and lack of food. The party apparently misjudged the strength of the deceased although the high winds that arose were apparently not accompanied by clouds that would have given clear warning of deteriorating weather. The party was experienced but the deceased had a documented history of pushing very hard for high peaks in the U.S., Mexico, and Europe, often becoming exhausted on the summits, and minimizing the potential difficulties in winter ascents. (2) The party of three who descended the mountain for help displayed good judgment and skill in avoiding becoming casualties themselves and then taking significant steps to initiate and assist search and rescue operations. (3) Once a serious problem arose, the deceased's rope partner displayed exceptional strength and endurance in his rescue and self-rescue efforts. (4) Not only were weather forecasts for the area significantly in error but reports given to pilots of existing weather were equally in error. Further, reports by using reliable sources looking right at the weather were just as wrong (estimates by officials late in the morning of 22 February concerning flying conditions around Mt. Shasta). To get reliable weather reporting, an observer trained in the type of operation proposed must be at the scene of the search/rescue operation and his estimates included with other reports.

NEWS AND RUMORS — continued

Many of the Latinos who are criticizing the film, like the Committee on Chicano Rights in San Diego, simply object to any portrayal of Border Patrol agents as heroic. They regard the agency — I believe unfairly — as little more than an American Gestapo, heartlessly harassing innocent men and women who only want to better their lives. Ironically, even as these Chicanos in San Diego picketed the film's SanDiego premiere, other Latinos were sponsoring a benefit premiere in Hollywood. Members of the Latino actor's group Nosotros approved of the film because it provided many roles for Chicano and Mexican actors, and because the Mexican characters in the film are not portrayed in a negative or insensitive manner.

While I would agree that "Borderline" is not anti-Mexican, the film troubles me nevertheless. For, while it correctly points towards some tragic social problems, it grossly oversimplifies them as well. I am afraid that it will leave moviegoers in Peoria convinced that all you need to stop illegal immigration is more Charles Bronsons patrolling the border. I have been writing about border problems for 10 years, and have never met a Border Patrol agent who believed that more men and equipment would make any real difference in stopping illegal immigration, except in making their difficult job a little easier.

Most Border Patrol agents I know remind me less of Charles Bronson's man-of-action than of Lee J. Cobb's Willy Loman in "Death of a Salesman." They are hard-working, well-meaning guys who believed too deeply in a system that has failed them and used them. "Borderline" would be a better, more informative film if it allowed for subtleties like this, as "Alambrista!" does. Unfortunately before "Borderline" flops at the box office and gets recycled onto televiion, it will probably misinform a lot of persons into thinking that there are easy solutions to what it portrays as simply a police problem. This simple-minded attitude is already far too commonplace, and limits constructive discussions of long-range solutions like economic development in countries like Mexico. Too many proposals to "solve the illegal-alien problem" — laws to prohibit their employment, ban their children from public schools, or turn them away from public hospitals — are based precisely on this over-simplified thinking. In reality, such quick and easy "solutions" will do no more to stop illegal immigration than the Volstead Act did to stop the imbibling of alcoholic beverages. All that this country's ill-fated experiment with Prohibition in the 1930's did was drive a legitimate economic demand underground, creating an environment where criminals could profit off it, becoming more powerful and sophisticated in the process. The one lasting legacy of Prohibition is organized crime as we know it today.

People who see "Borderline" would do well to remember the history of Prohibition before they get too carried away with Bronson's antics. In their struggle against Bootleggers and gangsters, Eliot Ness and the Untouchables were brave and resourceful, too. They won a lot of battles. But they lost the war.

EMERGENCY MEDICINE FOUNDATION ANNOUNCES FUNDING CYCLE

DALLAS TEXAS — Dec. 1980 — The Emergency Medicine Foundation will be accepting applications for grants befinning January 1. The applications will be considered for funding in the 1981-82 fiscal year, and must be received at the Foundation's Headquarters before June 1, 1981. The funding cycle was recently announced by Harris B. Graves, M.D., during the Annual Meeting of the Foundation recently held in conjunction with the Annual Scientific Assembly of the American College of Emergency Physicians.

The Foundation was organized in 1972 by the American College of Emergency Physicians and is the research and education arm of emergency medicine. In 1977 it was expanded to include representatives from the Emergency Department Nurses Association and the University Association for Emergency Medicine. In addition, representatives serve on the EMF Board of Trustees who are leaders in the National Association of Emergency Medical Technicians and the Society of Teachers of Emergency Medicine.

The primary purpose of the Foundation is to improve the availability and quality of emergency services through research and education.

Criteria for grants and applications may be obtained by writing: Emergency Medicine Foundation, Post Office Box 61911, Dallas, Texas 75261, or calling (214) 659-0911.

PIGEON RESCUE UNIT GETS WINGS CLIPPED

By Penny Pagano
Los Angeles Times

WASHINGTON — As the U.S. Coast Guard sees things these days, Federal cost-cutting efforts are literally for the birds.

As the 1981 fiscal year began Wednesday, October 1, the Coast Guard budget was missing all of the $150,000 for Project Sea Hunt, a unique search and rescue project that relied on pigeons instead of people. The pigeons-to-the-rescue squad had been undergoing instense training at the Naval Ocean Systems Center in Hawaii. Preliminary tests at sea had shown that, because of their super-keen sight, the birds could spot persons lost at sea faster than men could. Working in three-bird teams, the feathered searchers operated from a clear plexiglass compartment attached below a helicopter. When they recognized an object in the water — even a small one — with the international orange rescue color, the pigeons pecked a signal switch.

When the budget cut was made, the pigeons were in the final stages of being groomed for trial duty at sea next year, probably in a crowded boating area such as Miami, where rescue searches often are needed. Lt. Phil Sirois, the project's disappointed manager, said Thursday that the pigeons actually stopped work Monday, when word of the budget reduction was received.

Perhaps no one was more disappointed than biologist James Y. Simmons, who initiated the idea and had been overseeing the birds' training in Hawaii. Attempts to reach him were unsuccessful.

Although the project has been halted, some Coast Guard officials still hope the money for Project Sea Hunt will be reinstated in the final budget, still to be approved by Congress.

(Fall, 1980, *Search and Rescue Magazine* article details this project!)

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LIGHT STATIONS — END OF AN ERA

LELAND, MI — 11-18-80 — The end of an era has arrived at the light stations of the Great Lakes.

On Friday, Nov. 14, the last crew to be stationed on an offshore light station was removed from North Manitou Shoals, nine miles southwest of here in Lake Michigan.

The last of the manned lights were closed this year. First to go was the Minneapolis Shoals Light in Green Bay, then St. Martin's Island, and finally Thunder Bay, near Alpena on Lake Huron. The last one to close was "The Crib" at North Manitou.

Manned with a crew of five, the Crib was built in Frankfort and sunk in 20 feet of water four miles southeast off a point off North Manitou Island. In 1934 the first crews began monitoring weather and shipping traffic, and operating as a search-and-rescue station. Three men were on duty, with two on rotating leave. The crews spent two weeks on the light, with one week off.

Traverse City Record-Eagle, Traverse City, Mich.

CLIMBER KILLED IN YOSEMITE

YOSEMITE NATIONAL PARK, Calif. (UPI) — Sept. 1980 — An Austrian climber was killed when he fell 120 feet to a rocky ledge as he neared the end of a grueling four-day ascent of the sheet 3,600-foot face of El Capitan, park authorities said.

Walter Bertsch, 20, Feldkirch, Austria, was about 500 feet from the top of the giant monolith when the fall occurred, park spokesman Herbie Sansum said.

WOMAN FOUND AFTER 8 HOUR SEARCH

SANTA YNEZ — Oct. 1980 — An eight-hour air and ground search for a 36-year-old suicidal woman ended successfully when rescuers found the woman, comatose, but alive in rugged terrain near here. Sheriff's department officials said the woman's stomach was pumped to remove traces of a horse tranquilizer she had taken apparently in a fit of despondency.

The search was touched off at 7:20 a.m. and ended at 3:10 p.m. when the women was found six miles from the closest residence. Participating in the search was the Sheriff's aerosquadron helicopter; and units of the Santa Ynez, Lompoc and Santa Maria Search and Rescue teams. Members of the Santa Ynez unit are sheriff's Explorers and were called out of classes at Santa Ynez Valley Union High School for the search.

N.Y.P.D. RESCUES GIRL TRAPPED IN AUTO

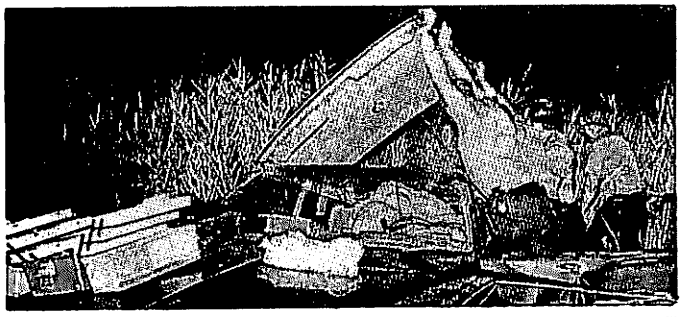
By Wayne T. Parola
Chief of Photo Services,
AAG Photo News
P.O. Box 474, Staten Island, NY 10314

Police officers from the 123 Pct. and Emergency Squad 5 were called upon to free a 15 year old girl who became trapped in an auto after it collided with a van.

Officials stated that Jenine Lampariello of Arden Heights, Staten Island, was returning home along Auther Kill Road with friends, when the car in which she was riding was involved in the accident. After hitting the oncoming van, the vehicle spun a number of times, glanced off of a utility pole, and came to rest at the intersection of Auther Kill Road and Muldoon Avenue.

When police arrived on the scene, they found Ms. Lampariello trapped in the rear seat of the vehicle bleeding from the head and left arm. It was said she had been riding in the front passenger seat at the time of the accident, but was knocked over the seat into the rear of the car upon impact with the van. Responding EMS units quickly began to attend to young Jenine's wounds as officers from Emergency Service Squad 5 began cutting away the doors of the vehicle. An examination by Medics showed that the girl was also suffering from a spinal injury. This meant that the roof of the car had to be lifted so the girl could be removed without additional injury. Using a Hurst Power Tool and pry bars, members of ESS 5 again began cutting away at the vehicle finally removing its roof and freeing Ms. Lampariello.

Having been trapped for just under an hour, the girl was quickly rushed to the emergency room at Richmond Memorial Hospital where she underwent surgery throughout the night. She was listed as being in critical condition. Police are still investigating the accident. ::



Police Officers begin to remove car roof. Note EMT and girl are both covered by a blanket in the rear seat so they would not be injured by flying glass.

Officers and EMT's remove the injured girl, rushing her to hospital.

MARCH ON SAR — continued

surface concave to facilitate extraction. The key to successful high angle ice climbing is not penetration and holding — all t[he] specialized tools do this) it is the ease of extraction whi[ch] conserves energy wasted hanging struggling to release a well placed tool. Vector II is a curved pick with serrated teeth all the way to the shaft. It is excellent for Alpine climbing and for hollow ice but is excelled by Vector I for overall use. A third interchangeable pick is available in the form of a tube pick for brittle ice. Finally there is the Verglas pick which is for general alpine mountaineering use.

A considerable amount of design and development work has been invested in this equipment by Bill Forrest and his 'metal man' Frank Lumpton. On field tests I found the Vector I to be the best piece of equipment I have used since the advent of the 'new ice technology.' The new tools are fitted with newly designed sewn on wrist loops which are superior to any in current use. Probably the most significant aspect of the new equipment is that it carries a life-time warranty to the original purchaser against breakage and a 20 year warranty to institutions and second owners. An impressive statement of faith by Forrest in his new equipment.

GORTEX BIVOUAC SACK

Another Forrest development is the one man bivouac sack with a waterproof nylon base and gortex top. It has a large zipped opening from head to naval with a two way double zip to allow the anchor rope direct access to the waist. If using it with an ensolite pad make sure you place the pad inside the bag. The bag has been tested in conditions from -30°C in winter to the rain of the Monashees in summer and has stood up well. All the seams are taped and the bag is well constructed and roomy. ::

BUSH ON SAR — continued

2. A field commander is appointed by, or with concurrence of, the Sheriff.
3. If the emergency site is known, the field commander selects the coordination center and field command post sites, and requests units for the operation. If the site is unknown, the field commander establishes the search pattern and assigns search areas for units and/or teams.
4. If or when the site is known, the field commander dispatches a "bash" team of the closest qualified personnel to the site — either by air or other form of transportation. Their primary function at the site will be the evaluative report back to the field commander — *even* before beginning emergency care. This reconnaissance is critical to the development of sufficient additional site personnel and support to effectively work the mission.
5. Coordination center and field command post are established to handle the functions described in section A.
6. Debriefing of all team leaders is carried out at the coordination center as they come out of the field and all records and equipment and supply are coordinated for future evaluation, and for the accountability of equipment.
7. The entire mission is critiqued in detail for future reference.

NOTE

This is an OUTLINE. It is usually the case that when developing an emergency plan authors try to apply too much specific detail and the plan then often becomes difficult to manage during an emergency. Implementation of this plan should involve its close study by all persons who might be involved with it. Annexes can be developed for each element of the plan, as can check lis[ts] equipment lists, etc. However, they should be addenda to the pl[an].

This plan is NOT in final form. It probably never will be. It should be in a process of constant study and revision — particularly after it is used on any mission or practice. Thus, the CSRB constantly welcomes suggestions relating to the material presented here. ::

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